

GEF-8 REQUEST FOR CEO ENDORSEMENT/APPROVAL

TABLE OF CONTENTS

GENERAL PROJECT INFORMATION	3
Project Summary	4
Project Description Overview	5
PROJECT OUTLINE	8
A. PROJECT RATIONALE	8
B. PROJECT DESCRIPTION	18
Institutional Arrangement and Coordination with Ongoing Initiatives and Project	41
Core Indicators	47
Key Risks	49
C. ALIGNMENT WITH GEF-8 PROGRAMMING STRATEGIES AND COUNTRY/REGIONAL PRIORITIES	54
D. POLICY REQUIREMENTS	55
Gender Equality and Women's Empowerment	55
Stakeholder Engagement	55
Private Sector	56
Environmental and Social Safeguards	56
E. OTHER REQUIREMENTS	56
Knowledge management	56
Socio-economic Benefits	56
ANNEX A: FINANCING TABLES	57
GEF Financing Table	57
Project Preparation Grant (PPG)	57
Sources of Funds for Country Star Allocation	58
Focal Area Elements	58
Confirmed Co-financing for the project, by name and type	58
ANNEX B: ENDORSEMENTS	59
Record of Endorsement of GEF Operational Focal Point (s) on Behalf of the Government(s)	60
ANNEX C: PROJECT RESULTS FRAMEWORK	60
ANNEX D: STATUS OF UTILIZATION OF PROJECT PREPARATION GRANT (PPG)	61
ANNEX E: PROJECT MAP AND COORDINATES	62
ANNEX F: ENVIRONMENTAL AND SOCIAL SAFEGUARDS SCREEN AND RATING	69
ANNEX G: BUDGET TABLE	70
ANNEX I: RESPONSES TO PROJECT REVIEWS	74

General Project Information

Project Title

Accelerating sustainable energy transition for decarbonization of micro, small and medium manufacturing enterprises in India

Region

Asia

GEF Project ID

11758

Country(ies)

India

Type of Project

FSP

GEF Agency(ies):

UNIDO

GEF Agency Project ID

230230

Project Executing Entity(s)

Ministry of Micro, Small and Medium Enterprises,
Government of India

National Productivity Council

The Energy Resource Institute

National Institute of MSME (ni-msme)

Confederation of Indian Industries- Green Business Centre

Project Executing Type

Government

Government

Others

Government

Others

GEF Focal Area (s)

Climate Change

Submission Date

1/29/2026

Type of Trust Fund

GET

Project Duration (Months)

72

GEF Project Grant: (a)

8,982,420.00

GEF Project Non-Grant: (b)

0.00

Agency Fee(s) Grant: (c)

853,330.00

Agency Fee(s) Non-Grant (d)

0.00

Total GEF Financing: (a+b+c+d)

9,835,750.00

Total Co-financing

56,329,231.00

PPG Amount: (e)

150,000.00

PPG Agency Fee(s): (f)

14,250.00

Total GEF Resources: (a+b+c+d+e+f)

10,000,000.00

Project Tags

CBIT: No NGI: No SGP: No Innovation: No Competitive Window: No

Project Sector (CCM Only)

Energy Efficiency

Taxonomy

Climate Change, Stakeholders, Private Sector, Climate Change Mitigation, Technology Transfer, Focal Areas, Influencing models, Transform policy and regulatory environments, Strengthen institutional capacity and decision-making, Communications, Awareness Raising, Behavior change, Public Campaigns, SMEs, Individuals/Entrepreneurs, Capital providers, Civil Society, Academia, Trade Unions and Workers Unions, Type of Engagement, Information Dissemination, Participation, Gender Equality, Gender Mainstreaming, Gender-sensitive indicators, Sex-disaggregated indicators, Gender results areas, Capacity Development, Participation and leadership, Capacity, Knowledge and Research, Learning, Theory of change, Adaptive management, Knowledge Exchange, Knowledge Generation, Energy Efficiency, Renewable Energy, Financing

Rio Markers

Climate Change Mitigation	Climate Change Adaptation	Biodiversity	Land Degradation
Principal Objective 2	No Contribution 0	No Contribution 0	No Contribution 0

Project Summary

Provide a brief summary description of the project, including: (i) what is the problem and issues to be addressed? (ii) what are the project objectives, and if the project is intended to be transformative, how will this be achieved? (iii), how will this be achieved (approach to deliver on objectives), and (iv) what are the GEBs and/or adaptation benefits, and other key expected results. The purpose of the summary is to provide a short, coherent summary for readers. (max. 250 words, approximately 1/2 page)

India's industrial sector is a major contributor to the country's greenhouse gas emissions, with manufacturing micro, small and medium enterprises (MSMEs) accounting for a significant share of industrial energy consumption and related emissions. Operating across energy-intensive sub-sectors such as textiles, steel re-rolling, chemicals, food processing, pulp and paper, foundry and forging, bricks, and light engineering, these enterprises collectively represent approximately 45–50% of industrial output. Yet they remain characterized by outdated equipment, heavy reliance on fossil-fuel-based thermal processes, and limited access to sustainable energy alternatives. Persistent barriers—including fragmented policy frameworks, insufficient technical capacity, misaligned financial instruments, and weak institutional coordination—constrain scalable decarbonization across these industrial segments.

The project aims to accelerate the decarbonization of India's industrial sector by supporting MSMEs in adopting sustainable energy solutions. It embeds decarbonization within policy frameworks, market mechanisms, and investment ecosystems through a phased, cluster-based approach across 60 industrial clusters and eight priority manufacturing sub-sectors.

Foundational activities strengthen the enabling environment through evidence-based policy inputs, cross-ministerial coordination, market facilitation, and capacity development for enterprises and service providers. These are complemented by investment-oriented interventions that leverage existing financial mechanisms and provide structured implementation support to drive scalable adoption of clean energy technologies.

Over a six-year period, the project will support approximately 14,280 MSMEs and 4,600 direct beneficiaries (including 1,012 women). It targets direct lifetime GHG emission reductions of 8.61 MtCO₂e and indirect reductions of 2.67 MtCO₂e (after application of 20% attribution factor), contributing to India's NDC commitments and long-term net-zero trajectory.

Project Description Overview

Project Objective

To accelerate industrial decarbonization in India by enabling MSMEs in eight priority manufacturing sub-sectors to adopt sustainable energy solutions at scale, delivering measurable and durable GHG emission reductions. The project achieves this through four interdependent pillars - strengthened policy coherence, market facilitation, investment mobilization and institutional capacity building.

Project Components

1. Policy Development and Market Transformation for Decarbonization in MSMEs

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
890,000.00	1,893,066.00

Outcome:

Outcome 1.1: Evidence-based policy and planning foundations for MSME sustainable energy transition and decarbonization are established.

Outcome 1.2 Conditions influencing MSME investment decisions for decarbonization are improved through targeted market facilitation and inclusive scheme design

Output:

Output 1.1.1: MSME Decarbonization Readiness and Policy Gap Assessment

Output 1.1.2: MSME Energy Use Profiling and Sector Classification

Output 1.1.3: Sectoral Roadmaps for MSME Sustainable Energy Transition

Output 1.2.1 MSME Investment Behaviour Analysis and Decision Support Design

Output 1.2.2 Market Facilitation Measures to increase MSME uptake of Decarbonization Solutions

Output 1.2.3 Inclusive MSME Decarbonization Support Schemes

2. Demand Creation and Strengthened Supply Chain for Sustainable Energy Solutions

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
1,257,000.00	2,687,944.00

Outcome:

Outcome 2.1: MSME awareness, skills, and decision-making capacity to act on sustainable energy transition frameworks are strengthened.

Outcome 2.2: Supply-chain and institutional capacity to deliver Sustainable Energy Solutions aligned with MSME decarbonization pathways is strengthened.

Output:

Output 2.1.1: Awareness and Sensitization Modules for MSMEs on Sustainable Energy Solutions

Output 2.1.2: Skills Development and Training Programs for MSME Workers and Managers

Output 2.1.3: Digital Knowledge and Learning Assets for MSME Sustainable Energy Solutions Adoption

Output 2.1.4: Gender-responsive international exposure, study tours, and knowledge exchange

Output 2.2.1: Assessment of Gaps in the Sustainable Energy Solutions Supply Chain

Output 2.2.2: Sector-Specific Performance Benchmarks for Sustainable Energy Solutions

Output 2.2.3: Strengthening Design, Engineering, and Manufacturing Capacity for Sustainable Energy Solutions

Output 2.2.4: Support for Needs-Driven Sustainable Energy Innovation

Output 2.2.5: Gender-Responsive Training and Certification of Sustainable Energy Solutions Professionals

Output 2.2.6: Capacity Building of Supporting Institutions for Sustainable Energy Solutions Delivery

3. Implementation of Sustainable Energy Solutions for Decarbonization in the MSME Sector

Component Type	Trust Fund
Investment	GET
GEF Project Financing (\$)	Co-financing (\$)
5,544,000.00	47,567,394.00

Outcome:

Outcome 3.1: MSME investments in Sustainable Energy Solutions are mobilized, implemented, and verified through facilitated access to finance, performance-linked incentives, and institutionalized implementation support.

Outcome 3.2: Institutional mechanisms and service delivery systems for sustained MSME decarbonization investment, implementation, and verification are operationalized.

Output:

Output 3.1.1: Baseline Energy Audits and Investment Diagnostics for MSMEs

Output 3.1.2: Customized Sustainable Energy Solutions Design and Implementation

Output 3.1.3: Gender-Responsive Technical Assistance and Implementation Support for MSMEs

Output 3.1.4: Monitoring, Evaluation, and Learning from Sustainable Energy Solutions Implementation

Output 3.2.1: Establishment of Virtual Decarbonization Cells (DCs)

Output 3.2.2: Deployment of Qualified Professionals through Decarbonization Cells

Output 3.2.3: Institutionalized Monitoring and Verification of MSME Decarbonization Investments

4. Knowledge Management, Learning, and Knowledge Dissemination

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
440,000.00	1,069,510.00

Outcome:

Outcome 4.1: Project knowledge and evidence are systematically captured, managed, shared, and applied to support learning, replication, and scaling.

Output:

Output 4.1.1: Gender-Responsive Knowledge Products on MSME Decarbonization

Output 4.1.2: National MSME Decarbonization Knowledge Hub

Output 4.1.3: Learning-Oriented Digital Monitoring for Knowledge Generation

Output 4.1.4: Knowledge Support Services through Virtual Decarbonization Cells

Output 4.1.5: Guided Online Knowledge Modules on MSME Decarbonization

Output 4.1.6: Knowledge Exchange and Learning Events

M&E

Component Type	Trust Fund
	GET
GEF Project Financing (\$)	Co-financing (\$)
248,000.00	329,138.00

Outcome:

Outcome 5.1: Project performance, results, and global environmental benefits are systematically monitored, evaluated, and reported in compliance with UNIDO–GEF requirements.

Output:

Output 5.1.1: Project Oversight and Performance Monitoring Mechanisms

Output 5.1.2: Periodic Monitoring, Reporting, and GEB Tracking

Output 5.1.3: Independent Mid-Term Review and Terminal Evaluation

Component Balances

Project Components	GEF Project Financing (\$)	Co-financing (\$)
1. Policy Development and Market Transformation for Decarbonization in MSMEs	890,000.00	1,893,066.00
2. Demand Creation and Strengthened Supply Chain for Sustainable Energy Solutions	1,257,000.00	2,687,944.00
3. Implementation of Sustainable Energy Solutions for Decarbonization in the MSME Sector	5,544,000.00	47,567,394.00
4. Knowledge Management, Learning, and Knowledge Dissemination	440,000.00	1,069,510.00
M&E	248,000.00	329,138.00
Subtotal	8,379,000.00	53,547,052.00
Project Management Cost	603,420.00	2,782,179.00
Total Project Cost (\$)	8,982,420.00	56,329,231.00

Please provide Justification

The Project Management Cost amounts to USD 428,420, representing approximately 4.77 percent of the total project cost of USD 8,982,420. This level of PMC is below the indicative 5 percent benchmark and is considered cost-effective given the project's multi-state implementation, engagement with multiple industrial clusters and MSMEs, and the need for effective coordination, fiduciary oversight, monitoring, and reporting to ensure timely and compliant delivery of project results.

PROJECT OUTLINE

A. PROJECT RATIONALE

Describe the current situation: the global environmental problems and/or climate vulnerabilities that the project will address, the key elements of the system, and underlying drivers of environmental change in the project context, such as population growth, economic development, climate change, sociocultural and political factors, including conflicts, or technological changes. Describe the objective of the project, and the justification for it. (Approximately 3-5 pages) see guidance here

CURRENT SITUATION

Environmental problems, climate vulnerabilities, and system dynamics

India's manufacturing Micro, Small and Medium Enterprises (MSMEs) form the backbone of the national economy and are central to industrial production, employment generation, and export performance. As of 2025, more than 6.4 crore officially registered MSMEs employ close to 270 million people and contribute approximately 30–30.1% of GDP, 35.4% of manufacturing output, and nearly 46% of exports (IBEF, 2025; PIB, 2025; NITI Aayog, 2025). Manufacturing MSMEs are particularly important for regional development and economic inclusion in semi-urban and peri-urban

areas, consistent with priorities articulated in the National Manufacturing Policy and successive MSME policy frameworks.

At the same time, the scale, dispersion, and production characteristics of MSME manufacturing create significant environmental pressures and climate vulnerabilities that are increasingly relevant to India's national and global environmental commitments.

Development drivers and system context

Sustained economic growth, population increase, and rising domestic and export demand for manufactured goods continue to drive the expansion of MSME production across India. MSME clusters have emerged as localized hubs of industrial activity, supporting employment and value creation but also concentrating energy use and environmental impacts. Development policies have historically prioritized enterprise growth, competitiveness, and job creation, while improvements in ecological performance in MSME manufacturing have progressed more slowly and unevenly. Technological and financial constraints reinforce this trajectory. Many MSMEs operate with outdated equipment, limited automation, and incremental process improvements rather than comprehensive modernization. Investment decisions are shaped by short planning horizons, limited internal capital, and high sensitivity to upfront costs, slowing the adoption of energy-efficient and low-carbon technologies despite their relevance to national energy and climate objectives.

Environmental pressures from MSME manufacturing

Manufacturing MSMEs are characterized by energy- and resource-intensive production systems and widespread reliance on fossil-fuel-based processes. Estimates indicate that MSMEs consume approximately 105–130 million tonnes of oil equivalent (Mtoe) annually, accounting for 20–25% of industrial energy consumption, and generate between 110 and 200 MtCO₂e, equivalent to 3–4% of India's total GHG emissions (CSTEP, 2024a; CSTEP, 2024b). Energy use and emissions are not evenly distributed across the sector. Of the 184 energy-intensive MSME clusters identified nationally, a relatively small number account for a disproportionate share of total energy consumption and emissions (BEE, 2025). This reflects entrenched technological inefficiencies, continued dependence on coal, oil, and biomass for process heat, and limited process optimization, particularly in traditional manufacturing sectors. In addition to GHG emissions, MSME manufacturing contributes to local environmental pressures, including air pollution (PM, SO₂, NO_x), untreated effluents, and material inefficiencies. These pressures are especially pronounced in dense industrial clusters where production activities are closely interlinked with residential areas.

State of the MSME production system

The current state of the MSME manufacturing system is characterized by high variability in energy performance, uneven access to sustainable energy solutions, and limited integration of environmental considerations into routine business and policy decisions. While India has established comprehensive frameworks under the National Action Plan on Climate Change (NAPCC) and its missions, including the National Mission for Enhanced Energy Efficiency, these instruments are often not sufficiently tailored to MSME operational realities, scale, and transaction capacities. Financial instruments and incentive schemes for energy efficiency and clean energy investments exist, but are frequently misaligned with MSME risk profiles, documentation capacities, and investment sizes. Coordination across ministries, financial institutions, and cluster-level support organizations remains limited, reducing the effectiveness of existing policies and programs in reaching MSMEs at scale.

At the enterprise level, many MSMEs lack the technical, managerial, and informational capacity required to identify, assess, and implement sustainable energy solutions. Underdeveloped local service-provider ecosystems, uneven service quality, and limited access to trusted technical assistance further constrain adoption, reinforcing perceptions of risk even where solutions are technically proven and economically viable.

Environmental, social, and economic impacts

The environmental pressures associated with MSME manufacturing translate into significant environmental and social impacts. Air pollution, water contamination, and material inefficiencies contribute to public health risks, including respiratory and cardiovascular disease, heat stress, and other adverse health effects. These impacts disproportionately affect vulnerable groups, including women, who account for approximately 24% of the MSME workforce, and youth employed in labour-intensive manufacturing sectors (ICRIER, 2025; WRI India, 2024).

From an economic perspective, energy inefficiency and fossil-fuel dependence increase operating costs, expose MSMEs to fuel price volatility, and undermine productivity and competitiveness. Health-related costs and productivity losses further weaken enterprise resilience, counteracting national objectives for inclusive and sustainable industrial development.

Climate change as a risk multiplier

Climate change exacerbates existing vulnerabilities in the MSME manufacturing system. Rising temperatures increase cooling demand and heat stress in production environments, raising energy consumption and operational costs. More frequent extreme weather events disrupt production continuity and supply chains, while coastal and flood-prone industrial clusters face heightened exposure to climate-induced damage. These impacts reinforce a feedback loop in which climate risks increase energy demand and emissions, further intensifying environmental pressures.

Response gaps and relevance to national and GEF priorities

Despite the central role of MSMEs in India's economy and their growing environmental footprint, MSME manufacturing remains an under-addressed segment in climate mitigation and energy efficiency efforts. India's Updated NDC commitment to reduce emissions intensity of GDP by 45% by 2030 and to achieve 50% cumulative installed electric power capacity from non-fossil sources, as well as the Long-Term Low Emissions Development Strategy (LT-LEDS), explicitly emphasize energy efficiency, electrification, and cleaner fuels in industry, including small-scale manufacturing. However, systematic mechanisms to translate these priorities into MSME-scale action remain limited.

In this context, MSME clusters represent a critical leverage point for addressing global environmental problems related to climate change and local environmental degradation, while simultaneously supporting national priorities on energy security, industrial resilience, and inclusive growth. The current situation underscores the need for integrated, system-level interventions that address underlying drivers, reduce environmental pressures, strengthen institutional and market responses, and enable MSMEs to participate effectively in India's low-emissions development pathway, consistent with GEF strategic objectives and national policy frameworks.

Baseline: Policy and institutional landscape for MSME decarbonization

India's policy and institutional architecture for industrial energy efficiency and MSME development is extensive but fragmented across multiple ministries, agencies, and programmes, with limited coordination mechanisms tailored to the specific needs and scale of MSME manufacturing. The baseline landscape is shaped by three principal ministerial mandates: the Ministry of MSME (MoMSME), which oversees enterprise development, competitiveness, and technology upgrading; the Bureau of Energy Efficiency (BEE) under the Ministry of Power, which administers industrial energy efficiency standards, programmes, and regulatory instruments; and the Ministry of New and Renewable Energy (MNRE), which drives renewable energy deployment, distributed generation, and clean energy access across sectors.

Under the MoMSME mandate, several flagship programmes target MSME modernization and competitiveness. The Raising and Accelerating MSME Performance (RAMP) programme, supported by World Bank financing, focuses on

institutional strengthening, market access, and technology upgrading for MSMEs across states. The Zero Defect Zero Effect (ZED) certification scheme incentivizes quality and environmental performance improvements, though its reach among energy-intensive manufacturing MSMEs remains limited. The MSME Champions Scheme and the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) provide financial support channels, but these are not specifically structured around decarbonization or energy transition objectives. The National Institute for MSME (NI-MSME) and related training institutions offer enterprise development and capacity-building services, though energy efficiency and clean energy modules are not yet systematically integrated into their mainstream curricula.

Under the BEE mandate, the Energy Conservation Act 2001 (amended 2022) provides the legal framework for industrial energy efficiency in India. BEE administers the Perform, Achieve and Trade (PAT) scheme, which sets energy consumption norms for designated consumers in energy-intensive industries. However, PAT coverage is predominantly limited to large industrial units and does not extend to the majority of MSMEs, which fall below designated consumer thresholds. The BEE SME programme has delivered meaningful breadth of outreach across three phases - approximately 5,000 to 6,500 MSMEs engaged across 25 industrial clusters in 12 energy-intensive sectors through capacity-building workshops, B2B exhibitions, and the SAMEEEKSHA cluster platform; technology gap assessment studies undertaken initially across 35 SME clusters; energy-efficient technology demonstrations supported in 21 units across 4 selected clusters for wider replication; and emission reductions of approximately 1.9 million tonnes of CO₂ documented under the programme to date. The depth of engagement that translates outreach and initial audit into bankable, implemented investment has, however, remained narrow — to the order of 45 MSMEs supported for ISO 50001 Energy Management System implementation, around 200 participants from 20 clusters trained in ISO 50001, and a comparatively limited base of investment-grade audit-plus-implementation pairs. The binding structural constraint for MSME-scale decarbonization in India is therefore not awareness or initial audit, but the audit-to-investment translation gap — and the cluster-scale technician and financing architecture required to close it. The structural reasons for this depth-and-translation gap are four-fold and inform the design choices of the present project: (i) the BEE programme is delivered through a primarily supply-side technical-service model (audits, benchmarking, accredited Energy Auditor pool) without a corresponding cluster-level demand-aggregation mechanism that would convert audit recommendations into bundled, financeable demand; (ii) the audit deliverable is not bundled with a financing pathway, so the gap between an audit recommendation and a bankable investment proposal — consistently reported by MSMEs as the binding constraint — remains open; (iii) the accredited Energy Auditor workforce is concentrated on large industry engagements where per-audit fee economics work, and the cluster-scale technician and installer pipeline required to execute MSME-side measures remains thin; and (iv) programmatic convergence between BEE and the MSME-side schemes that do have cluster reach (RAMP, ZED and CGTMSE) is at an early stage.

BEE also administers the Carbon Credit Trading Scheme (CCTS), notified under the Energy Conservation Act, which establishes a domestic carbon market framework that could, in principle, incentivize MSME emission reductions, though the operational modalities for MSME participation have not yet been defined. The Assistance for Deployment of Energy Efficient Technologies in Industries and Establishments (ADEETIE) programme provides financial support for technology adoption, though uptake among MSMEs has been constrained by awareness gaps, documentation requirements, and limited outreach to MSME clusters.

Under the MNRE mandate, India has made substantial progress in renewable energy deployment, with installed capacity exceeding 200 GW from non-fossil sources. Key programmes relevant to MSMEs include the PM Surya Ghar Yojana (rooftop solar), Green Energy Open Access Rules 2022 (enabling captive and group captive renewable energy procurement for industrial consumers), the National Green Hydrogen Mission, and various state-level solar and biomass energy incentive schemes. MNRE's programmes have driven significant renewable energy capacity addition at the grid and large-consumer level, but systematic mechanisms for channelling renewable energy solutions to MSME clusters remain underdeveloped. MSMEs face barriers related to rooftop availability, grid connectivity, demand aggregation, and the transaction costs of accessing open access or captive renewable energy procurement. The Draft

Climate Finance Taxonomy (2024), being developed in consultation with the Reserve Bank of India and other agencies, provides a further enabling signal, but operational guidelines for MSME-scale investments have not yet been issued.

Critically, coordination between these three ministerial domains remains limited. MoMSME programmes focus on enterprise competitiveness and employment but do not systematically integrate energy or emissions objectives. BEE programmes address industrial energy efficiency but lack dedicated MSME delivery mechanisms at scale. MNRE programmes drive renewable energy supply but do not specifically target MSME demand-side barriers. No standing inter-ministerial coordination mechanism exists to harmonize these complementary mandates around a common MSME decarbonization agenda. The absence of such coordination results in policy fragmentation, overlapping or duplicative scheme designs, inconsistent eligibility criteria, and missed opportunities for leveraging complementary instruments. Financial institutions, including SIDBI and commercial banks, have developed green finance products, but these remain disconnected from the technical assistance and implementation support required by MSMEs to translate finance availability into actual technology adoption.

