Funding Proposal

FP177: Cooling Facility

Multiple Countries | International Bank for Reconstruction and Development and International Development Association (World Bank) | Decision B.30/03

23 November 2021

GREEN CLIMATE FUND

Contents

Note to Accredited Entities on the use of the funding proposal template

- Accredited Entities should provide summary information in the proposal with cross-reference to annexes such as feasibility studies, gender action plan, term sheet, etc.
- Accredited Entities should ensure that annexes provided are consistent with the details provided in the funding proposal. Updates to the funding proposal and/or annexes must be reflected in all relevant documents.
- The total number of pages for the funding proposal (excluding annexes) **should not exceed 60**. Proposals exceeding the prescribed length will not be assessed within the usual service standard time.
- The recommended font is Arial, size 11.
- Under the GCF Information Disclosure Policy, project and programme funding proposals will be disclosed on the GCF website, simultaneous with the submission to the Board, subject to the redaction of any information that may not be disclosed pursuant to the IDP. Accredited Entities are asked to fill out information on disclosure in section G.4.

Please submit the completed proposal to:

fundingproposal@gcfund.org

Please use the following name convention for the file name:

"FP-[Accredited Entity Short Name]-[Country/Region]-[YYYY/MM/DD]"

LIST OF ACRONYMS

AE	Accredited Entity
AC	Air Conditioning
BFAR	Bureau of Fisheries and Aquatic Resources
BAU	Business As Usual
CDM	Clean Development Mechanism
CLASP	Collaborative Labelling and Appliance Standards Programs
CO2eq	Carbon Dioxide Equivalent
DRR	Disaster Risk Reduction
ECCP	Efficient, Clean Cooling Program
EDGE	Excellence in Design for Greater Efficiencies
EE	Executing Entity
EEff	Energy Efficiency
EERF	Energy Efficiency Revolving Facility
ESA	Energy Service Agreement
ESMAP	Energy Sector Management Assistance Program
ESF	Environment and Social Framework
ESCO	Energy Service Company
ESCP	Environmental and Social Commitment Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
ESPC	Energy Savings Performance Contract
ESRC	Environmental and Social Risk Classification
ESS	Environmental and Social Standards
FAO	Food and Agriculture Organization of the United Nations
FI	Financial Institution
FM	Financial management
GHG	Greenhouse gas
GWh	Gigawatt-hours
GWP	Global Warming Potential
GoP	Government of Panama
GoU	Government of Uganda
GCF	Green Climate Fund
GHG	Greenhouse Gas
GRM	Grievance Redress Mechanism
HCFC	Hydrochlorofluorocarbons
HFC	Hydrofluorocarbon
IFC	International Finance Corporation
ICR	Implementation Completion Report
IFR	Interim financial report
ISR	Implementation Status and Results Report
IEG	Independent Evaluation Group
IDP	Information Disclosure Policy
IPCC	Intergovernmental Panel on Climate Change
IBRD	International Bank for Reconstruction and Development

IDA	International Development Agency
IEA	International Energy Agency
LMP	Labor Management Plan
MSME	Micro small and medium enterprise
MEPS	Minimum Energy Performance Standards
MP	Montreal Protocol
NAMA	Nationally Appropriate Mitigation Action
NAP	National Adaptation Plan
NBS	Nature-based solution
NDA	National Designated Authority
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organization
PFI	Participating Financial Institution
PIE	Project Implementing Entity
PMU	Project Management Unit
PPSD	Project Procurement Strategy Document
PS	Performance Standard
SSA	Sub-Saharan Africa
SDG	Sustainable Development Goal
SEforALL	Sustainable Energy for All
TA	Technical Assistance
TFs	Trust Funds
USAID	United States Agency for International Development
WBG	World Bank Group
WHO	World Health Organization

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LIST OF FIGURES

A. PROJECT/PROGRAMME SUMMARY

A.1. Project or programme	Programme	**A.2. Public or private sector**	Public
A.3. Request for Proposals (RFP)	Not applicable		
A.4. Result area(s)	*Check the applicable GCF result area(s) that the overall proposed project/programme targets. For each checked result area(s), indicate the estimated percentage of GCF budget devoted to it. The total of the percentages when summed should be 100%.*		
	Mitigation: Reduced emissions from: ☐ Energy access and power generation: ☐ Low-emission transport: ☒ Buildings, cities, industries and appliances: ☐ Forestry and land use: Adaptation: Increased resilience of: ☐ Most vulnerable people, communities and regions: ☐ Health and well-being, and food and water security: ☒ Infrastructure and built environment: ☐ Ecosystem and ecosystem services:		GCF contribution: : 0% 0% 77% 0% 0% 0% 23% 0 %
A.5. Expected mitigation impact	16,240,201 *tCO2eq*	**A.6. Expected adaptation impact**	4.2 million direct and 16.8 million indirect beneficiaries of which 50% of women 10.3% of total population
A.7. Total financing (GCF + co-finance)	879.8 million USD	**A.9. Project size**	Large (Over USD 250 million)
A.8. Total GCF funding requested	157 million USD		
A.10. Financial instrument(s) requested for the GCF funding	*Mark all that apply and provide total amounts. The sum of all total amounts should be consistent with A.8.*		
	☒ Grant 32 million USD ☒ Loan 125 million USD ☐ Guarantee 0		☐ Reimbursable grants 0 ☐ Results-based payment 0
A.11. Implementation period	10 years	**A.12. Total lifespan**	27 years
A.13. Expected date of AE internal approval	*Tbc*	**A.14. ESS category**	B I-2

A.15. Has this FP been submitted as a CN before?	Yes ☐ No ☒	**A.16. Has Readiness or PPF support been used to prepare this FP?**	Yes ☐ No ☒
A.17. Is this FP included in the entity work programme?	Yes ☒ No ☐	**A.18. Is this FP included in the country programme?**	Yes ☐ No ☒
A.19. Complementarity and coherence	Yes ☒ No ☐		
A.20. Executing Entity information[1]	Democratic Republic of Sao Tome and Principe, represented by the Ministry of Finance, Planning and Blue Economy and acting through the Ministry of Health Democratic Socialist Republic of Sri Lanka, represented by the Ministry of Finance, and acting through the Ministry of Power Federal Republic of Somalia, represented by the Ministry of Finance, and acting through the Ministry of Health People's Republic of Bangladesh, represented by the Ministry of Finance, and acting through the Ministry of Power, Energy and Mineral Resources Republic of El Salvador, represented by the Ministry of Finance, and acting through the Ministry of Health Republic of Kenya, represented by the National Treasury of the Republic of Kenya and acting through the Ministry of Energy and Petroleum Republic of Malawi, represented by Ministry of Finance, Economic Planning and Development, and acting through Ministry of Industry, Trade and Tourism Republic of North Macedonia, represented by the Ministry of Finance and acting through the Ministry of Economy Republic of Panama, represented by Ministry of Economy and Finance and acting through the Ministry of the Presidency		

[1] For the purposes of the loans and grants, the Executing Entities would be the Host Countries, acting through the relevant Ministry(ies). A Project Implementing Entity (PIE) may be designated by the Host Country, to implement Components 1-3, as identified and confirmed during Project preparation.

A.21. Executive summary (max. 750 words, approximately 1.5 pages)

The Cooling Facility is proposed as an innovative, multi-sector and multi-country programmatic financing mechanism to help address the key sustainable development challenge of providing access to cooling while minimizing negative climate impacts.

In a warming world, access to cooling – from cold chains and refrigeration to ensure the safety of foods, medicine and vaccines, to space cooling to ensure comfortable, healthy and productive homes, institutions and workplaces – is not a luxury, as over 1 billion people globally are deemed at risk from the lack of it. The need to adapt and build resilience in a rapidly warming climate – together with growing populations, urbanization, and rising disposable income levels in developing countries – are driving the exponentially growing demand for cooling services in many developing countries, which is associated with a projected rapid increase in cooling-related energy demand and greenhouse gas (GHG) emissions. There is a window of opportunity to support access to cooling services while avoiding maladaptation and limiting GHG emissions if we can shift this growing demand toward climate-friendly, passive and low-carbon cooling solutions, thereby creating an opportunity for driving scale, reducing costs and ultimately creating sustainable markets for sustainable cooling. Such actions would contribute to responding urgently to the challenge of climate change, meeting Sustainable Development Goals (SDGs), planning for disaster risk reduction (i.e. from heatwaves) and supporting the goals of the Kigali Amendment.

Developing countries have many competing demands for capital -- it is estimated that only 0.04 percent of total Overseas Development Assistance is directed to cooling solutions[2].-- and the COVID-19 pandemic has further compounded these constraints. The onset of the global pandemic due to COVID-19 and its impact across economies, further heightens the relevance of sustainable cooling solutions, which have a role to play in support of recovery efforts. This is reflected, for example, in the need for proper cooling and ventilation in health (as well as other) facilities, as well as the need for efficient cold chains to safely store vaccines, and to support food value chains from harvest to markets.

In this context, a dedicated Facility for cooling would target addressing the barriers that have so far limited the deployment of clean cooling technologies and also put into place the support for a broader paradigm shift by working across key cooling target areas and with a range of countries from different parts of the developing world to amplify the potential to leverage the experiences and learnings. The Facility seeks to scale and mainstream sustainable cooling applications in a number of key sectors (agriculture, health, buildings), thereby accelerating the deployment of climate-friendly solutions. It will help countries facing risks of extreme heat hazard enhance access to cooling by putting place climate resilient sustainable infrastructure and equipment, thereby contribute to adaptation efforts. At the same time, the Facility also aims to help countries build enabling environments and support investments to scale up access to sustainable cooling with a lower carbon footprint. The Facility is designed to promote passive and low-carbon cooling in a manner that will lead to the improved energy efficiency of buildings, cooling equipment and appliances; enhance access to climate-friendly and heat-resilient cooling solution, as well help strengthen enabling environments for the scale-up of climate friendly cooling solutions. It is expected that the Cooling Facility will also lead to broader development impacts, such as helping lower pressures on already strained energy systems, lowering local air pollution, as well as helping lower losses of food and medicine.

In so doing, the Facility, taking into account the cross-sectoral nature of cooling, the different cooling needs and priorities of countries and the necessity to adapt to different national contexts, hopes to develop and demonstrate implementation and business models and approaches that can be fit-for-purpose in more countries with similar circumstances, and thus provide a foundation to further scale-up access to cooling

[2] Kigali Cooling Efficiency Program (https://www.k-cep.org/why-cooling/)

services and the shift to sustainable cooling investments, supporting mitigation objectives as well as goals of building resilience to increased temperatures, even beyond the scope of this Facility.

The Cooling Facility will support projects[3] that meet the Facility's criteria in the following cooling target areas (in either grid or off grid contexts): (i) space cooling and cool/green surfaces (including passive cooling strategies in the built environment, cooling equipment; building automation and controls, as well as solar and vegetative roofs and walls); and (iii) refrigeration, cold chains and logistics (including refrigeration, storage, and distribution activities, along with associated equipment and logistics).

Components

The Cooling Facility consists of three main components which support activities to be adapted to the needs and specific context of each country that is part of the Facility:

***Component 1 - Policy, regulatory and enabling environment support* (US$15.7 million of GCF grant).** This component will support activities that aim to strengthen institutional, policy and regulatory frameworks, raise awareness and stimulate behavior changes, as well as build the capacity of key stakeholders to plan, finance and implement sustainable cooling investments as well as to plan for responses to increased heatwaves and other extreme events. Enabling activities will include cooling-specific inputs (related to both climate mitigation and adaptation) into the country's Nationally Determined Contributions planning process under the Paris Agreement such as Cooling Action Plans, as well as inputs on national policies and regulations that encourage sustainable cooling. It will also support activities linked to the Facility's Gender Action Plan.

