



# GEF-6 PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

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## PART I: PROJECT INFORMATION

Project Title:	Climate change mitigation through methane recovery and reuse from industrial wastewater treatment		
Country(ies):	Myanmar	GEF Project ID: <sup>1</sup>	9830
GEF Agency(ies):	UNIDO (select) (select)	GEF Agency Project ID:	150011
Other Executing Partner(s):	Department of Urban and Housing Development under the Ministry of Construction Environment Conservation Department under the Ministry of Natural Resources and Environmental Conservation Directorate of Industrial Supervision and Inspection under the Ministry of Industry University of Yangon, RECP Office	Submission Date:	05/15/2017
		Resubmission Date:	07/04/2017
GEF Focal Area(s):	Climate Change	Project Duration (Months)	60
Integrated Approach Pilot	IAP-Cities <input type="checkbox"/> IAP-Commodities <input type="checkbox"/> IAP-Food Security <input type="checkbox"/>	Corporate Program: SGP <input type="checkbox"/>	
Name of parent program:	[if applicable]	Agency Fee (\$)	390,411

## A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES<sup>2</sup>

Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs)	Trust Fund	(in \$)	
		GEF Project Financing	Co-financing
(select) CCM-1 Program 1 (select)	GEFTF	3,984,589	19,105,322
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
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(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
<b>Total Project Cost</b>		<b>3,984,589</b>	<b>19,105,322</b>

## B. INDICATIVE PROJECT DESCRIPTION SUMMARY

<b>Project Objective: Increasing Myanmar's efforts towards climate mitigation by minimizing GHG emissions through the application of integrated low-emission wastewater treatments and the Transfer of Environmentally Sound Technologies (TEST).</b>						
Project Components	Financing Type <sup>3</sup>	Project Outcomes	Project Outputs	Trust Fund	(in \$)	
					GEF Project Financing	Co-financing
1. Legal framework and national capacity improved as well as pilot demonstrations	TA	Outcome 1.1: Greenhouse gas emissions from industrial effluent	Output 1.1.1: Wastewater regulatory framework reviewed, policy tools identified	GEFTF	380,000	1,100,000

<sup>1</sup> Project ID number will be assigned by GEFSEC and to be entered by Agency in subsequent document submissions.

<sup>2</sup> When completing Table A, refer to the excerpts on [GEF 6 Results Frameworks for GETF, LDCF and SCCF](#) and [CBIT guidelines](#).

<sup>3</sup> Financing type can be either investment or technical assistance.

at company and industrial park levels implemented applying UNIDO's TEST integrated approach		discharges reduced through improved and integrated wastewater management and technologies, supported by an strengthened policy framework and increased capacity.	and introduced, and institutional capacity on sound wastewater management strengthened.				
	Inv		Output 1.1.2: Industrial parks and companies with TEST integrated approach assessed and pilot low-emission technologies demonstrated.	GEFTF	1,964,847	12,105,322	
	TA		Output 1.1.3.: National capacity increased on low-cost industry wastewater treatment and methane recovery power generation technology through TEST training delivery.	GEFTF	800,000	2,800,000	
	TA		Output 1.1.4: Awareness programs on sound wastewater management developed and implemented.	GEFTF	450,000	1,700,000	
2. Monitoring and Evaluation	TA	Outcome 2.1: Project objective achieved on time through effective monitoring and evaluation	Output 2.1.1: M&E mechanism developed and applied.	GEFTF	200,000	495,238	
	(select)			(select)			
	(select)			(select)			
	(select)			(select)			
Subtotal						3,794,847	18,200,560
Project Management Cost (PMC) <sup>4</sup>					(select)	189,742	904,762
<b>Total Project Cost</b>						<b>3,984,589</b>	<b>19,105,322</b>

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust funds here: ( )

### C. INDICATIVE SOURCES OF **CO-FINANCING** FOR THE PROJECT BY NAME AND BY TYPE, IF AVAILABLE

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
Recipient Government	DUHD	In-kind	1,500,000
Recipient Government	DRI	In-kind	1,500,000
Private Sector	Participating companies and industrial zones	Equity	15,000,000
Donor Agency	SECO (via UNIDO)	Cash	1,000,000
GEF Agency	UNIDO	Cash	105,322
(select)		(select)	
<b>Total Co-financing</b>			<b>19,105,322</b>

<sup>4</sup> For GEF Project Financing up to \$2 million, PMC could be up to 10% of the subtotal; above \$2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

**D. INDICATIVE TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES), FOCAL AREA AND THE PROGRAMMING OF FUNDS <sup>a)</sup>**

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	(in \$)		
					GEF Project Financing (a)	Agency Fee (b) <sup>b)</sup>	Total (c)=a+b
UNIDO	GEFTF	Myanmar	Climate Change	(select as applicable)	3,984,589	378,536	4,363,125
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
<b>Total GEF Resources</b>					<b>3,984,589</b>	<b>378,536</b>	<b>4,363,125</b>

a) Refer to the [Fee Policy for GEF Partner Agencies](#).

**E. PROJECT PREPARATION GRANT (PPG)<sup>5</sup>**

Is Project Preparation Grant requested? Yes  No  If no, skip item E.

**PPG AMOUNT REQUESTED BY AGENCY(IES), TRUST FUND, COUNTRY(IES) AND THE PROGRAMMING OF FUNDS**

Project Preparation Grant amount requested: \$125,000					PPG Agency Fee: 11,875		
GEF Agency	Trust Fund	Country/ Regional/Global	Focal Area	Programming of Funds	(in \$)		
					PPG (a)	Agency Fee <sup>6</sup> (b)	Total c = a + b
UNIDO	GEF TF	Myanmar	Climate Change	(select as applicable)	125,000	11,875	136,875
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
<b>Total PPG Amount</b>					<b>125,000</b>	<b>11,875</b>	<b>136,875</b>

<sup>5</sup> PPG requested amount is determined by the size of the GEF Project Financing (PF) as follows: Up to \$50k for PF up to \$2m (for MSP); up to \$100k for PF up to \$3m; \$150k for PF up to \$6m; \$200k for PF up to \$10m; and \$300k for PF above \$10m. On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

<sup>6</sup> PPG fee percentage follows the percentage of the Agency fee over the GEF Project Financing amount requested.

## F. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS<sup>7</sup>

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	<i>Hectares</i>
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	<i>Hectares</i>
3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services	Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins;	<i>Number of freshwater basins</i>
	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	<i>Percent of fisheries, by volume</i>
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO <sub>2e</sub> mitigated (include both direct and indirect)	<i>140,000 metric tons (direct) and 56,000-210,000 metric tons (indirect)</i>
5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Disposal of 80,000 tons of POPs (PCB, obsolete pesticides)	<i>metric tons</i>
	Reduction of 1000 tons of Mercury	<i>metric tons</i>
	Phase-out of 303.44 tons of ODP (HCFC)	<i>ODP tons</i>
6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks	Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries	<i>Number of Countries:</i>
	Functional environmental information systems are established to support decision-making in at least 10 countries	<i>Number of Countries:</i>

## **PART II: PROJECT JUSTIFICATION**

1. *Project Description.* Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, GEF focal area<sup>8</sup> strategies, with a brief description of expected outcomes and components of the project, 4) [incremental/additional cost reasoning](#) and expected contributions from the baseline, the GEFTF, LDCF, SCCF, CBIT and [co-financing](#); 5) [global environmental benefits](#) (GEFTF) and/or [adaptation benefits](#) (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up.