At the state and cluster level, institutional capacities for MSME energy and environment support vary considerably. State MSME Departments, District Industries Centres, MSME Development Institutes, and cluster-level industry associations provide enterprise-facing services, but energy efficiency and clean energy remain peripheral to their core mandates. Cluster Development Agents and Common Facility Centres, where they exist, offer entry points for technology demonstration and service delivery, but are unevenly distributed and often under-resourced. PPG-phase consultations confirmed that while state-level stakeholders express strong interest in MSME decarbonization, they lack the technical tools, trained personnel, and institutional mandates to deliver systematic support at the scale required.

Baseline of MSME technology penetration and adoption rates

Cluster-level baseline assessments completed during the PPG phase (Annex D - PPG Activity 7) indicate the following indicative penetration rates for the four technology families covered by the project, across the eight priority sub-sectors: high efficiency motors, pumps and compressors - 18-24% penetration in textile and food-processing clusters, 8-12% in foundry, brick and steel re-rolling clusters; waste-heat recovery - under 5% across all sub-sectors except pulp and paper (~12%); captive solar PV --6-9% in textile, chemicals and food processing, under 3% in other sub-sectors; energy management systems /ISO 50001 - under 2% in MSME clusters across all sub-sectors. These baseline rates are documented in detail in the PPG Baseline Energy Assessment Report and are summarised in Annex P.

Phased baseline-deepening approach

Consistence with the GEF guidelines that the PPG-stage analysis should be deepened during inception and implementation, the project follows a three-stage baseline-deepening protocol: (i) PPG-stage rapid assessment establishes the indicative national baseline reflected in the present CEO-ER; (ii) inception phase (Year 1-2) cluster-level diagnostics under Output 3.1.1 (Baseline Energy Audits across 3,280 MSMEs) refine the baseline to enterprise level for each priority clusters; (iii) MTR-stage update at Year 3 consolidates the refined baseline as the planning input for the scale-up phase, and informs the National MSME Decarbonization Knowledge Hub.

Lessons learned from GEF and related MSME energy projects in India

India has benefited from a sequence of GEF-supported projects targeting industrial energy efficiency and MSME modernization, generating a substantial evidence base and operational experience that has directly informed the design of the current project. Key predecessors include the GEF-4 UNIDO Cluster Development Programme for MSMEs (GEF ID 3550), the GEF-5 Market Transformation for Energy Efficiency in MSMEs project (GEF ID 5765), and the ongoing GEF-7 Improving Thermal Energy Efficiency in Industrial Boilers project (GEF ID 10878). Parallel initiatives supported by bilateral donors, development finance institutions, and the Government of India (notably under the National Mission for Enhanced Energy Efficiency and BEE's SME Programme) have further enriched the knowledge base.

Several cross-cutting lessons emerge from this experience. First, pilot-based and technology-specific interventions, while valuable for demonstrating technical feasibility, have consistently failed to achieve sector-wide transformation. The GEF-5 Market Transformation project demonstrated that energy audits and technology demonstrations in individual MSMEs produced measurable savings at the enterprise level but did not translate into sustained market uptake in the absence of institutional mechanisms, aggregation platforms, and policy linkages to embed results within mainstream MSME support systems. Second, purely supply-side interventions (e.g., training auditors, certifying technologies) are insufficient without parallel demand-side support: MSMEs require sustained, trusted advisory services to move from awareness to investment decision. Third, cluster-based approaches offer significant advantages in terms of peer learning, shared infrastructure, and institutional engagement, but require dedicated intermediary capacity (Cluster Development Agents, Decarbonization Cells) to function effectively. Fourth, financial de-risking mechanisms must be tailored to MSME investment sizes, risk profiles, and documentation capacities; conventional project finance and guarantee instruments designed for larger enterprises are not directly transferable. Fifth, gender-responsive design must be embedded from the outset, as post-hoc gender integration yields limited results. Sixth, cross-ministerial coordination is essential for MSME decarbonization because the relevant policy levers (enterprise development, energy efficiency standards, renewable energy incentives, financial instruments, environmental compliance) span multiple ministries whose programmes and eligibility criteria are not harmonized.

The GEF-7 Boiler project, currently under implementation, offers particularly relevant operational insights. While the project has successfully demonstrated measurable thermal efficiency improvements in selected boiler operations, it has also confirmed that technology-specific interventions alone are insufficient for sector-wide impact. The project's experience underscores the need for broader institutional embedding, sustained capacity development, and structured linkages between demonstration activities and mainstream financial and policy instruments. These lessons have been directly incorporated into the GEF-8 project design through the multi-component architecture, the emphasis on policy coherence and cross-ministerial coordination, the institutionalization of service delivery through Virtual Decarbonization Cells, and the structured approach to investment facilitation and performance verification.

Barrier analysis

Despite the growing national commitment to industrial decarbonization and the expanding portfolio of support programmes, several interrelated barriers prevent MSMEs from adopting sustainable energy solutions at scale. These barriers operate simultaneously across policy, institutional, financial, technical, and informational dimensions, creating a system-level lock-in that individual interventions have proven unable to overcome. PPG-phase assessments, stakeholder consultations, and evidence from prior GEF projects converge on the following barrier structure.

Policy and regulatory barriers. MSME decarbonization cuts across the mandates of MoMSME, BEE (Ministry of Power), MNRE, MoEFCC, and state-level industrial and energy departments. However, no integrated policy framework or inter-ministerial coordination mechanism exists to harmonize these mandates around MSME-scale energy transition. MoMSME schemes prioritize competitiveness and employment but do not incorporate energy or emissions performance criteria. BEE's PAT scheme and standards-based approach target designated consumers (typically large industry), leaving MSMEs without equivalent regulatory signals or support pathways. MNRE's renewable energy programmes are designed for utility-scale or large consumer deployment, with limited provisions for MSME aggregation or cluster-level delivery. Eligibility criteria, reporting formats, and incentive structures across these programmes are not harmonized, creating confusion and high transaction costs for MSMEs seeking to navigate available support. Sectoral roadmaps for MSME decarbonization do not exist, and there is no commonly agreed planning framework that would enable national, state, and cluster institutions to sequence and prioritize actions across sectors.

Financial barriers. MSMEs face acute constraints in accessing finance for sustainable energy investments. While public-sector financial institutions such as SIDBI and commercial banks offer green credit products, these are typically designed for larger investment sizes and require documentation, collateral, and appraisal processes that exceed MSME capacities. MSME investment decisions are characterized by short payback expectations (typically 18–24 months), high discount rates reflecting perceived risk, and a strong preference for self-financing or informal credit. The absence of standardized investment appraisal tools, performance benchmarks, and verified savings data for

MSME-scale sustainable energy investments compounds the perceived risk for both enterprises and lenders. Demand aggregation mechanisms that could reduce transaction costs and improve pipeline quality for financial institutions are largely absent. Existing incentive schemes (e.g., capital subsidies under ADEETIE, interest subvention through SIDBI) are individually valuable but not coordinated into a coherent financing pathway that matches MSME investment cycles and risk profiles.

Technical and capacity barriers. At the enterprise level, most MSMEs lack the technical expertise to identify, evaluate, and implement appropriate sustainable energy solutions. Energy management practices are rudimentary or absent, with limited awareness of energy consumption patterns, efficiency benchmarks, and available technology options. Qualified energy auditors and technical service providers with MSME-relevant expertise are unevenly distributed, with particular shortages in smaller clusters and less industrialized states. The local service-provider ecosystem for MSME-scale sustainable energy solutions (including energy service companies, system integrators, technology vendors, and monitoring and verification specialists) remains underdeveloped in most clusters. Technology suppliers often lack the capacity to offer integrated solutions tailored to MSME operational constraints, including phased implementation, small investment sizes, and limited technical absorption capacity. The absence of standardized performance benchmarks and verified case studies further inhibits informed decision-making. Gender-differentiated barriers are significant: women-owned and women-led MSMEs face additional constraints related to access to information networks, technical training, and financial services, as documented in PPG-phase gender assessments.

Information and awareness barriers. Despite the growing policy attention to industrial decarbonization, awareness among MSME owners and managers regarding the availability, cost-effectiveness, and operational benefits of sustainable energy solutions remains low. Information asymmetries between technology providers, financial institutions, and MSMEs persist, reinforcing perceptions of high risk and uncertain returns. The absence of a centralized, trusted information platform for MSME decarbonization—providing verified performance data, technology specifications, financing options, and regulatory guidance—means that each enterprise must independently navigate a fragmented information landscape. Demonstration effects from successful implementations are poorly documented and disseminated, limiting peer learning and replication potential across clusters and sectors.

Business-as-usual scenario

Under a without-project counterfactual, several positive trends are expected to continue. In this counterfactual, India is assumed to continue pursuing its NDC commitments and net-zero-by-2070 trajectory at the national level across all sectors. However, within the industrial sub-system, the MSME segment is expected to fall short of its realisable decarbonization potential because the structural constraints identified above (fragmented delivery, financing misalignment, capacity gaps, information asymmetries) are not jointly resolved. CSTEP (2024a) estimates that, without targeted MSME-segment intervention, residual emissions in the manufacturing-MSME sub-system reach approximately 138 MtCO₂e by 2030 and exceed 350 MtCO₂e by 2045 — i.e. the gap between national NDC pathway compliance overall and full realisation of the MSME industrial-segment mitigation potential. This residual gap defines the scope and rationale of the proposed GEF intervention.

Socio-economic drivers of MSME decarbonization

Several converging socio-economic drivers create both urgency and opportunity for accelerated MSME decarbonization. These drivers strengthen the case for GEF intervention and define the strategic window within which the project operates.

International trade and carbon border measures. The European Union's Carbon Border Adjustment Mechanism (CBAM), entering its definitive phase from 2026, introduces carbon-cost-equivalent tariffs on imports of carbon-intensive products including iron, steel, aluminium, and fertilizers. While CBAM currently targets upstream commodities, its potential expansion to downstream manufactured goods poses a direct competitiveness threat to Indian MSME exporters. Preliminary assessments indicate that CBAM-equivalent costs could impose tariff-equivalent impacts of 5–10% on carbon-intensive exports, disproportionately affecting MSMEs in sectors such as steel re-rolling, foundry, and chemicals that form part of export-oriented supply chains. Beyond CBAM, major international buyers

and multinational corporations are increasingly imposing supply-chain sustainability requirements, including Scope 3 emissions disclosure, on their MSME suppliers. MSMEs that cannot demonstrate credible decarbonization pathways risk exclusion from global value chains.

Demographic and labour market dynamics. India's working-age population is projected to remain substantial through 2040, sustaining demand for MSME employment and enterprise creation. However, generational shifts in workforce expectations, combined with rising urbanization and educational attainment, are creating labour market pressures that favour modernized, cleaner, and more productive manufacturing environments. Younger workers and entrepreneurs are more likely to adopt digital tools, sustainable practices, and cleaner technologies, provided that enabling conditions are in place. Gender-responsive decarbonization programmes can tap into the growing share of women entering the MSME workforce and entrepreneurship, estimated at approximately 24% of the MSME workforce (ICRIER, 2025), by reducing gender-differentiated barriers to participation.

Climate risk and energy security. As noted in the preceding sections, climate change acts as a risk multiplier for MSME manufacturing systems. Rising temperatures, water stress, and extreme weather events increase operational costs and supply chain disruptions. Energy security concerns arising from fossil fuel price volatility and import dependence further strengthen the economic case for diversifying MSME energy sources toward renewable and efficient alternatives. The Government of India's strategic emphasis on energy independence under the Aatmanirbhar Bharat (Self-Reliant India) initiative, combined with the ambitious targets under the National Green Hydrogen Mission and Make in India programme, creates a favourable policy environment for accelerating MSME energy transition. These converging drivers create a strategic window of opportunity for the project to catalyze MSME decarbonization at a moment when international competitive pressures, domestic policy momentum, and technology cost reductions are simultaneously aligned.

Derivation of project objective

The project objective is derived from the convergence of the baseline analysis, barrier assessment, lessons learned, BAU scenario, and socio-economic drivers presented above. The baseline analysis establishes that India possesses a substantial policy and institutional architecture for industrial energy efficiency and MSME development, but that this architecture is fragmented across ministerial mandates, insufficiently adapted to MSME operational realities, and lacking the coordination mechanisms needed for sector-wide impact. The barrier analysis confirms that policy incoherence, financial misalignment, technical capacity gaps, and information asymmetries constitute a mutually reinforcing system of constraints that individual programmes and pilot interventions have been unable to overcome. Lessons from prior GEF projects demonstrate that technology-specific and supply-side interventions, while necessary, are insufficient without parallel policy, institutional, and demand-side support. The BAU scenario indicates that, notwithstanding ongoing positive trends, the pace and scale of MSME decarbonization under current trajectories fall significantly short of what is needed to align with India's NDC commitments and net-zero-by-2070 target. Socio-economic drivers, particularly CBAM, supply-chain sustainability requirements, and demographic shifts, create both urgency and opportunity for accelerated action.

The project objective therefore focuses on accelerating the decarbonization of energy-intensive manufacturing in India by enabling MSMEs across eight priority industrial sub-sectors to adopt sustainable energy solutions at scale. The objective is deliberately framed to position industrial decarbonization as the primary purpose, with MSMEs as the principal delivery channel, consistent with the GEF Secretariat's guidance on sectoral framing. The objective encompasses four interdependent pillars—strengthened policy coherence, market facilitation, investment mobilization, and institutional capacity building—reflecting the integrated approach required to address the identified barriers simultaneously. The emphasis on “measurable and durable GHG emission reductions” provides a clear results anchor aligned with GEF CCM objectives and India's NDC commitments, while the eight priority sub-sectors (textiles, steel re-rolling, chemicals, food processing, pulp and paper, foundry and forging, bricks, and light engineering) define the specific scope of intervention based on the MCDA-informed sector selection process.

PROJECT OBJECTIVE AND JUSTIFICATION

The project objective is to accelerate industrial decarbonization in India by enabling MSMEs in eight priority manufacturing sub-sectors to adopt sustainable energy solutions at scale, delivering measurable and durable GHG emission reductions. The project achieves this through four interdependent pillars -strengthened policy coherence, market facilitation, investment mobilization and institutional capacity building - described in the approach paragraph below.

To achieve this objective, the project adopts a phased, cluster-based approach across 60 manufacturing clusters and eight priority sectors, combining upstream policy and market reforms with downstream investment facilitation and implementation support. This approach moves beyond isolated pilots toward systemic transformation, ensuring that decarbonization becomes institutionalized within national programs rather than treated as a one-off intervention.

Cluster and sector selection followed a Multi-Criteria Decision Analysis (MCDA) approach based on the Analytical Hierarchy Process (AHP) framework (Saaty, 1980). AHP is a well-established decision-support methodology commonly applied in energy and climate planning. During the Project Preparation Grant (PPG) phase, its application was adapted to reflect MSME-specific considerations, including mitigation potential, implementation feasibility, and scalability, informed by IPCC AR6 Working Group III guidance on industrial mitigation assessment.

The analysis applied four weighted criteria:

1. Emissions intensity and mitigation potential (40%)
2. Stakeholder readiness and institutional capacity (25%)
3. Co-financing potential and economic viability (20%)
4. Geographic balance and replication potential (15%)

The assessment was conducted through structured expert elicitation involving representatives from government agencies, financial institutions, energy auditors, and cluster associations. Pairwise comparisons were validated to ensure methodological robustness, with consistency ratios maintained below 0.10, in line with AHP best practice.

The MCDA results informed a phased cluster selection strategy, distinguishing between pilot clusters, first-phase scale-up clusters, and second-phase scale-up clusters. This approach balanced technical ambition with implementation feasibility, while allowing lessons from early implementation to inform subsequent expansion. The detailed methodology and scoring results are documented in a separate “Cluster Selection Methodology” provided as Annex J.

Based on the MCDA results, the following eight industrial sectors were selected for project intervention:

1. Textiles
2. Steel Re-Rolling
3. Chemicals
4. Food Processing
5. Pulp and Paper
6. Foundry and Forging (treated as a combined sector group)
7. Bricks
8. Light Engineering

These sectors were prioritized not only for their high energy intensity and emissions-reduction potential, but also for their strong scalability and replication prospects across multiple MSME clusters nationwide. The project focuses on deploying Sustainable Energy Solutions (SES) within these sectors to reduce reliance on fossil fuels, improve energy efficiency, and enhance competitiveness in increasingly carbon-constrained markets, including in the context of emerging international measures such as the Carbon Border Adjustment Mechanism (CBAM).

Under a business-as-usual (BAU) trajectory, GHG emissions from India’s manufacturing MSMEs are projected to grow by 6–7% annually, reaching approximately 138 MtCO₂e by 2030 and exceeding 350 MtCO₂e by 2045, driven by industrial expansion, rising energy demand, and continued reliance on fossil fuels (CSTEP, 2024a). This trajectory

would place increasing pressure on India's ability to meet its NDC targets and its long-term net-zero-by-2070 commitment.

In the absence of coordinated intervention, the growing MSME industrial energy demand could increase exposure to energy security risks, asset stranding, and emerging trade measures such as the EU Carbon Border Adjustment Mechanism (CBAM), which may impose tariff-equivalent impacts of 5–10% on carbon-intensive exports. These pressures risk undermining MSME competitiveness and resilience.

Over six years, the project is expected to demonstrate and scale up the deployment of sustainable energy solutions in approximately 14,280 MSMEs and reach 4,600 direct beneficiaries (including 1,012 women). It will result in direct lifetime GHG emission reductions of about 5.46 million tonnes of CO₂e, with an additional 1.69 million tonnes of CO₂e in indirect reductions (after application of the 20% attribution factor as required by GEF guidelines), contributing to durable industrial decarbonization and India's NDCs.

India has a substantial and growing investment landscape supporting industrial energy efficiency, renewable energy deployment, and MSME competitiveness. Public financing is provided through national programs such as the Raising and Accelerating MSME Performance (RAMP) program, the Zero Defect Zero Effect (ZED) scheme, the Assistance for Deployment of Energy Efficient Technologies in Industries and Establishments (ADEETIE) program, and the Perform, Achieve and Trade (PAT) mechanism, complemented by a range of state-level MSME incentive schemes. In addition, dedicated credit facilities are administered by the Small Industries Development Bank of India (SIDBI) and commercial banks to support MSME investment. Parallel international support has demonstrated the technical feasibility of energy-efficiency measures, clean heat solutions, and innovation-based approaches for selected MSMEs. However, these investments have not been translated into sector-wide transformation. Existing financing flows remain fragmented, technology-specific, and largely inaccessible to MSMEs, due to high transaction costs, perceived investment risks, limited mechanisms for aggregation, and the absence of policy and market frameworks tailored to MSME operating realities. GEF financing under this project provides clear additionality by directly addressing these systemic barriers. Rather than financing individual assets, GEF resources are deployed catalytically to de-risk early adoption, strengthen policy and institutional coherence, develop aggregation, monitoring, and verification mechanisms, and crowd in domestic public and private finance at scale. The project leverages existing national programs and financial instruments as co-financing platforms, enabling investments and market responses that would not occur under business-as-usual conditions.

References

- Bureau of Energy Efficiency (BEE). (2025). *Small and Medium Enterprise sustainable energy solutions (SME) Programme*. Government of India. <https://udit.beeindia.gov.in/sme-programme/>
- Center for Study of Science, Technology and Policy (CSTEP). (2024a). *Scope for Deep Decarbonisation in the MSME Sector*. <https://cstep.in/publications-details.php?id=2851>
- Center for Study of Science, Technology and Policy (CSTEP). (2024b). *Decarbonising the MSME Manufacturing Sector in India*. <https://cstep.in/publications-details.php?id=2853>
- Indian Council for Research on International Economic Relations (ICRIER). (2025). *Annual Survey of Micro, Small and Medium Enterprise sustainable energy solutions (MSMEs) in India*. https://icrier.org/pdf/Annual-Survey-MSMEs_India_2025.pdf
- India Brand Equity Foundation (IBEF). (2025). *Explore the Booming MSME Industry in India*. <https://ibef.org/industry/msme>
- NITI Aayog. (2025). *Report on MSMEs in India*. Government of India. <https://www.drishtiias.com/daily-updates/daily-news-analysis/niti-aayog-report-on-msmes-in-india>
- Press Information Bureau (PIB). (2025). *MSME sector accounts for 30.1% of India's GDP and 35.4% of manufacturing output*. Government of India. <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2142170>
- Renewable Watch. (2024). *Decarbonisation Roadmap: Strategies for India's Heavy Industries and MSMEs*. <https://renewablewatch.in/2024/08/22/decarbonisation-roadmap-strategies-for-indias-heavy-industries-and-msmes/>

- World Resources Institute (WRI) India. (2024). *Greening MSMEs is Critical to India's Clean Energy Transition*. <https://wri-india.org/perspectives/greening-msmes-critical-indias-clean-energy-transition>

B. PROJECT DESCRIPTION

This section asks for a theory of change as part of a joined-up description of the project as a whole. The project description is expected to cover the key elements of good project design in an integrated way. It is also expected to meet the GEF's policy requirements on gender, stakeholders, private sector, and knowledge management and learning (see section D). This section should be a narrative that reads like a joined-up story and not independent elements that answer the guiding questions contained in the guidance document. (Approximately 3-5 pages) see guidance here

THEORY OF CHANGE

Micro, Small and Medium Enterprises (MSMEs) constitute a significant share of industrial energy consumption and GHG emissions. Yet, they face persistent structural barriers that limit their participation in decarbonization pathways. These barriers include fragmented and non-MSME-specific policy frameworks; limited availability of tailored financial instruments; weak institutional coordination across ministries, financial institutions, and cluster institutions; insufficient technical and managerial capacity within enterprises; underdeveloped local service-provider and technology supply ecosystems; and high perceived risks associated with sustainable energy investments.

Despite the technical and economic viability of many sustainable energy solutions, these systemic constraints prevent MSMEs from translating national climate and energy ambitions into investible, scalable action. Without targeted intervention, MSME decarbonization remains incremental, fragmented, and heavily dependent on temporary project support, limiting its contribution to national climate targets and sustainable industrial development.

The project's Theory of Change is structured around the premise that sustained MSME decarbonization requires simultaneous intervention across policy, capacity, finance, implementation, and learning systems, rather than isolated technology deployment.

Foundational System Change – Enabling Environment (Component 1)

The first causal step addresses upstream structural constraints. If MSME-specific evidence on energy use, emissions, investment readiness, and gender-differentiated barriers is generated and used to design coherent policy instruments, sectoral roadmaps, and inclusive support schemes, then MSME decarbonization becomes embedded within national industrial, energy, and climate frameworks. By aligning MSME decarbonization with existing schemes (e.g. MoMSME programs, energy efficiency frameworks, and carbon market mechanisms), the project reduces policy fragmentation. It creates durable market signals that persist beyond the project cycle.

Key assumptions: (a) National and state institutions adopt and operationalize the proposed policy instruments and roadmaps; (b) Cross-ministerial coordination mechanisms between MoMSME, BEE (Ministry of Power), and MNRE are established and sustained, enabling coherent MSME decarbonization policy across energy efficiency, renewable energy, and enterprise development mandates.

Capability and Market Readiness – Translating Policy into Action (Component 2)

Policy alignment alone is insufficient if MSMEs, service providers, and supply chains lack the capacity to respond. Therefore, the second causal step focuses on strengthening human, institutional, and organizational capabilities. If MSMEs gain awareness, skills, and confidence to evaluate sustainable energy solution investments, if service providers and cluster institutions can deliver consistent, high-quality technical services, and if information asymmetries across markets are reduced through targeted diagnostics and digital tools, then policy intent and financial availability translate into informed, investible demand.

Gender-responsive capacity building ensures that women-owned and women-led MSMEs are not structurally excluded from emerging low-carbon markets.

Key assumption: MSMEs and market actors respond positively to improved information, skills, and service availability.

Investment Mobilization and Demonstration – From Readiness to Assets (Component 3)

With enabling policies and market readiness in place, the project shifts to investment mobilization and implementation. If MSMEs receive structured support to prepare bankable investment proposals, access existing financial instruments, and implement sustainable energy solutions under real operating conditions, with risks mitigated through performance-linked incentives and verified outcomes, then sustainable energy investments can be deployed at scale. Demonstration of technical performance, cost-effectiveness, and measurable GHG reductions reduces perceived risk for both MSMEs and financiers, catalyzing replication beyond direct project support. Institutionalization of service delivery through Virtual Decarbonization Cells and deployment of qualified professionals ensures that investment facilitation and verification functions continue beyond the project duration.