Component 2 - Financing for cooling investments (US$141.3 million of GCF funds, of which $125 million in loan and $16.3 million in grant). The Facility will provide financing to eligible projects for investments that support and help lock-in more resilient, climate-friendly as well as affordable development paths for cooling. Concessional financing will foster the adoption or scale-up the deployment of sustainable cooling technologies, appliances and business models. The deployment of these funds will be tailored to the needs of the projects, through suitable financing modalities for each project's context, for example, credit lines to financial intermediaries, or loans to households, municipalities and small, medium and large enterprises, or subsidies.

Component 3 – Project management (US$0 million of GCF funds). This component will support the Executing Entities (EEs) and Project Implementing Entities (PIEs) in their management, coordination and implementation of their project activities, in compliance with the EEs' and PIEs' contractual obligations included or referred to in the legal agreements entered into with the Accredited Entities (AE).

Facility's impact

The Facility will provide critical support to the transition to sustainable cooling through the mobilization of approximately US$879.8 million in financing (including both GCF and IBRD/IDA). It is expected to avoid or reduce over 9.1 $MtCO_2e$ over the 10-yearimplementation period of the Facility (reduction that would reach 16.2 $MtCO_2e$ over the 27 year lifespan of the Facility's underlying assets), strengthen local capacities, policy and regulatory environments to mainstream and support sustainable cooling, facilitate countries' efforts to meet NDCs, and importantly reach approximately 4.2 million direct beneficiaries across the 4 countries most vulnerable to extreme heat risk hazards.

[3] The Cooling Facility is referred to as a "Program", which supports a number (9) of "projects"

B. PROJECT/PROGRAMME INFORMATION

B.1. Climate context (max. 1000 words, approximately 2 pages)

I. Rising global temperatures, cooling needs and GHG emissions

a. Global perspective

The world is off-track to meet the 1.5°C objective of the Paris agreement. The global demand for cooling resulting from this temperature rise is generating a vicious cycle: as temperatures increase demand for cooling increases. The consequent increases in GHG emissions as a result of increased energy use and refrigerants will further increase temperatures. Population growth, increased urbanization and increased incomes in developing countries – especially in the world's hotter regions that are increasingly susceptible to extreme heatwaves and related weather shocks - further contribute to the projected exponential increase in the demand for cooling and its associated energy consumption and greenhouse gas emissions (GHGs). Worldwide, there are currently an estimated 3.6 billion cooling appliances in use; a figure projected to increase to 9.5 billion by 2050 – and this would not even provide cooling for all who will need it in a warming world (as opposed to only to those who can afford it), which could require in the order of 14 billion cooling appliances (Dreyfus et al 2020).

Greater and rapid access to affordable cooling has become a development necessity. In 2019, the Intergovernmental Panel on Climate Change (IPCC) reported that at 1.5°C of warming, 2.3 billion people could be both exposed and vulnerable to heatwave events – a threshold that could be reached as early as 2030. SEforALL (2020) estimates over 1 billion people in developing countries are already facing immediate risk from lack of access to cooling, which includes 699 million slum dwellers living in hotter-climate urban areas where electricity services do not exist, are intermittent or are too expensive; and about 318 million people living in poor rural areas without access to cold chains for storage and preservation of food and medicine. This situation has implications for the health and well-being of people, food security, productivity and economic development and livelihoods. In terms of health, extreme heat can cause illnesses, including heat cramps, fainting, heat exhaustion heat stroke and even death. In terms of productivity and livelihoods, the International Labour Organization (ILO 2019) estimates the productivity loss due to heat by 2030 to amount to 80 million full time jobs, representing GDP losses averaging 1.5 percent in low income countries and 4 percent in lower-middle income countries – figures that are likely under-estimates as projections assume that the increase in global temperatures by the end of the century will not exceed 1.5ºC. Productivity losses may reach 5 percent by 2030 in the worse affected regions of South Asia and West Africa. The worse affected sectors will be construction and agriculture – which in many countries will disproportionately affect women given their proportionately larger participation in that sector.

The global demand for cooling resulting from this temperature rise – which is trending towards higher than the 1.5ºC target set under the Paris agreement according to multiple reports - is generating a vicious cycle: as temperatures increase, demand for electricity increases to meet the growing cooling needs. The consequent increases in GHG emissions because of increased fossil-fuel driven energy use and high pollutant refrigerants will further increase temperatures. Population growth, increased urbanization and increased incomes in developing countries – especially in the world's hotter regions that are increasingly susceptible to extreme heatwaves and related weather shocks - further contribute to the projected exponential increase in the demand for cooling and its associated energy consumption and GHGs.

b. Sector context

The scale of the cooling challenge is significant across many sectors as illustrated below.

Agriculture and rural development. Higher temperatures contribute to droughts can increase undernourishment through impact on crop yields resulting in malnutrition and affecting food security in many developing countries, where it is estimated that about 45 percent of food spoils mainly due to inadequate cold storage and cold chains. The GHG emissions associated with food loss and waste contribute to about 4.4 GTCO2e per year, representing 8-10 percent of total GHG emissions from 2010 to 2016 (Mbow C., et al 2019)Supply chain disruptions further threaten food security and nutrition of millions of people, are lead to urban centers struggling to access fresh fruits, vegetables, dairy, meat and fish, making the existing gaps felt even more. The FAO (2018) warns that "addressing food loss and waste through cold chain extension without any technology improvement would have serious adverse effects on climate change as a result of increased GHGs". As governments around the world plan to boost local employment, the agriculture and fisheries sectors stand-out; and are also areas where integrating efficient, clean cooling (from efficient building constructions to efficient cooling and refrigeration systems powered with renewable energy) could support low-carbon development.

Health. The health sector is a priority. Hospitals and many health facilities are often open 24 hours a day and require heating, ventilation and air conditioning (HVAC) systems to control room temperature, pressurization, air change rates and humidity in order to mitigate airborne contaminants and provide a healing space for patients while also providing a high level of protection for healthcare personnel. The increased electricity load from hospitals should be met as efficiently as possible to avoid burdening electricity systems and lowering costs for health facilities so they can dedicate scarce resource for treatments. Rural clinics may need to be built and should be done integrating energy efficiency into the design and construction; their increased energy needs for cooling (and other uses) can be met with distributed renewable energy. The availability of sustainable cold chains to safely store and preserve medicine and vaccines– was already inadequate[4] – and becomes more urgent. The global healthcare sector, with its need for temperature control facilities and storage for medicine and vaccines, is estimated to account for about 4.4 percent of net GHG emissions globally (E3G, 2020). A well-functioning cold chain and health system infrastructure is essential; it is also an opportunity to build institutional capacity and sustainability to put countries' health systems on a more sustainable and climate-friendly path with sustainable cooling.

The COVID-19 pandemic has shed light on – and compounded - the pre-pandemic inequities in the health cold chain and the challenges in achieving universal immunization coverage, especially in Africa. It has been estimated that the cost of vaccine lost due to exposure to temperature fluctuations amounts to approximately USD 34 billion annually – a figure that does not include the physical and financial cost associated with avoidable illnesses[5]. The COVID-19 pandemic will have both short– and long- term effects on populations around the world, causing hardship practically everywhere, but with particularly severe risks for the poorest countries and under-resourced communities. COVID-19 will likely have long-lasting impacts on healthcare systems globally, especially in developing countries where health facilities are already lacking in capacity and reach, but also in other sectors and across the economy. It is clear that priorities of countries are shifting. A multi-pronged approach will be needed to respond to the crisis and help address the strains put on health, food, energy, housing, and other systems and plan a recovery. The World Bank Group has been responding aggressively to address these needs, making available up to $160 billion in financing capacity through June 2021, including an envelope of $12 billion for vaccine purchase and deployment[6], which could help cover vaccination for up to 1 billion people, and support strong immunization and health systems, including cold chain infrastructure. This overall $160 billion support is tailored to the health, economic and social shocks countries are facing and includes over $50 billion of IDA resources on grant and highly concessional terms. A

[4] Hinnant and Mednick (2020) estimate that nearly 3 billion live where temperature-controlled vaccine storage is insufficient for an effective COVID-19 immunization campaign.

[5] Peters, T. and B. Hartley (12 November 2020), https://www.seforall.org/news/sustainable-cold-chains-needed-for-equitable-covid-19-vaccine-distribution

[6] World Bank (October 13, 2020), "IBRD and IDA Project Paper on a Proposed Additional Financing to the COVID-19 Strategic Preparedness and Response Program Using the Multiphase Programmatic Approach (Global COVID-19 MPA)" (P173789).

portion of the cooling solutions supported by this Facility will contribute to those efforts, and help "green" the response and recovery.

Refrigerants. About 20 percent of the climate impact comes from the direct emissions of hydrofluorocarbons (HFC) refrigerants.[7] Further, the leakage of refrigerants used are responsible for 15-20 percent of the global warming effect of refrigeration. (Carbon Trust, 2020). This highlights the importance of tackling the energy dimension of cooling across sectors, as efforts to only address the climate impact of refrigerants (under the Montreal Protocol's 2016 Kigali Amendment, countries committed to cut use of HFCs, a potent greenhouse gas widely used as refrigerants, by more than 80 percent over 30 years), would leave out the largest share of the cooling mitigation challenge. The HFC phase down schedule of the Kigali Amendment could avoid up to 0.5°C of warming by 2100. If combined with efforts to maximize energy efficiency in cooling equipment, close to 1°C of global warming can be avoided by the end of the century (G. Dreyfuss et al, 2020).

Buildings. Cooling is the fastest growing end-use in buildings. Forty percent of the world's population resides within the tropics, with dramatically lower access to space cooling in relation to their need – and this figure is projected to grow to 50 percent by 2050[8]. The use of air conditioners and electric fans is becoming increasingly common and already accounts for about a fifth of the total electricity in buildings around the world – or 10 percent of all global electricity consumption (IEA, 2018). Globally, the energy consumption of buildings represents 36 percent of the global final energy demand and almost 40 percent of GHG emissions[9]. The global energy use for space cooling is projected to grow 300% between 2016 and 2050, and by then space cooling could account for 30-50 percent of peak electricity loads, requiring an increase of 2,500 GW to meet that additional demand. Improvements are needed for the existing building stock to become less energy and GHG intensive, and new buildings (keeping in mind that half of the buildings that will be standing in 2060 have not yet been built and the majority of these will be in developing countries) will need to be built with a lower energy and GHG footprint.

Energy. About 80 percent of the climate impact of cooling equipment is associated with energy use (i.e. the indirect CO_2 emissions from fossil-fuel based electricity generation). Much of the use of energy for cooling is driving peak demand which is typically the least efficient and carbon intensive and driving the need for more power plants. In hot countries like India the share of air conditioners (ACs) in peak electricity load could reach 45 percent in 2050, up from 10 percent today. Globally, space cooling-associated emissions from electricity use are set to double by 2050 (even as the grid gets cleaner). In fact, an estimated 2.3 billion people in lower-middle class in developing countries are on the verge of purchasing the most affordable – and also least efficient – ACs. Worldwide, there are currently an estimated 3.6 billion cooling appliances in use; a figure projected to increase to 9.5 billion by 2050 – and this would not even provide cooling for all who will need it in a warming world (as opposed to only to those who can afford it), which could require in the order of 14 billion cooling appliances (Dreyfus et al 2020). Moving to best available technologies would reduce cumulative emissions by 38-60 GtCO2eq by 2030 and up to 130-260 GtCO2eq by 2050.

c. Facility country-specific context

Each of the countries covered by the Facility face the need to adapt to a warming world as they are exposed to risks of extreme heat hazard[10], albeit at different intensity levels, which translates into a growing demand for cooling. For example, Bangladesh[11], Malawi, Somalia, and El Salvador are exposed to a high risk, while

[7] Refrigerants are critical to vapor compression-based equipment used in refrigeration and air conditioning.
[8] ESMAP (2020), Primer for Space Cooling.
[9] Global Alliance for Buildings and Construction (www.globalabc.org).
[10] See the World Bank Global Facility for Disaster Reduction and Recovery (GFDRR)'s *ThinkHazard!* web-based tool (https://thinkhazard.org/en/)
[11] According to SEforALL 2020, Bangladesh ranks among the top 10 countries with urban poor populations at risk from lack of cooling.

the others are facing a medium risk. Table 1 provides a summary of the climate trends and drivers for each of these four high risk countries.