1) *The global environmental and/or adaptation problems, root causes and barriers that need to be addressed;*

While the water sector has to manage the impacts on climate change, it is also a contributor. This is particularly the case with regards to wastewater, causing high levels of nitrous oxides and methane emissions, which have much larger multiplier effects on global warming. On a global scale, 80 per cent of all wastewater is released untreated into the environment representing three times the greenhouse gas (GHG) emissions of conventional wastewater treatment. As such, the expansion of wastewater treatment combined with energy-saving and renewable energy producing measures, can lead towards utilities achieving carbon-neutrality.

<sup>7</sup> Provide those indicator values in this table to the extent applicable to your proposed project. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the [GEF-6 Programming Directions](#), will be aggregated and reported during mid-term and at the conclusion of the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF, SCCF or CBIT.

<sup>8</sup> For biodiversity projects, in addition to explaining the project's consistency with the biodiversity focal area strategy, objectives and programs, please also describe which [Aichi Target\(s\)](#) the project will directly contribute to achieving.

Myanmar is considered to be the second hardest-hit country by climate change-related extreme weather events from 1993 to 2012, according to the Global Climate Risk Index 2014. Myanmar's overall climate vulnerability factor to 2030 is classified as acute. As such, the increase of GHG emissions and its considerable contribution to climate change has been recognized as a serious threat to the country. This is evidenced by the World Resource Institute Study (2013), which breaks down the increase in GHG emission's release by sector.

An often overlooked significant contribution to GHG emissions is stemming from discharged untreated effluents, a pervasive practice in Myanmar. It was identified that only 1 in 10 Myanmar factories treat industrial effluents properly before releasing them into various waterways. More specifically, agricultural industries and food producers are hereby singled out as the worst water polluters due to their generation of significant amounts of wastewater containing high organic content causing serious depletion of oxygen levels. As such, the organic matter is broken down by microorganisms in a process that (i) consumes large quantities of oxygen negatively contributing to oxygen depletion in water bodies and (ii) releases GHGs, such as methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>), in the atmosphere. This is an alarming situation since methane causes as much as 20 times global warming potential than CO<sub>2</sub>.

Although water resources in Myanmar are mostly abundant, localized pollution threatens to render water resources unsuitable for downstream use. The reason can be attributed to the virtual absence of any form of treatment of household and industrial wastewater. Besides the increase of the GHG emissions released into the atmosphere from industrial wastewater, these effluents also cause serious socio-economic impacts on poor communities that cannot afford to dig deep wells. Excessive water consumption combined with under investment in preventative health care, drainage and sanitation services have resulted in severe health threats causing widespread water-related vector borne diseases, such as malaria, dengue fever and chikungunya virus.

As a consequence of unsustainable industrial development in particular insufficient wastewater treatment, the corresponding high levels of GHG emissions greatly impact on climate change as well as on the degradation of human health and the environment.

## **Barriers**

Reducing GHG emissions stemming from water services presents a significant contribution for Myanmar's carbon targets under the Paris Climate Agreement. Despite the government's recognition of the urgency to integrate climate change considerations in policies, strategies, plans and operations, structural barriers remain. This is particularly the case with regards to the treatment of industrial wastewater, whereby Myanmar will not be able to decrease its GHG emissions if the following structural barriers remain unaddressed.

- **Policy:** ineffective legal framework as a result of insufficient or overlapping laws, acts and regulations in terms of water resource management. This results in unclear guidance and delineation of responsibilities in planning, regulating and managing industrial zone infrastructure. These need to be strengthened to enforce unified water resource laws to ensure improved coordination and monitoring systems, for example by developing appropriate water quality criteria and sewage effluent guidelines.
- **Economy:** Lacking economic incentives and pricing strategy for the private sector to be involved in the funding and construction of industrial wastewater treatment projects. Additionally, there is a lack of economic incentive and perceived competing interest between productivity and environmental considerations among companies.
- **Monitoring and enforcement:** lack of enforcement towards industries by the respective government agencies regarding (i) illegal dumping of wastewater in suburban areas; (ii) weak management of industrial effluents; and (iii) weak regulation of large-amount wastewater generators. Additionally, there is no regular training of Yangon City Development Committee (YCDC) and Mandalay City Development Committee (MCDC) personnel on wastewater management issues.
- **Technology:** no adequate technical assistance in particular for wastewater treatment processes in industrial zones is available or offered on an institutional macro level.
- **Capacity:** in terms of industrial zones, there is a lack of capacity in particular for small and medium sized enterprises (SMEs) to install proper treatment systems for effluents discharged.

- Awareness: lack of resources and exposure to international best practices as well as limited knowledge on climate change in general. More specifically, there is a lack of awareness of factory owners on water pollution and the discharging of wastewater without prior treatment as well as a lack of knowledge regarding the consequences of water pollution.

In order to assist Myanmar to address the above outlined structural barriers, this project provides technical assistance via the identified project outputs and intervention areas. More specifically the project design intends to support companies in overcoming wastewater management problems targeting the below industry specific root causes mitigating their impacts on climate change.

### **Root causes**

The root causes of identified wastewater management problems deriving from industries within the area of Yangon and Mandalay are summarized below. These root causes are systemic issues and thus need to be addressed at the (i) policy and planning; and (ii) industrial zone and company levels.

- Poor monitoring and regulatory framework, proper and systematic keeping of records, monitoring and surveillance of data for water quality control of companies;
- Inefficient urban planning and provision of infrastructure to support companies in terms of water as well as sewers and sewage treatment systems;
- Lack of policy incentives for company management to install the equipment required for wastewater treatment causing severe underinvestment in infrastructure and services;
- Scarcity of knowledge and skills of local engineers and companies to tackle the issue of wastewater treatment;
- Absence of environmentally sound combined treatment of domestic and compatible industrial effluents; and
- Weak Environmental Impact Assessment in terms of the regulation of water resource management.

2) *The baseline scenario or any associated baseline projects;*

#### **2a) Baseline scenario;**

With rapid urbanization and increased pollution in Myanmar, air and water pollution is a growing problem, especially in the city of Mandalay and Yangon. Among the most critical environmental concerns are the provision of safe water supply, drainage, sanitation as well as the control and treatment of industrial effluents.

There are currently 25 industrial zones in Myanmar with a total of 9,827 factories employing 187,885 people. The physical proximity of industries to rivers intensifies the potential of environmental degradation in the country as many companies illegally discharge their wastewater into the nearby river as a common practice. The food processing industry is well established in Myanmar accounting for 64% of industrial activity mostly consisting of registered SMEs in the industrial zones of Yangon and Mandalay. These producers generate large quantities of effluents with a high organic load. During the degradation of these organic substances, significant quantities of GHG are emitted. During government inspections at various industrial zones in the region of Yangon, it was found that the discharge of wastewater from food processing industries and textile factories without prior treatment is a widespread practice. According to the YCDC, 207 out of 3,264 factories within Yangon's industrial zones release wastewater into the Hlaing and Pan Hlaing rivers with only 109 ensuring proper treatment. It was reported that more than 1.2 million gallons (equivalent to 4542 m<sup>3</sup>) of industrial wastewater passes by the urban settlements of Hlaing Township. The wastewater is reported to be dark and inky with a stark chemical smell and as a result of the air pollution the corrugated iron used in people's houses in the walls and roofs has caused severe damages and holes forcing them to exchange it every three years.

The situation of industrial wastewater pollution is similar in the region of Mandalay. The industrial wastewater treatment and disposal system put in place in Pyi Gyi Tagon consists of a stabilization pond with 400 acres (equivalent to 1.6 km<sup>2</sup>). However this system is highly inefficient and not utilized by the company owners, which was evidenced during an inspection visit with the effluent water from textile-dyeing factories and the factory workers' hostels being discharged into nearby waterways. As such, increased industrial wastewater pollution along

the Dokehtawaddy River bank by the Mandalay Industrial Zone is reported to cause diarrhea and skin diseases affecting the nearby urban settlements. Additionally, residents complain regarding the depletion of the fish populations as a result of the pollution as well as regarding a toxic odor from the discharged wastewater. This unsustainable situation has sparked widespread protests of up to 500 people demanding immediate action from the government if regional authorities continue to fail to ban these wastewater dumping sites.