Key assumption: Financial institutions respond to reduced transaction costs and verified performance data.

Learning, Replication, and Policy Feedback – Scaling Systemic Impact (Component 4)

To avoid isolated successes, the project embeds a learning-and-knowledge feedback loop. If lessons from policy reform, capacity building, and investment implementation are systematically captured, synthesized, and disseminated through accessible knowledge platforms and learning forums, then evidence-based decision-making, replication, and future programming are enabled at national and sub-national levels. Knowledge dissemination reinforces policy refinement, market confidence, and institutional learning, accelerating scale-up beyond project beneficiaries.

Key assumption: Stakeholders actively use knowledge products and learning platforms.

Accountability and Adaptive Management – Ensuring Credibility (Component 5)

During implementation, independent monitoring and evaluation ensure accountability, adaptive management, and verification of GEBs. If project performance and outcomes are systematically tracked and evaluated in line with UNIDO and GEF requirements, then implementation risks are identified early, corrective actions are taken, and credible evidence of impact is generated for stakeholders and donors.

Expected Outcomes and Impact

Through this integrated and sequential approach, the project achieves:

- Institutionalized MSME decarbonization frameworks embedded in national policies and schemes
- Increased MSME investment in sustainable energy solutions
- Verified and scalable GHG emission reductions
- Strengthened domestic service and financing ecosystems
- Enhanced inclusion of women-owned and women-led MSMEs
- Sustained learning and replication beyond the project lifecycle

The project contributes to a systemic transformation of MSME production and energy-use practices, enabling long-term decarbonization, resource efficiency, and inclusive industrial growth aligned with national climate and development objectives.

The project delivers a paradigm shift in MSME decarbonization by moving from fragmented, single-ministry, pilot-based interventions toward institutionalized, cross-ministerial, and investment-driven transformation. By integrating the mandates of MoMSME (enterprise development), BEE (energy efficiency standards and programmes), and MNRE (renewable energy deployment) into a coherent framework, the project addresses the systemic policy incoherence that has constrained MSME decarbonization at scale.

Through MSME-specific policy instruments, sectoral roadmaps, and inclusive schemes, the project embeds decarbonization within national industrial and energy frameworks, transforming it from a voluntary or donor-driven activity into a mainstream element of MSME development policy. This creates durable market signals and regulatory coherence that persist beyond the project lifecycle.

By strengthening MSME capabilities, service-provider ecosystems, and information flows, the project converts latent interest into credible, investible demand, including for women-owned and women-led enterprises. Investment facilitation, performance-linked incentives, and verified demonstrations reduce perceived risks for MSMEs and financial institutions, catalyzing replication without reliance on ongoing subsidies.

Institutionalization of service delivery and monitoring functions ensures continuity of investment support beyond GEF financing, while systematic knowledge capture and dissemination enable replication and policy feedback at scale.

Transformational impact is achieved through the durable reconfiguration of systems governing MSME behaviour,

finance, and energy use, resulting in sustained GHG emission reductions, strengthened domestic markets for sustainable energy solutions, and inclusive low-carbon industrial growth aligned with national climate objectives.

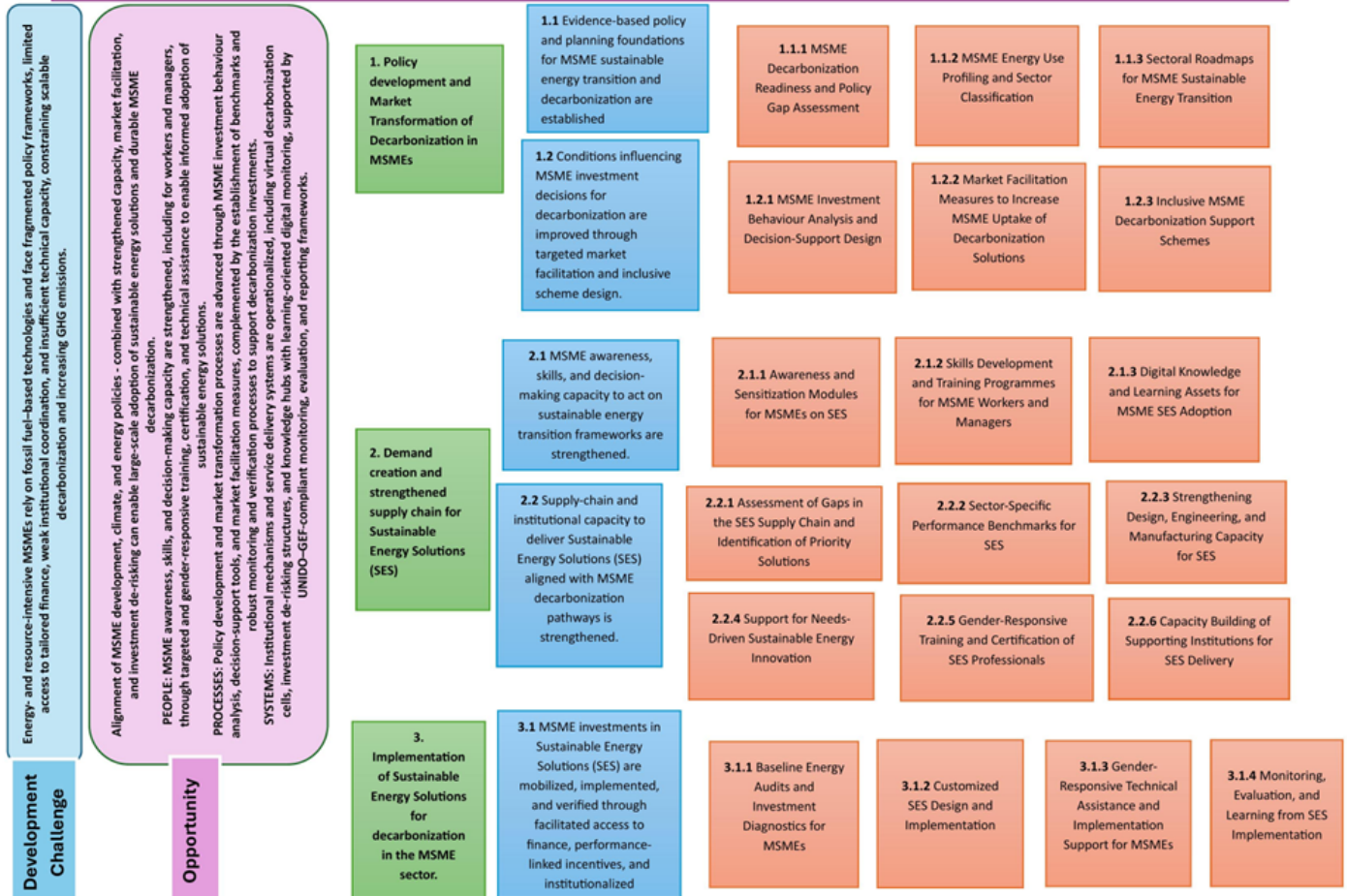
Risk mitigation embedded in the Theory of Change

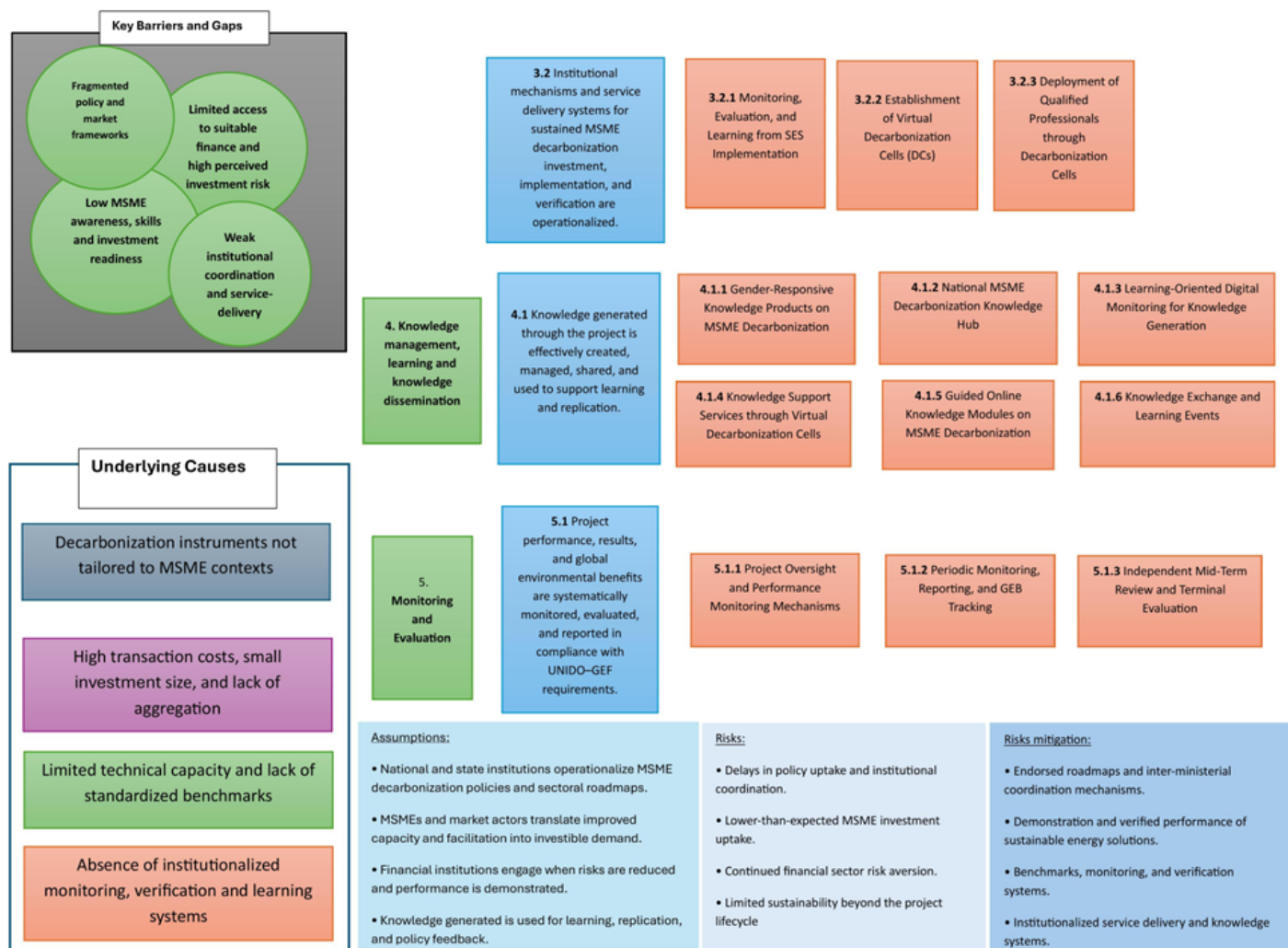
- Policy delays and coordination failures: Mitigated through endorsed roadmaps, inter-ministerial coordination mechanisms including a Technical Working Group with BEE and MNRE representation, and alignment with existing policy frameworks under the Energy Conservation Act and MNRE deployment programmes.
- Limited MSME uptake: Mitigated through demonstration, verified performance, and reduced transaction costs
- Financial risk aversion: Mitigated through standardized appraisal tools and performance-linked incentives
- Sustainability risks: Mitigated through institutionalization of service delivery and knowledge systems

The Theory of Change diagram is presented below (Figure 1), illustrating the project's causal logic from identified barriers through five interlinked components to the project objective and global environmental benefits. This is followed by an analysis of key assumptions and future narratives per the STAP Exploratory Future Narratives Primer.

Figure 1: Theory of Change Diagram

Objective: To catalyze a sustained and scalable transition of India's MSME sector toward net-zero-aligned production systems by embedding decarbonization within policy frameworks, market mechanisms, and investment ecosystems, thereby mobilizing private investment and delivering durable greenhouse gas emission reductions.





Source: Project Preparation Grant (PPG) phase analysis. Full resolution diagram available as Annex N.

The diagram illustrates the causal pathways through which project outputs translate into outcomes and global environmental benefits. The four key barriers identified during the PPG phase, namely fragmented policy and market frameworks, low MSME awareness and investment readiness, limited access to suitable finance, and weak institutional coordination, are addressed through a sequenced intervention logic across five components. The assumptions, risks, and mitigation strategies are elaborated below.

Key Assumptions and Future Narratives

Following the STAP guidance on integrating future narratives into project design (STAP, 2023: Exploratory Future Narratives Primer), this section articulates the key assumptions underpinning the Theory of Change and tests the project design against plausible future scenarios. This strengthens the project's adaptive capacity and identifies conditions under which the intervention logic may require adjustment during implementation.

Assumption 1 (Policy adoption): National and state institutions adopt and operationalize the proposed MSME-specific decarbonization policies, sectoral roadmaps, and inclusive scheme designs. Evidence from PPG consultations indicates strong alignment with the Ministry of MSME's policy direction, including the National MSME Sustainable Development Framework and the Energy Conservation Act Amendment 2022. However, the pace of adoption is sensitive to political cycles and competing policy priorities.

Assumption 2 (Market response): MSMEs and market actors respond positively to improved information, skills, and service availability by translating enhanced capacity into investible demand for sustainable energy solutions. PPG-

phase surveys across 15 clusters indicate that 60-70% of MSMEs express willingness to invest in energy efficiency when transaction costs are reduced and technical support is available, though actual conversion rates are typically 25-35% of expressed intent.

Assumption 3 (Financial engagement): Financial institutions, led by SIDBI and participating commercial banks, engage when investment risks are demonstrably reduced through standardized appraisal tools, verified performance data, and aggregated demand. SIDBI's existing green finance portfolio provides a strong institutional foundation, though scaling to 3,280 direct MSME investments requires sustained relationship management and competitive terms.

Assumption 4 (Knowledge uptake): Stakeholders actively use knowledge products, learning platforms, and the National MSME Decarbonization Knowledge Hub for replication and policy feedback beyond the project's direct intervention clusters. Sustainability depends on institutional anchoring through NPC and ni-MSME and continued demand from state-level MSME agencies and industry associations.

Exploratory Future Narratives: Scenario Matrix

The project design is tested against four plausible future scenarios along two critical uncertainty axes: (i) the degree of political ownership for MSME decarbonization at national and state level, and (ii) the trajectory of economic growth affecting MSME investment capacity. These represent the most consequential external factors that could shape project outcomes but lie largely outside the project's direct control.

Scenario A: Accelerated Transition (High Ownership + High Growth). Strong policy push meets expanding MSME investment capacity. All four assumptions hold. Project achieves full targets with potential for over-achievement on replication. This is the design-case scenario. Project response: Full implementation as designed; accelerate Component 4 knowledge dissemination and scale-up.

Scenario B: Policy-Led Slow Transition (High Ownership + Low Growth). Strong government commitment but constrained MSME investment capacity due to economic slowdown. Assumption 3 (financial engagement) is weakened. Component 3 faces slower uptake; Components 1 and 2 remain effective. Project response: Shift emphasis toward concessional finance, de-risking instruments, and smaller investment packages; extend Component 3 phasing.

Scenario C: Market-Driven Partial Transition (Low Ownership + High Growth). Weak policy adoption but strong private sector dynamism. Assumption 1 (policy adoption) is weakened. Component 1 outcomes are delayed; Components 2 and 3 can still achieve results through market-driven MSME demand and CBAM/trade pressures. Project response: Pivot Component 1 from national policy toward state-level and industry-led standards; leverage CBAM preparedness as an alternative driver.

Scenario D: Stalled Transition (Low Ownership + Low Growth). Both drivers are weak. Assumptions 1 and 3 are significantly compromised. Component 3 investment targets face substantial risk. This is the stress-case scenario. Project response: Concentrate on pilot clusters with strongest co-financing; focus on institutionalization (Component 4) and demonstration effects; trigger adaptive management via MTR.

Project Design Robustness

The project design is robust under Scenarios A, B, and C, which collectively represent the most probable trajectories. India's strong institutional commitment to MSME development (PLI schemes, NMEEE, Energy Conservation Act Amendment), combined with sustained GDP growth projections (6.5-7% annually through 2030), suggests Scenario A remains the most likely baseline. Even under Scenario D, the cluster-based approach, phased implementation, and embedded learning loops provide sufficient flexibility for adaptive management. The Mid-Term Review (Year 3) serves as the primary decision point for scenario assessment and adaptive response, when Component 1 policy outcomes and Component 3 pilot results provide empirical evidence to determine the trajectory and enable targeted course corrections.

Reference: STAP (2023). *Exploratory Future Narratives: A Primer for GEF Projects*. Scientific and Technical Advisory Panel to the Global Environment Facility.

The project is designed to build directly on the breadth that the BEE SME Programme has established, and to close precisely the audit-to-investment translation gap that has constrained MSME-scale impact to date. The cluster-based delivery model is anchored in four executing partners — the National Productivity Council (NPC), the Confederation of Indian Industry – Green Business Centre (CII-GBC), The Energy and Resources Institute (TERI), and the National Institute for Micro, Small and Medium Enterprises (ni-MSME) — with embedded cluster-level outreach through MoMSME's existing field formations: the MSME-Development Institutes (MSME-DIs), District Industries Centres (DICs) and MSME Technology Centres. Demand is aggregated across the 14 priority clusters identified at the PPG stage (approximately 6,500 MSMEs targeted), so that audit-grade recommendations can be converted into bundled, cluster-scale investment propositions that the per-enterprise audit model of the BEE programme cannot, on its own, deliver. TA delivery under Components 1 and 3 is bundled with investment mobilization under Component 2 — the five industry-association investment-mobilization commitments captured in Annex B-1 (USD 71.1 million+, sector-level) close precisely the audit-to-finance gap that has constrained translation to investment under the BEE programme. Programmatic convergence with RAMP, ZED and CGTMSE is operationalized through the Ministry of MSME in-kind contribution of USD 5.4 million, which carries convening authority over these schemes and their associated public-sector banking relationships, providing the credit-enhancement and scheme-overlay architecture needed for cluster-scale finance to flow. Critically, BEE itself retains a central technical role — its accredited Energy Auditor cadre will be deployed at cluster scale under Component 3 (providing the depth-of-engagement layer that the BEE programme's national auditor pool has not been able to deliver at MSME scale), and its M&V framework will be applied to the project's investment portfolio under Component 4. The project is therefore not a substitute for the BEE SME Programme: it is the cluster-level delivery, demand-aggregation and finance-bundling architecture that converts the breadth BEE has already built into the depth of bankable, implemented investment, while providing BEE the cluster-scale operating experience required to scale its own national programme.

PROJECT COMPONENTS AND INTERVENTIONS

The project comprises five interlinked components that jointly address policy and institutional conditions, MSME and market readiness, deployment of sustainable energy solutions, knowledge and learning, and monitoring and evaluation. Rather than a strictly linear sequence, the components are implemented in a coordinated and iterative manner, enabling policy and capacity development to inform and adapt alongside solution deployment, performance monitoring, institutionalization, and learning for scale-up and replication.

Component 1 – Policy development and market transformation for MSME decarbonization

Component 1 establishes the enabling policy, institutional, and market conditions required for MSME decarbonization. Three rationale-stage questions are answered explicitly in the Component 1 design: (i) BEE SME Programme coverage gap - addressed through Output 1.1.1 (MSME Decarbonization Readiness and Policy Gap Assessment, co-developed with BEE) and Output 3.2.2 (Virtual Decarbonization Cells across 60 clusters that extend the SME Programme delivery footprint by an order of magnitude); (ii) MNRE procurement barriers for open-access and captive renewable energy - addressed through Output 1.2.2 (Market Facilitation Measures including a model open-access PPA template for MSME aggregators and a captive-solar aggregation pilot under Output 3.1.12 designed in coordination with MNRE); (iii) inter-ministerial coordination gap - addressed through the establishment of a Technical Working Group (TWG) under Output 1.1.3 with BEE, MNRE and MoEFCC representation, with TWG terms of reference annexed and a quarterly inter-ministerial review cadence. The TOC therefore reflects BEE and MNRE as co-implementing technical partners alongside MoMSME- led national execution; should this evolve toward a formal executing-partner role during inception, the project will pursue a Major Amendment per the inception-phase amendment pathway described above.

Outcome 1.1: Evidence-based policy and planning foundations for MSME sustainable energy transition and decarbonization are established.

Output 1.1.1: MSME decarbonization readiness and policy gap assessment

This output produces an assessment report that documents MSME decarbonization readiness and identifies policy and implementation gaps at the national and state levels. The assessment covers (i) MSME technical and managerial readiness, (ii) investment readiness and constraints, (iii) applicability of existing MSME, energy, and climate instruments to MSMEs, and (iv) institutional roles and coordination arrangements that affect MSME decarbonization support. Gender-differentiated constraints affecting access to information, finance, and support mechanisms are assessed and documented in the findings and recommendations.

Activities:

- Assess MSME awareness, technical capacity, and investment readiness using standardized assessment templates,
- Review national and state-level policies, schemes, and regulatory instruments affecting MSME energy use and emissions;
- Map institutional mandates and coordination arrangements relevant to MSME decarbonization;
- Identify gender-differentiated barriers and entry points for inclusion;
- Prepare, validate, and disseminate the assessment report and recommendations.

Output 1.1.2: MSME energy use profiling and sector classification

This output produces an empirical baseline dataset and analysis of MSME energy consumption patterns (electricity and thermal/process heat) across selected clusters and sectors. MSMEs are classified by energy intensity, fuel mix, process type, and indicative emissions profile. Results are documented in a profiling report and sector classification that can be used to prioritize technologies, develop roadmaps, and define monitoring baselines.

Activities:

- Collect energy consumption and process data from representative MSME samples in selected clusters,
- Analyze electricity and thermal energy use by process step and end-use category,
- Classify MSME sectors by energy intensity, fuel mix, and indicative emissions profile,
- Validate findings with technical experts and cluster associations and finalize profiling outputs.

Output 1.1.3: Sectoral roadmaps for MSME sustainable energy transition

This output produces sector-specific roadmaps that define MSME decarbonization pathways, including priority measures/technologies, indicative sequencing, enabling policy actions, institutional roles, and implementation considerations. Roadmaps incorporate gender-responsive measures where relevant to access, outreach, and scheme design. Roadmaps are aligned with national climate and energy strategies and validated with relevant stakeholders.

Activities:

- Develop sector-specific decarbonization scenarios and pathways based on profiling and readiness findings,
- Identify priority sustainable energy solutions and enabling actions per sector,
- Estimate indicative investment needs, timelines, and implementation prerequisites,
- Align roadmap measures with applicable national energy efficiency and climate instruments,
- Validate roadmaps through stakeholder consultations and finalize roadmap documents.

Outcome 1.2: Conditions influencing MSME investment decisions for decarbonization are improved through targeted market facilitation and inclusive scheme design.

Output 1.2.1: MSME investment behaviour analysis and decision-support design

This output provides an analysis of investment behaviour and a set of decision-support designs that address documented MSME decision-making constraints. The study covers payback expectations, risk perceptions, information gaps, documentation constraints, and gender-differentiated barriers affecting investment decisions and access to

support. Decision-support designs include practical tools/guidance that cluster institutions and support programs can apply to improve MSME investment readiness.

Activities:

- Assess MSME investment decision drivers, barriers, and risk perceptions across sectors and clusters,
- Identify gender-differentiated constraints affecting investment decisions and access to finance,
- Develop decision-support tools and guidance (templates, checklists, guidance notes) for MSME investment readiness,
- Validate decision-support designs with MSMEs, cluster institutions, and financial institutions and finalize materials.

Output 1.2.2: Market facilitation measures to increase MSME uptake of decarbonization solutions

This output defines and applies market facilitation measures in selected clusters to reduce transaction costs for MSMEs to access prioritized sustainable energy solutions. Measures include demand aggregation approaches, structured linkages with solution and service providers, and standardized information provision at the cluster level.

