



## Global Cleantech Innovation Programme (GCIP) to accelerate the uptake and investments in innovative cleantech solutions

### Part I: Program Information

**GEF ID**

**Program Type**

PFD

**Type of Trust Fund**

GET

**CBIT/NGI**

☐ CBIT

☐ NGI

**Program Title**

Global Cleantech Innovation Programme (GCIP) to accelerate the uptake and investments in innovative cleantech solutions

**Countries**

Global, Cambodia, Indonesia, Kazakhstan, Moldova, Morocco, Nigeria, South Africa, Turkey, Indonesia, Moldova, Tanzania, Thailand, Ukraine, Uruguay

**Agency(ies)**

UNIDO

**Other Executing Partner(s)**

**Executing Partner Type**

**Other Executing Partner(s)**

Under discussion. An expression of interest (EoI) will be published to survey interest and competitiveness of entities active in the space of cleantech business growth, acceleration and investment facilitation.

**Executing Partner Type**

Private Sector

**GEF Focal Area**

Multi Focal Area

**Taxonomy**

Biodiversity, Focal Areas, Productive Landscapes, Protected Areas and Landscapes, Agriculture and agrobiodiversity, Mainstreaming, Chemicals and Waste, Waste Management, Industrial Waste, Hazardous Waste Management, eWaste, Best Available Technology / Best Environmental Practices, Industrial Emissions, Sound Management of chemicals and waste, Plastics, Persistent Organic Pollutants, Emissions, Influencing models, Stakeholders, Gender Equality, Capacity, Knowledge and Research, Sustainable Development Goals, Climate Change, United Nations Framework Convention on Climate Change, Paris Agreement, Nationally Determined Contribution, Climate Change Mitigation, Energy Efficiency, Agriculture, Forestry, and Other Land Use, Renewable Energy, Technology Transfer, Sustainable Urban Systems and Transport, Financing, Land Degradation, Land Degradation Neutrality, Land Productivity, Food Security, Sustainable Land Management, Sustainable Agriculture, Improved Soil and Water Management Techniques, Income Generating Activities, Demonstrate innovative approach, Strengthen institutional capacity and decision-making, Convene multi-stakeholder alliances, Civil Society, Academia, Type of Engagement, Participation, Information Dissemination, Partnership, Communications, Education, Awareness Raising, Behavior change, Public Campaigns, Strategic Communications, Beneficiaries, Private Sector, Large corporations, Capital providers, SMEs, Individuals/Entrepreneurs, Financial intermediaries and market facilitators, Gender results areas, Capacity Development, Knowledge Generation and Exchange, Participation and leadership, Access to benefits and services, Gender Mainstreaming, Sex-disaggregated indicators, Knowledge Generation, Professional Development, Training, Workshop, Course, Learning, Indicators to measure change, Innovation, Knowledge Exchange, South-South, North-South, Peer-to-Peer

**Rio Markers****Climate Change Mitigation**

Climate Change Mitigation 2

**Climate Change Adaptation**

Climate Change Adaptation 0

**Duration**

60 In Months

**Agency Fee(\$)**

**Program Commitment Deadline**

**Submission Date**

10/10/2019

**Impact Program**

IP-Food-Land-Restoration **No**

IP-Sustainable Cities **No**

IP-Sustainable Forest Management Amazon **No**

IP-Sustainable Forest Management Congo **No**

IP-Sustainable Forest Management Drylands **No**

Other Program **Yes**

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

<b>Programming Directions</b>	<b>Expected Outcomes</b>	<b>Trust Fund</b>	<b>GEF Amount(\$)</b>	<b>Co-Fin Amount(\$)</b>
CCM-1-4	Promote innovation and technology transfer for sustainable energy breakthroughs for cleantech innovation	GET	21,702,252	160,252,580
CW-1-1	Strengthen the sound management of industrial chemicals and their waste through better control, and reduction and/or elimination	GET	883,242	2,870,000
LD-1-4	Maintain or improve flow of agro-ecosystem services to sustain food production and livelihoods through Sustainable Land Management (SLM)	GET	875,000	3,412,000
BD-1-1	Mainstream biodiversity across sectors as well as landscapes and seascapes through biodiversity mainstreaming in priority sectors	GET	882,547	5,400,000
<b>Total Program Cost (\$)</b>			<b>24,343,041</b>	<b>171,934,580</b>

**B. Indicative Project description summary**

**Program Objective**

To foster private sector engagement in accelerating the uptake and investments in innovative cleantech solutions at scale

Program Component	Financing Type	Program Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
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Program Component	Financing Type	Program Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Pillar 1. Transforming early-stage innovative cleantech solutions into commercial enterprises	Investment	<p><b>1.1 Acceleration of early-stage cleantech innovations into enterprises</b></p> <p>Outputs:</p> <ul style="list-style-type: none"> <li>• Methodologies, guidelines, tools and training systems for cleantech innovation and entrepreneurship accelerators developed and implemented</li> <li>• Pool of business innovation and entrepreneurship experts (coaches, mentors and judges) trained and certified to support cleantech innovation and entrepreneurship accelerators at national and global levels</li> <li>• Competition-based cleantech innovations and entrepreneurship accelerators conducted annually at national and global levels</li> </ul> <p><b>1.2 Targeted business growth support and tipping point investment facilitation services provided to growth-stage cleantech SMEs to commercialize</b></p> <p>Outputs:</p> <ul style="list-style-type: none"> <li>• Targeted advanced business growth support services provided to selected cleantech enterprises towards commercialization including investment in pilot projects</li> <li>• Tipping point investment facilitation support provided to high impact cleantech enterprises and link them to investment and financing opportunities at national, regional and global levels</li> <li>• Innovative financing mechanisms designed and established to support the deployment and scale-up of cleantech solutions</li> <li>• Investment projects implemented to deploy innovative cleantech solutions across various sectors</li> <li>• Mentorship and partnership support provided to cleantech enterprises for cross-border market expansion</li> </ul>	GET	16,193,179	122,113,603

Program Component	Financing Type	Program Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Pillar 2. Cleantech innovation and entrepreneurship ecosystems strengthening and connectivity	Investment	<b>2. Cleantech innovation and entrepreneurship ecosystems strengthened at national levels and connected at the global level</b> Outputs: <ul style="list-style-type: none"> <li>• Capacity building for national technology innovation and entrepreneurship support institutions, industry associations and business platforms</li> <li>• Development and dissemination of cleantech innovation and entrepreneurship related policy recommendations and strategies at national and global levels</li> <li>• Knowledge creation, exchange and dissemination at national and global levels to promote linkages, collaboration and synergies across cleantech ecosystems of GCIP countries</li> </ul>	GET	3,978,499	31,401,740

Program Component	Financing Type	Program Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Pillar 3. Programme coordination and coherence	Technical Assistance	<p><b>3.1 Standards and programmatic coherence to improve efficiency and sustainability of GCIP interventions.</b></p> <p>Outputs:</p> <ul style="list-style-type: none"> <li>• Program level internal guidelines developed and implemented for programmatic coherence across countries</li> <li>• Program level communication and advocacy strategy developed and implemented</li> <li>• Web platform established and operated to coordinate and consolidate GCIP operations at national and global levels</li> </ul> <p><b>3.2 Impact of GCIP tracked and reported at national and global levels</b></p> <ul style="list-style-type: none"> <li>• Methodologies of estimating environmental impact of GCIP (including GHG emissions) established and applied across the program</li> <li>• Program monitoring and evaluation framework developed and applied</li> </ul>	GET	2,425,329	10,612,421
PMC differential	Technical Assistance	<p>The cumulative amount of PMC of requested by each child project is 1,746,034 USD. The online portal automatically assumes 5% PMC as the GCIP is over 2 mil USD as a programme. However, as the individual child projects are mostly MSPs, and therefore request PMC of between 5 to 10%. Therefore in the portal only, the PMU is manipulated to 5% and this component is created to rectify the discrepancy.</p>	GET	642,058	



Program Component	Financing Type	Program Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
			Sub Total (\$)	23,239,065	164,127,764
Program Management Cost (PMC)					
			GET	1,103,976	7,806,816
			Sub Total(\$)	1,103,976	7,806,816
			Total Program Cost(\$)	24,343,041	171,934,580

C. Co-Financing for the Program by Source, by Name and by Type				
Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Government				
GEF Agency	UNIDO	Grant	Recurrent expenditures	554,500
GEF Agency	UNIDO	In-kind	Recurrent expenditures	1,665,000
Private Sector	Private sector - Global	In-kind	Recurrent expenditures	2,240,000
Private Sector	Private sector - Global	Equity	Investment mobilized	19,000,000
Government	Cambodia Government	In-kind	Recurrent expenditures	1,000,000
Beneficiaries	Cambodia Beneficiaries	Equity	Investment mobilized	1,250,000
Private Sector	Cambodia Private Sector	Equity	Investment mobilized	3,216,560
Government	Indonesia Government	Grant	Investment mobilized	6,500,000
Government	Indonesia Government	In-kind	Recurrent expenditures	6,300,000
Others	Indonesia Other (University)	Grant	Investment mobilized	500,000
Others	Indonesia Other (University)	In-kind	Recurrent expenditures	500,000
Private Sector	Indonesia Private Sector	Grant	Investment mobilized	1,500,000
Government	Kazakhstan Government	Grant	Investment mobilized	4,700,000
Government	Kazakhstan Government	In-kind	Recurrent expenditures	3,000,000

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Private Sector	Kazakhstan Private Sector	Grant	Investment mobilized	1,000,000
Government	Moldova Government	Grant	Investment mobilized	3,473,970
Government	Moldova Government	In-kind	Recurrent expenditures	800,000
Donor Agency	Moldova Donor Agency	Grant	Investment mobilized	620,000
Private Sector	Moldova Private Sector	Equity	Recurrent expenditures	250,500
Private Sector	Moldova Private Sector	Grant	Investment mobilized	25,000
Government	Morocco Government	Grant	Investment mobilized	1,000,000
Government	Morocco Government	In-kind	Recurrent expenditures	2,500,000
Private Sector	Morocco Private sector	Equity	Investment mobilized	2,679,050
Government	Nigeria Government	Grant	Investment mobilized	5,500,000
Government	Nigeria Government	In-kind	Recurrent expenditures	4,500,000
Private Sector	Nigeria Private sector	Loans	Investment mobilized	1,824,500
Government	South Africa Government	Grant	Recurrent expenditures	500,000
Government	South Africa Government	In-kind	Investment mobilized	4,000,000
Government	South Africa Private sector	In-kind	Recurrent expenditures	2,000,000

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Private Sector	South Africa Private sector	Equity	Investment mobilized	6,000,000
Private Sector	South Africa Private sector	Grant	Investment mobilized	7,250,000
Government	Turkey Government	Grant	Investment mobilized	1,000,000
Government	Turkey Government	In-kind	Recurrent expenditures	5,000,000
Private Sector	Turkey Private sector	In-kind	Recurrent expenditures	830,000
Private Sector	Turkey Private sector	Grant	Investment mobilized	30,000
Private Sector	Turkey Private sector	Equity	Investment mobilized	1,000,000
CSO	Turkey CSO	In-kind	Recurrent expenditures	1,000,000
Others	Turkey Other	In-kind	Recurrent expenditures	1,690,000
Government	Tanzania Government	In-kind	Recurrent expenditures	350,000
Donor Agency	Tanzania Donor Agency	Loans	Investment mobilized	6,465,500
Private Sector	Tanzania Private Sector -TBD	Loans	Investment mobilized	5,000,000
Government	Ukraine	In-kind	Recurrent expenditures	2,500,000
CSO	Ukraine	In-kind	Recurrent expenditures	250,000
Others	Ukraine	Loans	Investment mobilized	10,000,000

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Government	Uruguay Government	In-kind	Recurrent expenditures	150,000
Government	Uruguay Government	Grant	Recurrent expenditures	500,000
Donor Agency	Uruguay Donor Agency	Loans	Investment mobilized	3,000,000
Private Sector	Uruguay Industry	In-kind		1,500,000
Others	Uruguay Public Utility	Unknown at this stage		5,000,000
Others	Uruguay National Oil Company	Grant	Investment mobilized	5,000,000
Government	Thailand	Grant	Recurrent expenditures	510,000
Government	Thailand	In-kind	Recurrent expenditures	6,650,000
Private Sector	Thailand	Equity	Investment mobilized	8,000,000
Donor Agency	Thailand	Loans	Investment mobilized	10,660,000
Total Program Cost(\$)				171,934,580

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

Investment mobilized was identified through discussions with stakeholders on their interest in the project and willingness to support it. Further details on the co-financing by source and amount are available in Annex E.

**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	Global	Climate Change	CC Global/Regional Set-Aside	1,834,862	165,138	2,000,000
UNIDO	GET	Cambodia	Climate Change	CC STAR Allocation	1,417,890	127,610	1,545,500
UNIDO	GET	Indonesia	Climate Change	CC STAR Allocation	1,784,863	162,637	1,947,500
UNIDO	GET	Kazakhstan	Climate Change	CC STAR Allocation	1,775,000	159,750	1,934,750
UNIDO	GET	Moldova	Climate Change	CC STAR Allocation	855,000	76,950	931,950
UNIDO	GET	Morocco	Climate Change	CC STAR Allocation	913,242	82,192	995,434
UNIDO	GET	Nigeria	Climate Change	CC STAR Allocation	1,826,484	164,384	1,990,868
UNIDO	GET	South Africa	Climate Change	CC STAR Allocation	3,236,525	291,287	3,527,812
UNIDO	GET	South Africa	Chemicals and Waste	POPs	883,242	79,492	962,734
UNIDO	GET	Turkey	Land Degradation	LD STAR Allocation	875,000	78,750	953,750
UNIDO	GET	Turkey	Climate Change	CC STAR Allocation	901,484	81,119	982,603
UNIDO	GET	Tanzania	Climate Change	CC STAR Allocation	1,592,201	143,298	1,735,499
UNIDO	GET	Thailand	Climate Change	CC STAR Allocation	2,912,407	262,116	3,174,523
UNIDO	GET	Ukraine	Climate Change	CC STAR Allocation	1,326,147	119,353	1,445,500
UNIDO	GET	Uruguay	Climate Change	CC STAR Allocation	1,326,147	119,353	1,445,500

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNIDO	GET	Thailand	Biodiversity	BD STAR Allocation	882,547	79,430	961,977
Total GEF Resources(\$)					24,343,041	2,192,859	26,535,900

## Core Indicators

### Indicator 3 Area of land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
50000.00	0.00	0.00	0.00

### Indicator 3.1 Area of degraded agricultural land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
50,000.00			

### Indicator 3.2 Area of Forest and Forest Land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

### Indicator 3.3 Area of natural grass and shrublands restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

### Indicator 3.4 Area of wetlands (incl. estuaries, mangroves) restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

### Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
101905.00	0.00	0.00	0.00

### Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

### Indicator 4.2 Area of landscapes that meets national or international third party certification that incorporates biodiversity considerations (hectares)



Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Type/Name of Third Party Certification

Indicator 4.3 Area of landscapes under sustainable land management in production systems

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
101,905.00			

Indicator 4.4 Area of High Conservation Value Forest (HCVF) loss avoided

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Documents (Please upload document(s) that justifies the HCVF)

Title	Submitted			
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)	3631790	0	0	0
Expected metric tons of CO <sub>2</sub> e (indirect)	9985790	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)
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Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	3,631,790			
Expected metric tons of CO <sub>2</sub> e (indirect)	9,985,790			
Anticipated start year of accounting	2020			
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 9 Reduction, disposal/destruction, phase out, elimination and avoidance of chemicals of global concern and their waste in the environment and in processes, materials and products (metric tons of toxic chemicals reduced)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
13.40	0.00	0.00	0.00

Indicator 9.1 Solid and liquid Persistent Organic Pollutants (POPs) removed or disposed (POPs type)

POPs type	Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
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Indicator 9.2 Quantity of mercury reduced (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
6.70			

Indicator 9.3 Hydrochlorofluorocarbons (HCFC) Reduced/Phased out (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
6.70			

**Indicator 9.4** Number of countries with legislation and policy implemented to control chemicals and waste (Use this sub-indicator in addition to one of the sub-indicators 9.1, 9.2 and 9.3 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
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**Indicator 9.5** Number of low-chemical/non-chemical systems implemented, particularly in food production, manufacturing and cities (Use this sub-indicator in addition to one of the sub-indicators 9.1, 9.2 and 9.3 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
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**Indicator 9.6** Quantity of POPs/Mercury containing materials and products directly avoided

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
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**Indicator 10** Reduction, avoidance of emissions of POP to air from point and non-point sources (grams of toxic equivalent gTEQ)

Grams of toxic equivalent gTEQ (Expected at PIF)	Grams of toxic equivalent gTEQ (Expected at CEO Endorsement)	Grams of toxic equivalent gTEQ (Achieved at MTR)	Grams of toxic equivalent gTEQ (Achieved at TE)
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200.00

**Indicator 10.1** Number of countries with legislation and policy implemented to control emissions of POPs to air (Use this sub-indicator in addition to Core Indicator 10 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
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**Indicator 10.2** Number of emission control technologies/practices implemented (Use this sub-indicator in addition to Core Indicator 10 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (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)
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<b>Female</b>	5,775
<b>Male</b>	10,725

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
<b>Total</b>	16500	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

**Please see section 6 on global environmental benefits for more details on targets and estimations for relevant indicators.**

## **Part II. Programmatic Justification**

### **1a. Program Description**

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

##### **Climate Change**

Climate change is now globally accepted that climate change present an urgent and existential threat to humanity. As such, government, business and civil society needs to systematically and rapidly embrace climate action to avoid detrimental impacts to people and planet. According to the most recent IPCC report, GHG emissions have continued to increase and we're on track to surpass 1.5°C of global warming as early as 2040, unless drastic solutions are immediately implemented[1]. Business can play a key and central role in driving down carbon emissions by bringing different sectors and stakeholders together to accelerate the development and scale-up the adoption of innovative cleantech solutions. In fact, the transition towards low-carbon economies presents an economic opportunity for the businesses, especially SMEs, start-ups and entrepreneurs (herein collectively referred to as SMEs) who can develop and adopt innovative cleantech[2] solutions into their operations and increase the productivity and competitively. Since SMEs operate across national boundaries, they can effectively drive the global transition towards low-carbon economies through the development and large-scale deployment of innovative cleantech solutions.

##### **Chemicals and waste**

The sound management of chemicals throughout their lifecycle is central to efforts to reduce pressure on the environment as well as the protection of human health. With increased economic and industrial development, more hazardous chemical and waste is being produced. One effective way to phase out hazardous chemicals and wastes, is to promote the deployment of suitable replacement solutions or alternatives. To spur the effective and efficient deployment of alternatives, Governments shall be assisted in strengthening regulatory frameworks and required enabling environments to foster entrepreneurial activities and private sector investment in the sustainable management of chemicals and wastes and the development of new techniques, approaches and alternate solutions to substitute hazardous chemicals and wastes as well as eliminate Ozone depleting substances (ODS) as listed in the relevant annexes of the Stockholm Convention, Minamata Convention and Montreal Protocol. In the process, SMES can develop new innovative replacement solutions (green chemistry) and other business models that, if deployed at scale, will effectively reduce and eventually eliminate hazardous chemicals and waste and create economic opportunities. This approach harnesses the ingenuity of enterprises in addressing a global environmental problems and is key steps in promoting circular economy principles.

##### **Land degradation**

The increasing world population is driving rising demands for agricultural produce including food, feed, fiber, and fuel. The increasing demand for food and agricultural commodities is one of the key drivers of pressure on the global land resource. Building competitive and efficient agricultural systems will ultimately reduce land degradation. However, this requires effective use of the physical potential of existing lands, efficient energy and resource use, regulation and aggregation of lands, scale up of the utilisation of modern and efficient agricultural machinery, and use renewable energy resources, among other. These areas presents opportunities for SMEs to develop innovative cleantech solutions in the agricultural sector (agricultural technology/agtech) that, if deployed at scale, would improve food and agricultural systems and hence reduce the drivers of land degradation.

Large-scale adoption of innovative cleantech solutions will ultimately transform entire economies, industries and secure sustainable and inclusive futures. However, many carbon, chemical intensive industries and food production systems are falling far short of the expected scale and speed in adopting innovative cleantech solutions due to various reasons that include technology lock-in, lack of awareness, unavailability of the technologies and support mechanisms. Priority sectors such as energy, industry, transport, agriculture and service sectors significantly lag behind in harnessing the power of innovative cleantech solutions. In developing countries, innovative cleantech solutions can also help to address existing infrastructure and service gaps like access to sustainable energy forms through the deployment of renewables, promotion of energy use efficiency across various sectors, adoption of e-mobility solutions, and replacement of hazardous chemicals and waste with sustainable/green chemistry approaches and technologies in order to reduce the volume, velocity and toxicity of flow of chemical in economic processes. At the same time, there are vast innovative cleantech solutions being developed, which are increasingly becoming cost-competitive, and would support the low-emission and low carbon, transition of these industries. The existing gap between the development of innovative cleantech solutions and their rapid deployment needs to be systematically addressed to reduce emissions of GHG, hazardous chemicals and wastes, build competitive and efficient agricultural systems but also create green industries and jobs.

### **Role of cleantech innovation SMEs in addressing global environmental problems**

SMEs are uniquely placed to drive the development and adoption of innovative cleantech solutions. In particular, SMEs operate at local levels and have a unique appreciation of local markets, which enables them to develop innovative cleantech solutions that can be transformed them into viable, scalable and investible enterprises. The GEF has also long recognized that the protection of the global commons requires full engagement and mobilizing of the private sector to leverage, technological know-how, innovation, investments and market access. SMEs are the mainstay of the economies in developing countries and economies in transition. In these countries, SMEs employ between 60-90% of the total workforce and they provide goods and services across various sectors. Furthermore, SMEs operate at very local levels and hence they significantly influence decisions and choices by society. They are well positioned to lead the transition towards resource efficient, low-emission economies by actively driving the development and adoption of innovative cleantech solutions across all sectors.

Given the reach and operations of SMEs across various economic sectors, they can identify opportunities and develop appropriate and scalable innovative cleantech solutions, which could result in GHG emission reductions, eliminate hazardous chemicals and waste and improve food and agriculture systems. The important role of SMEs in developing key technologies to tackle climate change has been widely documented, including in the Briefing Document #12 of the Technology Executive Committee of the UNFCCC[3] and role of innovation in chemical and waste reduction is recognized by UN Environment[4]. The range of technological and market or business model innovations that SMEs can develop can range from breakthrough, architectural, disruptive to incremental innovations depending on the existing market opportunities, circumstances and technological needs.

The combination of artificial intelligence, big data and connectivity is expanding the opportunities and horizons for new cleantech innovation by SMEs even further. By developing and advancing such cleantech innovations, SMEs have the potential to drive transformational change by creating business opportunities that contribute achieve global environmental benefits while creating jobs and new clean industries.

**Barriers to large-scale adoption and deployment of innovative cleantech solutions**

In most developing and emerging economies, SMEs face serious barriers in transforming promising innovative cleantech ideas into viable businesses since the “valley of death” they face is deeper and wider compared to those in developed countries. These barriers can be classified into three inter-linked categories relating to 1) barriers faced by SME; 2) barriers related to cleantech innovation and entrepreneurship ecosystems that the SMEs operate in, and 3) global systemic barriers.

SMEs often lack the skills and organizational capacity to transform innovative cleantech solutions into marketable products. This is compounded by the existing gaps between demand and supply of funding available for SMEs. Typically small and early stage cleantech SMEs require lower levels of funding and the provision of patient capital, whereas commercial banks, public markets as well as venture capital funds tend to invest in low-risk and tested technologies.