Table 1: Summary of climate trends and drivers for each country at high risk of extreme heat hazard

Country	Historical extreme temperature	Extreme temperature projections (base period 1986-2005)	Cooling degree day (CDD) - linked to temperature projections
Bangladesh	Observed data between 1985 and 1998 indicate an increasing trend in temperatures of about 1°C in May and 0.5°C in November. The seasonal frequency of days with Tmax≥36°C has been showing an increasing trend since 1986 in most parts of Bangladesh, with the highest rate of +1.018 day/year at Mongla. Average temperatures have been increasing more rapidly during the monsoon season, from June to August, as is evident from historical data for the last 30 years (1991-2020). Maximum and minimum temperatures during monsoon season increased by 0.05°C and 0.03°C respectively.	Mean annual temperatures are predicted to increase by about 1.2°C by mid-century, and by 1.9°C by the end of the century compared to the 1986-2005 base period. Compared to the 1986-2005 base period, the total number of hot days in a year where the daily maximum temperature is above 35°C will rise by 13.23 by 2039, and by 41.11days by 2099. The probability of heat waves, defined as a period of three or more days where average temperature is above 95th percentile, will grow by 5% in 2040-2059, and by 9% between 2080-2099 compared to 1986-2005 base period.	Projected change in annual cooling degree days is projected to rise from 482 CDD between 2020-2039 to 778 CDD between 2040 and 2059 and 1210 CDD by the end of the century.
El Salvador	One of the most climate affected countries in the world. El Salvador experienced a sustained increase in monthly temperature over the last 30 years. The summer months of April to August have witnessed consistent increase in temperature. The average temperature recorded in April 2020 was 27.9 ºC which exceeded the average April temperature of 1986-2005 (26.6 ºC) by 1.3ºC Since, 1950s, the temperature increased on average by 1.3°C compared with the global average of 0.8°C.	Mean annual temperature will rise by 1.24°C in 2050. The projected change in the annual probability of heatwaves in El Salvador will grow by 19% by 2040-59, 25% by 2060-79 (compared to 8% between 2020-2039). The projected change in hot days (Tmax>35°C) will increase by 14.49 days by 2059, and 36.12 days by the end of the century.	Projected change in annual cooling degrees is projected to rise to 946.81 CDD by 2050 and 1370.68CDD by the end of the century (compared to 578.98 CDD in 2020-2039 period).

Malawi	Between 1960 and 2006, mean annual temperature increased by 0.9°C, with an average increase of 0.21°C per decade. Climate trends over this period show the total number of hot days in a year have increased by 30 days.	Mean annual temperature will rise by 1.58°C in 2040-2059 and 2.16°C by the end of the century. The number of days where the daily maximum temperature exceeds 35°C will increase by about 21 days by 2059 relative to the period 1986-2005, and by 32 days by the end of the 21st century.	Projected change in annual cooling degree days is projected to rise by 1,154 CDD between 2040 and 2059, and 1317 CDD by the end of the century.
Somalia	Between 1960 and 2020, mean annual temperature increased by about 0.5°C in the hottest months (April and May) and 0.3°C in the coldest months (January and December).	Mean annual temperature is projected to increase by 1.3°C by mid-century and 1.7°C by the end of the century, with the number of hot days (Tmax>35°C) in a year expected to increase by 70 days.	Annual cooling degree days are projected to rise by 836 CDD between 2040 to 2059, and 1182 CDD by end of the century.

The rationale for climate change adaptation of the countries at high risk extreme heat hazard is presented below.

Bangladesh. Bangladesh is highly exposed to extreme heat, drought, and wildfires. Extreme heat hazard is classified as high throughout the country, which indicates that prolonged exposure to extreme heat, resulting in heat stress, is expected to occur at least once in the next five years[12]. The seasonal frequency of days with Tmax ≥ 36°C has been on an increase since 1986 in most parts of Bangladesh, as highlighted in Table 1. Average temperatures have been increasing more rapidly during the monsoon season from June to August, according to historical data for the last 30 years (1991-2020). The increment in temperature has been consistent in the last 5 years alone. Looking into the future, extreme temperatures are expected to occur with high frequency, duration, or severity. Mean annual temperatures are predicted to increase by about 1.2°C by mid-century, and by 1.9°C by the end of the century, with warming more likely pronounced during winter months from December to February. Most notably, the total number of hot days in a year (where daily maximum temperature is above 35°C) is projected to increase by 13.23 days by 2039, 22.27 by 2040-59, and by 41.11 days by 2099. By mid-century, annual cooling degree days (CDD) are projected to rise from 482 CDD (202-2039) to about 778 CDD by 2059 , and 1210 by the end of the century . Overall, this will impact the energy sector as any time the temperature rises above 18.3°C, there is an expected increase in power demand for cooling[13]. Without decarbonization efforts, this could result in significant increases in GHG given high share of fossil fuel in the power generation mix.

On average, Bangladesh is affected by a major country-wide drought every five years. There have been 19 major droughts between 1960 and 1991 that have affected around 53% of the population and 47% of the country[14]. Seasonal drought events commonly occur throughout the country, mostly in the relatively drier northwestern region. Climate change is projected to exacerbate drought conditions in Bangladesh, especially

[12] *ThinkHazard!* – Bangladesh https://thinkhazard.org/en/report/23-bangladesh/EH
[13] Climate Change Knowledge Portal: Bangladesh – Climate Data: Historical and Projections https://climateknowledgeportal.worldbank.org/country/bangladesh
[14] Climate Policy Institute: https://www.climateemergencyinstitute.com/uploads/M__Drought_in_Bangladesh_and_its_adaptive_measures.pdf

in the northwestern parts. Areas of the country that currently experience moderate droughts will likely turn into severely drought-prone areas in the next 20-30 years[15]. This can put significant stress on the energy system as it is likely to increase energy demand while decreasing energy supply reliability. With higher aridity, wildfires are also expected to be a prevalent risk in Bangladesh. Wildfire hazard is classified as high in the country. This means that there is greater than 50% chance of encountering weather that could support a significant wildfire that is likely to result in both life and property loss in any given year. Climate projections identify a likely increase in the frequency of fire weather occurrence, including an increase in temperature and greater variance in rainfall. In particular, the fire season is likely to increase in duration with greater number of days with weather that supports fire spread and longer periods without rain during fire seasons. Projections also indicate that there could be an increase in the severity of fire, and even areas that are not currently at risk of wildfire hazard could see an increase due to an expansion of the wildfire hazard zone.

These changes in climate will only lead to increase in energy demand for both space cooling and cold storage. This increase will be on top of energy demand growth driven by increasing urbanization and rise in income levels. Thermally efficient design and construction and passive measures that limit heat entering into the building, efficient air conditioning and ventilation will be needed, especially to protect vulnerable segments of the population, such as children, the elderly and the sick during hot days and heatwaves. Furthermore, various economic and social sectors will rely more on cooling solutions as adaptation mechanisms as temperatures increase across regions. Therefore, the Facility will support investments in sustainable cooling solutions as essential adaptation measures delivered through low-carbon efficient solutions.

El Salvador. El Salvador is highly exposed to extreme heat, hurricanes, droughts, and wildfires. Extreme heat hazard is classified as high throughout the country, which indicates that prolonged exposure to extreme heat, resulting in heat stress, is expected to occur at least once in the next five years[16]. Historical trends suggest that the temperature increase in El Salvador has been more pronounced than in other parts of the world, with the temperature increase since 1950s of 1.3°C compared to 0.8°C globally[17]. El Salvador experienced a sustained increase in monthly temperature over the last 30 years (1991-2020). In particular, the summer months(i.e., April to August) have witnessed consistent increase in temperature. The average temperature recorded in April 2020 was 27.9 ºC which exceeded the average April temperature of 1986-2005 (26.6 ºC) by 1.3ºC. Looking into future, mean annual temperature is projected to increase by 1.24°C by 2059. Most notably, the number of days where the daily maximum temperature exceeds 35°C will increase by 36.12 days by the end of the 21st century, and the probability of heat waves will increase by 30% by 2100. The annual cooling degree days are projected to rise by 46.81 CDD by 2050, and 1370.68 CDD by the end of the century[18].

El Salvador is situated in the dry corridor of Central America, and prolonged dry periods often result in significant economic losses. More than 10,000km^2 of land area in El Salvador is likely to be regularly affected by severe, moderate, or weak droughts[19]. The probability of severe drought will grow by 36% by 2059, compared to 1986-2005[20]. Droughts can put significant stress on the energy system as they increase energy demand while decreasing energy supply reliability (which have a detrimental impact on key health services and vaccine safety). Additionally, the annual precipitation is predicted to decrease by -65.33mm by 2059.

[15] GFDRR: https://climateknowledgeportal.worldbank.org/sites/default/files/2018-10/wb_gfdrr_climate_change_country_profile_for_BGD.pdf
[16] Think Hazard – El Salvador: https://thinkhazard.org/en/report/75-el-salvador
[17] Climate & Development Knowledge Network: https://cdkn.org/project/planning-around-temperature-increases-san-salvador/?loclang=en_gb
[18] Climate Change Knowledge Portal: El Salvador – Climate Data, Historical and Projections: https://climateknowledgeportal.worldbank.org/country/el-salvador/climate-data-projections
[19] The CGIAR Research Program on Climate Change, Agriculture and Food Security: https://ccafs.cgiar.org/regions/latin-america/el-salvador
[20] Climate Change Knowledge Portal: El Salvador – Climate Data: Historical and Projections

Similar to other countries in Central America, El Salvador has seen a steady increase in the intensity and frequency of extreme weather events and storms in the last 30 years. Due to its social and economic vulnerability, economic assets and infrastructure in El Salvador are at a high risk of damage from hurricanes. Annual average loss from hurricanes is estimated at US$2.9million (0.01% of GDP) and the probable maximum loss at US$ 374million (1.5% of GDP)[21]. Adding to that, the frequency and intensity of hurricanes and extreme weather events is likely to increase in the future. Wildfire hazard is classified as high in the country. This means that there is greater than 50% chance of encountering weather that could support a significant wildfire that is likely to result in both life and property loss in any given year. Warming climate, rising sea level rise, combined with the increasing unpredictability of the EL Niño Southern Oscillation's patterns, will likely put additional stress on the country's energy system, especially considering that ~35% of El Salvador's energy supply comes from hydropower energy[22] that might be impacted by droughts and decrease in annual precipitation.

These changes in climate will only lead to a significant increase in demand for both space cooling and cold storage. This increase will be on top of energy demand growth driven by increasing urbanization and rise in income levels. Efficient air conditioning and ventilation will be needed, in particular to protect vulnerable segments of the population, such as children, the elderly and the sick during hot days and heatwaves. Further, in health facilities, for example, adaptation mechanisms such as adequate cooling and ventilation will be needed to create the ambient temperature ranges for optimal functionality and to safely preserve medications and vaccines. This will be another factor contributing to increasing energy demand. The impacts of increased demand will be exacerbated by the supply variability from hydropower as a result of droughts and decrease in annual precipitation thus putting additional stress on the power system.