Activities:

- Design and apply demand aggregation mechanisms at the cluster level for priority solutions,
- Facilitate structured linkages between MSMEs, technology providers, service providers, and cluster institutions,
- Prepare and disseminate standardized information packages on available solutions and service options,
- Document market facilitation procedures and disseminate guidance through cluster platforms and national institutions.

Output 1.2.3: Inclusive MSME decarbonization support schemes

This output delivers design recommendations for public and publicly supported MSME decarbonization support schemes, including grant, incentive, technical assistance, and blended finance programs implemented by ministries, agencies, development banks, and partner financial institutions.

The recommendations aim to improve overall scheme effectiveness while explicitly enhancing accessibility for micro-enterprises, sustainable energy solutions, and women-owned or women-led MSMEs, without excluding other MSME segments.

Activities:

- Review existing public and publicly supported MSME support schemes and identify entry points for integrating or strengthening decarbonization support,
- Develop inclusive design recommendations covering eligibility, application procedures, documentation requirements, transaction costs, and incentive structures,
- Validate and refine scheme design recommendations through consultations with relevant ministries, implementing agencies, development banks, and financial institutions.

Component 2 – Demand creation and strengthened supply chain for sustainable energy solutions

Component 2 strengthens firm-level MSME demand and implementation capacity, as well as the capacity of service providers and supporting institutions, to deliver sustainable energy solutions aligned with the decarbonization roadmaps developed under Component 1.

While Component 1 assesses energy solutions policy, financing, and enabling frameworks, Component 2 focuses on energy solutions on operational readiness, addressing gaps in:

- MSME awareness, skills, and decision-making capacity,
- Availability, quality, and accessibility of technical and advisory services,
- Supply-chain and service-provider readiness for priority decarbonization solutions.

Service providers include energy auditors, technology suppliers, system integrators, ESCOs, and technical assistance providers, while supporting institutions include cluster organizations, industrial zone authorities, business membership organizations, training institutions, and relevant public agencies.

Outputs under Component 2 deliver practical training packages, digital tools, benchmarks, and targeted capacity-strengthening actions, applied through selected industrial clusters and institutional platforms, to strengthen MSME readiness and support the uptake and implementation of sustainable energy solutions aligned with the priorities defined under Component 1.

On the renewable-energy side, three barriers have constrained MSME-scale uptake to date. First, state-level regulatory variability in open-access frameworks — differences in banking charges, cross-subsidy surcharges, applicable wheeling charges and procedural requirements across the project's 14 priority clusters — increases transaction cost and risk for MSME off-takers. Second, off-taker confidence for developer-led PPA models at the MSME scale remains low: developers prefer larger, single-counterparty contracts, and aggregator structures for MSME demand have not yet matured. Third, the capex requirement for captive RE installations is binding for the typical MSME balance sheet, particularly where audit-grade energy-efficiency measures have not yet been implemented to right-size the load. The project's response under Component 2 addresses each barrier in turn: cluster-level RE-EE bundling pilots, sequencing demand-side energy efficiency first to right-size the RE requirement; engagement with MNRE-accredited channel partners and discom-facing aggregators to lower transaction costs; and demonstration of Renewable Energy Service Company (RESCO) and aggregated-demand PPA models that shift capex off the MSME balance sheet. Policy-engagement work under Component 4 is taken forward in collaboration with CII-GBC's and TERI's existing MNRE relationships, focused on the open-access procedural items that are most binding at cluster scale.

Outcome 2.1: MSME awareness, skills, and decision-making capacity to act on sustainable energy transition frameworks are strengthened.

Output 2.1.1: Awareness and sensitization modules for MSMEs on sustainable energy solutions

This output produces standardized awareness and sensitization modules tailored to targeted MSME sectors and clusters. Modules cover priority sustainable energy solutions, decarbonization pathways, available support mechanisms, and basic considerations for investment decisions. Delivery approaches include gender-responsive outreach methods and cluster-based dissemination.

Activities:

- Develop awareness and sensitization modules tailored to MSME sectors and clusters,
- Conduct outreach and sensitization sessions using gender-responsive approaches,
- Disseminate modules through cluster institutions, industry associations, and MSME support networks,
- Capture feedback and update modules to improve clarity and usability.

Output 2.1.2: Skills development and training programs for MSME workers and managers

This output produces modular training programs that build the skills required to identify, operate, and maintain sustainable energy solutions in MSMEs. All skills - development and training activities will integrate explicit gender dimensions. (i) Participation targets - at least 30% female participation across all training cohorts, monitored and reportedly annually, with adaptive enablers (timing, venue accessibility and childcare support) to make participation feasible for women workers and women-led MSMEs. (ii) Access measures — targeted outreach to women entrepreneurs, engineers, managers and workers through women's industry associations, women-led MSME tracks within each cluster training programme, and partnership with ni-MSME's Women Entrepreneurship Cell. (iii) Gender-responsive training approaches — a female-instructor pipeline through cluster-level technical service providers and the accredited Energy Auditor cadre, gender-sensitive case studies and curricula, and adult-learning methods adapted to women workers in manufacturing settings. (iv) Sex-

disaggregated monitoring indicators — female participation rates, female completion rates, and post-training income / employment outcomes for women, embedded in the Results Framework. (v) Women's leadership and decision-making opportunities — women-only cohorts at advanced training tiers, female-mentor programmes, and pipeline placement of female trainees as energy auditors and trainers in subsequent project cycles.

Activities:

- Develop modular training curricula and materials for MSME workers, supervisors, and managers,
- Deliver training through cluster-based and institutional training platforms,
- Assess training outcomes and update training materials based on results.

Output 2.1.3: Digital knowledge and learning assets for MSME SUSTAINABLE ENERGY SOLUTIONS adoption

This output delivers digital learning content and self-learning assets that enhance MSME knowledge, foster peer exchange, and support learning-oriented benchmarking on the adoption of sustainable energy solutions.

Benchmarking in this context refers to simple, non-mandatory comparisons that allow MSMEs to situate their energy performance or solution uptake relative to indicative sector, technology, or cluster reference values, supporting informed decision-making and peer learning rather than formal performance assessment. Assets are designed for open dissemination and self-learning and, where feasible, are integrated into relevant national and institutional digital platforms.

Activities

- Develop digital learning assets and content packages supporting MSME adoption of sustainable energy solutions,
- Integrate digital assets into relevant national and institutional platforms where feasible,
- Develop simple, voluntary benchmarking and peer-learning functions, such as indicative comparisons with sectoral or cluster reference ranges, through digital tools where feasible,
- Update and refine digital assets based on user feedback and implementation experience.

Output 2.1.4: Gender-responsive international exposure, study tours, and knowledge exchange

This output delivers targeted international study tours that provide MSME representatives, service providers, and supporting institutions with direct exposure to practical MSME decarbonization implementation approaches relevant to project needs. Participation is structured and gender-responsive, ensuring the inclusion of women professionals and women-led enterprises where relevant, and is designed to enable active engagement with host institutions and practitioners to support the practical adaptation of observed approaches to local MSME decarbonization pathways.

Activities:

- Organize targeted international study tours linked to specific project implementation needs,
- Capture key practical observations and lessons from study tours, with a focus on applicability to local MSME decarbonization pathways.

Outcome 2.2: Supply-chain and institutional capacity to deliver sustainable energy solutions aligned with MSME decarbonization pathways is strengthened.

Output 2.2.1: Assessment of gaps in the sustainable energy solutions supply chain

This output produces a supply-chain assessment report that identifies gaps in availability, quality, geographic coverage, after-sales service, and maintenance capacity for priority sustainable energy solutions. The assessment covers key actors across the delivery chain (manufacturers, integrators, and service providers) and identifies priority actions to strengthen capacity.

Activities:

- Assess supply-chain capacity against priority technology pathways identified under Component 1,
- Identify gaps in solution availability, service quality, geographic coverage, and after-sales support,
- Review maintenance and troubleshooting capacity relevant to the sustained application of sustainable energy solutions,
- Validate findings with MSMEs, service providers, and financial institutions and finalize the assessment report

Output 2.2.2: Sector-specific performance benchmarks for sustainable energy solutions

This output produces documented sector-specific performance benchmarks for priority sustainable energy solutions, incorporating both national standards and international best practices. Benchmarks define measurable performance parameters that support solution comparability, quality assurance, investment decision-making, and monitoring. National benchmarks are aligned with applicable Indian standards where relevant and are complemented by international technology benchmarks drawn from global databases and UNIDO's portfolio of industrial energy efficiency programmes across developing countries. The international benchmarking component enables Indian MSMEs and technology providers to assess their energy performance and technology choices against global peers, identify performance gaps, and prioritize technology upgrades with the highest decarbonization potential.

Activities:

- Compile international performance benchmarks for priority sustainable energy technologies across the eight target sub-sectors, drawing on global databases, UNIDO industrial efficiency data, and published studies from comparable MSME economies.
- Develop sector-specific national performance benchmarks and parameters for priority solutions, calibrated against the international benchmarks.
- Align benchmarks with national standards and certification frameworks where applicable.
- Prepare sector benchmark reports comparing Indian MSME technology performance against international best practices, with recommendations for priority technology interventions.
- Validate benchmarks through technical review and stakeholder consultations with industry associations and technology providers.
- Disseminate benchmarks through training programmes, cluster institutions, the National MSME Decarbonization Knowledge Hub, and digital platforms.

Output 2.2.3: Strengthening design, engineering, and manufacturing capacity for sustainable energy solutions

Strengthening of design, engineering and manufacturing capacity under Output 2.2.3 will integrate explicit gender dimensions. (i) Participation targets — at least 25% female representation among engineers and designers trained, and women-led-MSME inclusion in technology-transfer support with appropriate eligibility thresholds. (ii) Access measures — targeted outreach to women engineers and entrepreneurs through CII's Indian Women Network, industry-association partners, ni-MSME's Women Entrepreneurship Cell, and engineering institutions with women's chapters; direct engagement with women entrepreneurs in clusters with significant female-ownership representation. (iii) Gender-responsive approaches — design and engineering content incorporating ergonomic and safety considerations relevant to women workers in manufacturing, gender-conscious workshop scheduling, and dual-language / dual-format delivery. (iv) Sex-disaggregated indicators — women engineers trained, women-led MSMEs benefited from technology transfer, and gender-disaggregated outcomes on technology adoption. (v) Leadership opportunities —

women's representation on technology selection panels and recognition programmes, and integration of women technology leaders into the knowledge dissemination work under Component 4.

Activities:

- Support technical improvements in solution design and engineering relevant to MSME operational constraints,
- Promote standardization, testing, and quality assurance practices in manufacturing and assembly
- Facilitate collaboration between manufacturers, service providers, and cluster institutions to improve delivery readiness
- Document improved practices and prepare replication guidance.

Output 2.2.4: Support for needs-driven sustainable energy innovation

This output supports early-stage testing and validation of sustainable energy innovations that respond to practical implementation challenges, technical needs, or uncertainties encountered in MSME decarbonization pathways, without financing procurement or commercialization. The output generates documented testing and validation results, providing evidence on feasibility, limitations, and relevance for MSME application.

Activities:

- Identify priority technical needs and uncertainties encountered in MSME decarbonization pathways,
- Support structured testing and validation protocols with MSMEs and technical institutions,
- Facilitate collaboration between innovators, MSMEs, and technical institutions for field validation,
- Document outcomes, limitations, and lessons learned for dissemination.

Output 2.2.5: Gender-responsive training and certification of sustainable energy solutions professionals

This output produces and delivers training and certification modules for professionals (auditors, consultants, technicians, service providers) involved in designing, installing, operating, and maintaining sustainable energy solutions. Gender-responsive measures are applied to increase women's participation in training and certification pathways. Certification alignment with existing frameworks is pursued where feasible.

Activities:

- Develop gender-responsive training and certification modules for sustainable energy solutions professionals,
- Conduct training programs for relevant professional categories,
- Align certification approaches with existing national frameworks where applicable.

Output 2.2.6: Capacity building of supporting institutions for sustainable energy solutions delivery

Capacity building of supporting institutions under Output 2.2.6 will explicitly integrate gender dimensions. (i) Participation targets — designation of gender focal points within each institutional counterpart (BEE, MNRE, MoMSME field formations, the four Executing Partners and supporting industry associations); gender-balanced participation in institutional capacity-building events. (ii) Access measures — targeted capacity building for women officials within partner institutions, women's networks within institutional counterparts, and women-led knowledge dissemination from institutional gender focal points. (iii) Gender-responsive approaches — integration of gender considerations into institutions' technical-assistance and outreach protocols; a gender component in institutional capacity assessments; gender-disaggregated data-collection system roll-out at the institutional level. (iv) Sex-disaggregated indicators — institutional gender focal points trained and active, gender-disaggregated reporting from supporting institutions, and gender-equity reviews of supporting-institution outreach. (v) Leadership opportunities — women's representation on inter-ministerial coordination mechanisms (including BEE / MNRE PSC observer designations where feasible), institutional gender champions programmes, and women-led knowledge products from the supporting-institutions network.

Activities:

- Assess institutional capacity gaps related to sustainable energy solutions
- Provide targeted capacity-building support to selected institutions

- Develop tools, guidance, and operating procedures for selected institutions
- Embed sustainable energy solutions support functions into existing institutional service offerings

Component 3 – Implementation of sustainable energy solutions for decarbonization in the MSME sector

Component 3 translates enabling conditions and readiness into MSME investments, installation of sustainable energy solutions, and verified performance outcomes. It addresses key operational barriers to uptake and implementation, including access to audits, investment documentation and preparation, implementation quality assurance, and practical performance verification. It facilitates MSME access to existing finance and schemes and, where applicable, applies performance-linked incentives, while establishing service delivery mechanisms through Virtual Decarbonization Cells.

Eligible technologies under Component 3. The sustainable energy solutions supported under this project are exclusively non-fossil-fuel-based. Eligible technology categories include: (a) solar energy systems (rooftop solar PV for captive power generation, solar water heating, concentrating solar thermal for process heat, solar drying systems); (b) biomass energy systems (biomass gasifiers for process heat, biomass briquette-fired boilers replacing coal-fired boilers, biogas digesters), subject to biomass sustainability criteria; (c) high-efficiency electric systems (IE3/IE4 class motors replacing older motors, variable frequency drives, high-efficiency pumps and compressors, electric furnaces replacing fossil-fuel-fired furnaces); (d) waste heat recovery systems (heat exchangers, economizers, recuperators); (e) energy-efficient lighting and cooling (LED lighting upgrades, high-COP chillers, evaporative cooling systems); (f) process optimization and energy management systems (ISO 50001, IoT-based energy monitoring, compressed air optimization); and (g) non-fossil thermal systems (electric boilers, industrial heat pumps, solar thermal systems, biomass boilers replacing fossil-fuel-based systems).

The replacement and retrofitting of energy-efficient motors, pumps, and compressors is limited to applications that reduce electricity consumption in manufacturing processes or that replace fossil-fuel-powered equipment with electric alternatives. The project will not finance efficiency improvements to motors or equipment that serve fossil-fuel-based energy conversion or combustion systems.

Technology ineligibility. The project will not finance any boiler, thermal system, or process equipment that uses coal, oil, natural gas, or any other fossil fuel as its primary or supplementary energy source, regardless of efficiency improvements. Specifically excluded are: fossil-fuel-fired boilers even with efficiency improvements; fossil-fuel-based thermal systems (furnaces, kilns, dryers); diesel generators; natural gas switching from coal; and motor upgrades applied to fossil-fuel combustion systems.

Outcome 3.1: MSME investments in sustainable energy solutions are mobilized, implemented, and verified through facilitated access to finance, performance-linked incentives, and institutionalized implementation support.

Output 3.1.1: Baseline energy audits and investment diagnostics for MSMEs

This output delivers standardized enterprise-level energy audits and investment diagnostics for selected MSMEs to support investment preparation and implementation. While Output 1.1.2 establishes sector- and cluster-level energy profiling and indicative baselines for prioritization and roadmap development, this output translates those insights into firm-specific baselines for energy use, emissions (as applicable), and energy costs. It identifies prioritized, investment-ready measures aligned with sectoral roadmaps and performance benchmarks.

Activities

- Conduct enterprise-level energy audits covering electricity and process heat using standardized protocols,
- Establish firm-specific energy, emissions, and cost baselines for investment preparation,
- Identify and prioritize decarbonization measures aligned with sectoral roadmaps and benchmarks,
- Validate audit findings with MSMEs and technical experts and finalize audit reports.

Output 3.1.2: Customized sustainable energy solution design and implementation

This output delivers enterprise-specific technical design and implementation packages that translate audit findings into installation-ready sustainable energy solutions for MSMEs. The output supports the technical preparation and coordination steps required for installation and commissioning, including detailed design specifications, implementation schedules, and commissioning records, all aligned with applicable performance benchmarks and technical standards.

Activities:

- Prepare enterprise-specific technical design packages for sustainable energy solutions, based on audit results, site conditions, and MSME operational constraints,
- Support procurement coordination, installation planning, and commissioning arrangements in line with agreed project procedures,
- Verify compliance of designs and installations with applicable technical standards and performance benchmarks,
- Coordinate implementation with technology suppliers and service providers and document installation and commissioning completion.

Output 3.1.3: Gender-responsive technical assistance and implementation support for MSMEs

This output delivers hands-on, on-site technical assistance to MSMEs after design and installation are complete, focusing on the proper execution and stabilization of the early operation of sustainable energy solutions. The support reduces implementation errors and performance risks by addressing site-specific issues, troubleshooting operational problems, and supporting corrective actions during the initial operating period.

The output also ensures the structured transfer of operational and maintenance practices to MSME staff, strengthening in-house capacity. Gender-responsive measures are applied to provide access for women-owned and women-led MSMEs and to promote the inclusion of women staff in operational roles where applicable.

Activities:

- Provide on-site technical assistance during the initial operating period of installed sustainable energy solutions,
- Support MSMEs in resolving technical and operational issues that arise after installation,
- Facilitate structured transfer of operational procedures and maintenance requirements to enterprise teams,
- Document support actions and recurrent implementation issues to inform improvements in guidance and support approaches.

Output 3.1.4: Monitoring, evaluation, and learning from sustainable energy solutions implementation

This output generates verified performance information on implemented solutions, including energy savings, operational performance, and emissions reductions (as applicable) relative to agreed baselines and benchmarks.

Activities:

- Monitor post-implementation energy performance and operational parameters using agreed methods,
- Verify savings and emissions reductions against baselines and benchmarks,
- Document implementation results, operational issues, and corrective measures,
- Feed verified performance data into project reporting and knowledge systems.

Outcome 3.2: Institutional mechanisms and service delivery systems for sustained MSME decarbonization investment, implementation, and performance verification are operationalized.

Output 3.2.1: Establishment of Virtual Decarbonization Cells

This output establishes Virtual Decarbonization Cells within selected host institutions, with documented mandates,

governance arrangements, and operating procedures. Cells function as service hubs that coordinate MSME access to technical support, investment facilitation interfaces, and monitoring/verification processes.

Activities:

- Identify and formalize host institutions for Decarbonization Cells through documented agreements,
- Define governance structure, service scope, eligibility, and operating procedures,
- Set up operational systems to link Cells with financiers, service providers, and relevant digital platforms,
- Integrate Cell functions into host institutional mandates and service offerings.

Output 3.2.2: Deployment of qualified professionals through Decarbonization Cells

This output establishes and implements a roster mechanism to deploy qualified, certified professionals to MSMEs for implementation oversight, troubleshooting, and verification support.

Activities:

- Establish and maintain rosters of qualified and pre-certified professionals linked to Decarbonization Cells,
- Deploy professionals to MSMEs for defined tasks (oversight, troubleshooting, verification support),
- Define and apply service standards and quality assurance procedures for professional services,
- Ensure equitable access to professional services, including for women-owned and women-led MSMEs.

Output 3.2.3: Institutionalized monitoring and verification of MSME decarbonization investments

This output implements post-installation monitoring and verification arrangements for MSME sustainable energy solutions supported under the project, focusing on tracking and verifying operational performance after commissioning. The output covers data collection, sample-based verification, and reporting required for performance-linked incentives (where applicable), project reporting, and aggregation of results, without duplicating audits, commissioning, or benchmarking activities.

Activities:

- Operate digital systems to record and track operational energy savings and emissions reductions from installed and commissioned solutions,
- Conduct sample-based physical verification of installations using agreed protocols to confirm reported performance,
- Validate reported performance data against agreed benchmarks and verification procedures,
- Aggregate and integrate verified performance data into project reporting and relevant national reporting channels, where applicable.

Component 4 – Knowledge management, learning, and knowledge dissemination

Component 4 consolidates and disseminates knowledge generated across Components 1–3. It produces knowledge products, establishes a knowledge hub, generates learning-oriented analytics, and delivers structured learning events. Outputs are designed for replication and use as evidence by policymakers, institutions, financiers, service providers, and MSMEs.

Outcome 4.1: Project knowledge and evidence are systematically captured, managed, shared, and applied to support learning, replication, and scaling.

Output 4.1.1: Gender-responsive knowledge products on MSME decarbonization

This output will produce dedicated gender-focused knowledge products and learning under four headings, in direct correspondence with the Secretariat's clarification request. (i) Documentation of women's participation and leadership outcomes — a baseline study of the state of women in MSME decarbonisation across the 14 priority clusters, and periodic reports on participation and leadership outcomes against the Gender Action Plan KPIs (female participation rates, women-led MSMEs reached, women's leadership representation across project structures). (ii) Case studies and success stories — illustrative case studies of women-led MSMEs that have adopted EE-RE solutions

through the project, of women trainees who have transitioned into accredited Energy Auditor and trainer roles, and of women leaders within supporting institutions advancing the project. (iii) Lessons learned on advancing gender equality — synthesis at the cluster, institutional and policy levels, structured to inform downstream programmes and the broader BEE / MNRE / MoMSME convergence platform. (iv) Replicable models for women's inclusion in sustainable energy value chains — a Replication Toolkit on Women's Inclusion in Sustainable-Energy Value Chains, with operationally usable templates and protocols. The relatively significant budget allocation under this output reflects the scope of these dedicated gender-focused knowledge deliverables.

Activities:

- Develop knowledge products (case studies, synthesis reports, policy briefs, technical notes) based on evidence and experience generated through project implementation,
- Document gender-differentiated barriers, participation, outcomes, and good practices observed across project activities,
- Synthesize practical lessons from policy design, capacity-building, and MSME investment support components,
- Disseminate knowledge products through relevant national and international platforms and partner networks.

Output 4.1.2: National MSME decarbonization knowledge hub

This output establishes and operates a centralized, open-access national knowledge hub that consolidates and disseminates project knowledge products, publicly accessible tools, and non-confidential datasets produced under the project. The hub provides structured, user-oriented access tailored to different stakeholder groups, including MSMEs, service providers, institutions, and policymakers, and is linked to existing national digital platforms where feasible to ensure sustainability and uptake. The hub will also be tasked with coordinating work on the project's sustainability and exit strategy.

Activities:

- Design and establish the knowledge hub (web-based portal and/or mobile application) with a defined content architecture and user pathways,
- Upload, organize, and maintain project knowledge products, guidance documents, tools, and curated resources intended for public access,
- Ensure accessibility, usability, and inclusive design for key stakeholder groups, including MSMEs and women-led enterprises,
- Integrate the knowledge hub with relevant existing national knowledge and information platforms where feasible,
- Coordinate the preparation of the project's sustainability and exit strategy.

Output 4.1.3: Learning-oriented digital monitoring for knowledge generation

This output develops learning-oriented digital analytics and dashboards that aggregate and visualize non-confidential implementation and performance data from project activities across MSMEs and clusters. The output supports cross-cutting analysis of trends, patterns, and operational insights to inform learning, synthesis, and reflection.

The analytics are distinct from formal project M&E systems and investment performance verification, and are designed solely to support knowledge synthesis, adaptive management, and policy dialogue, drawing on data generated under Components 1–3.

Activities:

- Aggregate non-confidential implementation and performance data from Components 1–3 for learning and analysis purposes,
- Develop dashboards and analytical views to identify trends, patterns, and recurring operational insights across MSMEs and clusters,

- Use analytical outputs to inform knowledge products, learning events, and synthesis activities under the knowledge management component,
- Provide synthesized insights to support adaptive project management and evidence-informed policy dialogue.

