



Project Identification Form (PIF) entry ? Medium Sized Project ? GEF - 7

## Accelerating low-carbon circular economy through cleantech innovation towards sustainable development in Pakistan

### Part I: Project Information

**GEF ID**

10885

**Project Type**

MSP

**Type of Trust Fund**

GET

**CBIT/NGI**

CBIT No

NGI No

**Project Title**

Accelerating low-carbon circular economy through cleantech innovation towards sustainable development in Pakistan

**Countries**

Pakistan

**Agency(ies)**

UNIDO

**Other Executing Partner(s)**

Ministry of Climate Change (MoCC)

**Executing Partner Type**

Government

**GEF Focal Area**

Climate Change

**Taxonomy**

Knowledge Exchange, Capacity, Knowledge and Research, Focal Areas, Climate Change, Climate Change Mitigation, Technology Transfer, Renewable Energy, Sustainable Urban Systems and Transport, Financing, Energy Efficiency, United Nations Framework Convention on Climate Change, Paris Agreement, Nationally Determined Contribution, Chemicals and Waste, Waste Management, Sustainable Development Goals,

Influencing models, Demonstrate innovative approach, Deploy innovative financial instruments, Convene multi-stakeholder alliances, Stakeholders, Local Communities, Civil Society, Academia, Communications, Public Campaigns, Education, Awareness Raising, Behavior change, Type of Engagement, Participation, Partnership, Consultation, Information Dissemination, Beneficiaries, Private Sector, Individuals/Entrepreneurs, Capital providers, Financial intermediaries and market facilitators, SMEs, Large corporations, Gender Equality, Gender Mainstreaming, Gender-sensitive indicators, Women groups, Sex-disaggregated indicators, Gender results areas, Participation and leadership, Knowledge Generation and Exchange, Access and control over natural resources, Capacity Development, Learning, Indicators to measure change, Theory of change, North-South, Knowledge Generation, Innovation

**Sector**

**Rio Markers**

**Climate Change Mitigation**

Climate Change Mitigation 2

**Climate Change Adaptation**

Climate Change Adaptation 0

**Duration**

48 In Months

**Agency Fee(\$)**

168,766.00

**Submission Date**

9/23/2021

**A. Indicative Focal/Non-Focal Area Elements**

<b>Programming Directions</b>	<b>Trust Fund</b>	<b>GEF Amount(\$)</b>	<b>Co-Fin Amount(\$)</b>
CCM-1-4	GET	1,776,484.00	10,012,960.00
<b>Total Project Cost (\$)</b>		<b>1,776,484.00</b>	<b>10,012,960.00</b>

## **B. Indicative Project description summary**

### **Project Objective**

Promote high-impact clean technology innovation for scale up climate action and creation of green jobs in Pakistan, integrating renewable energy, energy efficiencies, and waste management within the context of material, energy and resources sustainability and circularity.

<b>Project Component</b>	<b>Financing Type</b>	<b>Project Outcomes</b>	<b>Project Outputs</b>	<b>Trust Fund</b>	<b>GEF Amount(\$)</b>	<b>Co-Fin Amount(\$)</b>
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Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
1. Transforming early-stage innovative cleantech solutions into scalable enterprises	Technical Assistance	1.1 Early-stage cleantech innovations are accelerated	<p>1.1.1 The Cleantech accelerator operational guidelines including GCIP methodologies, guidelines, tools and training systems are developed and adopted in alignment with Clean Green Pakistan Index (CGPI)</p> <p>1.1.2 Pool of cleantech innovation and entrepreneurship experts (trainers, mentors, and judges) is trained through regional training programs in cooperation with local universities and institutions</p> <p>1.1.3 Three cycles of the annual competition-based accelerator are conducted in alignment with the national initiative of Clean Green Pakistan Movement? (at least 85 enterprises)</p>	GET	260,000.00	1,300,000.00

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
1. Transforming early-stage innovative cleantech solutions into scalable enterprises	Technical Assistance	1.2 Start-ups and SMEs are supported through advanced and gender-responsive business growth	<p>1.2.1 Advanced technical, business advisory and commercialization support for the selected start-ups and SMEs provided (for at least 12 startups and SMEs)</p> <p>1.2.2 Enterprises are connected to financing opportunities and provided with tipping-point investment facilitation support and/or finances for piloting (for at least 4 of the selected 12 startups and SMEs)</p>	GET	400,000.00	2,000,000.00
1. Transforming early-stage innovative cleantech solutions into scalable enterprises	Investment	1.2 Start-ups and SMEs are supported through advanced and gender-responsive business growth	1.2.3 Investment is mobilized to implement at least one project in each of the four city municipalities performing under CGPI (in total at least four projects)	GET	280,000.00	2,000,000.00

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
2. Cleantech innovation and entrepreneurship ecosystem(CIEE) strengthening and connectivity enhanced	Technical Assistance	2.1 The CIEE in Pakistan is strengthened and interconnected	<p>2.1.1 National and regional institutions structural and operational capacities are strengthened considering social and gender dimensions so as to promote GEEW</p> <p>2.1.2 Policy and regulatory recommendations to enhance the clean technology innovation and entrepreneurship ecosystem are developed at local level under consideration of gender equality</p> <p>2.1.3 Linkages, collaboration, and synergies across CIEEs are promoted</p>	GET	500,000.00	2,940,000.00

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
2. Cleantech innovation and entrepreneurship ecosystem(CIEE) strengthening and connectivity enhanced	Technical Assistance	2.2 Gender equality is supported and strengthened by the CIEE in Pakistan	<p>2.2.1 Women's cleantech hub/network established to support and accelerate the formation of local innovation ecosystems in a more inclusive manner</p> <p>2.2.2 Mentoring programme for women implemented</p> <p>2.2.3 Campaign conducted to raise awareness on roles of women in CIEE</p>	GET	74,986.00	350,000.00



Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Programme coordination and coherence	Technical Assistance	3.1 Efficiency and sustainability of the CIEE in Pakistan is ensured through programme coordination and coherence with other GCIP country projects	<p>3.1.1 The internal guidelines for project management teams are adapted for Pakistan's country context and implemented</p> <p>3.1.2 Programme-level knowledge management, communication and advocacy strategy is adapted for Pakistan's country context and implemented</p> <p>3.1.3 The web platform is operated for the project to maintain the cleantech community</p>	GET	40,000.00	210,000.00

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
3. Programme coordination and coherence	Technical Assistance	3.2 Impacts and progress of all the project activities and indicators are adequately monitored and reported	<p>3.2.1 National impact monitoring established in coordination with MoCC</p> <p>3.2.2 Project effectively monitored including monitoring and reporting on the ESMP and risks</p> <p>3.2.3 Gender mainstreaming action plan operationalized, monitored and gendered impact evaluated</p> <p>3.2.4 External mid-term review and independent terminal evaluation conducted</p>	GET	60,000.00	302,694.00
				<b>Sub Total (\$)</b>	<b>1,614,986.00</b>	<b>9,102,694.00</b>
<b>Project Management Cost (PMC)</b>						
			GET	161,498.00	910,266.00	
<b>Sub Total(\$)</b>			<b>161,498.00</b>		<b>910,266.00</b>	

**Project Management Cost (PMC)**

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**Total Project Cost(\$)**

**1,776,484.00**

**10,012,960.00**

**Please provide justification**

**C. Indicative sources of Co-financing for the Project by name and by type**

<b>Sources of Co-financing</b>	<b>Name of Co-financier</b>	<b>Type of Co-financing</b>	<b>Investment Mobilized</b>	<b>Amount(\$)</b>
Recipient Country Government	National Productivity Organization (NPO)	In-kind	Recurrent expenditures	350,000.00
Recipient Country Government	Pakistan Institute of Management (PIM)	In-kind	Recurrent expenditures	1,000,000.00
Recipient Country Government	IGNITE-Technology Development Fund	Grant	Investment mobilized	1,000,000.00
Recipient Country Government	Higher Education Commission	In-kind	Recurrent expenditures	1,000,000.00
Recipient Country Government	AEDB, Ministry of Climate Change (MoCC)	In-kind	Recurrent expenditures	500,000.00
Private Sector	Laraib Energy (Pvt.)Ltd.	Grant	Investment mobilized	1,000,000.00
GEF Agency	UNIDO	Grant	Investment mobilized	50,000.00
GEF Agency	UNIDO	In-kind	Recurrent expenditures	100,000.00
Recipient Country Government	Rawalpindi Chamber of Commerce & Industry (RCCI)	In-kind	Recurrent expenditures	12,960.00
Recipient Country Government	National Incubation Center (NIC)	In-kind	Recurrent expenditures	5,000,000.00
<b>Total Project Cost(\$)</b>				<b>10,012,960.00</b>

**Describe how any "Investment Mobilized" was identified**

The co-financing modalities were initially discussed among the stakeholders. In general, cleantech enterprises (start-ups and SMEs) and their solutions, that are to be identified and supported in the framework of this project, are of interest to the above-mentioned entities as providing potential investment opportunities. To this end, IGNITE provides funding opportunities in the form of 'Final Year Project (FYP)' aimed for assisting final year under graduate students and 'Seed Fund' to support and innovative projects to be channelled with the project. The amount of Investment Mobilized from IGNITE is estimated to be USD 1 million in the form of grant. Laraib is a leading renewable energy developer with in-house capacity of technology, finance, economics, engineering, environmental science and power development science and will channel its fund to energy related innovations to diversify its portfolio. The amount of Investment Mobilized from Laraib is estimated to be USD 1 million in the form of grant. In addition, UNIDO as the GEF agency involved in the project as the implementing entity will provide USD 50,000 in the form a grant. Due to COVID-19, in-depth stakeholder consultations with the private sector were limited while there are many potential private sector stakeholders in Pakistan with the appetite to invest in cleantech innovations. During the PPG phase, the project will engage the stakeholders including private sector with a view to further elaborating and mobilizing co-financing and determine the confirmed structures of co-financing.

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

<b>Agency</b>	<b>Trust Fund</b>	<b>Country</b>	<b>Focal Area</b>	<b>Programming of Funds</b>	<b>Amount(\$)</b>	<b>Fee(\$)</b>	<b>Total(\$)</b>
UNIDO	GET	Pakistan	Climate Change	CC STAR Allocation	1,776,484	168,766	1,945,250.00
<b>Total GEF Resources(\$)</b>					<b>1,776,484.00</b>	<b>168,766.00</b>	<b>1,945,250.00</b>

**E. Project Preparation Grant (PPG)**

PPG Required **true**

**PPG Amount (\$)**

50,000

**PPG Agency Fee (\$)**

4,750

<b>Agency</b>	<b>Trust Fund</b>	<b>Country</b>	<b>Focal Area</b>	<b>Programmin g of Funds</b>	<b>Amount(\$)</b>	<b>Fee(\$)</b>	<b>Total(\$)</b>
UNIDO	GET	Pakistan	Climate Change	CC STAR Allocation	50,000	4,750	<b>54,750.00</b>
<b>Total Project Costs(\$)</b>					<b>50,000.00</b>	<b>4,750.00</b>	<b>54,750.00</b>

## Core Indicators

### Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	153000	0	0	0
Expected metric tons of CO <sub>2</sub> e (indirect)	765000	0	0	0

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

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)				
Expected metric tons of CO <sub>2</sub> e (indirect)				
Anticipated start year of accounting				
Duration of accounting				

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

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	153,000			
Expected metric tons of CO <sub>2</sub> e (indirect)	765,000			
Anticipated start year of accounting	2022			
Duration of accounting	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)				

### 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)
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**Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment**

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
<b>Female</b>	924			
<b>Male</b>	1,716			
<b>Total</b>	2640	0	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

The figures mentioned in the indicators section are tentative and is subject to change during the project. Indicator 6: Indicative expected results of 153,000 to 306,000 tCO<sub>2</sub>e of direct GHG emission savings and 765,000-1,530,000 tCO<sub>2</sub>e of indirect GHG emission savings at the end of project implementation. Methodology for estimating GHG emissions is to be further elaborated during the preparatory grant phase (PPG) while taking into account of the approach taken by the GEF approved program GEF ID10408 (described in Section 6 of this document). Since the project will target cleantech solutions integrating renewable energy, energy efficiencies, and waste management within the context of material, energy and resources sustainability and circularity, avoided methane emissions from waste sector are also expected. The potential additional global environmental benefits from waste management measures leading to avoided methane emissions will further be clarified during the PPG phase taking into account of the site specific and technology specific information. For the purpose of ensuring ex-ante estimation and ex-post monitoring of GHG emission reduction, the selection criteria will be developed considering the feasibility of tracking indicators for calculating emission reductions. Other environmental and social co-benefits are also expected to result from this project such as marine litter avoided and/or waste with POPs/mercury avoided. Such additional environmental benefits to GHG emission reductions will be considered and tracked if any as per the selected technologies and innovations. Indicator 11: 2,640 beneficiaries (at least 35% female) consisting of: 85 enterprises (around 3-5 persons per enterprise) accelerated under output 1.1.3 (around 25- 30 enterprises per accelerator cycle, 3 cycles), 100 cleantech experts trained and certified under output 1.1.2, as well as approximately 2,200 stakeholders sensitized which are estimated based on prior project experience and the scope of stakeholder engagement activities. Gender

mainstreaming target of 35% beneficiaries being women is set, based on experience in other similar projects. These may be revised at CEO Endorsement stage based on gender analysis conducted during PPG.

## **Part II. Project Justification**

### **1a. Project Description**

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

1. The most recent 2018 IPCC report[1]<sup>1</sup> notes that current trends indicate that global warming will pass 1.5° above pre-industrial levels between 2030 and 2052. The effects of climate change in Pakistan are already evident including floods and droughts as well as sea level rise and spread of diseases. The socio economic impacts of climate change are significant and negatively affect its developmental agenda since the country has a predominantly agriculture based economy which is particularly vulnerable to climate change[2]<sup>2</sup>.

2. According to the Second National Communication on Climate Change in 2018, the national GHG emissions of Pakistan for the year 2015 was estimated to be at 408.1 million tons of carbon dioxide equivalent. The figures have been growing more than twice since 1994 due to its steady growth of population and economy as well as increasing industrialization and urbanization. The growing trend of GHG emissions is therefore expected to continue if no effective mitigation measures are taken. There is an estimate that the total GHG emissions of Pakistan as per the government's economic growth strategy may be around 14 times by 2050 compared to the emissions in 2008.[3]<sup>3</sup>

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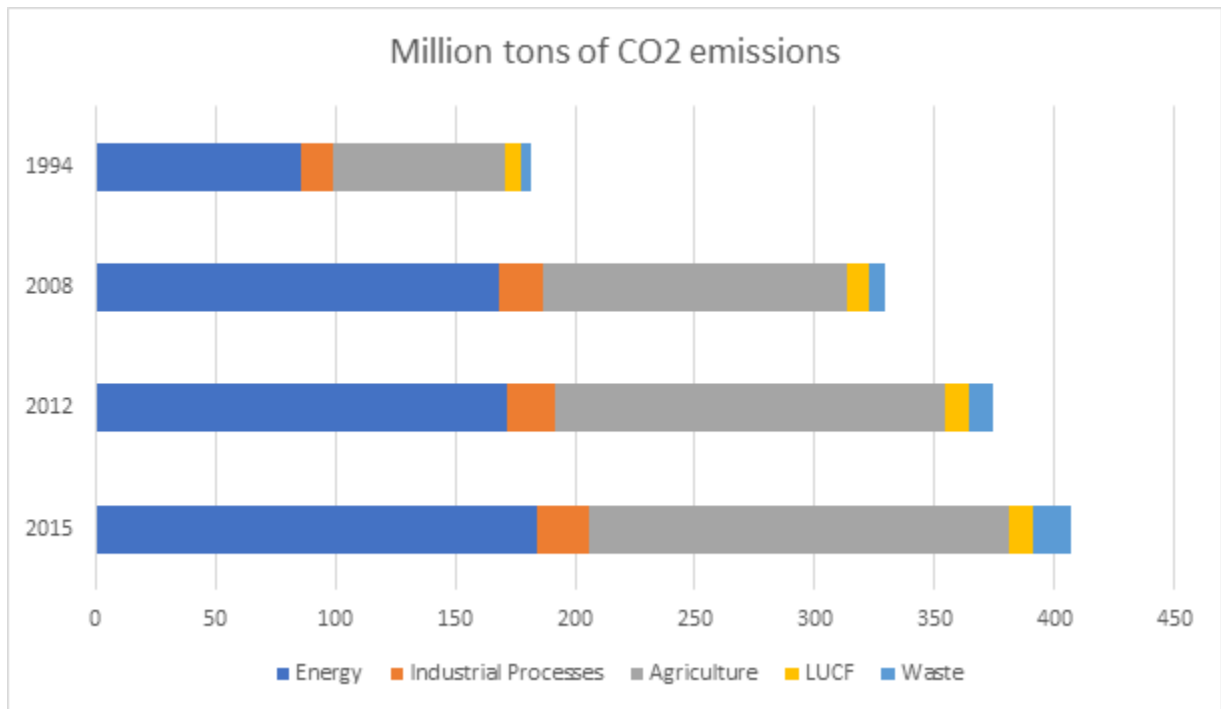


Figure 1: CO2 emissions in Pakistan by sector in 1994, 2008, 2012 and 2015[4]<sup>4</sup>

3. Among the sources of GHG emissions, the largest, 45.5% share is from energy sector. The energy sector is heavily relying on fossil fuels. 93% of the emissions from the sector is derived from fossil fuel combustion in the subsectors such as energy industries, transport including road transport, aviation, and railways, and manufacturing industries in cement, iron and steel, chemicals, brick and kiln, and others. As such, economic growth is directly result in the increase of GHG emissions. The Pakistan's current energy mix is mainly relying on natural gas which has relatively lower per unit GHG emissions compared to the other fossil fuel resources. Hence Pakistan's GHG intensity of energy production is yet among the lowest in the world as of today. It is observed that the country's natural gas reserve is being depleted and reliance on coal as alternative for natural gas is seen as an option to meet its energy demand which will further increase towards future. It is of utter importance to decouple economic growth from the fossil fuel use in Pakistan in consideration of its impact on climate change. The government essentially understands the importance of integrating the energy policy with climate change objective to avoid lock-in of infrastructure, technology and associated fuel in energy sector, However, the renewable energy technologies are not fully exploited in the country. The aging and weak electricity transmission system infrastructure poses further complexity hindering the uptake ability of the system upon needs for expansion of grid connected generation capacity. In addition, weak regulatory frameworks do not take into account the potential of utilizing cleaner electricity sources including uptake of renewable energy and enhance energy efficiency to reduce the environmental

burden. This systemic problem also causes risks to the energy security of the country while demands for electricity grow rapidly.

4. Next to the energy sector, agriculture and livestock sector has the share of 42.7%, which is followed by 5.4% share of industrial processes, 3.8 % share of waste and 2.5% share of land use change for forestry sectors. The waste sector has only a marginal share in the national GHG inventory as of 2015 generating the total emissions of 12.29 million tons of CO<sub>2</sub> equivalent. Nevertheless, the measures to address emissions from the waste sector is regarded no less important than the others as the emissions from the waste sector has been steadily growing. It is estimated that Pakistan generates about 50 million tons of solid waste annually, which has been increasing with a rate of more than 2.0% per year<sup>[5]</sup>. The overwhelming amount of waste generated without appropriate waste management infrastructure leads to the situation where such wastes are either burned, dumped, or buried on vacant lots without any environmental protection measures. This causes significant negative impacts on human welfare including bad odor, degrading water quality, air pollution, water and soil pollution, dermatological, respiratory diseases, vector borne diseases etc. Moreover, urbanization is also put another layer of environmental problems including urban sprawl, land- use change, increased demand for transportation and energy and resultant air pollution. In conjunction with the country's vulnerability to the climate change impacts which are leading to increase frequency and occurrence of natural disaster, the increasing threats to health as well as human welfare lead to poverty and easily jeopardize continuous economic growth and sustainable development in Pakistan.

5. There is normally strong correlation among the amount waste generated and population growth as well as urbanization. As of 2019, the total population of the country is estimated to be about 217 million increased 5 times since 1960<sup>[6]</sup>. Pakistan is projected to be the fifth most populous country in the world by 2050 with population growth at the rate of about 2% annually. According to the Second National Communication, Pakistan's urban population has increased from 43.0 to 72.5 million between 1998 to 2014 and is expected to become predominantly urbanized by the year 2025, making the country as the most urbanized nation in South Asia during the period. The impact of waste sector is particularly high as the dominant sources of the emission from the sector is CH<sub>4</sub> (methane) which has more than 20 times higher global warming potential compared to CO<sub>2</sub>. The Second National Communication and INDC predicts that the emissions from waste sector will increase exponentially in future with the unprecedentedly high urbanization rate and forecasted GDP growth of the country. According to the estimation given by the Government of Pakistan in the National Communication and INDC, the emissions from the waste sector is projected to be 89 million tons of CO<sub>2</sub> equivalent in 2030 which is 7 times higher than 2015 level.

