

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

**Disclosure related to Environmental & Social Impact Assessment
[ESIA] and Environmental & Social Management Plan [ESMP]**

**Direct Financing
Brick Kiln Sector**

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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

The Indian brick kiln industry is a century-old, labor-intensive manufacturing sector that remains central to the country's construction and infrastructure growth. It is one of the largest brick producers globally, with an estimated annual output of 150–200 billion bricks from more than 100,000 kilns spread across the country. The sector provides direct and indirect employment to nearly 10 million workers, many of whom are seasonal migrants, and consumes approximately 25 million tons of coal each year, making it one of the most energy-intensive small-scale industries in India.¹

Production is dominated by traditional technologies such as the Fixed Chimney Bull's Trench Kiln (FCBTK), which account for the majority of output. These kilns are characterized by low energy efficiency, high coal consumption, and significant emissions of particulate matter, sulfur oxides, nitrogen oxides, and fly ash. The industry is largely informal, with small and medium enterprises (SMEs) forming the backbone of production, often operating with limited access to finance, technology, and regulatory oversight.

India's brick sector is diverse in terms of kiln types, product quality, and production standards. While traditional solid clay bricks dominate, there is increasing interest in cleaner technologies such as zig-zag kilns, vertical shaft kilns, and hybrid Hoffman kilns, which offer improved energy efficiency and reduced emissions. These modern alternatives are gradually gaining traction, supported by policy initiatives and international development programs.

The sector plays a critical role in meeting domestic construction demand but also contributes significantly to air pollution and greenhouse gas emissions. Transitioning to cleaner technologies presents opportunities for reducing coal consumption by 20–30 percent and cutting particulate emissions, thereby aligning the industry with India's broader sustainability and climate goals.

Challenges and Strategic Issues

- **Energy inefficiency & emissions:** Traditional kilns consume excessive coal and emit high levels of pollutants, impacting air quality and climate.
- **Labor conditions:** Workers face occupational risks such as dust exposure, heat stress, and unsafe working environments, with limited access to protective equipment.
- **Regulatory enforcement:** Weak compliance monitoring and informal operations hinder modernization and adoption of cleaner technologies.
- **Technology transition:** While cleaner kiln designs exist, MSMEs face barriers in financing, awareness, and technical capacity to adopt them at scale.

¹ Clean Air Task Force (CATF), 2012, "A Roadmap for Cleaner Brick Production in India". CATF, https://cdn.catf.us/wp-content/uploads/2019/10/21093607/Brick_Kilns_Performance_Assessment.pdf?_gl=1*16buq3n*_ga*NDk3NzA1OTA0LjE3Njk2NzAyMTQ.*_ga_88025VJ2M0*cZkE3Njk2NzAyMTMkbzEkZzAkDDE3Njk2NzAyMTckajYwJGwwJGgw*_gcl_au*MzYxMTEwNTQ2LjE3Njk2NzAyMTg.

MSME 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.

Major brick kiln Clusters in India²

India's Brick Kiln production is characterized by regional clusters where multiple manufacturers and allied suppliers are geographically concentrated. These clusters are energy mapped under Sameeksha programs:

- 1. Punjab Brick Kiln:** Punjab is one of India's leading brick-producing states with about 3,300 kilns spread across clusters in Ludhiana, Moga, Ferozepur, and Jalandhar, producing nearly 19 billion bricks annually. Most units use manual moulding and traditional Bull's Trench Kilns (BTKs), though a few have adopted zig-zag technology. Coal and biomass are the main fuels, with total energy use around 1.5 million toe per year. The sector is dominated by solid brick production, with limited adoption of resource-efficient bricks, and is represented by associations such as the Punjab Brick Kiln Owners Association and AIBTMF.
- 2. Ludhiana (Punjab):** Ludhiana hosts about 330 brick kilns, almost all using fixed-chimney BTKs with some adoption of zig-zag firing. Production is manual and seasonal (January–June), focused on clay-fired solid bricks, with average kiln capacity around 40,000 bricks per day. Energy consumption is high, with specific energy use estimated at 1.27 MJ/kg of fired brick compared to optimal levels of 0.9–1.2 MJ/kg, indicating strong potential for efficiency improvements. Coal is the primary fuel, with annual energy use of about 243,000 tone, and the cluster is supported by associations including the Ludhiana Brick Kiln Association and Punjab Brick Kiln Owners Association.
- 3. Haryana Brick Clusters:** Haryana is a major brick-producing state with about 2,800 kilns concentrated in clusters such as Jhajjar, Sonapat, Faridabad, and Ambala. Production is largely manual, though a few units use extruders, and firing is dominated by Bull's Trench Kilns (BTKs) with limited adoption of zig-zag technology. The state produces around 14 billion bricks annually, mainly solid bricks with some resource-efficient bricks like perforated and hollow blocks. Coal and biomass are the primary fuels, with total energy consumption estimated at 1.12 million toe per year. The sector is represented by the Haryana Brick Kiln Owners Association and AIBTMF.

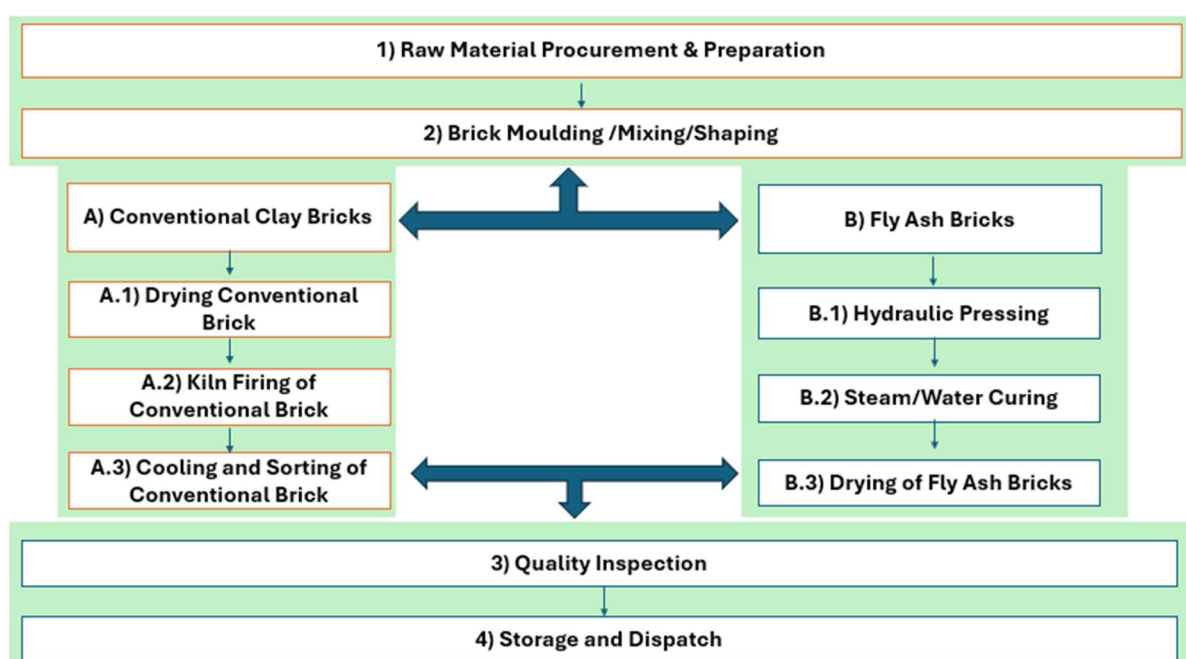
² Ministry of MSME, Govt. of India, 2016, "SAMEEESHKA", Ministry of MSME, Govt. of India , https://www.sameeeksha.org/index.php?option=com_content&view=article&id=218&Itemid=499