These examples highlight the urgency for the project to introduce appropriate wastewater management policy tools as well as to demonstrate the positive environmental and socio-economic benefits of integrated low-emission wastewater technology systems at company and industrial park levels.

## **2b) Baseline projects;**

### **(i) Baseline policies:**

On a policy level, Myanmar has enforced a number of policy guidelines for the promotion of environmental conservation and water management in order to reduce air and water pollution across the country. Currently the government seeks to combine economic development with sustainable environmental conservation practices under the current Environmental Conservation Law (2012). According to this law, companies are required at point source of pollution to treat, emit, discharge and deposit pollutants in accordance with environmental quality standards. For that purpose companies need to install or use controlling equipment and contribute cash or in-kind to wastewater treatment facilities. Additionally, the government seeks to establish environmental and effluent standards with regards to water quality based on the existing regulations under the Myanmar Agenda 21 from 2002. However, until now city-level initiatives to mitigate GHG emissions have not been undertaken in Myanmar. Nationwide climate change mitigation remains a very recent priority with the ongoing Intended Nationally Determined Contribution (INDC) process representing the first policy level approach to mitigation, submitted to the UNFCCC in 2015.

As a result, under the current UNIDO pilot national RECP programme the Industry Association of Myanmar has raised concerns during the last steering committee meeting in January 2017 and expressed their interest in participating in a dedicated project focusing on industrial wastewater management targeting specifically industrial zones. The proposed project seeks to address such concerns and to strengthen national institutional capacity with regards to the sound management of wastewater through improved policies and mechanisms.

### **(ii) International organization initiatives:**

The project will draw on UNIDO's substantive experience with regards to the Transfer of Environmentally Sound Technologies (TEST) application in the region. In order to reduce the environmental footprint of Cambodian industries, while increasing their competitiveness, UNIDO previously implemented the TEST methodologies in Phnom Penh and Kandal provinces, from January 2011 to mid-2013. The project was developed in cooperation with the Ministry of Industry, Mines and Energy (MIME) of Cambodia and with the financial support of the Korea International Cooperation Agency (KOICA). During this initial project, a number of new management tools were introduced in selected enterprises, including Environmental Management Accounting (EMA), based on ISO 14051; Environmental Management System (EMS), based on the principles of ISO 14001; and Corporate Social Responsibility (CSR), based on the first steps of ISO 26000.

Additionally, UNIDO is currently implementing a pilot program for a national RECP program in Myanmar funded by the State Secretariat for Economic Affairs (SECO)/Government of Switzerland. The program aims at improving resource efficiency and environmental performance of enterprises, in particular SMEs, through the adaptation and adoption of internationally proven RECP methods and techniques. Specific outputs pertain to enable multi-stakeholder dialogues; technical capacity building for RECP service delivery; and pilot industry demonstrations. The pilot program will furthermore operate in two regions, respectively Yangon and Mandalay, to underpin the national relevance and scale of the pilot program.

Based on the success experienced under the pilot national RECP program, SECO has expressed interest of funding for a next phase with a focus on industrial zones. In this regard, the TEST methodology will provide a more comprehensive and holistic approach when approaching companies and industrial zone authorities as it is addressing key departments of a company through solution-oriented tools for the upgrading of processes and technologies. For further information on the TEST methodology, please refer to annex A.

UN-Habitat has already undergone extensive cooperation with Myanmar on climate change mitigation and technology transfer as well as its current implementation efforts of the Myanmar Climate Change Alliance Program (MCCA). MCCA is a EUR 4 million, 4 year program implemented by UN-Habitat and UNEP, funded by the European Union under the Global Climate Change Alliance window. MCCA is an important baseline to this project because it seeks to develop a guiding framework, in the form of a National Climate Change Strategy, and raises awareness among the general population including the private sector about measures to mitigate climate change. The project will be able to build on the three following result areas (i) raise awareness in society as a whole on the threat of climate change and potential ways for mitigation; (ii) build capacity of the government, including the development of a National Climate Change Strategy and sector action plans; and (iii) demonstrate measures that support climate change mitigation in the central dry-zone and the coastal/delta region.

The Japan Fund for Poverty Reduction (JFPR) is currently implementing a project in selected underserved areas of Yangon and Mandalay, which seeks to reduce environmental related diseases and provide access to basic services, such as water and sanitation facilities. Priority is given to safe and regular water supplies as well as the removal of solid and liquid waste in two selected townships in Yangon and Mandalay with 3,000 target households. Capacity building and awareness raising activities are also a key component of the JFPR's project. Specifically key local government institutions, such as YCDC and MCDC and other relevant township development committees that are responsible for the provision and maintenance of essential urban infrastructure and services are involved.

The Asian Development Bank is currently implementing a project with the objective to increase agricultural value added by improving irrigation and strengthening agricultural value chains in three regions of Myanmar's central dry zone (CDZ). It supports the modernization of irrigation systems in Magway district of the Magway region, Shwebo district of the Sagaing region, and Meiktila and Yamethin districts in the Mandalay region during a 7-year implementation period. The irrigation system rehabilitation and modernization component covers about 20,000 hectares (equivalent to 200 km<sup>2</sup>) and benefit around 24,000 households in addition to the agricultural sector.

The project will closely work together with these ongoing initiatives in strengthening capacity and demonstrating low-emission wastewater treatment technology in the industrial zones and companies in the Mandalay region.

*3) The proposed alternative scenario, with a brief description of expected outcomes and components of the project;*

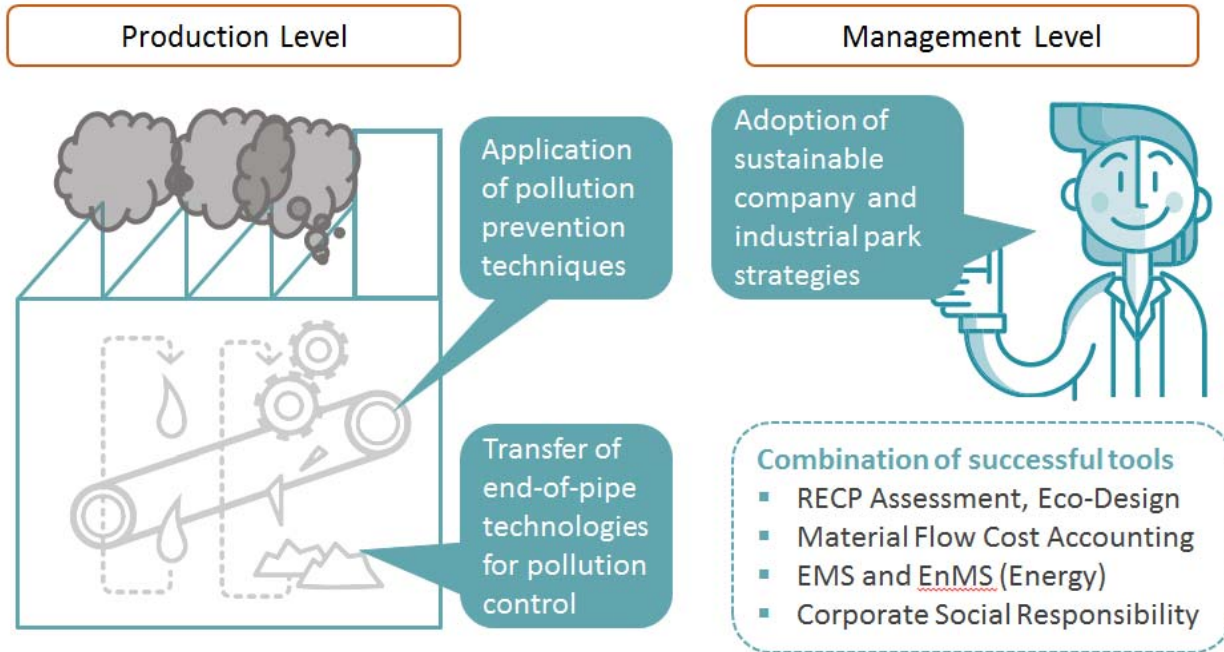
This PIF was conceptualized and put forward as a result of ongoing projects by UNIDO. It was realized that the unique expertise of the private sector, its capacity to innovate and produce new technologies and its financial leverage can form an important part of the multi-sectoral partnership that is required between governmental, private and non-governmental actors to mitigate climate change. In particular, the unaware issue concerning methane released from untreated wastewater in open ponds requires urgent attention. If properly quantified, the methane emission from open ponds around the country pushes the carbon dioxide emission per capita of the country to even higher level.