Therefore, the investments in sustainable cooling solutions supported by the Facility will not only help adapt to extreme temperature hazard on the demand side (for space cooling and cold chains), but also help reduce system stress due to hydropower variability, which will help safeguard the efficacy of vaccines and medecines, as well as essential medical services necessary for the health and well being of the population.

Malawi. Malawi is prone to adverse climate hazards including extreme temperatures, dry spells, seasonal droughts, intense rainfall, and flash floods. Extreme heat hazard is classified as medium to high risk throughout the country, which indicates that prolonged exposure to extreme heat that results in heat stress is likely to occur at least once in the next five years[23]. The southern region is particularly highly exposed to extreme temperatures and heat stress. Between 1960 and 2006, mean annual temperature increased by 0.9°C, with an average increase of 0.21°C per decade. Climate trends over this period show that average temperatures are increasing more rapidly during the rainy summer season (i.e., December to January), and the total number of hot days in a year has increased by 30 days. As climate change intensifies, **mean annual temperature will rise by 1.58°C (1.38°C to 1.96°C) in 2040-2059.** By mid-century, annual cooling degree days are projected to rise by 953 CDD, with the number of hot days in a year expected to increase by about 21days[24]. This can significantly impact the energy sector as any time the temperature rises above 18°C, there is an expected increase in power demand for cooling.

[21] GFDRR: El Salvador, Earthquake and Hurricane Profile https://www.gfdrr.org/sites/default/files/El%20Salvador1.pdf

[22] IRENA: Renewables Readiness Assessment, El Salvador https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Dec/IRENA_RRA_El_Salvador_2020.pdf

[23] *ThinkHazard! – Malawi https://thinkhazard.org/en/report/23-bangladesh/EH*

[24] Climate Change Knowledge Portal: Malawi – Climate Data: Historical and Projections https://climateknowledgeportal.worldbank.org/country/malawi/climate-data-projections

Beyond extreme temperatures, droughts and floods are two of the most severe of climate hazards in Malawi, which have only increased in frequency and severity over the past twenty years. On average, 1.5 million people are affected by water scarcity every year, mainly in the central and southern parts of the country[25], and close to 6 million people were affected by drought between 1985 and 2018. This is especially important for Malawi, where about half of the population lives below the national poverty line, as severe droughts (1-in-25-year drought) can increase the poverty rate by 17 percentage points (roughly an additional 2.1 million people falling below the poverty line)[26]. Drought conditions are a significant risk to the country's energy supply as 70% of generation capacity comes from hydro, as well as to agriculture production – a key economic sector in the country. Such conditions are worsened by extreme temperatures and wildfires. Even when looking at the next few decades, wildfire hazard is projected to continue to be a high risk throughout the country given that in any given year, there is greater than a 50% chance of encountering weather that could support a significant wildfire[27]. Extreme heat events will likely put additional stress on the country's energy system, especially considering that majority of of Malawi's energy supply comes from hydropower that might be impacted by droughts and decrease in annual precipitation. At the same time, the agriculture sector will need to adapt to a warming and changing climate which is reducing yields and impacting livelihoods.

These changes in climate will have a negative impact on many economic sectors, and agriculture in particular – affecting food security and livelihoods. The changes will also lead to a significant increase in demand for both space cooling and cold storage. This increase will be on top of energy demand growth driven by efforts to achieve higher access rates. Specifically, in the agriculture sector – which employs a very large share of the working population and is vulnerable to external shocks, particularly climatic shocks[28], adaptation mechanisms such as proper cold storage for optimal functionality and to preserve perishable agricultural products will be critical for farmers and for avoiding food security problems. This will be another factor contributing to increasing energy demand with rising temperatures and increased extreme heat events. The impacts of increased demand will be exacerbated by the impact of potential supply decrease from hydropower as a result of droughts and decrease in annual precipitation thus putting additional stress on the power system, in a country where there are significant energy shortages.

As the agriculture sector is both one of the most vulnerable to climate change and one of the largest contributors of GHG emissions in the country, facilitating the deployment of climate-friendly (including energy efficient, low GWP refrigerants, use of solar energy) cooling technologies would contribute to achieving a low-carbon and climate-resilient economy. The support provided through the Cooling Facility will not only help adapt to extreme temperature hazard on the cold chains for the agriculture sector but also help increase agricultural productivity, reduce power system stress due to hydropower variability and avoid the use of diesel.

Somalia. Somalia is generally arid and semi-arid with two seasonal rainfall seasons. The country's climate is influenced by the Inter-Tropical Convergence Zone (ITCZ), monsoonal winds and ocean currents, jet-streams, and conditions of the neighboring Indian Ocean and Red Sea. Mean annual temperatures was about 27°C in the period between 1901-2016, with June to September being the hottest months in the north and December to March hottest in the south. Between 1960 and 2020, mean annual temperature increased by about 0.5°C in the hottest months (April and May) and 0.3°C in the coldest months (January and December). By mid-century, mean annual temperature is projected to increase by 1.3°C and by around 1.7°C by the end of the

[25] GFDRR: https://www.gfdrr.org/sites/default/files/publication/malawi_low.pdf
[26] Climate Change Knowledge Portal: Malawi – Vulnerability https://climateknowledgeportal.worldbank.org/country/malawi/vulnerability
[27] *ThinkHazard! – Malawi https://thinkhazard.org/en/report/23-bangladesh/EH*
[28] See https://www.worldbank.org/en/country/malawi/overview

century across all areas of Somalia[29]. In addition, the El Niño Southern Oscillation (ENSO) influences Somalia's climate variability in several ways, bringing more rainfall and flooding during El Niño and droughts in La Niña years[30]. Majority of Somalia is at risk of several natural hazards, including extreme heat, drought, floods, and cyclones due to these factors that affect the level of temperature and precipitation in the land. For example, extreme heat hazard risk is considered high, with prolonged exposure to extreme heat that results in heat stress expected to occur at least once in the next five years[31]. The number of days where the daily maximum temperature exceeds 35°C will increase by about 70 days by 2059 relative to the period 1986-2005, and by 93 days by the end of the 21st century. Annual cooling degree days are expected to rise by more than 836 CDD between 2040 to 2059, and by 1182 CDD by the end of the century. This significant increase in temperatures will impact the energy sector as there will be higher power demand for cooling.

Beyond extreme temperatures, droughts and floods pose the most severe hazards to the country. According to Somalia's National Adaptation Program of Action, the country has endured multiple, severe drought episodes since 1965. Somalia experienced a severe drought event in 2011, which resulted in 258,000 deaths in the country and affected 13 million people throughout the Horn of Africa between October 2010 and April 2012. Continued increases in temperature could have vast impacts on the Somali population, livestock, and crop yields. Heat stress could also alter livestock's feed intake, health, mortality rates, agricultural production, and thus the country's overall economic growth.

These changes in climate will only lead to a significant increase in demand for both space cooling and cold storage. This increase will be on top of energy demand growth driven by increasing urbanization and rise in income levels. Efficient air conditioning and ventilation will be needed, especially to protect vulnerable segments of the population, such as children, the elderly and the sick during hot days and heatwaves. Further, in health facilities, for example, adaptation mechanisms such as proper cooling and ventilation will be needed to create the ambient temperature ranges for optimal functionality, ensure safe and healthy indoor environments, and to preserve medications and vaccines. This will be another factor contributing to increasing energy demand with rising temperatures and increased extreme heat events.

In summary, there is an opportunity to set the course for affordable and sustainable cooling pathways now. The proposed cooling-related investments in the Facility's Somalia project will help improve the quality of health infrastructure and services, while also limiting operational costs which is key in the context of the health ministry's depleted budget. The investments in sustainable cooling systems supported by the Cooling Facility will not only help enhance the health system's resilience and adaptation to extreme temperature hazard on the demand side (for space cooling and cold chains), but also make it more sustainable and help improve health outcomes in the country's population by making available medicine and vaccines longer to more people.

II. Cooling Facility strategic approach

The wide range of cooling needs and priorities implies an equally diverse set of challenges and solutions. Many issues are also country and context specific. There is no one-size-fits-all solution or approach.
Given the nascent and still early stage focus on cooling (globally) to address for both development and climate reasons, the Cooling Facility seeks to cater to different contexts – geographic, socio-economic and including within countries' efforts and priorities to respond to the COVID crisis. In fact, it is hoped that the diversity of the selected countries in the Facility will provide pioneering examples for mitigation and adaptation activities related to cooling in different contexts. The Facility aims to support different approaches and generate lessons that can then be adapted and scaled more broadly to enhance access to affordable cooling while at same time

[29] Climate Change Knowledge Portal: Somalia – Climate Data: Historical and Projections: https://climateknowledgeportal.worldbank.org/country/somalia/climate-data-projections
[30] Somalia National Adaptation Programme of Action to Climate Change: https://unfccc.int/resource/docs/napa/som01.pdf
[31] Think Hazard – Somalia https://thinkhazard.org/en/report/226-somalia/EH

kick start a transformation towards more sustainable cooling, offering examples to be emulated and adapted in countries beyond the scope of the Facility. Operationally, the nature of cooling needs is such that often interventions will consist of projects within larger country programs; this is particularly likely for measures to address cold chain issues in health, food security, and labor productivity, for example (e.g., the sustainable cold chain investments will typically be a part of a broader projects targeting support to a country's health sector).

Where growing cooling demand is creating pressures on country energy systems and upward pressures on GHG emissions, the priority is to support space cooling, both in terms of passive measures (such as building design and high efficiency thermal envelopes) and energy efficient cooling equipment and systems (this is the case for Bangladesh[32], Sri Lanka, Panama, North Macedonia). In agriculture-dominant economies with needs to expand access cooling to rural and off-grid areas, the priority is to support efficient and climate friendly cold chain (as through the Facility's support to Malawi and Kenya).

In hot climate countries, ensuring health infrastructure is adequate for patients and storage of pharmaceuticals is a priority, as pharmaceuticals expire and become ineffective more quickly in hot climatic conditions. Efficient and solar-powered cold chain and health facilities can expand quality health services and ensure safe storage of vaccines while making them more resilient to warmer temperatures, in addition to keeping their carbon footprint low (e.g. Somalia, Sao Tome and Principe and El Salvador).

Overall, the Cooling Facility is aligned and supports countries' climate change goals and ambitions, as reflected in their respective climate change Nationally Determined Contributions (NDCs).

III. Related interventions / programs

The Cooling Facility draws on and coordinates with other initiatives and programs[33] related to cooling, which are funded through other financiers but are not part of the Funded Activities.

The ESMAP[34] Efficient, Clean Cooling program (ECCP) is a multi-sectoral technical assistance (TA) program dedicated to cooling implemented in collaboration with the World Bank's Montreal Protocol unit (housed within the Bank's Environment, Natural Resources and Blue Economy Global Practice). It was established in 2019 with seed funding from the philanthropic Kigali Cooling Efficiency Program (K-CEP), with the aim of kick-starting a new business line within the WBG by supporting the design and inclusion of efficient, clean cooling components or characteristics in WBG country engagements, lending and investments, as well as activities to raise awareness and disseminate knowledge. The ECCP also seeks to develop strategic partnerships within and outside the WBG and help mobilize funding. Under ESMAP's new business plan for FY21-24, the Efficient Clean Cooling TA Program is proposed to be sustained and scaled up, including to support project preparation activities and develop a pipeline of projects across the World Bank's Global Practices. The ESMAP Efficient Clean Cooling TA program will also support knowledge exchange events and the development of knowledge products (e.g. case studies) to share experiences and lessons from World Bank projects, including from those supported by the Facility – both among the beneficiaries of the projects and other key national and international

[32] Bangladesh also ranks among the top 10 countries with lower-middle income populations on the brink of purchasing the most affordable air conditioner or refrigerator – and least energy efficient – on the market, causing increased energy demand (along with GHG emissions) that will further strain the country's energy system.