- 4. Lucknow Brick Cluster (Uttar Pradesh):** Lucknow hosts about 230 brick kilns, almost all using fixed-chimney BTKs, with around 10 units adopting zig-zag firing. Production is manual and seasonal (January–June), focused on clay-fired solid bricks, with average kiln capacity of 27,000 bricks per day. The cluster produces about 4.8 million bricks annually, consuming roughly 108,000 toe of energy, primarily from coal. Kilns supply multiple grades of bricks—Class-1, Class-2, Class-3, Tamda, Kali Peti, and Tukda—and are supported by the Lucknow Brick Kiln Association.
- 5. Ghazipur Brick Cluster (Uttar Pradesh):** Ghazipur is an important brick manufacturing hub with about 480 units, of which 380 were operational in 2017–18. Nearly all kilns use BTKs, though some have shifted to zig-zag firing. Production is manual, focused on clay-fired solid bricks, with average kiln capacity of 25,000 bricks per day. The cluster consumes over 302,000 tonnes of coal annually, equivalent to about 181,600 toe, with thermal energy accounting for nearly 100% use. Supported by associations such as AIBTMF, Int Nirmata Parishad, and Ghazipur Janpath Int Nirmata Samiti, the cluster produces bricks seasonally from January to June.
- 6. Bihar Brick Clusters:** Bihar is one of India's largest bricks-producing states, with about 6,600 kilns manufacturing nearly 19.7 billion bricks annually. Production is predominantly manual, though some units use extruders, and firing is mainly through BTKs, with limited adoption of zig-zag and Vertical Shaft Brick Kiln (VSBK) technologies. Coal and biomass are the primary fuels, with total energy consumption estimated at 2.6 million toe per year. The sector is represented by the Bihar Brick Manufacturers Association and AIBTMF.
- 7. Ranchi Brick Cluster (Jharkhand):** Ranchi hosts about 200 brick kilns, all using fixed-chimney BTKs and producing clay-fired solid bricks through manual processes. The average kiln capacity is around 15,000 bricks per day, with operations running for seven months annually (December–June). Coal is the primary fuel, with diesel used for auxiliary purposes, and total energy consumption is about 91,600 toe per year. Annual production is estimated at 3.2 million bricks, and the cluster is represented by the Ranchi Brick Fields Owners Association.
- 8. Maharashtra Brick Clusters:** Maharashtra is a major brick-producing state with about 17,000 kilns manufacturing nearly 28 billion bricks annually. Production is largely manual, though some units use extruders, and firing is dominated by clamp kilns and Bull's Trench Kilns (BTKs). The sector is highly energy-intensive, consuming around 2.1 million toe per year, with coal and biomass as the main fuels. Solid bricks are the primary product, and the industry is represented by the Maharashtra Brick Kiln Manufacturers Association and AIBTMF.
- 9. Andhra Pradesh Brick Clusters:** Andhra Pradesh hosts about 8,000 brick kilns producing 9.3 billion bricks annually, using both manual and mechanized moulding processes. Clay is often transported from distant sources and mixed at site, with clamp kilns and BTKs as the dominant firing technologies. Coal and biomass are the main fuels, with total energy consumption estimated at 1.37 million toe annually. The sector is primarily engaged in solid brick production and is represented by AIBTMF.
- 10. Tamil Nadu Brick Clusters:** Tamil Nadu is among the largest brick-producing states in southern India, with about 66,000 kilns manufacturing 12 billion bricks annually. Production uses both manual and mechanized moulding, with clamp kilns and BTKs as the main firing technologies. Coal and biomass are the primary fuels, with annual energy consumption of about 1.5 million toe. Solid bricks dominate, though concrete blocks are steadily gaining popularity in the southern part of the state. The industry is represented by the Tamil Nadu Chamber of Brick Manufacturers Association and AIBTMF.

11. Malur Brick Cluster (Karnataka): Malur, near Bengaluru, is India's largest hub of downdraft kilns, with about 620 units producing clay-fired solid bricks and, in larger Hoffman kilns, resource-efficient bricks (REBs). Downdraft kilns are small, manual, and relatively inefficient, with average batch capacity of 35,000 bricks over an 8-day cycle, while Hoffman kilns are continuous and more energy-efficient. The cluster consumes about 70,600 tone annually, mainly from eucalyptus twigs and firewood, and supplies bricks to Bengaluru year-round. It is represented by the Malur Brick Kiln Association and supported by MSME-DI Bengaluru.

Note: The above cluster list is indicative and not exhaustive; additional clusters could be added by the Implementing Agency for funding under FMAP.

1.1.2 Process in Brick Kiln Industry in Indian Setup³



The process flow illustrates the manufacturing of both (A) conventional clay bricks and (B) fly ash bricks, beginning with raw material procurement and preparation, followed by brick moulding, mixing, and shaping. After this stage, the process diverges into two production pathways: conventional clay bricks undergo drying, kiln firing, and cooling and sorting, whereas fly ash bricks are produced through hydraulic pressing, followed by steam/water curing and drying. Despite the different manufacturing techniques, both types of bricks are subsequently subjected to quality inspection to ensure compliance with required standards. Finally, the approved bricks are moved to storage and dispatch for distribution and use in construction projects.

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**

³ Shakti Foundation, 2013, "Towards Cleaner Brick Kilns in India", Shakti Foundation, <https://shaktifoundation.in/wp-content/uploads/2014/02/CATF-2013-Towards-Cleaner-Brick-Kilns-in-India.pdf>

MSMEs Context. 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 (ESDD) 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 definition 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** involve technology or process where risks and impacts are considered limited, and the magnitude is expected to be low to moderate. The risks and impacts are few in number, 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 **brick kiln 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.

Linkage with GCF (Green Climate Fund)

The **Green Climate Fund** supports projects that reduce greenhouse gas emissions and enhance climate resilience. MSMEs in the brick kiln 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/ BioCNG/ 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 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.
- 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 brick kiln sector plays a critical role in construction but is associated with notable environmental and social risks. Environmentally, the most significant impacts arise during the firing stage, which is highly energy-intensive and releases large amounts of particulate matter, carbon monoxide, sulfur oxides, nitrogen oxides, and black carbon. These emissions contribute to local air pollution and greenhouse gas levels. Other stages, such as clay preparation and drying, also involve considerable water use, land occupation, and fuel consumption, while ash and residues from combustion add to solid waste concerns.

On the social side, workers face exposure to wet clay, heat, smoke, and ash, which can cause respiratory illnesses, skin irritation, musculoskeletal strain, and heat stress. Manual molding requires heavy physical effort, raising risks of fatigue and ergonomic injuries, while informal or child labor remains a concern in some units. Safety hazards such as slips, falls, burns, and accidents from high-temperature kiln operations further heighten risks. Communities living near kilns may also be affected by emissions and noise, making the sector's impacts extend beyond factory boundaries.

1.1.7 Key mitigation measures and recommendations

To address these challenges, the brick kiln sector can adopt a forward-looking approach that safeguards both the environment and workers:

- **Water & Effluent Management:** Introduce drainage systems, reuse process water, and adopt rainwater harvesting to reduce strain on local water resources.
- **Energy Efficiency & Cleaner Kilns:** Transition to improved kiln technologies (zig-zag kilns, VSBKs, tunnel kilns) and integrate renewable energy solutions such as solar PV for captive use.
- **Pollution Control & Safer Fuels:** Use cleaner fuels, install emission control systems, and ensure proper ash disposal to minimize air pollution.
- **Worker Health & Safety:** Provide PPE, ergonomic workstations, shaded drying areas, and regular training on safe kiln operations.
- **Community Safeguards:** Establish buffer zones, monitor emissions, and maintain strong fire and emergency preparedness systems to protect surrounding populations.
- **Technology Upgradation:** Encourage automation (e.g., PLC-based molding machines), modern wastewater treatment (if applicable), and energy-efficient drying systems to reduce risks and improve compliance.

Note: (larger list is described in the process wise 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 brick kiln 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 programme, Category A projects are not covered.**

Key steps in the methodology included:

- **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.
- **Documentary 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. 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:

As the Accredited Entity (AE), SIDBI shall ensure that all Brick Kiln subprojects financed under FMAP comply with the Green Climate Fund (GCF) Environmental and Social Safeguards (ESS) through a proportionate, risk-based Environmental and Social Due Diligence (ESDD) process.

For brick kiln sector interventions, the Fit-for-Purpose ESIA focuses on the principal environmental and social risk pathways likely to arise from:

- Raw material procurement and clay sourcing;
- Brick moulding and shaping operations;
- Conventional clay brick drying and kiln firing processes;
- Fly ash brick manufacturing, hydraulic pressing and curing;
- Storage, handling and dispatch activities;
- Labour and occupational health and safety issues;
- Community health and safety risks;
- Seasonal migrant labour and worker welfare concerns;
- Air emissions, fugitive dust, fuel consumption, and climate impacts.

The assessment has been designed proportionate to the risk profile of brick kiln MSMEs and focuses on site-specific, reversible and manageable risks that may arise during project implementation

Following are the detailed E&S Risk Assessment associated with Brick Kiln Process & Technologies.

Mining of Clay

For MSME brick kiln units, clay mining is generally not undertaken in-house. Most MSMEs procure clay and other raw materials from external, licensed suppliers or designated borrow areas likely to consider the supply chain due diligence by unit and therefore do not have direct operational control over mining activities. As a result, the environmental and social risks associated with clay extraction – such as land degradation, land acquisition, or community-level impacts - do not fall within the project boundary of financed activity. Accordingly, GCF environmental and social categorization is not applied to the clay mining stage for MSME brick kiln projects.

1.3.1 Raw Material Procurement & Preparation (Clay / Fly Ash / Sand / Aggregates)

refers to the systematic process of sourcing, receiving, handling, storing, processing, and preparing the primary raw materials required for manufacturing bricks in traditional brick kilns and fly ash brick production units. The objective is to ensure consistent quality, optimum production efficiency, and compliance with technical specifications.

(a) Key Environmental Risks:

- Land degradation and soil erosion at extraction sites.

- Dust generation during unloading and handling.
- Transportation-related emissions.
- Disturbance to nearby water bodies and drainage systems.
- Improper storage causing runoff and sedimentation.

(b) Key Social Risks:

- Occupational Health Risks: Exposure to wet clay and prolonged standing in damp conditions can cause skin irritation and musculoskeletal strain.
- Workplace Safety Risks: Slips and falls due to wet floors and uneven surfaces.

GCF Category: Category C (Low Risk)

Rationale:

Impacts are generally localized and manageable but may become significant if raw material extraction is done in environmentally sensitive locations.

Applicable IFC Performance Standards:

PS1 - Assessment and Management of Environmental and Social Risks and Impacts: Preparation of wet clay mix is a controlled, small-scale process with localized risks related to water use and workplace safety. PS1 is supportive but not primary unless the operation is large or water intensive.

PS2 - Labor and Working Conditions: Highly relevant due to risks of slips, musculoskeletal strain, and prolonged exposure to wet working conditions. PS2 requires safe working practices, adequate drainage, and worker awareness.

PS3 - Resource Efficiency and Pollution Prevention: Applies to efficient water use, prevention of wastewater discharge with high suspended solids, and reuse of process water where feasible.

PS4 - Community Health and Safety: Not applicable, as impacts are confined within the site. PS4 becomes relevant only if wastewater or runoff affects nearby areas.