Limited understanding of opportunities and capacity to assess risks in investing in innovative cleantech solutions as well as limited exposure and interaction between SMEs and potential investors are indications of weak innovation and entrepreneurship ecosystems.

The quality and complementarity of support services available to SMEs is determined by the maturity of cleantech innovation ecosystem. The existence and enforcement of the supportive policy frameworks as well as interconnectivity of relevant ecosystem players from academia, industry and state organizations with complementary skills and competences are key. The status of the policy and regulatory framework varies enormously across economies but in many cases it is characterized by weak incentives to sufficiently foster and mainstream innovative cleantech solutions across priority sectors. Accordingly, key policy makers have limited exposure to best practice examples and cross border policy dialogues and miss opportunities to learn. At the global level, the cleantech innovation and entrepreneurship ecosystem is characterized by disconnected and disparate sub-ecosystems and missing coordination supra-structure. This results in highly fragmented efforts and discrepancy in quality and availability of support services, misinformed investors and a lack of efficiency in global efforts. This means that opportunities to develop and grow cleantech businesses providing global environmental benefits are largely untapped and unexplored. Ultimately, the global and national innovation and entrepreneurship ecosystems are weak and SMEs are not given the opportunity to transform their cleantech innovations into viable enterprises that can attract investment at local and global levels, which in turn would allow them to scale and to deliver transformational economic, social and environmental impacts.

A summary of the barriers that SMEs face in developing and scaling innovative cleantech solutions are presented below.

<i><b>Barriers</b></i>	<i><b>Description</b></i>
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1. Barriers faced by SMEs in developing and scaling innovative cleantech solutions

- Limited access to finance has been identified as a challenge on global scale and confirmed by national counterparts involved in the formulation of child projects. This is largely due to the absence of venture capital funds and angel investors as well as state supported grant funding for innovation and technologies targeted at cleantech innovations. The limited availability of suitable finance, particularly commercial finance and venture capital is due to a number of the following reasons:
  - a) a mismatch of start-up needs and offerings of financing institutions;
  - b) lack of interaction between SMEs and potential investors;
  - c) difficulty to access capital for innovation projects that normally comport specific risks;
  - d) lack of patient capital and advanced business growth support tailored to the needs and conditions for early-stage businesses;
  - e) limited understanding of opportunities and specific risk of investing in (local) cleantech markets;
  - f) limited awareness of financial schemes and respective requirements and procedures available to cleantech businesses as well as limited government financial incentives to support private sector in advancing and adopting innovation in the cleantech space;
  - g) limited knowledge of cleantech innovation and investment amongst local investors and subsequently a very low risk appetite
  - h) loan/grant officers lack the skills to properly evaluate the value and potential of innovative technologies; and
  - i) entrepreneurs lack the ability to prepare and present adequate business plans and financial statements (i.e. poor financial literacy).
- Lack of capacity by SMEs to develop solid and validated business plans and marketing strategies to reduce risk of failure;
- Lack of awareness in businesses and private sector of new developments and trends on innovations related to their operations, manufacturing and distribution, locally or globally which limits their development;
- Limited access to international expertise and limited knowledge of markets and potential partners outside their country which could expand their business;
- Limited knowledge of local and international standardization procedures and access to testing facilities stalling some ideas.



2. Barriers related to cleantech innovation and entrepreneurship ecosystems	<ul style="list-style-type: none"> <li>· Absence or weak enabling policy and regulatory environment that would create the market-pull for cleantech innovations in SMEs; fostering of innovation and entrepreneurial spirit requires supportive policies and a business environment that encourages investment;</li> <li>· Weak and non-functioning innovation ecosystems where resources invested in the knowledge economy are not linked to changes in the commercial economy</li> <li>· Institutions mandated to promote technological innovation lack capacity and policy guidance on accelerating cleantech innovations;</li> <li>· Lack of trained experts and information about technology – A potential barrier to provision of support to SMEs is the lack of trained experts for mentoring start-ups and entrepreneurs involved in cleantech innovations and also a lack of information about technology options, best practices, and benchmarks within SMEs</li> <li>· Lack of coordination amongst sectoral players on market intelligence research (undermining decision-making regarding market opportunities and penetration strategies) and meaning they do not collaborate to support and foster cleantech SMEs to develop new innovations and commercialize their products and services;</li> <li>· Very limited connectivity between innovation cleantech ecosystems which would allow synergies to be identified and would help support SMEs within their own country and to harness global opportunities.</li> <li>· No policy best practice sharing nor dialogue between countries so lessons are not learned, knowledge is lost and opportunities to improve and be more effective and efficient are missed.</li> </ul>
3. Systemic global barriers	<ul style="list-style-type: none"> <li>· Lack of public awareness regarding market potential of cleantech and low-emission innovation technologies;</li> <li>· No standard performance scheme such as label or badge which defines cleantech innovation quality; there are a number of different labels which are applied to aspects of the cleantech market but not something that is all encompassing which the financial markets will recognize;</li> <li>· Limited sharing of knowledge between ecosystems and limited tracking or reporting of cleantech experience in different countries which undermines successful cleantech innovation and limits growth;</li> <li>· There is limited standardization and differing methodologies between different country support and between existing international support programs so it is difficult to set specific baselines or targets which could support up-scaling and uptake of innovation and lead to really understanding the impact.</li> <li>· Limited global support available which is open to developing and transition economies and which allows entrepreneurs to look beyond their boundaries, particularly when their own in-country support is not targeted at their sector. Technologies with potential are not able to progress to become viable businesses.</li> </ul>

**Table 1: Barriers experienced by SMEs in commercializing innovative cleantech solutions**

## **2) the baseline scenario and any associated baseline projects**

## a) **Baseline Scenario**

### i) Global trends in cleantech innovation

Globally, cleantech innovation is considered as the solution to some of the challenges and opportunities that arise from megatrends, in particular climate change, resource depletion, rapid population growth and urbanisation, emission of chemicals and waste, food systems, digitisation, globalisation and social change (e.g. a growing middle class and increased democratisation/participation). In fact, innovative cleantech solutions are considered as key to decoupling economic growth from resource use, environmental degradation, especially carbon emissions and waste generation. If innovative cleantech solutions are systematically integrated across all economic sectors, this will effectively support the transition towards low-emission economies, create new and green industries and jobs and bring about global environmental benefits.

The market opportunity in the cleantech sector in developing countries is expected to exceed \$6.4 trillion over the coming decade, with \$1.6 trillion of that investment accessible to SMEs[6]. While around 50 per cent of the entire value stream of these technologies originates from major equipment, the rest is generated by balance of system components, smaller replacement parts, assembly, installation, operation and maintenance services as well as civil works. The latter are the areas where there is room to develop local content and where local SMEs can play a key role as ancillary industries. Furthermore, local SMEs can further create new technological and business model innovations beyond these ancillary industry areas to solve local problems that have global environmental benefits. In particular, the convergence of the need for climate action and addressing energy access and security challenges in developing and emerging economies presents huge opportunities for SMEs to develop innovative cleantech solutions that can be a basis for inclusive and sustainable industrialization.

Cleantech is directly relevant to sustainability and profitability of many economic sectors. In the energy sector, mega trends including decarbonisation, decentralisation, electrification and digitisation are creating major technological and market disruptions and breakthroughs. Some of the key technological enablers of this rapid innovations include utility scale batteries, behind-the-meter batteries, e-vehicles smart charging etc. This, along with big data, block chain, artificial intelligence and the Internet of Things (IoT), is creating innovations in hardware and software solutions such as sensors, communication and optimisation technologies, which can increase energy efficiency, give customers more control as well as facilitating easier and more distributed generation, e.g. peer-to-peer off-grid energy trading. Distributed energy generation is an area of focus as is energy access with emphasis on low-cost intelligent off-grid systems. Innovations continue in the renewable energy space with new technologies that are efficient as well as technologies that optimise generation, grid connection and maintenance.

An important area of cleantech innovation is in energy storage including all chemical, electrical, energy or mechanical systems as well as systems that optimize, integrate or control storage systems or minimise waste. With growing grid-connected renewable energy and mini-grids based on renewable energy, energy storage is set to be a key part of future energy systems. In transportation, cleantech innovation trends relate to electric vehicles (EVs), their energy storage and charging infrastructure, as well as software solutions and AI for vehicles and logistics. Increasing regulation and a growing focus on a circular economy is driving innovation in recycling processes, waste and waste-water processes and water treatment. Advances in packaging are being made to eliminate single-use plastics through development of replacements such as biodegradable organic packaging. In industry, IoT is being increasingly applied to processes to improve efficiencies and 3D printing is developing fast with improvements being made and a shift from small items

towards larger scale production in high-performance, high-value markets, such as aerospace and high-end automotive. In biotech, there is an increased focus on bio-based alternatives of high-value products.

Therefore, cleantech innovation presents a unique opportunity to effectively support the transition towards low-emission economies. To be able to fully participate in this newly emerging economic space, developing countries need to design appropriate strategies and targeted support measures to foster home-grown cleantech innovations to capture a growing share of this expanding future market and the related employment and industrialization opportunities. In particular, the role of private sector in accelerating the innovation, development and wide-scale adoption of innovative cleantech solutions is central to the growth of the cleantech industry in developing countries.

#### ii) Growing demand of global investors for innovative cleantech solutions

The impact investment industry is rapidly growing. In 2016, 205 investors committed more than USD 22 billion to impact investment and anticipated committing 17% more in 2017[7]. International impact investors are increasingly considering the opportunities that innovative cleantech solutions offer. These investors tend to be particularly interested in potential innovations that are scalable at global level, rather than those that tend to be constrained to national level. Although impact investors do show interest in investing across many countries, they are simply not aware of the opportunities in many emerging and developing economies, resulting in missed opportunities for scaling cleantech innovation in these countries and achieve huge global environment benefits. Global platforms allow impact investors to be introduced to enterprises in countries they may not previously have considered. With a critical mass of cleantech innovators on one platform, impact investors have a trusted place to identify and engage innovative cleantech solutions from different countries. International investors are looking for truly global innovative cleantech solution that can have impact at scale, whereas national investors may have global aspirations but will settle for solutions potential to scale at national or regional levels.

PFAN (the Private Financing Advisory Network)[8] provides institutional financing for scaling-up of climate and sustainable energy technologies at large-scale for positive environmental impact. It supports developing and emerging economy country cleantech projects until they reach financial closure. Its figures show that more than half of the sources of investment to reach financial closure are international in nature. Of the 24 projects from PFAN's pipeline, that are in the cleantech category, 13 have managed to mobilize investments from international sources[9]. PFAN investments are already saving 3.3 million tCO<sub>2</sub>e/year. Thus, there is evidence that international investors have an appetite to invest in cleantech SMEs in developing countries, if they have a valid technology, a strong team, validated business model and customer traction.

#### iii) Growing sustainability commitments by business and opportunities for innovative cleantech solutions

There is increased recognition of the importance of sustainability commitments by the private sector as central to their business and their shareholders. Many large corporations are adopting sustainability commitments and standards in their supply chains, internal processes and market linkages. Such sustainability commitments include reducing resource consumption, closing the materials loop, embracing circular economy principles and adopting renewable energy and energy efficiency technologies and services. Furthermore, some private companies have started promoting partnerships with local companies and SMEs, to ensure compliance with sustainability standards and a more diversified pool of suppliers. Some commodity based corporations have gone a step further by linking their operations to efforts to promote entrepreneurship, innovations and achieving SDGs. This creates shared value, whereby actions to create shareholder value also creates value for society and tackles many of the global challenges that the SDGs are designed to address.

At the same time large corporates are teaming up with accelerators and incubators to engage with thematic problem orientated entrepreneurs/solutions and are co-investing. These companies are therefore becoming important partners, not just future markets of cleantech innovation. These developments are creating great market opportunities for SMEs to develop cleantech innovations and partnerships with large corporations in support of their greening efforts.

## **b) Baseline Projects**

Since 2011, interest in cleantech innovation has grown steadily, and the number of cleantech incubators and accelerators is now estimated at approximately 70[10]. Most of these are located in North America and Europe with very few working in developing or emerging economies. In addition, many focus on software solutions rather than hardware. While there is no definitive figure, best estimates put climate-focused incubators/accelerators at less than 2% of all incubators/accelerators[11]. There are a number of global initiatives helping cleantech start-ups but few focus on developing countries and are truly global, i.e. they are multiple country initiatives, and none provide holistic support across the ecosystems. Some of the key international initiatives/projects working in these economies are outlined below.

### **i) Global Cleantech Innovation Programme (GCIP) under GEF 5 and GEF 6 and achievements**

In 2011, UNIDO, in partnership with GEF, piloted the first Cleantech Innovation Competition for green entrepreneurs and SMEs in South Africa with innovative ideas and concepts in the areas of green buildings, energy efficiency, and renewable energy[12]. Building on the resounding success of this pilot, UNIDO and the GEF developed the Global Cleantech Innovation Programme (GCIP), which uniquely fosters an ecosystem approach that supports cleantech innovations in existing and new SMEs. Since the pilot in South Africa, under GEF 5 and GEF 6 cycles, GCIP has been implemented in a total of nine countries, namely Armenia, India, Malaysia, Morocco, Pakistan, Thailand, Turkey, Ukraine and South Africa[13].

GCIP's main objective was to strengthen innovation and entrepreneurship ecosystems that would catalyze the transformation of cleantech innovations by SMEs into viable investment businesses, and link them to financing opportunities. An integral part of GCIP is the development of an enabling environment for cleantech innovation and entrepreneurship. Each GCIP project has had the four following interventions: a) entrepreneurship and business acceleration of cleantech innovation SMEs and start-ups; b) policy and regulatory strengthening; c) linking cleantech SMEs to private sector financing; and d) building capacity of national institutions.

By 2019 over 1200 cleantech SMEs had been trained, mentored, and linked to funding opportunities[14]. On average, about 25% of the innovators and companies are women-owned and operated, a significantly higher percentage than most cleantech accelerators and incubators worldwide. In many cases, the supported GCIP companies are already up and running, attracting investment, making innovative cleantech products and services, and delivering huge global environmental benefits. A small sample of just fourteen (14 out of 1000) GCIP alumni indicated that they have raised USD 22 million in investment and created over 300 jobs while delivering 600,000 tCO<sub>2</sub>e benefits between 2011 and 2017[15]. The leveraging effect of the GCIP is demonstrated by the fact that these 14 companies have such high growth prospects that they project that by 2020, they would have generated revenues of over US\$ 263 million, created over 1200 new jobs and generated over 4.8 million tons of GHG emissions savings. This was achieved from a total budget of US\$ 12 million invested across 9 countries. This gives GCIP leverage effect of at least 21 times. With many more GCIP alumni start-ups commercializing and mobilizing more

investments, this implies that GCIP leverage effect will continue to increase. GCIP has also successfully delivered outcomes beyond the level of individual businesses by nurturing the innovation ecosystems in each country and building up capacity in national organizations.

The 8 GCIP projects were implemented independently from one another and of the existing GCIP alumni few have managed to attract global investors. Exceptions include: 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 tCO2e/year and growing. Similarly Solter Vision (remote PV plant analysis) now estimates annual emission reductions of 15,300 tCO2/yr and Seyisco (efficient pot hole filling) already estimates 826k tCO2e 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.

Under GEF 5 cycle, GCIP programme invited SMEs to submit their innovations under technology categories initially focusing on climate change mitigation such as renewable energy, energy efficiency, water efficiency, waste-beneficiation, etc. However, over the years, there has been a discernible increase in innovations that are not only linked to climate change, but have co-benefits for in other GEF focal areas that include Chemicals and Waste and Land degradation.

Examples of such innovations include:

GEF Focal Area	Name of SMEs and their innovation
Chemicals and waste and advanced materials	A company called Thevia <a href="#">[16]</a> <sup>1</sup> from South Africa developed roofing tiles produced from 99% waste materials, which reduces 1,99kg of CO2 emissions per tile, and consumes 100 tons of slimes and 30 tons of plastic waste per production line per week. A South African startup has developed roof-tiles made of 99.4% waste material. Made from recycled High-density Poly Ethylene (HDPE), one of the most commonly used plastics, these green roof tiles are twice as strong as traditional concrete tiles and 70% lighter. Thevia’s selling price yields an 8–15% saving on the total roof installation cost. These roof tiles are especially suited to low-cost housing, and offer a green solution for roof building and construction

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<b>Multi-focal areas</b>	<p><b>Free the Seed: Free the Seed team from Malaysia<sup>[17]</sup> <sup>2</sup>which produces biodegradable packing using waste paddy husks. The business model provides additional revenue streams for over 1300 rice farmers, and is calculated to save 600,000kg of CO2 reductions per annum. This biodegradable material effectively replaces the need for plastic packaging and the challenges with plastic waste.</b></p> <p><b>Saathi from India<sup>[18]</sup> <sup>3</sup> produced fully biodegradable sanitary pads from sustainably sourced banana fiber, addressing plastic and chemical disposal issue of conventional sanitary pads. The product is also providing local solutions for women and girls that were previously prevented from working and attending school during menstruation as they had no have access to sanitary pads.</b></p>
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These innovations are results of the GCIP approach in identifying solutions that have climate change benefits and demonstrates that the GCIP approach can be used to catalyze environmental technology innovations across other GEF focal areas and priorities such as food systems, sustainable cities, chemicals and waste, and circular economy.

The independent evaluation of GCIP has unequivocally concluded that GCIP was very successful. The evaluation further concluded that there is potential to increase impact and that effectiveness of the approach could have been improved through programmatic delivery. More still needs to be done to link ecosystems across countries to identify more investment and market opportunities, and to engage with the private sector, to really create global transformational impacts and environmental benefits. Further details regarding findings of GEF IEO thematic evaluation of GCIP are provided in Annex J.

#### ii) UNIDO's portfolio in Chemical and Waste programmes under Multilateral Environmental Agreements

Through an extensive project portfolio, UNIDO has assisted emerging and developing countries in managing hazardous chemicals and wastes including persistent organic pollutants (POPs) under the Stockholm Conventions and heavy metals including mercury under the Minamata Convention and Substances that Deplete the Ozone Layer under the Montreal Protocol. Through various technical assistance projects, UNIDO has assisted industries to improve their resource productivity and environmental performance, through the adoption of resource-efficient and cleaner production practices, methods and techniques and enhanced recycling, resource recovery and treatment of all wastes, in particular in case of small and medium enterprises. Further UNIDO has assisted Governments in the preparation and implementation of policies and strategies, projects as well as national and sector programs for fostering green industry at large and specifically for the reduction of production and use of persistent organic pollutants (POPs), ozone depleting substances (ODS), mercury and other toxic or hazardous chemicals manufactured intentionally or used by industry. To stimulate the transition to low-emission and sustainable industrial development, UNIDO complements the phasing out of hazardous chemicals and waste through promoting alternative technologies and substitutes that minimize the impact on the environment, natural resources and the climate. Ultimately, these interventions seek to promote the environmentally sustainable use of natural resources by industry, in particular through conservation, substitution and efficient use of materials, as well as recycling, reuse, recovery and treatment of wastes. UNIDO will build on the experience in working with governments and industry in promoting innovative solutions and technologies in order to reduce emitting hazardous chemicals and waste along the supply chains of commercial and domestic products.

iii) Other initiatives

#### **World Bank's InfoDev**

This program includes a number of Climate Innovation Centres and includes some match-making in the Caribbean, Ethiopia, Ghana, Kenya, Morocco, South Africa and Vietnam. CIC activities vary significantly by country, including the focus on physical space (incubation) versus acceleration services. There is some knowledge sharing but it is not a global platform. Recent evaluation of the CICs seem to indicate that CICs have not been able to achieve the expected volumes of deal flows.

#### **Cleantech Open (CTO)**

Cleantech Open is a US based international accelerator and was a partner in the first phase of GCIP. CTO provided the initial platform for the GCIP national accelerators. CTO provides support to entrepreneurs, investors, governments and stakeholders from across the ecosystem and links entrepreneurs to markets and investors and runs global events. Since its involvement in GCIP it is now no longer providing services in the developing and transition economies as it is looking to mainly focus on activities just within the North American market.

#### **Clean Technology Climate and Network (CTCN)**

CTCN promotes the accelerated transfer of environmentally sound technologies for low carbon and climate resilient development at the request of developing countries. They provide technology solutions, capacity building and advice on policy, legal and regulatory frameworks tailored to the needs of individual countries. Each project supported is very small and support is provided at the national level rather than for cleantech entrepreneurs/start-ups.

#### **Network for Global Innovation (NGIN)**

NGIN is dedicated to building a global commercialization ecosystem focused on helping clean technology entrepreneurs collaborate and prosper. It is a global membership organization that includes incubators, technology parks, research institutes, universities and corporations. It is a matchmaker between customer and company, between investor and opportunity. It assists members in locating, incubating, growing and expanding portfolio company solutions. It acquires mentors, advisors, coaches, and interim executives to assist entrepreneurial creativity. NGIN will be a technology and knowledge partner in running the GCIP IP accelerator programmes in some countries and will be a partner in connecting innovation ecosystems across GCIP countries.

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

PFAN is a global network of climate and clean energy financing experts that aims to bridge the gap between entrepreneurs developing climate and clean energy projects and private sector investors. PFAN achieves this by: providing free business coaching to projects, increasing the chances of attracting investment; and growing its investor outreach. PFAN organises Investment Forums to showcase selected investment-ready projects to groups of investors and provides one-on-one Investment Facilitation services

to investment-ready projects, shortening the path to further growth. PFAN does not provide early stage support and would be involved post-accelerator when innovations are moving towards commercialization.

### **Global Innovation (GI)**

GI is a non-profit innovation fund that invests in the development, rigorous testing, and scaling of innovations targeted at improving the lives of the world's poorest people. Through grants and risk capital, it helps innovative solutions to global development challenges from for-profit firms, non-profit organisations, researchers, and government agencies to maximise their impact and affect meaningful change. Support is provided at all stages of their life cycle through grants, loans (including convertible debt), and equity investments ranging from \$50,000 to \$15 million. Support is not limited to cleantech but is limited to innovations that have clear social impact at a large scale, i.e. they improve the lives of those living on less than \$5 a day.

### **Mission Innovation (MI)**

MI is supporting 8 international innovation Challenges[19]. The challenges support R&DD working with a mixture of prizes and facilitating of exchange between member country researchers. Support is focused more at early stage R&D. GCIP would aim to work with MI potentially supporting SMEs from GEF non-MI countries to participate.

### **Ideas to Impact**

This program is designing, implementing and testing five innovation prizes inducing innovative solutions to development challenges in Climate Change Adaptation, Energy Access and WASH. Some are international and some national. Prize winners receive cash but do not get the sort of mentoring, coaching and support to SMEs that GCIP provides. Besides just the prizes, there is no work on policy and regulatory frameworks, and institutional capacity building that GCIP provides.