Over the last decade, UNIDO has developed and implemented TEST programs to address water pollution caused by productive activities. This integrated approach aims at initiating a cycle of continuous improvements in industries ensuring that the technology transfer is part of a company's strategy for increased resource efficiency, which consequently reduces GHG emissions. The introduction of TEST combines (i) extensive capacity building and (ii) pilot demonstrations in industrial parks and companies. Air emission and effluents discharges will be monitored throughout the project in order to assess the contribution to climate change. To achieve the project objective in contributing to Myanmar's efforts in mitigating climate change, the project will build on UNIDO's previous capacity building activities in Myanmar by introducing necessary policies, economic incentives and awareness raising initiatives to enable a self-sustaining environment encouraging low carbon industrial development centered in Mandalay and Yangon.

The UNIDO TEST approach is summarized in the below illustration:

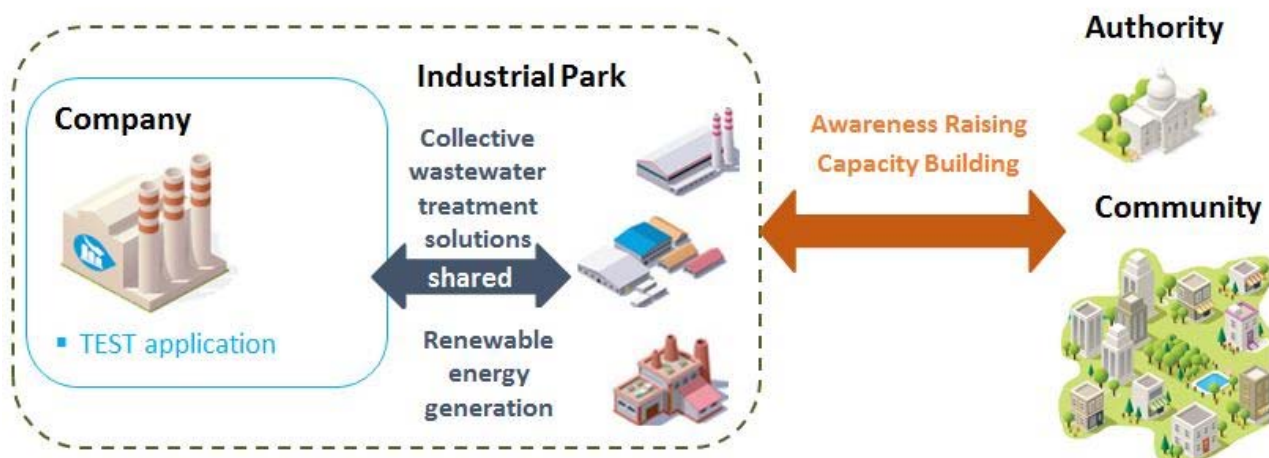


# UNIDO TEST Approach



Under the ongoing UNIDO RECP Pilot Programme funded by SECO, key project stakeholders and members of the project steering committee meeting endorsed such initiatives as valuable, timely, and appropriate for the country and recognized the need for capacity building and technical assistance in this regard. Key barriers were highlighted including, lacking availability of wastewater treatment facility and wastewater management in industrial zones; limited access to information, technologies and finance, and policy regulatory uncertainty. In this regard, governmental officials will benefit from the project through strengthened capacity to reduce industrial polluted discharges and GHG emissions through sound wastewater management. Additionally, the project will target industrial zone developers, industrial park authorities and company representatives when demonstrating technologies and practices in managing organic sludge in such a way that it has a positive impact on GHG emissions by generating biogas for electricity consumption. In return, the methane generated by the sludge and the electricity acquired through biogas can substitute the electricity that is being produced with fossil fuels reducing Myanmar's overall GHG emissions. The below scheme illustrates the targeted intervention areas under this project.

## Project Approach



During the PPG phase the industrial zones and companies to be targeted under this project in the area of Yangon and Mandalay will be identified. Potentially, Shwe Lin Pan Industrial Zone, the fourth largest industrial zone in greater Yangon, could be selected for the project's pilot demonstration. Shwe Lin Pan has been in operation since 2002 and is currently hosting 155 factories mainly producing food and beverages, textile and household goods. Some factories treat wastewater before discharge with very basic treatment facilities, however the majority release their effluents without any treatment. All wastewater is left for natural treatment in one stabilized pond and subsequently discharged into Hlaing River. In the area of Mandalay, the industrial zone Pyi Gyi Tagon could potentially be selected for the demonstration component of the project. It is comparable in size with Shwe Lin Pan and its main producing industries are also food processing companies. The wastewater treatment facility is similar also consisting of one stabilization pond with the majority of companies not yet connected to it.

The proposed technology will provide Myanmar with a sustainable wastewater treatment model and increase the competitiveness of its agriculturally related industries. To apply the above-mentioned methodologies and tools and to meet the project targets, the project's components and outputs are presented in more details hereafter.

**Component 1: Legal framework and national capacity improved as well as pilot demonstrations at company and industrial park levels implemented applying UNIDO's TEST integrated approach**

***Output 1.1.1: Wastewater regulatory framework reviewed, policy tools identified and introduced, and institutional capacity on sound wastewater management strengthened.***

Myanmar has already established a comprehensive legislative framework in particular under the before mentioned Environmental Conservation Law with Section 15 & Section 16, Rules 42 (a) and (b) focusing on wastewater management. Since the law was only passed in 2012, Myanmar particularly lacks an adequate monitoring system as well as regulatory framework. Additionally, the project seeks to streamline and strengthen other existing policies to ensure low carbon growth. Under the broad umbrella of resource efficiency, existing policies will be reviewed and complemented by components of (i) cleaner production as a tool to reduce raw material use, GHG emissions and pollution loaded effluent discharges, (ii) chemical management and pollution prevention, (iii) waste minimization through the reduction, reuse and recycling of raw material, energy and water, in line with the 3R principles (reduce, reuse and recycle). As such, this output seeks to strengthen institutional capacity of the Ministry of Natural Resource and Environment Conservation by reviewing the legal provisions and if necessary providing policy assistants in the area of wastewater regulation, as well as by identifying regulatory measures that can be developed. Subsequently, the project will engage with the Ministry of Construction and the Ministry of Industry to raise awareness on the national legal framework provisions and international good practice examples of sound wastewater management as well as develop and implement regulatory measures and tools that are needed.