[33] The listed programs and initiatives, while having the potential to strengthen project's impact and producing analytical and knowledge products which will inform project design, are not part of the Cooling Facility nor the projects supported by the Facility.

[34] For more information on the World Bank Energy Sector Management Assistance Program (ESMAP), a global technical assistance and knowledge program administered by the World Bank (housed within the Bank's Energy and Extractives Global Practice), see www.esmap.org.

stakeholders, as well as with other countries– to help raise awareness and inform further scaling-up of sustainable cooling more broadly.

The Climate Investment Funds (CIF). The Cooling Facility builds on synergies with the CIF, a multi-donor fund administered by the World Bank. For example, CIF funding could address the barriers to the deployment of standalone-solar technologies in general, while the Cooling Facility would focus on cooling solutions for productive uses. The Cooling Facility will continue to identify and leverage partnerships with the CIF to enhance its development impact.

The Bank's Energy Leap proposal for Africa[35] seeks to help reach universal energy access by 2030. It specifically aims to promote conditions for increased use of productive efficient refrigeration and cooling electric appliances for households, micro, small and medium enterprises (MSME), and agriculture sector to help boost both household income and energy demand – and in doing so help strengthen the business case for electrification and provide households access to welfare-enhancing appliances.

The ESMAP Gender and Energy Program is helping to strengthen women's roles as consumers, employees, and entrepreneurs in the energy sector. Aligned with the WBG Gender Strategy (FY16-23), the program works with countries to generate crucial knowledge of actions and design interventions needed to close gender gaps in the sector and improve development outcomes. The ESMAP Gender and Energy program will provide support to identify, assess and suggest options to respond to specific gender issues in the context of cooling-informed projects, including in new areas, such as women in energy leadership and productive uses of energy.

B.2. Theory of change (max. 1000 words, approximately 2 pages plus diagram)

The theory of change diagram (Figure 1) presents the logical underpinning of the Facility.

There are multiple barriers and risks to the scale-up deployment of climate-friendly cooling solutions. The first barrier, i.e. lack of regulatory/policy framework for sustainable cooling system along with limited institutional capacity to design, implement, monitor, and enforce cooling standards, is a fundamental hurdle to address to foster a transformational change in the cooling sector. However, the extent to which market transformation can be sustained relies particularly on changes to people's behavior whether that means changes in consumption patterns or in approaches to meet their cooling needs. Low demand for sustainable cooling usually hampers market development. Addressing the barriers related to the lack of public awareness of the benefits of climate-friendly cooling, and the absence of suitable business models and market mechanisms becomes critical to stimulate the demand.

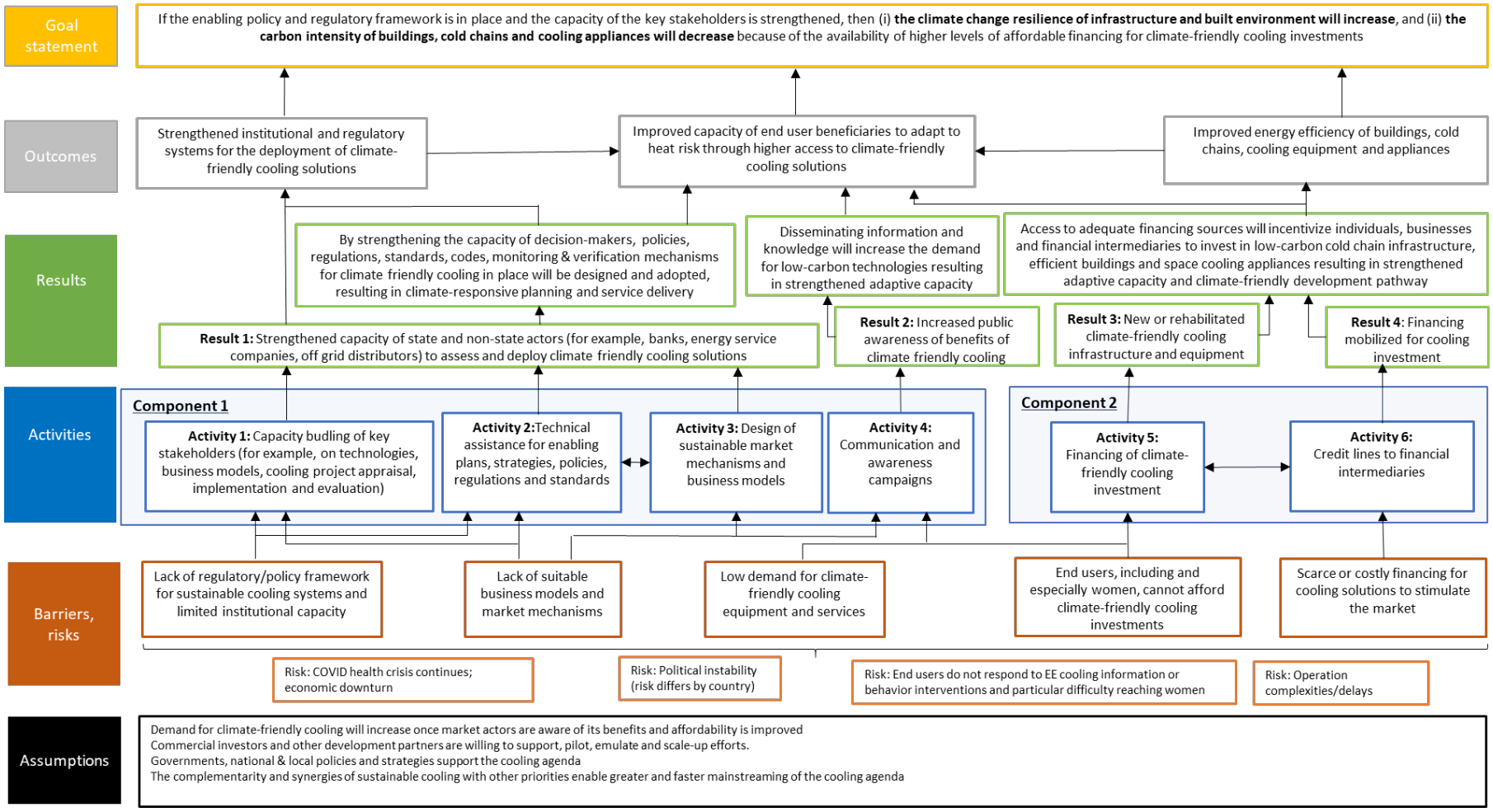
Meeting the demand for climate-friendly cooling solutions requires access to sufficient and affordable sources of financing. Gaps in financing for investments in energy efficient buildings and efficient and climate friendly equipment have been highlighted by the IEA, SEforALL and others. According to the NGO CLASP (Collaborative Labelling and Appliance Standards), consumer affordability is the most significant constraint for growth of demand for off-grid appliances**.** On the demand side, consumers cannot afford the retail price of an off-grid appliance without upfront financing. On the supply side, producers and retailers struggle to lower the retail price due to high distribution costs. Access to finance for consumers, product innovators, and distributors will be critical to achieving scale

In this context, the Facility will support activities that address and help remove regulatory/policy-related, institutional, market and behavioral barriers to the development of sustainable cooling investments by (i) providing technical assistance and building the capacity of state and non-state actors (such as commercial banks, private investors and technical companies, end user beneficiaries), (ii) supporting the design of sustainable implementation mechanisms and business models; (iii) increasing end user awareness of the benefits of low-carbon cooling solutions, (iv) facilitating access to affordable sources of financing; and v)

[35] The Africa Energy Access Leap is a program proposing a WBG global effort to help reach universal access to modern energy, aiming to achieve SDG7 ("Access to affordable, reliable, sustainable and modern energy for all") by 2030. The proposal is currently under development.

provide credit lines to financial intermediaries. In turn, these activities will strengthen the capacity of key stakeholders, stimulate the demand for climate-friendly cooling solutions, foster the penetration of climate-friendly equipment and infrastructure and mobilize capital from public and private sources. These interventions will strengthen institutional and regulatory systems, improve access to cooling, improve the adaptive capacity of end user beneficiaries to respond to rising temperatures, as well as the energy efficiency of cooling buildings and cooling infrastructure. Ultimately, the climate change resilience of built infrastructure will increase, while the carbon intensity of buildings, cold chains and cooling appliances decreases. The Facility seeks to provide pioneering examples of countries, cooling sectors, approaches and technologies and measures that can be scaled up including in other countries, beyond the Facility, that are facing similar situations and opportunities. It is indeed hoped that other countries may emulate or adapt the Facility's experience and lessons to their own circumstances to enhance access to cooling services which is critical to building resilience in a warming world while breaking the vicious circle of rapidly increasing emissions that is projected to be associated with meeting cooling needs. At a time when there are many pressing demands on developing country governments' priorities and budgets, including responding to the global COVID-19 pandemic that has left no country untouched, the Facility opts for a pragmatic approach, seeking to take advantage of available entry points that build on synergies between sustainable cooling and other sector and development priorities to trigger the changes that need to be put in place and lead, over time, to broader mainstreaming of sustainable cooling among the priorities of target countries. Building on these synergies between priorities, identifying the counterpart(s) in target countries that can become champions of sustainable cooling and the ability to stimulate interest and generate results to build confidence in sustainable cooling solutions will be key factors to ensure success, The Program is designed in full awareness of the barriers and particular risks that may affect the successful implementation of the Facility's project, including (i) hard to predict disruptions due to the COVID-19 pandemic and its impact; (ii) as well as political instabilities, and (iii) risks associated with potential operational delays, and (iv) end-users not responding as anticipated to information and interventions highlighting the benefits of energy efficient and climate friendly cooling.

Figure 1: Cooling Facility Theory of Change



B.3. Programme description (max. 2000 words, approximately 4 pages)

I. Objectives and goals

The World Bank's proposed Cooling Facility is a multi-sector, multi-country financing mechanism as part of its efforts to support countries to mainstream and bring to scale sustainable cooling solutions across key sectors. It aims to support the eligible countries to:

- Mobilize additional financing to support transition and market transformation in support of the most climate friendly means of meeting cooling needs;
- Enhance access to energy efficient and climate friendly cooling services;
- Strengthen enabling environments to catalyze a demand for sustainable cooling solutions;
- Raise public awareness of the benefits, financial viabilities and positive impacts that result from investments and public programs to promote sustainable cooling;
- Build and strengthen skills and capacity among the range of stakeholders involved in the deployment and scale-up of sustainable cooling solutions; and
- Integrate and mainstream cooling into both long-term climate planning for mitigation and adaptation and Sendai framework disaster risk reduction (DRR)[36] planning, and support the achievement of the Kigali Amendment Goals.

In doing so, the Facility will (i) increase access to cooling, contributing to multiple Sustainable Development Goals; (ii) mitigate the climate impacts of meeting the projected increased cooling demand; (iii) promote interest and support for innovative means of providing cooling services; and also (iv) contribute to improving climate change resilience, contributing to countries' Nationally Determined Contributions (NDCs), as well as National Adaptation Plans and Disaster Risk Reduction Plans, while also delivering a wide range of co-benefits including those related to health, economic impacts, and development of nature-based solutions (NBS). Recognizing the magnitude of financial needs, the proposed Facility is the first phase, which will expand to be the basis for substantial scaling and replication to follow.