### **FINTECC**

FINTECC, supported by GEF, is part of the energy efficiency accelerator and is supporting climate technology projects rather than SMEs with innovative cleantech solutions. (<http://fintecc.ebrd.com/index.html>)

### **Africa Energy Challenge Fund (AECF)**

AECF runs a business plan competition for RE and climate change projects and provides investment capital. They do not support early stage technological innovations nor provide coaching, mentoring and training services. They also do not work on policy and regulatory innovations. (<https://www.aecfafrica.org>)

### **The Solar Impulse Foundation**



The Foundation awards technologies with a label, which provides the applicant with international recognition and showcasing opportunities. Importantly, they do not provide the mentoring or training support that GCIP provides. UNIDO has recently signed a Memorandum of Understanding with Solar Impulse Foundation to ensure that some of the GCIP alumni will be able to get the label from Solar Impulse Foundation, thereby increasing their visibility and confidence in their innovations. (<https://solarimpulse.com>)

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

The GCIP, at the programmatic level, is designed to respond to the increasing global demand for environmental sustainability, climate action, and unleashes the potential of cleantech innovation and entrepreneurship to help transform priority sectors and systems. In order to address the existing barriers for SMEs to transform their cleantech innovations into market ready solutions that generate global environmental benefits, the programme seeks will be implemented in a holistic ecosystem approach to facilitate the implementation of national cleantech projects, improve coordination of national activities and foster synergies between participating countries. GEF funding will be utilized for the establishment of a global coordination platform for GCIP to ensure a systematic approach, programme coherence and quality across the participating countries. It will ensure that the catalytic grant investments from the GEF to will leverage more investments by establish an enabling environment for the national stakeholders and private sector to cleantech sector and deliver greater impact at scale. In particular, GCIP will de-risk investments in cleantech SMEs by transforming their early-stage cleantech solutions into viable, scalable and investible enterprises.

The scaling-up of the GCIP, calls for systematic coordination at the global level, leveraging on opportunities for synergies and improved cost efficiency of allocated resources. The platform for GCIP will aggravate and enhance efforts to strengthen and connect the ecosystems of partners countries, and at the same time connect them to a truly global innovation ecosystem. Over the long-term, the project seeks to build robust innovation ecosystem that can identify and systematically support high-impact cleantech technology innovations as well as attract large-scale investments into the cleantech space for large-scale deployment. This mechanism is expected to generate local environmental benefits with significant global impact on limiting global temperature rise to well below 2 degrees centigrade, reduce and eliminate chemical and have efficient food and agricultural systems that reduce land degradation.

Beside local and global environmental benefits, the systematic acceleration of fast-growing cleantech innovation SMEs creates new green jobs, therefore contributing to national and global poverty alleviation efforts, and supports the formation of new sectors supporting low-carbon and low-emission economic development and further catalyzes greater private sector investments in protecting the local and global climate security. GCIP has a unique approach as it seeks to capacitate private sector to deliver environmental benefits through transforming early-stage clean tech companies into fast-growing enterprises and simultaneously developing the cleantech innovation and entrepreneurship ecosystems in partner countries. The platform for GCIP seeks to reduce duplication and ensures that GCIP becomes a truly global platform connecting cleantech entrepreneurs, relevant ecosystem players and financiers as global efforts are currently too fragmented. The global programme will build on the key lessons learned from the implementation of previous GCIP projects. In particular, it builds on the collective feedback by various stakeholders including national counterparts, partner institutions and SMEs successfully participating in the GCIP as well as strategic partners at global levels.

The table below outlines how the programme addresses the particular findings and recommendations of the GEF IEO independent thematic evaluation of GCIP and feedback from various GCIP stakeholders.

GEF IEO Recommendations and GCIP Feedback	How the recommendations will be addressed in the project
a) More focus on Investor outreach and connecting with investor networks /  Outreach and marketing of the program and showcasing of GCIP supported innovations at global events	Pillar 1 will specifically address this by organizing investor connect platforms and events as well as connecting GCIP alumni directly with potential investors, financiers and networks. Further, each child project is expected to have activities dedicated at implementing investor outreach and marketing strategies at local scale and connect to global platforms. Pillar 3 includes global communications, advocacy and outreach activities which will also market the program and advocate innovators at regional and global events.
b) Improved cross-country coordination and system to ensure coherence and quality	Pillar 3 will include GCIP programmatic coherence and coordination activities in order to provide support to national child project PMUs, share guidelines and internal standards as well as promote interaction between PMUs.
c) Quality of Support	Pillar 1 will develop and provide a GCIP Accelerator Guidebook which will equip Child Projects with standard GCIP approach and methodology to promote cleantech innovation and entrepreneurship in the countries. The guidebook will also include practical tools and guidelines for operations and management of the accelerator. Specific effort will be focused on ensuring that the training and mentorship support provided under the Cleantech Accelerator will be adapted to the local context of the applicant countries.
d) Advanced business-support for SMEs post GCIP acceleration needed	Pillar 1 will provide standards approach for advanced investment and commercialization support to GCIP alumni's. This will include further mentoring for advanced business growth support, match-making services with interested corporations, investors, governments, and also offering opportunities for startups to be showcased at high-level international events.
e) An increased focus on policy strengthening and regulatory frameworks to foster cleantech innovation is needed	Pillar 2 will provide policy and regulatory aspect for developing a mature innovation ecosystem. The global programme will assist in child projects in strengthen the policy framework through the sharing best practices, policy dialogue and cross-country learning of success stories from different countries and contexts.
f) Global peer networking among entrepreneurs	Pillar 1 of the global child project will create and maintain a global community of GCIP stakeholders which will allow cross-border connectivity among GCIP partner countries, facilitate peer to peer networking among entrepreneurs as well as investor matching, sharing of best practices between countries, identifying suitable in-country partners and promoting export opportunities.
g) Knowledge exchange between national executing agencies and government counterparts	Pillar 2 includes a focus on knowledge management and exchange and is designed to maximize the impact of GCIP by identifying synergies between national ecosystems and ensuring that the successes and achievements of GCIP are captured in knowledge products. Networking will be facilitated between national executing agencies and government counterparts.
h) Improved monitoring and evaluation of impact	Pillar 3 has a specific activity dedicated to impact tracking, which will develop a common methodology for measuring outcomes and impacts to allow for extrapolation and comparison. Each child project will use the same methodology and feed their results into the global figures.

i) Widening the reach of GCIP	Global accelerators will be organized under Pillar 2 of the global child project and will build on the selection of high impact technology innovation with market potential beyond domestic markets. This will ensure that cleantech innovations with potential global impact receive the specific mentoring and business support for entering global markets.
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**Table 2: GEF IEO recommendations and how they are addressed by this project**

The project design is premised on the need to respond to the increased requests by member countries to participate in the GCIP. The need to ensure programming efficiency and cost efficiency of implementation through building synergies, and the need to provide ongoing support to GCIP alumni companies in their growth, expansion and scaling-up stages.

Global coordination will enhance the performance of the individual child GCIP projects as well as reducing duplication of efforts and costs. The GCIP coordination programme will have three important functions:

Concretely, the Global GCIP programme seeks to achieve the following objectives:

As shown in Figure 1 below, the Global Cleantech Innovation Programme is structured into three Pillars, namely:

- 1) Transforming early-stage cleantech innovations into commercial enterprises;
- 2) Cleantech innovation and entrepreneurship ecosystems strengthening and connectivity; and
- 3) Strategic program coordination and programmatic coherence.

## Global Cleantech Innovation Program

### PILLAR 1 :

Transforming early-stage cleantech innovations into commercial enterprises

- Methodologies, guidelines, tools and training materials on cleantech accelerators.
- Competitions based cleantech innovation and entrepreneurship accelerators at national and global levels.
- Pool of business innovation and entrepreneurship experts (coaches, mentors and judges) created and trained to support cleantech innovation and entrepreneurship accelerators at national and global levels
- Targeted advanced business growth support services provided to selected cleantech enterprises towards commercialization
- Investment facilitation support provided to high impact cleantech enterprises through linking to financing opportunities at national, regional and global levels
- Investment projects implemented
- Mentorship and partnership support provided to cleantech enterprises for cross-border market expansion

### PILLAR 2 :

Cleantech innovation and entrepreneurship ecosystems strengthening and connectivity

- Capacity building for national technology innovation and entrepreneurship support institutions, industry associations and business platforms
- Development and dissemination of cleantech innovation and entrepreneurship policies and strategies, roadmaps and recommendations, best-practices
- Joint activities across GCIP countries to promote linkages across ecosystems, learning and collaboration

### PILLAR 3 :

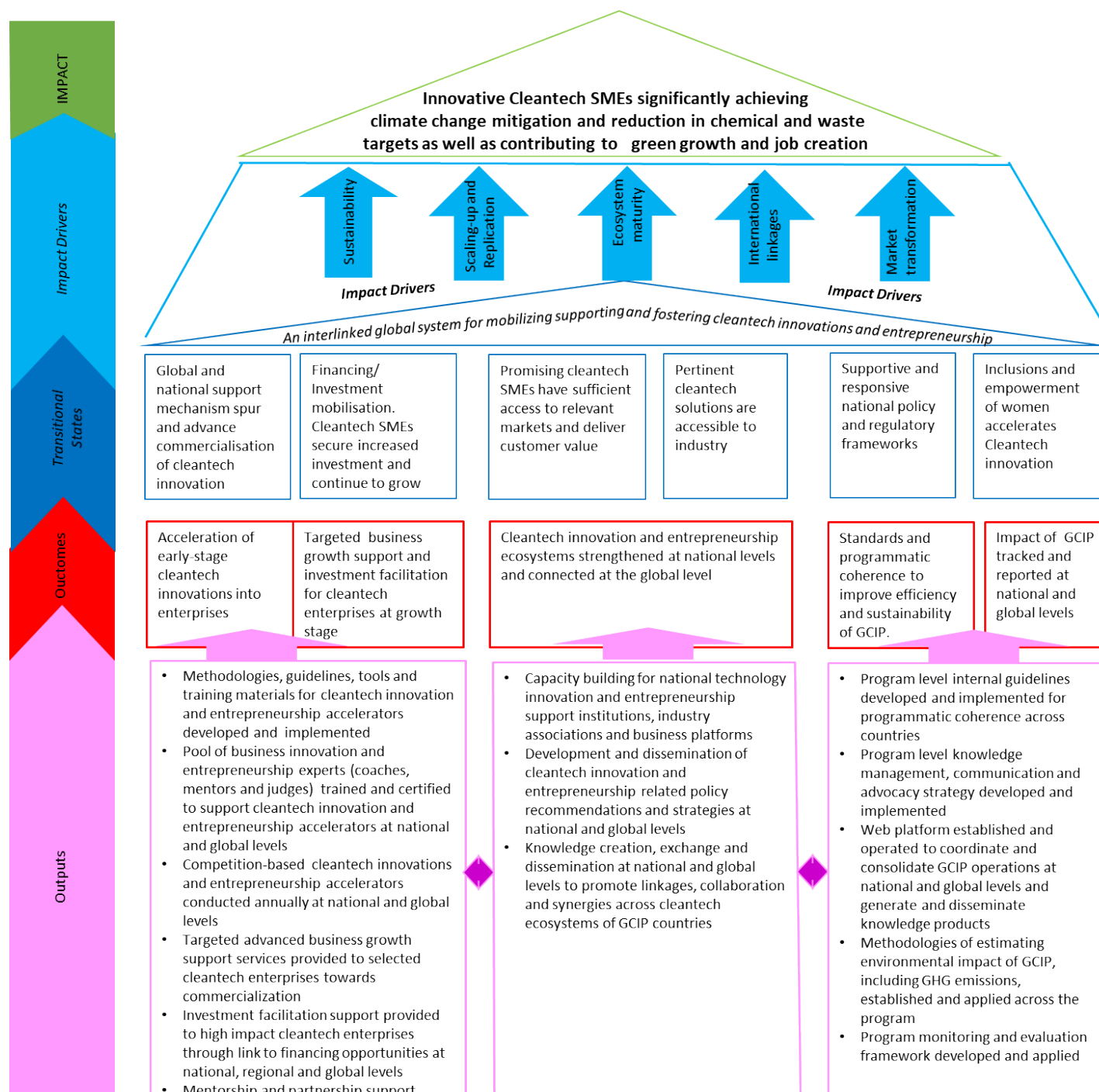
Strategic program coordination and coherence

- Program level internal guidelines developed and implemented for programmatic coherence across countries
- Strategic knowledge management, communication and advocacy
- Web platform established and operated to consolidate GCIP operations at national and global levels and generate and disseminate knowledge products
- Methodologies of estimating environmental impact of GCIP ( including GHG emissions) established and applied across the program
- Program monitoring and evaluation framework developed and applied

Figure 1: The three (3) pillars of the Global Cleantech Innovation Programme

At the national level, global programme will support the implementation and integration of the GCIP approach on local level and facilitate the development of the local cleantech innovation and entrepreneurship ecosystems to support national SMEs. As such a significant part of the work of the global programme will be dedicated to supporting countries to implement their child projects through the platform, knowledge products, advocacy, outreach and programme coherence and coordination as well as direct technical support to SMEs, GCIP alumni's, mentors, judges, national institutions and governments.

Figure 2 below shows the Theory of Change (ToC) for the programme for an accelerated uptake and investments in SMEs with high-impact cleantech innovation products and services meaningfully contributing to climate change mitigation targets, reduction in chemicals and waste in economic production systems ultimately contributing to green growth and job creation.



**Figure 2: Theory of Change for the Global Cleantech Innovation Programme**

## Project components

### **Pillar 1: Transforming early-stage innovative cleantech solutions into commercial enterprises**

Pillar 1 will enhance the capacity and competitiveness of cleantech SMEs to leverage market opportunities embedded in climate change mitigation, chemicals and waste reduction/elimination and efficient agricultural systems, and transform innovative cleantech solutions into technically and commercially viable solutions. All activities under this Pillar are geared towards providing direct support to SMEs, start-ups and entrepreneurs to become providers of cleantech solutions, which will lead to a pipeline of market-ready innovative cleantech solutions at national and global levels. Figure 3 below shows the demand for funds by cleantech business, depending on their stage of growth as well as the associated technical assistance required. Outcome 1.1 will focus on very early-stage innovative cleantech solutions and provide acceleration support related to entrepreneurship and business skills training. Outcome 1.2 provide targeted technical assistance to the SMEs that would have been accelerated and they have evidence of traction and sales, but would need specialized enterprise growth support. Furthermore, SMEs that would be in the expansion stage will receive tipping point investment facilitation services so that their project can reach financial closure.

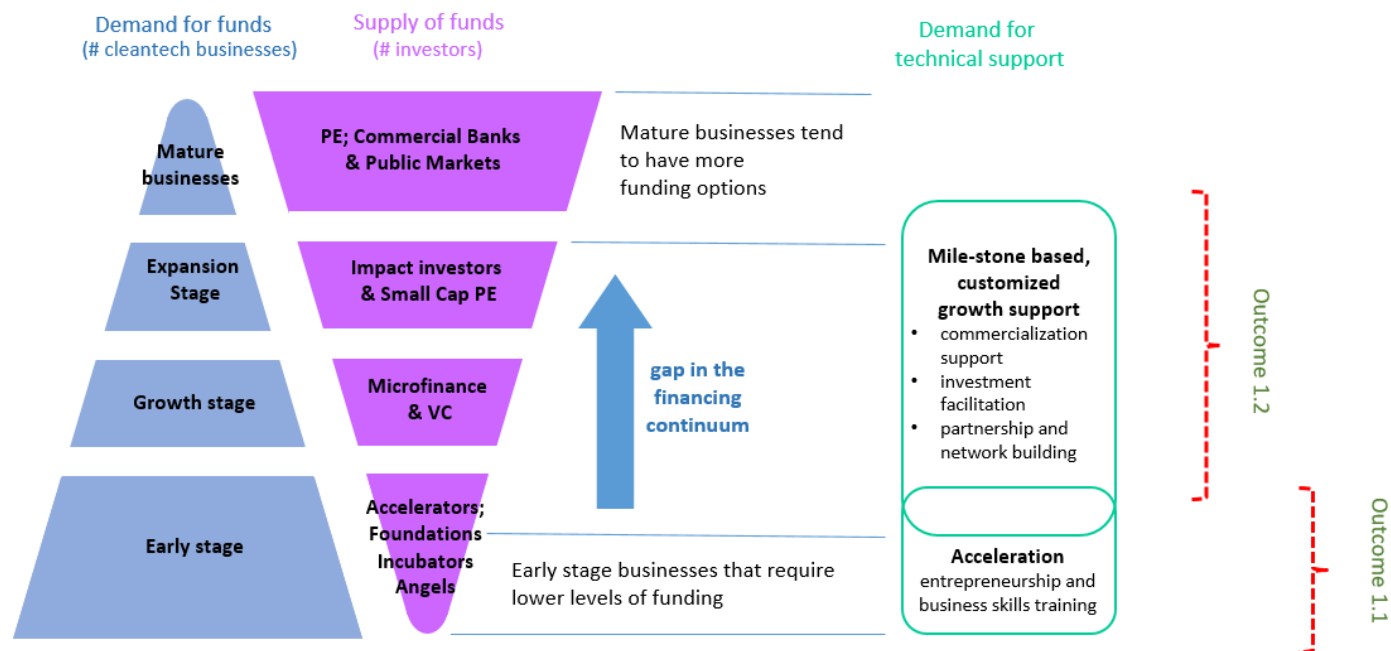


Figure 3: Demand for funds and technical support per development stage

### Outcome 1.1 : Acceleration of early-stage cleantech innovations into enterprises

Early-stage cleantech innovations with high impact potential will be supported towards the next step of their business growth through competition-based cleantech accelerators, conducted annually at national and global levels. The accelerators will be guided by a GCIP approach and methodology, and participants of the accelerators will benefit from tailored coaching and mentoring by experts.

Expected outputs include:

i) Methodologies, guidelines, tools and training systems developed for cleantech innovation and entrepreneurship accelerators developed and implemented



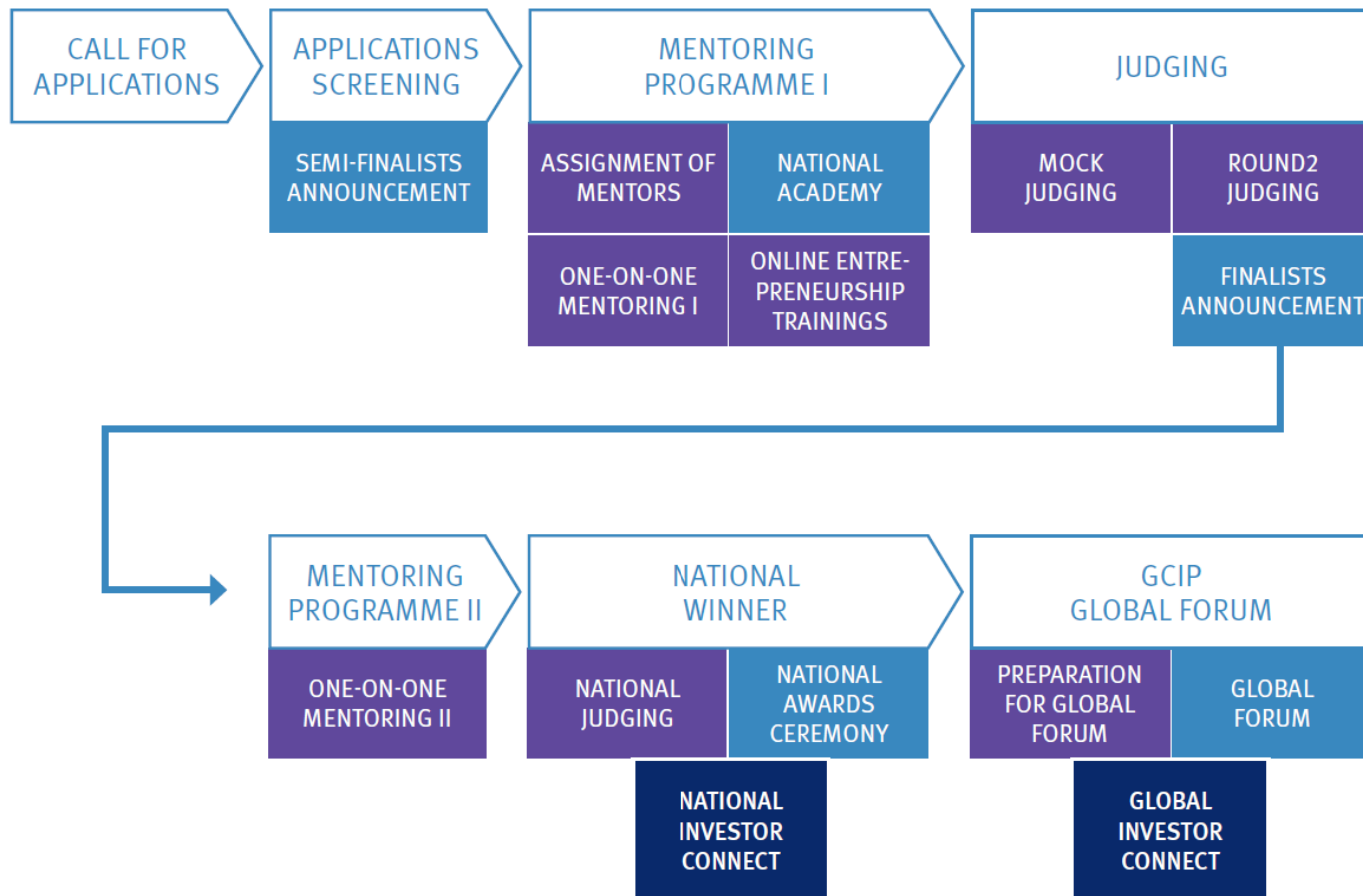
A GCIP Accelerator Guidebook will be developed at the global level, as a comprehensive document that articulates the GCIP approach and methodology for promoting cleantech innovation and entrepreneurship in developing countries. The guidebook will also include practical tools and guidelines for operations and management of the accelerator. For a draft outline of the guidebook, please see pg. 15 of Annex D. GCIP Accelerator Guidebook will be reviewed by each GCIP partner country, and adapted to best suit the context of the respective national cleantech ecosystem including market conditions, policy environment, development priorities, technology priorities etc. The national GCIP Accelerator guidebook will then be used as an operations and management plan to conduct the annual Accelerator in the respective countries. Improvements and suggestions from national guidebooks may be incorporated into the global guidebook for application to the next Accelerator cycle.

*ii) Pool of cleantech innovation and entrepreneurship experts trained and certified*

Developing a pool of cleantech innovation and entrepreneurship experts to act as mentors, coaches and judges<sup>[20]</sup> is critical to the effectiveness of accelerators in providing the right support to the participating teams. This is because the delivery of the accelerator curriculum and the connections facilitated with the right actors will depend on the capacity and competitiveness of these experts. In order to ensure coherence of approach among mentors, coaches and judges, a GCIP cleantech innovation and entrepreneurship expert training programme and resources will be developed at the global level. Similar to the GCIP Accelerator Guidebook, the training programme and resources will be reviewed by each GCIP partner country and adapted as per their national contexts, ensuring that the training materials accurately reflect market, business, policy and investment climates. A pool of experts with the knowledge and connections to support cleantech innovations towards commercialization are also crucial to the cleantech ecosystem, beyond scope of GCIP accelerators. The community of experts trained/certified by GCIP are expected to positively influence the cleantech innovation initiatives at nation and global levels, and will contribute to the strengthening of the cleantech innovation and entrepreneurship ecosystem in general.

*iii) Competition-based cleantech innovations and entrepreneurship accelerators conducted annually at national and global levels*

Child projects will be assisted through the global programme to establish and operate the annual GCIP accelerator, which is a 4 to 6 month curriculum designed specifically to support cleantech innovations stemming from developing and emerging countries, develop viable business models, and grow cleantech enterprises. Through the accelerator, cleantech innovations with high-impact potential are identified and invited to receive intensive business and entrepreneurship mentoring and coaching to accelerate their growth as businesses. The national accelerators will be conducted annually, based on the developed guidebooks (see above section). The cycles across each country will be aligned so they all feed into global level activities (online webinars, participation at the global forum, etc.).