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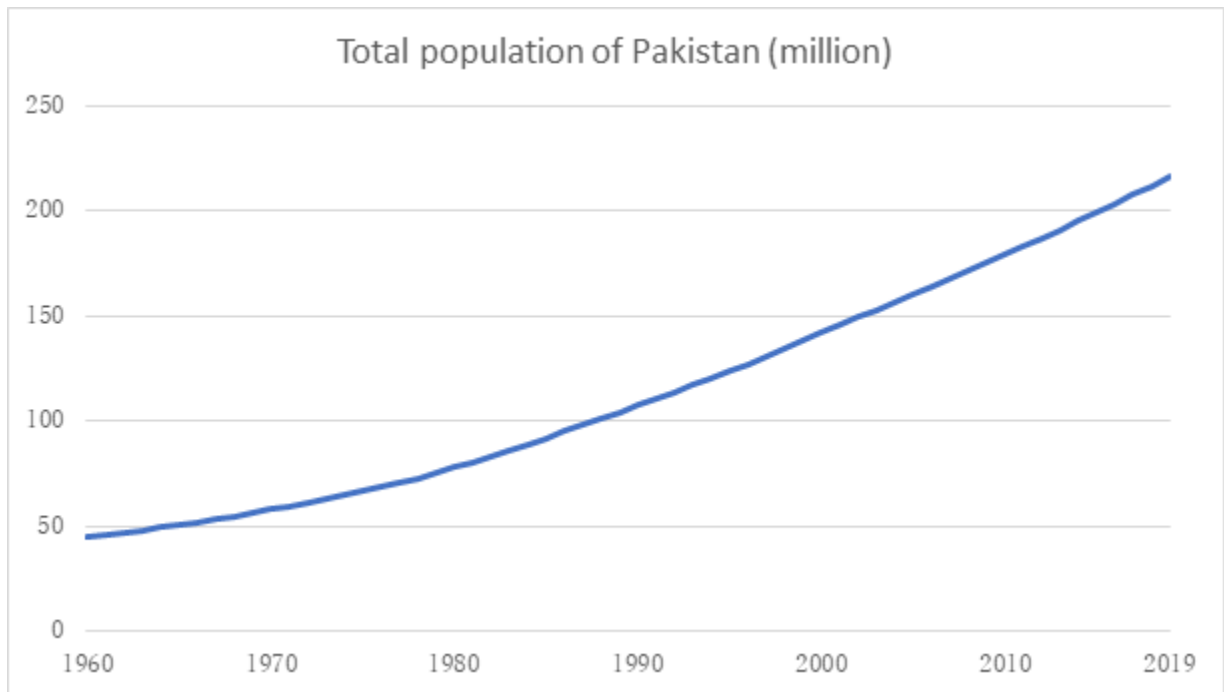


Figure 2: Total population of Pakistan from 1960 - 2019

6. The introduction of public-private partnerships is widely regarded as one of the solutions to effectively implement solid waste management systems. It is observed that mobilization of private sector initiatives in waste management system are yet in its infant stage in Pakistan. Such privatization was implemented in one urban city in Pakistan, Lahore. The study 'Solid waste management practices under public and private sector in Lahore, Pakistan?' (Ashraf et al., 2016)[7]<sup>7</sup> showed mixed results as there was certainly an increase in the collection rate and larger storage capacity but there were no significant changes in street sweeping. Measures such as waste to energy or material recovery were not utilized. The study concluded that the full benefits of privatization are yet to come if measures such as energy and material recovery, sanitary landfill and integration of informal sector, are introduced. There are still much rooms for further elaboration and materialization of opportunities in the sector.

7. According to the World Bank, Pakistan is classified as a lower middle-income country.[8]<sup>8</sup> Economic growth of the country is projecting a mixed message. In the past ten years GDP growth is in upward trend while over the past two decades, the average growth rate was at 2% which is less than half of the South Asia average point. This was regarded as due to inconsistent macroeconomic policies and an under-reliance on investment and exports. Most recently, due to Covid-19 the GDP growth was

stagnated the economy and the GDP growth was at 0.9% in 2019[9]<sup>9</sup>. Accordingly, it was observed that half of the working population lost job or income sources where informal and low-skilled workers were the hardest hit[10]<sup>10</sup>. As a result, poverty rate was increased from 4.4 to 5.4 % in 2020 meaning more than two million people fell below the line of USD 1.9 per day.

8. Small and medium enterprises (SMEs) play pivotal role in the Pakistan's economy constituting nearly 90% of all the enterprises in the country and providing non-agricultural sector employment of 80%, which shares 40% in the GDP[11]<sup>11</sup>. Due to the inherent nature of SMEs, their business faces several constraints. While regulatory and policy environment as well as institutional and networking support are not systematically developed for the SMEs in Pakistan, the largest barriers is the access to finance[12]<sup>12</sup>.

9. The increased promotion of entrepreneurship and adoption of clean technology innovations will be able to support addressing challenges of the country spread across the sectors integrating renewable energy, energy efficiencies, and waste management. This will build and enhance the sustainability of Pakistan economy, while also having positive economic and social benefits through the promotion and support of entrepreneurs and innovation, and through its contribution to energy diversification and security while accruing other environmental benefits such as reduced contamination and pollution. The potential beneficiaries are not only the entrepreneurs themselves, but all actors along the value chain, including distributors and retailers who might come from historically disadvantaged communities.

10. The need for Pakistan to foster innovation and research on economic (as opposed to socio-ecological) grounds alone is highlighted by Pakistan's relatively low position in the Global Innovation Index (107 of 131)[13]<sup>13</sup>, the Knowledge Economy Index (116 of 144)[14]<sup>14</sup> and the Global Competitiveness Index (110 of 141)[15]<sup>15</sup>. In addition, innovation in cleantech has the potential to help Pakistan, as the country with the growing carbon emissions profile in Asia with expectation of population and economic growth, to achieve its policy commitment to transition away from its legacy of fossil-fuel-powered development that produce harmful environmental, social and economic conditions.

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11. The integrated and sustainable waste management can be a driver for cleantech innovation, particularly in contributing to climate change mitigation, as it encompasses such a wide range of sectors and technologies. The integrated and sustainable waste management takes approaches aligned with the concept of circular economy by recognizing that natural resources are finite and aims to use waste materials or keep the materials in products in circulation for as long as possible: reusing, repairing, remanufacturing, sharing and recycling. Within the context of material, energy and resources sustainability and circularity, solutions such as renewable energy, energy efficiency, biogas, water recycling and a reduction in new materials will be integrated and have clear potential to contribute to GHG emission reductions and a low carbon economy.

12. In making the transition to a low carbon economy, the country is faced with complex interconnected challenges of structural unemployment, socio-economic inequality, lackluster economic growth and resource-intensive economic activity and development. Although switching to greener, more sustainable industrialization pathways present short and medium-term policy challenges, it can also create more resilient opportunities over the short, medium and long-term while simultaneously mitigating serious social-ecological risks.

Root causes and barriers that need to be addressed

13. Pakistan, like other developing countries, has challenges in planning infrastructural management and coming up with new and innovative solutions towards taking sustainable pathway. For example, apart from large scale projects in energy and urban infrastructural development, the government has not been able to make meaningful strides in finding solutions including utilization of public private partnerships as well as grass root level development support. Even the large scale projects are marred with resource unavailability and face delay in their implementations which result in additional costs over time and/or causing long suspension or non-implementations.

14. Potential synergies are seldom built between the opportunities and solutions towards greening urbanization. For example, ever expanding waste from municipal and industrial sector has never been seen seriously enough as a potential source of energy. The institutions charged with the responsibility to make decisions on solid waste management, operate in the enormous information, policy and strategy vacuum and lack therefore in the ability to address the looming environmental disaster.

15. Nurturing business models, services and products with established local ecosystem for cleantech innovation can be one of the counter measures to address these issues including e.g. maximizing energy source from renewables, enhancing energy efficiency at the process including recovery of energy as



well as minimizing environmental impact considering life cycle of materials. However, there are no vibrant mechanisms to support introduction, develop and maintain such initiatives and actions at the scale until today. The performance of such cleantech businesses as well as to accelerate domestically grown cleantech innovations are yet marginal due to for example, weak institutions and political instability, ineffectiveness of regulatory frameworks, inefficiencies of conventional systems and a lack of investor confidence. In addition, the capacity of market players like developers, technology suppliers and financiers needs to be further strengthened especially in terms of dealing with the business in the field of sustainable and integrated waste management as well as the associated technologies.

16. There are complex challenges and barriers in Pakistan related to acceleration of SMEs and startups towards operationalization of sustainable and integrated waste management as follows:

**Barriers and challenges to Cleantech Innovation in Pakistan**

<b>Barrier category</b>	<b>Description</b>
Policy and regulatory related barriers	<p>The current policy and regulatory frameworks do not comprehensively support the demand for cleantech finance. Additionally, they do not envisage innovative market mechanisms, particularly these suiting the needs of the SME sector that would incentivize uptake of cleantech. Also, there are no mechanisms to regulate additional cost of external verification, enhanced disclosure (in the case of green bonds) and the participation of institutional investors and the capital market to indirectly stimulate demand. Challenges related to policy and regulatory related barriers include the following:</p> <ul style="list-style-type: none"> <li>? Lack of an enabling and supporting policy and regulatory environment targeting innovations</li> <li>? Limited government financial incentives to support industrial enterprises for the uptake of innovation in clean technology</li> <li>? Limited strategy and planning</li> <li>? Lack of enforceable legislative and regulatory measures for promoting waste management</li> </ul>

<p>Awareness, knowledge and capacity related barriers</p>	<p>In general, there exists a lack of awareness about the potential of financial innovations and market mechanisms in accelerating low-carbon economy development. At the institutional level, there remain significant weaknesses in the organization and capacity around sustainable and low-carbon development planning and execution in general especially. Government entities have limited national capacity to manage the planned transition and mobilization of finance at the necessary scale. The absence of a platform to efficiently operationalize and leverage the various available green and low-carbon financial instruments hurdle their mainstreaming. The relevant national actors are not fully aligned and coordinated along the green financing cycle.</p> <p>Furthermore, private and public sector lack experience, knowledge and skills in cleantech, including available market mechanisms and financing sources. In addition, start-ups/SMEs lack expertise in identifying and developing bankable innovative cleantech projects. The limited technical capacity makes it difficult for them to source green investments. In particular, this includes a lack of capacity related to business model elaboration and aspects related to passing detailed due-diligence (proof of concept, financial aspects, legal aspects, etc.) of the projects and companies, which enhances the risks of bankruptcy and financial losses or litigation cases at later stages of product development. The barriers also include limited capabilities in moving an idea to product manufacturing and aspects such as prototype development, identification of production sites and partners, establishing supply chains and logistics, etc. Besides, capacity barrier also relates to lack of understanding of climate change aspects and potential climate mitigation and adaptation benefits of the cleantech products and services. Challenges related to awareness, knowledge and capacity related barriers include the following:</p> <ul style="list-style-type: none"> <li>? Insufficient participation and support by key stakeholders and the public at large</li> <li>? Inadequate institutional capacity to lead sustainable and integrated waste management activities at national and/or local institutions</li> <li>? Lack of trained experts to mentor start-ups and entrepreneurs on cleantech innovation especially related to the field of waste management</li> <li>? Insufficient information about technology options, best practices and benchmarks</li> <li>? Weak linkages between research institutes and industry and SMEs</li> <li>? Limited awareness of financial schemes, requirements and procedures to access finance for cleantech projects</li> <li>? Immaturity of the sector</li> <li>? Lack of environmental awareness</li> </ul>
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Finance related barriers	<p>Despite the large array of financial mechanisms, there are significant constraints for the uptake of cleantech projects in the country. Access of start-ups/SMEs to green finance remains limited mainly due to a) the high cost of finance associated with high interest rates and the fact that the foreign exchange loans are exposed to currency risk; b) very short finance maturities for cleantech; c) high collateral requirements for borrowers. Therefore, traditional financing sources that are available today are insufficient. In general, there is lack of innovative financing schemes for start-ups/SMEs, that could help leverage existing instruments, as well as limited transparency in the conditions and availability of financial support. Given SMEs share in country's economy, facilitating their access to green financing schemes and mainstreaming green financing into generic SME financing products becomes a central challenge. Challenges related to finance related barriers include the following:</p> <ul style="list-style-type: none"> <li>? High investment cost and less or uncertain return on investment</li> <li>? Lack of initial capital</li> <li>? Non-availability of accessible finance (e.g. bank loans) to encourage cleantech</li> <li>? High initial cost of cleantech</li> <li>? Access to Finance i.e. getting financing for such type of product</li> <li>? Difficulties to identify and materialize investment opportunities with longer term and non-quantifiable benefits associated to the intervention</li> </ul>
Behaviour related barriers	<p>Associated with the lack of awareness mentioned above, there is consequently a lack of supportive actions including sectoral and cross-sectoral cooperation and partnership among SMEs, academia, finance and policy-making entities. There is no proactive and effective outreach as well as easily accessible information on the initiatives and benefits of cleantech innovation. The information does not reach the relevant target beneficiaries and may not achieve intended outcome. This consequently leads to continuation of the status quo. Challenges related to behaviour related barriers include the following:</p> <ul style="list-style-type: none"> <li>? Lack of commitment and initiative for promoting cleantech application</li> <li>? Lack of cooperation or poor organization culture among policy, businesses and general public</li> <li>? Poor service quality in energy and waste sector</li> <li>? Lack of pressure from the communities for cleaner energy and better waste management services</li> <li>? Lack of cooperate social responsibility and ethical standards</li> <li>? Resistance to change</li> </ul>

17. In summary, Pakistan's cleantech sector is an emerging sector which lacks capacity and coordination. There remains a need for further support in the field of advanced commercialization support, further incubation, access to early-stage financing, national networking within the complex ecosystem, commercialization with market and finance linkages, widening and increasing the geographical reach and support to national partners. These interventions are required to further strengthen the resilience of the Pakistan's innovation and entrepreneurial economy to address domestic environmental challenges while also to operate within the global market and to result in economic growth, global environmental benefits and job creation. This will create economic opportunities and support a shift towards a sustainable development of the country. The proposed project is therefore designed to directly address the barriers described.

**2) The baseline scenario and any associated baseline projects**

## **a) Policy and legislative baseline**

18. Pakistan's second National Communication entails several efforts that the country made as well as plans and projections of its actions related to climate change. Among others, energy sector is the largest source of GHG emission in the country. The emission from the sector will be projected to raise since the country need to keep up with increasing demands for energy from its growing population and economy. While the sector relies heavily on natural gas at this moment, it is projected that the country will inevitably rely on its coal for medium term future, which will result in intensified GHG emissions even utilizing clean coal technologies.

19. While the renewable energy (wind, solar and bagasse) provides only a fraction (3.36 %) of the country's total power generation capacity of 25,374 MW as of 2016[16]<sup>16</sup>. The country has taken steps to reduce GHG emissions from the sector. For example, the 2013 Framework for Implementation of Climate Change Policy (FICCP) included several priority actions in energy sector for the purpose of: (i) develop and enhance renewable energy sources and uses to achieve green growth in the energy sector. (ii) develop and obtain clean energy technologies and uses to achieve low carbon growth in the energy sector. (iii) reduce total energy demand through conservation and efficiency. In 2015, National Power Regulatory Authority (NEPRA) issued net-metering regulations, which allows Distribution Companies (DISCOs) to purchase electricity produced by the consumers and facilitate installation of renewable energy. In addition, back in 2006, the National Energy Conservation Policy was approved by the Cabinet which paved the way for establishing the Energy Efficiency Act. However, in order to utilize full potential of the country's renewable energy while developing and enhancing clean sources and other efficiency measures towards a low carbon economy, there are still rooms for developing and operationalizing creative and sustainable energy policy as recognized in the National Communication.

20. Among others, emissions from the waste sector is also seen as an issue growing significance in the country's second National Communication. This is based on the assumption of the increased share of emission from the sector in the country's GHG inventory due to its growing population and economy as well as rapid urbanization. In conjunction with the energy related constraints as mentioned above, the country sees the opportunities in waste management not only within the sector but also to improve energy use including measures such as landfill gas utilization, composting, wastewater treatment and and electricity generation based on municipal solid waste. However, in general, wastes are simply collected, transported and dumped on to public land in the country as of today. In many cases, it is still true that hazardous wastes are mixed and dumped along with municipal waste as well as industrial

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waste is burned, dumped or drained in a river or mixed with municipal waste without any mitigation measures of environmental protection.

21. Policy measures to promote appropriate waste management system as well as while addressing climate change are emerging in the country. For example, National Electric Power Regulatory Authority (NEPRA) recently announced upfront tariff for municipal solid waste power plants recently[17]<sup>17</sup>. The leveled tariff of US Cents 10/kWh based on 25 years operational period has been announced with overall capacity cap of 250 MW wherein share of each province and federal territory have been kept at 50 MW each. For protection from environmental hazards, the power producer shall obtain necessary approvals from the relevant government agencies. The upfront tariff will be in field for one year. [18]<sup>18</sup> In addition, the Government of Pakistan recently announced ARE Policy 2019, which set target of 30% share of renewable energy in the energy mix by the year 2030[19]<sup>19</sup>. The innovative approaches to harness renewable energy and alternative energy technologies to reach that target, however, have not been defined in the Policy.

22. In addition, **Clean Green Pakistan Movement (CGPM)** was started by the Pakistan government in 2018 and it is a national campaign underpins behavioral change and institutional strengthening. It also envisages the need to address five pillars: plantation, solid waste management, liquid waste management/ hygiene, total sanitation, and safe drinking water[20]<sup>20</sup>. There are two programmes operated under the CGPM, namely, Pakistan Clean Green Index (CGPI)[21]<sup>21</sup> and Clean Green Champions Programme (CGPC) both of which were launched in 2019. CGPI presents city and community level index with a view to rank those stakeholders according to performance indicators to the each pillar of CGPM[22]<sup>22</sup>. CGPC aims for mobilizing the voluntary participation of the citizens towards keeping the cities clean, improving civic amenities and creating in them the spirit and sense of owning their habitats. The cities are also aligned with the five pillars by providing points and rewards system to enhance involvement as well as preparing guidelines for educational institutions and training programme[23]<sup>23</sup>.

#### **b) National baseline initiatives for accelerator programme**

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23. In Pakistan, SME sector faces multiple challenges and barriers including lack of resources, expertise, time, awareness etc. Besides, the government has recently started to adopt cleantech-friendly policies including green buildings, emissions standards, feed-in tariff and tax incentives for renewable energy projects. The Pakistan government is also working to set up Pakistan Innovation Fund in an effort to support micro, small and medium-sized enterprises in various segments including farming, fishing, livestock, and poultry, dairy and agro-based industries. The federal government is working with various organizations to facilitate micro-businesses by offering, for example, soft loans and providing them with lower electricity tariff.

24. Pakistan Council of Science and Technology (PCST)[24]<sup>24</sup> is mandated to advise the Government on the development of Science and Technology involved in related policy making, planning, implementation and in carrying out policy studies. PCST is also the secretariat of National Commission of Science and Technology (NCST), headed by the Prime Minister. Therefore it plays a pivotal role in nurturing clean technology innovation and entrepreneurship in the country. Its core functions include i) taking measures for effective collaboration among academia, research and development organizations and industry for development of indigenous products or technologies, ii) evaluating national research and development activities, and iii) promoting collaboration among national and international organizations for capacity-building and other policy initiatives in the field of science and technology.

25. National Incubation Centres (NICs)[25]<sup>25</sup> were created in Islamabad, Lahore, Peshawar, Karachi and Quetta during 2017 to 2018. Based on a unique public-private partnership between the Ministry of IT & Telecom, Ignite ? National Technology Fund, Jazz and Teamup, the center provides incubation and acceleration support for startups across the country. There are several programs operated under the centers including i) the 12-month incubation program opened twice a year, ii) the Jazz xlr8 Program which is premium acceleration program for start-ups that are market ready, and iii) organization of thematic Hackathons.

26. IGNITE[26]<sup>26</sup> is a national technology fund mandated by Ministry of Information Technology & Telecom. It provides funds for startups and innovative projects that utilize 4th industrial wave tech to solve local problems and target global opportunities in health, education, energy, agriculture, telecom, finance and other verticals. By doing so, it aims to fulfill its mission of creating a knowledge economy in Pakistan through network of national incubators in thematic areas of artificial intelligence, cloud infrastructure & cyber security, Internet of Things, augmented & virtual reality, wearables & implantable, shared economy, robotics, 3D/4D printings, neuro tech and block-chain

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27. Jazz xlr8?s[27]<sup>27</sup> is a startup support program under Pakistan?s mobile networking company Jazz. It aims to discover and support Pakistan?s best startups, help them scale and build a thriving startup ecosystem in Pakistan through its global partnerships, customized curriculum, mentor network & expertize services. It offers startups with access to mentors, data & analytics, data distribution and digital marketing services, digital trainings, digital financial services and free access to software.

28. National Productivity Organization (NPO)[28]<sup>28</sup> is mandated to enhance productivity and through human resource development, technology demonstration and improved practices, processes and procedures by 2030. It conducted a number of projects in the field of business acceleration including IFC Business Edge (R) teaser events project of 2016 where NPO completed 4 Teaser events and IFC developed 53 training modules in various disciplines including Marketing Management, Human Resource Management, Financial, Management and Accounting, General and Operations Management, Personal Productivity Skills and Tourism and Sector Specific Management of Accommodation Services, specially designed to train SMEs and MSMEs.

29. Pakistan Institute of Management (PIM)[29]<sup>29</sup> was set up in 1954 as a non-profit organization with the mandate to ?take the lead role in management development in Pakistan?. It is under oversight of Ministry of Industries & Production and has hubs in Karachi, Lahore and Islamabad and providing leading services in the field of management training and development. PIM offers several programmes including various sector specific professional trainings, consulting services such as Marketing Management and Research, Human Resource Management, Quality Systems and Supply Chain Management, Financial Management and Restructuring, Organizational Development, Security and Risk Management, Production Operations Management, Information System Auditing and Systems Development

30. The Small and Medium Enterprises Development Authority (SMEDA)[30]<sup>30</sup> is a government institution under Ministry of Industries & Production, which is mandated to provide an enabling environment and business development services to small and medium enterprises. For example, SMEDA provides Business Development Services for SMEs where it provides, among others, financial, legal and capacity building consulting services. It also implements projects ?Kamyab Jawan ? Youth Entrepreneurship Scheme? where young entrepreneurs and existing businesses between the age group of 21 - 45 years (18 Years for IT sector), are provided finance through 21 Commercial, Islamic

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and SME banks under the guidance and supervision of the State Bank of Pakistan. Under 'Economic Revitalization of Khyber Pakhtunkhwa Project (ERKP)', which was designed to support the Government of Pakistan in the economic recovery and revitalization of the crisis-affected areas, SMEDA is implementing the SME development component to increase the income of the SMEs and also to boost employment opportunities by providing grants from the region's private sector. Two types of grant supports are provided, namely (1) Up-gradation and (2) Rehabilitation. The Projects Round-1 was from Oct 2011- March 2017 and Round-2 is from April 2017 ? June 2020. The Round-2 of the project is being extended for another two years i.e. July 2020- June 2022. Under 'Public Sector Development Programme (PSDP)', SMEDA provided support to catalyze adaptation of best business practices and induction of new technologies through demonstration, training, provision of common facilities and ancillary services.