In addition to wastewater and water management related policies, principles of differential pricing may have to be explored based on the economic context. Cost-recovery from users, especially in industrial zones, is an important mechanism for financing water resource management requirements. The recycle and reuse of water after its treatment process should hereby meet specific quality standards and could also be incentivized through a properly planned tariff system. Additionally, incentives to attract community and private sector participation in investment and provision in such infrastructures should be evaluated.

To achieve output 1.1.1, the following activities are planned:

- Activity 1.1.1.1 Assess current industrial legal, regulatory measures, urban planning processes and policy frameworks on water and wastewater management;
- Activity 1.1.1.2 Strengthen regulations on sound wastewater management and identify policy tools needed on a national and municipal level;
- Activity 1.1.1.3 Develop a proposed wastewater quality monitoring system, including on-site measures;
- Activity 1.1.1.4 Assess the scope and possibility of private sector participation in the construction and maintenance of water and wastewater infrastructure development;
- Activity 1.1.1.5 Analyze possible regulations to introduce user-pay and polluter-pay principles in terms of wastewater treatment; and,

Activity 1.1.1.6 Explore existing support mechanism and banking conditions for financial assistance for SMEs and industry to ensure access to investment opportunities.

During the PPG phase, a preliminary study on existing support mechanisms and banking conditions for SMEs, as well as the development of appropriate business models for shared wastewater treatment infrastructure will be conducted. The strengthening and/or development of policies and instruments will be done by international and national consultants in close collaboration with officials from the DRI – formerly Myanmar Science and Technology Research Development (MSTRD) and other relevant ministries.

***Output 1.1.2: Industrial parks and companies with TEST integrated approach assessed and pilot low-emission technologies demonstrated.***

Under this component, the innovative approaches promoted by the project will be demonstrated at pilot scale on (i) industrial park and (ii) company level. The Transfer of Environmentally Sound Technology (TEST) integrated approach will be implemented primarily in selected industrial parks and enterprises located in the areas of Mandalay and Yangon, assisting them to increase their environmental and economic performances. The technical and management improvements undertaken by these parks and companies will then be used as examples during the dissemination campaign, part of the awareness raising activities (component 3). During the PPG phase the most suitable industrial parks and companies for the project intervention will be identified via a quick assessment.

Company level intervention: This output will focus on means of saving water and learning to recognize wastewater as a potential resource of fresh water, energy and nutrients. Hence, the TEST approach combines management tools targeting the various levels of industries, from the production process to the accounting and quality departments and finally the strategic level. The combination of the management tools aims at initiating a cycle of continuous improvement where the top management of a company recognizes the importance of searching for resource efficiency and sustainable development, for the company benefit, but also for social and environmental benefits and realizing that these interests are not competing with each other. Industrial wastewater pre-treatment could be a further important contribution to reducing the strain on the centralized wastewater treatment facilities used in the industrial zone. Since the majority of companies do not treat their effluents before discharging them, the industrial pre-treatment technology would result in a direct improvement to the quality of water. Pilot technology demonstration only takes place once every effort is made to improve resource efficiency through targeted assessments and consequently reduce solid and liquid waste generation and GHG emissions. According to previous experience under the ongoing GEF funded UNIDO Eco-Industrial Park project in Vietnam (GEF ID 4766), the expected size of investment for industries with regards to the improvements needed in their sound wastewater management ranges between USD 100,000 and 1 Mio.

Industrial zone level intervention: On the industrial park level, the project will assess the existing central wastewater treatment infrastructure and carry out feasibility studies for the application of low-emission technology and the usage of the produced biogas for electricity purposes. Tentatively the project will seek to encourage infrastructure investments in the industrial park through targeted co-financing. Several different anaerobic technologies exist and the identification of the most effective technology depends on the organic loading rate and operating conditions. The following technologies could be assessed in particular: aerobic biological, physico-chemical and anaerobic biological treatment. The latter is a particular energy efficient method for the treatment of industrial wastewater characterized by low energy use, a small reactor surface area, lower chemical usage and reduced sludge handling costs especially when compared to aerobic alternatives. The technology that could be applied for the pilot demonstration is a **closed-type anaerobic reactor**, which was already successfully introduced in other food and agricultural processing industries, such as in Thailand. It treats wastewater whereby the methane produces biogas in return that can be used for heat and electricity purposes by companies located in the industrial park, replacing costly and environmentally unfriendly fossil fuels and responding to the problem of electricity shortages in industrial zones. In addition, the technology reduces foul odors and is small in size, requiring only an installation area of one fifth of the size of the currently used open pond systems. The treated water is usable for irrigation as no chemicals are added during the process, which becomes an increasing viable solution with regards to intensification of droughts in Myanmar.

The activities are as follows:

- Activity 1.1.2.1 Implement TEST tools at selected companies targeting tentatively 50, including Cleaner Production Assessment or Quick-Scan, Environmental Management Accounting and Corporate Social Responsibility;
- Activity 1.1.2.2 Develop a common wastewater treatment plan based on the identified technology to treat wastewater coming from industrial zones;
- Activity 1.1.2.3 Design and implement a sustainable park management model for sound wastewater management and methane for energy use; and,
- Activity 1.1.2.4 Develop specific assessments and master plans for the improvement or establishment of centralized wastewater plants. Hereby, city planning, demonstration companies and selected industrial zones will be involved in the process in order to potentially combine the domestic and industrial wastewater discharges in one combined treatment plant.

***Output 1.1.3: National capacity strengthened on low-cost industry wastewater treatment and methane recovery power generation technology through TEST training delivery.***

It is recognized that infrastructure for industrial zones cannot fully function without a citywide connection as a source, such as in the case of the point for final discharge and drainage of flood water. This output will engage the University of Yangon, more specifically the Department of Industrial Chemistry and the hosted RECP Office to build the required capacity. This will allow that all training material and international good practice examples, which will be collected and presented, are available at the University of Yangon (as well as potentially additional local academic institutes upon interest) and can be further utilized beyond the project's completion.

Particularly the training on Environmental Management Accounting, Environmental Management System and Corporate Social Responsibility will be based on theoretical in-class room training sessions as well as consist of demonstration sessions in selected companies. This will allow the participants to apply their learned theoretical knowledge and further strengthen their capacity to implement such systems within their companies or in the park management.

The activities are as follows:

- Activity 1.1.3.1 Prepare capacity building material based on the capacity gap analysis carried out under the PPG phase;
- Activity 1.1.3.2 Deliver general training on the TEST integrated approach as well as low-cost industry wastewater treatment and methane recovery power generation technology;
- Activity 1.1.3.3 Conduct trainings on Environmental Management Accounting (EMA), Environmental Management System (EMS) and Corporate Social Responsibility (CSR); and,
- Activity 1.1.3.4 Conduct training on Planning for climate change for government officials from YCDC and MCDC
- Activity 1.1.3.5 Carry out capacity building activities for local government to better tackle issues connected with proper wastewater treatment, including water supply and sanitation.
- Activity 1.1.3.6 Deliver a train-the-trainer programme to the University of Yangon and the RECP Office to strengthen their capacity and ensure sustainability beyond project completion.

***Output 1.1.4: Awareness programs on sound wastewater management developed and implemented.***

This output is designed to tackle the lack of knowledge on water pollution and resource efficiency by organizing large scale advocacy and awareness raising campaigns. As a result of the identified barriers in terms of lacking awareness of key stakeholder groups, the understanding of wastewater management needs to be increased in order to enable stakeholder to incorporate wastewater management into city planning and industrial processes. This output will closely engage with the University of Yangon as well as the Myanmar Industry Association and other key stakeholders that are identified during the PPG phase.