**Figure 4: The GCIP Accelerator process**

At national level, it is expected that each national accelerator will attract between 100 to 200 applications per year, with higher number of applications in the later cycles. Applications will be invited for cleantech innovations that are in line with GEF 7 priorities that include 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. From these applications,

around 30 semi-finalists will be selected to receive support from the accelerator. Categories for the accelerator[21] will be determined at the global level in consideration of GEF 7 priorities (mainly renewable energy based mini-grids with storage, e-mobility and energy efficiency), and adapted at the national levels to reflect each country's circumstances. Selection criteria will include business growth potential and impact potential (environmental and social), and will be further detailed in the guidebook. Through round 2 judging, 10 to 15 finalists will be selected per country to receive further support under the accelerator, and from these finalists, 3 to 5 winners (national winners and category winners) will be selected to participate in the annual GCIP Global Forum. A national investor connect event will then be organized to link finalists to local angels, venture capital funds and other potential investor.

At global level, a Global Accelerator will be conducted to allow cleantech innovations from all developing and emerging countries to participate in the global drive for cleantech innovation and entrepreneurship. The Global Accelerator will allow cleantech innovations with game-changing and high impact potential from all GEF member states (that are not a GCIP partner country) the opportunity to receive support to grow their business globally. The Global Accelerator will focus on identifying cleantech solutions in GEF 7 priority areas, and will also be relevant for innovations that have scale-up and replication potential in other GCIP partner countries. This will be a unique way to identify and promote catalytic cleantech solutions that can deliver GEBs at the global level. Four Global Accelerator cycles will be conducted, and its management and operations will be based on the guidebook developed under 1.1.a.

### **Outcome 1.2 : Cleantech enterprises are supported towards commercialization through targeted advanced business growth support and tipping point investment facilitation services and demonstration projects implemented**

Upon completing the GCIP accelerator, supported SMEs are expected to continue growing their business and move into the growth and expansion stages. However, they will continue to face very weak and generally hostile innovation and entrepreneurship ecosystems where there is limited or no access to systematic support services for them to reach business growth and expansion stages. Experience from GCIP in 2014 to 2017 has also shown that after successful completion of the GCIP Accelerator, SMEs required further targeted and specialized support in areas that include intellectual property, access to finance to sufficiently mature and penetrate the market.

Therefore, under this Pillar, a select number of cleantech enterprises who have successfully completed the GCIP Accelerator (GCIP alumni) and have shown significant traction will receive targeted and specialized advanced commercialization support and tipping point investment facilitation services, please see figure 5 above. The support required towards full commercialization can be categorized into four related, but not necessarily linear dimensions: business and management readiness, investment readiness, market readiness, and technology readiness. The selection criteria will include evidence of growth during and after participation in the GCIP accelerator, further growth potential, environmental and social impact potential, among others. A detailed selection criteria and process will be developed at the global level, and disseminated to GCIP partner countries for adaptation to national contexts.[22]

Expected outputs include:

*i) Targeted and specialized advanced business growth support services provided to selected cleantech enterprises towards commercialization including investment in pilot projects*

Under this Pillar, selected GCIP alumni's will receive tailored post-acceleration support as per the specific needs for progressing into the next phase of business growth and in overcoming product related market barriers, per each enterprise. 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. As there is no "one approach serving all" model for each GCIP alumni, an extensive consultation will take place as part of the selection criteria and process to ensure that the needs and expectations of the GCIP alumni is fully understood and agreed on at entry into post-acceleration support. A mile-stone based approach will be employed to measure progress of each enterprise. At the global level, a GCIP approach and methodology for post-acceleration support will be developed and disseminated for national review and adaptation.

*ii) Tipping point investment facilitation support provided to selected cleantech enterprises through linking to financing opportunities*

In many developing and emerging countries, available funding mechanisms and investment raising for cleantech products and services is a lengthy and iterative process. Therefore, GCIP alumni enterprises with high replication and scaling up potential will benefit from tipping point investment facilitation support. At national levels, each country will seek to establish a robust network with national financial institutions, funds and investors to raise awareness and sensitize various stakeholders on the opportunities and risks associated with cleantech products and market trends. One main barrier to the financing of cleantech innovations/businesses is the lack of knowledge and understanding of the potential risks and potential rewards. Therefore, efforts will be made to actively engage financing institutions and investors to increase investor confidence in cleantech innovations by creating dialogues and providing training sessions as well as short, interactive webinars. Examples of GCIP alumni may be presented to demonstrate possible returns on investments. Communications efforts tailored for investors (e.g. venture capital funds, angel investor networks, impact investors, etc.) will also be made to showcase the profitability and impact potential of the cleantech businesses thereby influencing the investment landscape for the cleantech sector.

In parallel, national investor connect events will be organized regularly to introduce GCIP alumni innovations and enterprises to financiers and investors. (These events may also benefit semi-finalists during the accelerator.) For larger impact, these events will be co-organized regularly with partner corporations and government agencies to highlight opportunities for investment, loans, grants, technology adoption and partnerships.

As opportunities arise at national, regional and global levels, selected GCIP alumni will be invited to pitch to impact funds, foundations, challenges, competitions and crowdfunding platforms with an appetite to invest in Cleantech businesses. Especially on a global scale, such funds often need a critical mass of portfolio projects to engage meaningfully in developing countries. While GCIP alumni at country levels may be considered as uneconomic for some large investors, combining portfolios of selected cleantech innovations/enterprises across all GCIP countries will increase investor appetite. At regional and global levels, efforts will also be made to build a network of financing institutions, funds and investor communities, and global/regional investor connect events will also be organized to support cross-border expansion of GCIP alumni companies.

In particular, the regional and global investment facilitation will build on UNIDO's Private Financing Advisory Network (PFAN) ([www.pfan.net](http://www.pfan.net)). PFAN bridges the gap between entrepreneurs developing climate and clean energy projects and private sector investors by providing business coaching to projects, increasing the chances of attracting investment and growing its investor outreach. [23]Based on the results and lessons learned from piloting the linkages between GCIP and PFAN, more systematic and institutional mechanisms to facilitate PFAN support will be developed. In particular, PFAN will operate a special window for all GCIP alumni to submit their projects and innovation and link them to global investors. PFAN methodology is trusted by investors, and has a track record of mobilizing investments exceeding 1,25 billion US\$. Bringing GCIP alumni to the PFAN platform, will ensure that these companies are able to mobilize, investments to grow and expand their businesses and achieve more GHG emission reductions. Furthermore, the PFAN platform will help to track the progress of the GCIP alumni companies and capture and report the actual investments mobilized, GHG emission benefits and other socio-economic benefits (such as the number of jobs created, community impact, gender diversity etc.). Beyond PFAN, GCIP will also explore targeted investment/financing vehicles at global levels, and select and connect GCIP alumni as appropriate. UNIDO will target partnerships with impact investors such as the Global Innovation Fund[24] and other global cleantech innovation funds that are operational or are being designed. As an example, UNIDO was invited to contribute inputs to the discussions on the Global Sustainable Energy Innovation Fund[25] under development by the World Economic Forum.

#### *iii) Investment projects implemented to deploy innovative cleantech solutions*

A good number of GCIP alumni will have innovative cleantech solutions that will be ready for deployment and realize GHG immediately. As such, the project will facilitate the implementation of pilot projects related to the key GEF priorities namely renewable energy based mini-grids with storage, e-mobility, and energy efficiency. The support from GCIP will focus on catalytic activities like developing contracting modalities, seed and gap funding etc. It is expected that each of the project that will be supported will mobilize co-financing from other investors such as angels, ventures, banks, cities, municipalities. Furthermore, technical assistance will be provided to GCIP countries on investment focused services that include designing impact investment funds.

#### *iv) Mentoring and partnership support for cross-border market expansion*

Many GCIP supported cleantech innovations have potential for replication and potential in other developing countries. Based on requests received from GCIP alumni enterprises, international mentors will be assigned in the target country of expansion to facilitate building of connections and networks for expansion into a new market. This service will be offered through the global programme platform, with support from the national child project in identifying a suitable mentor with the appropriate expertise. In addition, enterprises will be given curated peer networking opportunities with other GCIP enterprises, as well as cleantech enterprises within UNIDO's partner network. Through peer networking, the enterprises will explore opportunities for technology collaboration, product co-development, joint venture for market expansion, etc. in a business-to-business to context. An example is a pilot initiative between UNIDO and KOTEC to connect GCIP alumni enterprises with cleantech SMEs of Korea that have matching interests. The aim of this pilot was to create joint-venture opportunities across borders, to facilitate market expansion and product co-development. Five GCIP start-ups participated in this pilot. From this pilot approach, initial discussions on technology collaborations were established between a Korean SME and a GCIP alumnus from Morocco. GCIP will build on this pilot to develop a systematic approach where GCIP alumni with matching needs will be linked to SMEs in other countries to develop joint ventures, technology co-development and co-innovation opportunities.

On ad-hoc basis, as opportunities arise, matchmaking services for GCIP alumni enterprises will be provided with interested corporations, investors, governments. Further, opportunities to showcase cleantech innovations and solutions at high-level national and international events, such as the UN Climate Summit, UNFCCC Conference of Parties, Vienna Energy Forum, etc., will be provided to GCIP alumni. Such high-profile events are instrumental for GCIP alumni companies to build their global presence and extend their partnerships and networks. To maximize the visibility of GCIP as a programme, and to increase the visibility and credibility of GCIP alumni, partnerships will be established and leveraged on a continual basis. This will allow GCIP to be fully connected to other technology innovation related initiatives, and to contribute to the wider discourse on how cleantech innovation ecosystems can best be leveraged to offer transformative environmental solutions in the market.

## **Pillar 2: Cleantech innovation and entrepreneurship ecosystems strengthening and connectivity**

### **Outcome 2: Cleantech innovation and entrepreneurship ecosystems strengthened at national levels and connected at the global level**

This Pillar is key to the overall GCIP programme with cross-cutting activities designed to maximize the impact of GCIP by strengthening national cleantech ecosystems of GCIP partner countries, identifying synergies between national ecosystems, and connecting ecosystems for knowledge exchange and partnership building. At the national levels, the policy framework and institutional sustainability are integral parts of GCIP's "ecosystems approach", and also of strategic relevance in ensuring that the outputs and outcomes of the child projects are contributing to the national priorities and sustained post project implementation.

#### *Expected outputs include:*

##### *i) Capacity building for national cleantech innovation and entrepreneurship support institutions, industry associations and business platforms*

At the global level, a cleantech innovation and entrepreneurship ecosystem (CIEE) assessment framework will be developed and disseminated to national child projects as a tool to analyze the strengths and weaknesses of each country's cleantech ecosystem. This will be instrumental in identifying the capacity building needs and optimal set of interventions for each country. The aim will be to ensure that national 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 GEF support. Where necessary, the national child projects will assist the countries in building on and further developing suitable national policies and regulations that create an enabling business environment for cleantech innovation. This will be an iterative process where analyses are conducted and recommendations made. Targeted trainings and seminars for cleantech ecosystem actors will be organized to facilitate understanding of their respective roles in contributing to the promotion, commercialization, and upscaling of cleantech solutions. An integral part of national cleantech ecosystem strengthening will be to ensure that the ecosystem recognizes and fosters socially inclusive economic growth and job creation in the cleantech sector. At national levels, a gender baseline study and a gender and youth mainstreaming strategy and action plan will be developed during the inception phase. Based on the national strategy and action plan, targeted interventions to promote gender equality and to enhance participation of women and youth in the cleantech sector will be designed and conducted.

##### *ii) Development and dissemination of cleantech innovation and entrepreneurship related policy recommendations and strategies at national and global levels*

Policy remains a key determinant that influences cleantech market and investment behavior. At national levels, multi-stakeholder policy dialogues will be facilitated to prompt thinking and collaboration among cleantech ecosystem actors, and to influence the policy decisions that can create a conducive environment for commercialization of cleantech solutions. The dialogues will be captured as policy briefs and presented to relevant government ministries and agencies. At national level, priority will be given to assisting national governments to ensure that they have the best policies, regulations and incentives required for the promotion of cleantech innovations. The work will be tailored to the country situation. For instance, the project might assist in reviewing the existing policies and regulations relating to the promotion of clean technologies, innovation and entrepreneurship and prepare a gap analysis report on policy requirements. Stakeholder consultation will be carried on any recommendations and support provided to the government to implement it. At the global level, GCIP will develop, document and disseminate policy best practices, roadmaps and recommendations across the GCIP countries. These will document success stories on how policy and regulatory measures are used to stimulate and sustain cleantech innovations and support their commercialization.

*iii) Knowledge creation, exchange and dissemination at national and global levels to promote linkages, collaboration and synergies across cleantech ecosystems of GCIP countries*

Emergence of a cleantech sector requires convergence of technical knowledge, understanding of policy, market and financial environments, as well as business savvy and entrepreneurial skills. As it is an emerging sector, knowledge and capacities of individuals or single institutions are often not sufficient to translate into market success. Therefore knowledge creation, exchange and dissemination are especially important in strengthening the cleantech ecosystems of developing countries. The global programme will serve as a coordination platform to capture the knowledge created from all GCIP activities, and produce promotional materials for effective communication tailored for each segment of the ecosystem, to influence thinking and decision making processes around cleantech at national and global levels. In addition, this will allow GCIP to play a key role in connecting innovation ecosystems of different developing and emerging countries to the global innovation ecosystem, and to facilitate and contribute to community of practice in this space. The global programme will identify synergies between national innovation ecosystems and facilitate exchange and learning among the countries. Networking among national ecosystems of GCIP partner countries will allow national ecosystems to become part of a larger global innovation ecosystem. The wealth of information and insights collected through GCIP activities will be translated into knowledge products<sup>[26]</sup> that reflect the technology and investment trends, and inform and influence the international discourse on policy and investment decisions for cleantech innovation. At national levels, knowledge will be captured through policy briefs, impact reports, brochures, webinars, and other types of promotional materials, and disseminated through events, social media channels, etc. as appropriate.

Conducting an annual GCIP Forum will also be an integral part of ecosystem connectivity. 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. This provides GCIP alumni enterprises with exposure to the global community, and the opportunity to forge new partnerships for co-innovations and joint ventures. The GCIP Forum is further a culmination of innovation showcasing, investment matching, and networking among national GCIP counterpart institutions, and will continue to be an important annual milestone for networking, advocacy, and knowledge exchange among cleantech innovation ecosystem players. The Global forum will not be a stand-alone event, but will be organized on the margins of highly visible global events such as the UNFCCC COP, cleantech forums organized by partners such as Cleantech Group, Cleantech Scandinavia etc.

### **Pillar 3. Programme coordination and coherence**

#### ***Strategic guidance for efficiency and effectiveness in achieving impact among GCIP countries***

#### **Outcome 3.1 Standards and programmatic coherence to improve efficiency and sustainability of GCIP.**

This Pillar is a core value addition of the global GCIP programme, with enhanced coherence and coordination. The activities will ensure that the successes and achievements of GCIP are captured and communicated globally, so that GCIP is leading and contributing to the global cleantech ecosystem. Coherence and standards in the execution of GCIP country projects will be developed which, along with networking, will benefit GCIP Project Management Units, as well as national executing agencies. The activities within this Pillar are necessarily interlinked.

#### ***Expected outputs include:***

##### ***i) Programme level internal guidelines developed and implemented for programmatic coherence across countries***

In order to maintain coherence and standards of GCIP execution across multiple countries, GCIP guidelines will be developed under the global child project and disseminated as a tool for national child projects. This will also include the establishment of national GCIP Project Management Units (PMUs). International training for PMUs will be an important channel for programmatic coherence across partner countries, and therefore PMUs will be brought together at least once a year to discuss the GCIP approach and methodologies, and share experiences and insights. In addition, sustainability and exit strategy of GCIP will be developed at the global level in year 2 of implementation for review and adaptation by each GCIP partner country by beginning of year 3 at national levels. It is envisaged that the management and financing of the national PMU operations will be handed over to national entities post GEF funding. Any other guidelines to ensure programmatic coherence will be developed under the global child project as needs arise, and disseminated to national PMUs for execution.

##### ***ii) Programme level knowledge management, communication and advocacy strategy developed and implemented***

Past experience has shown that exchange of learnings and experiences among GCIP national PMUs are of key value, especially in conducting the annual national accelerators, supporting startups at various stages of development with diverse range of technologies, and strengthening the cleantech ecosystem of which they are part. Therefore this will be formalized as part of the GCIP global child project, and programme management and operation related knowledge created and accumulated at national levels will be collected and disseminated systematically among GCIP partner countries. To this end, each national PMU will be requested to coordinate closely with UNIDO HQ and other GCIP national PMUs in connecting GCIP alumni enterprises and counterparts through systematic and continuous efforts. In addition, a communication and advocacy strategy for GCIP at the global level will be developed and executed under the global child project. In addition, guidelines for national level communication and advocacy strategy for review and adaptation by each national PMU. The communication and advocacy efforts will aim three levels: 1. Promoting visibility of GCIP as a programme and communication of impacts achieved at national and global levels, 2. Increasing awareness of the catalytic role of clean technologies as a business model in addressing climate change and environmental issues and their profitability, 3. Showcasing cleantech innovations from GCIP alumni enterprises and enhancing their visibility and credibility.



*iii) Web platform established and operated to coordinate and consolidate GCIP operations at national and global levels and generate and disseminate knowledge products*

The web platform will be developed as a tool for four key functions. First is as an internal management and operations tool for use by PMUs at national and global levels by PMUs. Guidelines and tools developed at the global levels will be disseminated through the web platform. Second is as a tool for execution of annual accelerators at national and global levels, to be used from the beginning of the accelerator cycle (call of applications and receipt of applications), and during the accelerator (webinars, submission of assignments etc.). Third is for maintenance of a GCIP community at national and global levels. All GCIP alumni enterprises, as well as certified GCIP mentors and coaches will be invited to join the online community as a net working tool. Profiles and impact potential of each GCIP 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 GCIP alumni enterprises. Fourth is as a knowledge depository for the general public. The web platform will make available all knowledge and communication products developed at national and global levels for public consumption.

Outcome 3.2 Impact of GCIP tracked and reported at national and global levels

*Expected outputs include:*

*i) Methodologies of estimating environmental impact of GCIP (including GHG emissions) established and applied across the program*

A common methodology for gathering information on outcomes and higher-level impacts/ results will be established at the global level. This will ensure a shared understanding of GCIP associated terminology amongst all involved stakeholders and will allow for extrapolation and comparison. It will ensure that GCIP'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 including GHG emissions), job creation and investment leveraged. Data will be gender disaggregated where appropriate. Dedicated resources will be assigned to track and monitor the business growth, social and environmental impact of the GCIP alumni enterprises. The data will be used to create 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). The data collected will also be analyzed and published as a knowledge product to inform the larger international discourse on cleantech innovation and its impact. This will benefit the GCIP alumni enterprises by providing increased credibility and visibility. The impact monitoring and capturing efforts in each country will be coordinated with efforts at the global level, to consolidate the impact of GCIP as a global initiative. In particular, the methodology for calculation of global environmental benefits (GEB) such as the GHG reduction potential of innovations will be refined, in order to track the expected environmental impact of the GCIP innovations and enterprises. All semi-finalists will receive training (as part of the Accelerator) to provide GEB estimations of their innovations. The methodology will be standardized across all GCIP partner countries to ensure uniformity and accuracy of the calculations. This will further allow the programme to show impact on global level.

*ii) Program monitoring and evaluation framework developed and applied*

Programme monitoring and evaluation (M&E) will be conducted in accordance with established UNIDO and GEF procedures (see section 6 on coordination).

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

GCIP is fully aligned with objectives of GEF-7 Climate Change Focal Area Strategy CCM 1-4 , “ Promoting innovation and technology transfer for sustainable energy breakthrough” , CW-1-1, “Strengthen the sound management of industrial chemicals and their waste through better control, and reduction and/or elimination”, LD Area of landscapes under improved practices (hectares; excluding protected areas). The program seeks to foster private sector engagement in accelerating the uptake and investments in innovative cleantech solutions at scale. For climate change focal area, the program will prioritize 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. In particular, the program supports cleantech innovation and entrepreneurship by providing catalytic support to early-stage cleantech innovation SMEs so that they commercialize and scale-up their operations thereby delivering climate and sustainable energy solutions that reduce GHG emissions as well as reduction of emission and release of chemical pollutant through the use of sustainable materials that do not contribute to toxic loading of the environment.

Therefore, GCIP is a transversal intervention that supports all priorities of GEF 7 Climate change and Chemical and Waste and Land Degradation focal areas. The programme provides much needed and best available catalytic technical assistance to cleantech SMEs so that they commercialize and scale-up globally and in the process create new industries and green jobs. In line with GEF strategy on private sector engagement, GCIP capitalizes on the growing interest by private actors in the sustainability agenda and create the conditions for SMEs driven creation and transformation of cleantech markets. This ultimately harnessed the ingenuity and creativity of SMEs and “crowd-in” private sector investments to deliver environmental benefits beyond business as usual. GCIP will promote synergies with other GEF Programs to leverage more impacts. In particular, GCIP will collaborate with the Clean Rural Electrification for Africa Program, Sustainable cities and FOLUR where GCIP supported SMEs with innovations related to these programme will be linked to these programme for potential partnerships and investments to scale up their innovations. Furthermore GCIP will also exchange knowledge and lessons on opportunities for technology and business model innovations in across these programs.

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

The private sector is key to the creation and expansion the market of cleantech products and services, achieving GEBs, generating jobs and supporting economic growth. However, the innovation and entrepreneurship ecosystems in frontier markets ( mainly developing and emerging economies) present a host of barriers and challenges to cleantech SMES in transforming their innovations into enterprises and ultimately commercialisation. Therefore, without strategic interventions targeted at both the skills and capacities of SMEs and strengthening and connecting ecosystems, the existing early-stage cleantech innovations will either just fail or achieve very minimal growth and hence fail to realise their full potential. GCIP is therefore carefully designed to provide catalytic and effective interventions that will on one hand, galvanise private sector interest and investments in the cleantech innovation and entrepreneurship space and on the other hand, strengthen national cleantech innovation and entrepreneurship ecosystems and connect them at global

level. These interventions, will 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.

GEF support to GCIP is focussed on supporting the commercialization of high impact and innovative cleantech solutions that will have lasting positive effects on the global environment, as well as the development of a dynamic and vibrant local market for clean technologies. This will allow for a balance between supporting economic growth and climate change mitigation. Without GEF these opportunities will be missed as the existing barriers to cleantech innovation and entrepreneurship will prevail. Therefore GEF resources are requested to help address the barriers, which in turn will be instrumental in catalyzing cleantech innovations and sustaining an entrepreneurship culture beyond the lifetime of the project.

In addition, GEF incremental cost reasoning is premised on multi-level factors based on the overall effect of GCIP as a programmatic framework as following:

- the acceleration of early-stage cleantech innovations at country and global levels ensures that a critical mass of these innovations are able to be transformed into enterprises;
- to increase chances of commercialization of accelerated enterprises, GCIP will provide targeted enterprise growth support and investment facilitation to ensure that these enterprises commercialize and expand their operations;
- to ensure that GCIP Alumni can truly mature and be able to harness global market opportunities support will be provided in connecting cleantech ecosystems across countries;
- GCIP alumni will have higher chances of commercializing their innovations and of getting connected to investors and the private sector through international mentoring for global expansions and linkages to other sources of financing that include impact investors, crowdfunding platforms, angel investors etc.;
- enhanced communication, advocacy and outreach about the GCIP will increase the appreciation of technology innovation and entrepreneurship to climate change mitigation and also increase the global appreciation of the brand of GCIP and promote it as an effective badge or label of quality and innovation;
- enhanced knowledge generation and management in the GCIP programme will ensure that the rich knowledge generated across the GCIP countries is effectively managed and disseminated thereby increasing the leverage of GCIP in influencing decision making processes across the cleantech innovation and entrepreneurship ecosystems; and
- coherence and standards in the GCIP project will bring about consistency and trust in the GCIP brand and will ensure that high quality SMEs are supported to the highest level thereby increasing their chances of scaling up their innovations.