31. Pakistan Credit Guarantee Company (PCGC)[31]<sup>31</sup> was established in 2019 as development finance institution which is mandated to develop SMEs sector and to promote access to finance especially collateral deficient SME borrowers. to increase SME lending, reduce Collateral constraints for small farmers and small enterprises, increase quality of SME credit granting & risk monitoring, mitigate against business cycles & external shocks, enhance public information dissemination, facilitate access to reinsurance capital, improve treatment of Risk Weighted Assets, reduce risk perception / increase risk appetite of banks, and lower financing cost for SMEs.

32. Pakistan Innovation Foundation (PIF)[32]<sup>32</sup> is a private sector driven and donor supported non-profit organization charged with promoting innovation across the country, particularly in corporate sector delivered through three pillars of activities i.e. awareness building, reward and recognition and research and advocacy. It operations various initiatives including, Innovation Labs & Challenges which support youth, students, professionals and citizens in Pakistan to find innovative solutions to address the country's development challenges, Innovation celebration which is an annual events featuring National Conference, Innovations Showcase and Awards Gala, Creativity, Science & Innovation which gives opportunities for youth to build awareness and knowledge on science and technology, and Research and Advocacy which is to create capacity for promoting science and science based innovation and entrepreneurship in Pakistan.

33. PAKImpactInvest[33]<sup>33</sup> is organized by Ministry of Information, Technology & Telecommunication under which pitching events are organized to bring together businesses and startups from Pakistan with high growth and impact potential and impact investors. For example, the pitching event in 2021 will comprise of live pitch sessions by businesses, speeches by the guest of

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honor, video livestreaming showcasing investment opportunities in Pakistan and emerging sectors in education, health and medicine, energy, automobile, smart agriculture and tourism.

34. Plan 9[34]<sup>34</sup> is Pakistan's largest technology incubator; a project of the Punjab Information Technology Board (PITB) that was launched in August 2012 to promote a new wave of technological entrepreneurship in the country providing early stage technology startups with a nurturing ecosystem to facilitate the successful and sustainable development of their business ideas into commercially viable companies. The services include: provision of office space for free for 6 months, provide grants of Rs. 20,000 for up to 5 member of startups for 6 months, support networking and partnership at national and international level, provide mentorship support, and support business model development.

35. National Solutions Convention (NasCon)[35]<sup>35</sup> is annually organized by FAST National University, Islamabad campus which comprises of competitions of thematic categories such as computer science, engineering and business to address challenges of the country. Due to the COVID-19 crises, the 2020 convention was postponed but it on average gather 7,000 participants annually from all over the country showcase of exceptional professional skill and a platform for innovation[36]<sup>36</sup>.

36. Pakistan Startup Cup[37]<sup>37</sup> is business model competition open to any type of business idea in Islamabad, Karachi, Lahore and Peshawar. It is hosted by TiE Islamabad. The Competition based program are given to grow businesses, entrepreneurs and the ecosystems that support entrepreneurs. It offers opportunities through support programmes including: i) StartUp Academy which provides fifteen weekly interactive, visually driven business-building sessions, ii) Extreme Build-A-Business Weekend, which consists of either a 48-hour event or three-hour workshop where mentor training and certification on the GriffinWorx business building methodology and VizToolz. This is regarded as the first level vetting process to identify potential mentors to advance through the mentor certification programs with the goal of identifying potential Master Mentors. StartUp Cup Challenge, a proven business acceleration program run over 208 times in over 72 countries since 2012. The participants are transformed into investment ready businesses as they build their business or take an existing one to the next level during the 6 ? 7 month judging and mentoring.

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37. LUMS Entrepreneurial Society (LES)[38]<sup>38</sup> is a student society of Lahore University of Management Sciences (LUMS) established to play an active role in developing the local entrepreneurial ecosystem and supporting sustainable student-run initiatives in Pakistan and beyond. It operates several projects to support students to build skills in entrepreneurship. The projects include i) Young Leaders and Entrepreneurs Summit (YLES) which is held annually and convene more than 800 participants all across the country, ii) Social Outreach Program (SOP) which supports cultivation and channeling the entrepreneurial spirit in the society through social work at the very grass root level, iii) Innovation which supports provision of a tenable platform for future entrepreneur by showcasing business idea and conducting skills trainings, and iv) Initiate which supports refinement and development of the business ideas of peers towards successful implementation.

38. The Indus Entrepreneurs (TiE) [39]<sup>39</sup> was founded in 1992 in Silicon Valley to foster entrepreneurship through mentoring, networking, education, funding and incubation. In Pakistan, the chapters of TiE are located in Islamabad and Lahore with missions of promoting entrepreneurial culture, mentoring and coaching new entrepreneurs and arranging discussion forums for various entrepreneurial ideas. TiE Islamabad, together with US Embassy in Islamabad, organizes Pakistan Startup Cup which is one of the Pakistan's largest startup competition based accelerator programs. [40]<sup>40</sup>

### **c) Regional and international initiatives on accelerator programmes**

#### ***GCIP***

39. Since 2011 UNIDO has been supporting cleantech companies in their development via GCIP which uniquely fosters an ecosystem approach that supports cleantech innovations in existing and new SMEs and start-ups through the provision of catered tools and methodologies that enhance their productivity and competitiveness while promoting the establishment of a supportive policy and regulatory framework. By the end of 2017, GCIP accelerated over 865 start-ups/SMEs in 8 countries.

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40. The success of GCIP was confirmed through the GEF's evaluation in 2018[41]<sup>41</sup>. In its framework it was also recommended that: a) Any future GCIP or similar program should be structured using a more globally coordinated approach with appropriate choice of interventions based on strategic country selection; b) GCIP should actively support national-level coordination to dynamize the CIEE; c) There should be sufficient time allowed to customize and sharpen the focus on policy strengthening and regulatory frameworks to foster cleantech innovation and its adoption; d) The network of private sector partners should be expanded to address GCIP participant needs for business expertise and early stage technology validation; e) Direct and indirect impacts of the GCIP should be measured by establishing adequate monitoring and evaluation systems and ensure that they are implemented using standardized and relevant indicators; f) Country engagement should be deepened during the project period, including a plan and resourcing to sustain activities and expand outcomes after project closure.

41. Based on the above-mentioned recommendations UNIDO designed the GCIP Framework in 2019. The GCIP Framework consists often country child projects, all of which are connected to the three driving pillars, including a) Pillar 1. Transforming early-stage innovative cleantech solutions into commercial enterprises; b) Pillar 2. Cleantech innovation and entrepreneurship ecosystems strengthening and connectivity; c) Pillar 3. Programme coordination and coherence. The coherence within the GCIP Framework is ensured through the GCIP global coordination child project (GEF ID 10461) (hereinafter referred to as GCIP Global).

42. The GCIP Framework builds upon the achievements and key lessons learned from the implementation of the GCIP projects so far. In particular, it benefits from the collective feedback by various stakeholders including national counterparts, institutions and SMEs successfully participating in GCIP as well as strategic partners at the global level.

### ***GCIP 1 in Pakistan***

43. The 'Global Cleantech Innovation Programme for SMEs and Start-ups' (GCIP Phase 1) in Pakistan was implemented from 2014 to 2018. The main aim of the project was to seek to promote clean energy technology innovations through a cross-sectoral and multi-tiered approach that combines strengthening of the national technology innovation policy framework with institutional strengthening so as to build a sustainable 'ecosystem' for innovative entrepreneurship in small businesses. The programme focused on fostering emerging clean energy technology start-ups in Pakistan, enhancing engagement with the private sector, scaling up the momentum for sustainable development and strengthening the policy framework as required. The project also employed a competition-based

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ecosystem approach to identify the most promising entrepreneurs across the country with especially targeting SMEs and startups involving extensive mentoring, training, access to investors and opportunities to showcase their innovations.

44. GCIP Phase 1 in Pakistan was a pioneer in introducing commercialization of cleantech focused innovations. According to the Terminal Evaluation completed in March 2019[42]<sup>42</sup>, the programme contributed to: environmental safeguarding by supporting the development of cleantech ideas, solutions, and services related to energy efficiency, renewable energy, waste to energy, and water efficiency; 40% of the cleantech startups supported by the project successfully reached commercialization during the project's timeframe, which is above the average rate of commercialization for start-ups; and gender mainstreaming with intention to create more opportunities for women entrepreneurs. It was also reported that GCIP Phase 1 in Pakistan played an instrumental role in raising awareness about the significance of cleantech in the country by sensitizing many stakeholders including those of universities, R&D institutions, chambers of commerce, government bodies, incubation & other startup bodies regarding the cleantech's potential to revolutionize the economy. In addition, around 43 semi-finalists among 249 between 2014-2018 competitions were focused on waste related clean technologies, which showed a potential interest of the innovators in this sector.

45. The Terminal Evaluation also identified some recommendations which included, among others, the followings: 1) further enhancing engagement of overlooked groups and leverage previously untapped resources and contributions through adoption of a strategic approach to gender mainstreaming; 2) developing an up-to-date mapping of the innovation eco-system for cleantech and beyond to identify synergistic effects considering the growth and evolution of the innovation landscape in the country as well as possible entry of multiple players during the project's implementation; 3) operationalizing national cleantech platform under national ownership, while maintaining service quality, to sustain momentum and effectively leverage the GCIP reputation and achievements thus far; and 4) budgeting and allocating a full-time resource for communications, advocacy, and training of partner organizations on these aspects can expand outreach and magnify impact. These recommendations are taken into account in the design and implementation of the proposed project.

#### ***The Private Financing Advisory Network (PFAN)***

46. The Private Financing Advisory Network (PFAN), is an initiative hosted jointly by UNIDO and the Renewable Energy and Energy Efficiency Partnership and is a global network of climate and clean

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energy financing experts that offer business coaching and investment facilitation to entrepreneurs developing climate projects in emerging markets. PFAN mobilizes private financing to reduce greenhouse gas emissions and build climate resilience contributing to Paris Agreement and SDGs i.e., SDGs 7 (Energy), 9 (Industry), 13 (Climate Action), and 17 (Partnership). A network of 99 in-country private sector experts in 39 countries are supported by network of 45 investment partners globally to provide investment advisory services, investment facilitation and financing. To date, PFAN has supported at least 127 climate and clean energy businesses to mobilize more than USD 1.7 billion of investment. Furthermore, PFAN currently has a pipeline of hundreds of projects across the globe that are being supported. Further results demonstrate that through this investment, 3.3 million tonnes of CO<sub>2</sub> have been mitigated annually and an additional 975MW of clean power installed. This year already, PFAN has facilitated at least 69 investment-ready projects.

47. In partnership with the United States Government, UNIDO recently launched the Pakistan Private Sector Energy Project. [43]<sup>43</sup> Under the project, PFAN will play integral part by expanding the portfolio of commercially-viable small and medium-scale clean energy projects and providing support to enable them to access financing and reach financial close with a view to help to stimulate clean energy technologies in Pakistan and contribute to the country's efforts on mitigating climate change.

#### *ClimateLaunchpad*[44]<sup>44</sup>

48. ClimateLaunchpad is a global initiative by Climate-KIC which is supported by the European Institute of Innovation & Technology (EIT) in which Pakistan is participating. Under the initiative, Climate-KIC together with local consulting firms of Stimulus and CleanTech Republik works on developing strategic green industry partnerships through competition based support for local entrepreneur towards August 2021.

#### **The Global Entrepreneurship Network (GEN)**[45]<sup>45</sup>

49. GEN operates a platform of projects and programs in 170 countries aimed at making it easier for anyone, anywhere to start and scale a business, including Pakistan. It has several initiatives including Global Entrepreneurship Week (GEW) through which GEN celebrates the successes and impact of

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entrepreneurs in an effort to help break down cultural barriers and reach new audiences, the Global Entrepreneurship Research Network (GERN) and GEN's Startup Nations policymaker network through which GEN helps identify and crowdsource best-in-class policies and public programs that help entrepreneurs thrive, the Global Business Angels Network, Global Enterprise Registration, Startup Huddle, GEN Starters Club, Startup Open, and other programs through which GEN offers programs and resources intended to help smooth the path to market for founder teams and provide entrepreneurs at all stages with the support necessary to reach the next level, and other outreaching and networking events including its Global Entrepreneurship Congress (GEC) and GEC+ series, the annual Startup Nations Summit, global annual meetings of its vertical communities and by co-hosting other events across the globe through which GEN helps break down siloes and enhance collaboration among entrepreneurs, investors, policymakers, researchers.

*Google for Startups Accelerator: Southeast Asia*<sup>46</sup>

50. Google for Startups Accelerator: Southeast Asia aims to support local startups and entrepreneurs to solve specific, technical challenges with the best of Google resources - people, network, and technologies. As part of the global programme of 'Google for Startups Accelerator', once the selected founders outline the top challenges facing their startups, they will be paired with relevant experts from Google and the industry to solve those challenges. Participating startups will receive mentorship and specialized expert supports from the global mentor network. Google for Startups Accelerator: Southeast Asia will cover applications from startups headquartered in Indonesia, Malaysia, Pakistan, Philippines, Singapore, Thailand, and Vietnam.

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

51. The project promotes the transition towards low-carbon and circular economy by facilitating investments in clean technologies integrating renewable energy, energy efficiencies, and waste management within the context of material, energy and resources sustainability and circularity. It aims to optimize and rationalize the material and energy inputs and controlling the outputs affecting the environment in holistic manner. For this purpose, the project will support, through operationalization of accelerator programme and other relevant activities, introduction of innovative clean technologies which will include improving resource and energy efficiency as well as renewable energy capacity within the material cycle towards disposal in the end. The approach will also take into account of, as

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applicable, management of wastage and pollution, drawing on methods of pollution control, cleaner production, eco-efficiency, life cycle assessment, closed loop production and industrial ecology.

52. The project will take advantage of national priorities and initiatives such as Clean and Green Pakistan Index (CGPI). In addition, in the wake of Industry 4.0 as well as the Pakistani governments 'Digital Pakistan'[47]<sup>47</sup> initiative, digital transformation within the context of waste management will also be considered for prioritization. Taking into account of priorities of the country, the project will effectively lead new startups and entrepreneurs to be supported to contribute in finding innovative solutions.

53. The project will directly respond to the findings of the Independent Evaluation of GCIP Phase 1 in Pakistan[48]<sup>48</sup> and will be aligned with the approaches of the GEF approved program GEF ID10408, which is designed to respond to the increasing global demand for environmental sustainability, climate action, and to unleash the potential of cleantech innovation and entrepreneurship to help transform priority sectors and systems. To address the highlighted barriers above faced by SMEs in transforming their cleantech innovations into market ready solutions, the programme uses a holistic ecosystem approach which facilitates the growth of cleantech SMEs, improves coordination of national activities and foster synergies between participating countries. The project has a unique approach as it seeks to capacitate the private sector to deliver environmental benefits through transforming early-stage cleantech companies into fast-growing enterprises whilst simultaneously developing the cleantech innovation and entrepreneurship ecosystems in participating countries.

54. The global GCIP framework will aggregate and enhance efforts to strengthen and connect the ecosystems of the countries involved, and at the same time connect them to a truly global innovation ecosystem. Over the long-term, the project seeks to build robust innovation ecosystems that can identify and systematically support high-impact cleantech technology innovations as well as attract large-scale investments. This mechanism is expected to deliver significant global impact on limiting global temperature rise to well below 2 degrees centigrade as well as generating local environmental benefits.

55. The proposed advanced cleantech innovation project for Pakistan which is aligned with the global GCIP framework of which UNIDO is the lead implementing agency. The Theory of Change (ToC) for the project as in the figure below shows how the project will deliver accelerated uptake and investment

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Figure 3: Theory of Change for the Pakistan cleantech project

### **Brief Description of the Theory of Change**

The project has been designed to address the barriers set out in the previous section. Specifically, the barriers faced by innovators will be addressed by the provision of support from concept through to commercialization while helping them adopt different approaches to entrepreneurship. This will include: provision of ideation and concept validation services, holding annual accelerators, advanced accelerators to provide follow-on support to the alumni as well as targeted support services, investment facilitation, mentorship and partnership support - across the country supporting at least 85 entrepreneurs. To assist piloting projects of innovation and early-stage entrepreneurship with a view to support the deployment and scale-up of cleantech solutions integrating renewable energy, energy efficiencies, and waste management within the context of material, energy and resources sustainability and circularity. To support these outputs, guidebooks will be developed for Pakistan and at least 100 business innovation and entrepreneurship experts will be trained in and certified to an enhanced approach to business model development.

The fragmented cleantech innovation ecosystem will be addressed with the establishment of a national cleantech innovation platform linking all the project support and the development of at least 3 regional hubs to provide support to entrepreneurs. Capacity gaps will be addressed with targeted capacity building for policy makers and institutional actors, and the policy and regulatory environment will be strengthened with support to address the gaps in areas such as IP, behavior change in value chains and consumers and promoting a circular economy. Networking, advocacy, knowledge generation and exchange will enhance awareness amongst ecosystem stakeholders and increase impact of the project whilst global GCIP cooperation and exchange will increase opportunities for Pakistan entrepreneurs.

**IF** these outputs are delivered **THEN** the following outcomes will be realized: promising early stage cleantech innovations are accelerated across the country by being supported from concept through to commercialization; alumni are supported and financed for national, regional and global expansion; and the national ecosystem and institutions are strengthened to promote and support cleantech innovation and entrepreneurship. All the outputs are underpinned by a gender mainstreaming action plan that contributes toward the debunking of gender stereotypes and ensuring that women, men and youth can equally lead, contribute to and benefit from the programme. At the same time there will be greater recognition and improved efficiency and sustainability of the Pakistan accelerator programme.

**BY** identifying and supporting innovative technologies and viable business models whilst increasing institutional capacity and ecosystem connectivity, **THEN** the cleantech entrepreneurs are able to secure increased investment from more aware investors, **AND** enables them to commercialize their innovative products. At the same time, **IF** a supportive policy and regulatory environment, including incentives exists, **THEN** cleantech investment and adoption will be fostered. **ALSO** in turn these interventions will bring innovative clean technologies to market and drive uptake, delivering customer value and contributing to the reduction of GHG emissions and energy savings. Continued growth and the mainstreaming of the technologies will result in market transformation and job and wealth creation within Pakistan, accompanied global environmental benefits including GHG emission reductions.

56. The project has three substantive components, in line with the global GCIP framework pillars. These have been designed based on the current needs of Pakistan, also taking into account recommendations from the GEF 5 GCIP terminal project evaluation and feedback from GCIP participants. An overview of the pillars is shown below, including how this project is expanding the support that was provided under GEF 5.

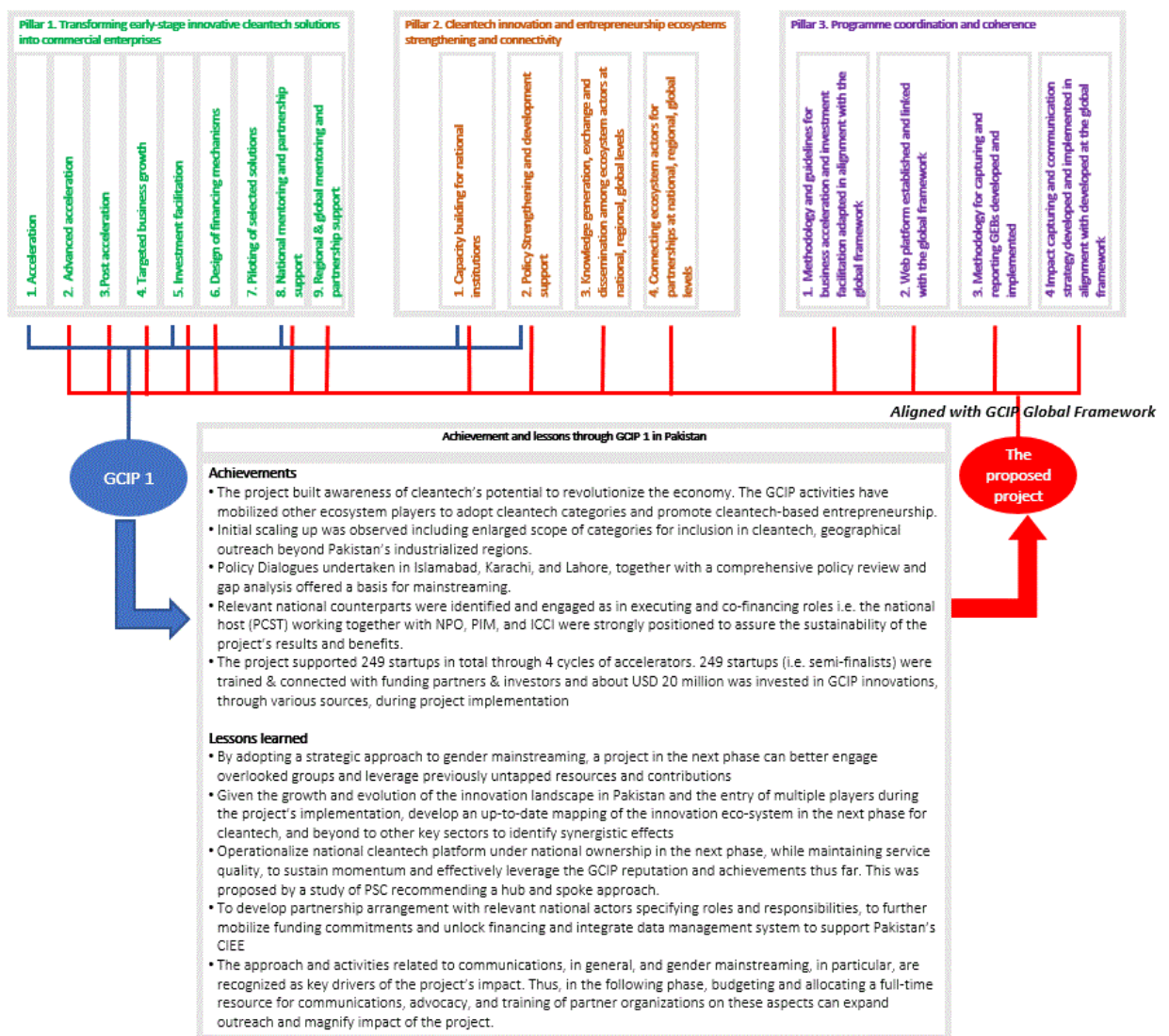


Figure 4: Additional support provided by this project over the GCIP supported project by GEF5

57. The project approach in Component 1 especially, accelerates innovations that have highest GHG emission reduction potential and have highest chances of going to the market through a number of phases. Together with its relevant initiatives like PFAN, the project continually de-risks the enterprise's business model in order to increase the likelihood of investor interest. This is important to note since the sources of investment that the cleantech start-ups will be able to mobilize will depend on the alignment of the priorities of the institutions that have shown interest to invest.