Output 4.1.4: Knowledge support services through Virtual Decarbonization Cells

This output establishes frontline knowledge support services embedded within Virtual Decarbonization Cells to provide standardized, demand-responsive information and referral support to MSMEs and other stakeholders. The services focus on explaining decarbonization pathways, available schemes, support mechanisms, and resource options, and on directing users to relevant technical, financial, or institutional support providers.

The output produces operational helpdesk procedures, standardized response content, and anonymized inquiry records, which are used to improve service delivery and to inform learning and synthesis activities under the project's knowledge management component. The output does not duplicate implementation support or formal advisory services.

Activities

- Establish helpdesk or call-centre functions linked to Virtual Decarbonization Cells, with clearly defined operating procedures and response protocols,
- Provide standardized, up-to-date information on decarbonization pathways, support schemes, available resources, and referral routes,
- Route technical, financial, and investment-related inquiries to appropriate institutions, service providers, or project mechanisms,
- Log and analyze anonymized inquiry data to identify recurring information needs and inform knowledge products and learning outputs.

Output 4.1.5: Guided online knowledge modules on MSME decarbonization

This output develops guided, self-paced online knowledge modules that provide conceptual orientation and awareness-level understanding of MSME decarbonization approaches and available support mechanisms. The modules are informational rather than skills-based, and do not replace or duplicate technical training delivered under Component 2.

Content draws on project implementation experience and synthesized lessons, including gender-responsive examples and narratives, and is hosted on the project knowledge hub for open access and periodic updating.

Activities:

- Develop guided online modules covering key concepts, approaches, and support mechanisms for MSME decarbonization,
- Incorporate synthesized lessons and illustrative examples drawn from project implementation and case material,
- Host modules on the knowledge hub and update content periodically based on user feedback and evolving project experience.

Output 4.1.6: Knowledge exchange and learning events

This output delivers structured knowledge exchange and learning events that disseminate synthesized project evidence and lessons and facilitate peer exchange among MSMEs, policymakers, financiers, service providers, and technical institutions. The events focus on reflection, dialogue, and replication, rather than training or technical assistance.

The output produces documented event proceedings and replication-relevant takeaways, which are disseminated through project knowledge platforms and partner networks.

Activities:

- Organize workshops, conferences, and learning forums focused on project evidence, implementation experience, and lessons learned,
- Facilitate participation of MSMEs, policymakers, financiers, service providers, and technical institutions, using inclusive and gender-responsive approaches where relevant,
- Present synthesized lessons and verified implementation evidence from project components,
- Document event proceedings and disseminate replication-relevant takeaways through project knowledge channels.

Component 5 – Monitoring and evaluation (M&E)

Component 5 establishes independent monitoring and evaluation arrangements for the project in line with UNIDO and GEF requirements. It covers governance-related performance monitoring, results tracking, GEB tracking, and independent evaluations (mid-term and terminal). Implementation functions remain separate from evaluation functions to ensure objectivity.

Outcome 5.1: Project performance, results, and GEBs are systematically monitored, evaluated, and reported in compliance with UNIDO–GEF requirements.

This outcome ensures that project progress and results are tracked against agreed indicators, that risks and performance issues are identified in time for corrective action, and that verified evidence is available for accountability and reporting.

Output 5.1.1: Project oversight and performance monitoring mechanisms

This output establishes and operationalizes project oversight, coordination, and performance-monitoring arrangements, as defined in the RCE section on institutional arrangements, including governance structures, roles and responsibilities, reporting lines, and periodic review mechanisms, in line with GEF requirements.

Output 5.1.2: Periodic monitoring, reporting, and GEBs tracking

Monitoring, reporting and GEBs tracking under Output 5.1.2 will explicitly capture gender dimensions throughout. (i) Gender-disaggregated indicators will be monitored across all output- and outcome-level indicators of the Results Framework — including female participation rates, women-led MSMEs reached, gender-disaggregated GHG-emission reductions where attributable, and female leadership in institutional structures. (ii) The annual Project Implementation Reports (PIRs) will include a dedicated gender section reporting progress against the Gender Action Plan KPIs and against the project's gender targets. (iii) Gender Action Plan implementation will be reviewed periodically by the Project Management Unit and reported to the Project Steering Committee, with gender-related observations and corrective actions logged and reported in the PIRs. (iv) Gender-disaggregated GEBs reporting will follow GEF STAR and GEBs guidance, including sex-disaggregated direct and indirect beneficiary numbers.

Output 5.1.3: Independent mid-term review and terminal evaluation

The independent Mid-Term Review (MTR) and Terminal Evaluation (TE) under Output 5.1.3 will explicitly include gender assessment criteria. (i) The Terms of Reference for both MTR and TE will require gender expertise on the evaluation team — at least one team member with documented gender-evaluation experience. (ii) The MTR and TE will include a dedicated gender-assessment section reporting on the project's Gender Action Plan implementation and outcomes, including progress against gender targets and lessons learned on advancing gender equality. (iii) Gender-disaggregated impact analysis will be required for all Results-Framework indicators where applicable. (iv) The evaluations will be conducted under UNIDO

Evaluation Group oversight and UNEG quality standards, which incorporate the UNEG Guidance on Integrating Human Rights and Gender Equality in Evaluations.

SUSTAINABILITY

Sustainability is embedded in the project through a multi-dimensional approach that ensures institutional continuity, financial and operational viability, durable market transformation, sustained knowledge management, and long-term coordination with relevant initiatives. The project deliberately avoids creating parallel or time-bound structures, instead embedding functions, tools, and service delivery mechanisms within existing national, state, and cluster-level institutions and aligning outputs with ongoing schemes, regulatory frameworks, and market practices.

Institutional sustainability

Across Components 1–4, the project’s core functions are designed to be absorbed by existing institutions rather than remaining project-dependent. National MSME agencies, sectoral institutions, cluster organizations, technical institutions, and relevant public agencies are engaged as hosts and implementing partners, with project outputs aligned to their mandates and operating procedures.

Virtual Decarbonization Cells established under Component 3 are institutionalized within selected host institutions through documented agreements that define governance arrangements, service scope, and operating procedures. From inception, Cell functions are aligned with existing institutional service offerings, such as cluster development support, technical advisory services, and scheme facilitation. This enables progressive integration of Cell functions into routine institutional operations beyond the project period. Similarly, professional rosters for audits, implementation oversight, and verification are anchored in institutional procurement, certification, and service-delivery systems to enable continued deployment after project closure. Component 2 strengthens the institutional ecosystem required for sustained delivery by building the capacity of supporting institutions, service providers, and training bodies. Benchmarks, certification modules, operating procedures, and quality assurance practices developed under the project reduce dependence on individual project staff and support long-term institutional learning and replication.

Financial sustainability

Financial sustainability is addressed by mainstreaming project-supported functions into existing public and publicly supported MSME schemes and programs. Outputs under Component 1, particularly scheme design recommendations and policy inputs, are intended to be adopted by national and state programs, enabling continued financing of decarbonization-related support through routine program budgets rather than external grant funding. For selected service functions—such as standardized diagnostics, implementation troubleshooting support, helpdesk and referral services, and professional deployment through Decarbonization Cells, the project supports the development of viable post-project financing arrangements. These include integration into scheme-funded service packages, contracting by cluster institutions or financial institutions, and cost-recovery mechanisms where appropriate and affordable, without imposing mandatory fees on micro-enterprises.

The project does not provide lending capital or assume credit risk. Instead, it reduces transaction costs and perceived risks associated with MSME investments through standardized diagnostics, verified performance information, and implementation-quality assurance. These measures support continued mobilization of private investment beyond the project period, even in the absence of project-linked incentives.

Operational sustainability

Operational sustainability is ensured by strengthening the capacity of MSMEs, service providers, and institutions to independently deliver, operate, and maintain sustainable energy solutions. Training programs for MSME workers and managers (Outcome 2.1), together with certification and professional training pathways (Output 2.2.5), create a

sustained pool of skilled personnel capable of supporting MSME decarbonization without ongoing project involvement.

Supply-chain strengthening actions under Outcome 2.2 improve solution availability, service quality, and after-sales support, addressing a common barrier to long-term uptake. Performance benchmarks and verification protocols developed under Components 2 and 3 support consistent implementation quality and credible performance tracking, enabling institutions and financiers to rely on standardized evidence over time.

Market sustainability

Market sustainability is reinforced through demand aggregation and structured market facilitation measures under Component 1, thereby reducing transaction costs for MSMEs and normalizing MSME-scale procurement and service delivery models. By improving the readiness of technology suppliers, service providers, and system integrators, the project supports the emergence of replicable business models tailored to MSME constraints. Support for needs-driven innovation focuses on generating validated technical evidence rather than subsidizing procurement or commercialization. This ensures that innovation outcomes can be taken up by market actors and institutions beyond the project period without continued dependence on grants.

Knowledge, digital, and data sustainability

Knowledge sustainability is anchored in Component 4 through the establishment of the National MSME Decarbonization Knowledge Hub. The Hub consolidates project knowledge products, tools, and non-confidential datasets and provides structured access for MSMEs, service providers, institutions, and policymakers. The Hub is designed to be interoperable with existing national platforms, with clear institutional ownership and governance arrangements to ensure long-term hosting, maintenance, and content updating. Learning-oriented digital analytics and dashboards support continued synthesis of implementation experience and operational insights, enabling adaptive learning and evidence-informed policy dialogue beyond the project lifecycle. Knowledge support services embedded within Virtual Decarbonization Cells provide a sustained frontline interface for information and referral, reinforcing the practical usability of knowledge assets.

Project Sustainability and Exit Strategy (Output 4.1.2)

A Project Sustainability and Exit Strategy will be prepared during implementation (early-to-mid phase) and disseminated through Output 4.1.2: National MSME Decarbonization Knowledge Hub. The Strategy will operationalize sustainability and transition pathways and serve as a guiding reference for post-project continuity. It will define:

- Post-project ownership and institutional anchoring arrangements for key project functions and assets,
- Staffing, capacity retention, and handover plans for sustained service delivery,
- Financing options for maintaining priority services, including integration into existing schemes and cost-recovery models where appropriate,
- Long-term hosting, governance, and maintenance arrangements for the Knowledge Hub and associated digital tools and datasets, and
- Coordination protocols with relevant initiatives and institutions to prevent duplication and ensure continued alignment beyond the GEF funding period.

Sustainability of coordination

Coordination is sustained by embedding project alignment mechanisms within existing national and institutional platforms rather than relying on project-specific arrangements. Engagement with the MoEFCC-led GEF coordination mechanisms and structured linkages with national and state MSME, energy efficiency, and industrial programs ensure continued coherence with the broader policy and investment landscape.

Coordination protocols developed under the project, such as standardized information-sharing procedures, harmonized guidance, and alignment of tools and benchmarks, are institutionalized within host agencies and partner programs. This ensures that coordination becomes a routine function of the system rather than an activity dependent on project personnel.

Role of M&E in sustainability

Component 5 supports sustainability by providing an independent assessment of institutional embedding, operational continuity, and coordination effectiveness. Findings from the Mid-Term Review and Terminal Evaluation will assess the durability of project-supported mechanisms and inform adaptive management and transition planning, ensuring that sustainability considerations are actively managed rather than treated as an end-of-project formality.

Execution risks. The project faces several execution-level risks: (a) Delays in executing partner agreements and PMU establishment (medium likelihood, high impact) – mitigated through advance consultations and UNIDO backstopping; (b) Insufficient cross-ministerial coordination between MoMSME, BEE, and MNRE (medium likelihood, high impact) – mitigated through PSC composition including all three ministries and inter-ministerial TWG; (c) Co-financing shortfalls (medium likelihood, medium impact) – mitigated through conservative estimates and diversified sources; (d) Limited MSME uptake in pilot clusters (medium likelihood, medium impact) – mitigated through MCDA-based cluster selection and phased approach; (e) Procurement delays for technology solutions (low-medium likelihood, medium impact) – mitigated through supply chain assessment and vendor pre-qualification; (f) Technology performance below expectations (low-medium likelihood, medium impact) – mitigated through benchmarks, verification, and pilot-phase validation.

Technical Assistance/ Knowledge Management and Investment balance.

The project's GEF grant of USD 8.98 M is allocated approximately 30% to technical assistance and knowledge management activities (Components 1,2,4 and 5: USD 2.84 M) and approximately 70% to investment-mobilization activities. The project's GEF grant of USD 8.98M is allocated approximately 30% to technical assistance and knowledge management activities (Components 1, 2, 4 and 5: USD 2.84M) and approximately 70% to investment-enabling and investment-mobilization activities (Component 3: USD 5.54M and the investment-facilitation outputs of Components 1 and 2). The TA/KM activities directly feed the investment pipeline: Outputs 1.1 and 1.2 produce the policy signals, sectoral roadmaps, market-facilitation measures and inclusive scheme designs that de-risk investment; Outputs 2.1 and 2.2 build firm-level demand readiness and supply-chain capacity; and Outputs 3.1 and 3.2 channel the resulting investment-ready pipeline through SIDBI's dedicated MSME green credit line (formal co-financing commitment to be confirmed via the inception phase amendment pathway) and the industry-association investment commitments totalling USD 50.75 M. DFI and bank partnership architecture: SIDBI remains the project's anticipated green-credit conduit, in continuation of its existing MSME credit operations, providing dedicated MSME concessional financing windows aligned with the eligible technology list. The inception phase will establish coordination MoUs with NABARD (rural MSMEs), SBI and EXIM Bank for sectoral co-financing under the MSME Sustainable Finance Window referenced in Component 1. Structured de-risking is delivered via partial-credit-guarantee linkages to existing CGTMSE schemes. Inception-phase amendment pathway. Where the project's coordination with BEE, MNRE or other ministries evolves toward a formal executing-partner role beyond the role envisaged at CEO ER stage, the project will pursue a Major Amendment per GEF procedures to formalize the institutional arrangements. This pathway is consistent with the framing accepted by the GEF Secretariat for the present CEO Endorsement.

GENDER EQUALITY AND WOMEN'S EMPOWERMENT

The project is aligned with the GEF Gender Equality Policy and UNIDO's Gender Strategy and integrates gender considerations across policy development, capacity building, implementation support, and knowledge management,

consistent with the project's scope and delivery mechanisms. It recognizes that women-owned and women-led MSMEs, as well as women professionals within MSME ecosystems, can face gender-differentiated barriers in accessing information, technical services, finance, and institutional support for decarbonization.

Under **Component 1 – Policy development and market transformation for MSME decarbonization**, gender dimensions are explicitly incorporated into evidence generation and scheme design. Gender-differentiated constraints are assessed and documented under Output 1.1.1 (MSME decarbonization readiness and policy gap assessment) and Output 1.2.1 (MSME investment behaviour analysis and decision-support design), including barriers affecting access to information, finance, and support mechanisms. These findings inform Output 1.1.3 (Sectoral roadmaps) and Output 1.2.3 (Inclusive MSME decarbonization support schemes) by integrating gender-responsive measures where relevant to outreach, accessibility, eligibility approaches, and transaction-cost reduction, while maintaining inclusivity across MSMEs.

Under **Component 2 – Demand creation and strengthened supply chain for sustainable energy solutions**, gender is mainstreamed through gender-responsive outreach and participation measures. Output 2.1.1 applies gender-responsive dissemination approaches for awareness modules, Output 2.1.2 includes measures to increase women's participation in technical and managerial training, and Output 2.1.4 ensures gender-responsive participation in international exposure and knowledge exchange. On the supply side, Output 2.2.5 (Gender-responsive training and certification of sustainable energy solutions professionals) applies targeted measures to increase women's participation in training and certification pathways for auditors, consultants, technicians, and service providers.

Under **Component 3 – Implementation of sustainable energy solutions for decarbonization in the MSME sector**, gender considerations are embedded in delivery and access to implementation support. Output 3.1.3 (Gender-responsive technical assistance and implementation support for MSMEs) applies gender-responsive measures to ensure access for women-owned and women-led MSMEs and to promote inclusion of women staff in operational roles where applicable. Output 3.2.2 further reinforces equitable access to qualified professionals deployed through Virtual Decarbonization Cells, including for women-owned and women-led MSMEs.

Gender-responsive evidence capture and dissemination are reinforced under **Component 4 – Knowledge management, learning, and knowledge dissemination**, particularly through Output 4.1.1 (Gender-responsive knowledge products), which documents gender-differentiated barriers, participation patterns, outcomes, and good practices for inclusive replication and scaling. Output 4.1.2 (National MSME decarbonization knowledge hub) also commits to accessibility and inclusive design for key stakeholder groups, including women-led enterprises.

Finally, **Component 5 – Monitoring and evaluation (M&E)** ensures that gender-related results are tracked through sex-disaggregated participation and outcome data, where relevant, in line with UNIDO and GEF monitoring and reporting requirements, enabling adaptive management and accountability throughout implementation.

Overall, the project integrates gender considerations in a targeted and evidence-based manner across policy development, capacity building, implementation support, and knowledge management, in line with the GEF Gender Equality Policy and UNIDO's Gender Strategy. Gender-differentiated barriers are identified through assessments and analyses. They are addressed through inclusive policy and scheme design, gender-responsive outreach and training, equitable access to technical assistance and professional services, and systematic documentation of gender-related outcomes. Rather than standalone activities, gender is embedded within core project functions to improve accessibility, effectiveness, and sustainability of MSME decarbonization support, while remaining consistent with the project's scope and operational mandate.

PRIVATE SECTOR ENGAGEMENT

Private sector engagement is central to the project's theory of change, as MSMEs, technology providers, service companies, and financial institutions are the primary actors responsible for implementing and sustaining decarbonization investments. The project is designed to mobilize, de-risk, and structure private sector participation

through evidence-based policy inputs, market facilitation, capacity building, and institutionalized service delivery, without distorting markets or substituting for private investment.

At the MSME level, the project strengthens private-sector demand and decision-making capacity through assessments, awareness-raising activities, training, audits, and implementation support (Components 1–3). MSMEs are engaged as active partners in energy profiling, investment diagnostics, technology design, and performance verification, ensuring that solutions respond to real operational constraints and investment criteria. Demonstration and early implementation support reduce information asymmetries and perceived performance risks, enabling MSMEs to make informed investment decisions using their own or mobilized capital.

On the supply side, the project engages private technology suppliers, ESCOs, auditors, system integrators, manufacturers, and service providers through structured capacity strengthening under Component 2. Activities include performance benchmarking, training and certification, design and engineering support, and needs-driven testing and validation. These interventions improve solution quality, standardization, and service reliability, strengthening the commercial viability and scalability of sustainable energy solutions for MSMEs.

Financial institutions, including SIDBI and partner banks, are engaged to facilitate MSME access to existing financial products and public support schemes. The project supports investment behaviour analysis, decision-support tools, demand aggregation, and institutional interfaces through Virtual Decarbonization Cells, reducing transaction costs, and improving pipeline quality.

Private sector engagement is further institutionalized through market facilitation mechanisms, Decarbonization Cells, and the national knowledge hub, which provide durable platforms for interaction among MSMEs, service providers, financiers, and public institutions. Through this structured, non-distortive approach, the project leverages private-sector capabilities, capital, and innovation to achieve sustained MSME decarbonization outcomes beyond the project lifecycle.

Institutional Arrangement and Coordination with Ongoing Initiatives and Project.

Please describe the Institutional Arrangements for the execution of this project, including financial management and procurement. If possible, please summarize the flow of funds (diagram), accountabilities for project management and financial reporting (organogram), including audit, and staffing plans. (max. 500 words, approximately 1 page)

The project will be implemented in accordance with GEF policies and procedures, with UNIDO serving as the GEF Implementing Agency and holding overall fiduciary responsibility. The Ministry of Micro, Small and Medium Enterprises (MoMSME) shall serve as the lead national executing entity, providing overall strategic direction, policy coordination, and governance through the Project Steering Committee. Project execution will be supported by four national technical institutions serving as Executing Partners, selected for their sectoral expertise, institutional mandates, and established presence across MSME clusters. The detailed implementation structure, including the designation of specific institutional roles and responsibilities, shall be finalized under the guidance of MoMSME during the project inception phase, taking into account the mandates and capacities of the participating national institutions.

UNIDO - GEF Implementing Agency

UNIDO will provide overall oversight, fiduciary management, and assurance of compliance with GEF policies, environmental and social safeguards, gender requirements, and results-based management standards. UNIDO will supervise project execution, approve annual work plans and budgets, manage financial flows, oversee procurement, and ensure quality assurance, monitoring and evaluation, and reporting to the GEF. UNIDO retains final decision-making authority where required to ensure policy compliance and project continuity.

Executing Partners

Project execution will be undertaken by national institutions with complementary mandates and expertise:

CII–Green Business Centre (CII-GBC) will facilitate engagement with industrial MSMEs and clusters, mobilize private-sector participation, and support uptake of clean and resource-efficient technologies.

National Productivity Council (NPC) will contribute technical expertise in productivity diagnostics, benchmarking, and process optimization, supporting scalable and policy-relevant decarbonization solutions.

The Energy and Resources Institute (TERI) will provide analytical and technical expertise in energy systems, emissions accounting, and technology performance assessment, ensuring technical robustness and credibility.

National Institute for MSME (ni-MSME) will provide cluster-level knowledge management, coordination of capacity building activities across the 60 project clusters, and gender-responsive enterprise support.

The detailed implementation and execution arrangements, including the final composition of the Project Management Unit (PMU) and the specific allocation of responsibilities among the four executing partners, shall be confirmed during the project inception phase under the guidance of MoMSME, in consultation with UNIDO as the GEF Implementing Agency. This Ministry recognizes that the project's scope extends to important international dimensions where UNIDO's comparative advantage is well established, and expects that UNIDO will, through its agency oversight functions and institutional contributions, ensure that these dimensions are adequately addressed, including through such operational and institutional support arrangements as may be agreed during the inception phase.

Project Governance and Management

Project Steering Committee (PSC) A PSC will be established to provide strategic oversight and guidance. It is expected to be chaired by a senior government representative and include key national ministries and agencies with mandates relevant to MSME decarbonization, specifically including the Ministry of MSME, the Bureau of Energy Efficiency (Ministry of Power), the Ministry of New and Renewable Energy, the Ministry of Environment, Forest and Climate Change (as GEF OFP host), SIDBI, and UNIDO. An inter-ministerial Technical Working Group (TWG) will be convened under the PSC to facilitate structured coordination on policy coherence, technology eligibility, and programme alignment across MoMSME, BEE, and MNRE.

UNIDO will be a member of the PSC, participating in an advisory capacity, without exercising voting rights. All decisions adopted by the PSC shall remain subject to UNIDO's non-objection decision, exercised in its capacity as the Implementing Agency responsible for project supervision and oversight, in accordance with UNIDO's applicable rules, policies and procedures.

Inter-ministerial coordination mechanism: To create the structured inter-ministerial coordination touch-point that has historically been missing for MSME-scale energy transition — and to harmonize the mandates of the Ministry of MSME (the demand-side and scheme architecture), the Bureau of Energy Efficiency under the Ministry of Power (the audit, benchmarking, technical-standards and M&V architecture) and the Ministry of New and Renewable Energy (the RE access, RESCO/PPA and channel-partner architecture) — the Project Steering Committee will include permanent observer seats for the Director of the Bureau of Energy Efficiency and a Director-level designate from the Solar Energy Division of MNRE. The PSC will continue to be chaired by the Additional Secretary and Development Commissioner, MSME, ensuring that the inter-ministerial coordination is anchored in the National Lead Executing Entity. Formal Memoranda of Understanding with BEE and with MNRE will be signed during the project inception phase, defining the scope of technical collaboration in operational terms — BEE: deployment of the accredited Energy Auditor cadre at cluster scale, M&V framework application, contribution to technical norms for the cluster-level interventions; MNRE: channel-partner engagement, RE-EE bundling protocols, RESCO and aggregated-PPA model templates for MSME demand, and engagement on the open-access procedural items most binding at

cluster scale. This arrangement establishes the inter-ministerial coordination mechanism without altering the executing-partner architecture validated at the National Stakeholder Consultation of 3 November 2025 and reviewed at GEF Secretariat level on 5 May 2026.