To achieve this goal, the Facility will channel concessional climate finance from the GCF to co-finance IBRD- and IDA-financed operations that:

- support ***investments*** in efficient, affordable and sustainable cooling;
- catalyze technology, financial and business model ***innovations*** across cooling value chains and sectors to reduce barriers for private sector investment;
- help build an **enabling environment** for sustained, long-term systemic changes.
- Support the integration of sustainable cooling into long-term plans to address climate change, DRR and SDGs.

At country level, the Facility development objectives will be adapted to reflect the specific needs and priorities of countries and thereby to align the objectives and impacts of the investments.

Figure 2 provides an overview of the Cooling Facility's overall framework, including its goals to contribute to the transformation of the cooling sector through policy, regulatory and enabling environment support that would help mainstream sustainable cooling into countries' overall development and climate change strategies, its key cooling target areas, (i.e., (i) space cooling[37] and cool/green surfaces; as well as (ii) refrigeration, cold

[36] The Sendai Framework for Disaster Risk Reduction 2015-2030 provides Member States with concrete actions to protect development gains from the risk of disaster, including heatwaves.

[37] "Space cooling", also referred to as "comfort cooling", refers to the means by which people are provided thermal comfort from heat by maintaining the optimum temperature, humidity, and ventilation within the built environment (See ESMAP 2020, *Primer on Space Cooling*). See below for more details.

chains and logistics, along with its proposed approach enabled by GCF concessional climate finance. It is important to note that the Facility's two cooling target areas could be implemented in on-grid as well as off-grid contexts.[38]

Figure 2: Overview of the Cooling Facility

Space Cooling and cool/green solutions. "Space cooling[39]" refers to the means by which people are provided thermal comfort from heat by maintaining the optimum temperature, humidity, and ventilation within the built environment. Space Cooling includes (i) passive cooling strategies and measures to reduce or avoid building cooling loads (energy efficient building construction and design, including building thermal insulation and ventilation); (ii) equipment used to achieved required amount of cooling (e.g. fans, air conditioning, and centralized cooling systems); and (iii) building automation, controls and good operation and maintenance practices. Cool surfaces[40] are solar reflective roofs and walls; while green surfaces refer to vegetative roofs and walls (also referred to as nature-based solutions).

Space cooling projects may (i) improve the thermal efficiency of buildings (to reduce or avoid cooling loads), (ii) improve the energy efficiency of cooling equipment and appliance, (iii) use low GWP refrigerants available in the local market, in line with the goals and requirements of the Kigali Amendment; and may also (iv) further lower the emissions associated with cooling with the installation of clean energy (mainly solar) supply.

Space cooling projects may target greenfield investments or refurbishments in different sectors, i.e., public (including health facilities, education, and administrative buildings), residential- (multi-family and single family), commercial or industrial.

[38] For example, off grid cooling appliances could be deployed in the context of broader energy access programs, e.g. the deployment of efficient off-grid cooling technologies (refrigeration and cooling, including fans) in homes, farms, rural schools and health facilities. Such deployment may be in the context of productive uses of electricity, which are typically diverse applications across agricultural, commercial, industrial and public sectors as a direct input to the production of goods or provision of services that enable or enhance income generation.

[39] See ESMAP 2020 *Space Cooling Primer* (https://www.esmap.org/primer-for-space-cooling-report)
[40] See ESMAP and Global Platform for Sustainable Cities 2020 *Primer for Cool Cities: Reducing Excessive Urban Heat* (https://www.esmap.org/primer-for-cool-citiesreducing-excessive-urban-heat

Refrigeration, cold chain and logistics

Refrigeration and cold chain refer to managing the temperature (at specified low-temperature range) of perishable products in order to maintain quality and safety from the point of origin through the distribution chain to the final consumer[41]. Refrigeration has many applications, including household refrigerators, industrial freezers. A cold chain includes refrigeration, storage and distribution activities, along with associated equipment and logistics. The projects may target energy efficient refrigeration equipment and facilities in residential, public, commercial and industrial sectors.

For the health cold chain, projects may target the different components of cold chains, i.e., national and regional facilities and cold stores, as well as district-level stores and local clinics and vaccination outreach. The projects may include efficient, clean built infrastructure (e.g., walk-in refrigerators and freezers) and cold storage equipment (e.g., refrigerators and freezers, as well as passive cooling solutions).

Similarly, for food cold chains (e.g., in agriculture and fisheries sectors), projects may include efficient, clean cold chain equipment linked efficient, clean build infrastructures (e.g. refrigerated warehouses, hubs, and packhouses) and cold storage equipment (e.g., refrigerators and freezers).

Projects may include the solarization of the cold chain (built infrastructure and cold storage equipment). Project may also include digital devices and to monitor and track temperature and performance of the equipment, as well as logistics planning systems to enhance overall efficiency of the cold chain. An eligible project under the Cooling Facility may involve the replacement of existing equipment or refurbishment of existing facilities or target new equipment and facilities.

II. Program components

The Cooling Facility is composed of three complementary components that will be adapted to each eligible country's context and focus cooling area, and will be calibrated according to its needs and in accordance to the Facility's criteria. The Facility's components are structured to help countries address the barriers to sustainable cooling by (i) helping address the upfront cost and financing barriers, along with (ii) supporting measures that help build an enabling foundation to enable and sustain sustainable cooling through activities such as informing policy and regulatory frameworks, reaching out to stakeholders through effective communication and supporting training and capacity building. (the last component – not funded with GCF resources is for project management – essential for effective implementation). Subject to receiving World Bank corporate approval in due time, the projects supported by the Facility will be co-financed by IBRD/IDA. The indicative total co-financing amounts to $722.8 million.

Component 1 - Policy, regulatory and enabling environment support[42] **(US$15.7 million in GCF grant).** This component will support activities that aim to strengthen institutional, policy and regulatory frameworks, support program design and roll-out, raise awareness and stimulate behavior changes, as well as build the capacity of key stakeholders. These are critical to help address some of the key barriers and market failures to a systematic shift towards sustainable cooling. Indeed, support provided through Component 2 seeks to support countries address fundamental market and non-market barriers to sustainable cooling, including lack of awareness, lack of transparency (about the cost savings and benefits of energy efficient buildings, cooling and refrigeration appliances and equipment, as well as nature-based solutions and energy efficient cold chains), the first-cost bias, mis-aligned policies and incentives and the capacity gaps. A key feature will be support for developing an enabling environment that can support the effective implementation of sustainable cooling investments, mainstream sustainable cooling policies and actions, and sustain the development of regional, national or local industry and services in the relevant sectors, while ensuring alignment with the Kigali Amendment.

[41] Global Cold Chain Alliance website: https://www.gcca.org/about/about-cold-chain
[42] ESMAP Efficient Clean Cooling technical assistance program would finance upstream activities and ultimately help identify potential investment opportunities, including for the Facility.

Activities relevant to the eligible cooling areas supported under Component 1 may include, for instance, (i) capacity building of key stakeholders (for example, on technologies; business models; cooling project appraisal, implementation and evaluation); (ii) technical assistance for enabling plans, strategies, policies, regulations, standards; (iii) designing sustainable market mechanisms and business models; and (iv) communications and awareness campaigns.

Component 2 - Financing for cooling investments (US$141.3 million of GCF funds, of which $125 million in loan and $16.3 million in grant). In order to promote and accelerate the uptake of investments in innovative and climate friendly cooling technologies and systems, including in markets with low penetration and unmet cooling demand, the Cooling Facility aims to support increased access and deployment of sustainable cooling solutions performing better than current market practice and at the same time, ensure that the level of ambition is appropriate and relevant to each market (i.e. affordable) to expand access to – and deployment of - more climate-friendly cooling at scale (and avoid promoting a prohibitively expensive market niche, which would hinder the goals of scaling-up access and deployment). The Facility will provide concessional funds to foster the adoption or scale-up the deployment of sustainable cooling technologies, appliances through (i) financing of climate friendly cooling investment and (ii) credit lines to financial intermediaries. The financial instruments will be calibrated to what is needed to make the cooling project viable and to overcome barriers to implementation, including addressing the incremental cost associated with the adoption of efficient cooling solutions or serve remote off-grid areas, which include higher upfront capital costs compared to baseline options, and market entry barriers arising from efficient, clean cooling solutions underrepresentation in many developing country regions and sectors. The deployment of these funds will be tailored to the needs of the projects, through various financing modalities, for example, public financing to sovereign or sub-sovereign entities credit lines to commercial banks, loans or subsidies to households, municipalities and small, medium and large enterprises.

High concessional loans and grant from the GCF will largely be targeted toward investment projects where upfront affordability is a major obstacle and the quantity or concessionality of the World Bank's IDA/IBRD resources[43] are insufficient to ensure affordability and/or to make the efficient, clean cooling project viable.

Different financing and implementation mechanisms and models – suitable for different cooling sectors and different countries may be deployed by different projects of the Facility based on specific country and sector conditions. Examples of these financing and implementation mechanisms and models are provided below (Section B.4).

Component 3 – Project management (US$ 0 in GCF funds). This component will support the Executing Entities (EEs)' and Project Implementing Entities (PIEs)' management, coordination and implementation of their project activities, in compliance with the EEs' and PIEs' contractual obligations included or referred to in the legal agreements entered into with the Accredited Entities (AE).

III. General approach for activities supported by the Cooling Facility

Integrated and holistic approach: The scale of the cooling challenge and the window of opportunity to get now on a path to affordable, efficient, clean cooling demand an approach that integrates the development and strengthening of an enabling environment. Doing this involves technical assistance, capacity building, and concessional financing to mainstream sustainable cooling and establish sustainable implementation and business models. Moreover, in line with the Facility's goals of supporting access to affordable, efficient, clean cooling in a warming world, the Facility will integrate efficiency (starting with passive measures) and low carbon

[43] The World Bank offers IBRD and concessional IDA lending. The lending terms can be found here (https://treasury.worldbank.org/en/about/unit/treasury/ibrd-financial-products/lending-rates-and-fees) for IBRD and here (https://treasury.worldbank.org/en/about/unit/treasury/ida-financial-products/lending-rates-and-fees) for IDA.

considerations and adopt a holistic approach to sustainable cooling consisting of one or more of the following elements[44]:

- **Minimize** - Reduce and avoid cooling loads, for example, with passive building design, increase of thermal efficiency of buildings and cold storage warehouses/facilities, and nature-based solutions such as green roofs.
- **Shift to cooling solutions with lowest GHG emissions**, for example solar cooling, climate-friendly (low GWP) refrigerants-based cooling systems, or centralized cooling solutions where the right enabling conditions are in place.
- **Improve efficiency** – use energy efficient technologies to achieve cooling with less energy (and less GHG emissions), for example, super-efficient appliances and equipment and demand management to reduce peak demand and the need for new generating power capacity.
- **Optimize** – control cooling loads, for example, smart sensing and behavior change approaches.
- **Protect the most vulnerable** in urban and rural areas from extreme heat and consequences of unreliable or insufficient medical and agriculture cold chains.

National and sectoral contexts: The Cooling Facility recognizes that the technologies, opportunities and modalities to enhance access to efficient, clean cooling depend on the sector of application (e.g. space cooling vs agriculture cold chains), as well as specific national – and sub-national (e.g. urban or rural) circumstances, and capabilities. As such, assessments of potential cooling-informed activities should consider, as relevant, country-specific context and technology benchmarks (including those derived from regional benchmarks).

Link with climate change and cooling policy goals: Projects supported by the Cooling Facility should be aligned with, and contribute to the respective country's NDC revisions under the Paris Climate Change Agreement, and Cooling Action Plan (where available), as well as support and/or strengthen as appropriate, NAMAs, National Adaptation Plans and Disaster Risk Reduction Plans and support the goals and requirements of the Kigali Amendment to the Montreal Protocol.