These factors, present a compelling case for the incremental reasoning of this programme. The added-value of the global child project is to nurture entrepreneurs to scale, to reach global investments and markets and to strengthen private sector partnerships resulting in further GHG emission reductions. Without GEF funds these opportunities will be lost and there will be no additional GHG emissions benefits. Each of the specific Pillars have been carefully designed to maximize impact.

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

The long-term lifetime of innovative cleantech solutions introduced in the market with support from GCIP will be reflected in multiple environmental benefits primarily as GHG emission reductions as well as reduced chemicals and waste, and land degradation. The environmental benefits achieved through the programme will be measured and quantified on the basis of the innovations marketed and their uptake. Given the nature of the programme, the innovative cleantech solutions and products developed and commercialized will achieve environmental benefits beyond the project life and scope.

By definition GCIP encourages open innovation, therefore estimating a priori the emission reduction potential of innovations supported through the GCIP has proven to be difficult since the types and categories of innovative cleantech solutions that will be supported will be determined during the selection of semifinalists as part of the annual accelerators.

The Standard GCIP methodology for calculating, tracking and monitoring environmental impact will be developed and regularly assessed and updated under Pillar 3, in order to achieve coordination and coherence in the calculation, tracking and monitoring of the impact achieved through GCIP at national and global levels. As such, all child projects will be provided with GCIP impact tracking methodology through the global platform.

### ***GCIP's target for avoided GHG emission***

In order to ensure that GCIP supports innovative cleantech solutions with high impact potential, and delivery of GEBs at the program level, a target approach will be applied. In order to achieve cost effectiveness of GEF funding for GEBs, a value of 5 to 10USD/tCO<sub>2</sub>e avoided is targeted. This would mean, with GEF funding of more than USD 18 million, GCIP aims to deliver between 1.8 million and 3.6 million tons CO<sub>2</sub>e by 2030. As 9 countries will be a part of GCIP at the time of this proposal, at least 1000 semi-finalists are expected to be supported through the accelerators in all countries across the program, Therefore the target the minimum projected potential of avoided GHG emissions per enterprise would be between 1,800 to 3,600 tCO<sub>2</sub>e by 2030. (More details on the methodology for GHG emission reduction potential is provided in Annex I).

As a key focus of GCIP is to identify and support cleantech innovations with high impact potential, this benchmark will guide the accelerators at national and global levels to take into account the GEB potential as a key criterion in accepting applications into the accelerator. This benchmark will guide child projects to select applications under the annual national accelerators. The provided range of 5 to 10 USD/tCO<sub>2</sub>e in reduction potential, will allow the child projects to support a mix of technologies with different CO<sub>2</sub> emission reduction potentials. This will allow, to permit innovations into the accelerator with lower CO<sub>2</sub> reduction potential but exploring new market applications, as well as innovations creating multiple benefits including social indicators such as job creation, innovations contributing to gender dimensions, and a range of technologies with varying potential as long as this minimum average across the program is achieved.

### ***GCIP's target for avoided toxic chemicals and waste***

The identification of suitable technologies and solutions for reductions and substitution of hazardous chemicals and wastes will be guided by the Stockholm Convention and Minamata Convention. Both multilateral agreements provide clear guidance on the identification and selection of alternate solutions applying sustainable/green chemistry approach. This includes Minamata Convention Forms and Guidance Documents on New and Emerging Techniques, and Stockholm Convention General Guidance Document on

considerations related to alternatives and substitutes for listed persistent organic pollutants and candidate chemicals. The identification, assessment and selection of innovation in the development of new and safer alternatives will be guided by these documents.

***GCIP’s target for area of landscapes under improved practices***

Technologies that are aligned with Land Degradation Neutrality (LDN)[\[27\]](#) will be identified and accelerated, especially those with high-impact potential to contribute to sustainable land management, diversified agro-ecological food production systems, and integrated landscape management and restoration. In particular, innovative technology solutions to increase the prospects for food security for smallholders and communities will be prioritized, as well as solutions for increased crop and livestock production, without the risk of further expansion of farmland, erosion of genetic diversity, overexploitation of land and water resources, overuse of chemical fertilizers and pesticides, and inefficient practices that lead to greenhouse gas emissions and food loss and waste. As a general guide, each child project will aim to target improved land practices in 0.5-1% of the entire arable land in the country.

***GCIP’s target for biodiversity protection***

Innovative cleantech solutions with potential for impact in the protection of biodiversity will be identified and accelerated, in particular technology solutions and processes that support management of biodiversity in production landscapes, harnessing biodiversity for sustainable agriculture, securing high conservation value forest (HCVF) areas in production landscapes, and integrating biodiversity and ecosystem values in urban planning, will be given priority.

***Estimation of Global Environmental Benefits***

The following table shows the contributions from each country and the total expected global environmental benefits.

Child Project	No. of semi-finalists to be supported through the accelerator	Target range* for GHG emissions avoided (10 year horizon, tCO <sub>2</sub> e)		Target in toxic chemicals (tons) and POPs (gTEQ) avoided	Target in area of landscapes under improved practices (ha)
		Direct	Indirect		
Cambodia	70	126,000 to 252,000	630,000 to 1,260,000		
China	400	720,000 to 1,440,000	3,600,000 to 7,200,000		
Indonesia	40	72,000 to 144,000	360,000 to 720,000		
Kazakhstan	75	135,000 to 270,000	675,000 to 1,350,000		
Malaysia	90	162,000 to 324,000	810,000 to 1,620,000		
Moldova	35	63,000 to 126,000	315,000 to 630,000		
Morocco	75	135,000 to 270,000	675,000 to 1,350,000		
Nigeria	75	135,000 to 270,000	675,000 to 1,350,000		
South Africa	200	360,000 to 720,000	1,800,000 to 3,600,000	6.7 tons / 200 gTEQ	
Turkey	100	180,000 to 360,000	900,000 to 1,800,000		101,905 to 203,810
Global	100	180,000 to 360,000	900,000 to 1,800,000		
<b>Total</b>	<b>1210</b>	<b>2,178,000 to 4,356,000</b>	<b>10,890,000 to 21,780,000</b>		

\* As described above, the target range for each supported enterprise would be between 1,800 to 3,600 tCO<sub>2</sub>e by 2030.

**Table 3: Estimation of global environmental benefit targets through child projects**

During the accelerator, further training will be provided as part of the curriculum regarding estimating GEBs of cleantech solutions, and how to monitor and capture actual impact versus estimates. In order to report on the GEBs achieved, annual monitoring exercise of alumni will be conducted by the Global GCIP platform.

For some technology categories, specific GEBs beyond GHG emissions reduction potential will be monitored and captured. For example innovations/solutions under renewable energy and energy efficiency categories, quantity of energy saved and/or capacity or renewable energy installed will be calculated, monitored and reported on. Other GEBs may include POPs reduction, reduction in air pollutants (e.g. NO<sub>x</sub>, SO<sub>x</sub>, PM and CO), improved water quality and reductions in material use. To ensure coherence in the calculation methodologies, the type of GEB and the corresponding calculation methodology will be identified and determined/developed under the global child project, and disseminated to the country PMUs for application and data collection.

In the case of Ukraine, the GHG reduction potential of investments in low carbon and clean technologies through the child project are calculated based on the assumptions made regarding the amount to be raised during the 1st green bond issuance, as well as data from the World Bank Green Bond Impact Report 2018, which shows that every 1 million USD allocated on energy efficiency projects in Ukraine generated annual direct emission reduction around 5,000 tCO<sub>2</sub>eq. These projects financed through World Bank Green Bonds passed through certain due diligence process, which would also apply to the 10 demo projects mentioned in this project proposal. Assuming that the green bond market

mechanism in Ukraine attracts 27 million USD in the first issuance, as was the average 1st sovereign green bond issuance in Seychelles, Fiji and Nigeria weighted by their mean sovereign credit rating, the expected annual direct emission reduction would be equal to 135,000 tCO<sub>2</sub>eq per year, equal to 1,350,000 tCO<sub>2</sub>eq over the average 10-year investment lifetime.

The expected emission reductions will come as a result of increased investments in low carbon transitioning of Ukraine's extractive and a manufacturing industry that is often characterized by outdated technologies and resource-intensive practices, as well as growing clean technology innovation ecosystem and energy efficiency measures. Based on the GEF manual for calculating GHG Benefits of GEF projects, a bottom-up estimate using a multiplication factor of 4 (for Credit and Guarantee facilities) gives indirect emissions reductions over 10-year lifetime of up to 5,400,000 tCO<sub>2</sub>eq, but assuming 50% GEF causality factor for a substantial contribution from the GEF intervention, indirect GHG emission reductions would be up to 2,700,000 tCO<sub>2</sub>eq.

In cases where GCIP alumni received support for cross boarder expansion through the global child project and solutions were sold outside of their country of origin, these GEBs will be disaggregated and reported as GEBs achieved under the global child project to showcase the value addition of global coordination activities and ecosystem connectivity.

Under the submitted child projects, so far South Africa has requested funding under chemical and waste focal area. As such, emission potential of hazardous chemicals and wastes have been estimated as following:

South Africa emitted 460 million metric tons (MtCO<sub>2</sub>e) in 2015, or 1,840 million metric tons over four years. Here reductions are  $243,000 + 900,000 = 1,143,000$  or 0.248% (over four years, length of the project) of total annual emissions = reduction of 0.062% of the annual emissions/year. NIP (2011): emissions to air are 2,311.4 g TEQ/year or 9,245.6g over four years. Mercury consumption/year: 2,371,685.1 kg (cf. Inventory of mercury releases in South Africa, DEA, 2011). Mercury consumption /48 months: 9,486,740.4 kg

Under the submitted child project, so far Turkey has requested funding under land degradation focal area. A top-down approach was employed to estimate the target impact on land degradation as reduced degradation of 0.5-1% of the entire arable land in Turkey. In 2016, arable land was reported to be 20,381,000 hectares<sup>[28]</sup>, and therefore innovative technologies to be promoted through the Turkey child project will cumulatively target to improve land practices in 101,905 to 203,810 hectares.

### ***Incremental contribution of a global program to overall GCIP emission mitigation***

The largest contribution to the program's emission reductions will result from the child projects as listed in the table above, whilst the global coordination and facilitation provided at the programmatic level will enhance emission reduction through supported GCIP alumni's identified at national level and connected to the global platform. GCIP alumni receiving global support will be selected on the basis that their innovations have potential for significant scaling up and global impact. On that basis the global platform has the potential to considerably affect their international prospects facilitating market opportunities, partnerships and investment. The global enhancement contributions will be achieved through the following activities:

In summary, these activities are expected to create the additional catalytic effect at global scale and help GCIP alumni to transform into global companies and hence consolidate and rapidly expand GEB. As a very low-estimate, it is expected that the global project will result in a 10% increase of the national GEB achievements. This very conservative figure is used for estimation purposes. Evidence from GCIP alumni SMES shows that those SMEs that are able to mobilize international financing will be able to expand their businesses by more than 19%. The table below shows the estimated global enhancement contribution, details on estimations are provided in Annex I.

	Results scenarios (10 years)		
	GHG emissions reduction in tCO <sub>2</sub> e	Reduction in hazardous chemicals and wastes in metric tons	Area of landscapes under improved practices in ha
Total GEB through individual Child projects	250,000	6.7 tons / 200 gTEQ	101,905 to 203,810
Enhanced benefits for GCIP Alumni	22,500	0.5 tons/25 gTEQ	101,905 to 203,810
<b>Total</b>	<b>272,500</b>	<b>7.2 tons/ 225 gTEQ</b>	<b>112,095.5 to 224,191</b>

## 7) innovation, sustainability and potential for scaling up

### Innovation

GCIP is a lean, effective and results-oriented solutions towards catalyzing cleantech innovation and entrepreneurship in frontier markets where the cleantech innovation ecosystems are weak and presents a suffocating environment to cleantech innovations that have the potential to have transformational impacts. GCIP's innovative design is premised on having a dual pronged approach that on one hand creates a critical mass of early-stage cleantech innovation SMEs that will transformed into market ready enterprises and on the other hand strengthens national cleantech innovation ecosystems and linking them at global level to create market opportunities for the SMEs to truly grow their businesses beyond their national boundaries. At a national level, GCIP is unique in its approach of transforming early-stage cleantech SMEs into market ready enterprises that deliver cleantech products and services in response to national priorities. GCIP supports entrepreneurs across the whole innovation value chain to develop demand-driven and investment-ready climate solutions that can become global enterprises. In comparison with other incubators or accelerator programmes, GCIP not support cleantech SMEs, but also strengthen cleantech innovation and entrepreneurial ecosystems by building capacity in national institutions, developing policy roadmaps and creating strong linkages between the most relevant ecosystem players and by raising awareness among them. GCIP's innovation is demonstrated by connecting innovation ecosystems across the countries as so to create market opportunities for GCIP SMEs, promote the sharing of experiences and policy best practices to promote learning. Beyond this, the organization of the global accelerators helps GCIP SMEs to link into global markets but also attracts cleantech SMEs from other developing counties into GCIP countries. GCIP will hand-hold start-up



entrepreneurs through the development process of the concepts and help enterprises to ensure that their innovative concepts are sustainable and will have a real impact on the market. Furthermore the GCIP programme will provide additional advanced post-accelerator support, which is an innovative concept based on the stated needs of alumni.

### **Sustainability**

The program is predicated on creating a critical mass of cleantech innovations that commercialize thereby establishing cleantech markets in frontier markets. It promotes the active engagement of private sector ecosystem players into the cleantech innovation and entrepreneurship space thereby ensuring that there is a strong and systematic link between the GCIP alumni enterprises (solution providers), investors, and the market. The sustainability of GCIP is reinforced by the following:

- Through investment facilitation, GCIP SMEs will be able to mobilize funding and investments from angels, impact investors and other sources of finance there by bringing their businesses into full sustainability;
- By generating and using methodologies, guidelines, tools and training materials for competition-based accelerators, GCIP 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 program;
- Strengthening innovation and entrepreneurship ecosystems at national levels galvanizes various ecosystem players to pool resources, know-how and investments towards supporting the acceleration and commercialization cleantech innovations. Once ecosystem players start appreciating, the benefits of supporting cleantech innovations, they will continue do so in the long-term;
- By linking cleantech innovation ecosystems across countries, GCIP will create a business motive for cleantech SMEs, policy makers, 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 program;
- Through the establishment of a web platform, where GCIP alumni enterprises 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 of 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 GCIP in terms of fact sheets, guidebooks, tools and reports on accelerating cleantech innovation. This will ensure that stakeholders, countries and the private sector will have on-going access to these tools and apply them to sustain the GCIP approach;
- Strengthening national institutional capacity within the child projects 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 GCIP processes and practices so as to ensure adherence to the highest quality of norms. Such norms will ensure that the GCIP will develop as a recognized brand and hence ensure long-term sustainability.
- Development of long-term partnerships with the private sector which will form part of national and the global exit strategy and guarantee funding this program
- Supporting development of common exit strategies for the national child projects based on the successful experiences. Based on these experiences actions will be tailored to the country context but are likely to include interventions such as below:

- identify and work with institutions that will retain the knowledge and skills developed under the project;
- pursue country ownership through engagement of relevant public and private sector actors;
- build local capacities (trainers, mentors, judges) to sustain the ongoing organization of the accelerator;
- ensure access to training materials and infrastructure to manage applications (whether local, international, or centrally-shared);
- provide clarity about the point at which exit will take place, based on targets and outcomes; and engage in a handover process and transition where UNIDO support is phased out.

These measures will collectively create a basis for sustainability in GCIP by galvanizing partnerships and resources to expand and sustain the programme approach in the long-term.

### **Scaling up**

Replication and scaling up is systematically included in the program design. At country level, GCIP activities and accelerators will be operated in partnership with public and private entities. Partnership with private entities ensures that the private sector will mobilise their resources and network to scale-up the activities of GCIP. In the particular case of accelerators at national level, partnerships will be established with the private sector in establishing challenge focused accelerators where successful innovations will be immediately linked to private sector for incubation, investments and scaling up. Partnership will be established at national levels with national agencies responsible for innovation. This will ensure that they will ultimately access national funding to continue and scale-up GCIP activities. GCIP will act as a hub of innovation at national levels and connect other ecosystems players such as incubators, networks of investors, policy makers, regulators etc. By acting as national hubs of innovation, GCIP will be able to influence cleantech innovation and entrepreneurship at country level and hence expand and scale-up the influence of GCIP.

At global level, GCIP will establish partnership with corporations, industry associations with a view to leverage networks, resources and support to scale-up the program. In particular GCIP will establish partnerships with global platforms like Mission Innovation and Clean Energy Ministerial with a view to link innovations from GCIP countries to the global level, but also to establish programmatic collaboration that will support the scaling-up of GCIP and increase the number of SMEs supported, investments and linkages with global corporations.

GCIP will provide targeted support to GCIP alumni that have potential for global expansion to expand and scale up into new markets, thereby rapidly scaling up the innovations into various markets. Furthermore, the projects will support linking and connecting of ecosystems in different countries to promote exchange of experiences and know-how. In fact, ecosystems connectivity helps in connecting cleantech innovators to connect with partners and investors from different countries thereby creating opportunities for scaling their innovations. By supporting outreach, communication and advocacy activities, this project will increase the visibility of GCIP and confidence around it. This will in turn attract more partners to GCIP like investors, private sector and foundations who will be agents to support the scaling up of GCIP. At the global level, the knowledge products and tools will be made available for participating and interested countries and stakeholders.

GCIP will also bring global visibility to GCIP alumni start-ups and SMEs. Such visibility at the global level will be key in creating awareness about GCIP and will open up investment and partnership opportunities at global levels that will lead to the scaling up of innovations and their businesses in global markets.

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[1] <https://www.ipcc.ch/sr15/chapter/spm/>

[2] GCIP defines cleantech as a broad range of solutions (technologies, processes, services, business models, and their combinations) that that improve operational performance, productivity, or efficiency while reducing costs, inputs, energy consumption, waste, or environmental pollution. Cleantech lead to an increase in positive impact or a decrease in negative impact on climate change mitigation and adaptation, transition to a low-emission economy, sustainable energy systems, and other dimensions of environmental sustainability. Climate technology, clean energy technology, agtech etc. are subsets of cleantech.

[3] <https://unfccc.int/sites/default/files/resource/docs/2017/cop23/eng/11a01.pdf>

[4] Global Chemicals Outlook II – From Legacies to Innovative Solutions: Implementing the 2030 Agenda for Sustainable Development, UN Environment, 2019

[5] limited knowledge of the cleantech sector among investors in emerging/developing markets leads to a low risk appetite when investing in such ventures. GCIP has a proven ability in providing effective investor trainings to inform on market opportunities and barriers to enable informed decisions making.

[6] <http://www.infodev.org/innovations-scaling-green-sectors>

[7] Annual Impact Investor Survey, 2017, Global Impact Investment Network (GIIN)

[8] [www.pfan.net](http://www.pfan.net)

[9] [https://open.unido.org/api/documents/10995645/download/PFAN%20Presentation\\_July%202018.pdf](https://open.unido.org/api/documents/10995645/download/PFAN%20Presentation_July%202018.pdf)

[10] [unfccc.int/ttclear/misc/\\_StaticFiles/gnwoerk\\_static/incubators\\_index/ee343309e8854ab783e0dcae3ec2cfa6/c172d2f388234bdbbe3dd9ae60e4d7e9.pdf](https://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/incubators_index/ee343309e8854ab783e0dcae3ec2cfa6/c172d2f388234bdbbe3dd9ae60e4d7e9.pdf)

[11] Climate Technology Incubators and Accelerators: United Nations Framework Convention on Climate Change Technology Executive Committee, Green Climate Fund, Climate Technology Centre and Network. July 2018

[12] This was implemented as part of the Greening the COP 17 project - <https://www.thegef.org/project/greening-cop17-durban>

[13] More information on GCIP is available on - <https://www.unido.org/our-focus/safeguarding-environment/clean-energy-access-productive-use/climate-policies-and-networks/global-cleantech-innovation-programme>

[14] More information available on : <https://www.unido.org/sites/default/files/files/2017-12/GCIP-Brochure.pdf>

[15] <https://www.unido.org/sites/default/files/files/2017-12/GCIP-Brochure.pdf>.

[16] <https://www.innovationbridge.info/ibportal/?q=content/thevia-roof-tiles>

[17] <https://www.malaymail.com/s/1300037/malaysian-companys-biodegradable-products-makes-it-to-europe>

[18] <https://saathipads.com/>

[19] [Smart Grids Innovation Challenge](#) ; [Off-Grid Access to Electricity Innovation Challenge](#); [Carbon Capture Innovation Challenge](#) ; [Sustainable Biofuels Innovation Challenge](#); [Converting Sunlight Innovation Challenge](#); [Clean Energy Materials Innovation Challenge](#); [Affordable Heating and Cooling of Buildings Innovation Challenge](#); [Renewable and Clean Hydrogen Innovation Challenge](#).

[20] Mentors are advisors assigned to the participating teams of the Accelerator to provide guidance as required on a rolling basis for the duration of the accelerator cycle. Coaches are experts delivering parts of the accelerator curriculum as per their expertise, to the cohort of participating teams. Judges are specialists in the fields of technology, business, investment, sustainability etc. invited to participate in the selection panel of the accelerator as required. No monetary remuneration is offered for mentors and judges, other than travel cost support as required. Coaches (national and international) may be contracted or recruited to deliver the accelerator curriculum.

[21] As part of the accelerator categories, “Innovation Challenges” will be established to facilitate identification and development of demand-driven solutions that can address the most pressing climate change mitigation and sustainability challenges, as defined by key industrial sectors. This approach allows the market to “pull” innovative solutions to very specific challenges, thereby increasing opportunities for direct market access. Examples of potential challenges could include energy-efficient refrigeration for the food processing sector or new energy storage technologies for the garment manufacturing sector. At national levels, GCIP child projects will engage with national partners such as industry associations, and at the global level large corporations and industry associations such as the World Business Council for Sustainable Development will be approached.

[22] Support will not be limited to winners of the Accelerator, but will also be provided to qualifying GCIP alumni as per the selection criteria. It will also be a cost-effective way to directly support and monitor growth of GCIP alumni enterprises. It will have the added advantage of removing the overemphasis on the competition aspect of the Accelerator, and allow all semifinalists to focus on the added value and benefits of the entire GCIP accelerator process.

[23] In 2018, PFAN issued a pilot call for applications specific to GCIP alumni enterprises. While PFAN traditionally facilitates investment in mature technologies, GCIP passed on to PFAN selected alumni on a pilot basis. During the Vienna Energy Forum of 2018, GCIP alumni that had been coached by PFAN showcased their innovations to PFAN investors. This pilot initiative was used to assess the appetite by investors to invest in new technology innovations and early stage businesses. Agnisumukh is one example of former GCIP alumni from India that has received support from PFAN and has mobilized debt and equity investments exceeding 1,2 million US\$ ([https://pfan.net/projects\\_and\\_stories/agnisumukh-energy-solutions-pvt-ltd/](https://pfan.net/projects_and_stories/agnisumukh-energy-solutions-pvt-ltd/)) and has GHG mitigation potential of 1800 tons CO2/year.