**The project connection to PFAN to support the start-up to scale up journey of cleantech enterprises**

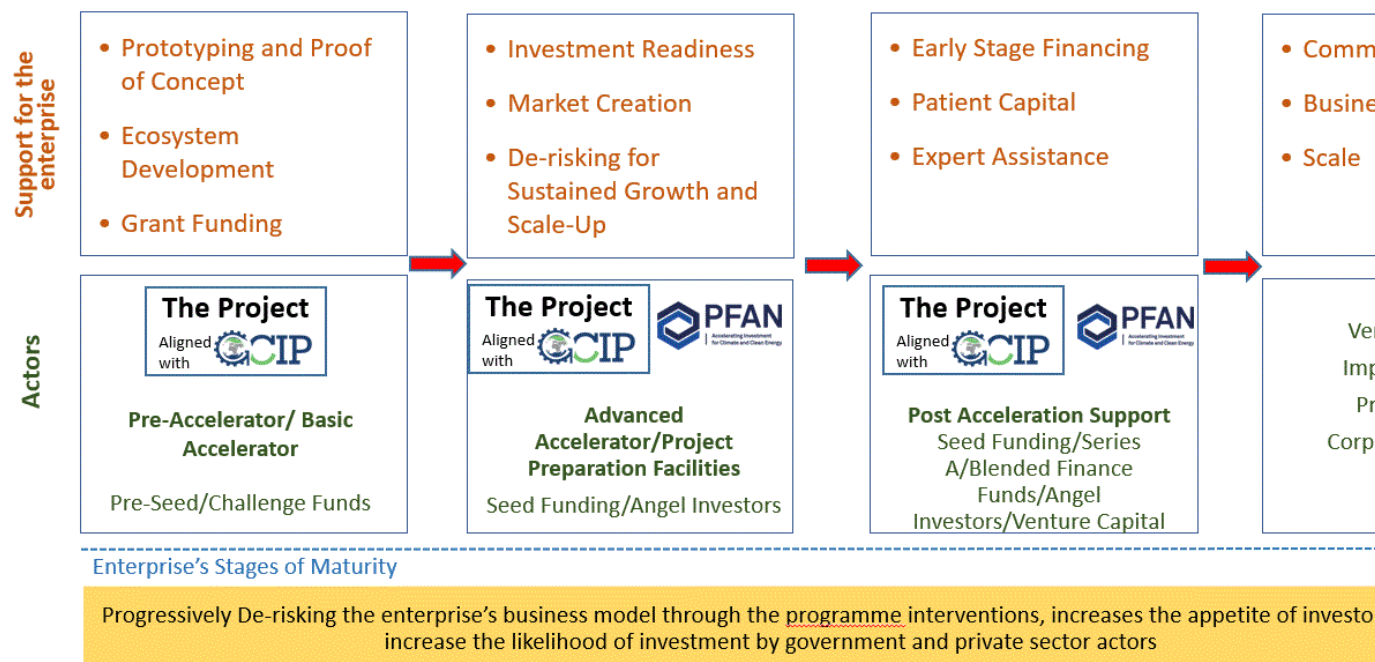


Figure: 5 Start to Scale-up Journey, De-risking for Investment Readiness

58. The objective underpinning the linkages established between the project and PFAN is to offer the ventures supported by the project a continuum of support services as they mature towards commercial viability and scaling up. The project combines a top-down (policy support) with a bottom-up (support for home-grown innovation) approach. It is technology-neutral and its theory of change is grounded in sustainability (incl. energy) transition theories and as such, the type of the innovations that are supported are not pre-determined.

59. The final investment decisions are made between the start-up and the investor, once they find common value. A start-up may have several investors mixing public and private financing. The connection between the Pakistan accelerator programme with the other country projects under the global GCIP framework enables investors at a global level to also access start-ups from each country i.e., through activities like Investor Connect, National Forums and the Global forums.

### **Component 1: Transforming early-stage innovative cleantech solutions into scalable enterprises**

60. Component 1 focuses on identifying innovative cleantech solutions and business model ideas, and providing entrepreneurial skills and business growth support. Providing direct support to early-stage cleantech SMEs to enhance the capacity and competitiveness for business growth, Pakistan's private sector's potential and contribution as cleantech solution providers, and to leverage market opportunities embedded in climate change mitigation enhances. Outcome 1.1 focuses on early-stage innovative cleantech solutions and provides business acceleration support related to entrepreneurship and business skills training. Outcome 1.2 provides targeted technical assistance through advanced and gender-responsive business growth and investment facilitation service. Furthermore, cleantech SMEs in the expansion stage will receive investment facilitation and mentoring services towards financing, piloting and commercialization.

#### ***Outcome 1.1: Early-stage cleantech innovations are accelerated***

61. Early stage cleantech innovations with high impact potential for climate, environment and social benefits in the field of integrating renewable energy, energy efficiencies, and waste management will receive business acceleration support for increased market and investment readiness. The selection criteria for innovations to receive support will be determined in alignment with the national priorities outlined in the NDC targets, and other key policies and strategic documents in consultation with key stakeholders, as well as potential contribution for GHG emission reductions which can be plausibly estimated ex-ante and monitored ex-post and will be aligned with GEF 7 programing directions. During the PPG phase, more information will be gathered in order to inform project interventions being effective in business acceleration.

62. This project will benefit from the tools, approach and methodologies on how to promote cleantech innovation and entrepreneurship in developing and emerging economy countries as developed under GEF program 10408. This support includes guidebooks and practical tools for operation and

management of the accelerator at a national level and complimentary activities, which will provide the reference framework for the accelerator in Pakistan within this project.

63. The diagram below shows the types of assistance required by cleantech SME, depending on their stage of growth, based on which the project approach is built where outcome 1.1 focusses on early-stage cleantech SMEs while outcome 1.2 will focus on growth and expansion stage cleantech SMEs.

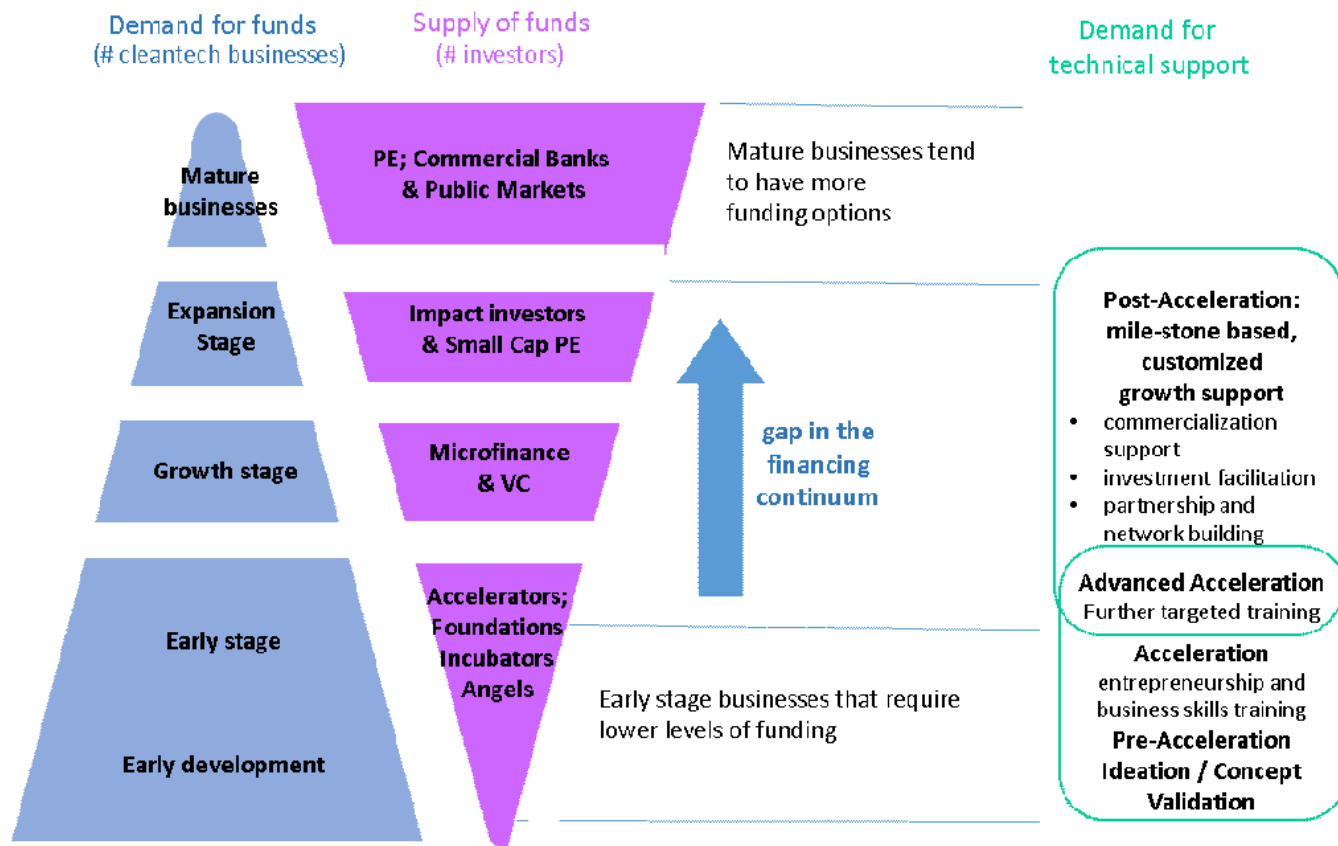


Figure 6: Demand for funds and technical support per development stage.

*1.1.1 The Cleantech accelerator operational guidelines including methodologies, guidelines, tools and training systems are developed and adopted in alignment with Clean Green Pakistan Index*

64. Accelerator guidebooks that emphasize on the approach and methodology for promoting cleantech innovation and entrepreneurship in developing and emerging countries aligned with the

Global GCIP framework, will be made available as practical tools and guidelines for the operation and management of the national accelerator in Pakistan. These guidebooks will be reviewed and adapted by the national Project Executing Entity (PEE) to reflect the context of Pakistan's cleantech ecosystem including market conditions, policy environment, development priorities, technology priorities, local examples, etc. Three Accelerator guidebooks will be developed on i) acceleration; ii) advanced acceleration; and iii) post-acceleration support. These guidebooks will define the scope, criteria and awards categories of the Accelerator in consultation with Pakistan's ecosystem actors, including the government, business and civil organization stakeholders and so be aligned with their priorities and in line with the country's innovation potential. The level of innovation to be eligible to receive support through the Accelerator will also be specified during the review of the guidebooks, as well as the selection criteria of the Accelerator. The guidelines will also be the principal input to the web based knowledge management tool.

***1.1.2 Pool of cleantech innovation and entrepreneurship experts (trainers, mentors, and judges) is trained through regional training programs, in cooperation with local universities and institutions***

65. Regional entrepreneurship training programme will be organized for local universities. The training sessions on entrepreneurship will be organized, focusing on those aspiring students and individuals who want to be the torchbearer and hand holders, to further spread the message for innovation to other aspiring for making careers in innovation in clean technologies to themselves become role models.

66. Developing a pool of cleantech innovation and entrepreneurship experts to act as mentors, coaches and judges is critical to the effectiveness of accelerators in providing the right support to the participating teams as well as their long-term sustainability. This is because the delivery of the accelerator curriculum and the connections facilitated with the right actors will depend on the capacity and networking of these experts. In order to ensure coherence of approach among mentors, coaches and judges, the project will adopt and employ a cleantech innovation and entrepreneurship expert training system developed under UNIDO/GEF program 10408. Similar to the accelerator guidebooks, the training system will be reviewed by the Pakistan PEE and adapted for the national context, ensuring that the training materials accurately reflect market, business, policy, and investment climates.

67. A pool of experts with the knowledge and connections to support cleantech innovations towards commercialization is also crucial to the cleantech ecosystem. The community of experts trained/certified are expected to positively influence the cleantech innovation initiatives at national level, and will contribute to the strengthening of the cleantech innovation and entrepreneurship ecosystem in general.

***1.1.3 Three cycles of the annual competition-based accelerator are conducted in alignment with the national initiative of ?Clean Green Pakistan Movement? (at least 85 enterprises)***

68. Three annual competition based cleantech innovation and entrepreneurship accelerators will be conducted based on the guidelines and tools developed under output 1.1.1. The Accelerator is a 4 to 6 month curriculum designed specifically to support cleantech innovations stemming from developing and emerging countries, to develop viable business models and grow cleantech enterprises. About 25-30 enterprises are supported through each Accelerator cycle. The Accelerator will identify promising cleantech teams with high-impact potential, and provide intensive mentoring and coaching to accelerate the growth of the participating teams. Competition elements will be incorporated into the Accelerator as an incentive to participating teams. The call for applications will be issued in ?impact categories?, defined to address multiple environmental challenges with specific focus on those related to solutions on integrating renewable energy, energy efficiencies, and waste management. Support is also provided to improve their business skills and investor pitch and in connecting them to potential business partners, financiers or investors.

69. The National Accelerator cycle will be aligned with Clean Green Champions ranking criteria. The organization of the competition cycle will be guided by a general timeline recommended by UNIDO that aims to leverage the ongoing cycles across the global programme and allows Pakistan to align with some activities under the global GCIP framework where possible (e.g. online webinars, participation at the global forum, etc.).

70. In terms of selection criteria, priority will be given to innovations with significant GHG reduction potential, which will be plausibly estimated ex-ante and monitored ex-post and determined through the reduction potential of the innovation (technology or business model) itself, and the estimated market and business potential which will determine the uptake of the innovation. Accordingly, selection criteria of the Accelerator will include a threshold for the projected environmental impact per USD for supported technologies. Women and youth empowerment and entrepreneurship will also be a key consideration in the selection process into the Accelerator. In addition, specific considerations are given so that the project will assist the country's programme of CGPI by directing and focusing the startups and innovators to come up new models/solutions to applicable to the specific local settings.

***Outcome 1.2: Start-ups and SMEs are supported through advanced and gender-responsive business growth services***

71. Start-ups and SMEs will be supported through advanced and gender-responsive business growth services as well as receiving investment facilitation services. Post-Accelerator Business growth support and tipping point investment facilitation services will be provided to the cleantech SMEs to commercialization.

***1.2.1 Advanced technical, business advisory and commercialization support for the selected start-ups and SMEs provided (for at least 12 startups and SMEs)***

72. The guidelines adapted to Pakistan's ecosystem context (under output 1.1.1) will be the basis of executing this output. The advanced and Post-acceleration support will be tailored to the specific alumni's needs for progressing into the next phase of business growth and in overcoming product related market barriers. This may include technology verification, prototyping and product development, piloting, legal and administrative support, IT services, tax registration, protection of intellectual property (IP), product life cycle assessment, environmental and social risks assessment, additional mentoring/courses on cleantech entrepreneurship, etc. Additional business model validation may also be necessary to reflect the developments in technology/product readiness, business, market and manufacturing readiness. Market conditions and market demand created by national policies and development priorities of Pakistan will be an integral part of the business model development and market potential of the innovations.

73. As each innovation and enterprise is different and will require customized support, extensive consultations will take place as part of the selection criteria and process to ensure that the needs and expectations of the alumni is fully understood and agreed on at entry into advanced and post acceleration support. A mile-stone based approach will be employed to measure progress of each enterprise.

74. International consultants will be assigned to provide first hand technical support for the small-scale project proponents such as startups and small local entrepreneurs, to commercialize their solutions and for the large scale deployment of clean technologies.

75. At least 12 innovative technologies as identified under Output 1.1.3 will receive support for detailed feasibility studies towards the implementation of demonstration according to the result of the accelerator program. These will include decentralized and small scale clean technologies for integrating renewable energy, energy efficiencies, and waste management with necessary localization and modification.



***1.2.2 Enterprises are connected to financing opportunities and provided with tipping-point investment facilitation support and/or finances for piloting (for at least 4 startups and SMEs)***

76. Investment facilitation and support for selected start-ups and SMEs including those integrating renewable energy, energy efficiency and waste management will be implemented, as selected from Accelerator program. It will promote the cause of CGPI on broad level, as selected startups will be strengthened to provide scale up projects under the project.

77. Moreover, to assist companies in making connections to potential investors and partners, investment facilitations will be held at partner corporations and government agencies to highlight opportunities for investment, loans, grants, technology adoption and partnerships. The intention is to assist as many semifinalist companies as possible to raise funding (grant and equity), find customers, and build partners within 12 months of completing the competition. There will be a specific focus on undertaking activities that would involve women entrepreneurs more actively in seminars and investor group meetings. National investor forums will be organized to encourage linkages, collaboration and synergies across the stakeholders.

78. At least 4 of 12 selected startup/projects supported by mobilizing the investor connect to enable the demonstration of clean technologies in medium to small cities (CGPI ranking criteria will be used).

***1.2.3 Investment is mobilized to implement at least one project in each of the four city municipalities performing under CGPI (in total at least four projects)***

79. At least 1 pilot project is implemented in each of four city municipalities including big, medium and small cities covering 3,000 households. The CGPI ranking criteria will be used for selection of such cities. Linkage will be developed with the startup projects that are currently undergoing in the CGPI cities. By doing so, the project will benefit implementation of CGPI by inducing local municipalities to build its capacity and create job opportunities through private sector engagements.

80. In addition, the project will support elaboration of the ideas in the area of circular economy on waste management systems including approaches for supply chain system involving concept of ?Circular Urban Metabolism?. One of the pillars of this approach is a ?closing the loop? where

integrated waste management system will not only realize circularity of material use through e.g. material recovery, but also minimize and optimize energy use while maximizing clean energy e.g. , by utilizing waste to energy and/or renewable energy technologies.

## **Component 2: Cleantech innovation and entrepreneurship ecosystem (CIEE) strengthening and connectivity enhanced**

81. The policy framework and institutional sustainability are integral parts of the 'Cleantech innovation and entrepreneurship ecosystem (CIEE)', and also of strategic relevance in ensuring that the outputs and outcomes of the project are contributing to the national priorities and sustained after project closure. This component will aim to institutional capacity in key national ecosystem players, as well as regional and local institutions, to engage in cleantech acceleration and commercialization in Pakistan. The regional hubs will be capacitated for accelerating innovation and networks and connectivity will be created among the CIEE in Pakistan.

### ***Outcome 2.1: The CIEE in Pakistan is strengthened and interconnected***

82. The project aims to strengthen the national cleantech innovation ecosystem by enhancing services provided in GCIP Phase 1 in Pakistan. For that purpose, the project will strengthen national CIEE through creation of integrated platform which will, among others, provide technical support to provinces in upgrading the existing institutional framework for facilitating introduction of clean technologies while identifying the gaps and solutions for up taking clean technologies especially with a view to integrating renewable energy, energy efficiencies, and waste management.

#### ***2.1.1 National and regional institutions structural and operational capacities are strengthened considering social and gender dimensions so as to promote GEEW***

83. A cleantech innovation and entrepreneurship ecosystem (CIEE) assessment will be conducted to analyze the strengths and weaknesses of Pakistan's CIEE including an expert study for identification of relevant players to be engaged and coordinated as well as provision of a framework model under the present institutional and regional institutions to strengthen the ecosystem with a view to establish the regional hubs. This will be instrumental in identifying the capacity building needs and optimal set of interventions nationally. In addition, it will aim to ensure that national, regional, local ecosystem players are supported to understand and contribute in their roles as part of the ecosystem, and will have

the capacity to continue promoting national cleantech innovations and enterprises towards commercialization beyond the project.

84. Effective and innovative clean technology ecosystem will be identified and established in order to guide and support local SMEs and startups on finding solutions for low carbon and circular economy integrating renewable energy, energy efficiencies, and waste management.

85. The technical guidelines and data base such as existing legislative and regulatory, database of innovative clean technologies, practical tools, benchmarking, best practices, value chains database, pool of experts, related list of institutions, etc. will be developed and disseminated. The specific consideration will also be put on potential utilization of digital technologies including robotics, artificial intelligence, internet of things, cloud computing and data analytics, which are increasingly regarded as key enabler for sustainable resource management and utilization including through improving recycling, facilitating the use of recycled by producers, enabling better purchasing and sorting decisions by consumers, and improving waste sourcing options for recyclers.