Link with gender equality objectives: The Cooling Facility will seek to contribute to enhancing the knowledge base on gender issues associated with access to cooling and will seek to contribute to reducing gender gaps in cooling-related sectors (including agriculture, buildings, health and energy) by (i) identifying gaps relevant to the four pillars of the World Bank Group (WBG) Gender Strategy[45], and (ii) aiming to address these gaps through specific actions supported by the project.

Link with countries' COVID-19 response and 'build better' efforts - The Cooling Facility may also support efficient cooling-related interventions in the context of the Bank's overall COVID-19 response and related operations. As an example, the Cooling Facility may support the deployment of efficient, climate friendly cold chains for COVID-19 and routine immunization vaccines as a component of projects seeking to strengthening the countries' overall health services. This could include:

- strengthening the health sector cold chain by financing the gap at service delivery points at national, regional, district and sub-district levels;
- energy efficient and climate friendly built infrastructure, including vaccine stores, walk-in cold rooms, walk-in freezers, etc;
- efficient and climate friendly cooling equipment (including refrigerators and freezers) with lower GWP refrigerants;
- preventive maintenance and as-needed repairs of walk-in cold/freezer rooms at national and sub-national levels;

[44] This approach is consistent with the approach promoted by the Cool Coalition (https://coolcoalition.org/about/overview/).

[45] The four pillars: (i) improving human endowments, (ii) removing constraints for more and better jobs, (iii) finding solutions that help increase women's ownership of and control over assets, and (iv) enhancing women's voice and agency and engaging men and boys.

- strengthening vaccine logistics systems and energy efficiency upgrades of ventilation and refrigeration systems in cold storage hubs for vaccines and medicines;
- Solarization of health and agricultural cold storage facilities.

Nine countries are currently considering potential investments to be supported from the Facility. The World Bank will work with each Executing Entity covered under this Facility to finalize the scope and co-financing of these investment opportunities, taking into account (i) the needs of the clients as they may evolve, (ii) the results of the ongoing market assessments, and (iii) stakeholder consultations.

IV. Eligibility criteria for Facility-supported projects

The Cooling Facility will allocate a maximum amount equivalent to an aggregate of 30% of the total GCF proceeds to any given Host Country, regardless of the financial instrument(s) deployed. Supported projects will be assessed by the Bank as meeting the following eligibility criteria. A market assessment may be conducted prior to appraisal to inform the design of the project and demonstrate how it meets the criteria to access funds from the Cooling Facility.

- **Cooling investments**. Projects selected under the Cooling Facility will support investments in the following cooling target areas: (i) space cooling and cool/green solutions; and (ii) refrigeration, cold chain and logistics, as defined in section B3.I. above.

  In the case of (i) space cooling and cool/green solutions, projects should demonstrate a pathway towards financially sustainable models that reduce the need for public resources over time and eventually, leverage commercial and private sector funding.

  In the case of Facility-supported projects financing investments in off-grid cold storage capacity additions (under (ii) refrigeration, cold storage), Executing Entities will need to demonstrate that the main source of energy to power these additional cold storage facilities is renewable energy (e.g. solar).

- **World Bank operation linkage.** A Cooling Facility-supported project may: (i) co-finance a new IDA or IBRD[46] operation; or (ii) be an additional financing to an existing IDA or IBRD operation. The ratio of GCF funds to IDA/IBRD funds for each supported project will be at least 1:2.

- **Performance threshold**. To receive support from the Facility the proposed project will meet the following performance thresholds:
  - At least 20% energy efficiency improvement; and/or
  - At least 20% avoided/reduced GHG.

  To that effect, for each project, an estimate of GHG impact should be developed based on publicly available GHG methodologies and calculation tools and consistent with guidelines outlined in Annex 24[47].

- **Alignment with the transition to low GWP refrigerants** - Facility supported projects will be aligned with the goals and requirements of the Kigali Amendment to the Montreal Protocol, under which HFCs are being phased down and replaced with climate friendly refrigerants that do less damage to the climate. As such, investments supported by the facility will promote the use of climate friendly cooling equipment/appliances commercially available for the cooling applications

[46] Together IBRD and IDA form the World Bank. IDA focuses on the world's poorest countries, while IBRD assists middle-income and credit-worthy poorer countries.
[47] Annex 24 provides calculations of estimated GHG emissions for each Facility project.

considered in the respective project that either (i) provide cooling services without the use of refrigerants (e.g. fans and passive cooling solutions); and/or (ii) use refrigerants that are aligned with the Kigali amendment and meet relevant safety standards, as commercially available in respective local markets[48].

- **Adaptation to climate change**. The Host Country will be vulnerable to climate change, facing extreme heat risk hazards, and in need of cooling services. The Cooling Facility-supported projects will bring cooling-related benefits associated with services provided by the buildings, cold chains, health facilities and other related cooling investments.

- **Paradigm shift potential.** Supported projects will propose activities/ technology/applications that aim to achieve market transformation, create new markets and business activities at local, national or international levels, and can potentially be replicated in other sectors or geographic areas.

- **Country ownership & alignment with country priorities**. Facility-supported projects will be aligned with country priorities and climate change/cooling action plans as presented in national development plans or other policy documents.

- **GCF Concessionality Level.** The concessionality levels would be assessed based on the pricing of the WB co-financing, risk of external debt distress of the Host Country as published by the IMF under joint WB-IMF debt sustainability framework, and the financial analysis of the projects. In doing so, it would apply the following principles:
  (a) *Grant only*. Countries in external debt distress and for which the WB co-financing is exclusively grant-based, would receive 100% grant from the Facility.

  (b) *Combination of high concessional loans and grants.* Projects would meet any of the three criteria below:
  - Host country in high risk of debt distress;
  - Non-revenue generating project or where the reflows from the ultimate beneficiaries are not cost-reflective;
  - Projects that target vulnerable communities or groups that are more vulnerable than the overall population (for example, refugees, people in rural areas with low economic income).

  (c) Financing terms: 40-year maturity, 10-year grace period with an all-in fee of 0.25 percent (i.e., 0.00 percent interest rate, 0,00 percent commitment fee, 0.25 percent service fee). *Low concessional loan.* Projects not meeting the conditions set out in (a) or (b) above would be eligible for low concessional loans for investment.

  Financing terms: 20-year maturity, 5-year grace period, 0.75 percent interest rate, 0.5 percent service fee, 0.75 percent commitment fee.

B.4. Implementation arrangements (max. 1500 words, approximately 3 pages plus diagrams)

The Cooling Facility is essentially designed as an umbrella facility (a Program) that enables aggregating, through a programmatic approach, different types and sizes of sustainable cooling interventions. This will enable to lower transaction costs, reach a broader range of countries (of different sizes and income levels), and generate the necessary experience and lessons to underpin further scaling-up of sustainable cooling more broadly and the needed transformation of the cooling sectors. In fact, without the possibility of aggregating

[48] This criteria takes into account that very low GWP refrigerant alternatives may not be readily available in all local markets for all the applications considered in the project

through the Facility's programmatic approach to sustainable cooling, it would not be possible to reach the diverse set of countries covered by the Facility, especially smaller and more fragile countries. Moreover, the programmatic approach is essential to take advantage of opportunities to introduce and support climate friendly cooling solutions in the context of different sectoral operations - that may otherwise be overlooked.

The Cooling Facility currently proposes to support nine projects (one project per country) subject to the results of their appraisal. This Funding Proposal includes indicative information for each of the currently proposed projects. Under the programmatic approach, the GCF would rely on the AE's due diligence on the proposed projects included in the Program. Subject to the outcome of such due diligence, the World Bank will approve funding for such projects that meet the eligibility criteria as presented in Section B.3.

I. Facility-level arrangements

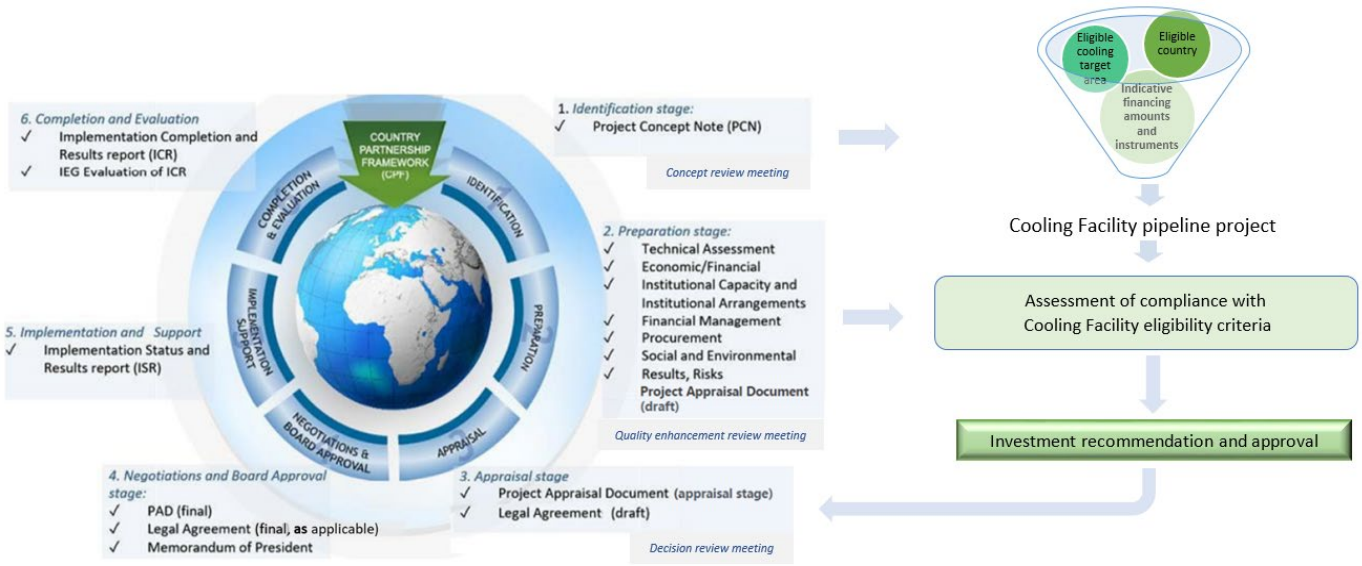
As part of its role as GCF AE and co-financier of the projects to be supported under the Facility, the World Bank will assess and confirm the eligibility of each such Project to be included in the Facility's pipeline for Bank and GCF Financing. In order to do so, for each project proposed to be included in the Facility, the World Bank team will comprise energy and climate finance experts to manage and be responsible for the Facility's overall objectives and ensure that the projects selected meet all the eligibility criteria as presented in Section B3. The team will aggregate findings from each project team's implementation progress reports and facilitate the dissemination of lessons learned across Facility projects and beyond the Facility.

Following the GCF Board approval, the World Bank and the GCF will, based on the Accreditation Master Agreement (AMA), enter into one Funded Activity Agreement (FAA) for the Facility for the provision of the funds under all GCF instruments supporting the Program. The World Bank will be solely responsible for the management and administration of GCF resources and will carry out such management and administration in accordance with its policies, procedures and practices, and the relevant provisions of the FAA and AMA. The World Bank will apply its own fiduciary principles and standards relating to any integrity checks, anti-corruption, countering of financing of terrorism, fraud, financial sanctions, embargoes and anti-money laundering.

The process for reviewing and approving GCF funding for the Facility-supported projects is embedded in the WB's project cycle (Figure 3) and based on its standard policies and procedures.