[24] <https://globalinnovation.fund/>)

[25] <https://www.weforum.org/press/2018/05/we-need-a-global-fund-to-ensure-a-clean-energy-revolution/>

[26] In 2017, UNIDO contributed to the Global Cleantech Innovation Index (GCII) with the GCIP Country Profiles report as a policy tool for GCIP partner country governments[26]. GCIP global project will support the regular updating and publication of GCII-GCIP Country Profiles for which data will be continuously collected and analyzed. This will provide value addition and help contribute to creating an enabling environment for cleantech innovation. Index report available on : [https://www.unido.org/sites/default/files/files/2017-11/GCII\\_GCIP\\_report\\_2017.pdf](https://www.unido.org/sites/default/files/files/2017-11/GCII_GCIP_report_2017.pdf)

[27] Defined as “a state whereby the amount and quality of land resources necessary to support ecosystem function and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems”

[28] <https://data.worldbank.org/indicator/AG.LND.ARBL.HA>

## 1b. Program Map and Coordinates

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



## 2. Stakeholders

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

**Civil Society Organizations** Yes

**Indigenous Peoples and Local Communities**

**Private Sector Entities** Yes

**If none, please explain why:**

UNIDO will implement the global programme and coordinate with other GEF agencies interested in implementing GCIP child projects in line with the GCIP established methodology. Furthermore, UNIDO will provide execution support for specific Pillars and will mainly work with other stakeholders. Many stakeholder consultations –designed to be as inclusive as possible have been taking place during the design period paving the way for concrete involvement and commitment from all relevant actors. In particular, in the design of the child projects, stakeholder consultations have reached out to government agencies, multilateral organizations, development agencies, academia, private sector, financial institutions, especially impact investors, and civil society organizations. It must be noted that indigenous people will not be impacted nor specifically involved in this program, however, innovations from such communities or that benefits these communities will be supported. International stakeholders identified so far which may be involved in more than one child project are shown in the table below. In addition, stakeholders that are specific for the child projects are listed in the child project PIFs.

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

Potential Partners	Role
UNIDO	Lead implementing agency.
UNIDO and other GEF Agencies	Child project implementation

Green Climate Fund	<p>GCIP will collaborate with various innovation initiatives being developed by GCF that include the proposed Climate Innovation Initiative. Areas of potential collaboration include connecting to regional level platform, linking GCIP alumni to equity fund managers, policy and knowledge management on climate technology innovation, in particular:</p> <ol style="list-style-type: none"> <li>1. Explore options to connect national and regional cleantech platforms for the identification of cleantech enterprises to be supported by accelerators/incubators</li> <li>2. Systematically support GEF-GCIP supported enterprises (alumni) as a pipeline portfolio of the GCF equity fund investment managers</li> <li>3. Link policy/regulatory work conducted in GEF-GCIP countries to investment plans of GCF investment managers</li> <li>4. Establish a consultative platform/dialogue on methodological issues related to ex-ante estimation/calculation of global environmental benefits of cleantech solutions and cleantech enterprises (such as GHG emission reduction or impact on climate adaptation impact)</li> <li>5. Facilitate knowledge exchange and management on lessons learned and best practices in incubation/acceleration of cleantech businesses in low/middle income countries</li> </ol>
Climate KIC	Will be a technology and knowledge partner in running the acceleration programme in some countries and at the global levels and will be a partner in connecting innovation ecosystems across GCIP countries
NGIN – Network for Global Innovation	NGIN will be a technology and knowledge partner in running the acceleration programme in some countries and will be a partner in connecting innovation ecosystems across GCIP countries
Cleantech Group	Potential to be a knowledge partner in developing the cleantech innovation index (GCII). Furthermore GCIP alumni will be showcased at global events organized by Cleantech Group
Cleantech Scandinavia	Potential to be a technology and knowledge partner in running the acceleration programme in some countries and will be a partner in connecting innovation ecosystems across GCIP countries and also linkages with Scandinavian ecosystems. Furthermore GCIP alumni will be showcased at global events organized by Cleantech Group
Climate Technology Centre and Network (CTCN)	Will be consulted with to ensure that the technology solutions, capacity building and advice on policy, legal and regulatory frameworks are specifically tailored to the needs of individual countries
Global Innovation Fund	Potential partner for investment for high impact innovations
Private Finance Advisory Network (PFAN)	Will be a partner in supporting successful innovators in scaling up their ventures by providing business coaching to GCIP alumni and helping them to link to investors until they reach financial closure.
Academia -universities and institutions of higher learning	Will be the main source of early-stage innovations that will apply to GCIP for acceleration support.

Industry and business associations	Will be partners at national and global levels to provide incubations support to GCIP SMEs, provide access to networks, investments and incubation support. They will also provide trainers, mentors and judges to the accelerators
Networks of angel, venture and impact investors	Will be engaged at national and global levels to link with GCIP supported SMEs so that they can access investments and grow their businesses
Corporations	Will partners with GCIP accelerators to provide know-how, investments and market access.

### 3. Gender Equality and Women's Empowerment

**Are gender dimensions relevant to the success of program.** Yes

**If yes, please provide indicative information on these dimensions and how these will be addressed in the program. If no, please explain why**

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 (2015), 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.

Female entrepreneurship is considered a key tool in enabling women's empowerment. It is often seen as crucial for increasing the quality of life of women in the developing world, a way of triggering changes of the status-quo of women and re-addressing the balance of power within the family<sup>[1]</sup>. A guiding principle of the programme will be to 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. GCIP has already shown higher levels of women's participation than other accelerator and incubator programmes with 25% of the 795 alumni supported to date being women led enterprises. This project hopes to continue this trend and even to increase this proportion.

Female entrepreneurs are expected to contribute to and benefit from all the project Pillars and activities, participate and facilitate in post accelerator support, as well as in successful competition and acceleration programmes, thus fostering the empowerment of women.

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 programme 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 raised regarding gender issues.
- Considering gender dimensions in all decision-making processes (this will consider but will not be limited to efforts to achieve gender balance/ representation in such processes), including Project Steering Committee meetings.
- Collection of sex-disaggregated data.
- Consultations with and involvement of stakeholders focusing on gender equality and women's empowerment issues, such as gender experts and organizations, CSOs and NGOs promoting GEEW (providing them with equal voice), e.g. for outreach purposes.

Gender Action Plans will be developed as part of the child projects. The gender analysis during the child project design 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. Child project log-frames 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 Global Cleantech Innovation Programme (GCIP) for SMEs for a better understanding of the barriers faced by female entrepreneurs and so design effective mitigation tools. Analysis of the project has identified the following gender specific targets to be monitored and evaluated throughout the project implementation period. The project will take the following suggested approach to gender mainstreaming:

Stage	Gender equality measure
Application stage for Accelerator	Collection of gender disaggregated data through application forms: Number of women-led enterprises, % of women in the applying team;  Targeted outreach: 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	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.



Special Awards	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 national and global cleantech competitions involving all Cleantech countries concerned. A similar prize has been awarded in a number of the ongoing GCIP projects in the 2014 and 2015 cycles and has led to increase in the number of female-led innovators applying to the GCIP. In countries like South Africa, Pakistan and Morocco where such a prize was included the number of female-led applications increased to between 25% and 40%. 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.
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### *Supporting youth cleantech entrepreneurs*

In addition to gender dimensions, GCIP has also been able to support youth entrepreneurship and employment as an added benefit in GCIP partner countries. GCIP's main goal is to strengthen the cleantech innovation ecosystem of our partner countries, and GCIP 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 many of GCIP partner countries, 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 GCIP, 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.

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 GCIP are more attractive to youths that seek to establish businesses that offer environmental solutions. Therefore interest from youths to participate in GCIP is higher. For example in Pakistan the average age of GCIP innovators 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. 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 has focused on engaging universities and students. This has the added benefit that youths are naturally the target group of GCIP communications and advocacy efforts. GCIP is also indirectly impacting the entrepreneurial culture of partner countries, 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 GCIP 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.

[1] Anwar/ Rashid, Female Entrepreneurs – A review of the literature and proposed conceptual framework, 2011

**In addition, please also indicate whether the program the program will include gender sensitive indicators in its result framework**

Yes

#### 4. Private sector engagement

##### Will there be private sector engagement in the program?

Yes

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

Private sector engagement is key to the success of overall GCIP programme. The private sector is the main target group for the overall programme. GCIP includes four areas of private sector interaction; all of which are integral to the GCIP approach to identifying and supporting cleantech innovation:

- Direct interaction and support for SMEs, start-ups and entrepreneurs with climate and clean energy technology and business model innovations. Innovative technology SMEs are agents of change and by supporting them to strengthen their businesses and commercialize results in market transformation. In this project support will be provided to SMEs identified in the national and global accelerators as well as post-accelerator advanced support being provided to SMEs identified under the national accelerator programmes. Support will be provided to, inter alia, help companies commercialize, to establish and connect to overseas markets and to find investment and partners. Investment facilitation support will be provided by linking GCIP alumni enterprises with potential investors and by “de-risking” them for financial institutions.
- At national and global levels, GCIP will engage with industry associations to leverage their knowhow, capital and interest in cleantech innovations. In particular, GCIP will also build capacity of national industry associations in acceleration of cleantech innovations. Furthermore, GCIP will engage captains of industry as mentors, trainers and judges in the acceleration processes.
- Cleantech SMEs will have direct engagement with PFAN (Private Financing Advisory Network [www.pfan.net](http://www.pfan.net)) to mobilize private investments (debt/equity) from international impact investors and other investors, who are mainly from the private sector such as venture capital funds and angel investors. The effort to mobilize investments for the GCIP alumni will be closely linked to PFAN operations.
- GCIP will partner with large corporations with commitment to identify and invest in specific technology innovations. GCIP will develop targeted cleantech accelerators in partnerships with global/local corporations to find demand driven solutions with direct market access, as successfully demonstrated in Morocco. The scope of the specific challenges will be discussed with the specific corporations.
- Furthermore, partnerships with corporations will be formed to connect GCIP alumni with other cleantech companies with the aim to create joint venture and co-innovation 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. This pilot will be expanded under this program.

GCIP will bring financiers together with the SME innovator start-ups and will engage with financiers to transform investment decisions to consider socio/economic benefits in addition to profit. Financing institutions, venture capitalists and angel investors will be a key target group for the communications and outreach activities of GCIP at global, regional and national levels. GCIP aims to bring together a robust network of national and international investors to raise awareness and sensitize various stakeholders on the opportunities and risks associated with cleantech products and market trends. This will result in greater appetite for investment in cleantech start-up and so crowd in private sector investments. Investor Connect events will be organized for GCIP alumni with targeted impact investment funds and venture capital funds and targeted investment / financing vehicles will be connected with selected GCIP alumni.

A description of the specific private sector involvement in each child project is detailed in their individual PIFs.

## 5. Risks

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

Risk	Level of Risk	Mitigation Actions
<b>Institutional risk</b> Lack of capable and relevant institutional partners for project execution and sustainability	Low	Since the introduction of the GCIP in 2011 the programme has been operated without dedicated funding and resources for global coordination activities and knowledge management. Recognizing the value of these efforts and the need to build on the experience, the proposed global coordination mechanism is designed in part as a mitigation measure against the institutional risk to ensure that the Global programme can continue be operated in a systematic and continuous manner. To ensure vertical and horizontal integration, UNIDO has built a strong network of partners at international and regional levels that can be leveraged for project implementation and execution.
<b>Sustainability risk</b> Lack of ownership to run activities and inability to source funding to continue the program's activities in the medium/long term	Low	Sustainability is mainstreamed through the global programme through the following means: national institutional capacity building will ensure development of adequate skill and expertise to run the programmes; Strategic government and corporate partnerships at global and national levels will be built to secure programme funding on long term basis
<b>Political risk</b> Lack of political support to mainstream innovative clean technologies	Low	Currently, Cleantech innovation and entrepreneurship are high priority areas in international climate action dialogue and governmental agendas. To keep the momentum and the political support, advocacy and awareness raising activities will be an integral part of the global programme. To ensure that innovations with a high potential of generating global environmental benefit identified and promoted through the GCIP are adequately promoted and mainstreamed as solutions to the international development agenda, the Project Steering Committee will ensure strategic directions and guidance.
<b>Financing risk</b> Default in mobilizing co-financing from key partners	Low	The co-financing commitments are obtained at the time of project design and a proper follow up will be made with the co-financing partners to ensure timely availability of co-financing options. During project implementation, the co-finance received (cash or in-kind) will be closely monitored and documented.

Risk	Level of Risk	Mitigation Actions
<b>Financing risk</b> Incentive and financial support system are insufficient	Medium	<p>Financing institutions, venture capitalists and angel investors will be a key target group for forming strategic partnerships and outreach activities of GCIP at global and regional levels. Investment facilitation support will be provided by linking high-impact GCIP enterprises with potential investors and by “derisking” them for financial institutions. GCIP is highly recognized by investors and through programmatic coherence seeks to build confidence in national and international investors to invest in GCIP cleantech innovations.</p> <p>In addition, strategic partnerships with recognized and respected public and private institutions will be strengthened to increase the visibility and confidence in the GCIP methodology, thereby increasing the confidence in GCIP enterprises and the understanding of market opportunities and barriers in the Cleantech space.</p>
<b>Market risk</b> Lack of interest from entrepreneurs and potential start-ups	Low	<p>There is robust demand from GCIP alumni’s for further post-accelerator support including enhancing linkages with investors and the private sector. Coherent communications campaigns and outreach activities on global and national level will provide evidence of the benefits of GCIP as well as advertising the competitions as widely as possible. UNIDO will leverage on its own network as well as strategic alliances and their respective networks and partners to advertise the Cleantech programme and competitions in global, regional and national forums ensuring the coverage is as wide as possible.</p>
<b>Market risk</b> Failure of businesses	Medium	<p>The programme will provide GCIP methodology to provide innovators and entrepreneurs with the skills required to develop and commercialize their innovations. The Accelerator provides intensive training, mentoring as well as technology and business model validation to ensure adequate understanding of customer segment and the market to increase commercial success rates. High-impact innovations are selected, validated and provided with advanced business growth support to access funding as well as grow organisational capacity for scaling-up.</p>
<b>Market risk.</b> Lack of interest of the industries for shifting to clean technologies	Medium	<p>Global and national stakeholder consultation has taken place to assess commitment and prioritization in cleantech innovation programme resulting in confirmed interest in mainstreaming green technologies as important contributions for low carbon development pathway. Global methodology will be adopted to national priorities and innovation environment to respond to the actual local needs of the industrial sector thus providing adequate innovative clean technology solutions to an existing environmental problem and potential industrial production constrain. This approach seeks to create a win-win situation for the innovators and the industries as industries will be able to identify a solution without extensive resource allocation for R&amp;D and the innovators will be able to validate their technology and find customers. This will include innovative business modeling for delivery of clean technology solutions to industry partners such as appropriate ESCO models, etc.</p>
<b>Social and Gender Risk</b>	Low	<p>To ensure gender inclusiveness of all programme activities, UNIDO methodology for gender assessment and gender responsive communication showing the benefits of gender equality for both women and men, and ensure stakeholder involvement at all levels will be promoted throughout the programme on global level and down streamed to national levels, incorporating local aspects of cultural and gender sensitivity. To mainstream female entrepreneurship, adequate and gender responsive communication strategy as well as further sensitization workshop will be employed.</p>
<b>Climate change risks</b>	Low	<p>Although, climate change risk are not foreseen for the achievement of the programme’s objectives, they will be considered through the programme activities are not expected to be subject to climate change risks.</p>

Risk	Level of Risk	Mitigation Actions
Environmental and Social Risks	Low	To mitigate potential environmental risks of the cleantech innovations, the program will engage renowned and expert mentors, trainers and judges that will have expertise in environmental and social risks of new technologies.

## 6. Coordination

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

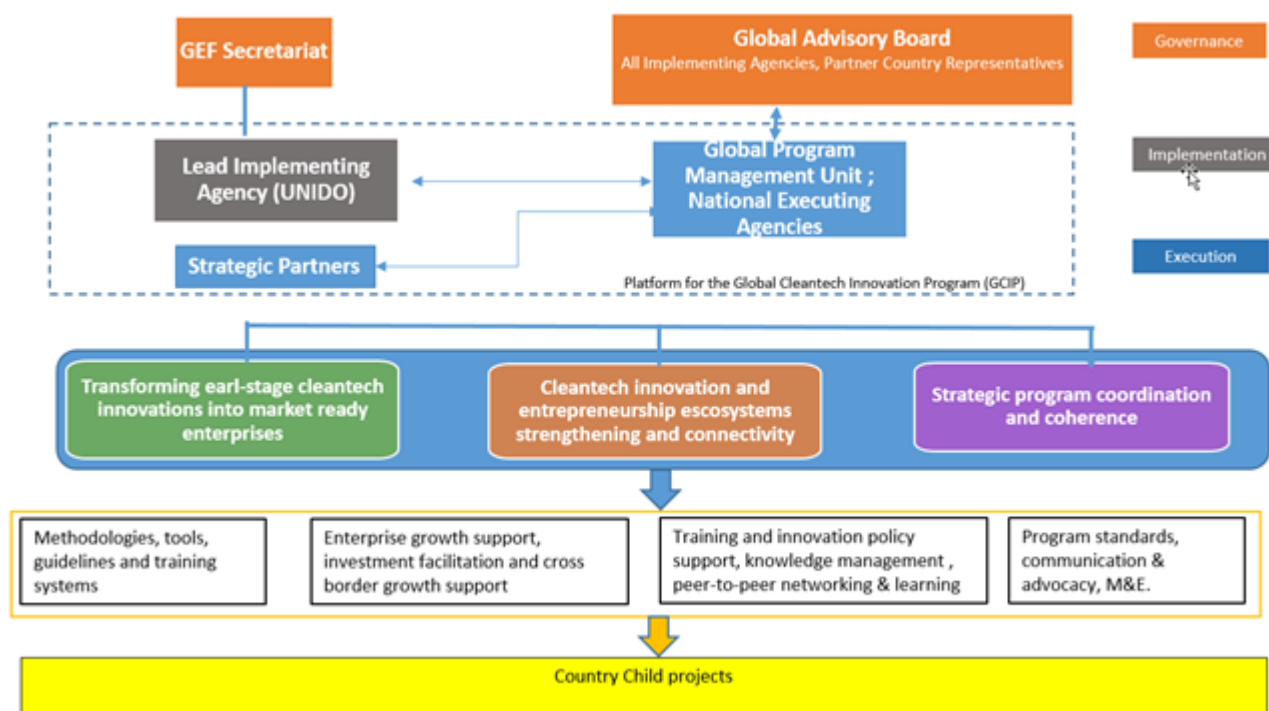


Figure: New coordination structure of GCIP

UNIDO – Lead Implementing Agency

Figure above depicts the structure of the institutional arrangement of Global Cleantech Innovation Programme (GCIP) from governance, implementation and execution perspectives. UNIDO, the Lead Implementing Agency will lead the global coordination efforts through the GCIP Platform, established as part of the global child project. As the lead GEF Implementing Agency for GCIP, UNIDO holds the ultimate responsibility for the implementation of the programme, the delivery of the planned outputs and the achievement of the expected outcomes. In particular, UNIDO will be responsible for monitoring of the programme, and reporting on the programme performance to the GEF.

Through pillar 3, programmatic coherence and standards will be maintained to ensure efficiency, effectiveness and sustainability of GCIP. Each child project will earmark between 6% and 10% of its respective GEF grant (minimum of 90,000 USD) across the project components to benefit from the global level interactions. Please see Annex H for the indicative budget breakdown. UNIDO will be responsible for coordinating monitoring and evaluation of child projects and sharing the lessons across GCIP.

### **Global Program Management Unit**

The day-to-day execution of the programme will be conducted by the Global Programme Coordination Unit (PCU) that will be funded through the global child project. In order to identify an executing entity as the Global PCU with the adequate competency and capacity, an Expression of Interest (EoI) will be published as per UNIDO procurement rules and guidelines, to survey potential service providers internationally. Several service providers with experience in cleantech acceleration are being considered, and will be invited to participate in the EoI. The PCU will compose of a GCIP Coordinator, two technical experts on cleantech innovation and acceleration that will also be responsible communications and partnerships as well as impact monitoring and reporting, and one administration assistant. Main added value of the Global PCU will be to maintain the programmatic approach to ensure the efficient use of funds across all child projects that benefit from the constant development and updating of the materials provided from the Global PCU to the national child projects. This will require robust communication channels between the Global PCU and the National Project Management Units as well as the national counterparts and executing entities. Further details of child GCIP projects are described in Annex A.

### **GCIP Advisory Board**

The Advisory Board will comprise of the GEF, UNIDO and all GEF agencies implementing a national child project, plus government representatives each GCIP partner country. Other key partners and stakeholders active in the cleantech space may be invited to join the Advisory Board if deemed adequate by the Board. The Advisory Board will provide strategic guidance to the program, and will be the decision making body for items of major impact on the programme. It will meet once a year to monitor progress against the objectives of the overall GCIP programme, address potential problems and address strategic and policy issues affecting the programme. It will review impact tracking and will be responsible for defining strategy and advocacy messages. While each county child project will have its own project steering committee, the Global Advisory Board will also actively discuss emerging issues across child projects and suggest solutions that contribute to the overall objectives of GCIP.

### **Child project implementation**

At national levels, the GCIP child projects will be implemented by GEF Agencies including UNIDO. In line with the GEF's emphasis on national ownership of projects, it will be the decision of the GEF Focal Point to designate a leading implementing and executing agency for the respective country child project, as well as a National Project Management Unit (PMU). National PMUs of all country child projects will meet once a year under the umbrella of the GCIP Platform to exchange ideas and experiences and programme coordinated actions. Each national child project will also establish a National Project Steering Committee (PSC) that will provide strategic guidance to the respective child project. For the global child project, the Global Advisory Board will also serve as the PSC.

### **Monitoring and evaluation**

UNIDO will develop a measurement, reporting and verification (MRV) framework based on the SMART indicators used to assess project implementation and progress for the GEF. The MRV indicators will be developed by the Global PCU with guidance from the Global Advisory Board, and in consultation with the National PMUs. The National PMUs will be responsible for reporting annually and at the end of the project against these indicators, and the Global PCU will consolidate these reports, in conjunction with the Implementing Agencies.

Monitoring and evaluation (M&E) will be conducted in accordance with established UNIDO and GEF procedures. This is in addition to the impact tracking detailed in Pillar 3 (which will focus on the impact and outcomes of the programme at national and global levels, and will feed into the overall results framework). The overall objective of the monitoring and evaluation process is to ensure successful and quality implementation of the project by:

- i) tracking and reviewing project activities execution and actual accomplishments;
- ii) providing visibility into progress as the project proceeds so that the implementation team can take early corrective action if performance deviates significantly from original plans; and
- iii) adjusting and updating project strategy and implementation plan to reflect possible changes on the ground, results achieved and corrective actions taken.

A detailed Result Framework (LogFrame) will be prepared for each child project, including the global child project, which will provide performance and impact indicators for project implementation along with their corresponding means of verification. These will form the basis on which the project's M&E Plan will be built. The evaluation team reports and verifies the actual progress against the work plan approved by the National PSC.

The M&E procedures will consist of project inception, progress reporting, and a project final report. A detailed monitoring plan for tracking and reporting on project time-bound milestones and accomplishments will be prepared by the implementing agency of each child project in collaboration with the National PMUs and respective project partners at the beginning of project implementation and then periodically updated.