Project Assurance

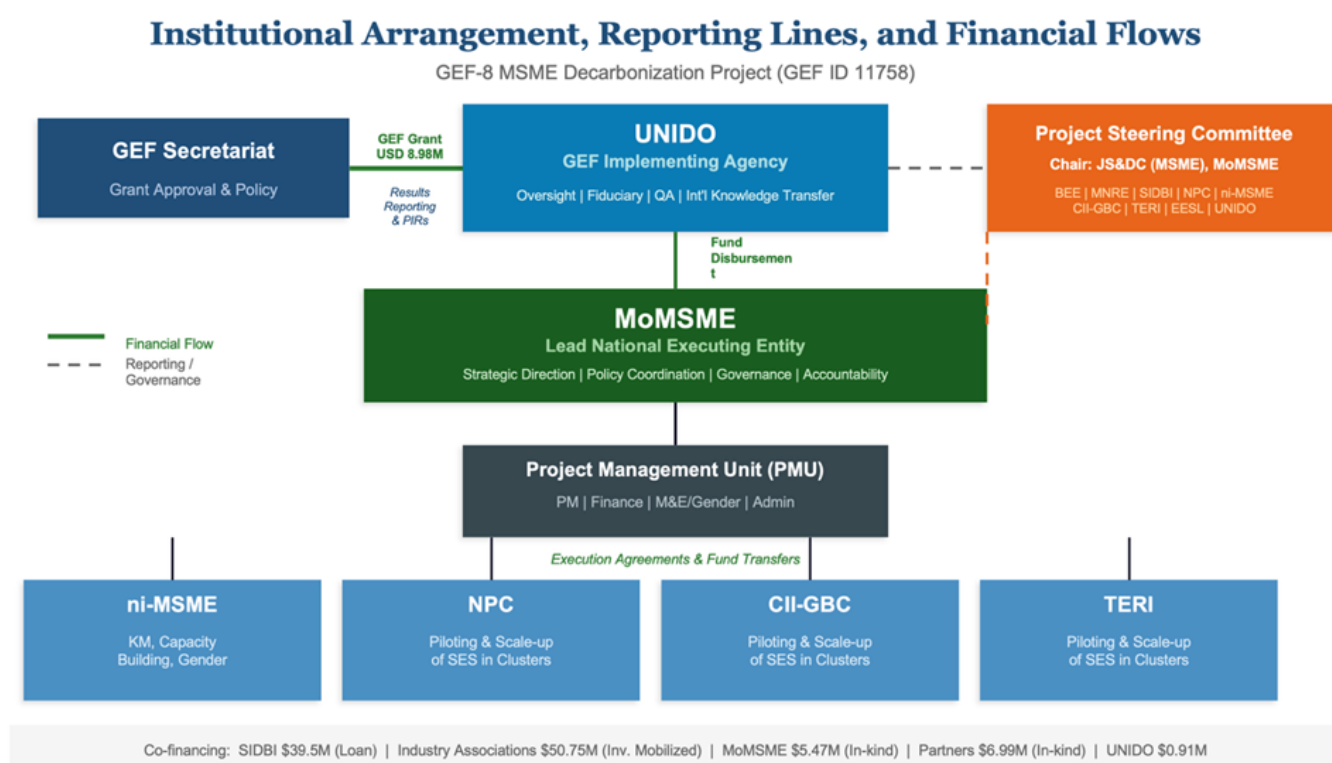
UNIDO will provide project assurance through an independent function separate from project execution. This function ensures compliance with approved plans, budgets, safeguards, and risk management procedures, and supports the PSC with objective oversight and quality assurance. The project monitoring and evaluation framework will strictly follow and be aligned with relevant UNIDO-GEF policies and procedures, including GEF's Monitoring and Evaluation Policy, UNIDO's Evaluation Policy, and applicable results-based management standards.

Project Management Unit (PMU)

A dedicated PMU will be established and hosted by a designated national executing entity. The PMU will manage day-to-day implementation, coordination, procurement, financial management, monitoring and reporting. Core staffing will include a Project Manager, Finance and Administrative Officer, Monitoring and Gender Expert, and technical expertise as required. Staff will be competitively recruited in line with UNIDO procedures.

Financial management and flow of funds

Figure 2: Institutional Arrangements, Reporting lines and financial flows



GEF grant resources will be transferred to UNIDO and managed in accordance with UNIDO financial rules. UNIDO will disburse funds to designated national executing entities through approved implementation arrangements and dedicated project accounts. These funds will cover PMU operations, procurement of goods and services, consultants, and eligible project expenditures. Co-financing will be mobilized and implemented in parallel by partners under their own procedures. Where applicable, funds for pilot or demonstration activities will be disbursed to eligible beneficiaries based on formal agreements and achievement of agreed milestones, under UNIDO supervision.

Legal context

The Government of the Republic of India agrees to apply to the present project, mutatis mutandis, the provisions of the Revised Standard Technical Assistance Agreement concluded between the United Nations and the Specialized Agencies and the Government on 31 August 1956 and as amended on 3 October 1963.

Will the GEF Agency play an execution role on this project?

If so, please describe that role here and the justification.

Also, please add a short explanation to describe cooperation with ongoing initiatives and projects, including potential for co-location and/or sharing of expertise/staffing (max. 500 words, approximately 1 page)

The project is strategically positioned to complement, reinforce, and scale the impacts of ongoing GEF and non-GEF initiatives in India's MSME, energy efficiency, and climate mitigation landscape. Its design explicitly avoids duplicating effort, overlapping beneficiary outreach, and fragmenting policy signals, while leveraging existing institutional structures, programs, and investments to enhance systemic impact.

India hosts a dense ecosystem of relevant interventions, including GEF-7 climate mitigation projects, flagship Government of India MSME schemes, Bureau of Energy Efficiency (BEE) programs, state-level industrial initiatives, and multilateral development operations. Rather than operating as a parallel delivery mechanism, the project is structured to function as a catalytic integrator within this ecosystem, strengthening linkages across initiatives and embedding decarbonization objectives into mainstream MSME support frameworks.

Complementarity within the GEF portfolio

Coordination with ongoing GEF-funded projects is institutionalized as a formal governance requirement. The project engages through the bi-annual National GEF Coordination Platform convened by the Ministry of Environment, Forest and Climate Change (MoEFCC), in its role as GEF Operational Focal Point. This platform provides a structured mechanism for cross-project learning, harmonization of policy recommendations, identification and resolution of potential overlaps in geographic or sectoral coverage, and sharing of tools, methodologies, and monitoring approaches. Active participation of the project management team ensures transparent alignment of cluster selection, technology focus, financing approaches, and policy advocacy with the broader GEF climate mitigation portfolio in India.

At the operational level, coordination with ongoing GEF-7 initiatives in industrial energy efficiency and cooling is organized around clear differentiation in target groups, technology scope, and intervention depth. While those projects primarily focus on large-scale industrial facilities and sector-specific technology transitions, this project targets MSMEs. It adopts a holistic, facility-level decarbonization approach that extends beyond single-technology solutions. Structured coordination mechanisms, including periodic exchange of beneficiary information, joint technical consultations, shared expert pools, and cross-linking of digital knowledge platforms, ensure complementarity, prevent double financing, and provide coherent guidance to enterprises in cases of sectoral or geographic proximity.

Overall, the coordination architecture enables the project to act as a force multiplier, leveraging existing programs for scale, reinforcing ongoing GEF investments through complementary interventions, and embedding climate considerations into mainstream MSME support mechanisms. By institutionalizing coordination through formal platforms, defined protocols, and shared accountability mechanisms, the project ensures durable, scalable outcomes

fully aligned with national priorities while maintaining clear boundaries of responsibility and manageable risk exposure for all participating entities.

The table below provides an overview of relevant initiatives and synergy potential with this project.

No.	Initiative title	Initiative description	Potential synergy with GEF-8 project
1	Improving Thermal Energy Efficiency in Industrial Boilers for MSMEs (GEF-7, ID 10878)	Focuses on improving thermal energy efficiency in industrial boilers used by MSMEs in selected states through targeted equipment upgrades.	The project can build on demonstrated improvements in boiler efficiency while expanding support to a broader range of energy transition solutions across MSME manufacturing clusters.
2	Eliminating Hazardous Chemicals from Textile Fashion Supply Chains (GEF-8, ID 11178)	Addresses chemical management and safer production practices in textile clusters, with a focus on a single manufacturing sector.	Operating in the same MSME cluster context, the project can pursue energy transition and decarbonization objectives without duplicating sector-specific chemical management activities.
3	Cities and Industrial Green Growth (CIGG) Initiative	Supports sustainable urban development in India through improved urban planning, resource efficiency, and low-carbon infrastructure, with linkages to industrial and enterprise activities within urban areas.	The project can align cluster-based MSME energy transition efforts with broader urban sustainability and low-carbon planning frameworks supported under the Cities-IAP.
4	Promoting Energy Efficiency and Renewable Energy in Selected Micro, Small and Medium Enterprises (MSME) Clusters in India (GEF-4, ID 3553)	Promotes adoption of energy-efficient technologies and renewable energy solutions in selected MSME clusters in India through demonstrations, capacity building, and market development activities.	The project can build on early UNIDO–GEF experience in cluster-based deployment of energy efficiency and renewable energy solutions for MSMEs, while expanding scale, sectoral coverage, and the depth of decarbonization interventions.
5	Promoting Market Transformation for Energy Efficiency in Micro, Small and Medium Enterprises (MSMEs) (GEF-5, ID 4893)	Promotes market transformation for energy efficiency in MSMEs by addressing barriers related to technology uptake, financing, and institutional capacity through pilot interventions and enabling mechanisms.	The project can build on market transformation approaches and lessons from earlier MSME energy efficiency interventions to support scale-up and replication of energy transition solutions in manufacturing clusters.
6	Facility for Low Carbon Technology Deployment (GEF-6, ID 4927)	Supports the identification, validation, and deployment of innovative low-carbon and energy-efficient technologies for industrial applications in India through pilot demonstrations and enabling mechanisms.	The project can leverage experience from low-carbon technology validation and deployment to support the adoption of proven energy transition solutions in MSME manufacturing clusters.
7	National Clean Energy Fund (NCEF)	The Government of India has established a financing mechanism to support clean energy and environmental initiatives, funded through a levy on coal, and used to	The project can address MSME energy transition and decarbonization needs that have remained underserved under broader clean energy financing mechanisms such as NCEF.

		finance a range of clean energy and sustainability-related investments.	
8	Raising and Accelerating MSME Performance (RAMP) Program	National MSME reform and capacity-building program implemented by the Ministry of Micro, Small and Medium Enterprises (MoMSME), with support from the World Bank, aimed at strengthening MSME institutional performance, improving market access, and enhancing firm competitiveness through policy reforms, institutional capacity building, and performance-linked incentives to states.	While RAMP supports broad MSME competitiveness and institutional strengthening, it does not directly finance or provide technical implementation support for enterprise-level energy transition or decarbonization investments. The project complements RAMP by supplying MSME-specific energy and emissions diagnostics, sectoral prioritization, and implementation support that can be integrated into RAMP-supported institutional platforms and state-level MSME initiatives.
9	Asian Development Bank (ADB) Support to Energy Efficiency Services Limited (EESL) Energy Efficiency Programmes	Supported by the Asian Development Bank and implemented by Energy Efficiency Services Limited (EESL) to scale up deployment of energy-efficient technologies in India through aggregation and market-based delivery models, primarily targeting public-sector and large institutional consumers.	The project can draw on experience from large-scale energy efficiency aggregation and delivery models to inform approaches adapted to MSME manufacturing clusters, while maintaining a distinct focus on MSME decarbonization.
10	Financing Energy Efficiency at MSMEs (GEF, World Bank–SIDBI)	GEF-supported project implemented by the World Bank in partnership with SIDBI to promote energy efficiency improvements in MSME clusters by facilitating access to commercial financing for energy-efficient technologies and practices.	The project can build on experience from MSME energy-efficiency financing models to support the scale-up of energy transition investments in manufacturing clusters.
11	India - Industrial Energy Efficiency Programme under NMEEE	National programme under the National Mission for Enhanced Energy Efficiency (NMEEE) supporting improvements in industrial energy efficiency through policy instruments, market-based mechanisms, and enabling frameworks implemented by the Bureau of Energy Efficiency.	The project can align MSME energy transition and decarbonization activities with national industrial energy efficiency frameworks established under NMEEE.
12	Bureau of Energy Efficiency (BEE) – SME Programme	National programme implemented by the Bureau of Energy Efficiency (BEE) to promote energy efficiency in micro, small and medium enterprises through cluster-based approaches, capacity building, technology demonstrations, and facilitation of financing mechanisms.	The project can build on sector- and cluster-level energy-efficiency diagnostics and implementation experience generated under the BEE SME Programme to support integrated energy-transition pathways for MSME manufacturing.
13	SIDBI Energy-Efficiency and Green Financing Initiatives for MSMEs	SIDBI financing facilities support MSME investments in energy-efficient and environmentally sustainable technologies through dedicated lending	The project can complement SIDBI's broader green and energy-efficiency financing facilities by strengthening MSME cluster-level project

		instruments and financial products developed outside of specific GEF-supported projects.	identification and readiness for energy transition investments.
14	Assistance in Deploying Energy Efficient Technologies in Industries and Establishments (ADEETIE)	National scheme implemented by the Bureau of Energy Efficiency to promote the adoption of advanced energy-efficient technologies in industries, including MSMEs, through implementation support and interest subvention mechanisms.	The project can complement ADEETIE by supporting the identification and deployment of suitable energy-efficient technologies at the MSME cluster level, while enabling broader energy transition pathways beyond individual technology upgrades.
15	Zero Defect Zero Effect (ZED)	National MSME quality and sustainability certification scheme implemented by the Ministry of Micro, Small and Medium Enterprises (MoMSME), focusing on improving product quality, process efficiency, and environmental performance. While ZED promotes resource efficiency and environmental management practices, it does not provide detailed technical guidance or implementation support for MSME energy transition or decarbonization investments.	The project complements ZED by strengthening the “Zero Effect” dimension through energy and emissions diagnostics, sector- and cluster-level prioritization, and implementation support, while using ZED-certified MSMEs and cluster institutions as entry points for scaled adoption of energy-efficient and low-carbon solutions.

Core Indicators

Indicate expected results in each relevant indicator using methodologies indicated in the GEF-8 Results Measurement Framework Guidelines. There is no need to complete this table for climate adaptation projects financed solely through LDCF and SCCF.

Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO₂e (direct)	5428600	5460000	0	0
Expected metric tons of CO₂e (indirect)	0	1690000	0	0

Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO₂e (direct)				
Expected metric tons of CO₂e (indirect)				
Anticipated start year of accounting				
Duration of accounting				

Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO₂e (direct)	5,428,600	5,460,000		
Expected metric tons of CO₂e (indirect)		1,690,000		

Anticipated start year of accounting	2027	2028		
Duration of accounting	10	10		

Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
Target Energy Saved (MJ)	81,239,829,840			

Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)
------------	---------------------------------	---	---------------------------------	--------------------------------

Indicator 11 People benefiting from GEF-financed investments

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	25,000	1,012		
Male	55,000	3,588		
Total	80,000	4,600	0	0

Explain the methodological approach and underlying logic to justify target levels for Core and Sub-Indicators (max. 250 words, approximately 1/2 page)

Energy savings and associated GHG emission reductions under CI-1 (Energy savings) and CI-6 (GHG emissions mitigated) are estimated using sector-specific MSME baseline data and the GEF STAP ex-ante methodology. Direct impacts reflect the lifetime energy savings achieved by 3,280 MSMEs that adopt energy-efficient and sustainable energy technologies supported by the project. Average savings per MSME are derived from empirical cluster-level studies and validated UNIDO project experience, assuming a conservative operational lifetime of installed measures.

Indirect impacts capture replication and systemic effects beyond directly supported enterprises. These are calculated by applying a conservative replication factor of 1.45 to direct impacts and an attribution factor of 20% (maximum permitted under GEF guidelines) to account for the contribution of other actors and ongoing programmes to indirect outcomes. The attribution factor reflects the GEF project's catalytic role in enabling policy reforms, market transformation, and knowledge dissemination that would not have occurred at scale without GEF financing.

Using standard GEF conversion factors, direct lifetime energy savings under CI-1 amount to 2.171 Mtoe (approximately 90,912 TJ), corresponding to 8.61 MtCO₂e of direct emission reductions under CI-6. Indirect emission reductions, after application of the 20% attribution factor, amount to 2.67 MtCO₂e. The anticipated start year of accounting under CI-6.1 is 2028, corresponding to the expected commissioning of first pilot installations in Phase 1 clusters during Year 2 of implementation.

The project targets a weighted average energy efficiency improvement of 28.2% per MSME (35% in pilot clusters and 28% in scale-up clusters), achieved through comprehensive intervention packages that combine fuel switching to lower-carbon energy sources, process optimization and energy management systems, renewable energy integration (including rooftop solar PV, captive and group captive procurement, and solar thermal applications), and waste heat recovery solutions within cluster settings. This

integrated approach goes beyond incremental equipment replacement and is designed to enable sustained emissions reductions and market transformation across participating MSME clusters.

Detailed assumptions and calculations underlying the GHG estimates are provided in Annex P.

Key Risks

	Rating	Explanation of risk and mitigation measures
CONTEXT		
Climate	Low	Climate change may indirectly affect project implementation by exacerbating existing vulnerabilities in MSME manufacturing systems. Rising temperatures can increase cooling demand and heat stress in production environments, leading to higher energy consumption and operating costs for MSMEs. In addition, more frequent extreme weather events may disrupt production continuity and supply chains, particularly in coastal and flood-prone industrial clusters, potentially affecting implementation timelines and performance monitoring. These risks are assessed as low for the project because core activities focus on industrial energy efficiency, renewable energy integration, and institutional and market capacity building, which are not directly dependent on climate-sensitive ecosystems and are implemented within existing industrial facilities. The project design emphasizes energy efficiency and improved operational performance, thereby increasing resilience to heat and energy cost pressures. Adaptive management arrangements under the Project Steering Committee (PSC), including flexible implementation planning and coordination with cluster institutions, will enable timely adjustments to activities should climate-related disruptions affect MSME operations, installation schedules, or data collection processes.
Environmental and Social	Moderate	The project does not involve land acquisition, involuntary resettlement, or high-risk civil works. Environmental and social risks are limited to minor, localized operational impacts arising from technology retrofits and equipment installations. UNIDO's Environmental and Social Safeguards (ESS) will be applied throughout implementation, including screening, monitoring, stakeholder engagement, gender mainstreaming, and a functional grievance redress mechanism, ensuring risks remain low and manageable.
Political and Governance	Low	The project is closely aligned with national priorities on MSME competitiveness, energy efficiency, and climate mitigation, including India's Updated NDC and long-term Net Zero 2070 commitment. This strong alignment reduces the likelihood that adverse political or policy shifts will

		affect project relevance or implementation. Institutional anchoring within the Ministry of Micro, Small and Medium Enterprises (MoMSME), combined with structured coordination with the Ministry of Environment, Forest and Climate Change (MoEFCC) and other relevant national and state-level agencies, mitigates governance and inter-institutional coordination risks. The project's governance structure, including a multi-stakeholder Project Steering Committee (PSC), provides oversight, transparency, and policy coherence, and supports continuity across administrative and implementation cycles.
--	--	---

INNOVATION

Institutional and Policy	Moderate	Manufacturing MSMEs remain underrepresented in national energy-efficiency, renewable energy, and emerging carbon-market instruments, which may constrain early uptake of sustainable energy and decarbonization measures. Existing policy and regulatory frameworks are often designed for larger industrial entities. They may not fully reflect MSME operational realities, transaction capacities, or risk profiles, potentially slowing alignment of incentives and implementation modalities during initial project stages. This risk is mitigated through targeted policy and institutional support embedded in Component 1, including evidence-based assessments, sectoral roadmaps, and inclusive scheme design recommendations tailored to MSME-scale conditions. Structured engagement with the Ministry of Micro, Small and Medium Enterprises (MoMSME), the Bureau of Energy Efficiency (BEE), and relevant state governments supports policy coherence and facilitates integration of decarbonization considerations into existing MSME support schemes. The project's phased implementation approach across selected clusters generates practical implementation experience and verified evidence that informs policy dialogue and institutional refinement. Adaptive learning loops embedded in project design, through continuous monitoring, stakeholder consultations, and feedback from implementation, enable iterative adjustment of instruments and guidance over the project lifecycle, reducing institutional risk and supporting durable policy outcomes beyond project completion.
Technological	Moderate	Although the sustainable energy solutions supported under the project are commercially proven and aligned with national standards, adoption risks persist due to MSME concerns regarding performance reliability, operational compatibility, and payback periods. These concerns are amplified by limited prior exposure to standardized performance data and uneven quality of service provision at the MSME scale. This risk is mitigated through structured implementation support rather than experimental demonstration. The project applies standardized energy audits, sector-specific performance benchmarks, and verified implementation and commissioning procedures to reduce information asymmetries and build confidence in technology performance. Third-party verification of installation quality and operational performance, as well as structured post-installation technical assistance, further reduce perceived and actual performance risks. Vendor warranties, adherence to applicable technical standards, and quality assurance protocols remain central to risk allocation. Residual technology performance risk is borne by

		technology suppliers and MSMEs, consistent with normal commercial practice; UNIDO and GEF resources are not exposed to technology or operational risk.
Financial and Business Model	Moderate	Financial and business model risks may affect the pace and scale of MSME investment uptake, particularly where aggregation approaches, credit enhancements, or blended finance arrangements are applied to sustainable energy investments. MSMEs' limited transaction capacity, risk sensitivity, and heterogeneous financial profiles may constrain early uptake, while financial institutions may initially apply conservative lending practices. These risks are mitigated by structuring all financing instruments within the balance sheets, risk management frameworks, and regulatory oversight of participating financial institutions, including SIDBI and partner banks. Financial product risk, credit exposure, and portfolio performance remain fully ring-fenced within these regulated institutions. The project does not deploy UNIDO or GEF resources as lending capital, nor does it assume credit, market, or currency risk. UNIDO's role is limited to technical design support, pipeline preparation, performance monitoring frameworks, and knowledge generation to reduce transaction costs and information asymmetries. This delineation of responsibilities ensures that financial liabilities remain with appropriate market actors while enabling learning and refinement of MSME-appropriate financing approaches over the project lifecycle.