86. This output will also serve as a structured stakeholder consultation and engagement process at the start of project implementation including consideration of social and gender dimensions so as to promote gender equality and women's empowerment (GEEW). The CIEE assessment will be updated at least once during the project period as a means to measure impact achieved through project activities on the CIEE of Pakistan.

87. Accordingly, capacity of national and regional institutions and key associations of CIEE to host and support the Cleantech programme will be built. Capacity building activities will be organized concerning technical and administrative needs according to the result of the CIEE assessment. The target will include relevant national and local governmental officials and staffs as well as other market players such as project developers, enterprise executives, startups, government officials, operators, current users of waste, waste collection and management companies etc. on integrated solution.

88. The pool of experts that can act as mentors and judges for the Accelerator will be a valuable asset for building a robust national cleantech innovation ecosystem. The capacity building activities including trainings and workshops will produce a critical mass of informed actors that will trigger further clustering of the innovative thinkers as well as to create evidence based decision making models for the responsible and key post holders in the organizations. Therefore, the project will maintain a community of mentors and judges that can positively influence the cleantech innovation initiatives of Pakistan beyond the scope and timeframe of the project. It will also seek to establish a robust network

with national financial institutions and funds to raise awareness and sensitize various stakeholders on the opportunities and risks associated with cleantech products. Based on the stakeholder meetings/feedbacks, studies could be focused on measures to enhance CGPI impact through policy interventions and scale-up/replications.

89. In addition, clean technology and innovation hubs at regional levels will be established and integrated into national platform in alignment with Clean Green Pakistan Index (CGPI) while including all the key stakeholders. CGPI will provide the technical support to provinces in upgrading the existing solid waste management systems and introduction to clean technologies. The platform, by integrating the regional hubs and in alignment with CGPI, will identify the gaps and solutions up taking clean technologies.

90. These regional hubs are assumed to sustain support to local governments on promoting clean technologies at municipal levels, even after project ends to ensure sustainability. Through the regional hubs, the workshop, showcasing, exhibitions and other related events will be conducted appropriately in the CGPI cities (CGPI ranking criteria will be used) to create ecosystem and networking.

### ***2.1.2 Policy and regulatory recommendations to enhance the clean technology innovation and entrepreneurship ecosystem are developed at local level under consideration of gender equality***

91. Policy and regulation remain as a key determinant that influences cleantech market and investment behavior. Priority will be given to assisting national government in developing policies, regulations and incentives required to promote uptake of cleantech with a view to accelerate innovations in integrating renewable energy, energy efficiencies, and waste management. In addition, policy recommendations on regulatory framework on how to enhance the clean technology innovation and entrepreneurship ecosystem will be developed and presented to local authorities.

92. For the purpose of preparing policy recommendations, multi-stakeholder policy dialogues will be facilitated by MoCC to prompt discussion and collaboration among policy makers and other cleantech ecosystem actors under consideration of gender equality, and to influence the policy that can create a conducive environment for commercialization of cleantech solutions. The dialogues will be captured and reflected in the policy recommendations as necessary and applicable which will be presented to relevant government ministries and agencies.

93. The project will also assist in reviewing the policies and regulations relating to the promotion of clean energy technologies, innovation and entrepreneurship. The review will be done to identify the gaps and recommendations which would result in creating enabling conditions for renewable energy, energy efficiencies, and waste management within the context of material, energy and resources sustainability and circularity.

94. The related policies and regulations will include those promoting the clean energy technologies of the selected categories in SMEs including small scale waste to energy technologies and those governing the protection of intellectual property rights, agreements on sponsorships, roles, responsibilities, and rights of different stakeholders. The review will be guided by the approach applied in the evaluation of Pakistan's national research and innovation as part of the National Solid Municipal and Industrial Waste Management and Utilization Policy.

95. Special efforts will be made to formulate policies that would aim at involving women entrepreneurs and mentors in the Cleantech programme. For this purpose, a gender mainstreaming action plan operationalized under Output 3.2.3 will also be taken into account.

96. In addition, based on the experience gained through GCIP Phase 1 in Pakistan as well as the global GCIP framework, best practices for promoting clean technologies will be identified with specific focus on renewable energy, energy efficiencies, and waste management in the context of low carbon and circular economy to identify and establish the synergies.

97. Under the leadership of the MoCC as well as in a process of wide consultations with alumni and relevant national CIEE stakeholders, a roadmap will be prepared to guide a long-term implementation of the policy recommendations, also beyond the project timeline, especially for the effective and sustainable innovative clean technology ecosystem for low carbon and circular economy.

### ***2.1.3 Linkages, collaboration, and synergies across CIEEs are promoted***

98. In order to support the ability of the accelerator alumni and the coaches, judges and mentors, activities to gather, share lessons learned, and realize synergies, an alumni network will be established and actively supported by the NEE. Activities will be executed in conjunction with the web-based

knowledge management platform under Output 3.1.3 and establish online tools and the maintenance of the platform for the alumni network to gather, share, and correspond. National networking will further be strengthened and expanded by enabling the Pakistan's alumni network to gather with other stakeholders at national, related regional and international events

99. Public Private Partnership Forums will be held annually for facilitating ecosystem connectivity towards raising investment and partnership with the public and private sector organizations. These forums such as Pakistan Business Council, Pakistan Innovation Fund, etc. will be approached to hold special sessions to find ways and means to support cleantech innovation activities. An innovative B2G circular economy model is to be elaborated and developed including effective measures for waste management and utilization systems of for solid municipal and industrial waste.

100. At the regional and global levels, Pakistan cleantech SMEs and key ecosystem players will be invited to participate in the events organized under the global GCIP framework, including the global GCIP Forum organized in and for GCIP partner countries around the world. The GCIP Forum will bring selected finalists of the global and national Accelerators together for recognition and awards, and for opportunities to be connected with potential partners, customers, technology scouts and investors from around the world. Importantly, the GCIP Forum will also serve as a platform for innovation showcasing, and investment matching, and will be an important annual milestone for networking, advocacy, and knowledge exchange among CIEE players. The GCIP Forum will not be a stand-alone event, but it will be organized on the margins of highly visible global gatherings, such as for example the UNFCCC COP, Cleantech Group forums, etc.

101. In addition, participation at annual events such as the Cleantech Forum Asia, the Asia Clean Energy Summit and the Asia-Pacific Climate Week events will enable the Pakistan's alumni network to enhance dissemination of best practices and enhance their exposure to international investors. Furthermore, regional cooperation will be promoted and formalized between the Pakistan accelerator programme and other GCIP CIEEs in the region (e.g., with Indonesia and Cambodia). Particular attention will be given to garnering participation of successful women entrepreneurs in the programme to promote gender equality and the empowerment of women through involvement of role models.

***Outcome 2.2: Gender equality is supported and strengthened by the CIEE in Pakistan***

102. The project aims to strengthen gender equality within the Pakistan's CIEE with the intention to create more opportunities for women entrepreneurs. Drawing upon the successful practice under the GCIP Phase 1, specific efforts to include/empower women entrepreneurs will be implemented with a view to tap underutilized group's potential to accelerate cleantech innovation while addressing the important proven linkages between achieving environmental sustainability, gender equality, and women's empowerment.

***2.2.1 Women's cleantech hub/network established to support and accelerate the formation of local innovation ecosystems in a more inclusive manner***

103. In conjunction with the output 2.1.1, clean technology and innovation platforms will incorporate gender mainstreaming by establishing cleantech hub/network for women with a view to support and accelerate the formation of local innovation ecosystem in inclusive manner. With a view to reflect different needs and opportunities which are relevant to women, research and analysis will be conducted in conjunction with gender mainstreaming action plan operationalized under Output 3.2.3. The women's hub/chapter/network platform will function as a key vehicle for promoting women's involvement into the project by identifying and facilitating relevant stakeholder groups which are invited to provide their views on implementation of clean technology solutions within the context of material, energy and resources sustainability and circularity.

***2.2.2 Mentoring programme for women implemented***

104. In conjunction with Output 1.1.2, a mentoring programme specifically targeting women will be conducted. The programme will be elaborated to engage women entrepreneurs, associations and gender focal points to participate. Therefore, the design of the programme will take into account the output of a gender- mainstreaming action plan operationalized under Output 3.2.3. Based on the action plan, specific needs of women towards including in cleantech ecosystem in Pakistan will be identified and addressed through the programme. Engagement of women-focused institutions (e.g. women chambers, women universities, etc.) will be pursued.

105. A pool of woman experts with the knowledge and connections to support cleantech innovations towards commercialization will be developed with a view to further enhance sustainability of the cleantech ecosystem in Pakistan by addressing the inclusiveness of the action.

### ***2.2.3 Campaign conducted to raise awareness on roles of women in CIEE***

106. In order to promote gender dimension of the project, campaign will be conducted to enhance awareness on women role models in the cleantech ecosystem. This will be based upon the successful practices of GCIP Phase 1 in Pakistan as well as the global programme where several existing role models were featured. The campaign will include, among others: development of targeted promotional material e.g. documentation, print, video and other electronic media; success stories through social media; etc.

### **Component 3: Programme coordination, monitoring and coherence**

107. The activities under Component 3 are aimed at ensuring that the achievements of the Pakistan accelerator programme are alignment and coherent with other GCIP country projects under the global GCIP framework. To this purpose, the project executing entity of Pakistan accelerator programme is expected to collaborate with the GCIP Global through the global GCIP project executing entities (PFAN, NGIN, CTG, UNIDO), as well as to contribute to information gathering, knowledge sharing, and dissemination efforts.

### ***Outcome 3.1: Efficiency and sustainability of the CIEE in Pakistan is ensured***

108. The Pakistan accelerator programme will be implemented in coherence with the global GCIP framework. As such, it will link the CIEE of Pakistan to the global network of CIEEs in other GCIP partner countries, as well as it will receive support from the GCIP Global programme. In alignment with the under the global GCIP framework, efforts are streamlined and reflected in common impacts (cumulative GHG emission reductions, investment mobilized, and other environmental and socio-economic impacts achieved). Therefore, mutual benefits will be created between the GCIP global framework and individual country's efforts based on sound coordination and coherence mechanisms among the countries involved.

### ***3.1.1 The internal guidelines for project management teams are adapted for Pakistan's country context and implemented***



109. To maintain coherence of the approach across multiple countries, the internal guidelines for project management teams will be developed and disseminated by UNIDO, including 1) operational guidelines for the Project Management Unit (PMU) to be established within MoCC, 2) a sustainability and exit strategy framework to be developed in the first year of project implementation, and subsequently shared with the national PEEs for review and adaptation, i.e. for development of the sustainability and exit strategy. The operational guidelines will cover: a general introduction to the Framework, including explanation of organizational roles; description of communication channels between Pakistan and the GCIP Global; information on risk management and data protection; a list of foreseen activities to be available from the GCIP Global; introduction to the IT management of the web platform; environmental/social management principles, as well as gender mainstreaming and ESSPP principles to be applied by the PMU in the course of project management. In addition, annual meetings for national PEE representatives will be organized to offer a platform for training and exchange of experiences/insights related to the implementation of the internal guidelines.

***3.1.2 Programme-level knowledge management, communication and advocacy strategy is adapted for Pakistan`s country context and implemented***

110. To facilitate this exchange, a knowledge management, communication, and advocacy strategy framework will be developed by UNIDO with a particular focus on: 1) Promoting visibility of accelerator programme and communicating its impacts achieved at national and global levels aligned with the GCIP Global framework; 2) Increasing awareness of the catalytic role of cleantech in addressing climate change and environmental issues; 3) Showcasing cleantech innovations from the alumni and enhancing their visibility and credibility

111. The knowledge management, communication, and advocacy strategy framework will be shared with the national executing entity for review and adaptation to the needs of the country. As a result, the knowledge management, communication, and advocacy strategy of the Pakistan accelerator programme will be developed.

112. In line with the knowledge management, communication, and advocacy strategy framework, the national executing entity is expected to provide briefing sessions, press releases, social media presence and advertising, all of which will be targeted at different audience groups, with a special attention to the needs of women and youth. These activities will be supported by partners, including local entrepreneurs, celebrities, alumni, relevant service providers (e.g. patent attorneys, accountants), university departments and societies (e.g. engineering, entrepreneurship and energy clubs), organizations that are in frequent contact with cleantech entrepreneurs (e.g. trade groups, entrepreneur groups), and investors (e.g. venture capital funds, angel networks).

### ***3.1.3 The web platform is operated for the project to maintain the cleantech community***

113. A web based knowledge platform will be established and maintained which will act a one-point solution for all the information as well as progress of different cleantech projects. This platform will act as the cluster helping desk on clean technologies, to make a robust interacting and interactive vehicle for all actors to share the information on technical resources and financial/investment opportunities for cleantech innovation with the following key functions.

? For internal management and operations .Guidelines, tools and other knowledge products developed will be disseminated through the web platform.

? For execution of annual accelerators to be used from the beginning of the accelerator cycle (e.g. call for application and receipt of applications), and during the accelerator (e.g. webinars, submission of assignments, etc.)

? For connecting national ecosystem players .All alumni enterprises, as well as certified mentors and coaches will be invited to join the online community as a networking tool .Profiles and impact potential of each supported cleantech solution will be showcased through the web platform .Therefore, it will serve as a gateway for potential investors and customers to collect information on alumni enterprises.

114. The web platform will capture policy briefs, impact reports, brochures, webinars, and other types of promotional materials Information will be disseminated through events, social media channels, trainings, workshops, etc. as appropriate.

115. In addition, the website to the global web platform to connect Pakistan to the broader cleantech community globally. The web platform for the project will be designed and developed in conjunction with the guidelines and templates aligned with the GCIP global framework, to reap benefits of the plug-and-play approach of GCIP and to maximize synergies and efficiencies of linking with other GCIP partner countries.

***Outcome 3.2: Impacts and progress of all the project activities and indicators are adequately monitored and reported***

116. The monitoring of project impacts and progress is essential for the adequate and timely delivery of results. This project component covers project monitoring and oversight by UNIDO in close coordination other relevant stakeholders. Initial activities under this component include the definition of progress and impact indicators and the design of a detailed monitoring plan and methodology.

### ***3.2.1 National impact monitoring established in coordination with MoCC***

117. The project will incorporate general approaches hired under the global GCIP framework project (10408) where the GCIP methodology for impact assessment will be developed. The methodology will ensure a shared understanding of cleantech associated terminology amongst all involved stakeholders and will allow for extrapolation and comparison. It will also ensure that the project's impact is clearly understood and can be used for programme and management decision making. As a minimum, tracking will include global environmental benefits (GEBs), energy saved, additional renewable capacity installed, job creation and investment leveraged. Data will be gender-disaggregated where appropriate and data on youth participation will also be recorded. This common methodology will be used to monitor the project impact in Pakistan.

118. PEE and its partners will receive online training on the use of the methodology from UNIDO and subsequently they will train all semi-finalists across the programme (as part of the Accelerators) to provide GEB estimations of their innovations, using the training module developed. This will further allow the programme to show impact on a global level.

119. Dedicated resources will be assigned to track and monitor the business growth, social and environmental impact of the alumni enterprises in Pakistan. Alumni will be expected to periodically provide relevant data to the national organization for a period into the future, when the impacts will be primarily felt, and can be quantified and verified. The data will be used to create a Pakistan Project Impact report and content for promotion and advocacy purposes (news articles, social media posts, brochure and leaflets, videos etc.) that are tailored to diverse types of audiences (investors, national government agencies, donors, students). This will benefit the alumni enterprises by providing increased credibility and visibility. Monitoring data will be shared with the global GCIP framework project (10408), to consider consolidated impact of cleantech accelerator approaches as a global initiative.

### ***3.2.2 Project effectively monitored including monitoring and reporting on the ESMP and risks***

120. The monitoring of project progress is essential for the adequate and timely delivery of results. A detailed monitoring plan for tracking and reporting on project time-bound milestones will be prepared by UNIDO in collaboration with NEE and project partners at the beginning of project implementation and then periodically updated. NEE will prepare progress review reports every six months. Environmental and Social Safeguards Policy and Procedures, global environmental benefits (GEBs), energy saved and increase in installed renewable energy capacity, job creation, as well as gender dimensions and baselines for gender related targets (to be outlined in and aligned with the Gender Mainstreaming Action Plan operationalized under Output 3.2.3), will be captured appropriately in the M&E plan and reported on in the progress review reports and PIRs, and in the collection and assessment of relevant data. Further details of the M&E are provided, along with a budget, in the Section of 'Monitoring and Evaluation' below.

### ***3.2.3 Gender mainstreaming action plan operationalized, monitored and gendered impact evaluated***

121. In order to mainstream the gender dimensions, detailed gender analysis including gap analysis will be conducted during the PPG phase by hiring a gender expert based on which a detailed gender action plan will be developed and operationalized throughout the project implementation to support project contribution for enhancing gender equality and women's empowerment (GEEW). Efforts will be made to ensure that voices of both women and men are considered when discussions are held. As necessary, gender-disaggregated focus group meetings will be organized so that both men and women can lead, shape, participate in, contribute to and benefit from the project through mutual knowledge sharing. The operationalization of the action plan will be monitored and evaluated according to data and indicators incorporating gender dimensions including sex-disaggregated data collection, performing gender analysis, etc.

### ***3.2.4 External mid-term review and independent terminal evaluation conducted***

122. An external mid-term review will be conducted halfway through the project implementation period. An independent terminal evaluation will be conducted six months prior to the terminal review meeting. The final evaluation will look at the impact and sustainability of results, including the contribution to the capacity development and the achievement of global environmental benefits. An independent terminal evaluation will also provide recommendations for follow-up activities.

123. The project monitoring will support MoCC in evaluating the performance and progress of cleantech accelerator competition itself on the project level and to enhance the project impact during scale-up/replications activities.

#### **4) Alignment with GEF focal area and/or Impact Program strategies**

124. This project is firmly aligned with the objectives of the GEF-7 Climate Change Focal Area Strategy CCM 1-4, "Promoting innovation and technology transfer for sustainable energy breakthrough?". This project seeks to foster private sector engagement in accelerating the uptake and investments in innovative cleantech solutions at scale. The project prioritizes cleantech innovations in the domains that are fully aligned with GEF 7 priorities i.e., electric drive technologies and electric mobility, accelerating energy efficiency, decentralized renewable energy power with energy storage, and cleantech innovations related sustainable cities and sustainable food systems. Therefore, the project is a transversal intervention that supports all priorities of GEF 7's Climate change focal area.

125. The proposed project supports cleantech innovation and entrepreneurship in Pakistan so that they commercialize and scale-up their operations thereby delivering climate and sustainable solutions that reduce GHG emissions while accruing other benefits. By fostering commercially viable solutions, the project will have lasting positive effects on the global environment, as well as on development of a dynamic and vibrant markets for clean technologies creating new industries and green jobs locally and globally. This will be done through provision of much needed and best available catalytic technical assistance to cleantech SMEs. The project will ultimately promote establishment of sustainable innovation ecosystems for small and medium-scale enterprises and startups in the country.

126. By strengthening partnerships with the private sector interested in investing in clean technologies and contributing towards upscaling missed opportunities for green economic growth and green jobs, the project seeks to address existing barriers for entrepreneurs to fully commercialize their innovative products and exploit untapped potential especially in promoting clean technologies within the context of material, energy and resources sustainability and circularity. The potential scope of interventions will include waste recovery and waste to energy in major cities of Pakistan as well as the sustainable use of natural resources while reducing GHG emissions.

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

127. The private sector is key to the creation and expansion of the market for cleantech products and services, achieving GEBs, generating jobs, and supporting economic growth. In Pakistan, a clear government prioritization is given to promote innovations and start-ups/SMEs and to put the necessary policies and strategies in place. However, significant barriers still exist for cleantech enterprises, leading to their very low success rate. In essence, the CIEE in Pakistan is weak, and if the GEF funding is not provided, it is very likely that cleantech innovations will not be adequately developed in Pakistan in the near future. This will result in many unrealized opportunities in reducing GHG emissions, in strengthening partnerships with the private sector keen on investing in cleantech, in commercialization of cleantech enterprises, and ultimately in missed momentum for green economic growth and jobs.

128. This project aims to go beyond the current baseline. As discussed in the baseline section includes SMEs with breakthrough cleantech innovations in developing markets having a very low success rate due to lack of key skills and capacities to transform their innovations into viable, scalable, and fast-growing enterprises. Furthermore, the innovation and entrepreneurship ecosystem Pakistan can be hostile and initiatives to support these SMEs remain disjointed and uncoordinated. This project has been designed to learn from GCIP supported under GEF 5 & 6, to create opportunities for greater impact through providing greater commercialization support and investment facilitation services to expand opportunities for market expansion. This project is designed to provide catalytic and effective interventions that galvanize private sector interest and investments in the cleantech innovation and entrepreneurship space and also strengthen the national cleantech innovation and entrepreneurship ecosystem and connect it at a global level. These interventions, create a critical mass of interest in the cleantech sector, drive the transformation cleantech markets and result in more cleantech SMEs contributing to climate change mitigation and low-emission development.

129. Building on the baseline, including GCIP under GEF 5 & 6, the project will:

- a) adapt and institutionalize methodologies, guidelines, tools and training systems for the accelerator, advanced accelerator, and post-accelerator support and for mentors, judges, trainers to be trained and certified in Pakistan. This will ensure that the country will continue to run the accelerators long after the GEF project has ended.
- b) provide post acceleration support and investment facilitation services so that cleantech innovators from this will be able to commercialize their innovation and mobilize funding for scaling-up.
- c) increase focus on developing policy and regulations on cleantech innovations at national level

- d) participate in global events around the global competition-based accelerator such as dialogues, investor networks to promote networking and learning
- e) create bigger market opportunities for cleantech innovators to expand their businesses and hence increase their success rates and reduction of more GHG emissions.