PS 5 to PS 8 are conditional because they apply only if projects involve land acquisition affecting acquisition affecting biodiversity-sensitive areas, indigenous communities, or cultural heritage without regulatory compliance.

1.3.2 Moulding/Shaping of Bricks

Moulding of Clay / Fly Ash / Sand / Aggregates involves shaping wet clay into bricks, either manually or using mechanical presses.

(a) Key Environmental Risks:

- Material Wastage like rejected clay/fly ash bricks may generate minor waste.
- Dust generation from dry material handling

(b) Key Social Risks:

- Manual Handling Risks: High physical effort in manual molding leading to fatigue and musculoskeletal disorders.
- Child and Informal Labour Risks: The sector has higher vulnerability to informal employment practices if not properly monitored.

GCF Category: Category C (Low Risk)

Rationale:

Environmental impacts are minimal and localized. Social risks are primarily labour-related and can be addressed through labour standards compliance, and worker awareness programs.

Applicable IFC Performance Standards:

PS 1- Assessment and Management of Environmental and Social Risks and Impacts- Moulding is a low-impact process with minimal environmental risks. PS1 is generally not primary unless labour management risks are significant.

PS2 – Labor & Working Conditions - Highly relevant due to manual handling, repetitive tasks, and potential use of informal or migrant labour. PS2 addresses ergonomics, prevention of child labour, and safe working conditions.

PS3 – Resource Efficiency & Pollution Prevention - Limited applicability, mainly related to reduction of material wastage and energy use in mechanized molding units.

PS4 – Community Health & Safety - Not applicable as impacts do not extend beyond the facility boundary.

PS 5 to PS 8 are conditional because they apply only if projects involve land acquisition affecting acquisition affecting biodiversity-sensitive areas, indigenous communities, or cultural heritage without regulatory compliance.

1.3.A.1 Drying Conventional Bricks

It is the process of removing excess moisture from freshly molded clay bricks before they are fired in a kiln. Proper drying prevents cracking, warping, deformation, and breakage during handling and firing, while ensuring uniform quality and strength of the final product.

(a) Key Environmental Risks:

- Large open areas required for sun drying may cause temporary land occupation.
- Fuel consumption where artificial drying systems are used and contributes to emissions
- Land occupation within project premises

(b) Key Social Risks:

- Workers are exposed to high ambient temperatures and heat, particularly in open drying yards.
- Weather Dependency Risks: Sudden rainfall can affect productivity and working conditions.

GCF Category: Category C (Low Risk)

Rationale:

Drying is a low-impact process with limited environmental implications. Risks are operational and occupational in nature and manageable through scheduling, shading, and basic protective measures.

Applicable IFC Performance Standards:

PS 1- Assessment and Management of Environmental and Social Risks and Impacts- Drying is a low-risk process with predictable operational impacts. PS1 is supportive but not primary.

PS2 – Labor & Working Conditions - Relevant due to worker exposure to heat, sun, and weather variability, particularly in open drying yards.

PS3 – Resource Efficiency & Pollution Prevention - Applies where artificial drying is used, focusing on fuel efficiency and heat loss reduction.

PS4 – Community Health & Safety - not applicable as drying does not produce emissions affecting nearby communities.

PS 5 to PS 8 are conditional because they apply only if projects involve land acquisition affecting acquisition affecting biodiversity-sensitive areas, indigenous communities, or cultural heritage without regulatory compliance.

1.3.A.2 Kiln Firing of Conventional Bricks

Firing involves heating dried bricks in kilns (e.g., clamp kilns, Bull's Trench Kilns, zig-zag kilns, or vertical shaft brick kilns) using coal, biomass, or other fuels.

(a) Key Environmental Risks:

- Air Emissions: Significant emissions of particulate matter, CO, SO_x, NO_x, and black carbon affecting local and regional air quality.
- High Energy and Fuel Consumption: Brick firing is highly energy-intensive and contributes substantially to GHG emissions.
- Ash and Residue Generation: Solid waste from fuel combustion requires safe disposal.

(b) Key Social Risks:

- Worker Health Risks: Exposure to smoke, heat, and ash leading to respiratory and heat-related illnesses.
- Community Health Impacts: Emissions may affect nearby settlements, especially in densely populated areas.
- Fire and Burn Hazards: High-temperature operations pose risks of accidents.

GCF Category: Category B (Moderate Risk)

Rationale: Kiln firing may involve conventional brick production due to combustion-related emissions, fuel handling, ash generation and potential community health impacts. However, impacts remain site-specific and manageable through established mitigation measures and improved kiln technologies. However, adoption of improved kiln technologies (e.g., zig-zag kilns, VSBKs), cleaner fuels, and emission controls can substantially reduce impacts, keeping risks manageable and site-specific.

Applicable IFC Performance Standards:

PS 1- Assessment and Management of Environmental and Social Risks and Impacts - Firing is the most environmentally significant stage, involving high emissions and fuel use. PS1 is primary to ensure robust E&S risk management, monitoring, and compliance.

PS2 – Labor & Working Conditions - Highly relevant due to exposure to extreme heat, smoke, ash, and fire hazards. PS2 requires strict OHS protocols, PPE, and worker training.

PS3 – Resource Efficiency & Pollution Prevention - A key standard addressing fuel efficiency, reduction of particulate matter, black carbon, and GHG emissions, and proper ash disposal. Adoption of improved kiln technologies is central to PS3 compliance.

PS4 – Community Health & Safety - Relevant where kiln emissions affect surrounding settlements. PS4 ensures emission control, buffer zones, and emergency preparedness.

PS 5 to PS 8 are conditional because they apply only if projects involve land acquisition affecting acquisition affecting biodiversity-sensitive areas, indigenous communities, or cultural heritage without regulatory compliance.

1.3.A.3 Cooling and Sorting of Conventional Bricks

After completion of kiln firing, bricks are allowed to cool before manual or mechanized unloading, sorting, grading, stacking and movement to storage/dispatch areas.

(a) Key Environmental Risks

- Fugitive dust generation during unloading and handling of fired bricks.
- Ash disturbance during kiln emptying operations.
- Breakage of bricks resulting in waste generation.
- Vehicle and equipment emissions during internal transport and material movement.
- Noise from loading, unloading and sorting activities.

(b) Key Social Risks

- Exposure of workers to residual heat from recently fired bricks.
- Burns and heat-related injuries during premature handling.
- Manual handling and ergonomic injuries from lifting and stacking.
- Dust inhalation during sorting and grading.
- Slips, trips and falls around kiln unloading areas.
- Collision risks involving forklifts, tractors and internal transport vehicles.
- Fatigue due to repetitive handling activities.

GCF Category: Category C (Low Risk)

Rationale: Cooling and sorting activities do not involve combustion, chemical reactions or significant pollutant generation. Environmental impacts are localized and temporary, while social and occupational risks are manageable through standard OHS measures, proper work planning and PPE usage. Impacts remain site-specific, reversible and readily mitigated through good industry practices.

Applicable IFC Performance Standards

PS1 – Assessment and Management of Environmental and Social Risks and Impacts

Applicable for identification and management of operational risks associated with unloading, sorting, stacking and movement of finished bricks.

PS2 – Labour and Working Conditions

Highly relevant due to Heat exposure, Manual handling risks, Ergonomic stress, Dust exposure, Workplace safety requirements.

PS3 – Resource Efficiency and Pollution Prevention

Applicable for:

- Dust suppression.
- Waste minimisation through reuse of broken bricks.
- Housekeeping and ash management.

PS4 – Community Health and Safety

Limited applicability. Relevant only where:

- Internal transport connects to public roads.
- Significant dust emissions affect nearby communities.

PS5–PS8

Not normally applicable unless triggered through broader project siting considerations screened during ESDD.

1.3.B.1 Hydraulic Pressing (Fly Ash Brick Manufacturing)

Hydraulic pressing is the process of compressing a mixture of fly ash, sand/stone dust, cement/lime, gypsum and water into brick or block shapes using hydraulic pressure. Unlike conventional clay bricks, this process does not require thermal firing and therefore avoids combustion-related emissions.

(a) Key Environmental Risks

- Handling of fly ash, cement, lime and aggregates may generate fugitive dust during storage, batching and feeding operations.
- Electricity consumption associated with hydraulic presses, mixers and conveyors.
- Waste generation and rejected green bricks and spillage of raw materials.
- Water use during mixing and housekeeping activities.
- Fly Ash Handling and Uncovered storage or handling may result in wind-blown particulate emissions and localized contamination.

(b) Key Social Risks

- Worker exposure to fly ash, cement and lime dust, potentially causing respiratory irritation.
- Machine Safety and prevention of injuries arising from moving parts of hydraulic presses, conveyors and mixers.
- Musculoskeletal disorders due to lifting, stacking and transportation of bricks.
- Occupational Health Risks like exposure to noise, vibration and dust where engineering controls are inadequate.
- Informal Labour Risk such as potential use of unregulated labour practices if proper labour management systems are absent.

GCF Category: Category C (Low Risk)

Rationale: Hydraulic pressing operations involve limited and localized environmental impacts. The process does not involve combustion, kiln firing, significant emissions, hazardous effluents, or large-scale waste generation. Risks are primarily occupational and can be effectively managed through standard engineering controls, good housekeeping, dust suppression and occupational health and safety measures.

Applicable IFC Performance Standards

PS1 – Assessment and Management of Environmental and Social Risks and Impacts

Applicable for identification and management of environmental, occupational health and labour-related risks associated with brick manufacturing operations.