EXECUTION

Capacity	High	The project operates across 60 MSME clusters in 8 states, engaging six executing partners (MoMSME, SIDBI, EESL, NPC, ni-MSME, CII-GBC) with varying institutional capacities and coordination protocols. The scale and geographic dispersion of implementation may strain coordination mechanisms, particularly during the initial phase when execution arrangements are being operationalized. Capacity gaps at the cluster level, including limited availability of qualified energy auditors and technology service providers, may slow deployment in certain clusters. This risk is mitigated through phased implementation with 80 pilot MSMEs preceding the scale-up phase of 3,200 MSMEs, allowing institutional learning and capacity adjustments. Virtual Decarbonization Cells (Output 3.2.2) will be established in each cluster to provide localized implementation support. Capacity building of supporting institutions (Output 2.2.6) and deployment of qualified professionals (Output 3.2.3) directly address the supply-side constraint. Annual work plans approved by the PSC will ensure coordination across partners. [Note: This assessment is preliminary and will be updated upon confirmation of institutional arrangements.] The risk rating has been elevated to High to reflect that capacity and implementation-related risks were identified during the PPG stage and that the execution modality, including the finalization of institutional roles and the operationalization of coordination mechanisms across executing partners, remains subject to confirmation during the project inception phase. During the inception phase, anticipated challenges include: (a) delays in finalizing execution agreements with the four designated executing partners;
----------	------	--

		(b) uneven administrative and procurement capacities across partner institutions; (c) limited availability of qualified energy auditors and technology service providers in certain clusters. Envisioned mitigation actions include: phased onboarding of executing partners with clear performance milestones; deployment of UNIDO transitional procurement support during Years 1-2; establishment of Virtual Decarbonization Cells for localized implementation support. Should identified risks persist or materialize during implementation, the matter will be reviewed in consultation with the Ministry, the OFP, and the GEF Secretariat, including through the established GEF Major Amendment procedures if adjustments to the execution arrangements are warranted.
Fiduciary	Moderate	Fiduciary risks relate to the management and disbursement of GEF grant resources across multiple executing entities operating under different financial management systems. The transfer of funds to national partners requires compliance with both UNIDO financial rules and Government of India procurement and accounting standards. Delays in fund disbursement, misalignment of reporting cycles, or inadequate financial documentation at the cluster level could affect implementation timelines and audit compliance. This risk is mitigated through execution agreements with each partner specifying financial management requirements, reporting formats, and audit provisions. All HACT-assessed entities have been rated as low administrative risk. The Project Management Unit will maintain centralized financial oversight with quarterly expenditure reporting and annual audits. UNIDO's fiduciary role as GEF Agency provides an additional layer of financial assurance and compliance monitoring. Anticipated challenges include: delays in establishing dedicated project accounts at executing partner level; misalignment between UNIDO financial rules and Government of India procurement and accounting standards; and potential audit findings during the initial implementation period. Mitigation actions include: standardized execution agreements specifying financial management requirements; quarterly expenditure reporting with centralized PMU oversight; and annual project audits. The fiduciary risk will be re-assessed during the Mid-Term Review.
Stakeholder	Moderate	Stakeholder risks primarily concern the engagement and sustained commitment of MSME cluster associations, state-level agencies, and financial institutions over the six-year project period. Changes in leadership at cluster associations, shifts in state government priorities, or competing demands on MSME resources could reduce stakeholder participation. Additionally, industry associations operating as co-financiers must sustain their commitment to mobilize the anticipated USD 50.75 million in MSME technology investments. This risk is mitigated through the Stakeholder Engagement Plan (Annex M), which provides for ongoing consultation and feedback mechanisms across all 60 clusters. The PSC, with representation from MoMSME, BEE, MNRE, and executing partners, ensures sustained institutional commitment at the national level. At the cluster level, Decarbonization Cells serve as permanent stakeholder engagement platforms, embedding the project within existing industry structures. Anticipated

		challenges include: leadership transitions at cluster associations; competing demands on state-level MSME agency resources; and potential shortfalls in private sector co-financing commitments due to macroeconomic conditions. Mitigation actions include: formalized partnership agreements with each cluster association; annual stakeholder review meetings at state level; and contingency plans for co-financing mobilization through alternative industry channels.
Other	Moderate	Additional risks include potential delays arising from the ongoing resolution of the project's institutional arrangements (national execution modality), which may affect the timing of CEO Endorsement and subsequent project launch. Macroeconomic factors, including exchange rate fluctuations affecting co-financing values denominated in INR, and potential disruptions from trade policy changes (e.g., CBAM implementation timelines), may affect the project's external operating environment. These risks are mitigated through the two-track approach adopted for the CEO revision process, separating technical clearance from institutional arrangements to avoid compounding delays. Co-financing amounts include conservative exchange rate assumptions, and the phased cluster approach allows reallocation of resources across clusters in response to changing conditions. [Note: Institutional arrangement risks will be elaborated once the execution modality is confirmed.] The project's adaptive management framework, anchored in the Mid-Term Review at Year 3, provides a structured mechanism for assessing the operational environment and triggering course corrections. Should the execution modality require adjustment based on documented implementation experience, the Ministry will engage with the OFP and GEF Secretariat through the established Major Amendment process.
Overall Risk Rating	Moderate	The overall risk rating is assessed as Medium, reflecting residual financial, institutional, and market uptake risks associated with scaling sustainable energy and decarbonization solutions across a highly heterogeneous MSME sector. These risks arise primarily from variations in MSME investment capacity, policy alignment timelines, and the pace of market response, rather than from unproven technologies or unmanaged financial exposure. The risk profile is balanced by strong institutional anchoring of project activities within existing national and state-level frameworks, clear delineation of technical, financial, and performance responsibilities among project partners, and robust fiduciary, environmental, and social safeguard systems. Financial risks are ring-fenced within regulated financial institutions, while technology performance risks remain with vendors and MSMEs under standard commercial arrangements. The project's adaptive management framework phased implementation across selected clusters, and continuous engagement with key public institutions and financial partners enhance resilience and enable timely adjustment to emerging risks. Collectively, these measures

reduce the likelihood that residual risks will materially affect the delivery of project outcomes or the achievement of Global Environmental Benefits.

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

Explain how the proposed interventions are aligned with GEF- 8 programming strategies and country and regional priorities, including how these country strategies and plans relate to the multilateral environmental agreements.

For projects aiming to generate biodiversity benefits (regardless of what the source of the resources is - i.e., BD, CC or LD), please identify which of the 23 targets of the Kunming-Montreal Global Biodiversity Framework the project contributes to and explain how.

Confirm if any country policies that might contradict with intended outcomes of the project have been identified, and how the project will address this. (max. 500 words, approximately 1 page)

The project is aligned with GEF-8 CCM Focal Area Objective 1.1: Promote innovation, technology development and transfer, and enabling policies for mitigation options with systemic impacts, specifically through the entry point of accelerating efficient use of energy and materials. The project addresses this through: (a) development of MSME-specific decarbonization policy instruments and evidence-based sectoral roadmaps that build on existing BEE benchmarks and MNRE deployment frameworks (Component 1); (b) strengthening of the sustainable energy solutions supply chain and service-provider ecosystem (Component 2); and (c) deployment and demonstration of sustainable energy technologies in approximately 14,280 MSMEs (Component 3).

The project also aligns with GEF-8 CCM Focal Area Objective 1.2: Foster enabling conditions to mainstream mitigation concerns into sustainable development strategies. The project addresses this through: (a) cross-ministerial policy coherence for MSME decarbonization spanning MoMSME, BEE, and MNRE mandates (Component 1); (b) knowledge management and evidence-based policy feedback (Component 4); and (c) institutional capacity building including Virtual Decarbonization Cells to sustain mainstreaming beyond the project period (Component 3).

Alignment with country priorities and MEAs

The project is strongly aligned with India's Updated NDC under the Paris Agreement, which commits to (a) reducing emissions intensity of GDP by 45% by 2030 from 2005 levels and (b) achieving about 50% cumulative installed electric power capacity from non-fossil sources by 2030. By targeting MSME energy efficiency, renewable integration, and investment facilitation, the project supports these NDC pathways by reducing demand and emissions in an under-addressed industrial segment.

The project also aligns with India's Long-Term Low Emissions Development Strategy (LT-LEDS), which highlights energy and material efficiency, electrification, process and fuel substitution, circular economy, and carbon removal as pathways for industrial decarbonization, and includes MSME manufacturing as a priority segment for targeted intervention.

The project aligns with the National Action Plan on Climate Change (NAPCC), particularly the National Mission on Enhanced Energy Efficiency (NMEEE) covering the PAT scheme and related industrial energy efficiency instruments, and the National Solar Mission supporting renewable energy deployment in industrial applications.

The project is consistent with the Energy Conservation Act 2001 (amended 2022), which establishes the Carbon Credit Trading Scheme (CCTS), expands energy performance standards, and provides the legal basis for BEE's MSME energy efficiency programmes including the SME Programme covering 55 clusters.

The project supports India's Make in India and Aatmanirbhar Bharat industrial competitiveness objectives. It aligns with the RAMP Programme (Raising and Accelerating MSME Performance) and the ZED (Zero Defect Zero Effect) certification scheme under which the "Zero Effect" pillar directly addresses decarbonization.

The project is aligned with MNRE's PM Surya Ghar programme for distributed solar generation, the Green Energy Open Access Rules 2022, the Green Hydrogen Mission, and the Draft Climate Finance Taxonomy (MoF-DEA, 2025) establishing an enabling framework for green finance mobilization toward MSME decarbonization.

D. POLICY REQUIREMENTS

Gender Equality and Women's Empowerment

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

Yes

1) Does the project expect to include any gender-responsive-measures to address gender gaps or promote gender equality and women's empowerment?

Yes

If the project expects to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment, please indicate in which results area(s) the project is expected to contribute to gender equality:

Closing gender gaps in access to and control over natural resources;

Yes

Improving women's participation and decision-making; and/or

Yes

Generating socio-economic benefits or services for women.

Yes

2) Does the project's results framework or logical framework include gender-sensitive indicators?

Yes

Stakeholder Engagement

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

Yes

Select what role civil society will play in the Project

Consulted only; Yes

Member of Advisory Body; Contractor;

Co-financier;

Member of project steering committee or equivalent decision-making body ;

Executor or co-executor;

Other (Please explain)

Private Sector

Will there be private sector engagement in the project?

Yes

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

Yes

Environmental and Social Safeguards

We confirm that we have provided information regarding Environmental and Social risks associated with the proposed project or program, including risk screenings/ assessments and, if applicable, management plans or other measures to address identified risks and impacts (this information should be presented in Annex E).

Yes

Please provide overall Project/Program Risk Classification

Overall Project/Program Risk Classification

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate	Medium/Moderate		

E. OTHER REQUIREMENTS

Knowledge management

We confirm that an approach to Knowledge Management and Learning has been clearly described during Project Preparation in the Project Description and that these activities have been budgeted and an anticipated timeline for delivery of relevant outputs has been provided.

Yes

Socio-economic Benefits

We confirm that the project design has considered socio-economic benefits to be delivered by the project and these have been clearly described in the Project Description and will be monitored and reported on during project implementation (at MTR and TER).

The project is designed to deliver socio-economic co-benefits alongside climate change mitigation outcomes by strengthening the competitiveness, resilience, and capacity of manufacturing MSMEs. By supporting the adoption of sustainable energy solutions and improved energy management practices, the project is expected to reduce energy intensity and operating costs for participating MSMEs, contributing to improved productivity and business performance.

The project further supports socio-economic benefits through capacity building, skills development, and institutional strengthening across MSME clusters. Training of MSME workers and managers, certification of professionals, and strengthened service delivery mechanisms are expected to contribute to improved technical capacity and quality of employment within MSME ecosystems. Gender-responsive approaches are integrated to improve access to information, services, and implementation support for women-owned and women-led MSMEs and women professionals.

These socio-economic benefits are embedded within the Project Description, including the Theory of Change and component design. They will be assessed and reported through the project's Monitoring and Evaluation framework during implementation, including at the Mid-Term Review and Terminal Evaluation, in line with UNIDO and GEF requirements.

ANNEX A: FINANCING TABLES

GEF Financing Table

Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	GEF Project Grant(\$)	Agency Fee(\$)	Total GEF Financing (\$)
UNIDO	GET	India	Climate Change	CC STAR Allocation: CCM-1-1	Grant	8,442,420.00	853,330.00	9,295,750.00
UNIDO	GET	India	Climate Change	CC STAR Allocation: CCM-1-2	Grant	540,000.00		540,000.00
Total GEF Resources (\$)						8,982,420.00	853,330.00	9,835,750.00

Project Preparation Grant (PPG)

Was a Project Preparation Grant requested?

true

PPG Amount (\$)

150000

PPG Agency Fee (\$)

14250

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	PPG(\$)	Agency Fee(\$)	Total PPG Funding(\$)
UNIDO	GET	India	Climate Change	CC STAR Allocation: CCM-1-2	9,000.00	855.00	9,855.00
UNIDO	GET	India	Climate Change	CC STAR Allocation: CCM-1-1	141,000.00	13,395.00	154,395.00
Total PPG Amount (\$)					150,000.00	14,250.00	164,250.00

Please provide Justification

Sources of Funds for Country Star Allocation

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Sources of Funds	Total(\$)
UNIDO	GET	India	Climate Change	CC STAR Allocation	10,000,000.00
Total GEF Resources					10,000,000.00

Focal Area Elements

Programming Directions	Trust Fund	GEF Project Financing(\$)	Co-financing(\$)
CCM-1-2	GET	540,000.00	4340631
CCM-1-1	GET	8,442,420.00	51988600
Total Project Cost		8,982,420.00	56,329,231.00

Confirmed Co-financing for the project, by name and type

Please include evidence for each co-financing source for this project in the tab of the portal

Sources of Co- financing	Name of Co-financier	Type of Co- financing	Investment Mobilized	Amount(\$)
-----------------------------	----------------------	--------------------------	-------------------------	------------

Private Sector	Bidar District Chemicals & Pharmaceuticals Industries Association	Other	Investment mobilized	10240000
Private Sector	U.P. Paper Mills Association	Other	Investment mobilized	18072289
Private Sector	South Gujarat Textile Processors Association	Other	Investment mobilized	7200000
Private Sector	Bharatiya Cha Parishad (Assam Tea Cluster)	Other	Investment mobilized	5000000
Private Sector	Ankleshwar Industries Association	Other	Investment mobilized	10240000
Recipient Country Government	Ministry of MSME	In-kind	Recurrent expenditures	5469231
GEF Agency	UNIDO	Grant	Investment mobilized	107711
Total Co-financing				56,329,231.00

Please describe the investment mobilized portion of the co-financing

All five industry-association contributions (Bidar, U.P. Paper Mills, South Gujarat Textile, Bharatiya Cha Parishad, Ankleshwar — totalling USD 50.75M) are categorized as Investment Mobilized of type and grant-equivalent technology investment by member MSMEs with disbursement timeframe 2027–2033.

Investment mobilized under the project was identified through structured cluster-level consultations conducted during the project preparation phase.

The project's confirmed co-financing is structured across four categories: (i) Grant contributions — direct cash contributions from public-sector or development-partner sources; (ii) In-kind contributions — non-cash contributions of staff time, infrastructure and operational facilities, primarily from the National Lead Executing Entity; (iii) Industry investments — investment commitments from industry-association partners covering cluster-level pilot demonstrations, technology deployment, feasibility studies and operational expenditure at member-MSME level (categorised as "Other" in the GEF taxonomy); and (iv) Other forms of co-financing as relevant. Each contribution is described briefly in terms of what it finances and how it directly supports project implementation.

ANNEX B: ENDORSEMENTS

GEF Agency(ies) Certification

GEF Agency Type	Date	Project Contact Person	Phone	Email
Project Coordinator		Olga Rataj		o.rataj@unido.org
GEF Agency Coordinator		Ganna Onysko		g.onysko@unido.org

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

Please attach the Operational Focal Point endorsement letter(s) with this template.

Name of GEF OPF	Position	Ministry	Date (MM/DD/YYYY)
Tanvi Garg	Joint Secretary & GEF Operational Focal Point	Ministry of Environment, Forest & Climate Change Government of India	

ANNEX C: PROJECT RESULTS FRAMEWORK

Please indicate the page number in the Project Document where the project results and M&E frameworks can be found. Please also paste below the Project Results Framework from the Agency document.

Outcome / Output	Indicator	Baseline (2027)	Mid-term Target (Yr 3)	End-of-Project Target (Yr 6)	Means of Verification	Assumptions & Risks
PROJECT OBJECTIVE: Accelerate decarbonization of energy-intensive manufacturing in India by enabling MSMEs across eight priority industrial sub-sectors to adopt sustainable energy solutions						
CI-6: GHG emissions mitigated (GEF Core Indicator)	Direct: Cumulative lifetime GHG emission reductions from SES adoption (MtCO ₂ e, 10-yr accounting)	0	0.95 MtCO ₂ e (pilot + early scale-1)	8.61 MtCO₂e (Option A: 28.2% weighted avg)	Annex P GHG model; M&V reports; energy audit records; SIDBI loan disbursement data	Differentiated rates by phase (35%/28%/22%). Annex P recalculation pending.
	Indirect: Post-attribution indirect GHG reductions (20% factor applied)	0	0.28 MtCO ₂ e	2.67 MtCO₂e	Replication monitoring; policy adoption tracking; market studies	20% attribution per GEF guidelines. Replication factor 1.45x.
CI-1: Energy savings (GEF Core Indicator)	Cumulative direct energy savings from SES adoption (MJ, primary unit; Mtoe supplementary)	0	12,260 TJ (1.05 Mtoe)	90,912 TJ (2.171 Mtoe)	Energy audit baseline/endline; metered consumption data; fuel purchase records	MJ as primary unit per Comment 5.3.1. Start year: 2028 (Yr 2).
CI-11: Direct beneficiaries (GEF Core Indicator)	Number of people directly benefiting, sex-disaggregated	0	1,200 (936 M; 264 W)	4,600 (3,588 M; 1,012 W)	Beneficiary register; training attendance; enterprise survey (sex-disaggregated)	22% women target per GAP. Tracks MSME workers + owners.
Component 1: Policy Development and Market Transformation for MSME Decarbonization (GEF: \$940,000)						
Outcome 1.1: Evidence-based policy and planning foundations for MSME sustainable energy transition and decarbonization are established						
Output 1.1.1 Decarbonization Readiness and Policy Gap Assessment	Number of sector-specific policy gap assessments completed, with BEE/MNRE/MoMSME coverage	0	4 sectors assessed	8 sectors assessed	Assessment reports; PSC endorsement; policy briefs	Multi-ministry cooperation sustained through TWG
Output 1.1.2 MSME Energy Use Profiling and Sector Classification	Number of MSMEs profiled with energy/emission baselines across 60 clusters	~15,000 (PPG baseline)	5,000 detailed profiles	14,280 profiles	Profiling database; Udyam-linked records; audit reports	Udyam Registration data accessible. DIC cooperation.
Output 1.1.3 Sectoral Roadmaps for MSME Sustainable Energy Transition	Number of sector-specific decarbonization roadmaps validated by PSC and industry	0	3 roadmaps (pilot sectors)	8 roadmaps	Roadmap documents; PSC minutes; industry endorsements	Sector associations engaged. BEE benchmark data available.
Outcome 1.2: Conditions influencing MSME investment decisions for sustainable energy are improved						
Output 1.2.1–1.2.3 Investment Behaviour Analysis; Financial Mechanism Design; Scheme Integration	Number of blended finance instruments designed and operationalized with SIDBI/BEE/MoMSME convergence	0	2 instruments designed	3 instruments operational	Instrument ToRs; SIDBI board approvals; disbursement records	SIDBI co-financing confirmed. BEE programme convergence agreed.
Component 2: Demand Creation and Strengthened Supply Chain for SES (GEF: \$1,307,000)						
Outcome 2.1: MSME awareness, skills, and decision-making capacity for sustainable energy transition are strengthened						

Output 2.1.1–2.1.2 Awareness Modules; Skills Development and Training	Number of MSMEs and workers trained on SES (sex-disaggregated); % women participants	0	3,000 trained (≥20% women)	14,280 trained (≥22% women = 3,142)	Training registers (sex-disaggregated); certificates; pre/post assessments	ni-msme training infrastructure available. Differentiated gender modules per GAP.
Output 2.1.3–2.1.4 Digital Learning Assets; Gender-Responsive Modules	Digital platform operational; number of gender-specific training modules developed	0	Platform live; 4 gender modules	Platform with ≥5,000 users; 8 gender modules	Platform analytics; module evaluation reports; user feedback	Digital infrastructure available. Gender content validated by TriKone/ni-msme.
Outcome 2.2: Supply-chain and institutional capacity to deliver SES are strengthened						
Output 2.2.1–2.2.3 Vendor Engagement; Technology Standardization; Virtual Decarbonization Cells	Number of qualified technology vendors/ESCOs; number of Decarbonization Cells operational across clusters	0 DCs; limited vendor base	20 DCs; 30 vendors qualified	60 DCs; 100 vendors qualified	DC establishment records; vendor registry; technology performance database	CII-GBC vendor network leveraged. State DIC support for DC hosting.
Component 3: Implementation of Sustainable Energy Solutions (GEF: \$5,594,000)						
Outcome 3.1: MSME investments in SES are mobilized, implemented, and verified						
Output 3.1.1 Baseline Energy Audits and Investment Diagnostics	Number of MSMEs receiving detailed energy audits with investment-ready SES recommendations	~15,000 (walk-through, PPG)	3,280 detailed audits (80 pilot + 3,200 scale-1)	14,280 audits (all tiers)	Audit reports; BEE-accredited auditor records; investment plans	BEE-accredited auditors available. MSME cooperation sustained.
Output 3.1.2 Customized SES Design and Implementation	Number of MSMEs adopting SES; total investment mobilized (\$); types of non-fossil technologies deployed	0 adoptions	500 MSMEs; \$15M mobilized	3,280+ MSMEs; \$50M+ mobilized Across: solar thermal, biomass, WHR, heat pumps, RE, EMS	Technology installation records; SIDBI loan data; commissioning reports; performance verification	SIDBI credit facility operational. Technology supply chain adequate. No GEF finance for FF-only systems.
Output 3.1.3 Gender-Responsive TA and Implementation Support	Number of women-owned MSMEs receiving dedicated TA; % of TA activities with gender mainstreaming	0	150 women-owned MSMEs supported	500+ women-owned MSMEs 100% TA gender-mainstreamed	TA records (sex-disaggregated); gender audit reports; beneficiary interviews	Women-owned MSMEs identified through Udyam. Gender focal points in each DC.
Output 3.1.4 Monitoring, Evaluation, and Learning from SES Implementation	Digital monitoring platform operational; % of SES installations with real-time M&V; CBAM-ready MRV data	0	Platform live; 80% pilot MSMEs on M&V	100% SES installations on M&V platform	Platform data; M&V protocols; verification reports; CBAM-compatible emission records	IoT infrastructure affordable. MSME digital literacy adequate (with C2 support).
Component 4: Knowledge Management, Learning, and Knowledge Dissemination (GEF: \$465,000)						
Outcome 4.1: Project knowledge and evidence are systematically captured, managed, shared, and applied						
Output 4.1.1–4.1.2 Gender-Responsive Knowledge Products; National Knowledge Hub	Number of knowledge products published (sex-disaggregated case studies); Knowledge Hub operational with user base	0	10 products; Hub live with 500 users	40+ products (incl. ≥10 gender-focused); Hub with 3,000+ users	Knowledge product inventory; Hub analytics; download/citation tracking; user surveys	TERI knowledge management expertise. UNIDO global network access.
Output 4.1.3–4.1.5 Digital Monitoring for KM; DC Knowledge Services; Policy Feedback Reports	Number of policy feedback reports submitted to PSC/TWG; number of state-level replication actions triggered	0	3 policy reports; 2 state replications initiated	8 policy reports; 5+ state replications; PSC-endorsed sustainability plan	Policy reports; PSC/TWG minutes; state government adoption letters; sustainability plan	PSC functional. State interest in replication sustained by demonstration results.
Component 5: Monitoring and Evaluation (GEF: \$248,000)						
Outcome 5.1: Project performance, results, and GEBs are systematically monitored, evaluated, and reported						
Output 5.1.1–5.1.3 Project Oversight; Periodic Reporting; MTR and TE	PIRs submitted on time; MTR and TE completed with ratings; GEB data reported to GEF	0	3 PIRs; MTR completed (Yr 3)	6 PIRs; MTR + TE completed; final GEB report	PIR documents; MTR/TE reports; GEF tracking tools; PSC minutes	UNIDO M&E protocols followed. Independent evaluators contracted timely.