130. Furthermore, the link to the UNIDO/GEF program 10408, Pakistan's cleantech ecosystem will benefit from cross-border connectivity and synergies with ecosystems of other GCIP partner countries, leading to bigger market opportunities for Pakistani cleantech SMEs to expand their businesses and hence increase their success rates and results in greater GHG emission mitigation efforts. One of the many incremental services that the project provides (through its linkages to the global framework) is access to global investors. As an estimate, evidence from GCIP under GEF 5& 6 shows that some GCIP alumni were able to mobilize global funding and expand their operations. From Turkey, Episome Biotech (2017 semi-finalist) raised ?1.7million in investment through 3 rounds from Diffusion Capital Partners based in The Netherlands; Seyisco raised USD 100,000 and B-Preg and Solter Vision also raised foreign capital. Actual figures are not yet available as to the level of increased GHG emission reductions achieved as a result of the international funding, but the global funding allowed B-Preg (bio-composite parcel shelves) to expand internationally and they now estimate annual emission reductions of 4180 tCO<sub>2</sub>e/year and growing. Similarly, Solter Vision (remote PV plant analysis) now estimates annual emission reductions of 15,300 tCO<sub>2</sub>/yr and Seyisco (efficient pot hole filling) already estimates 826k tCO<sub>2</sub>e per year saved. Episome (biotech) has the potential to reduce GHG emissions by 40 million tonnes/year once expanded globally. Therefore, SMEs with innovative cleantech solution can rapidly expand their businesses by accessing international financing opportunities and simultaneously rapidly expand global environmental benefits.

131. The GEF funding of 1.77 million US\$ is estimated to catalyze co-financing of 10 million US\$ from both public and private sectors which are interested in promoting clean technologies within the context of material, energy and resources sustainability and circularity, which contribute to GHG emission reductions. The project activities are regarded as opportunities for growth in the sector. The GEF resources will be used to bring best practices and international expertise to capacity development efforts. The project will support at least 85 entrepreneurs among which at least 12 solutions will receive investment facilitation services, so that they reach financial closure and market expansion; none of which would be achieved without the project . In addition, through national ecosystem strengthening activities, the project will create basis for enhancing awareness and visibility of business and investment opportunities in the cleantech sector, thereby prompting further interest and financial flows.

132. The MoCC is responsible for fostering implementation of country's climate change mitigation actions. In addition, the project will work with already existing funds, institutions and programme as mentioned in the baseline section and develop targeted capacity building activities to

which GEF will bring experiences from cases from other regions. By channeling with the regional hubs through NICs the project will enhance outreach of its activities throughout the country including women and youth.

133. Pakistan is requesting GEF funding to help address the barriers to cleantech innovation, which will lead to positive socio-economic (economic growth, green job creation, attraction of foreign and domestic investment, etc.) and environmental (contribution to the reduction of GHG emissions and to global environmental sustainability, etc.) impacts. What is more, these impacts will be amplified through opportunities for coordination and connectivity with other GCIP partner countries, and thus for global cleantech innovation scale-up.

134. Pakistan requires further incremental technical and financial assistance from GEF in strengthening the local innovation ecosystems through establishment of local hubs in selected regions in Pakistan. Targeted support will aim at strengthening the local institutional capacities, supporting the formation of local innovation ecosystems around priority sectors and industries related to renewable energy, energy efficiencies, and waste management, and promoting innovative cleantech solutions for long lasting positive effects on environment and socio-economic benefits by enhancing economic green growth.

135. The GEF grant will stimulate the formation of local innovation ecosystems and will leverage additional sources of funding by private sector sponsorship, existing institutional resources, and funding mechanisms. The identification of local cleantech solutions through the operation of regional accelerator programs will provide tailored services for local environmental benefits with global GHG emission savings benefits. These locally identified solutions will be scaled across Pakistan through the national platform and linked to global markets through the Global Cleantech Platform to leverage allocated funding sources and maximize global environmental and climate mitigation benefits. This project will seek to catalyze systemic transformation in the cleantech sector by providing post-acceleration support services so that more cleantech SMEs commercialize their innovation and scale-up their operations. By employing an ecosystems-based approach, the project will stimulate cleantech ecosystems at provincial levels that will provide support to cleantech SMEs in the long-term. The project will build capacity of regional institutions and train a cadre of cleantech experts who will continue to support cleantech start-ups.

136. If GEF funding is not provided, it is very likely that clean technology innovations for clean technology solutions will not be adequately developed in Pakistan (or only at a very low levels). Cleantech enterprises will continue to lack key skills on transforming their innovations into enterprises. Furthermore, investment will not be accrued for the cleantech enterprises for expanding



their businesses. This will result in the loss of opportunities for green growth in the country where GHG emissions will continue to increase due to the economic development and increasing population is yet to be expected.

**6) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)**

137. The long-term lifetime of cleantech innovations introduced in the market and the strengthened and interconnected CIEE will be reflected in multiple GEBs including, primarily, GHG emission reductions. The GEBs achieved through the implementation of this project will be identified and quantified on the basis of the innovations marketed and their uptake. Given the nature of the project, the low-carbon products and services developed and commercialized will contribute to the GEBs beyond the project life and scope.

138. A ten-year horizon was selected for estimating the GHG emission savings. However, assessing a priori the GHG reduction potential of cleantech solutions (products, services) to be identified through accelerator program has proven to be difficult, as by definition accelerator program encourages open innovation, and the types and categories of cleantech products and services that will be supported can only be determined after the selection of semi-finalists as part of the Accelerator in Pakistan. Also, expected difficulties include attribution of the incremental GEBs of the cleantech solutions to the Pakistan accelerator programme.

139. A GCIP methodology for the calculation and monitoring of GHG reduction potential will be developed by the GCIP Global, as well as it will be shared with all GCIP partner countries to enable coherent approach. In order to ensure that the desired GEBs are cumulatively delivered at the GCIP programme level, appropriate measures will be applied across the programme. The project will align itself with the methodology while taking into account of the project and country specific context. By doing so, it will entail placing a benchmark for the estimated GEB to be delivered by the cleantech innovations at the Pakistan accelerator application stage, so that only solutions with sufficient impact potential are supported. If the projected GHG emission reduction does not meet the minimum requirement set, the innovation will not be accepted into the Pakistan accelerator programme. To facilitate the achievement of GEBs, there will be awareness raising and promotional activities during the call for applications to the Pakistan accelerator programme, and also the applicants will be supported in calculating GHG emission reduction potential of their innovations. Additional training on GHG monitoring and calculation will be provided to all semi-finalists.

140. The target of between 5 to 10 USD/tCO<sub>2</sub>e avoided, that is set for the GCIP Framework, translates into avoided GHG emissions per enterprise of between 1,800 to 3,600 tCO<sub>2</sub>e. The provided target range will enable the Pakistan accelerator programme to support a mix of technologies with

different CO<sub>2</sub> emission reduction potentials, and in particular allow innovations into the Pakistan accelerator programme that a) have a relatively low CO<sub>2</sub> reduction potential, but a considerable demand and market growth potential (that can lead to amplification of GEBs), as well as b) that create multiple benefits (including socio-economic, such as job creation, gender mainstreaming, etc.). The three cycles of Pakistan accelerator programme are expected to support at least 85 enterprises (semi-finalists), as a result of which, based on the above benchmark, the avoided direct GHG emissions over a ten-year horizon are estimated at between 153,000 tCO<sub>2</sub>e and 306,000 tCO<sub>2</sub>e. Please note that the lower range has been used as input to the GEF corporate core GHG indicator target (indicator 6) as a conservative estimation.

141. To define the minimum target and the range for CO<sub>2</sub> emission reduction potential, a review of previous GCIP alumni? GHG reductions was carried out. The review demonstrated a huge likely variety of emission reduction potentials due to the different country contexts and cleantech types. Also, it confirmed that, where a cleantech innovation has real market potential, the avoided GHG emissions can be very significant, and that the GCIP has a proven experience in successfully identifying and accelerating such innovations. The review was based on three sources of information. Firstly, a survey carried out by UNIDO of 14 of its GCIP alumni showed that these companies had already generated 600,000 tCO<sub>2</sub>e savings by 2017 and projected to generate over 4.8 million tons of GHG emission savings by 2020 (or 340,000 tCO<sub>2</sub>e/year per company). Secondly, the Independent Evaluation Office (IEO) report of eight GCIP projects included a sample of alumni in its annex with projected avoided emission between zero (either they had not been estimated yet or the cleantech was not related to CCM) and 5 million tCO<sub>2</sub>e per year, being a very broad range. A median for emission reductions that were reported (which occurred only for a small proportion of the total alumni, namely 60 out of 900) is 88 tCO<sub>2</sub> per year. If alumni with estimated reduction are included (34) in the calculations, then the median increases to 12,200 tCO<sub>2</sub>/year with the interquartile range from 350 tCO<sub>2</sub> to 81,000 tCO<sub>2</sub>/year. Thirdly, the Mission Innovation Framework for Assessing Avoided Emissions, in which a number of GCIP alumni (selected as part of Mission Innovation?s 100 innovative clean energy solutions in 2019) were included, shows for example that Atomberg Technologies (which manufactures an energy efficient fan) is estimated to avoid 5 million tCO<sub>2</sub>e/year by 2030. In turn BEAD, an energy management AI optimization enterprise, is estimated to avoid 319 million tCO<sub>2</sub>e/year by 2030. These two companies were also covered by the IEO report mentioned above, but Atomberg had not provided an estimate (so was assumed zero) and BEAD?s estimate was 5 million tCO<sub>2</sub>e/year.

142. Since the project will target cleantech solutions integrating renewable energy, energy efficiencies, and waste management within the context of material, energy and resources sustainability and circularity, avoided methane emissions from waste sector are also expected. The potential additional global environmental benefits from waste management measures leading avoided methane emissions will further be clarified during the PPG phase taking into account of the site and technology specific information. For the purpose of ensuring ex-ante estimation and ex-post monitoring of GHG emission reduction, the selection criteria will be developed considering the feasibility of tracking indicators for calculating emission reductions.

143. What is more, indirect GEBs facilitated through the CIEE strengthening are also expected. In particular, indirect GHG emission reductions could result from: strengthened capacity of institutions and human resources to support commercialization and uptake of cleantech solutions at large; investments mobilized for cleantech solutions at large due to reduced risk perceptions; as well as longer-term emission reductions from behavioural change. An estimated factor of 5 is chosen to provide a projection for indirect GEBs. This equates to estimated indirect emissions for Pakistan of between 765,000 tCO<sub>2</sub> and 1,530,000 tCO<sub>2</sub>e. Where possible, efforts will be made to verify the indirect GHG emission reductions achieved in the framework of M&E activities.

144. In addition, other environmental and social co-benefits are also expected to result from this project. These are likely to include reduction in waste in the environment, reduction in air pollutants (e.g. NO<sub>x</sub>, SO<sub>x</sub>, PM and CO) and bad odor, improved water quality, reductions in material use, avoid land pressure problem in urban area, improve energy security and access to clean and sustainable energy, promote circular economy, compliance with laws and regulation, improving living conditions, health & hygiene of population specially poor communities, quality of employment including income generation and jobs creation. These additional benefits are considered during the accelerator and tracked if any as per the selected technologies and innovations.

## **7) Innovation, sustainability and potential for scaling up**

### Innovation:

145. The project is unique in its approach of fostering the expansion of SMEs and startups into cleantech products and markets. From the assessment of the current policy framework and the identification of innovative technologies to their development and commercialization, the project supports entrepreneurs across the whole innovation value chain to develop demand-driven and investment-ready climate solutions integrating renewable energy, energy efficiencies, and waste management within the context of material, energy and resources sustainability and circularity, that will have a real impact in Pakistan and global markets. In contrast to other accelerators and incubator programmes, the project not only promotes innovation per se but also uses an innovative approach that is cross-sectoral and multi-tiered to strengthen the national innovation and entrepreneurship ecosystem by building capacity in national institutions, creating strong linkages between the most relevant ecosystem players and by raising awareness among them.

### Sustainability:

146. The impact pathways of the project are carefully selected to address key barriers and galvanize continued actions by ecosystem players so as to achieve transformation impact in terms of GHG emissions reductions and job and wealth creation in Pakistan. The mainstreaming of cleantech innovations that will continue beyond this project will ultimately result in the decoupling of economic growth from GHG emission increase.

147. The sustainability of this project is ensured by involving public and private sector institutions and by building their capacity to make sure that the activities under the different components can be carried out by them after project closure.

148. Besides, the comprehensive trainings conducted for participants, judges and mentors will create a critical mass of technicians with sound business skills in different regions of the country. This knowledge can be easily transferred to create a virtuous cycle of enhancing the cleantech ecosystem to identify and support innovations through business growth and towards commercialization.

149. Knowledge management is seen as a key enabler for ensuring sustainability of the project. Among others, the project will create opportunities for strengthening the knowledge sharing through organization of series of trainings, workshops, roundtables, expert group meetings, printing materials and through the Cleantech platform. These activities are conducted in conjunction with a set of outreach activities to enhance their impact within the country and beyond. Moreover, the project will develop a knowledge management, advocacy and communication strategy. The strategy is to support the creation of strong networks and the effective communication channels among the cleantech ecosystem actors, and their sustained interactions and networking post project closure.

150. The project will closely work with the proposed executing partner and associated agencies to strengthen its institutional capacity in order to effectively absorb the knowledge and technical capacity created by the project activities.

151. Strengthening the capacity within the project executing entity (PEE) to conduct the national accelerator with public and private funding post project closure will ensure sustainability of the project's impacts, as shown through previous GCIP partner countries. Sustainability and exit strategies will be developed and adapted for Pakistan, learning from previous and existing relevant activities. The sustainability of the project is reinforced by the following:

- ? During and post the Pakistan Accelerator the cleantech SMEs will be guided through the development process of the concepts to ensure that their innovative concepts are sustainable and will have a real impact on the Pakistani market. To ensure that this intensive mentoring approach is sustained beyond the project implementation period, the project will conduct capacity building activities for the national counterpart institutions, mentors and judges in the country;
- ? Through investment facilitation, cleantech SMEs will be able to mobilize funding and investments from angels, impact investors and other sources of finance;
- ? By generating and using methodologies, guidelines, tools and training materials for competition-based accelerators, the project will ensure that institutions and industry associations engaged in running the accelerators will have adequate resource materials to use in running such accelerators beyond the life of the programme;
- ? By linking cleantech innovation ecosystems across countries, the project will create a business environment and incentives for cleantech SMEs, policymakers, and industry associations to work across countries. This will be sustained through these stakeholders investing their own resources in these activities beyond the life of the programme;
- ? Through the establishment of a web platform, where cleantech SMEs alumni and stakeholders will continue to update and use as a market place where global technology innovation ecosystem players will continue to post innovations, investors will continue to scout for new innovations, policy makers and regulators will continue to use to learn about policy and regulatory innovations. In fact, the web platform, will catalyze continued connectivity of innovation ecosystems from different countries;
- ? The management of knowledge generated from the project in terms of fact sheets, guidebooks, tools and reports on accelerating cleantech innovation. This will ensure that stakeholders will be provided with an continuous access to these tools and apply them to sustain the project approach;
- ? Strengthening national institutional capacity to ensure that the skills and experience are there to sustain the cleantech innovation platforms and run the accelerators beyond the GEF funding;
- ? Supporting the maintenance of standards in terms of accelerator processes and practices so as to ensure adherence to the highest quality of norms. Such norms will guarantee that the project will transform to a recognized brand, securing long-term sustainability.
- ? Development of long-term partnerships with the private sector which will form part of national exit strategy and guarantee continued funding of the programme.

#### Scaling Up:

152. While the Pakistan cleantech project is not a GCIP child project per se, it is implemented in alignment with the GCIP child projects under the global GCIP Framework (GEF ID: 10408). This will enable the country project to bear a considerable potential for local and regional expansion in terms of cooperation and networking, as well as sectoral expansion through close relationship with the GCIP child project countries in the region and across the globe. The stakeholders involved in the Pakistan accelerator programme are enabled to form international partnerships and to enter foreign markets. Through continuous expansion of countries connected, these opportunities are continuously augmenting.

153. The project will enhance the traditional cleantech accelerator approach according to identified limitations by including post-competition services like investment facilitation and commercialization services as well as by expanding to challenge based competitions, focusing on categories with higher environmental impact including sustainable cities, low-carbon energy systems while building up of resilience against emerging challenges such as COVID-19.

154. The commercialization services aim at complementing the training provided during the acceleration process to maximize the ability of each supported alumni to reach the commercialization stage. By providing support to alumni and other eligible cleantech innovators, the project is expected to effectively increase job creation, competitiveness, wealth generation and GHG emission reductions. It is also expected that the project will serve as a catalytic force to advance the cleantech innovation and entrepreneurship ecosystem in Pakistan as well as to coordinate and maximize the synergies with national and international relevant players.

155. The private sector, in their attempts to address existing energy challenges, will play an instrumental role in driving and sustaining innovation integrating renewable energy, energy efficiencies, and waste management. The project approach is premised on mobilizing economic interest by stakeholders who will sustain the interventions of the project beyond the life of the project.

156. In addition, the Pakistan cleantech project is expected to set building blocks for the country to advance its actions under the following GEF replenishment cycle especially in terms of integrating circularity concept into the policies, planning and actions which can deliver multiple environmental benefits across climate, biodiversity and chemicals and waste[49]<sup>49</sup>.

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[40] <https://pk.mashable.com/tech/10477/us-embassy-and-tie-organized-the-7th-edition-of-pakistan-startup-cup-competition>

[41] [https://www.thegef.org/sites/default/files/council-meeting-documents/EN\\_GEF.ME\\_C.55.inf\\_03\\_GEF-UNIDO\\_Cleantech\\_program\\_evaluation\\_2018.pdf](https://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.ME_C.55.inf_03_GEF-UNIDO_Cleantech_program_evaluation_2018.pdf).

[42] Independent Terminal Evaluation GEF UNIDO Cleantech Programme for Small and Medium Enterprises (SMEs) in Pakistan (2019) < [https://www.unido.org/sites/default/files/files/2019-05/GEF%20ID-5553\\_GFPAK-130063\\_TE-2018.pdf](https://www.unido.org/sites/default/files/files/2019-05/GEF%20ID-5553_GFPAK-130063_TE-2018.pdf) >

[43] PFAN website <<https://pfan.net/news/launch-of-the-pakistan-private-sector-energy-project-cooperation-between-usaid-and-unido/>>/

[44] <https://climatelaunchpad.org/countries/pakistan/>

[45] <https://www.genglobal.org/>

[46] <https://startup.google.com/accelerator/southeast-asia/>

[47] Digital Pakistan <<http://digitalpakistan.pk/home.html#Digital-Pakistan>>

[48] [https://www.unido.org/sites/default/files/files/2019-05/GEF%20ID-5553\\_GFPAK-130063\\_TE-2018.pdf](https://www.unido.org/sites/default/files/files/2019-05/GEF%20ID-5553_GFPAK-130063_TE-2018.pdf)

[49] GEF-8 Programming Directions (PREPARED BY THE GEF SECRETARIAT)  
[https://www.thegef.org/sites/default/files/council-meeting-documents/GEF-8%20Programming%20Directions\\_0.pdf](https://www.thegef.org/sites/default/files/council-meeting-documents/GEF-8%20Programming%20Directions_0.pdf)

Transfer of assets: Full or partial title and ownership of equipment purchased under the project may be transferred to national counterparts and/or project beneficiaries during the project implementation as deemed appropriate by the UNIDO Project Manager in consultation with project stakeholders.

Legal context: The Islamic Republic of Pakistan 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 2 July 1956.

## **1b. Project Map and Coordinates**

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

While the project is targeted at beneficiaries (entrepreneurs and all relevant CIEE stakeholders, such as universities, policy makers, financiers, and R&D institutions) from all over the country, the main project events will be conducted in the capital city of Islamabad. In addition, some outreaching and capacity building events will be held in specific provincial hubs at Lahore, Quetta, Karachi and Peshawar, that will anchor project activities around existing platforms and networks. The specific

locations of these hubs and functions are elaborated during the PPG phase. The project boundary will not overlap any other country's territory. The geo-coordinates and location are as following:

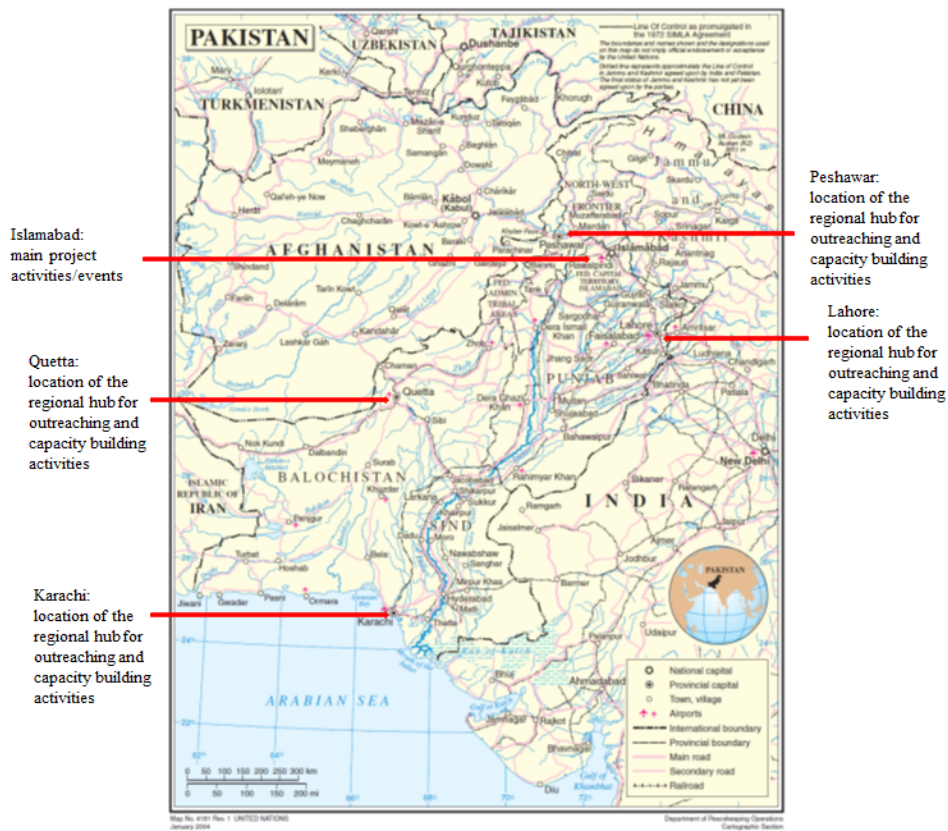
Islamabad 33.68992° S, 73.04510° E

Lahore 31.53736° S, 74.34555° E

Quetta 30.18684° S, 66.98436° E

Karachi 24.97904° S, 67.04886° E

Peshawar 34.18858° S, 71.50045° E



## 2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

**Indigenous Peoples and Local Communities** No

**Civil Society Organizations** No

**Private Sector Entities** Yes

**If none of the above, please explain why:**

**In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement**

157. In general, it is envisaged that cleantech enterprises are assumed to be interested in being involved. Due to COVID-19 related restrictions, in-depth stakeholder consultation with the private sector were limited. At this point, very initial consultations through MOCC, PIM, NIC, and RCCI were conducted to engage with the stakeholders for their possible interaction with the project especially from the perspective of how to align with and mutually benefit from the existing initiatives related to incubation support and accelerator program. Below table provides an indicative list of stakeholders to be engaged for successful implementation and execution of the programme. A detailed stakeholder map and engagement plan will be developed during the PPG phase, including roles and responsibilities of key stakeholders.