PS2 – Labour and Working Conditions

Highly relevant due to:

- Worker exposure to dust and noise;
- Machine guarding requirements;
- Safe work procedures;
- Labour welfare and worker protection measures.

PS3 – Resource Efficiency and Pollution Prevention

Applicable for:

- Dust suppression and containment;
- Efficient use of electricity and water;
- Fly ash management and waste minimization;
- Housekeeping and material handling practices.

PS4 – Community Health and Safety

May apply where dust emissions, truck movement or material transport activities affect surrounding communities.

PS5 to PS8

Generally, not applicable unless triggered through project siting, land acquisition, biodiversity impacts, Indigenous Peoples considerations or cultural heritage issues identified during ESDD screening.

1.3.B.2 Steam / Water Curing (Fly Ash Brick Manufacturing)

Steam curing or water curing is carried out after hydraulic pressing to facilitate strength development and proper binding of fly ash, cement/lime, gypsum, and aggregates. The process involves maintaining adequate moisture and curing conditions for a specified period before drying, quality inspection and dispatch. Unlike conventional clay brick manufacturing, curing does not involve combustion or kiln firing and therefore does not generate significant air emissions. This process is shown in the Fly Ash Brick manufacturing pathway. The curing process forms an important stage in achieving the required compressive strength and durability of fly ash bricks.

(a) Key Environmental Risks

- Excessive water use during curing may place pressure on local water resources, particularly in water-stressed regions.
- Steam curing systems consume electricity and thermal energy for steam generation and circulation.
- Proper Housekeeping for leakage from curing tanks, pipelines or curing chambers may result in localized waterlogging and inefficient resource utilization.

(b) Key Social Risks

- Wet surfaces around curing tanks and curing yards may increase employee accident risks.
- Workers may suffer burns or heat-related injuries during steam curing operations.
- Movement of green bricks before attaining sufficient strength may result in musculoskeletal injuries.
- Occupational Health Risks and inadequate PPE may increase workplace safety incidents.

GCF Category: Category C (Low Risk)

Rationale: Steam and water curing operations have limited environmental impacts that are localized, site-specific, reversible and readily manageable through standard engineering controls, water conservation measures, workplace housekeeping and occupational health and safety procedures. The process does not involve combustion, significant emissions, hazardous waste generation or community-level environmental impacts.

Applicable IFC Performance Standards

PS1 – Assessment and Management of Environmental and Social Risks and Impacts

Applicable for identification, assessment and management of environmental and occupational risks associated with curing operations, water use and workplace safety.

PS2 – Labour and Working Conditions

Highly relevant due to:

- Worker exposure to wet conditions and hot surfaces;
- Safe work practices around curing tanks and steam systems;
- Provision of PPE and worker training;
- Prevention of slips, falls and manual handling injuries.

PS3 – Resource Efficiency and Pollution Prevention

Applicable for:

- Efficient water utilization;
- Water recycling and reuse practices;
- Prevention of wastewater discharge;
- Energy efficiency of steam curing systems.

PS4 – Community Health and Safety

Generally, not applicable as impacts remain confined within the facility boundary. PS4 may become relevant only if uncontrolled runoff or wastewater affects nearby communities or receptors.

PS5 to PS8

PS5 to PS8 are conditional and apply only where projects involve land acquisition, biodiversity-sensitive areas, Indigenous Peoples, or cultural heritage considerations. SIDBI's ESDD process and Exclusion List screening ensures that such risks are identified and managed appropriately.

1.3.B.3 Drying of Fly Ash Bricks

After completion of steam curing or water curing, fly ash bricks are dried under natural conditions or in covered drying areas to remove excess moisture and achieve the desired strength, dimensional stability and handling characteristics prior to quality inspection, storage and dispatch. Unlike conventional clay brick manufacturing, drying of fly ash bricks does not involve thermal kiln firing and therefore does not generate combustion-related emissions.

(a) Key Environmental Risks

- Temporary occupation of space for storage and drying of cured bricks.
- Dust may be generated during movement and handling of partially dried bricks and raw materials.
- Use of fans, blowers or mechanical drying systems where adopted.
- Breakage of bricks during drying and handling may generate minor solid waste.

(b) Key Social Risks

- Workers may be exposed to high ambient temperatures during outdoor drying operations.
- Lifting, stacking and movement of bricks may result in ergonomic injuries and musculoskeletal disorders.
- Risks from uneven surfaces, water accumulation and handling areas.
- Exposure to dust and prolonged outdoor work conditions.

GCF Category- Category C (Low Risk)

Rationale - Drying of fly ash bricks is a low-impact, non-combustion process with localized and reversible environmental impacts. Risks are primarily occupational in nature and can be effectively managed through good housekeeping practices, proper storage arrangements, worker training and standard occupational health and safety measures.

Applicable IFC Performance Standards

PS1 – Assessment and Management of Environmental and Social Risks and Impacts

Applicable for identifying and managing operational risks related to drying activities, material handling, workplace safety and environmental management.

PS2 – Labour and Working Conditions

Highly relevant due to Heat exposure, Manual handling activities, Ergonomic risks, Worker safety requirements, Dust exposure and workplace welfare.

PS3 – Resource Efficiency and Pollution Prevention

Applicable for Efficient use of drying space and resources, dust suppression, housekeeping, Reduction and reuse of broken bricks and energy-efficient drying systems where applicable.

PS4 – Community Health and Safety

Generally, not applicable since impacts are confined within the unit/project boundary. May become relevant where dust emissions or transportation activities affect nearby receptors.

PS5 to PS8

PS5 to PS8 are conditional and apply only if triggered through land acquisition, biodiversity-sensitive areas, Indigenous Peoples, or cultural heritage impacts identified during ESDD screening. SIDBI's ESMS and FMAP Exclusion List ensure that such activities are screened appropriately.

1.3.3 Quality Inspection

Quality inspection is carried out after cooling and sorting (for conventional clay bricks) and after drying (for fly ash bricks) to ensure that the finished bricks conform to prescribed quality specifications relating to dimensions, strength, durability, appearance and market requirements. Quality inspection may involve visual inspection, dimensional checks, compressive strength testing and segregation of defective products. This process does not involve significant emissions or chemical reactions and is primarily associated with handling and testing activities.

(a) Key Environmental Risks

- Defective bricks separated during quality checks may generate minor solid waste.
- Dust may arise during handling, movement and testing of bricks.
- Electricity consumption associated with testing equipment and material handling systems.
- Improper handling of rejected bricks may lead to housekeeping issues.

(b) Key Social Risks

- Repetitive lifting, stacking and movement of bricks may lead to musculoskeletal disorders.
- Long periods of sorting, inspection and manual handling.
- Exposure to dust generated during handling and quality testing.
- Injuries arising from falling stacks, improper storage or movement of materials.
- Minor risks associated with laboratory testing equipment and mechanical handling systems.

GCF Category: Category C (Low Risk)

Rationale: Quality inspection activities involve negligible environmental impacts and limited occupational risks. The impacts are localized, site-specific, reversible and readily manageable through good housekeeping practices, proper storage arrangements, worker training and standard occupational health and safety measures. The process does not contribute materially to emissions, pollution loads, community impacts or resource depletion.

Applicable IFC Performance Standards**PS1 – Assessment and Management of Environmental and Social Risks and Impacts**

Applicable for identifying and managing operational risks associated with inspection activities, housekeeping, waste management and workplace safety.

PS2 – Labour and Working Conditions

Highly relevant due to Manual handling of bricks, Worker safety and ergonomics, Safe work procedures, Training and awareness and Occupational health requirements.

PS3 – Resource Efficiency and Pollution Prevention

Applicable for Waste minimization, Segregation and reuse of rejected bricks, Dust control, Efficient use of testing resources and equipment.

PS4 – Community Health and Safety

Generally, not applicable as activities remain confined within the facility boundary. PS4 may become relevant only where storage or handling practices create off-site safety concerns.

PS5 to PS8

PS5 to PS8 are conditional and apply only where triggered through land acquisition, biodiversity-sensitive areas, Indigenous Peoples, or cultural heritage considerations identified during ESDD screening. SIDBI's ESMS and FMAP Exclusion List ensure that such risks are screened and managed appropriately.

1.3.4 Storage and Dispatch

Storage and dispatch represent the final stage of both conventional clay brick and fly ash brick manufacturing processes, where finished bricks are stacked, stored, loaded and transported to customers or construction sites. Activities include stockyard management, loading and unloading operations, vehicle movement, packaging (where applicable), and transportation of finished products. While environmental impacts are generally limited, this stage has important occupational and community health and safety considerations associated with handling and transport operations.

(a) Key Environmental Risks

- Dust generation from brick handling, stockyards, loading and unloading activities.
- Exhaust emissions from trucks, forklifts, tractors and other transport vehicles.
- Noise from vehicle movement, loading equipment and handling operations.
- Waste Generation like Broken bricks, packaging materials and damaged pallets.
- Stormwater Runoff if poorly managed stockyards may generate sediment-laden runoff during rainfall events.
- Fuel Consumption associated with transportation and material handling equipment.

(b) Key Social Risks

- Increased movement of trucks may create risks for workers, nearby communities and road users.
- Manual handling, falling materials and improper stacking may result in workplace accidents.
- Repetitive lifting, carrying and stacking of bricks.
- Workers and nearby communities may be exposed to dust during loading and transport.
- Risks involving forklifts, tractors, trucks and other internal transport systems.
- Extended loading and dispatch operations may contribute to fatigue-related incidents.
- Traffic congestion, noise and dust affecting nearby residents and businesses.

GCF Category: Category C (Low Risk) for routine storage and dispatch activities within existing premises.