ANNEX D: STATUS OF UTILIZATION OF PROJECT PREPARATION GRANT (PPG)

Provide detailed funding amount of the PPG activities financing status in the table below:

Project Preparation Activities Implemented	GETF/LDCF/SCCF Amount (\$)		
	Budgeted Amount	Amount Spent To date	Amount Committed

Travel for PPG team field visits to MSME clusters across 8 priority sub-sectors for baseline data collection, stakeholder consultations, and site assessments (Delhi, Gujarat, Maharashtra, Tamil Nadu, Assam, UP, Karnataka, Telangana)	10,000.00	8,500.00	1,500.00
Travel for consultations with national stakeholders (MoMSME, BEE, MNRE, SIDBI, NPC, ni-msme, CII) in Delhi and state capitals to discuss project design, institutional arrangements, and co-financing commitments	5,000.00	1,500.00	3,500.00
National Gender Expert: Preparation of Gender Analysis Report and Gender Action Plan (Annex L), including sex-disaggregated baseline data collection, stakeholder gender mapping, and gender-responsive indicator design	12,000.00	0.00	12,000.00
National Environmental and Social Safeguards Expert: Preparation of Environmental and Social Management Framework (ESMF) including screening, risk assessment, mitigation measures, and grievance mechanism design	10,000.00	0.00	10,000.00
National Technical Expert: Support for baseline energy assessment data analysis, technology eligibility framework development, and GHG methodology review for Annex P revision	8,000.00	0.00	8,000.00
Institutional contract for baseline energy assessments and MSME cluster profiling: Comprehensive energy use mapping across 60 clusters in 8 sub-sectors, including sector classification, energy intensity benchmarking, and investment opportunity identification	43,000.00	35,000.00	5,000.00
Institutional contract for stakeholder engagement and consultation support: Organization of national inception workshop, stakeholder mapping, conducting SEP consultations, documentation of consultation outcomes for Annex M	25,000.00	20,000.00	5,000.00
Institutional contract for HACT Micro Assessment of CII-Green Business Centre: Financial and operational capacity assessment per UNIDO HACT requirements for executing partner due diligence	10,000.00	10,000.00	0.00
Institutional contract for HACT Micro Assessment of TERI: Financial and operational capacity assessment per UNIDO HACT requirements for executing partner due diligence	10,000.00	10,000.00	0.00
Institutional contract for co-financing mobilization support: Preparation of co-financing commitment documentation, industry association engagement, and investment mobilization framework for SIDBI green credit line	15,000.00	10,000.00	5,000.00
PPG inception workshop and stakeholder validation meeting: Venue, logistics, materials, and participant travel support for national PPG launch and design validation	2,000.00	1,192.00	808.00
Total	150,000.00	96,192.00	50,808.00

ANNEX E: PROJECT MAP AND COORDINATES

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

Location Name	Latitude	Longitude	GeoName ID
Tirupur, Tamil Nadu	11.1085	77.3411	1,253,928

Location Description:

Textile hub for knitwear

Activity Description:

Textile (Knit Wear) Cluster

Location Name	Latitude	Longitude	GeoName ID
Ludhiana, Punjab	30.9006	75.8573	1,269,938

Location Description:

Activity Description:

Textile (Woolen garments), Light Engineering (Forging)

Location Name	Latitude	Longitude	GeoName ID
Surat, Gujarat	21.1702	72.8311	1,254,945

Location Description:

Center for synthetic textiles

Activity Description:

Textile (Synthetic textiles) Cluster

Location Name	Latitude	Longitude	GeoName ID
Panipat, Haryana	29.3909	76.9707	1,260,112

Location Description:

Home textiles industry

Activity Description:

Textile (Home textiles) Cluster

Location Name	Latitude	Longitude	GeoName ID
Raipur, Chhattisgarh	21.2514	81.6296	1,259,229

Location Description:

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Mandi Gobindgarh, Punjab	30.657	76.3	1,266,575

Location Description:

Known as 'Steel Town of Punjab'

Activity Description:

Sponge Iron & Steel Re-Rolling

Location Name	Latitude	Longitude	GeoName ID
Bhavnagar, Gujarat	21.7645	72.1519	1,275,974

Location Description:

Port city with rolling industries

Activity Description:

Sponge Iron & Steel Re-Rolling

Location Name	Latitude	Longitude	GeoName ID
Sundergarh, Odisha	22.1208	84.0435	1,255,730

Location Description:

Mineral-rich steel hub

Activity Description:

Sponge Iron & Steel Re-Rolling

Location Name	Latitude	Longitude	GeoName ID
Kolhapur, Maharashtra	16.7049	74.2429	1,267,690

Location Description:

Industrial foundry activities

Activity Description:

Foundry & Forging (Castings and Al-dicast)

Location Name	Latitude	Longitude	GeoName ID
Agra, Uttar Pradesh	27.1767	78.0081	1,278,782

Location Description:

Tourist and foundry hub

Activity Description:

Foundry (Casting) Cluster

Location Name	Latitude	Longitude	GeoName ID
Jalandhar, Punjab	31.326	75.5762	1,273,163

Location Description:

Hand tools and light engineering

Activity Description:

Light Engineering (Hand tools)

Location Name	Latitude	Longitude	GeoName ID
Ankleshwar, Gujarat	21.5567	73.02	1,278,319

Location Description:

Chemical complex

Activity Description:

Chemicals (Bulk Chemicals & Pharma)

Location Name	Latitude	Longitude	GeoName ID
Vapi, Gujarat	20.3718	72.9081	1,254,479

Location Description:

Industrial hub for chemicals and kraft paper

Activity Description:

Chemicals (Dyes & Intermediates), Pulp & Paper (Kraft paper)

Location Name	Latitude	Longitude	GeoName ID
Bidar, Karnataka	17.9175	77.5128	1,276,504

Location Description:

Pharma cluster

Activity Description:

Chemicals (Pharma)

Location Name	Latitude	Longitude	GeoName ID
Ahmedabad, Gujarat	23.0225	72.5714	1,279,232

Location Description:

Industrial/business hub

Activity Description:

Chemicals (Pharma)

Location Name	Latitude	Longitude	GeoName ID
Patancheru, Telangana	17.5333	78.0667	1,269,843

Location Description:

Industrial zone near Hyderabad

Activity Description:

Chemicals (Pharma)

Location Name	Latitude	Longitude	GeoName ID
Gangtok, Sikkim	27.3314	88.6138	1,257,434

Location Description:

Food processing hub

Activity Description:

Food Processing & Dairy

Location Name	Latitude	Longitude	GeoName ID
Guwahati, Assam	26.1445	91.7362	1,271,125

Location Description:

Food processing hub

Activity Description:

Food Processing & Dairy

Location Name	Latitude	Longitude	GeoName ID
Dibrugarh, Assam	27.4728	94.912	1,272,423

Location Description:

Tea processing hub

Activity Description:

Food Processing (Tea)

Location Name	Latitude	Longitude	GeoName ID
Muzaffarnagar, Uttar Pradesh	29.4707	77.708	1,263,103

Location Description:

Pulp & paper industries

Activity Description:

Pulp & Paper Cluster

Location Name	Latitude	Longitude	GeoName ID
Shamli, Uttar Pradesh	29.17	77.31	1,263,104

Location Description:

Pulp & paper activities

Activity Description:

Pulp & Paper Cluster

Location Name	Latitude	Longitude	GeoName ID
Firozabad, Uttar Pradesh	27.1494	78.4167	1,269,755

Location Description:

Glass & ceramics industry

Activity Description:

Glass & Ceramics (Bangles & Decorative)

Location Name	Latitude	Longitude	GeoName ID
Coimbatore, Tamil Nadu	11.0168	76.9558	1,253,928

Location Description:

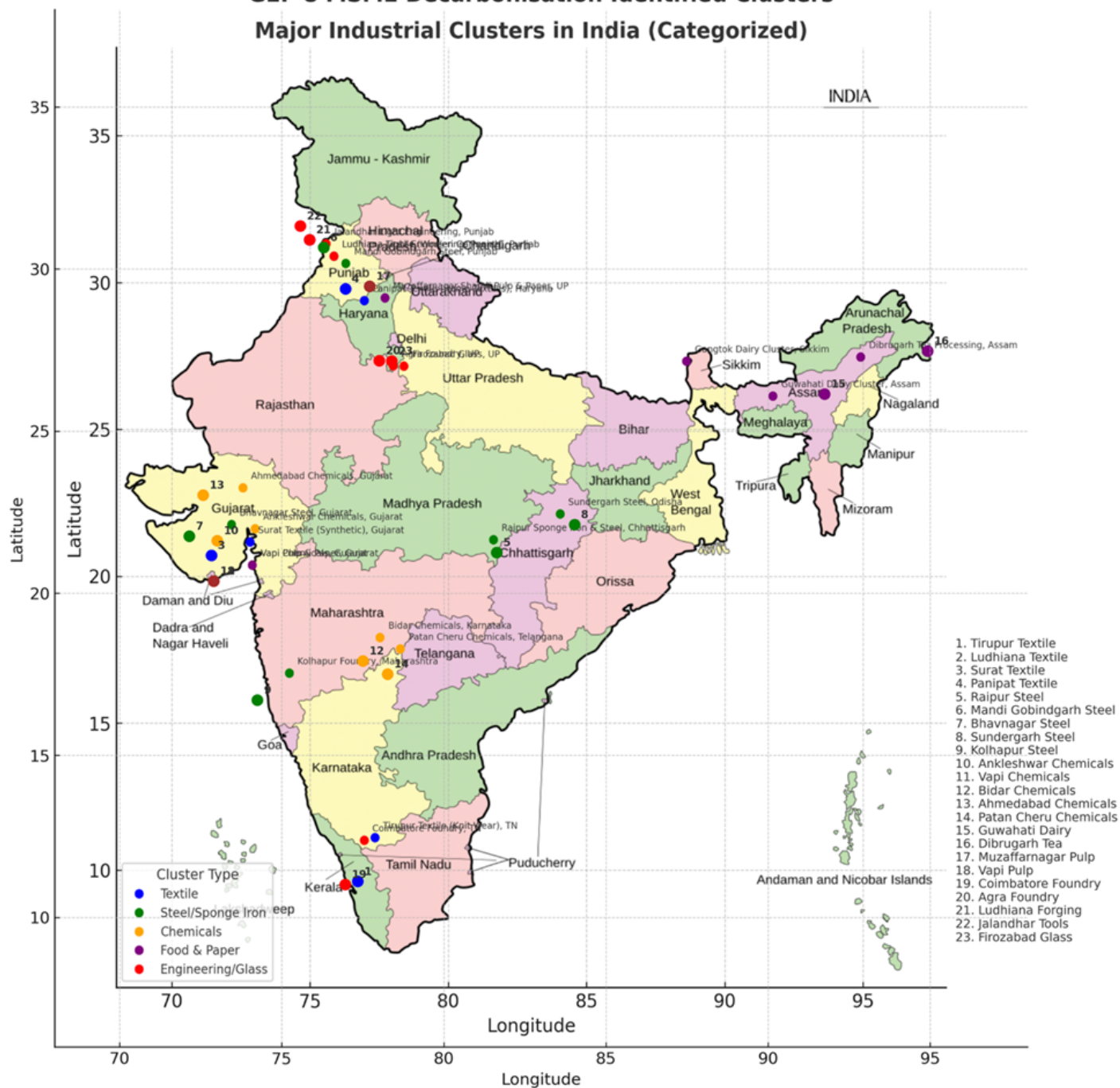
Foundry/forging hub

Activity Description:

Foundry & Forging (Castings, Pump Industry)

Please provide any further geo-referenced information and map where project interventions are taking place as appropriate.

GEF-8 MSME Decarbonisation Identified Clusters Major Industrial Clusters in India (Categorized)



ANNEX F: ENVIRONMENTAL AND SOCIAL SAFEGUARDS SCREEN AND RATING

Attach agency safeguard datasheet/assessment report(s), including ratings of risk types and overall project/program risk classification as well as any management plans or measures to address identified risks and impacts (as applicable).

Title

ESMF

ESS Screening

ANNEX G: BUDGET TABLE

Please upload the budget table here.

Annex G — Project Budget (GEF-8 ID 11758)

Indicative Project Budget — per GEF Appendix A template (GEF/C.70/Inf.18, p.58); subtotals shown per expenditure category; independent financial audit contracted by the PEE; UNIDO evaluation activities (MTR / TE) under UNIDO.

GEF allocation :	USD 8,982,420	Implementing Agency: UNIDO				NLEE: MoMSME, Government of India			
Expenditure Category	Detailed Description	Component 1	Component 2	Component 3	Component 4	M&E	PMC	Total (USD eq.)	Responsible Entity (receiving funds from GEF Agency)
Works	(no allocation under GEF financing for this project)	-	-	-	-	-	-	-	
Goods — Equipment / Vehicles	(no allocation under GEF financing for this project)	-	-	-	-	-	-	-	
Grants / Sub-grants	(no allocation under GEF financing for this project)	-	-	-	-	-	-	-	
Revolving funds / Seed funds / Equity	(no allocation under GEF financing for this project)	-	-	-	-	-	-	-	
Sub-contract to executing partner / entity									
	O1.1.1: Decarbonization Readiness & Policy Gap Assessment	180,000						180,000	NPC
	O1.1.2: Energy Use Profiling & Sector Classification	120,000						120,000	TERI
	O1.1.3: Sectoral Roadmaps for Sustainable-Energy Transition	130,000						130,000	NPC

	O1.2.1: Investment Behaviour Analysis	75,000						75,000	CII-GBC
	O1.2.2: Market Facilitation Measures for Uptake	155,000						155,000	CII-GBC
	O1.2.3: Inclusive Decarbonization Support Schemes	45,000						45,000	ni-MSME
	O2.1.1: Awareness & Sensitization Modules		80,000					80,000	ni-MSME
	O2.1.2: Skills Development & Training		170,000					170,000	ni-MSME
	O2.1.3: Digital Knowledge & Learning Assets		70,000					70,000	TERI
	O2.1.4: Gender-Responsive Study Tours		80,000					80,000	CII-GBC
	O2.2.1: SES Supply Chain Gap Assessment		60,000					60,000	NPC
	O2.2.2: Sector Performance Benchmarks		55,000					55,000	NPC / TERI
	O2.2.3: Design / Engineering / Manufacturing Capacity for SES		130,000					130,000	CII-GBC
	O2.2.4: Sustainable Energy Innovation		72,000					72,000	TERI
	O2.2.5: Gender-Responsive SES Training		55,000					55,000	ni-MSME
	O2.2.6: Institutional Capacity for SES		65,000					65,000	ni-MSME
	O3.1.1: Baseline Energy Audits (3,280 MSMEs)			600,000				600,000	NPC / TERI
	O3.1.2: Customized SES Design & Implementation			2,400,000				2,400,000	CII-GBC
	O3.1.3: Gender-Responsive TA & Support			250,000				250,000	CII-GBC
	O3.1.4: MRV System for SES			250,000				250,000	NPC
	O3.2.1: Virtual Decarbonization Cells (60 clusters)			800,000				800,000	CII-GBC
	O3.2.2: Qualified SES Professionals			524,000				524,000	ni-MSME
	O3.2.3: Monitoring & Verification of Investments			500,000				500,000	NPC / TERI
	O4.1.1: Gender-Responsive Knowledge Products				60,000			60,000	TERI
	O4.1.2: National Decarbonization Knowledge Hub				100,000			100,000	TERI
	O4.1.3: Digital Monitoring for Knowledge Management				50,000			50,000	NPC

	O4.1.4: Knowledge Support via District Centres				30,000			30,000	CII-GBC
	O4.1.5: Online Knowledge Modules				55,000			55,000	ni-MSME
	O4.1.6: Knowledge Exchange Events				40,000			40,000	CII-GBC
	O5.1.2(b): GEB tracking and MRV (GHG / energy / attribution)					73,000		73,000	TERI
	Subtotal — Sub-contract to executing partner / entity	705,000	837,000	5,324,000	335,000	73,000	-	7,274,000	
Contractual Services — Individual									
	Gender mainstreaming consultant (Component 1)	15,000						15,000	ni-MSME
	Gender mainstreaming consultant (Component 2)		15,000					15,000	ni-MSME
	Gender mainstreaming & technical consultant (Component 3)			80,000				80,000	MoMSME PMU
	Gender mainstreaming consultant (Component 4)				20,000			20,000	ni-MSME
	Subtotal — Contractual Services — Individual	15,000	15,000	80,000	20,000	-	-	130,000	
Contractual Services — Company									
	O5.1.1: Independent Mid-Term Review (MTR)					25,000		25,000	UNIDO
	O5.1.3: Independent Terminal Evaluation (TE)					50,000		50,000	UNIDO
	Subtotal — Contractual Services — Company	-	-	-	-	75,000	-	75,000	
Salary and benefits / Staff costs									

	Project Coordinator (72 person-months)						350,000	350,000	MoMSME PMU
	Project Assistant (72 person-months)						223,000	223,000	MoMSME PMU
	Subtotal — Salary and benefits / Staff costs	-	-	-	-	-	573,000	573,000	
Training s, Worksh ops, Meeting s									
	Policy roundtables and stakeholder workshops (C1)	120,000						120,000	MoMSME
	Training events and knowledge exchanges (C2)		230,000					230,000	ni-MSME
	Pilot showcases and cluster workshops (C3)			30,000				30,000	CII-GBC
	Conferences and dissemination events (C4)				60,000			60,000	CII-GBC
	Subtotal — Trainings, Workshops, Meetings	120,000	230,000	30,000	60,000	-	-	440,000	
Travel									
	Cluster visits and consultations (C1)	50,000						50,000	MoMSME PMU
	Cluster visits, training and study tours (C2)		175,000					175,000	CII-GBC
	Implementation visits and monitoring (C3)			110,000				110,000	MoMSME PMU
	Event participation and visits (C4)				25,000			25,000	MoMSME PMU
	M&E field visits (cluster verification, GEB data)					40,000		40,000	MoMSME PMU
	Subtotal — Travel	50,000	175,000	110,000	25,000	40,000	-	400,000	
Office Supplies									
	Office supplies, IT and communications						5,420	5,420	MoMSME PMU
	Subtotal — Office Supplies	-	-	-	-	-	5,420	5,420	
Other Operati ng Costs									
	Annual financial audits (6 years)						25,000	25,000	MoMSME PMU
	O5.1.2(a): Periodic operational monitoring (PIRs, progress)					60,000		60,000	MoMSME PMU

	Subtotal — Other Operating Costs	-	-	-	-	60,000	25,000	85,000	
	GRAND TOTAL — GEF Grant	890,000	1,257,000	5,544,000	440,000	248,000	603,420	8,982,420	
	Check vs GEF allocation (USD 8,982,420)							-	

Please explain any aspects of the budget as needed here

(1) Template per GEF Appendix A — Indicative Project Budget Template, Guidelines for Project and Program Cycle Policy (GEF/C.70/Inf.18), page 58. Activities grouped under each expenditure category, with subtotals per category and components shown as columns.

(2) Sub-contract to executing partner / entity — the four designated Executing Partners (NPC, ni-MSME, CII-GBC, TERI) deliver Components 1–4 outputs and the GEB tracking under M&E. Selection per documented HACT micro-assessments completed during PPG, in line with paragraph 10 of GEF/C.70/Inf.18.

(3) Contractual Services — Company — the two independent evaluation services (MTR and TE) sit under UNIDO.

(3a) Independent financial audit — contracted by the PEE (Ministry of MSME / Project Management Unit), shown under Other Operating Costs in the PMC column, per GEF / UNIDO standard practice.

(4) Empty expenditure categories (Works; Goods/Equipment/Vehicles; Grants/Sub-grants; Revolving funds / Seed funds / Equity) show zero allocation under GEF financing — cluster-level technology deployment is delivered through Sub-contracts to Executing Partners (Component 3) and is funded primarily through the Investment-Mobilized co-financing captured at Annex B-1.

(5) Co-financing is not included in this table; the revised Confirmed Co-financing Table (CEO ER §8.2) and Annex B-1 (Investment-Mobilized Co-financing — Technology Scope and Unit Economics) set out the co-financing architecture, including the five industry-association lines reclassified from 'Grant' to 'Other (Industry Investment)' per Edit J of the Final Round Addendum.

ANNEX I: RESPONSES TO PROJECT REVIEWS

From GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF.

The table presenting deviations between the Project Identification Form (PIF) and the CEO Endorsement Request (RCE) is provided in Annex I.

Responses to stakeholder comments received during the project approval process:

Stakeholder	Comment	Response
United Kingdom	Focus sectors: There is a slight mismatch between the table, which states chemicals and waste as two focus areas, whereas the write-up includes 8 sectors.	The project targets eight energy-intensive MSME sub-sectors: textiles, chemicals, pharmaceuticals, paper, foundry, forging, ceramics, and tea processing. The chemicals

		and waste reference in the PIF summary table has been corrected in the CEO Endorsement Request to align with the eight-sector scope confirmed during the PPG phase.
United Kingdom	Buy-in: It would be useful to have the buy-in from the Ministry of Power and BEE (nodal organisation for energy efficiency in India under MoP).	BEE has been actively engaged throughout the PPG phase. The Deputy Director General of BEE attended the National Stakeholder Consultation. BEE and MNRE are both represented on the Project Steering Committee. The project complements BEE's ongoing SME Programme under the Energy Conservation Act.
United Kingdom	Existing programmes in India: Significant work has been undertaken under ASPIRE and UK PACT in these 8 identified industrial sectors (both heavy and small). It would be helpful to understand how this programme progresses to ensure there are no overlaps and that collaborative opportunities are identified and taken forward. The proposal emphasizes leveraging existing platforms, with IDEEKSHA (developed under ASPIRE and to be taken forward by MoP) being an ideal choice to advance the programme's objectives.	The project design includes a dedicated coordination framework with ongoing programmes, including ASPIRE and UK PACT. The IDEEKSHA platform developed under ASPIRE has been identified as a key knowledge-sharing platform. Component 4 (Knowledge Management) includes specific activities for integration with IDEEKSHA for dissemination of MSME decarbonization tools and benchmarks. Coordination protocols are detailed in the CEO Section on Coordination with Ongoing Initiatives.
Germany	Germany appreciates the focus on MSMEs, which are the backbone of India's economy and often face unique financing challenges. To address these barriers, the proposal includes innovative financing mechanisms such as blended finance facilities and risk-sharing instruments. To maximize the initiative's impact on promoting energy efficiency, it is recommended that the scope be expanded to include MSMEs nationwide.	The project adopts a phased cluster-based approach across 60 MSME clusters in 8 states as a scalable demonstration model. Component 4 (Knowledge Management) and the National MSME Decarbonization Knowledge Hub are specifically designed to enable replication and nationwide scale-up beyond the direct intervention clusters. The project's indirect impact pathway (CI-6 Indirect: 2.67 MtCO ₂ e) accounts for this broader diffusion effect.
Germany	The initiative supports the inclusion of women in the industrial workforce by providing training to professionals, with a target of at least 30% female participation. To align with UNIDO's principles on gender equality and women's empowerment, which advocate for women in leadership positions, it is suggested to incorporate activities that strengthen female leadership within the Indian MSME sector. Furthermore, the social impact could be enhanced by including other underrepresented or vulnerable groups, such as ethnic minorities, as beneficiaries.	The Gender Action Plan (Annex L) includes 12 output-level actions with a dedicated budget of USD 800,000. CI-11 targets 4,600 direct beneficiaries with 22% women participation. Specific activities include gender-responsive training and certification of SES professionals (Output 2.2.5), leadership development modules for women entrepreneurs, and targeted outreach to SC/ST/OBC-owned MSMEs as identified in the ESMF (Annex E).

Germany	Within the initiative, the use of hydrogen is permissible, with a commitment to focus exclusively on green hydrogen, defined as having a carbon footprint of less than 2 kg CO₂ equivalent per kilogram of hydrogen according to the Green Hydrogen Standard for India. Given that the direct use of solar and wind power is more efficient, discussions during the Project Preparation Grant (PPG) phase should prioritize the direct use of these renewable energy sources over green hydrogen. Additionally, since waste heat recovery is eligible under the project proposal, it is crucial to ensure that the underlying energy generation is derived from renewable sources.	The project prioritizes direct use of solar thermal, biomass, and waste heat recovery technologies as the primary sustainable energy solutions for MSMEs. Green hydrogen is not included as a primary intervention pathway keeping in mind of the cost implications and size of the industries size being MSMEs. All supported technologies are commercially proven with established supply chains in India. Waste heat recovery applications are designed to capture thermal energy from existing processes, with the underlying energy transition toward renewable sources addressed through the sectoral roadmaps under Component 1.
Germany	Germany proposes alignment with ongoing activities: for example, GIZ is currently implementing the project “Promoting Energy Efficiency in Indian Industry,” which includes support for the steel and paper sectors. German financial cooperation (KfW Bank) also addresses energy efficiency in various areas, including households, industries, and buildings, through different projects. Close cooperation on technical and financial assistance is suggested to achieve greater collective impact.	The project includes coordination mechanisms with GIZ's 'Promoting Energy Efficiency in Indian Industry' programme and KfW's energy efficiency financing activities. The CEO Section on Coordination with Ongoing Initiatives details specific areas of synergy, including joint training events, shared benchmarking data, and complementary financing approaches. The PSC will include provisions for periodic coordination reviews with bilateral programmes.