A terminal evaluation by an independent consultant will be carried out at the national levels, and also at the programmatic level under the global child project. The terminal evaluation of the GCIP at the programmatic level will be managed by the UNIDO ODG/EVA. The terminal evaluations of the child projects will be managed by the relevant bodies of the implementing agencies. Terminal evaluation reports will be sent to the GEF Evaluation Office at the latest 6 months after the completion of the evaluation.

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

Yes

### **Is the Program consistent with the National strategies and plans or reports and assessments under relevant conventions**

- National Bio Strategy Action Plan (NBSAP)
- CBD National Report
- Cartagena Protocol National Report
- Nagoya Protocol National Report
- UNFCCC National Communications (NC)
- UNFCCC Biennial Update Report (BUR)
- UNFCCC National Determined Contribution
- UNFCCC Technology Needs Assessment
- UNCCD Reporting
- ASGM National Action Plan (ASGM NAP)
- Minamata Initial Assessment (MIA)
- Stockholm National Implementation Plan (NIP)
- Stockholm National Implementation Plan Update
- National Adaptation Programme of Action Update

The GCIP programme includes the GCIP Global Child Project as a global project enhancing and supporting national child GCIP projects as well as holding global accelerator and innovation challenges. As such the overall programme is consistent with the international climate change and sustainable development strategies and agenda and will also be fully in line with associated National strategies, plans and assessments. The consistency of the programme to each of the child country national priorities is included in each PIF.

Technological innovation is a critical accelerator and enhancer of the efforts to implement national climate actions and achieve the above-mentioned global objectives. The Paris Agreement explicitly refers to innovation in its Article 10, paragraph 5. In the 2030 Agenda for Sustainable Development, technological innovation is referred to in connection with various sustainable development goals, particularly goals 7 (affordable clean energy), 8 (decent work and economic growth), 9 (industry, innovation and infrastructure) and 17



(partnerships for the goals). Acknowledging the key role technological innovation can play in combating climate change, the UNFCCC Technology Executive Committee (TEC) conducted a study on the role of technology innovation for the Paris Agreement . In this TEC report, the ten key messages are:

1. Technological innovation is central to climate action - Tech innovation plays a key role in supporting countries to implement their NDCs and mid-century strategies
2. Acceleration of climate technology innovation needed - Climate techs are being deployed on unprecedented levels, but innovation needs to be scaled up and sped up to meet Paris Agreement objectives
3. Countries have unique innovation needs - Every country is different. This makes it difficult to identify quick fixes for enhancing innovation efforts
4. Effective innovation is based on actors, institutions and networks - Successful innovation interventions depend on a sound national system of innovation
5. The right “push” is important - Efforts to enhance RD&D are crucial. The national government can play a key role in stimulating private sector participation in these activities
6. Demand “pull” is equally important - The national government can play a role in incentivizing widespread deployment of climate technology innovations
7. Innovation is more than technology - Innovation in financing, business models and policy mechanisms is key for leveraging the full potential of climate technologies
8. Innovation benefits from involvement of many stakeholders - To have impact, technological innovation should be inclusive
9. International collaboration is efficient - Enhancing collaborative efforts can play an important role in facilitating large-scale deployment of low-emission and climate-resilient technologies
10. UNFCCC bodies: building coherence and synergies - The wealth of technological and financial knowledge that the UNFCCC bodies hold creates huge potential for collaboration that can affect transformational climate action.

In addition, understanding climate technology needs is the starting point for effective action on climate change. To understand these needs, and to determine a country’s climate and clean technology priorities, the UNFCCC technology needs assessments (TNAs) will be consulted to ensure that GCIP supported technology innovations are fully in line with national sustainable development priorities. In recent years, many countries have also identified climate technology innovation needs in their nationally determined contributions (NDCs), which will further inform the GCIP’s interventions in the GCIP partner countries.

Close cooperation and coordination with the Climate Technology Centre and Network (CTCN) will also be sought. CTCN is the operational arm of the UNFCCC Technology Mechanism co-hosted by UNIDO. CTCN aims to promote the accelerated transfer of environmentally sound technologies for low carbon and climate resilient development at the request of developing countries This is fully in line with and complementary to the GCIP objectives, and GCIP will also maintain an open channel with the CTCN through the GCIP Global Child Project to ensure that the technology solutions, capacity building and advice on policy, legal and regulatory frameworks are specifically tailored to the needs of individual countries.

GCIP was also invited to contribute to a UNFCCC Thematic Dialogue on Incubators and Accelerators in Bonn in March 2018 to explore how to boost climate tech incubators and accelerators in developing countries. The dialogue discussed the missing link that can be addressed by cleantech incubators and accelerators in providing life-support to small cleantech based firms and entrepreneurs. As such, the GCIP is acutely aware of and closely engaged in the discussions and policy dialogues at the international level in informing and

shaping the discourse surrounding national priorities for innovation of climate and clean technologies, and will continue to provide thought leadership and guidance to GCIP child countries to ensure that their national priorities are achieved in tandem with the international recommendations and best practices. Through the GCIP Global Child Project, design and implementation of GCIP at national levels will be further refined in light of the international discussions led by governments, and the experiences and expertise accumulated at national levels in GCIP partner countries will be valuable knowledge that can facilitate evidence-based discussion on cleantech innovation at the international level.

At country levels, the child projects are in alignment with the national priorities as below.

### **Cambodia**

Cambodia is highly vulnerable to the effects of climate change, in particular from floods, droughts, windstorms, and seawater intrusion. The agriculture, infrastructure, forestry, human health, and coastal zones are most affected.

Cambodia's main national development priority, enshrined in the National Strategic Development Plan (NSDP) for 2014-2018, is to reduce poverty while fostering economic growth at a steady rate of 7-8% per year. Cambodia aims to progress from least-developed country (LDC) status towards a low and high middle-income developing country by 2018 and 2030 respectively. The Royal Government of Cambodia designed a comprehensive strategic framework (including Rectangular Strategy, National Strategic Development Plan, Sectorial Development Strategies, Industrial Development Policy, and other policy documents) which should enable achievement of this goal, mainly by diversifying the economy, including through industrialisation and the development of physical infrastructure.

In Cambodia, SMEs account for 98% of total enterprises, 36.7% of total employment and 24% of total GDP, thus playing a significant role in the country's development. Despite recognition by the Cambodian government of the important roles played by SMEs and innovation for economic growth and stability, administrative hurdles and lack of access to finance continue to hinder entrepreneurship.

With a very young population, more people in Cambodia are devoting themselves to freelancing or they contribute to the buoyant digital economy. However, various challenges like access to entrepreneurial networks, lacking business technical skills and difficulties in accessing funding are issues that continue to limit the real potential of the start-ups in Cambodia.

Moreover, although in the recent years new startup hubs and incubators have been founded in Cambodia, there is still a limited number of incubators or accelerator programs for mid-stage startups, particularly post-seed and pre-venture start-ups. Further on, there is a lack of cooperation and knowledge exchange inbetween both local start-ups as well as inbetween potential funders and local entrepreneurs. This offers the opportunity for the Cleantech programme to utilize these established services, while improving on their capacity, reach and visibility.

In terms of investment in innovation, Cambodia allocates around 0.118% of its GDP for R&D investment, which is below the average of the ASEAN but above performances in Indonesia, Myanmar and Lao PDR. The need for Cambodia to improve the innovation and research has been highlighted in the Global Innovation Index (98 of 141), the Knowledge Economy Index (131 of 144) and the Global Competitiveness Index (94 of 144).

In 2018, the Ministry of Economy and Finance established a Techo Startup Center in order to create, incubate, and accelerate startups to become successful business ventures through the provision of mentoring and advisory services, co-working spaces, research and development, market trend and consumer behavior analysis, cooperation with relevant institutions and initiatives. The Center is currently at infancy stage and would benefit from support and exposure to global good-practices in order to fulfil its mission as catalyst for innovation.

## **Indonesia**

Indonesia's importance is underscored by its sizeable population of 250 million people – the fourth-largest in the world – and its significant role as a major producer and consumer of energy in regional and international markets. Indonesia is also the largest economy in ASEAN.

Indonesia is one of the world's largest emitters of greenhouse gases (GHG). Currently, the land-use and energy sector contribute to 80% of GHG in Indonesia. Indonesia's First Biennial Update Report (BUR) to the UNFCCC, submitted in 2015, includes a GHG inventory for the period 2000 to 2012 which shows LULUCF as the greatest source of emissions (65.5%), followed by energy (32.6%), agriculture (8%) and waste (6%). The national government has committed to unconditionally reducing GHG emissions by 29% against a 2030 business-as-usual case and up to 41% with international assistance.

Indonesia remains a net energy exporter: This resource-rich archipelagic nation is the world's fourth-largest producer of coal and a top coal exporter and Southeast Asia's biggest gas supplier (45% of its production). However, its imports of oil and oil products have been rapidly increasing in recent years. In terms of renewable energy, Indonesia is the largest producer of biofuels in the world, and is increasingly scaling up efforts to exploit its extensive renewable energy potential, particularly in geothermal power (all data is as of 2014). Renewable energy, particularly hydro and geothermal have a share of 6%, but statistics do not cover the traditional use of biomass as energy for cooking, lighting and process heat in rural areas.

In 2013 electricity was generated from fossil fuels (88%), hydro (8%) and geothermal (5%). Generation capacity growth in Indonesia has been lower than growth in electricity demand, leading to power shortages and a low electrification ratio. Insufficient power generation is due to several issues including inadequate supporting infrastructure, difficulty obtaining land-use permits, subsidized tariffs, and an uncertain regulatory environment all contribute to. With the energy sector projected to dominate Indonesia's greenhouse gas emissions by 2026–27, promoting renewable energy source and energy conservation offers significant emissions abatement potential.

Under the Paris Agreement, Indonesia has made the commitment to reduce its Green House Gas (GHG) Emissions by 29% by 2030 against business as-usual (BAU) baseline scenario and up to 41% subject to international assistance and support. This national determined contribution (NDC) of Indonesia includes mitigation activities in the areas of energy, waste, IPPU/ Industry and Agriculture, and Forestry. The energy sector shall contribute with a mitigation target of 314 tons of CO<sub>2</sub> by 2030.

Indonesia's National Action Plan for Greenhouse Gas Reduction (RAN-GRK) sets forth a wide range of mitigation activities and emission-reduction targets across major sectors. It sets out the different sectors in which Indonesia will make emissions reductions, namely Forestry and Peat land, Agriculture, Energy and Transportation, Industry and Waste Management. In addition, a new report from the Indonesian government's Low Carbon Development Initiative found that less carbon-intensive, more efficient energy systems can deliver an average of 6 percent GDP growth per year until 2045—even more economic growth than the business-as-usual path, with continued gains in employment generation, increased incomes and poverty reduction. This strategy would cut the country's greenhouse gas emissions nearly 43 percent by 2030, exceeding Indonesia's international climate target. The government is now feeding findings from this new report directly into its next five-year development plan, which will cover 2020-2024.

Finally, Indonesia, like many South-East Asian countries, faces a number of threats associated with climate change and as a result has a lot to gain from innovative clean technologies that support climate change mitigation, as well as economic growth and industrialization.

This child project will be implemented in alignment with the key national priorities of Indonesia to set the trajectory for Indonesia's low emissions development targets and will specifically focus on the identification and commercialization of clean technology innovations contributing to the transition towards low-carbon infrastructure in Indonesia and will simultaneously achieve significant GHG emission reduction.

## **Kazakhstan**

The economy of the Republic of Kazakhstan (hereinafter Kazakhstan) is mostly dependent on the extraction, processing and production of natural resources. Despite the substantial progress made over the last decade on many fronts, its main industries remain technologically underdeveloped, leading to one of the most energy and GHG intensive economies in the world. Kazakhstan's extensive mining and extraction operations causes the emission and release of local and global pollutants, such as harmful emissions generated from lead and zinc smelters, uranium-processing mills and other heavy industries in the eastern part of the country.

Recently Kazakhstan has taken a strong course of actions towards promoting technology innovation and renovation in all branches of its economy, including housing, utilities, industry among others. The country has ratified the Paris Climate Change Agreement and its Nationally Determined Contribution (NDC) contains an unconditional target to reduce GHG emissions by 15% below 1990 levels by 2030, and a conditional target of reducing emissions by 25% below 1990 levels by 2030. In order to operationalize the commitments, the majority of government programs are aimed towards development and deployment of energy and resource efficient technologies, digitalization of housing and utilities, waste recycling and many others.

In order to support the government in its commitment towards the transition to a low-carbon and sustainable development trajectory, technology innovations in the climate and clean energy sector will play a crucial and catalytic role, as referred to in Article 10 of the Paris Agreement. Technological innovation is also a key component of the Sustainable Development Goals, particularly goal 7 on energy, goal 8 on decent work and economic growth, and goal 9 on industry, innovation and infrastructure. Therefore this child project will address the existing barriers and obstacles to fostering and scaling-up of innovative cleantech solutions in Kazakhstan.

The promotion and adoption of innovative cleantech solutions will have lasting positive effects for the global environment as it will allow tackling of environmental problems at the source by simultaneously avoiding or reducing pollutant emissions and ensuring better use of natural resources and energy. By focusing on the adoption and scale-up of cleantech solutions in the market, and across all sectors of the economy, the project will further contribute to generate substantive and long-term benefits to the local and global environment, driving increased green economy activities and reduced energy consumption and CO<sub>2</sub> emissions in Kazakhstan as well as in the CIS region and beyond. The project will provide stronger momentum and greater visibility to clean energy technologies and innovations, reinforcing and multiplying the impact of government programmes in terms of faster-paced technological modernization of Kazakhstan industry, housing, commercial, utilities and transport sectors, contributing to allow striking a balance between growing economic activity and its global environmental impact.

## **Moldova**

According to the World Resources Institute, Moldova's GHG emissions are primarily traced to activities in the energy sector (74.6%) including electricity and heat generation and transportation contributing 58% of energy emissions. Moldova's First Biennial Update Report (BUR) to the UNFCCC, submitted in 2016, includes a GHG inventory for the period 1990 to 2013 which shows energy as the greatest source of emissions (65.5%), followed by agriculture (16.6%) and waste (12.2%).

With few natural energy resources, Moldova currently imports almost all of its energy supplies, mainly natural gas from Russia, Ukraine and Romania. Not only has this made Moldova vulnerable in terms of energy security it has also resulted in increasing domestic energy prices and national debt. In 2017, Moldova exported \$2.96B and imported \$5.07B, resulting in a negative trade balance of \$2.11B. Due to high gas and electricity costs, forests, which cover 11 percent of the land in Moldova, provide the majority of fuelwood for

heating and hot water in rural communities. Electricity is generated from a few CHP plants and its interconnections with Ukraine are used to ensure the necessary system reserves and balancing energy. The issue is compounded by the fact that, on the supply side, the energy infrastructure relies on aging inefficient technology, equipment and networks which result in high losses, whilst on the demand side there is limited energy efficiency.

Moldova is one of the most energy intensive economies in the region with energy consumption double the EU average and with limited uptake of renewables and energy efficiency. The residential sector accounts for about 50% of the final energy consumption due to a small industrial sector (accounting for only 8% of final energy consumption). Consequently the supply of reliable and affordable electricity, and heat, is a key concern for businesses and citizens alike, and negatively affects investment decisions and economic growth.

Moldova's overarching strategy relating to climate change mitigation, and clean technology, falls within Moldova's Low Emission Development Strategy 2030 (LEDS) which provides a sector development approach that sets the country's long-term climate change mitigation objectives and strategy. As such the LEDS strengthens the objectives related to GHG emissions reductions stipulated in other national legal acts such as the National Development Strategy Moldova 2030 and the Energy Strategy 2030. The Moldovan Energy Strategy envisages the diversification of energy supply sources towards renewables. The National Program on Energy Efficiency 2011-2020 stipulates targets in achieving 20% of improved efficiency in energy consumption by 2020, an increase of renewables in the total energy mix by 20% by 2020.

This child project will work closely with the National Energy Efficiency Agency to set the trajectory for Moldova's low emissions development targets and will specifically focus on the identification and commercialization of clean technology innovations contributing to the transition towards low-carbon infrastructure in Moldova and will simultaneously achieve significant GHG emission reduction.

## **Morocco**

More than 92% of all Moroccan businesses are classified as SMEs, and are responsible for 90% of the country's GDP. Morocco benefits from having one of the most diverse economies in the Middle East/North Africa (MENA) region, with a multitude of industries, a vibrant services sector and modern, knowledge-driven sectors, such as Information and Communications Technology (ICT) and film-making. In 2017, Morocco ranked 123 out of 187 countries surveyed in UNDP's Human Development Index (HDI).

The Government of Morocco has implemented many measures to foster innovation and support SMEs since 2010, yet there is still a clear need to develop further incentives to promote and strengthen cooperation between the the academic, public and private sectors.

The Moroccan government has committed itself to a socially-oriented market economy and a stability-oriented monetary, fiscal, and exchange rate policy. Sustainable economic growth is key to promoting employment. Central sectoral policies have made impressive achievements over the last 10-15 years, e.g. power supply for 98% and access to drinking water for 93% of the population. Despite the successes, there are still major inequalities in terms of access to employment, social services, and information for women and people with disabilities.

The Secretariat of State Responsible for Sustainable Development (SEDD) – Ministry of Energy, Mines and Sustainable Development is responsible for developing, and implementing, and monitoring government policy in the area of environment and sustainable development.

Responsibility for energy policy and implementation of Morocco's national energy strategy lies with the Ministry of Energy, Mines, Water and Environment (MEMEE).

Currently Morocco imports 95% of its primary energy needs, which puts a significant burden on the trade balance as well as on climate and environmental impacts. In addition, spending on energy imports is at the expense of social and educational expenditure. Population growth, increasing industrialization and urbanization, improved living conditions,

growing population, and a forced rural electricity supply are steadily increasing the demand for electricity.

Morocco offers excellent climatic conditions for the use of renewable (solar and wind) energy. By using these primary energy sources, CO<sub>2</sub> emissions can be significantly reduced. There is also great potential in the field of energy efficiency, particularly through savings in the construction, transport and industrial sectors.

Today, Morocco is classified as a 'middle income country' and is largely agrarian: the agricultural sector employs about 45% of the workforce. Unemployment (especially amongst young people, women, and disadvantaged groups), as well as a lack of vocational skills, remain the biggest challenges for the government.

Increased promotion and adoption of clean technology innovations will further strengthen the resilience of the Moroccan economy to climate change, while also having positive economic and social benefits through the promotion and support of entrepreneurs and innovation, beyond individual sectors and regions. The positive impacts of such interventions are magnified when applied to SMEs, which are particularly vulnerable to climate change.

## **Nigeria**

As of 2018, Nigeria's population was approximately 196 million people and growing at 2.6% per annum. Nigeria's population is projected to double and reach about 400 million people within the next 25 years. Nigeria is a lower middle-income developing country with a GDP per capita of \$2,082. Lack of access to modern energy services remains the principal constraints to economic development. It is worth noting that the energy sector contributes over 70% revenue to Nigeria's economy.

Nigeria is endowed with various types of energy resources ranging from fossil fuel (oil, natural gas and coal) to non-fossil fuel (bioenergy, solar, wind, hydro-power, ocean thermal energy, geothermal and reasonable amount of tidal energy) yet, these resources are not fully utilized, in particular non-fossil fuel sources. To date, Nigeria has relied on its fossil fuel resources especially for its electricity sector in which the country is yet to meet its electricity demand and constantly in short of supply. The estimated suppressed energy demand in the country is about 20,000 MW with supply capacity of about 7,000 MW and available capacity of hovering around 3,500-5,000 MW. As a result of this shortfall in supply and demand management, most households, small and medium enterprises (SMEs), industries have to resort to private fossil fuel generating sets to meet their energy demand. An estimated 50% of electricity consumed in the country is currently produced off-grid by fossil fuel generators.

In 2014, Nigeria became the largest economy in sub-Saharan Africa, with an economy growing at an average of 7% per annum between 2010 and 2015 which contracted to -1.6% in 2016. Due to the over reliance on crude oil as the main source of earnings for the government and continuous decline in crude oil price during mid-2014 - 2015, the country went into recession in the third quarter of 2016. However, the government has formulated an Economic Recovery and Growth Plan ((ERGP) (2017-2020) which focuses on three strategic objectives: Restoring growth, investing in the citizens, and building a competitive economy in order to diversify the economy. Viable SMEs and start-ups can create jobs and are essential for the overall development and diversification of the country's economy. Well-managed and financially stable SMEs and start-ups can play a major role in Nigeria's economy, but suffer from a number of challenges which the proposed cleantech project will address. The project will contribute, through its activities and continual engagements with the National Government, the private sector and other relevant stakeholders, to address the barriers in a holistic manner, promoting the development and deployment of clean energy technology innovations.

## **South Africa**

The South African economy holds significant potential in terms of economic growth and technology innovation. However in recent years economic development has been hindered

by a steep reduction in prices for key mineral exports and high unemployment rates. These issues are hindering foreign investment, as well as skills upgrading through innovation and technology development, which in turn would support economic development and job creation. The South African Government recognizes the value of adopting a greener, more sustainable development path. Green technologies have the potential to not only stimulate the needed economic growth, create new job opportunities, and mitigate environmental risks, but can also be implemented to improve living conditions and speed up service delivery, thereby fulfilling national social justice commitments. Adoption of climate and clean energy technology (cleantech) innovation is also one of the key means to meet international climate commitments, including the Paris Climate Agreement, to reduce CO2 emissions and mitigate climate change.

The national GHG inventory supplied by the Department of Environmental Affairs (DEA) of South Africa, based on 2000 data, states that the percentage contribution to CO2 emissions is: energy supply and consumption, 78.9%; industrial processes, 14.1%; agriculture, 4.9%; and waste, 2.1%. These areas provide opportunities for mitigation through technological and behavioral interventions. The findings of a 2011 report also demonstrate that jobs associated with natural resource management are expected to be around 43,000 direct jobs in the short term to over 230,000 direct jobs in the long term. Since job creation is a top priority of government and features prominently in the National Development Plan, the sector presents considerable opportunities in employment.

Given these factors' importance, it is essential to identify and overcome the barriers that impede the development and diffusion of green technologies. Some of the learning points from the Academy of Science of South Africa report on The State of Green Technologies in South Africa (Nov 2014) include, amongst others:

- encouraging investment in green technology innovation across the various stages of development, from R&D to commercialization
- promoting green technologies amongst consumers and encouraging a shift in behavior patterns
- streamlining bureaucratic processes to fast-track green innovation and project implementation
- facilitating public-private partnerships to pool resources
- supporting localization
- providing adequate financial instruments
- providing greater business support to emerging and established green enterprises
- building skills and capacity to foster innovation and facilitate a greater uptake of green technologies.

This child project aims to support the identification, fostering and growth of green technologies (cleantech) helping them to scale within South Africa and, through the global program, to scale internationally through the provision of commercialization support and links to markets and finance. Working within the global program will ensure that the child project is more efficient and more impactful through knowledge sharing, leveraging of synergies across national ecosystems, avoidance of duplication, global linkages and coordination. This will result in greater economic growth, global environmental benefits and job creation, in line with government priorities and contributing to the overall program impact.