Rationale: Storage and dispatch activities generally involve limited environmental impacts confined to the project site and transportation corridors. The principal risks relate to occupational health and safety, traffic management, dust emissions and community health and safety. These risks are typically site-specific, reversible and manageable through standard operational controls, good housekeeping, safe transport practices and worker training.

Applicable IFC Performance Standards

PS1 – Assessment and Management of Environmental and Social Risks and Impacts

Applicable for identification and management of logistics-related environmental, occupational and community health and safety risks, including transport management and emergency preparedness.

PS2 – Labour and Working Conditions

Highly relevant due to material handling, loading and unloading safely and ensure safety while operation like vehicle operation safety, worker welfare and fatigue management, occupational health and safety requirements.

PS3 – Resource Efficiency and Pollution Prevention

Applicable for Dust suppression measures, Vehicle emission reduction, Fuel efficiency, Waste minimization and Good housekeeping practices.

PS4 – Community Health and Safety

Highly relevant due to transport-related road safety risks, community exposure to traffic, dust and noises safe loading and unloading practices, Emergency response planning, and Communication with nearby communities

PS5 to PS8

PS5 to PS8 are conditional and apply only where triggered through broader project development activities involving land acquisition, biodiversity-sensitive areas, Indigenous Peoples or cultural heritage impacts identified during Environmental and Social Due Diligence (ESDD).

Mitigation Machinery/ Technologies in Brick Manufacturing Process in both Conventional and Fly Ash Brick

Sr. No.	Technology Name	Process Category	Project Category
1	Clay Mixer	Raw Material Procurement & Preparation	Category C
2	Clay Crusher	Raw Material Procurement & Preparation	Category C
3	Roller Crusher	Raw Material Procurement & Preparation	Category C
4	Clay Pug Mill	Raw Material Procurement & Preparation	Category C
5	Pan Mixer	Raw Material Procurement & Preparation	Category C
6	Paddle Mixer	Raw Material Procurement & Preparation	Category C
7	Fly Ash Silo	Raw Material Storage	Category C
8	Cement Silo	Raw Material Storage	Category C
9	Lime Silo	Raw Material Storage	Category C
10	Aggregate Storage Bin	Raw Material Storage	Category C
11	Hopper Feeder	Material mixing	Category C
12	Belt Conveyor	Material Transfer and mixing	Category C
13	Screw Conveyor	Material Transfer	Category C
14	Hydraulic Press Machine	Hydraulic Pressing / Brick Moulding	Category C
15	Vibro-Hydraulic Press	Hydraulic Pressing / Block Moulding	Category C
16	Hydraulic Power Pack	Hydraulic Pressing Support System	Category C
17	Fly Ash Brick Machine	Fly Ash Brick Manufacturing	Category C
18	Concrete Brick Machine	Fly Ash Brick Manufacturing	Category C
19	Solid Block Machine	Fly Ash Brick Manufacturing	Category C
20	Hollow Block Machine	Conventional Brick Manufacturing	Category C
21	Interlocking Brick Machine	Brick Manufacturing	Category C
22	Paver Block Machine	Brick Manufacturing	Category C
23	Brick Extruder	Brick Moulding & Shaping	Category C
24	Vacuum Extruder	Brick Moulding & Shaping	Category C
25	Wire-Cut System	Brick Moulding & Shaping	Category C
26	Mould Assemblies / Dies	Brick Shaping	Category C
27	PLC Control Panel	Automation & Process Control	Category C
28	Sprinkler / Mist Curing System	Water Curing	Category C

29	Steam Curing Chamber	Steam Curing	Category C
30	Steam Curing Tunnel	Steam Curing	Category C
31	Drying Shed	Drying	Category C
32	Drying Chamber	Drying	Category C
33	Tunnel Dryer	Drying	Category C
34	Zig-Zag Kiln	Kiln Firing	Category B
35	FCBTK Kiln	Kiln Firing	Category B
36	BTK Kiln	Kiln Firing	Category B
37	Hoffmann Kiln	Continuous Kiln Firing	Category B
38	Tunnel Kiln	Kiln Firing	Category B
39	Kiln Car System	Kiln Operations & Material Transport	Category B
40	Dust Collection System	Emission Control System	Category B
41	Automatic Pallet Stacker	Cooling, Sorting & Storage	Category C
42	Automatic Cuber / Stacker	Cooling, Sorting & Storage	Category C
43	Air Compressor	Utility Support	Category C
44	Electric Motors & Drives	Utility Support	Category C
45	DG Set / Power Backup System	Utility Support	Category B
46	Mobile Brick Machine	Small-scale Brick Production	Category C
47	Traveller Brick Machine	Small-scale Brick Production	Category C
48	Digital Quality Control System	Quality Inspection	Category C
49	Automated Brick Stacking System	Storage & Dispatch	Category C
50	Mechanized Loading and Unloading Equipment	Storage & Dispatch	Category C
51	Forklifts and Material Handling Equipment	Storage & Dispatch	Category C
52	Palletized Storage System	Storage & Dispatch	Category C
53	Covered Storage Yard	Storage & Dispatch	Category C
54	Dust Suppression and Water Sprinkling System	Air Pollution Control	Category C
55	Internal Traffic Management System	Community Health & Safety	Category C
56	GPS-Based Fleet Management System	Logistics Management	Category C
57	Electric Forklifts	Green Mobility & Logistics	Category C
58	Electric Trucks / E-Logistics Vehicles	Green Mobility & Logistics	Category C
59	Solar-Powered Yard Lighting System	Renewable Energy	Category C
60	Vehicle Emission Monitoring System	Environmental Monitoring	Category C
61	Safety Barriers and Pedestrian Segregation System	Occupational Safety	Category C
62	Automated Dispatch and Inventory Management System	Resource Efficiency	Category C
63	Emergency Response and Fire Safety Infrastructure	Community & Occupational Safety	Category C
64	Compressive Strength Testing Machine	Quality Inspection	Category C
65	Automated Brick Dimension Measurement System	Quality Inspection	Category C

66	Automated Sorting and Grading System	Quality Inspection	Category C
67	Dust Collection and Suppression System	Pollution Prevention	Category C
68	Material Handling Conveyor System	Material Handling & Inspection	Category C
69	Automated Palletizing System	Storage & Quality Management	Category C
70	Quality Monitoring Software and Data Logging System	Process Optimization	Category C

Currently, 70 technologies/machines are documented under brick kiln processes, along with an additional indicative **351 cross-functional technologies listed** which are not exhaustive and can be used by MSMEs in the brick kiln segment is considered under **Annexure 3**.

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 Environmental and social risks, including operational capacity, production performance, and compliance with regulatory norms, will be explicitly assessed as part of the Environmental & Social Due Diligence (ESDD) for all Category B brick kiln subprojects. During ESDD (Annexure 2), SIDBI's loan officer/relationship manager and E&S manager will:

- verify the operational status, performance, and regulatory compliance of kiln technologies and stack/chimney systems to which the MSME is connected, as appropriate.
 - examine whether the aggregate particulate matter (PM), , sulfur oxides (SOx), nitrogen oxides (NOx), carbon monoxide (CO), and fugitive dust emissions the proposed subproject may exceed or receiving-environment limits.
 - require that MSMEs implement E&S mitigation measures, including adoption of improved kiln designs, cleaner fuels, dust suppression control measures, flyash reuse/disposal, and source-level pollution reduction measures as part of the site-specific ESMP.
 - assess E&S impacts from clay sourcing, transport emissions, and seasonal worker migration , with attention to community health, shelter house , hygiene and sanitation, and exposure to smoke and dust.
- (a) During inspection, assessment identifies that cumulative emissions, fuel use, ash/dust loads, or clay sourcing practices are 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 excluded from FMAP financing.
- (b) phased/deferred until adequate 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 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, ⁴

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.	Brick Kiln Industry	Industry Category (Based Upon the Pollution Index – PI)
1	5.1	Brick kilns using coal as fuel	Orange
2	5.2	Brick kilns using biomass as fuel	Orange
3	5.3	Tunnel brick kilns (gas fired)	Orange
4	6.1	AAC Bricks/Blocks manufacturing using coal as fuel (≥ 12 TPD)	Red
5	6.2	AAC Bricks/Blocks Manufacturing Using coal as fuel (< 12 TPD)	Orange
6	6.3	AAC Bricks/Blocks manufacturing using biomass as fuel	Orange
7	6.4	AAC Bricks/Blocks manufacturing using gas as fuel	Orange
	7.1	Fly ash bricks/ block manufacturing (with boiler)	Orange
	7.2	Fly ash bricks/ block manufacturing (without boiler)	Green

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.

⁴ 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>

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 brick kiln segment (Section 2.2).

PS1- Assessment and Management of Environmental and Social Risks and Impacts: Verified through ESDD, ESG Screening Sheets, and ESMP documentation (Annexure 2).
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.
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 assist the project 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 inadequate sanitation, potential forced labour, and community impacts from wastewater discharge (if applicable). Vulnerable groups comprise, contract and migrant labor, women workers, and nearby households. Safeguards will include substituting safer chemicals (if applicable), 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, 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 and average grievance resolution time (Refer section number 5). 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, Raw material preparation, Kiln Firing Operations fall under **Category B (I-2)** due to potential pollutant-related risks, while low-risk interventions such forming & drying are classified as **Category C (I-3)**.

Under the FMAP Programme, environmental and social categorization is based on the nature, scale and significance of potential risks and impacts identified through ESDD and site-specific screening.