The activities planned under this component are:

Activity 1.1.4.1 Conduct awareness raising activities for industries, urban households and policy makers, to improve their understanding of wastewater management and the consequences of water pollution;

Activity 1.1.4.2 Lessons learned and best practices will be disseminated through events, publications and outreach/educational materials; and,

Activity 1.1.4.3 Develop training material on the integrated TEST approach more broadly and sound wastewater management more specifically to be used in universities and technical schools for vocational training.

## **Component 2: Monitoring and Evaluation**

### ***Output 2.1: M&E mechanism developed and applied.***

To ensure effective monitoring and evaluation, the project will include periodic progress reports on the impact status for each of the components of the project. The semi-annual and annual reports will be technical focusing on each of the project themes, which will serve as a base for the mid-term and final evaluations.

#### ***4) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing;***

Industries and SMEs in Myanmar are aware of the negative impact of polluted discharges and GHG emissions on the environment and are ready to invest in low carbon technologies with especially the government convinced of the importance of low carbon industrial development. However, the country lacks technical capacity and knowledge as well as institutional and policy framework to prevent industrial pollution. The proposed project will have a catalytic effect in Myanmar in providing the legal and institutional frameworks to support country wide investments in technology upgrades. It will also further demonstrate the economic viability of investing in the greening of Myanmar industries.

Likewise, City Development Corporations in Yangon and Mandalay are aware of the challenge of untreated wastewater from industrial areas, but lack the capacity to incorporate solutions that address them into their city development planning process, and are constrained by financial and technological limitations. The combined approach that the project takes of technology transfer, implementation and a focus on planning (including capacity to plan) will enable City Development Corporations to effectively plan for implementing wastewater treatment in other industrial areas in the future.

During the PPG phase it is planned to conduct information sessions with the participation of private sector, potential donors and international finance institutes to generate co-financing. In particular, under the current MoU between UNIDO and the World Bank Group, further cooperation with regards to infrastructure investments in the targeted industrial zones in Myanmar will be explored.

#### ***5) Global environmental benefits (GEFTF), and adaptation benefits (LDCF/SCCF)***

The project will deliver global environmental benefits by supporting Myanmar in the transition towards a sustainable and low-carbon development path. The project will contribute to reduce polluted discharges and GHG emissions from industries by facilitating the transfer of environmentally sound technologies. By increasing resource efficiency (raw material, energy and water), Myanmar industries will generate less waste and, as a direct consequence, fewer pollutants will be released into the atmosphere and discharged in sensitive environmental areas. Other indirect impacts can also be accounted for as a result of the TEST integrated approach, such as reduced pollution to surface water bodies as well as decreased releases of hazardous substances.

**GHG emissions avoided:** The below presented data on the direct and indirect emission reductions will be further confirmed and finalized during the PPG phase. The project will have a dual contribution to CO<sub>2</sub> emission reduction estimated at 140,000 metric tons. Direct CO<sub>2</sub> reduction is achieved through increased resource efficiency and wastewater treatment in industries. Indirect CO<sub>2</sub> reduction will be accomplished via the use of the organic matter captured by the wastewater treatment for the production of biogas. This will in return reduce the overall consumption of fossil fuels and the unsustainable extraction of wood for the generation of energy. More specifically, the treatment plant in Yangon could be equipped with an installation of a gas-collecting system leading to emissions reduction as

the gas can be utilized in a gas engine and the electricity can be supplied to the grid. With reference to the same flow/power ratio from a registered Chinese CDM project, the emissions reduction would then be (according to the Emission Reduction Profile Myanmar 2013) 53,000 MWh/year $16*0.2623$  tCO<sub>2</sub> emissions/year = 14,000 tCO<sub>2</sub>/year. Over a 10-year economic lifetime, the total direct GHG emission reduction is estimated at 140,000 tons CO<sub>2</sub>. To estimate the associated indirect emission reduction, a conservative estimate for a replication factor of 1.5 can be used on the demonstration projects, which will result in deployment of 75 TEST projects with the cumulative amount of emission reductions achieved at 210,000 tCO<sub>2</sub>eq over the project and post-project duration. Using the GEF top-down methodology with level 2 and 40 per cent as a causality factor, indirect emission reductions attributable to the project are estimated at 56,000 tCO<sub>2</sub>eq. The range of indirect CO<sub>2</sub> emission reductions is therefore 56,000 to 210,000 tCO<sub>2</sub>eq. See attached the calculation sheet in annex C.

Data for the total of CH<sub>4</sub> emissions from the disposal of solid waste as well as domestic and commercial wastewater are described in the table below (INC 2012). The trend of the estimated methane emissions is increasing due to an influx of population living in urban areas and intensified production processes as part of Myanmar's economic growth.

**Table 3.20 Estimation of CH<sub>4</sub> emission for waste sector**

Year	From SWDs	From Domestic & Commercial waste-water	From Sludge	Total Emissions
2000	133.31 Gg	1.198 Gg	0.059 Gg	134.57 Gg
2001	136.05 Gg	1.222 Gg	0.060 Gg	137.206 Gg
2002	138.01 Gg	1.240 Gg	0.061 Gg	139.311 Gg
2003	141.59 Gg	1.272 Gg	0.063 Gg	142.925 Gg
2004	144.396 Gg	1.297 Gg	0.064 Gg	145.757 Gg
2005	147.32 Gg	1.320 Gg	0.065 Gg	148.70 Gg
2010	157.32 Gg	1.420 Gg	0.070 Gg	159.44 Gg
2015	172.690 Gg	1.550 Gg	0.076 Gg	174.30 Gg
2020	188.650 Gg	1.700 Gg	0.083 Gg	190.40 Gg

(source: INC, 2012)

*6) Innovativeness, sustainability and potential for scaling up.*

This project is innovative as it applies a holistic approach when targeting effluents from industrial zones, which contribute to the common problem of GHG emissions release. At the city level, the proposed project represents the first large-scale approach to climate mitigation in Myanmar. As such the project will work with city authorities, the Ministry of construction (MoC) and the Ministry of Environmental Conservation and Forestry (MoECaF), to tackle such issues through enhanced urban planning that incorporates improved wastewater treatment, technology transfer and private sector engagement. On a company and industrial zone levels, the proposed project will apply UNIDO's amended TEST approach that is compatible for SMEs. Thus, the innovative adaption of the TEST tools, which were initially designed for large and medium-sized companies, allows enough flexibility for effectively implementing cleaner production and low carbon growth principles among SMEs.

The continuous improvement approach to be initiated by the introduction of the TEST methodology will ensure the sustainability of the project beyond its completion hereby two underlying mechanisms will be applied. Firstly, the project will build national expertise and know-how on the application of the integrated TEST approach and more specifically on water pollution and wastewater treatment. In parallel, sustainability will be achieved by the strengthening of the regulatory framework, urban planning and enacted policies with regard to water resource and particularly wastewater treatment management as well as policies related to low carbon growth. Through the creation of institutional capacities and an appropriate monitoring system resource efficient industrial development will be incentivized. Additionally, the project seeks to develop and strengthen interaction among government and city planning agencies, the private sector as well as research institutions. Hereby it is important to facilitate partnerships that encourage investment and technology transfer and the diffusion of technical know-how and expertise to ensure



replication. As such, capacity building and training is a core component in this project seeking to provide extensive technical assistance that is targeted at government and city officials as well as staff of the participating companies. In this regard, the lead governmental agencies will ensure sustainability through replication and scaling up beyond the end of the project. Secondly, at the business level the project seeks to develop the demand side by communicating the successful results achieved by the pilot industrial sites. This will be facilitated through a strengthened regulatory monitoring framework and the evaluation and potential development of suitable cost-recovery tariff schemes.