<b>Main Partner</b>	<b>Brief Intro and Role</b>	<b>Envisaged role in the project</b>
Ministry of Climate Change (MoCC)	The Ministry of Climate Change is a Cabinet-level Ministry of the Government of Pakistan concerned with climate change issues which is the GEF Focal Point and the chair of the Project Steering Committee. The project will take advantage of the Provincial Departments under the Ministry to reach out to private sector (Chambers of Commerce and Industry, big corporations, trade associations, etc.) as well as financial institutions (national banks, funds, etc.) allowing the project to actively engage with more ecosystem players in different regions.	MoCC will guide the overall strategic direction of the project execution. MoCC will be the secretariat of the Project Steering Committee (PSC) which will be established under the Chairmanship of the GEF Focal Point of the Ministry. MoCC will ensure the segregation of the function between chairmanship and secretariat within the Ministry.

<p>IGNITE (Formerly National ICT R&amp;D Fund)</p>	<p>The government of Pakistan has mandated that a certain percentage of gross revenue generated by all telecom service providers is to be allocated to development and research of information and communication technologies. The collected financial resources are managed by IGNITE which is mandated to transform Pakistan into a knowledge based economy by promoting efficient, sustainable and effective ICT initiatives.</p>	<p>IGNITE will be a member of the PSC and will incorporate the project approaches in its service portfolio after project completion guaranteeing the programme sustainability.</p>
<p>National Productivity Organization (NPO)</p>	<p>NPO is the sole government body undertaking productivity with quality initiatives in Pakistan. NPO fosters a productivity culture in public and private sector organizations by providing training, seminars, workshops, consultancy, release of index surveys, qualification certification, promotion of a comprehensive understanding of energy and the environment, research on productivities.</p>	<p>NPO under its Green Productivity Center will technically support project activities to actively promote green productivity in the industrial sector such as training, seminars, workshops, consultancy, release of index surveys, qualification certification, promotion of a comprehensive understanding of energy and the environment, research on productivities. Representative of NPO will be a member of the PSC.</p>
<p>Pakistan Council for Science and Technology (PCST)</p>	<p>The Council is an autonomous organization working under the umbrella of the Ministry of Science and Technology. The Council is responsible for advising the government on ST&amp;I policies, evaluating scientific research planning, conducting futuristic studies and promoting R&amp;D. As one of the executing partners, PCST will provide technical support to the policy component of the project.</p>	<p>The project will cooperate with PCST for determining the policies and direction of the science and technology in Pakistan. Representative of PCST will be a member of the PSC.</p>

<p>Pakistan Institute of Management (PIM)</p>	<p>PIM was established by the Government of Pakistan to promote management development in the country. It functions under the Ministry of Industries &amp; Production with an autonomous Board of Governors appointed by the Federal Government. PIM is a non-profit organization, and its financial requirements are derived from course fees, contributions from member organizations and government grants. It has been a recipient of technical assistance from many international agencies and is widely recognized at home and abroad as the country's leading management development institute.</p>	<p>As one of the executing partners, PIM will support the project to build capacity of public and private sector with its fully equipped training centers and faculty. Representative of PIM will be a member of the PSC.</p>
<p>Islamabad Chamber of Commerce and Industries (ICCI)</p>	<p>Islamabad Chamber of Commerce &amp; Industry (ICCI) has representation in government advisory committees and boards. Representatives of ICCI give recommendations to policymakers on various policy related matters for business development to increase local and foreign investment, to expand tax net, increase exports, etc. High government officials are invited at Chamber to discuss with them local issues of businessmen and to find solutions of highlighted matters with mutual coordination and collaboration.</p>	<p>As ICCI with national and international linkages, shall continue to enhance its leadership role by being proactive and providing quality services to its members and to act as a catalyst for rapid economic development in this region through promotion of trade, industry, services and development of youth entrepreneurship culture. Representative of ICCI will be the PSC member.</p>

<p>Rawalpindi Chamber of Commerce &amp; Industry (RCCI)</p>	<p>RCCI is a prestigious business association of Pakistan established in 1952 which facilitates the business community and plays the role in keeping economic activity alive. Besides conventional activities, one of our objectives is to promote startups and small businesses. RCCI has taken the initiative to be a part of global entrepreneurship week and business competition plan to facilitate youth in networking, developing stronger linkages with academia, assist the innovators and support the idea of entrepreneurship as a career opportunity. Moreover, RCCI is assisting small businesses and provide business development support services including capacity building, trainings networking and mentorship.</p>	<p>This project will be fully integrated with the Clean and Green Pakistan Programme (CGPM) initiative of Government of Pakistan, the representative of RCCI will be the member of PSC committee and support on project activities such as incubation, networking, mentoring, trainings and others.</p>
<p>National Incubation Center (NIC)</p>	<p>NIC is the Pakistan's largest tech incubator. It's a public private partnership between MOITT, Ignite, and Jazz &amp; Teamup. In 4 years since its inception, NIC has incubated over 220 startups creating an impact of over 10,000 jobs and over PKR 3 billion in revenues and investments committed to startups.</p>	<p>The representative of NIC will be the member of PSC and support in terms of mentors, judges, facility, etc. for the execution of the project. It has hubs in Islamabad, Lahore, Peshawar, Karachi and Quetta and project which will be utilized to enhance the outreach of the project.</p>
<p>Technology Development Fund (TDF)- Higher Education Commission (HEC)</p>	<p>HEC aims to facilitate the role of the institutions of higher learning in Pakistan to serve as engine of socio-economic development. One of its main functions is to support the development of linkages between higher education institutions, industry and national and international organizations that fund research.</p>	<p>Under its plethora of ongoing projects, HEC will support the project by funding its innovators' applied research projects, for prototype development and industrial value addition for technology development, through its Technology Development Fund. Representative of HEC will be a member of the PSC.</p>

<p>Innovators/ Entrepreneurs</p>	<p>Innovators/entrepreneurs will be the most important stakeholders and will be the main beneficiaries from the project's activities.</p>	<p>It is expected that alumni will keep actively collaborating in the project either by taking advantage of the post-competition services offered or by serving as mentors and ambassadors. Currently, there is a huge pool of national innovators available from first GCIP project.</p>
<p>GCIP Global Executing Entities (PEEs) ? NGIN, Cleantech Group, PFAN</p>	<p>Execution of the GCIP Global Child Project</p>	<p>Under the global GCIP framework there will be significant two-way interaction with the PEEs of the GCIP Global Child Project. This will cover the development of methodologies and guidelines for local adaptation, training material and capacity building, global advocacy, tools for coordination and coherence, international forums, support for Pakistan alumni, knowledge products and advice. Impact monitoring will be done in coherence among national and global projects while taking into account of country context.</p>

<p>Organizations which promote GEEW and gender focal points</p>	<p>HBL is a Pakistan's largest bank and was the first commercial bank to be established in Pakistan in 1947. Over the years, HBL has grown its branch network and maintained its position as the largest private sector bank in Pakistan with over 1,650+ branches and 2,100+ ATMs globally, serving 23 million+ customers worldwide. The Bank is a leading full-service commercial bank. The key areas of operation are Branch Banking, Corporate &amp; Investment Banking, Treasury, SME &amp; Rural Banking, Financial Institutions &amp; Global Trade Services, Transaction Banking and Islamic Banking.</p> <p>Katalyst Labs is a technology accelerator and innovation hub, founded by Jehan Ara who along with her team has played a key role in building the entrepreneurship ecosystem of Pakistan.</p> <p>Recently the HBL and Katalyst Labs established a partnership on startup acceleration and women leadership enablement to build and strengthen the entrepreneurial ecosystem of the country.</p> <p>Other stakeholders will also include relevant gender focal points and experts, as well as local and international associations and/ or agencies promoting gender equality and women's empowerment, in particular those focusing on the nexus between gender, energy needs and entrepreneurship such as the Women Business Growth Centre (WBGC).</p>	<p>Relevant women entrepreneurs/innovators, CSOs and NGOs focusing on gender equality issues and advocating women's empowerment, and gender experts/focal points will be invited to participate in and contribute to all activities of the project.</p> <p>The project will deliberately mobilize interest from women entrepreneurs by targeting the involvement of their associations in the project process (for instance by reaching out to both qualified women and men equally). This will be done by taking into consideration the cultural context that exists in Pakistan. That way, the project would adequately address the gender imbalances in SMEs and provide a solid basis to empower women in clean technology innovations.</p>
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<p>Other International Agencies e.g.,</p> <p>USAID, JICA, GIZ</p>	<p>Development cooperation</p>	<p>Relevant International agencies will be invited to participate and consulted, where relevant, during project implementation. They will be recipients of the project outreach and advocacy activities.</p>
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### 3. Gender Equality and Women's Empowerment

**Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).**

158. UNIDO recognizes that gender equality and the empowerment of women have a significant positive impact on sustained economic growth and inclusive industrial development, which are key drivers for poverty alleviation and social progress. Commitment of UNIDO towards gender equality and women's empowerment is demonstrated in its policy on Gender Equality and the Empowerment of Women (2019), which provides overall guidelines for establishing a gender mainstreaming strategy. UNIDO has also developed an operational energy-gender guide to support gender mainstreaming within its sustainable energy initiatives.

159. UNIDO has extensive experience in promoting and achieving gender sensitive impact, even in countries where gender inequality is systemic. The previous GCIP Phase 1 in Pakistan proved great success in promoting gender mainstreaming activities with the intention to create more opportunities for women entrepreneurs. For example, during the implementation period from 2015-2017, the record showed that women held 25%-40% team leader positions, linked to extensive advocacy & mobilization efforts (24 seminars/workshops/learning sessions) undertaken, the targeted social media strategy, support under its Women in Green Industry initiative, and the introduction of the Most Promising Woman-led Team award from 2015 onwards. These were supported by abundant gender mainstreaming actions including: targets were set (e.g. exclusive seminars for women; 100% women participation desired; overall participation of women in all seminars-at least 30%); engaging women-focused institutions (e.g. women chambers, women universities, etc.); inclusion of "women role models & winners" in promotion, seminars & sharing their videos; launch of "Women in Cleantech Campaign" (?Change Agents? identified in relevant institutions each trained to organize a group of 20 interested women around him/her to provide support for submitting applications through the online CTO portal); training of women to become volunteers, mentors, judges; development of targeted promotional material[1]; "Women in Cleantech" campaign via social media; inspiring messages launched via social media

to mobilize women applicants; success stories of "Women in Cleantech" in social media; Skype sessions with interested women applicants; strong encouragement for the addition of at least 1 active female member in each participating team; women team leaders as presenters of final judging rounds; identification of women-focused sub sectors in relevant industrial sectors; groups of women connected with relevant cleantech categories and annual Calls for Awards; high profile women trained as policy experts; documentation of women success stories; sharing of these success stories through social media; female winners participated in print & electronic media; women entrepreneurs were invited to participate in the "International Women Day -2018" event organized by Islamabad Chamber of Commerce and Industry through the Women Business Growth Centre platform. All in all, the project contributed to women entrepreneurial development and job creation for women by establishing a special category award and setting targets for female participants entering the Competition, participating in networking events, and being trained to organize Competition-Accelerator activities.

160. Based on the successful track record of GCIP Phase 1 in Pakistan, a guiding principle of the project will be to further promote and ensure that both women and men are provided equal opportunities to access participate in and benefit from the project, particularly in the global challenges and competition as well as the post-accelerator support. Special efforts will be made to promote equal participation of women and men, both at managerial and technical levels, as consultants, participants, entrepreneurs, mentors, etc. in all stages of project implementation while setting specific project output targeting women. In general, GCIP has already shown higher levels globally of women's participation than other accelerator and incubator programmers with 25% of the 860 alumni supported by 2018 being women led enterprises. This project hopes to continue this trend and even to increase this proportion.

161. Women entrepreneurs are expected to contribute to and benefit from all the project components and activities, participate and facilitate in post accelerator support, as well as in successful competition and acceleration programmers, thus fostering the empowerment of women. To mainstream gender into this project, a gender baseline analysis is planned during PPG phase to identify entry points for defining gender-aware project outcomes, outputs as well as targets, a baseline and gender-responsive related activities. These will be summarized in a gender mainstreaming action plan.

162. UNIDO's Guide on Gender Mainstreaming Energy and Climate Change Projects will be used as a framework and guide for the gender studies of the project in order to ensure that the project is in line with both UNIDO and GEF requirements. Based on the guidelines, attention will be paid to:

- Gender-sensitive recruitment at all levels where possible, especially in selection of project staff.
- Gender responsive TORs will be used to mainstream gender in the activities of consultants and experts.
- In cases where the project does not have direct influence, gender-sensitive recruitment will be encouraged.
- Furthermore, whenever possible existing staff will be trained and their awareness rose regarding gender issues.

163. The gender analysis during the preparatory phase will identify the specific circumstances of women and youth, and will provide a basis on how the priorities and needs of these groups will be integrated in the implementation of the project. During the project development (PPG) phase, UNIDO will ensure that the relevant gender dimensions are considered, and the project log-frame will be developed to reflect key gender dimensions of the respective outputs, activities, indicators and targets. This analysis will also incorporate the experience of countries under the previous GCIP for SMEs for a better understanding of the barriers faced by female entrepreneurs and so design effective mitigation tools.

164. Initial analysis of the project has identified the following gender specific targets to be monitored and evaluated throughout the project implementation period. This will be reviewed during the PPG. The project will take the following suggested approach to gender mainstreaming:

***Application stage for Challenge and Competitions:***

165. Collection of gender disaggregated data through application forms: Number of women-led enterprises, % of women in the applying team.

***Targeted outreach:***

166. The main target groups would be both men and women engineers and business persons, but importantly also ways in which to bring the two groups together. From the second year of implementation, the project will consider organizing events specifically targeted at connecting women technicians/engineers with business women; Setting a target on the % of women-led enterprise applications.

***Selection of both men and women semi-finalists, and mentors and judges:***

167. Stringent selection criteria will be defined that provide equal opportunities for both women and men. The objective would also be to involve women in the mentoring process so that more role models could be created, thus mitigating the impact of this inequality in the future.

***Project output specifically focusing on GEEW***

168. The project as a design incorporated a specific outcome of "2.3 Gender equality is supported and strengthened by the CIEE in Pakistan". To achieve this outcome, specific activities targeting women are planned including creation of a hub for women to engage in CIEE in Pakistan, implementation of special mentoring programme for women cleantech entrepreneurs and conducting campaign for awareness raising on women's role and engagement in cleantech ecosystem.

169. Based on the fact that women are yet to be under represented and limited their access to resources in clean tech sector, the project will effectively increase women's engagement into the CIEE in Pakistan by incorporating the specific outcome and activities targeting women.

***Special Awards:***

170. Special consideration will be given to the creation of a gender related prize; either a prize for the women's entrepreneur of the year or a special award for the team with the product/service with the most potential positive impact on gender equality, which

would be part of the global cleantech competition involving all Cleantech countries concerned.

171. In sum, the project design will acknowledge the differences between women and men considering distribution of economic activities and social roles in the cleantech innovation space, in line with GEF 7 Programming Strategy.

### **Supporting Youth**

172. In addition to gender dimensions, GCIP phase 1 was also able to support youth entrepreneurship and employment as an added benefit in the countries involved. The project's main goal is to strengthen the cleantech innovation ecosystem and it supports cleantech startups by providing business and entrepreneurship training and mentoring. As cleantech is a relatively new industry sector worldwide, and at nascent stages in the country, the entry barrier for youths is low compared to other more established markets where lack of experience in that sector may prove to be a (both actual and perceived) disadvantage. Defining the product market, sales tactics, financing options for commercialization etc. for cleantech businesses are not transferrable from other industries and therefore experience in other sectors may not necessarily be an advantage. This means youth entrepreneurs are on a level playing field with older / more experienced entrepreneurs. Through the training and mentoring curriculum offered by the project, youth entrepreneurs develop necessary business skills specific to the cleantech sector, and are placed on an equal footing with older generations in the cleantech space.

173. Youths are more likely to be interested in mission/impact driven business models, as opposed to profit driven business models. This means the goals of the project are more attractive to youths that seek to establish businesses that offer environmental solutions. Therefore, interest from youths to participate in the project is higher. For example, in Pakistan the average age of innovators involved in the GCIP phase 1 was between 25 and 35 years and in South Africa 33% of the GCIP semifinalists over five years have been younger than 35 years old.

174. It is important to engage youths in the cleantech sector, as youths experience environmental problems differently due to behavioral and lifestyle differences compared to other generations. Many cleantech solutions are developed based on personal experiences, and therefore fully engaging the youth will be important in addressing environmental challenges comprehensively. To promote application from early stage R&D cleantech solutions, GCIP phase 1 focused on engaging universities and students. This has the added benefit that youths are naturally the target group of communications and advocacy efforts. The project is also indirectly impacting the entrepreneurial culture of the country through its communications efforts. The main message is that solutions to environmental and social challenges can be profitable business models. Also, in promotion efforts for the supported SMEs, many youth entrepreneurs are showcased, and the public is exposed to success stories of young entrepreneurs. Seeing peers as entrepreneurs may indirectly influence other youths to also consider entrepreneurship as an option.

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[1]United Nations Industrial Development Organization UNIDO - Pakistan<<https://issuu.com/unidopakistan>>

**Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?** Yes

**closing gender gaps in access to and control over natural resources;** No

**improving women's participation and decision-making; and/or** Yes

**generating socio-economic benefits or services for women.** Yes

**Will the project's results framework or logical framework include gender-sensitive indicators?**

Yes

**4. Private sector engagement**

**Will there be private sector engagement in the project?**

Yes

**Please briefly explain the rationale behind your answer.**

175. This project focuses on start-ups and SMEs, aiming at strengthening partnerships with the private sector interested in investing in clean technologies and innovation, and provides support to entrepreneurs and innovators seeking to establish commercial ventures in clean technologies. It is expected that at least 40 private sector entrepreneurs, SMEs, corporates, investors and associations will take active part in this project, so the private sector engagement will be crucial part of and success factor for the project.

176. The private sector engagement is key for the success of this project and its engagement in the project will further be confirmed in stakeholder consultations in the PPG phase. The project foresees several areas of interaction with the private sector:

a. There will be direct interactions with and support for entrepreneurs (SMEs and start-ups) offering innovative cleantech solutions. The entrepreneurs are considered as agents of change that bear the potential of instigating a market transformation. The SMEs and start-ups will be supported in the framework of Pakistan cleantech ecosystem including accelerator, advanced accelerator, and post-accelerator supports. It is expected that at least 40 entrepreneurs will take part in this project, so the private sector engagement will be crucial part of the project. In addition, there will be active involvement of private investors, banks and other institutions that will be led by the Chamber of Commerce and Industry to ensure promotion and stimulation of clean energy technology innovations in targeted industrial sectors.

b. The private sector companies intention to provide, and support access to, private equity investment to selected enterprises supported by the project will be confirmed during the PPG phase.

c. Corporate partnerships will be formed to connect the project participants with various companies with the aim to create joint venture opportunities across borders, to facilitate market expansion and product co-development. This has already been successfully piloted with the Korean Financing Technology Corporation (KOTEC) with collaborations established between Korean SMEs and GCIP alumni from Morocco, Pakistan, Thailand and Turkey. Similar partnerships are expected under this project.

d. The project will also partner with corporations that seek to identify and invest in innovative cleantech.

e. Moreover, the project will target financing institutions, venture capitalists, and angel investors in its communications and outreach activities that seek to raise awareness and strengthen the knowledge of opportunities and risks associated with investments in cleantech. In addition, Investor Connect events will be organized to connect potential financiers with entrepreneurs and to facilitate investments.

f. The project will also cooperate with industry and business associations to leverage their know-how, capital and interest in cleantech innovations, as well as to build their capacity.

g. In addition, industry experts will be engaged as mentors, trainers, judges, and Executive in Residence (EIR) to support the Accelerator, Advanced Accelerator, and Post-Accelerator.

h. In line with GEF strategy on private sector engagement, the project capitalizes on the growing interest by national and international private actors in the sustainability agenda and creates the conditions for SME driven creation and transformation of cleantech markets. This ultimately harnesses the ingenuity and creativity of SMEs and "crowds-in" private sector investments to deliver environmental benefits beyond business as usual.