Activities involving kiln firing, combustion processes, fuel storage and handling, stack emissions, ash generation, worker exposure to heat and smoke, fire risks, and potential community exposure to air emissions are generally classified as Category B, as impacts are moderate, site-specific, reversible and manageable through established mitigation measures and good industry practices.

Low-risk efficiency improvements and ancillary technologies implemented within existing premises, which do not increase pollution loads or trigger land acquisition, labour, community health and safety, biodiversity, Indigenous Peoples or cultural heritage considerations, are generally classified as Category C.

Final categorization confirmed through ESDD, site verification and application of SIDBI's ESMS and FMAP Exclusion List requirements.

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. Brick kiln operations present community health and safety risks primarily associated with kiln firing activities, fuel storage, ash handling, transport movements, fugitive dust generation and exposure to smoke and particulate emissions. To manage these risks, Category B subprojects shall maintain and implement a Site-Specific Emergency Preparedness and Response Plan (EPRP) appropriate to the scale and risk profile of the operation. To make these requirements explicit, every Category B subproject will be required to maintain and implement a Site-Specific Emergency Preparedness & Response Plan (EPRP).

EPRP to cover

- Fire prevention measures, firefighting equipment and response procedures for kiln and fuel storage areas;
- Burn injury response, first-aid arrangements and emergency medical referral mechanisms;
- Periodic inspection of kiln structures to minimize risks associated with structural instability or collapse;
- Safe storage and handling of coal, biomass and other approved fuels;
- Ash collection, storage and disposal/reuse practices, including dust suppression measures;
- Heat-stress and heatwave management measures for workers and vulnerable groups;
- Procedures for communicating smoke, dust and particulate matter-related concerns to nearby communities;
- Community contact points and grievance mechanisms;
- Safe transport practices for clay, fuels and finished products to reduce road safety risks; and
- Coordination and communication protocols with local fire services, health facilities and emergency response authorities.
- Managing labour and worker welfare risks, including seasonal migrant labour, informal employment arrangements, child and forced labour risks, labour contractors, worker accommodation, sanitation, drinking water access, heat stress, and exposure to smoke, dust and ash

Relationship manager/E&S manager will verify the existence of appropriate emergency preparedness arrangements, fire safety systems, first-aid facilities, worker training records and community grievance mechanisms as part of the ESDD and monitoring process. Where significant community exposure risks are identified, additional mitigation measures may be included in the site-specific ESMP.

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 (I-2):** Requires ESIA & ESMP and 30-day advance disclosure before GCF Board consideration.
- **GCF Linkages**
 - o Applies to Raw material preparation, Kiln Firing Operations
 - o Requires ESIA & ESMP and 30-day advance disclosure under GCF Information Disclosure Policy.
- **Category C (I-3):** No advance disclosure required under GCF Information Disclosure Policy.
- **GCF Linkages**
 - o Applies to forming & drying (minimal/no adverse impacts).
 - o For this, no advanced disclosure is required.

1.9 Brick Kiln Sector: Environmental Risks, Mitigation, and GCF Classification

Table 2: E&S Risk Assessment with Mitigation Measures Across Brick Kiln Manufacturing Processes

Process	Key Environmental & Social Risks	Mitigation Measures	Indicative Risk Level	Rationale	Applicable IFC PS
Raw Material Procurement	legal clay procurement; dust generation; transportation emissions; traffic accidents; community conflicts; child labour or forced labour risks in supply chain; road safety risks for nearby communities	Source clay and raw materials from legal and authorized suppliers; verify permits where applicable; avoid protected and environmentally sensitive areas; supplier due diligence; covered transport vehicles; dust suppression; vehicle	C	Risks are generally manageable when materials are sourced from licensed suppliers. Where clay extraction is captive or directly controlled by the MSME, additional environmental	PS1, PS2, PS3, PS4

		maintenance; driver safety training; contractor screening; grievance mechanisms		and social risks may arise, requiring enhanced due diligence.	
Brick Moulding & Shaping	Electricity consumption; material wastage; dust generation; repetitive manual handling; musculoskeletal disorders; machine safety risks; informal labour practices	Use energy-efficient machinery; recycle rejected green bricks; machine guarding; ergonomic workstations; worker rotation; labour compliance checks; PPE; worker awareness programmes	C	Risks are low, site-specific, and manageable through labour, OHS and operational controls.	PS1, PS2, PS3
Hydraulic Pressing (Fly Ash Brick Manufacturing)	Fly ash and cement dust emissions; electricity consumption; solid waste from rejected bricks; machine-related accidents; noise exposure; manual handling risks	Dust extraction and suppression systems; covered fly ash handling; machine guarding; preventive maintenance; PPE; worker training; waste recycling; safe operating procedures	C	Hydraulic pressing does not involve combustion or significant pollution loads. Impacts are localized and manageable.	PS1, PS2, PS3
Steam / Water Curing (Fly Ash Brick Manufacturing)	Water consumption; wastewater runoff; energy consumption for steam generation; slips and falls; steam exposure; burns from hot surfaces	Water recycling; efficient curing systems; proper drainage; PPE; safety barriers; preventive maintenance; worker training on steam safety; housekeeping controls	C	Impacts are largely operational and occupational, with limited environmental effects and no combustion-related emissions.	PS1, PS2, PS3
Drying (Clay Bricks / Fly Ash Bricks)	Land occupation for drying yards; dust emissions; heat exposure; weather-related disruptions; manual handling injuries; energy use where	Optimized drying layouts; covered drying areas; weather protection systems; worker hydration and rest areas; PPE; efficient dryers; housekeeping measures	C	Drying is a low-impact process with limited environmental implications and manageable occupational risks.	PS1, PS2, PS3

	artificial drying is employed				
Kiln Firing (Clay Brick Manufacturing)	High fuel consumption; emissions of PM, black carbon, SOx, NOx and CO; greenhouse gas emissions; ash generation; worker exposure to heat and smoke; fire and burn hazards; community exposure to air pollution	Adoption of zig-zag, tunnel or VSBK technologies; use of cleaner fuels; optimized combustion; emission control measures; ash management; fire safety systems; PPE; worker health surveillance; stack monitoring; emergency preparedness plans	B	This is the most environmentally significant stage of brick manufacturing. Combustion-related emissions, fuel handling and community health impacts require Category B treatment.	PS1, PS2, PS3, PS4
Cooling & Sorting	Dust generation; ash disturbance; brick breakage waste; residual heat exposure; burns; manual handling risks; vehicle movements within premises	Controlled cooling periods; dust suppression; PPE; safe stacking practices; worker training; proper housekeeping; designated movement routes; ergonomic handling procedures	C	Impacts are temporary, localized and primarily occupational in nature, readily mitigated through OHS measures.	PS1, PS2, PS3
Quality Inspection	Dust exposure; minor solid waste from rejected products; manual handling injuries; equipment-related hazards; storage of defective products	Quality control procedures; PPE; proper storage and segregation of defective bricks; worker training; safe testing procedures; recycling and reuse of rejected products where feasible	C	Environmental impacts are minimal and confined within facility boundaries. Risks relate mainly to workplace safety.	PS1, PS2, PS3
Storage & Dispatch	Fugitive dust; vehicle emissions; noise; loading and unloading injuries; traffic accidents; worker fatigue; community exposure to transport-related	Covered storage areas; dust suppression systems; mechanized loading/unloading; traffic management plans; vehicle maintenance; road safety training; designated	C	Routine storage operations are generally low risk; however, projects involving significant transportation activity and community exposure may	PS1, PS2, PS3, PS4

	risks; broken brick waste	transport routes; PPE; safe stacking practices		require Category B classification.	
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Through the Exclusion list 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 brick kiln 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.

Category C generally applies to low-risk, within-premises efficiency improvements, automation systems, lighting upgrades, energy management systems, rooftop solar installations within existing premises, and similar interventions where screening confirms no material impacts related to land acquisition, community health and safety, labour, pollution load. 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 involve 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 the land acquisition affects any of the PS 5-8 triggers, SIDBI will not assist the project 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-empanelled valuers and validates title and ownership through legal due diligence conducted by empanelled 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 Brick kiln 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 brick kiln sector

Under direct financing, SIDBI is responsible for ensuring that all subprojects under the Programme 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 brick kiln 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 fully mitigated.

2.2 Screening and Categorization of Activities

For brick kiln sector subprojects, technology categorization is based on the actual activity and associated environmental and social risk pathways rather than the technology name alone. Kiln firing technologies are normally classified as Category B due to combustion-related emissions, fuel handling, ash generation, occupational health and safety risks, and potential community health impacts. Low-risk ancillary improvements implemented within existing premises may be classified as Category C where

ESDD confirms no increase in pollution load, no material labour or community risks, and no PS5–PS8 will be triggered. Final categorization will be determined through SIDBI's ESDD process and site verification by manager from the respective office.

The steps will be -

- **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 Environmental & Social 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 (if applicable), hazardous waste, air emissions, OHS concerns, gender risks] are mapped into the ESMP.
- Each ESMP specifies:
 - o **Mitigation measures** (ETP, Pollution control, PPE,).
 - o **Monitoring indicators** (BOD/COD levels, emission compliance, PPE usage rates).
 - o **Responsible people** within the MSME.
 - o **Timelines** for implementation.
 - o Clay sourcing risk pathway
- 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 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

The following mitigation plan provides practical guidance to MSMEs, SIDBI Relationship Managers, technical officials, and other stakeholders for managing the environmental and social risks associated with Category B brick kiln subprojects. The measures are aligned with IFC Performance Standards, GCF ESS requirements, applicable Indian regulations, and SIDBI's Environmental and Social Management System (ESMS). The mitigation measures shall be incorporated into site-specific ESMPs based on the outcome of Environmental and Social Due Diligence (ESDD).