There is substantial potential for scaling-up since Myanmar currently has 24 industrial zones with almost 3,500 individual factories. In Yangon alone, 78 factories are not meeting YCDC mandated standards for wastewater treatment. Meanwhile, Myanmar’s urban areas are growing around 2.5% per year, and GDP economic growth will largely continue to grow at least 4% per year. With industry powering this growth, it means that industrial areas, numbers of factories and wastewater generated will all continue to increase, creating ample opportunity for the scaling-up.

2. **Stakeholders.** Will project design include the participation of relevant stakeholders from [civil society organizations](#) (yes  /no ) and [indigenous peoples](#) (yes  /no )? If yes, identify key stakeholders and briefly describe how they will be engaged in project preparation.

### Project execution arrangement

The project execution arrangement shall be done through contracting arrangements of institutions. A suitable national institution will be jointly selected and contracted via subcontract to host the project management unit (PMU) in Yangon. The function of the PMU is to manage and coordinate day-to-day activities and operations as well as to report regularly to UNIDO on all project activities. The contract will be based on a defined scope allowing the PMU a high degree of control as well as suitable resources and capacity to coordinate the project and mitigate any risks.

In addition and in order to maximize national ownership, technical officers from DUHD will be involved to the greatest possible extent. They will be first trained by international specialists and will then work closely with them and under their guidance in carrying out the different project activities.

As the GEF Implementing Agency, UNIDO will lead the process of project preparation and development with the participation of key stakeholders from the Government and the private sector. The project execution will be undertaken through multiple contractual arrangements between UNIDO and national governmental entities, and industry associations. Upon request of the Government, UNIDO will also provide targeted technical assistance, which will be further discussed with national stakeholders during the PPG phase and elaborated in detail in the CEO Endorsement document.

No.	Stakeholder	Envisaged Role in the Project
1	Department of Urban and Human Development (DUHD) under the Ministry of Construction (MOC)	DUHD will act as the chair of the project steering committee. DUHD develops and manages industrial zones around the country and develops industrial zones regulations including air and water pollution control, sanitation systems, solid waste disposal, and infrastructure. The DUHD will be heavily involved during the activities related to wastewater technology demonstration for industrial zones, the policy and regulatory framework components. The DUHD will reach out to industries in the industrial zones to engage them in the project.
2	Environment Conservation Department (ECD), Ministry of Natural Resources and Environment Conservation	ECD within Ministry of Natural Resources and Environmental conservation is a focal point of environmental conservation in Myanmar. ECD develops regulations such as waste water treatment in industries, solid waste disposal and systematic waste disposal in industrial zones. One of its mandates is to raise the awareness on hazard of industrial waste disposal in the industrial zones in Myanmar. The director general of ECD is the GEF National Operational Focal Point in Myanmar and will be included as a member of the project steering committee.

3	University of Yangon, RECP Office and Department of Industrial Chemistry	The Department of Industrial Chemistry at University of Yangon leads research related to applied science. Findings are incorporated in regional and local development, particularly among Small and Medium Enterprises (SMEs). The RECP office is hosted in the Department of Industrial Chemistry providing training and coaching on the application of RECP as well as offering RECP assessments and improvement options in companies.
4	Directorate of Industrial Supervision and Inspection (DISI), Ministry of Industry	DISI is tasked with inspecting production and process of industrial sectors in Myanmar whether environmental regulations are being met. DISI is mandated in handling industrial waste together concerned government agencies and industries.
5	Department of Research and Innovation-DRI, Ministry of Education (formerly Myanmar Science and Technology Research Development (MSTRD) under the Ministry of Science and Technology)	As the government entity in charge of monitoring and controlling the quality of surface water bodies, the DRI will be the recipient center of knowledge related to wastewater technology. The DRI involvement in capacity building and awareness raising efforts will ensure future replication and technology uptake in Myanmar after project completion.
6	Yangon City Development Council (YCDC)	YCDC will be a member of the project steering committee and will connect the project with industries as well as respective communities and urban settlements located in Greater Yangon. YCDC will ensure that the project is in line with the Yangon city development plan.
7	Mandalay City Development Council (MCDC)	MCDC will be a member of the project steering committee and will connect the project with industries and IZs as well as respective communities and urban settlements located in the region of Mandalay. Furthermore, MCDC will ensure that the project complements the Mandalay city development plan.
8	Participating industries	<p>The private sector will be a direct beneficiary of the project of the project. Participating and targeted industries will be encouraged to provide input during the PPG phase regarding their experiences, needs and concerns to be addressed.</p> <p>Depending on their production processes as well as technical and financial feasibilities participating industries will invest in proper wastewater management and the necessary treatment technologies.</p>
9	Myanmar Women Entrepreneur's Association	The Association will be a member of the steering committee and will facilitate gender mainstreaming in the project. It will provide inputs during the preparation of the gender assessment during the Project Preparation phase, and also participate in the awareness raising events and ensure the participation of women entrepreneurs.
10	Myanmar Industry Association (MIA)	MIA will participate in the project's outreach activities to involve other industries. This will be particularly important for the capacity building and awareness raising outputs and the dissemination of information to other members.
11	Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI)	UMFCCI plays a crucial role in coordinating with business and government sectors. It is also an important network to represent business interests and the views of the private sector to the government. Additionally, to the dissemination of market information, the UMFCCI could be an important partner in consultations and dialogue rounds with the private sector.



3. *Gender Equality and Women's Empowerment.* Are issues on [gender equality](#) and women's empowerment taken into account? (yes /no ). If yes, briefly describe how it will be mainstreamed into project preparation (e.g. gender analysis), taking into account the differences, needs, roles and priorities of women and men.

UNIDO recognizes that gender equality and the empowerment of women have a significant positive impact on sustained economic growth and inclusive industrial development, key drivers of poverty alleviation and social progress. Gender mainstreaming will be based on GEF's Policy on Gender Mainstreaming and UNIDO's (i) Policy on Gender Equality and the Empowerment of Women (2009) as well as (ii) the Guide on Gender Mainstreaming Environmental Management Projects, an operational guide to support gender mainstreaming in environmental initiatives.

Additionally, to meet UNIDO's guidelines on gender equality, local level decision making under this project will be aligned more in women's favor by, for example, ensuring that any committees formed (either at community or government level) will have at least 30 per cent representation from women, and that any consultation specifically involves women, enabling their voices to be heard. Additionally, female candidates will be encouraged to apply during recruitment process and given preference, when presenting professional qualifications similar to those of men. Throughout the project management and execution, staff will also be trained and made aware of relevant gender sensitive issues. This addresses the tendency for technology transfer projects to be male-driven and more aligned with men's needs.

The project's capacity building and awareness raising activities will further strengthen and encourage female engineers, planners and managers at YCDC and MCDC, envisioned to achieve 50 per cent in the relevant departments, to recognize their mandate in extending essential wastewater treatment services to IZs. In order to define the appropriate ratio, this will be verified by a gender expert during the PPG phase. As such, special attention will be paid to gender equality when evaluating and inviting members to participate at the Project Steering Group or to attend trainings and awareness workshops. The time and location of these events will be adjusted according to the needs and cultural traditions of gender groups. The training materials will be adapted to the audience and gender sensitized, taking into account local specificities.

A gender assessment will be conducted during the PPG phase to further define the actions needed to mainstream gender issues into the project's execution.

4 *Risks.* Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable).