## **Tanzania**

According to the published Tanzania country environmental assessment report, Tanzania's total wealth per capita – the sum of all physical, human, and natural capital – declined between 1995 and 2014, despite sustained economic growth. This decline is attributed to rapid population growth which has outpaced investment and occasioned the loss of total

renewable natural capital per capita by 35% over the past 20 years, and of non-land renewable natural capital per capita by 47%, the report highlights. Concerns raised by the report relate to more “traditional” environmental and natural resources challenges, which include degradation of land and water resources, deforestation, and biodiversity loss. Tanzania has an estimated forest area net loss of 483,859 ha per year – one of the highest deforestation rates in the world. Others are pollution-related, more frequently associated with urban settlements, industrialization, and agglomeration. The government is aware that Tanzania is highly vulnerable to climate change and needs to build resilience across all sectors. “The impacts of these challenges are intensifying and will result in significant loss of ecosystems, as competing demands for land, water, and environmental pollution increases. New urban settlements are emerging, and existing cities are rapidly developing. As the country industrializes, there is an opportunity to leapfrog toward cleaner production technologies. The importance of access to clean and renewable energy, modern fuels and low impact urbanization cannot be overstressed. At the same time, Tanzania’s urbanization needs to be compatible with environmental targets to limit pollution, and promote sustainable living conditions. Government is committed towards steering Dodoma on the path towards becoming a green and sustainable city through the promoting resource efficiency and clean and renewable energy integration. In order to reduce and limit further stress on the environment, a number of key project activities have been identified including the following:

1. In order to further improve the efficiency of mobility for Dodoma, the Government is also planning the construction of a new international airport (Msalato Airport) about 10km north of the city centre and the first phase to be financed by the African Development Bank. The completion of these projects is expected to greatly improve ease of accessibility and transportation to and from Dodoma, which is already feeling the effects of a rapidly escalating number of visitors who have begun frequenting Dodoma after the recent transfer of government functions from Dar es Salaam, to the capital city of Dodoma.
2. Government is committed towards steering Dodoma on the path towards becoming a green and sustainable city and, in this regard, another planned key intervention is focusing on promoting the use of clean cooking energy technology solutions for urban households in Dodoma. The rapid growth of unplanned settlements is giving rise to increased demand for charcoal, which is used by over seventy percent of households in Dodoma city as the main source of fuel for cooking. Apart from reducing charcoal consumption and deforestation, the initiative will also help to improve the environment in households by reducing indoor air pollution and its associated health risks. The use of charcoal in urban areas is considered to be one of the major causes of widespread deforestation and land degradation. In Tanzania, urban centres are the largest consumers of charcoal and in informal urban settlements, it is considered the most convenient option available, largely due to lack of awareness of clean fuel options which can match and outperform charcoal in terms of efficiency as well as cost.

### **Thailand**

The Eastern Economic Corridor (EEC) Policy committee is the primary Royal Thai Government collective force chaired by the Prime Minister of Thailand. The Government has indicated funding for several projects in the EEC including 12 billion USD for new cities and 15 billion USD for industry. A key priority for investment and development in the EEC is the development of smart cities. An example of new urban development includes the planned expansion of U-tapao airport within the Rayong Municipality and the development of Laemchabang, a coastal city with the largest port in Thailand. Additionally, Significant investment is being directed towards developing connectivity in the region through



infrastructure projects, including a high-speed train, double-track rail lines, expansion of ports and U-Tapao Airport, and encouraging investment in the 10 major industries identified by the government. Several ongoing and announced projects are of particular relevance to this project:

- Thailand Greenhouse Gas Management Organization (TGO) has developed and implements the “Integrating Climate Actions into EEC: Towards the Low Carbon Industry” project. As part of this project, TGO has performed a gap analysis using a questionnaire distributed to 150 factories in the EEC, surveys and in-depth interviews with 30 factories, and a review of energy management reports of designated factories. Based on analysis of 73% of the designated factories in the EEC, energy consumption and greenhouse gas emissions from designated factories were 25,125ktoe or equal to 94,681 ktCO<sub>2</sub>. This figure also represents 37% of total emissions from designated factories in Thailand. With respect to the priority S-Curve industries, the automotive industries had the highest share of reported emissions, accounting for 44.95% of total reported emissions. Regionally, Chon Buri accounted for 52.99% of emissions, followed by Rayong (27.2%) and Chachoengsao (19.89%). TGO has recommended based on their analysis five policy recommendations to promote GHG management and reduction in the EEC: policy and organizational management; legal; technology; finance and capacity development.
- National Science and Technology Development Agency (NSTDA) is working with the Bangkok Mass Transit Authority (BMTA), operator of mass transit bus in Bangkok and vicinities, on a project that aims to retrofit existing internal combustion engine (ICE) buses to battery electric vehicles (BEVs). This project is a partnership between the BMTA, Electricity Generating Authority of Thailand (EGAT), Metropolitan Electricity Authority (MEA), Provincial Electrical Authority (PEA), and NSTDA to improve Thai entrepreneur’s technical and capacity potential to have their own knowledge and technology for electric buses. The project also aims to develop new knowledge of ICE to electric bus conversions as well as develop an understanding of component that could be provided by Thai manufactures in order to decrease the volume of imported electric buses.
- An extension of the above project includes the research and development of a charging station prototype, up to IEC and SAE standard, to be used by BMTA’s electric buses, by the National Electronics and Computer Technology Center (NECTEC) under NSTDA. • NSTDA is completing research and developing a prototype three-phase induction motors for EVs. Induction motors are inexpensive, easy to produce and control compared to standard EV motors.
- NSTDA has additional ongoing relevant research collaboration and technology transfer. As recent as September 2019, NSTDA signed an MOU with local administration offices, the Land Development Department and Betagro Group to collaborate on the “Smart Tambon Model” project. This project aims to apply science, technology and innovation (STI) to support local development. The pilot will take place in seven sub-districts (Tambon in Thai).
- NSTDA has also partnered with the ASEAN Centre for Energy to drive bioenergy research and utilization in ASEAN. The project supports ASEAN’s goal of increasing renewable energy consumption to 23% by 2025.
- TGO has been implemented the “City Carbon Footprint” Project since 2014 in order to help cities calculate their footprint (based on GHG protocol calculation methodology), identify mitigation potential which will help them prepare mitigation action plans in their cities. As of now, there are 96 municipalities participated and calculated City Carbon Footprint (CCF).
- EEC will consider funds towards the creation of dedicated lanes for electric buses to support modal switching within the region.

- Thailand and the EEC are also prioritizing the preservation of natural assets and protection of biodiversity. The project will capitalize on NSTDA's existing initiative and work in this area as follows:
- NSTDA has initiated biodiversity thematic research with an annual budget approximately five million US dollars to promote conservation and sustainable utilization of Thailand biological resources. Toward the conservation goal, we focus on both new species discovery and conservation of endangered species. We support comprehensive ecological research using advance technologies, e.g., multi-sensor tracking systems and next generation sequencing technology. These research activities cover wide range of habitats, e.g., constructing an ecological model based on forest dynamics, studies on predator-prey habitat structure and understanding of coral bleaching due to global warming effect etc. To guarantee the conservation goal, NSTDA also established (with the new funding scheme to promote nation's economy via S&T). a nation long-term conservation facility— National Biobank of Thailand (NBT)—for microbes, plants and biodata. In terms of utilization goal, NSTDA hosts one of the largest microbial working collections, Thailand Biological Resource Center (TBRC), servicing microbes with high potential utilization for food, cosmetic to pharmaceutical industries.

## **Turkey**

In recent years, due to population and economic growth (with a cumulative GDP growth in 2005-2015 of 65%), Turkey has recorded the fastest increase in electricity demand among OECD members (annual growth rate of 5.5% since 2002). Turkey is now 21st on the global energy consumption list. Its installed electricity generation capacity exceeded 88 GW as of January 2019, which represents a threefold increase in 15 years. What is more, Turkey's energy use is expected to grow by 50% over the next decade.

In 2016, the share of fossil fuels in total primary energy supply was 87.3%. This is related to a range of environmental challenges such as climate change, desertification, deforestation, water scarcity, nature degradation and marine pollution.

According to the National Energy Efficiency Action Plan 2017-2023, improvement in industrial energy efficiency offers significant opportunities to reduce energy consumption, to upgrade technology development levels, and reduce GHG emissions. Investments in energy efficiency, particularly in new innovative technologies could save up to 20% of energy on the country level.

Turkey aims to build a competitive agricultural sector which requires effective use of its physical potential, efficient energy and resource use, regulation and aggregation of lands, scale up of the utilisation of modern and efficient agricultural machinery, and use renewable energy resources in the sector. Since 1990 there has been a significant decline of agricultural land in Turkey. The country had 23.7 million ha of arable land in 2016, compared to 27.9 million ha in 1990. There are 921 different agricultural basins, disaggregated by rainfall, temperature and topographical characteristics. Of the total arable land, 67% is cropland, 17% is fallow land and the rest is utilised for horticulture, vegetable production, vineyards and olive gardens . Furthermore, a significant share of forests in Turkey is degraded or damaged mainly due to climate factors, mostly forest fires followed by anthropogenic influence - illegal logging being the main issue.

According to its Intended National Determined Contributors (INDC), Turkey aims to achieve up to 21% reduction in GHG emissions compared to the BAU level by 2030. This will enable Turkey to step on low-carbon development pathways compatible with the long-term objective of limiting the increase in global temperature below 2C.

At the same time, small and medium-sized enterprises (SMEs) play an important role in the Turkish economy. There are 3.5 million SMEs which account for 99.9% of all businesses (97.5% of which are micro-enterprises), provide 76% of jobs, and produce 53% of the value added to the national economy.

Turkey ranks 33rd in the Global Cleantech Index. Its clear strength lies within general innovation drivers, scoring high in entrepreneurial culture indicators and giving evidence of an active early-stage ecosystem. For cleantech-specific drivers on the other hand, Turkey lacks strength across all constituent indicators, from a cleantech-supportive policy environment to access to private finance. This is reflected in Turkey scoring third worst in evidence of emerging cleantech SMEs.

## **Ukraine**

Over the past 10 years, the government of Ukraine has adopted a number of legislative frameworks and policies, such as the Energy Strategy of Ukraine 2035, Ukraine 2050 Low Emission Development Strategy (LEDS), Action Plan on the Implementation of State Climate Change Policy until 2030, Law "On Environmental Impact Assessment" to promote adoption of energy efficiency, renewable energy, and reduce GHG emissions in the country.

1. The Energy Strategy for Ukraine until 2035 adopted in 2017, sets an ambitious target to increase the share of renewables in its total primary energy supply to 25% by 2035, while reducing the energy consumption of Ukraine's economy by half until 2030. In addition, the strategy aims to (i) integrate with the European energy market; (ii) ensure transparency of energy sector regulations and policies; (iii) liberalize energy market relations; (iv) promote competition and independence of energy market regulators; and (v) prioritize innovative technological development. One of the tasks listed in the strategy includes the development of financial market infrastructure for project implementation in the energy sector. However, the strategy appears to have generic recommendations and lacks concrete mechanisms for investment or incentives to reduce GHG emissions.
2. Feed-in-tariff scheme introduced in 2009, will remain open until 1st January 2030. It is called "the Green Tariff" policy that aims to mobilize domestic financial resources for the adoption of renewable energy (solar, wind, biomass, biogas, hydropower, geothermal) and overseen by the National Commission for State Energy Regulation. Since the launch of Green Tariff, there were few amendments made that applied new tariff rates and also local content premium, whereby plants using components produced locally will receive the additional premium paid on top of the regular feed-in tariff in 2015. In addition, "green tariff" does not target SMEs and is amended each month by the current exchange rate, increasing the associated risks.
3. The Ukrainian Law on Public-Private Partnerships (PPP) was adopted in 2010 and took certain steps to promote PPP. However, SMEs and local authorities still lack information and understanding of this type of business and today, there are only a few successful projects of this type in Ukraine. The regulatory framework gives no clear understanding of which procedure should be followed at each stage of a PPP project. Hence, insufficient knowledge and peculiarities of managing such projects often result in low efficiency of their implementation.
4. The Action Plan on the Implementation of State Climate Change Policy until 2030 was adopted in December 2017 and serves as the first holistic policy document in Ukraine on climate action, focusing on strengthening institutional capacity, climate change mitigation, and transition to low emission development as well as adaptation and reduction of climate-related risks. Action Plan establishes the main principles of state policy in the field of climate change and covers 49 measures, among them the development of two national strategic documents: a Low Emission Development Strategy and a National Adaptation Strategy.

5. Ukraine 2050 Low Emission Development Strategy (LEDS) was adopted on July 2018. LEDS sets indicative GHG emissions target of 31-34% by 2050 (compared to 1990 levels), that is much more ambitious than the current commitment under the Paris Agreement.
6. The Strategy for SME Development in Ukraine until 2020 was adopted in May 2017 and largely calls on better coordination among various authorities and levels of government that cover SME operations. The document acknowledges various regulatory deficiencies and set the reform path to their resolution, included improved access to finance for SMEs. The Ministry of Economic Development and Trade is currently building an SME portal where they plan to collect and share information on all available programmes and opportunities for technical assistance that may also lead to access to finance, as a one-stop info-shop.
7. Ukraine, as a member of the Energy Community (EnC), is also requested to develop by 2020 an Integrated National Energy and Climate Plan (NECP), as a necessary measure to ensure that European Union as a whole can meet its targets and to coordinate policies between member countries. By 2030, the EU wants to reduce GHG emissions by 40%, improve energy efficiency by at least 32.5% and increase the share of renewables to 32%, compared to the 1990 levels. NECP also became the main tool of Energy Union governance and offers a unique opportunity for developing Ukraine's own low carbon and clean technologies and attracting investments. Ukraine's Ministry of Energy was assigned as the leading agency to coordinate the preparation of the NECP. In contrast to Ukraine's 2050 Low Emission Development Strategy (LEDS) that frames the transition process until 2050, NECP aims to derive the medium-term implications of the LEDs and define the policy agenda for the next decade. The plan can be instrumental to fostering Ukraine's Europeanization and attracting investments and funding.

Despite the above-mentioned economic incentives (feed-in-tariff, cost recovery programs, etc.), policies and measures, the share of renewables in power production of Ukraine are still negligible around 1.5%. Though the deployment of renewables accelerated in 2018, current incentives failed to achieve deployment targets, reaching only 2% instead of 10.4% planned in 2018. The lending of small and medium-sized businesses in Ukraine is insufficient and there is an urgent need to diversify the financial products. SMEs and clean technology project developers have limited access to green financing options matching their needs and usually cannot afford the high costs of borrowing, which limits SMEs' ability to take loans, particularly for long-term investments. SMEs have relatively good access to short-term local currency loans while foreign currency financing is restricted to those entities that have foreign currency earnings. Trade finance instruments are available on the market, mostly in the form of letters of credit, letters of guarantee and promissory notes. However, private equity and venture capital are rarely available. In 2016, 69.4% of Ukrainian companies satisfied their needs in capital investments with their own funds. The weak corporate governance of the dominant state-owned banks and the weak financial position of the Deposit Guaranty Fund stand in the way of stimulating investment and growth.

## **Uruguay**

In order to increase productivity in a sustainable and inclusive manner, Uruguay has developed the National System of Productive Transformation and Competitiveness: "Transforma Uruguay" created in December 2016, through Law 19,472. The principal objective is promoting economic, productive and innovative development, with sustainability, social equity, environmental and territorial balance.

The country's overarching program is integrated by the Ministerial Cabinet of Productive Transformation and Competitiveness (8 Ministries: Foreign Affairs; Economy and Finance; Education and Culture; Industry, Energy and Mining (MIEM); Labor and Social Security; Livestock, Agriculture and Fisheries (MGAP); Tourism; Housing, Land Administration and the Environment (MVOTMA); and the Director of the Office of Planning and Budget (OPP), with ministerial status), the Secretariat of Productive Transformation and Competitiveness, and the Consultative Councils with the participation of 9 public agencies (ANDE, ANII, URUGUAY XXI, INEFOP, INACOP, CND, INIA, LATU, SNRCC). This institutional arrangement coordinates and monitors the actions promoted by the different state organizations. To achieve and guide its objectives, “Transforma Uruguay” developed a National Plan for Productive Transformation and Competitiveness (“Plan Nacional de Transformación Productiva y Competitividad”) for the period 2017-2021.

The Plan has integrated Circular Economy as a priority given its potential to generate new businesses and jobs by addressing climate change risks. Within the framework of this plan, and in line with the economic sectors prioritized by the Office of Planning and Budget (OPP), interdisciplinary work is carried out by the public, private and academic sectors, identifying early actions related to Circular Economy in the following areas: i) meat sector, ii) dairy sector, iii) forestry sector, iv) valorization of materials, v) product as a service and vi) food waste and packaging. Additionally, the Circular Economy Action Plan has been developed, which focuses on seven main axes: 1) Public procurement of food and packaging with a sustainable perspective, 2) Industrial transition towards a Circular Economy, 3) Design development of the Bioeconomy Technology Center, 4) Electric vehicles for the public sector, 5) Dairy farms’ nutrient circularity, 6) Strengthening of CE’s capacities, 7) Valorization of materials

Throughout the identification phase of the project, consultations were held with various stakeholders, such as the National Meat Institute (INAC), Chamber of the Chemical Industry, Plastic Technology Center (CTPlast), Chamber of the Construction Industry, Ministry of Housing, Land Use Regulation & Environment – National Environment Directorate (MVOTMA – DINAMA), Ministry of Livestock, Agriculture and Fisheries - Development and Adaptation to Climate Change Project (MGAP – DACC), Ministry of Industry, Energy and Mining - National Energy Directorate and National Industry Directorate (MIEM- DNE - DNI), Office of Planning and Budget (OPP), working group in Circular Economy of “Transforma Uruguay” (public, private and academic sector), University of the Republic (UDEAR), Uruguayan Information Technology Chamber (CUTI), National Oil Company (ANCAP), Public Utility (UTE), Uruguayan Wind Power Association, National Development Agency (ANDE) and the National Institute of Statistics (INE).

Uruguay has been developing an institutional framework on gender in recent years. Through Law No. 18.104 of March 2017, the National Women' Institute was created as the governing body for gender policies in Uruguay, and the National Gender Council as a space for defining the strategic lines of public gender policies, integrating the State, the Academy and civil society.

Likewise, gender mechanisms have been created and strengthened at different levels of government. Commissions, divisions, gender secretariats or similar mechanisms have been created in Ministries, Public Entities and departmental governments. Some examples are the National Plan to Combat Gender-Based Violence and the Equity Quality Program as well as specific laws (Domestic Work Law, the Sexual Harassment Law, the Law of Parental Licenses and subsidies for care).

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## **8. Knowledge Management**

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

Knowledge management is one of the key objectives of the global programme. There is a specific knowledge management Pillar which aims is to generate, capture and disseminate knowledge generated by the GCIP at national and global level. Under this Pillar, knowledge management will be addressed in four ways as following:

- Web platform. A web platform will be established which will have various functionalities that will enhance knowledge management. To begin with the web platform will be used to manage the accelerator processes in all GCIP countries. It will also act as a repository of the reports, updates on the works on policy and regulatory innovations in each of the GCIP countries. In addition it will act as a platform for a Community of Practice in cleantech innovation. Furthermore, the platform will be used for showcasing GCIP assisted companies where they will have webpages to showcase their technologies and also provide updates on their businesses.
- The Cleantech Innovation index will be developed as a regular publication of the GCIP programme to share knowledge on the innovation ecosystems in GCIP countries.

- As part of knowledge management, enhanced GCIP impact tracking will be implemented. To this end, indicators and methodology of assessing impact of GCIP will be developed. Once developed and validated, the methodology will be applied to all GCIP activities to consistently and regularly track the impact of GCIP.

- With regards to policy and regulations, GCIP will develop, document and disseminate policy best practices, roadmaps and recommendations. The policy best-practices will document success stories on how policy and regulatory measures are used to stimulate and sustain cleantech innovation. Given the expressed interest by countries for cross-country learning, this Pillar will support the development of responsive policies and regulations across GCIP countries on promoting cleantech innovation.

- Furthermore, this project will develop guidebooks and methodologies that will be used in GCIP and for wider dissemination and replication. Standards will be developed and used across the GCIP countries to ensure the quality of the programme. These guidebooks and standards will strengthen knowledge management across the programme. Further details are provided in the description of Pillar 3.

## **9. Child Program Selection Criteria**

### **Outline the criteria used or to be used for child program selection and the contribution of each child program to program impact.**

GCIP child project countries will cover a wide selection of country sizes, status of economies, status of innovation ecosystem and a balanced representation of countries from Africa, Asia, Latin America & Caribbean and Eastern Europe and Middle East to ensure that the project results are as replicable as possible globally. The initial countries already cover Africa and Asia, large and small economies and countries with nascent innovation ecosystems and those where there has already been development.

It is expected that as the success of the initial countries is demonstrated there will be a large number of applicant countries interested in improving their own innovation ecosystems and in running their own cleantech accelerators. Therefore a number of strategic criteria will be developed for their inclusion, including:

- state and readiness of the country to support cleantech innovation.
- GCIP will support national targets on emission reductions (in line with NDC or other national policy documents).
- country ranking in the GCII.
- the country is interested to continue to run a national platform to support cleantech innovation to generate more impact from the project.
- the country has a co-financing base on which to build the project.
- the project will attain direct or indirect emissions reduction impacts.

Each country will also provide rationale for use of its STAR allocation for cleantech innovation. It is expected that with between 15 and 30 countries in the GCIP programme the total STAR allocation will be between US 30 and 60 million. Each country project will pool resources (estimated at 6-10% of grant with minimum of US\$ 90,000) to co-finance global



activities that will also include outreach and knowledge management (see Annex H). Countries will be expected to cover their costs to participate in regional and global events from their own country projects.

### 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).

Name	Position	Ministry	Date
Ponlok Tin	Secretary General of National Council of Sustainable Development	MINISTRY OF ENVIRONMENT, KINGDOM OF CAMBODIA	5/29/2019
Jin Fu	Ministry of Finance, International Financial Institutions Division III Operational Focal Point	PEOPLE’S REPUBLIC OF CHINA	
Ibu Laksmi DHEWANTI	Ministry of Environment and Forestry	REPUBLIC OF INDONESIA	9/30/2019
Sabit Nurlybay	Vice Minister, GEF Operational Focal Point	REPUBLIC OF KAZAKHSTAN MINISTRY OF ENERGY	4/29/2019
Nagulendran Kangayatkarasu	Ministry of Energy, Science, Technology, Environment and Climate Change	MALAYSIA	
Ion Lica	Head of Environmental Services, GEF Operational Focal Pont	MINISTRY AGRICULTURE, REGIONAL DEVELOPMENT AND ENVIRONMENT, REPUBLIC OF MOLDOVA	8/24/2018
Rachid Firadi	Director of Partnership, Communication and Cooperation	SECRETARIAT OF STATE IN CHARGE OF SUSTAINABLE DEVELOPMENT, MINISTRY OF ENERGY, MINES AND SUSTAINABLE DEVELOPMENT, KINGDOM OF MOROCCO	4/10/2019

Name	Position	Ministry	Date
Auwal Ahmed Maidabino	Director, Planning, Research and Statistics	FEDERAL MINISTRY OF ENVIRONMENT, FEDERAL REPUBLIC OF NIGERIA	5/7/2019
Zaheer Fakir	GEF Operational Focal Point	DEPARTMENT OF ENVIRONMENTAL AFFAIRS, REPUBLIC OF SOUTH AFRICA	4/5/2019
Akif Ozkaldi	Deputy Minister, GEF Operational Focal Point	MINISTRY OF AGRICULTURE AND FORESTRY, REPUBLIC OF TURKEY	10/31/2018

#### **ANNEX A: LIST OF CHILD PROJECTS UNDER THE PROGRAM**

1. Cambodia
2. China (missing will be submitted)
3. Indonesia
4. Kazakhstan
5. Malaysia (missing will be submitted)
6. Moldova
7. Morocco
8. Nigeria
9. South Africa
10. Turkey

#### **ANNEX A1: Project Map and Geographic Coordinates**

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