Table 3: Process-Specific Mitigation Plan for Category B Brick Kiln Subprojects

Process	Key Risks	Mitigation Measures	Validation & Monitoring
Kiln Firing Operations	PM, SO _x , NO _x , CO and black carbon emissions; high fuel consumption; worker exposure to heat and smoke; fire and burn risks; community air-quality impacts; ash generation	Adopt improved kiln technologies (Zig-Zag Kiln, Tunnel Kiln, VSBK, Hoffmann Kiln where applicable); use approved fuels only; optimize combustion efficiency; maintain stack/chimney systems; implement ash collection and disposal/reuse practices; provide PPE (masks, gloves, boots, heat-resistant equipment); establish fire-fighting systems and Emergency Preparedness & Response Plan (EPRP); maintain buffer distance from sensitive receptors where feasible	Review fuel records; verify kiln condition and maintenance logs; periodic stack emission checks as per SPCB norms; inspection of PPE compliance; fire-safety inspections; review community complaints and corrective actions

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 brick kiln E&S standards like IFC Performance Standards for pollution control, OHS, CHS, labour & GRM, gender & SEAH/POSH.

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 brick kiln sector.

To ensure asset-specific environmental and social risk management across brick kiln sub-projects, a consolidated asset-anchored mitigation has been added in table down 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 4: Asset Based Environmental & Social Mitigation measures

Assets / Technology	Process Step	Key E&S Risk	Mitigation Measures	O&M Requirements	Responsible Parties#
Raw Material Procurement	Raw Material Procurement	Dust emissions, community nuisance, fuel leakage, road safety risks	vehicle maintenance, designated routes, speed controls, driver training, community grievance mechanism, dust suppression during loading/unloading	maintenance records, transport logs	MSME Owner
Clay Preparation System	Raw Material Procurement & Preparation	Dust generation, worker exposure, machine-related injuries, noise	Dust suppression, machine guarding, PPE, housekeeping, worker training, enclosed transfer wherever feasible	Routine inspection, lubrication, housekeeping checks	MSME Owner
Fly Ash Preparation & Storage System	Raw Material Procurement & Preparation	Fly ash/cement dust exposure, material spills, respiratory hazards	Covered silos, enclosed handling, dust extraction systems, spill prevention, PPE, worker training	Silo inspection, cleaning schedules, inventory management	MSME Owner
Material Feeding & Transfer System	Raw Material Procurement & Preparation	Mechanical hazards, dust release, moving	Conveyor guarding, emergency stop systems, PPE, lock-out	Periodic mechanical inspection and maintenance	MSME Operator

		equipment injuries	procedures, operator training		
Brick Moulding, Mixing & Shaping System	Brick Moulding/Mixing/Shaping	Machine injuries, repetitive strain, electrical hazards, product wastage	Machine safeguarding, ergonomic workstations, PPE, operator competency training, preventive maintenance	Equipment inspection and calibration	MSME Owner
Hydraulic Brick Press System	Hydraulic Pressing	Hydraulic failure, noise, machine entanglement, manual handling injuries	Hydraulic safety systems, machine guards, PPE, LOTO procedures, operator certification and training	Hydraulic oil monitoring, inspection of safety devices	MSME Owner / Machine Operator
Steam Boiler System	Steam Generation	Combustion emissions, fire hazards, steam burns, fuel storage risks	Fuel management procedures, certified operators, firefighting systems, boiler safety inspections, emergency preparedness plan	Boiler testing, statutory inspections, maintenance records	MSME Owner / Boiler Operator
Steam/Water Curing System	Steam / Water Curing	Burns, heat exposure, water consumption, slips and falls	PPE, insulated pipelines, drainage arrangements, curing water reuse, worker training, safety barriers	Steam pressure monitoring, drainage inspection	MSME Owner / Operations Supervisor
Drying Infrastructure	Drying of Conventional Bricks / Fly Ash Bricks	Heat stress, weather exposure, dust generation,	Ventilation, hydration facilities, weather protection, PPE,	Inspection of drying infrastructure and utility systems	MSME Owner / Production Supervisor

		energy consumption	efficient drying arrangements		
Brick Kiln Firing	Kiln Firing of Conventional Clay Bricks	PM, SOx, NOx, CO, Black Carbon emissions, heat stress, fire hazards	Optimized firing, approved fuel usage, chimney compliance, PPE, ash management, emergency response measures	Kiln inspection, fuel records, emissions-monitoring compliance	MSME Owner
BTK / FCBTK Kiln/ Hoffmann Kiln/ Tunnel Kiln	Kiln Firing of Conventional Clay Bricks	Air emissions, fuel consumption, worker exposure to heat, community impacts	Fuel efficiency improvements, stack/chimney maintenance, PPE, dust control measures, fire safety systems	Periodic maintenance and regulatory compliance checks	MSME Owner / Kiln Supervisor
Cooling & Sorting System	Cooling and Sorting of Conventional Clay Bricks	Dust exposure, residual heat exposure, manual handling injuries, falling materials	Adequate cooling period, dust suppression, PPE, safe stacking, ergonomic handling practices	Housekeeping inspections and safety audits	MSME Owner
Quality Inspection & Testing System	Quality Inspection	Repetitive handling, dust exposure, rejected-product handling	Ergonomic arrangements, PPE, inspection procedures, recycling of reject products where feasible	Equipment calibration and inspection	MSME Owner / Quality Supervisor
Storage Infrastructure	Storage	Falling stacks, dust generation, unstable storage conditions	Safe stacking standards, covered storage areas, designated stockpiles, PPE	Stockyard inspection and housekeeping	MSME Owner / Store Supervisor
Dispatch & Loading System	Storage & Dispatch	Vehicle movements, loading	Traffic management plans,	Review of dispatch logs	MSME Owner /

		accidents, community road-safety impacts	designated loading areas, PPE, vehicle maintenance, driver awareness training	and transport records	Dispatch Supervisor
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Responsible parties might not have Technical Environmental expert at Micro and Small Enterprise. 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 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 5: SIDBI's Activity Wise ESMP

Sl. No.	Activity	Description	Responsibility	Frequency
1	Project Screening / E&S Risk Categorization	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	Environmental and Social Due Diligence (ESDD)	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	Review of ESDD Report	Examination and verification of ESDD documents and evidence for completeness, adequacy, and alignment with FMAP requirements.	SIDBI	At loan application review
3	Technical Assessment	Assessment of energy/resource savings, pollution reduction, OHS improvements, and other E&S benefits of the proposed assets.	SIDBI	During loan appraisal

Sl. No.	Activity	Description	Responsibility	Frequency
4	E&S Rating	Scoring of environmental and social performance using SIDBI's ESG/Green Rating Tool to support decision-making.	SIDBI	During loan appraisal
5a	Environmental & Social Management Plan (ESMP) Review	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
5b	Training & Undertaking	MSMEs receive guidance/training on ESMP implementation and submit undertakings committing to compliance with FMAP E&S requirements.	SIDBI / MSME	Need Based
6a	E&S Supervision	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]
6b	Monitoring & Reporting	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 programme 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, 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 6: E&S Actions and Responsibilities by Project Stage

A. Screening / Appraisal Stage				
E&S Actions (Asset-anchored)	Asset-Specific Conditions	Responsibilities	Evidence Records / Maintain to	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 note, 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 / Maintain to	Verification & Frequency
Contractor OHS plan (LOTO, work at height, hot work, confined space, electrical safety); site induction & PPE	Green Technologies, Boiler placement (if required) & foundations; ventilation; 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	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 / Maintain to	Verification & Frequency
Functional testing: stacks, DG/compressors	Calibrate flow meters, pH probes; verify stack height	Vendor (tests); MSME (witness)	Commissioning reports; calibration certificates	Technical Official spot-check

acoustics, PV protection relays				
Emergency preparedness drill; verify routes, alarms,	Simulate small spill; evacuation timing; assembly area	MSME; E&S Expert support	Drill records; emergency plan	Post commissioning
Operator training & SOPs	Vendor manuals translated; shift-wise SOPs	Vendor; MSME	Training attendance; SOPs; shift handover sheets	Post-commissioning at MSME end
D. Routine Operation Stage				
E&S Actions	Asset-Specific Conditions	Responsibilities	Evidence Records /	Verification & Frequency
emissions compliance; authorised vendor; waste manifests	stack/ambient checks as per SPCB	MSME (Ops)	Lab reports; manifests; calibration logs	By the concerned Regulators
OHS controls: PPE, machine guarding, LOTO, hot-surface insulation; periodic fire checks	confined space permits	MSME	PPE logs; PTW; incident/NMIS reports	Need based periodical review
Community safeguards: stack dispersion	acoustic enclosures maintained	MSME	acoustic and dispersion checks	Need based periodical review
Labour & GRM: contracts, wages, hours, GRM functionality; POSH functioning; facilities for women	GRM register; POSH training; toilets/lighting	MSME; HR/Welfare	GRM logs; POSH minutes	Need based periodical review
Residual-risk actions: unit-specific SOPs and corrective actions	Upset conditions; legacy drains; battery handling	MSME	CAR (Corrective Action Register)	Need based periodical review
E. Monitoring & Reporting Stage				
E&S Actions	Asset-Specific Conditions	Responsibilities	Evidence Records /	Verification & Frequency
Maintain M&V logs (emissions, energy, water), OHS incidents, drills, training	PV generation, EV charging	MSME	M&V sheets; training registers; drills	MSME shall maintain data which may be available for verification to regulatory bodies
Internal audits against cluster measures & asset conditions	Short, MSME-friendly checklists	MSME; RM support	Audit checklists; photos	MSME to keep audit data and make available for verification
Third-party verification (sample-based) across	Evidence review; site checks; Corrective Action Plan	Independent agency; SIDBI PMU	Verification reports; CAPs	Verification on sample basis as per requirement

Reporting to SIDBI/PMU; update MIS; track CAP closure	Aligning with FMAP reporting cadence	MSME; RM/ PMU	Periodic reports	As per loan conditions
F. Decommissioning Stage (recognising loan-tenure constraint)				
E&S Actions	Asset-Specific Conditions	Responsibilities	Evidence Records /	Verification & Frequency
Plan for end-of-life pathways at	PV module/battery recycling; Dismantling;	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
Residual risks during dismantling: OHS, spills, traffic control	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 . These ensure 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 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:

Kiln/Firing Technology Monitoring

For brick kiln subprojects classified as Category B, SIDBI shall apply a practical and proportionate monitoring approach focused on the principal environmental and social risks associated with kiln firing activities. Monitoring will be undertaken through Environmental and Social Due Diligence (ESDD), appraisal reviews, periodic site visits and routine supervision activities.