No	Risk	Rating	Mitigation
1	<b>Technical risk:</b> lack of awareness about technical opportunities for adopting sound environmental technologies	Low-medium	The project will encourage a participatory approach and provide the adequate information and training on planning and implementation of sound environmental technologies. International and local experts will work closely with the project management unit and relevant stakeholders.
2	<b>Socio-economic risk:</b> reluctance of the industrial owners to change to a climate resilient development, considering it as a burden instead of an opportunity.	Low-medium	Through awareness raising and capacity building initiatives, the project will demonstrate the benefits of the application of sound environmental technologies.
3	<b>Institutional risk:</b> lack of coordination between the key ministries, industries and other stakeholders. Slow response of some key actors may hinder the project implementation.	Medium	The Steering Committee will establish the institutional linkages among the stakeholders, and the Project Management Unit (PMU) will consult with executing partners and major stakeholders to ensure their involvement and ownership of the project. All stakeholders are committed to and understand the project's objective. UNIDO has a broad experience in

			implementing similar projects which may help to overcome possible problems with the project planning and implementation.
4	<b>Regulatory risk:</b> the proposed regulatory framework is not adopted and enforced.	Low-medium	The project will engage decision makers early on the project preparation and implementation.
5	<b>Climate risk:</b> natural disasters in the form of floods or severe droughts may interrupt the project's progress particularly during the rainy season.	Low-medium	Industries present in zones potentially exposed to flooding or natural hazards will not be selected for the technology pilot demonstration component.
6	<b>Political risk:</b> despite significant political progress, internal tensions remain.	Low-medium	The project will engage decision makers as well as civil society organizations early on during the project preparation phase as well as involving them during project implementation.

5. *Coordination.* Outline the coordination with other relevant GEF-financed and other initiatives.

The proposed project will closely liaise with other GEF initiated projects under GEF-TF and other related initiatives through coordination mechanisms that will be established during the PPG phase to ensure that there is no duplication and that all related projects can benefit from exchange of experience and best practices. Synergies and complementarities will be created with the ongoing projects developed by UNIDO, “Green Industry for Low Carbon Growth in Cambodia, Lao People’s Democratic Republic and Myanmar”, “Pilot National Resource Efficient and Cleaner Production (RECP) in Myanmar” and “Improvement of Industrial Energy Efficiency”. The current UNIDO energy efficiency project will be of particular relevance seeking to promote sustained GHG emission reduction among Myanmar industry by: improving policy and regulatory frameworks; institutional capacity building for industrial energy efficiency (IEE); implementation of energy management system based on ISO 50001; and optimization of energy systems in industry.

The results of the project will contribute indirectly to the success of the initiative developed by Food and Agriculture Organization (FAO), “Fish Adapt: Strengthening the Adaptive Capacity and Resilience of Fisheries and Aquaculture-dependent Livelihoods in Myanmar”.

6. *Consistency with National Priorities.* Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? (yes  /no  ). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

This project is highly consistent with the commitments of Myanmar as a non-Annex I member of the United Nations Framework Convention on Climate Change (UNFCCC) and it reflects national priorities that are expressed in Myanmar’s policies and measures for industrial processes and environment to address climate change as stipulated in the INDC (2015) under section 2.1. and 2.2. The proposed project is synergetic and complementary to the activities undertaken by the country to implement the UNFCCC. As such, the projects provides capacity-building, technology development through active participation of the national private sector. As a result of the project activities, institutional capacity and knowledge will be strengthened to assist Myanmar in achieving climate resilient, low-carbon and resource efficient industrial development. In this regard technical knowledge and good practice examples will be fostered and institutionalized in the area of sound wastewater treatment practices mitigating the emission of GHG, as well as generating access to renewable energy (i.e. biomass).

Additionally, as per Myanmar's Initial National Communication (INC) (2012), a large segment of the industrial community in Myanmar is not aware of industry related environmental problems and many factories are still using old machines and obsolete technologies. The INC also indicates that wastewater treatment and systematic waste disposal systems are lacking in most industrial zones. The publication gives recommendations that are in line with the project proposal as follows:

i) toxic and hazardous wastewater from industries should be treated properly to avoid environmental pollution; ii) industrial zones should introduce GHG emission reduction measures, such as installation of individual or central wastewater treatment system, iii) industries should improve access to updated environmentally sound technologies information to help the industries identify the technologies most suited to them; iv) awareness raising campaigns on environmentally sound technologies should be increasingly conducted for industries in both public and private sectors; v) industries should set high environmental standards and energy efficiency; and vi) information on pollution concerns resulting from gaseous wastes, wastewater and solid wastes are to be made available through regular monitoring.

As part of the national strategy to mitigate climate change, the National Environment Policy of Myanmar was created in 1994 to establish sound environmental policies in the utilization of water, land, forests, minerals, marine resources and other natural resources for conserving the environment and preventing its degradation. According to the objectives of an environmentally sound management of toxic chemical and hazardous wastes expressed in the Myanmar Agenda 21, pollution control and cleaning rules have been drawn up by the Yangon City Development Committee for the enactment of a hazardous waste law. In these rules, 10 sections are pointed out in chapter 5 for environmental management and 15 sections are directed at prohibitions on improper disposal of waste and other manners which cause damages to public health and the environment.

*7. Knowledge Management.* Outline the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

Knowledge management is inherent to UNIDO's operating modality by sharing experiences across its interventions worldwide. This has been demonstrated through many publications, events, webinars, and more. Moreover, a dedicated Knowledge Management Plan will be designed during the inception phase and implemented under the proposed project, which will function as the basis for gathering and distributing all data, information and lessons learned. The plan will also include the development of a knowledge management system; the final format shall be decided taking into consideration the nature of the information gathered, but could constitute a website, social media and associated platform with information accessible by the public as well as direct stakeholders. There will be a strong emphasis on communication from project start to ensure involvement of all project stakeholders. UN-Habitat will leverage its position in Myanmar to ensure that gains from the project are shared through, for example, the web-portal that is being established by MCCA.

Additionally, the project will benefit from the experience and lessons learned from UNIDO's SWITCH-Med project, a green industry initiative addressing land-based sources of pollution within priority industrial hot spots of the Mediterranean Strategic Action Plan via the TEST integrated approach. This project can specifically learn from the market uptake and up-scale of TEST in the Mediterranean Region through so-called MedPartnerships to ensure replication and sustainability. As such, results will be documented according to the various needs of the relevant stakeholders. A particular useful awareness raising component hereby is the development of communication material, such as 2-page factsheets presenting success stories of beneficiaries such as communities in urban areas as well as companies in the targeted industrial zones. Additionally, a wider dissemination of the project's results to other non-beneficiary and companies is planned.



**PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)**

**A. RECORD OF ENDORSEMENT<sup>9</sup> OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):**  
 (Please attach the [Operational Focal Point endorsement letter](#)(s) with this template. For SGP, use this [SGP OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Mr. Hla Maung Thein	GEF National Operational Focal Point/Director General Environmental Conservation Department	Ministry of Natural Resources and Environmental Conservation	04/06/2017

**B. GEF AGENCY(IES) CERTIFICATION**

<b>This request has been prepared in accordance with GEF policies<sup>10</sup> and procedures and meets the GEF criteria for project identification and preparation under GEF-6.</b>
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Agency Coordinator, Agency name	Signature	Date (MM/dd/yyyy)	Project Contact Person	Telephone	Email
Mr. Philippe R. Scholtès, Managing Director, Programme Development and Technical Cooperation (PTC), UNIDO GEF Focal Point		07/04/2017	Jérôme Stucki, Industrial Development Officer, Department of Environment 	+431 26026 3559	j.stucki@unido.org

**C. ADDITIONAL GEF PROJECT AGENCY CERTIFICATION (APPLICABLE ONLY TO NEWLY ACCREDITED GEF PROJECT AGENCIES)**

For newly accredited GEF Project Agencies, please download and fill up the required [GEF Project Agency Certification of Ceiling Information Template](#) to be attached as an annex to the PIF.

<sup>9</sup> For regional and/or global projects in which participating countries are identified, OFP endorsement letters from these countries are required even though there may not be a STAR allocation associated with the project.

<sup>10</sup> GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, SCCF and CBIT