#### 5. Risks to Achieving Project Objectives

**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)**

#### General risk analysis

Risk	Rating	Mitigation
Institutional Risk ? Lack of absorptive capacity by the national counterpart	Low	Capacity building of the national counterpart will be an ongoing process throughout the project implementation period to ensure that staff are comprehensively trained, and sustainability of the programme is ensured
Institutional Risk ? Insufficient administrative and organizational capacity of the project executing entity (PEE) for successful execution of the project	Low	An organizational assessment (a micro assessment under the Harmonized Approach to Cash Transfers framework) will be conducted during the PPG phase to evaluate potential execution risks



Institutional Risk ? Insufficient technical capacity of PEE for successful execution of the project	Low	PEE will be nominated by the GEF OFP in consultation with key stakeholders as the most appropriate national agency to execute the project, and as a technology incubator agency with a strong track record in cleantech therefore it is assumed that it has the pertinent mandate and technical capacity for successful achievement of the project objective and associated outputs and activities.
Institutional Risk ? Lack of effective coordination between various project partners	Low	Proper coordination will be ensured through the establishment of the Project Steering Committee (PSC) and ad-hoc working groups will be formed if necessary
Operational Risk ? On-going global restrictions due to global shock  S (e.g., COVID-19)	Medium/high	In case of travel and/or group meeting restrictions, the trainings and meetings/events will be organized on-line
Sustainability Risk ? Lack of ownership of project results and inability to source funding to continue the activities in the medium and long term	Low	A sustainability and exit strategy will be developed based on a framework delivered by the GCIP Global, and it will among other include specific considerations related to a formal project handover process and the point in time when UNIDO's exit takes place based on targets achieved by the project
Political Risk ? Lack of political support to mainstream innovative cleantech	Low	The project is supported by the Government of Pakistan, and different ministries will be involved in the design of the project
Market Risk ? Failure of businesses supported	Medium	The guidebooks (for Accelerator, Advanced Accelerator, and Post-Accelerator) will be comprehensive documents that articulate the project approach to promoting cleantech innovation and entrepreneurship aligned with the GCIP Global. As such, they will help ensure that the businesses supported have real market potential. In particular, the methodologies, guidelines, tools will define eligibility requirements and selection criteria for the participants.

Finance risk - Incentive and financial support system are insufficient	Low	The outreach and communications activities will be targeted at, among others, financing institutions, venture capitalists, and angel investors. Moreover, the project will be aligned with strong GCIP brand, and the ongoing activities, knowledge and lessons under the GCIP global, which are expected to build confidence of national and international financiers. The PSC will include at least one representative of a financing institution or an investor.
Coordination Risk: Lack of effective coordination between various project partners/stakeholders	Low	A proper coordination will be sought through the PSC and the established working groups.

Climate Change Risk

Medium

According to the Second National Communication, estimated temperature rise in the country ranges from 2 to 3°C by 2050s and 3 to 5 °C to 2080s. The projected warming is higher in the northern parts of the country. The most prominent aspect of climate change risks in Pakistan is an increase in frequency and intensity of extreme climate events such as floods, draughts, cyclonic activities, extreme precipitation events, etc. For example, following the hugely devastating flood of 2010, Pakistan occasionally experienced floods every year during 2011-2015. There is a strong likelihood that with increased global warming in the coming decades, thus the incidences of such extreme events will increase further. Such extreme events, especially floods, may have physical impacts on the project physical settings including the regional hubs. According to the flood map in Pakistan[1], Lahore is identified as a place where floods experienced intermittently among the location of regional hubs. On the other hand, in terms of cleantech innovation, the climate change it is not likely to have severe impacts, with an exception for cleantech innovation dependent on water supplies.

To safeguard against climate change risks, following measures are taken:

1) Types of floods prone to happen in Pakistan include a) monsoon floods, b) flash floods and c) flood wall failures[2]. In order to mitigate the impact of flood, several measures can be taken including establishing and operationalizing early warning system, flood forecasting and dissemination of updated information and support. The NEE and hubs will regularly monitor the climatic conditions will prepare for the possible hazards in cooperation with Flood Forecasting Division (FFD), Lahore which a specialized unit for (i) Flood forecasting

(ii) River stream flow forecasting, (iii) Water availability forecast for dams and (iv) Water management assistance at dams. In addition, following appropriate house building codes, infrastructure building practices, and adequate spatial planning[3] are important factor to mitigate physical risks of the flood. In developing the hubs, the NEE will coordinate with local authorities to confirm such practices to reduce the exposure to the risk of flood.

2) The screening of technologies to be supported by the project will include an assessment of the climate risks with a time horizon of 30 years, and where a risk is identified, it will be necessary for the entrepreneur to propose suitable adaptation or management measures. The GIZ's Climate Expert Tool could be used as a tool available to

Environmental Risks	Low	It is recognized that some technologies that could potentially be supported by the project, such as relevant to industrial wastes and hazardous wastes can have harmful environmental impacts if not managed effectively. Therefore, any cleantech innovation supported by the project will need to meet strict environmental screening criteria. In addition, an Environmental and Social Management Plan (ESMP) will be prepared to mitigate the environmental (and social) risks.
Social/ Gender Risk:	Low	To ensure gender inclusiveness of all project activities, UNIDO methodology for gender assessment and gender responsive communication showing the benefits of gender equality for both women and men will be applied. To mainstream women and youth entrepreneurship, adequate and gender responsive communication strategy will be implemented, and sensitization workshops will be organized. A full gender analysis will be carried out and its recommendations were incorporated into the project design and implementation.

#### COVID-19 risk analysis

Risk	Rating	Mitigation
Technical expertise is not readily available due to the pandemic	Low	Necessary efforts will be made to identify alternative technical experts in case it is required. Planning will be flexible enough to reschedule activities onsite that require specific expertise
Possible re-instatement of COVID-19 containment measures limits available capacity or effectiveness of project execution/ implementation	Medium	The capacity of stakeholders, and especially the beneficiaries, for remote-work and online interactions will be strengthened by securing access to commercially available conferencing systems. The current design of the curriculum for entrepreneurs is based on online interactions and deliverables, using webinars and web platforms, and therefore COVID-19 is not expected to pose a significant risk to the conduct of the acceleration cycles

Some project supporters, co-financiers or beneficiaries may not be able to continue with project execution/implementation	Low	The situation will be closely monitored in order to find alternate supporters or co-financiers, or to readjust the list of beneficiaries if needed.
Price increases for procurement of goods/services	Medium	The project team will undertake efforts needed to find alternative providers and make sure that competitive pricing is obtained.

### COVID-19 opportunity analysis

Opportunity	Opportunity level	Opportunity optimization measures
New business opportunities created in response to COVID-19 related restrictions and measures	High	Response to COVID-19 restrictions, such as remote working arrangements and no-contact business modalities will require solutions that can be turned into new business models. These opportunities will be analyzed at the national level and shared with the entrepreneurs. Examples of former GCIP alumni responding to new business opportunities by providing innovative solutions during the pandemic are summarized here: <a href="https://www.unido.org/stories/cleantech-innovators-take-covid-19">https://www.unido.org/stories/cleantech-innovators-take-covid-19</a> .
New business opportunities to build back better for business continuity and economic recovery post-COVID-19	High	By design, the project engages private sector to promote and scale up cleantech products and services, and business models with resilience to climate change (e.g. wastes management, waste recovery, and waste to energy including its business models). Information on relevant new business opportunities as well as policy/regulations will be added to the project curriculum so that the entrepreneurs are fully informed of the market and policy trends.

[1] <https://2009-2017.state.gov/p/sca/ci/pk/flood/maps/index.htm>

[2] <https://www.newworldhope.org/pakfloodmaps.html>

[3] [https://www.researchgate.net/profile/Muhammad-Tariq-117/publication/251679596\\_Floods\\_and\\_flood\\_management\\_in\\_Pakistan/links/56a16d0308ae27f7de266d6a/Floods-and-flood-management-in-Pakistan.pdf?origin=publication\\_detail](https://www.researchgate.net/profile/Muhammad-Tariq-117/publication/251679596_Floods_and_flood_management_in_Pakistan/links/56a16d0308ae27f7de266d6a/Floods-and-flood-management-in-Pakistan.pdf?origin=publication_detail)

## 6. Coordination

**Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.**

### **Institutional setup**

177. Implementation will be done by UNIDO and involves project identification, preparation of project concept, preparation of detailed project document, project approval and start-up, project implementation and supervision, M&E and project completion and evaluation. Execution will be done by a national counterpart(s) and include the management and administration of the day-to-day activities.

178. Execution of the project on the ground will be the responsibility of national Project Executing Entity (PEE). During the PPG phase, PEE is expected to be nominated by the GEF Focal Point in Pakistan and an assessment of the nominated PEE's capacity and capabilities for project execution of the project will be conducted, based on which its nomination as the PEE will be confirmed.

179. Following the assessment and the approval of the PEE at CEO endorsement of the project, collaboration between UNIDO and the PEE will be based on the Project Execution Agreement (the 'Agreement?'). The Agreement defines the respective responsibilities of the PEE, including but not limited to activities, deliverables, financial, personnel, procurement and asset management components, as well as the reporting schedule and format.

180. The confirmed PEE will be requested to designate internally, or recruit directly, project management personnel to form a Project Management Unit (PMU) to execute the activities of the national project. The PMU will consist of the National Project Coordinator (NPC) and a Project Assistant (PA). The PMU will be responsible for the day-to-day management of the project execution, monitoring and evaluation of project activities as in the agreed project work plan. The PMU will coordinate all project activities being carried out by project national experts and partners. The PEE provides all related information to the evaluation experts for any mid-term review and final evaluations.

181. Project management will be funded in part by the GEF budget as well as in-kind funding and co-financing from the project counterparts.

182. To ensure proper oversight and Government and institutional ownership of the Project, a Project Steering Committee (PSC) will be established under the Chairmanship of the GEF OFP. Representatives from institutions involved in the different project components will be members of the PSC. The PSC is setup to provide advisory inputs for the project and make decisions on the projects once it is approved. The PSC will meet twice per year to review the project implementation and execution progress and confirm the work plan for the subsequent year and any changes in the six months. Any changes/amendments proposed to the project and/or to the workplans and budgets by the PSC are conducted in accordance with the approved project document, the GEF policy, and UNIDO rules and regulations. Minutes of meetings are signed by UNIDO and the PSC Chairperson(s). The PMU forms the secretariat of and reports to the PSC on the progress of the project.

#### **Coordination with other relevant GEF-financed projects and other initiatives**

183. The project is in line with, UNDAF, SDGs and One UN Framework in Pakistan. Regarding the latter, the project actively contributes to the objectives of the One-UN Programme within the thematic areas of environmental sustainability and poverty reduction through productive uses. UNIDO has already a concluding GEF-4 -funded project on the development of gasification in SMEs in Pakistan entitled "Promoting Sustainable Energy Production and Use from Biomass" which provides important linkages that would be useful to accelerate initiatives for cleantech innovation in the context of low carbon and circular economy. Another GEF 5 Project, titled "Sustainable Energy Initiative for Industries in Pakistan" is underway, to promote Renewable Energy Technologies in Pakistan with which synergies can be developed. An important project named "Climate Change Adaptation through Water Resource Management Project in Leather Industry of Sialkot" has been launched to relocate the tannery industry from congested city and residential areas to a designated tannery zone, and to provide facilities of combined waste water treatment and solid waste management. Besides the project will introduce cleaner production techniques coupled with Chrome recovery and water reuse and conservation technique to ensure the availability of quality water to industry, local population as well as for agriculture use. Waste generated from tannery effluent plants operated under this project could be scrutinized and utilized as a source of fuel stock for the Waste to Energy systems as well.

184. The project will be linked to the UNIDO/GEF program 10408 to which UNIDO is a project executing entity. Coherence in the approaches including methodologies, guidelines, tools and training systems will be pursued between the project and the GCIP child projects through the global framework program. Knowledge will correctively be managed and shared among the countries

involved. This will enhance cross-border connectivity and synergies. In addition, Pakistani cleantech SMEs accelerated under the project will be provided wider opportunities to expand their businesses and hence increase their success rates and results in greater GHG emission mitigation efforts.

185. The project will also seek to collaborate with the UNFCCC Climate Technology Centres Network (CTCN) and the Private Financing and Advisory Network (PFAN), which are UNIDO hosted initiatives with expertise in supporting the technology innovation value chain. For example, by sharing the common vision of accelerating clean technology dissemination and effort for tackling climate change, the project will seek for cooperation with PFAN e.g. offering workshops, introducing PFAN and its systematic interventions at the series of events held under the project, exchange of advisors and experts in order to facilitate cross-fertilization between the project and PFAN. Since PFAN will collaborate with GCIP also under the GCIP Global framework this will help increase conformity among the countries involved and create synergies among them.

186. In addition, similar national, regional and international initiatives in the country will be identified and cooperation envisaged. For example, the project will specifically create mutual benefits with national programme under Clean Green Pakistan Movement (CGPM). Under CGPM, city municipalities are responsible for clearing sustainable cities including enhanced waste management. The project will harmonize its intervention of selecting and promoting clean technologies with these national and local initiatives for creating clean and green cities. Particular efforts will be made to engage other potential financiers and the private sector in general, and link them to cleantech SMEs supported by the project.

## **7. Consistency with National Priorities**

### **Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions?**

Yes

**If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc**

187. Pakistan ratified the Paris Agreement and submitted its INDC on 11th November 2016. In it, Pakistan declares its intention to reduce up to 20% of its 2030 projected GHG emissions subject to availability of international grants. The INDC highlights that sustained economic growth will remain a major challenge if the prevailing energy crisis and environmental vulnerabilities are not overcome in the near future. As such, the project will directly support the INDC objectives by promoting Waste to Energy Project which will ultimately result in the lesser emissions of carbon also it



will result in the development of professionals in the field of climate change and the facilitation of financial national and international support.

188. Pakistan Climate Change Act, which has been approved by the Cabinet envisages an over-arching Pakistan Climate Change Council headed by the Prime Minister of Pakistan and Pakistan Climate Change Fund which will mobilize resources from both domestic and international sources for providing finances to support mitigation and adaptation initiatives in the country.

189. National Climate Change Policy 2012 has the objective to achieve sustained economic growth while appropriately addressing climate change challenges. It offers recommendations on mitigation and adaptation technologies and capacity building of relevant stakeholders. The project is aligned with this policy as it seeks to build national institutional capacity and awareness raising among the relevant players on environmental challenges.

190. National Power Policy 2013 highlights the importance of energy conservation and efficiency as well identification of alternate resources of power generation. The project intervention will contribute for this objective by promoting clean technologies integrating renewable energy, energy efficiencies, and waste management.

191. As per the National Environment policy 2005, following two clauses i.e. "Encourage reduction, recycling and reuse of municipal and industrial solid and liquid wastes" and "Develop and implement strategies for integrated management of municipal, industrial, hazardous and other waste at national, provincial and local levels". This proposed project of cleantech innovation integrating renewable energy, energy efficiencies, and waste management within the context of material, energy and resources sustainability and circularity is directly consistent with the above two clauses of National Environment policy 2005.

192. In line with its efforts to promote renewable and indigenous resources for power generation, Pakistan's National Electric Power Regulatory Authority (NEPRA) has approved the generation licenses to a few waste to energy plant along with appropriate tariffs. This is an encouraging sign and will pave the way for future such projects and also indicates Government of Pakistan's commitment to promote W2E projects.

## **8. 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.**

193. A knowledge base will be developed in terms of information management, sharing best practices and lessons learned, as well as engagement in effective information exchange among the countries involved under the global GCIP framework. The proposed project will share the results and knowledge, to be disseminated through participation in regional meetings, conferences and Cleantech platform. As the project progresses and implementation results become tangible and demonstrable, the knowledge management system will be used to develop benchmarks for clean tech innovations in Pakistan and to develop case-studies for promotional activities. Therefore, the knowledge management postulates main framework of this programme and facilitates to capture findings, institutionalizing learning and knowledge sharing across participant countries by making the structure of the programme accessible and replicable, as well as bringing selected finalists from around the world to showcase their innovations at the Global Cleantech Forum. This facilitates the transfer, innovation and dissemination of low carbon technologies, a key challenge under the Framework Convention on Climate Change.

194. A key aspect in knowledge management will be the creation of a national pool of mentors and judges, by the 'training the mentors' approach, to enhance the sharing of best practices and business skills among participants and stakeholders in a structured manner. The national pool of mentors/judges will be created and trained to provide entrepreneurs required skills to enable their participation in this programme, and ultimately to bring their innovations to be commercialized at the market. Mentors and judges will broaden the impact of the programme by providing one-on-one training for entrepreneurs and alumni of the programme. The PMU will be established and be responsible for including various stakeholders to ensure that the selection process for entrepreneurs is inclusive and impactful in identifying the right candidates for the programme.

195. This is in line with the one of key government's goals, to expand innovative activities to ensure sustainable economic development and support scientific potential and innovative activity that is crucial for a knowledge-based economy. In order to support innovative entrepreneurship and developing new activity types and products in clean energy technology innovations, the government measures will be taken to establish industrial parks and innovation zones applying advanced technologies and designing knowledge intensive products and technologies in Pakistan.

196. In light of the above, the continuation of accelerator programme will be further build upon the experiences and lessons learned under the global GCIP framework. This will contribute to creating a vibrant platform and network members. It can represent a key partner for the implementation and delivery of this programme and also facilitates the transfer, innovation and dissemination of green technologies, a key challenge under the Framework Convention on Climate Change. The new trends in

innovation cleantech areas and integration of lessons learned, based on completed and ongoing GCIP projects, will be incorporated. Through organization of trainings, workshops, roundtables, expert group meetings, printing materials and through the Cleantech platform, the knowledge sharing will be strengthened as the programme expands into new countries and cleantech areas. These combined set of outreach activities will ensure recognition of and support for the programme beyond the competition cycle. In order to ensure sustainability of this project beyond project duration and to attract more interest, the national coordinators will be tasked to ensure the visibility of the programme and accessibility of key findings through the Cleantech Platform. This will provide the opportunity to reach out to future entrepreneurs and investors, while raising public awareness on clean energy technologies and ultimately contribute to the climate change mitigation. A number of regional and international events to bring project teams and semi-finalists together will be organized, as stated in the outputs. The project will strive to create a vibrant and sustainable Cleantech ecosystem through partnerships with various stakeholders, holding expert meetings with partners and SME associations to review successes in the various competition cycles and establish commitments to moving forward.

197. For its sustainability and further innovation fostering in the region, the inclusive and sustainable methods will be also discussed, in order to identify and apply tangible solutions to existing challenges in the country. These results will be made accessible to the public through the Cleantech platform and accelerator programme.

198. All project reports will be shared with the relevant counterparts and disseminated through their institutional websites and UNIDO's open data platform. All knowledge management material will be gender mainstreamed. For instance, gender responsive training and advocacy material will not perpetuate gender stereotypes through presenting women only in their traditional roles.

199. A knowledge management, communication, and advocacy strategy framework will be developed by UNIDO with a particular focus on a) Promoting visibility of the project and communicating its impacts achieved at national and global levels; b) Increasing awareness of the catalytic role of cleantech in addressing climate change and environmental issues; c) Showcasing cleantech innovations from the alumni and enhancing their visibility and credibility.

## **9. Environmental and Social Safeguard (ESS) Risks**

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

**Overall Project/Program Risk Classification\***

PIF	CEO Endorsement/Approva I	MTR	TE
<b>Medium/Moderate</b>			

**Measures to address identified risks and impacts**

Provide preliminary information on the types and levels of risk classifications/ratings of any identified environmental and social risks and potential impacts associated with the project (considering the GEF ESS Minimum Standards) and describe measures to address these risks during the project design.

200. A preliminary environmental and social risk screening was conducted according to the UNIDO Environmental and Social Safeguards Policies and Procedures (AI/2017/04). The screening categorized the project as 'B'. Category B projects are likely to have less adverse impacts on human populations or environmentally important areas than those of Category A projects. An Environmental and Social Management Plan (ESMP) will be developed during the PPG phase.

**Supporting Documents**

Upload available ESS supporting documents.

Title	Submitted
<b>5_ES screening-Pakistan_signed</b>	

**Part III: Approval/Endorsement By GEF Operational Focal Point(S) And GEF Agency(ies)**

**A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).**

<b>Name</b>	<b>Position</b>	<b>Ministry</b>	<b>Date</b>
Ms. Naheed Shah Durrani	Federal Secretary	Ministry of Climate Change	1/25/2021

#### **ANNEX A: Project Map and Geographic Coordinates**

Please provide geo-referenced information and map where the project intervention takes place

While the project is targeted at beneficiaries (entrepreneurs and all relevant CIEE stakeholders, such as universities, policy makers, financiers, and R&D institutions) from all over the country, the main project events will be conducted in the capital city of Islamabad. In addition, some outreaching and capacity building events will be held in specific provincial hubs at Lahore, Quetta, Karachi and Peshawar, that will anchor project activities around existing platforms and networks. The specific locations of these hubs and functions are elaborated during the PPG phase. The project boundary will not overlap any other country's territory. The geo-coordinates and location are as following:

Islamabad 33.68992° S, 73.04510° E

Lahore 31.53736° S, 74.34555° E

Quetta 30.18684° S, 66.98436° E

Karachi 24.97904° S, 67.04886° E

Peshawar 34.18858° S, 71.50045° E

Islamabad:  
main project  
activities/events

Quetta:  
location of the  
regional hub for  
outreaching and  
capacity building  
activities

Karachi:  
location of the  
regional hub for  
outreaching and  
capacity building  
activities



Peshawar:  
location of the  
regional hub for  
outreaching and  
capacity building  
activities

Lahore:  
location of the  
regional hub for  
outreaching and  
capacity building  
activities