SIDBI include verification of:

- Valid Consent to Operate (CTO), Consent to Establish (CTE) or other applicable regulatory approvals related to it.
- Compliance with permitted fuel requirements and applicable fuel restrictions;
- Availability of stack/chimney and compliance with applicable emissions-monitoring requirements;
- Basic kiln maintenance and safe operating conditions;
- Ash collection, storage, reuse or disposal arrangements;
- Dust suppression and site housekeeping practices;
- Availability and use of basic personal protective equipment (PPE);
- Worker awareness and basic occupational health and safety arrangements;
- Fire-fighting equipment, emergency response arrangements and first-aid availability;

SIDBI's monitoring approach is intended to remain proportionate to the financing activity and risk profile of the MSME. Accordingly, the Programme does not require borrowers to establish formal environmental and social management systems, undertake specialized technical studies, or maintain monitoring systems beyond applicable regulatory, consent-related or loan-condition requirements. Corrective actions, where necessary, may be incorporated into site-specific ESMP conditions and monitored through normal supervision activities.

Monitoring the implementation of ESMP measures for each subproject throughout the project lifecycle.

- Ensuring compliance with GCF Environmental and Social Safeguards (ESS), country regulations on Environment and OHS 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.
- Measures covering age verification, prohibition of child and forced labour, labour contractor oversight, wage and working-hour records, employment terms (where applicable), worker accommodation conditions, access to potable water and sanitation, worker grievance mechanisms, heat-stress management, first aid and emergency response arrangements
- 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. 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 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 operations⁵

3.1 Loan Screening and Approval Process (for direct loans)

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 held 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 (attached as Annexure 7 of ESMS). The Processing Officer conducts evaluations related to Know Your Customer (KYC) requirements, financial viability, credit due diligence and checking of ESDD checklist information (Annexure- 4 of ESMS). 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 of 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 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.

⁵ 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>

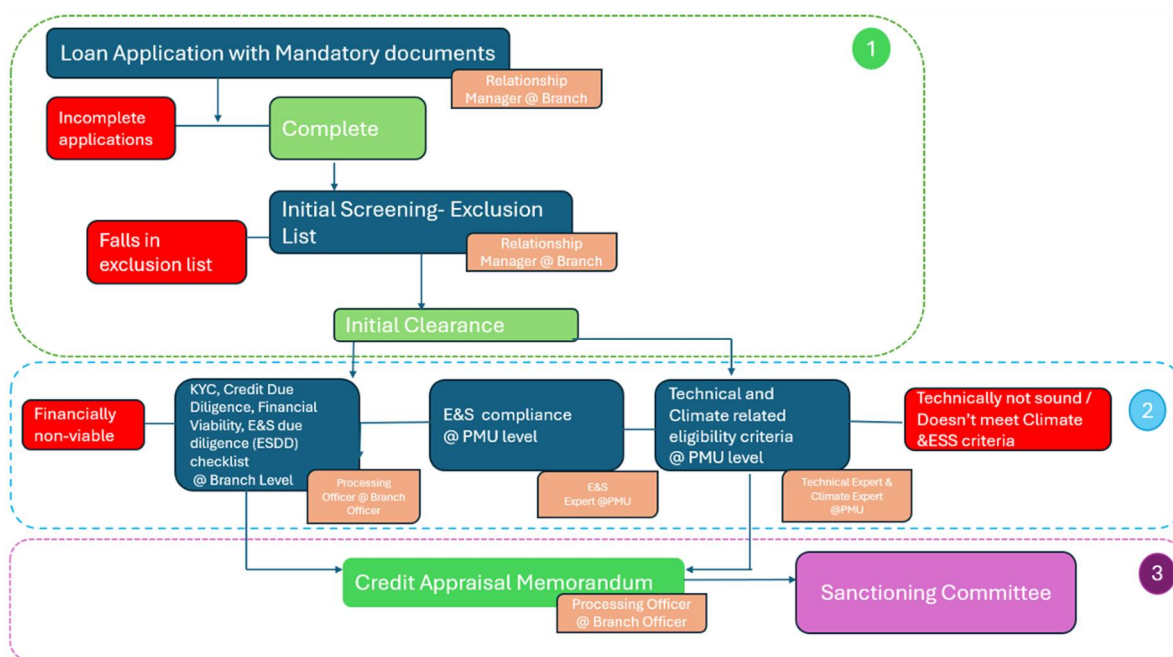


Figure 1: Loan Application Process

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 are focused on the individual project level. Each MSME borrower must demonstrate compliance with the sectoral ESIA/ESMP and ESMS, which outlines impacts/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 3: 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.
Social	Unsafe labour conditions, gender	Institutional safeguards, Personal protective Equipment (PPE) like Masks, Goggles, Gloves, Harness must be provided, Display boards

	inequity, SEAH, underpayment	with danger signs placed at electrical and hazardous areas, Wage enforcement, GRMs, Gender Action Plans
Community	Health deterioration, land stress, exclusion	Community consultations, inclusive benefits, shared infrastructure
Technological	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/her 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)

(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 4: Escalation matrix at SIDBI

Level	SIDBI Office	Official In-charge
First	Branch Office	Nodal Officer at Branch level
Second	Regional Office	Nodal Officer at Regional level
Third	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 to be furnished while registering the complaints enabling 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 complaint 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

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 PFI shall be made available on the SIDBI/project website.

To check 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)**⁶, 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 5 covers about the labour vulnerabilities including gender safeguards and compliance with India's Sexual Harassment of Women at Workplace (Prevention, Prohibition & Redressal) Act, 2013 (POSH) commonly known as the POSH Act and provides for SEAH/gender assessment under

⁶ <https://pgportal.gov.in/>

independent monitoring. Accordingly, SIDBI follows the POSH Act, ensuring zero tolerance for GBV/SEAH⁷. 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 have 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 workers, along with

⁷ 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>

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.⁸

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 category like Labour/Gender/OHS/SEAH/environment and resolved within the given timeline with corrective actions taken etc.

4.4 Conflict Sensitivity Assessment⁹

- **Community Health & Safety:** OHS safeguards are checked via ESDD/ESG tools before lending. Annual audits ensure compliance. Borrowers must provide medical care, redress, and compensation in case of incidents.
- **Land Acquisition:** Projects are screened to avoid acquisition/resettlement affecting biodiversity-sensitive areas, indigenous communities, or cultural heritage.
- **Indigenous Peoples:** Projects will not be assisted affecting people in voluntary isolation.

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 SIDBI, 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
- **Verification of mitigation measures** listed in the project-specific ESMPs, including:

⁸ 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>

⁹ 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>

- o Pollution control infrastructure (ETP, APCD, caustic recovery, sludge handling)
 - o PPE availability and OHS practices
 - o 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. 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 form 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) producing 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.

Annexure 2: Environmental & Social Due Diligence (ESDD) Checklist

Name of the MSME enterprise:

Project Location with address:

S.No.	Particulars	Response	Remarks
A. Environmental Aspects			
1	Environmental Clearance from MoEFCC* / SEIAA**	Yes / No / Not Applicable / Applied For	- If 'Yes', attach copy of the same. - 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.
2	Valid Consent(s) / Clearances from SPCB/CPCB	Yes / No / Not Applicable / Applied For	- If 'Yes', attach copy of Consent to Establish (CTE) / Consent to Operate (CTO). - 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.
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. Social Aspects			
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 religion/ethnicity/colour/ race/ gender and caste.	Yes/No	

S.No.	Particulars	Response	Remarks
7	Does the unit employ Occupational, Health and Safety related measures for its operations <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	
14	Is there any provision for Physically handicapped/ Challenged person in the workforce despite of gender.	Yes / No / Not Applicable	

S.No.	Particulars	Response	Remarks
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	
C. General Land Related Aspects – Common for all types of projects			
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 & 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	
D. Land-related Aspects (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	industrial area, industrial estate notified industrial zone,	

S.No.	Particulars	Response	Remarks
		• 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	
24	Transaction Status - Mode of Land Access / Acquisition	• Purchased from Govt (outright / lease) • Privately purchased land through willing buyer-willing seller transactions with clear title • Private Lease • Owned / inherited - Others (please specify)	

* 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 :

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.

Sr. No.	Technology Name
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 Cushion 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 dyeing 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	Rotoberatory 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.