Figure 3: **Project review and investment approval process**

(a) World Bank project cycle **(b) Cooling Facility investment process**



During the identification stage (stage 1), candidate-projects are screened for formal inclusion in the Facility pipeline. This preliminary review focuses on the proposed use of the GCF funds, the scope of activities, the paradigm shift potential and the financing instruments envisaged. The WB project teams then carry out a technical, economic, financial, environmental and social, fiduciary, procurement appraisal of the project, in line with WB's operational policies and procedures, and prepare a draft Project Appraisal Document (PAD) or equivalent for a technical review meeting (stage 2). This due diligence is separate from the responsibility of the recipient countries to prepare and implement the projects according to WB's policies and procedures. The scope of the technical review will cover the assessment of the GCF financing against the eligibility criteria for the Facility-funded projects. Upon determination by the Bank that the projects meet the eligibility criteria, the WB project team will prepare the appraisal-stage project documents and the draft legal agreements (stage 3). The next stages (negotiations, WB institutional approval, project implementation through completion and evaluation) will follow the WB's applicable rules and procedures. Following approval of projects, the World Bank will sign Subsidiary Agreements with the Executing Entities to make available GCF investment financing in line with the provisions of the FAA.

Relevant experience and track record of the World Bank. The proposed facility builds on the WBG's decades of experience in supporting client countries across the globe implement clean energy projects. Over the past dozen years (FY10-21), the Bank has built a strong track record in financing clean energy, providing support to developing countries across the globe with a clean energy portfolio of 520 operations amounting to US$33.9 billion (approximately US$3 billion per year), helping countries achieve their energy and climate (NDCs) goals as well as SDG goals. The renewable energy share of the portfolio amounts to about US$1.6 billion per year, and the share of solar PV - the most likely source of RE to be associated with sustainable cooling activities – is growing fast. The Bank's EEff portfolio of US$ 16.5 billion (about US$1.5 billion per year). The Bank's EEff portfolio alone has saved more than 1,300 TWh to date, associated with 575 Mt of avoided CO2 emissions. Demand-side EEff accounted for about a third of the total FY-10-21 World Bank EEff portfolio and covers different sectors (public, industrial, and residential), implemented primarily through the Bank's Energy and Extractive Global Practice, but with an increasing share with other WB Global Practices, including Urban, Water, Transport and Agriculture. Demand side energy efficiency interventions have also

been combined with other energy sector focus, such as energy access, and have been combined with renewable energy investments. This EEff experience has included interventions related to cooling, such a building energy efficiency projects and energy efficient appliance programs.

The WBG has an extensive history of EEff projects aimed at overcoming the market failures and barriers to scaling-up energy efficiency which include weak policy/regulatory frameworks, higher first cost, lack of access to affordable financing, new technology risk, lack of credit worthiness, transaction/aggregation costs (for financiers) and risk of financing low-income consumers. The World Bank has helped deploy a menu of effective clean energy financing and delivery mechanisms across sectors and across the developing world, including dedicated credit lines, financing facilities, results-based schemes and others. Projects have encompassed both public and private financial institutions. The design of these mechanisms has evolved, building on lessons learned and in response to local needs and circumstances; and they have achieved considerable success as documented in multiple evaluation reports.

The Cooling Facility builds on this deep operational foundation, combined with the Bank's traditional energy – and sectoral - dialogues with client countries. It also builds on the Bank's experience as one of four Implementing Agencies of the Multilateral Fund of the Montreal Protocol, supporting the transition towards climate friendly refrigerants. The Facility will also benefit from the Bank's extensive track record in providing energy efficiency and clean energy technical assistance – principally through ESMAP -, to support the upstream design of lending operation, setting up the regulatory, policy and institutional foundations to help mobilize financing and catalyze private sector investments. In particular, ESMAP's Efficient, Clean Cooling technical assistance program (established under ESMAP) which is assisting the Bank in developing a new business line for sustainable cooling –will be leveraged by the Facility. Already, the Bank has gained experience with the inclusion of sustainable cooling activities in the urban, agriculture, transportation, and health sectors.

II. Project Management Arrangement

For each project, a project management unit will be established by the relevant Executing Entity with a team expected to include a team lead, technical expert, procurement specialist, financial management specialist, environmental specialist and social/gender specialist, and a lawyer. Each project will have its own monitoring and evaluation (M&E) and reporting process.

Figure 4: Typical project management unit key personnel

Project-level implementation arrangements are defined during the appraisal phase and vary according to the design of the project and are adapted to the country-specific context.
Cooling cuts across different sectors (public, residential, commercial and industrial), and targets different areas (space cooling; off-grid appliances; and refrigeration/cold chains). In this context and given the different circumstances in individual countries, there is no single, one-size-fits-all implementation model. In addition, the Bank's experience with demand-side energy efficiency and off-grid energy access projects in particular provide valuable insights that have been considered for implementation. For these reasons, the Cooling Facility will provide individual projects the opportunity to adopt the implementation model that suits their own

situation best among those described below, and in doing so enhance the prospects for successful implementation – and inform a sustainable cooling transformation in other countries.

III. Indicative countries' implementation arrangements

The Facility will support one project per country and thus, a total of nine projects. Each project comprises activities from all three components of the Facility and may include one or more implementing models as shown in Table 2 below. Several models may be considered for projects at their current early stage of development. The actual implementation models/arrangements will be finalized during the preparation stage of each project depending on the specific situation at project preparation and negotiations with the government. It is expected that all Projects shall be approved by the World Bank within five years of the GCF Board approval of the Funding Proposal.

Table 2: Indicative implementing model by country

Country	Target cooling area	Implementation models				
		Component 1: Policy, regulation and enabling environment support	**Component 2: Financing for cooling investments support**			**Component 3: Project management**
		PP&C	PP&C	CL	EEFF	PP&C
Bangladesh	S	✓	✓	✓	✓	✓
El Salvador	S,R	✓	✓			✓
Kenya	R	✓			✓	✓
Malawi	R	✓		✓	✓	✓
North Macedonia	S	✓	✓		✓	✓
Panama	S	✓		✓		✓
Sao Tome and Principe	S,R	✓	✓			✓
Sri Lanka	S	✓	✓	✓	✓	✓
Somalia	S,R	✓	✓			✓

Notes

S: Space cooling & cool/green surfaces
R: Refrigeration, cold chains and logistics

PP&C: Public procurement and contracting
CL: Credit lines
EEFF: Energy efficiency financing facility including the public sector ESCO and the revolving facility variation

IV. Implementation models description

This section describes the implementation models and arrangements that would be followed by the projects supported by the Cooling Facility.

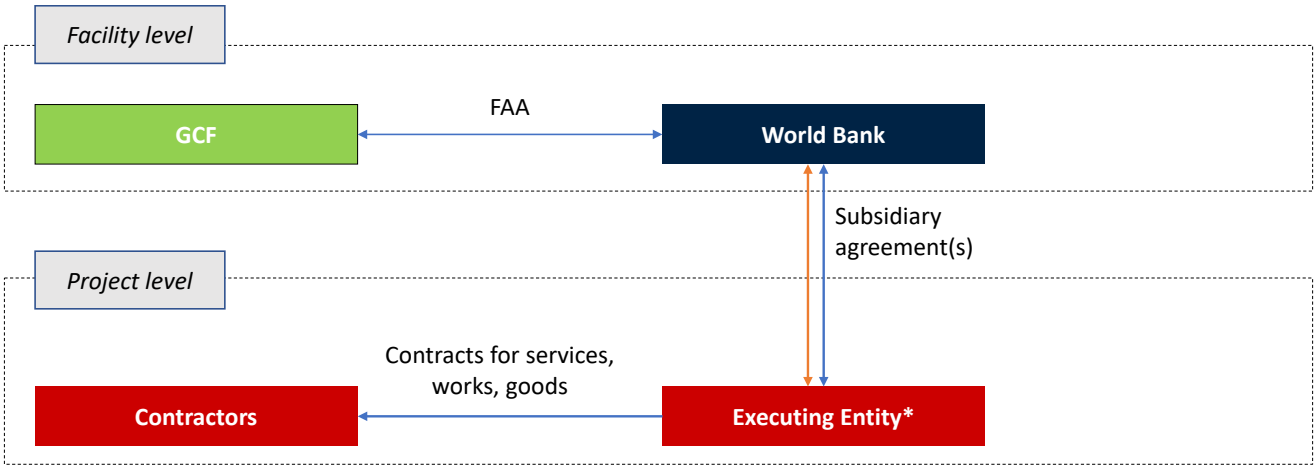
,

(i) Public procurement and contracting for cooling infrastructure service delivery and technical assistance[49]

GCF funds would be used to support investments through a traditional public procurement and contracting model. Under this model, the EE (or the Project Implementing Entity (PIE) as designated by the EE) would need to possess the necessary capacities to conduct the required activities consistent with relevant Bank procedures (see below), This may be in the form, for example, of a dedicated unit within a government ministry or designated national agency such as a rural electrification agency.

The EE (or PIE as applicable) would: (i) prepare the technical specifications and terms of reference of the cooling infrastructure or equipment it wishes to procure; (ii) subject to no-objection of the World Bank, launch the procurement process to invite bids from suitable contractors; (iii) award the procurement contract; (iv) sign contractual agreements with the winning bidders; (iv) monitor the delivery of the goods and services to ensure quality control using its own resources or through an owner's engineer procured by the project, and (v) remunerate the contractor according to the agreed terms. Depending on its capacity and operating model, the EE (or PIE as applicable), may subsequently enter into an operations and maintenance (O&M) contract to ensure the sustainability of the infrastructure. (Figure 5). Otherwise, the EE would ensure that the beneficiaries receive adequate training to conduct O&M to ensure continuous operation of the equipment and infrastructure and that the impact is achieved as per estimates.

Figure 5: Implementation arrangement for public procurement and contracting model



*If a project has a Project Implementing Entity (PIE), there may be additional arrangements including a project agreement between the World Bank and such PIE

This implementation model is well-suited where the private sector does not have the capacity or the appetite to implement the cooling activities and thus, public intervention is critical for service-delivery. Such cases include:

- Interventions that strengthen the enabling environment by establishing the conducive policy, legal, regulatory and economic frameworks, reduce barriers to investment, improve access to knowledge, and strengthen institutional capacities.

[49] This model is primarily relevant for both Component 1 and Component 3.

- Despite their economic viability, interventions that are not commercially viable to adequately remunerate [50] private investors (for example, dissemination of off-grid appliances in poor and marginalized communities with limited economic opportunities and low capacity to pay).
- Interventions that promote the deployment of a public good (for example, refrigeration and cold chain for vaccines and medicines such as in El Salvador, Sao Tome and Principe and Somalia).
- Pilot interventions that aim to demonstrate the benefits of energy efficient cooling options to improve energy services and energy access and generate lessons for a replication at scale.

GCF concessional funds provided through loan or grant agreements with the Government would help reduce the systemic risk of undertaking cooling investment and reduce transaction cost by establishing conducive investment, legal and policy frameworks. Further, it would promote social equity and protection by ensuring that the projects benefit poor and marginalized communities. To this end, GCF funding will be priced lower than and blended with WB funds, to reduce the overall financing cost and thereby absorbing the incremental cost to deploy efficient cooling solutions. Final beneficiaries could include households, sole traders, micro-, small- and medium- enterprises, communities. Through these interventions, GCF concessional funds would play a catalytic role in creating a market for and increasing access to clean, efficient and sustainable cooling.

For the purposes of the FAA, this model may be used for the activities under Component 1, financing of climate-friendly cooling investments under Component 2 and project management activities under Component 3.

(ii) Credit lines

A key barrier to investing in energy efficiency in general – and sustainable cooling in particular – is the limited availability of commercial financing for these projects. The Facility will support the provision of credit lines,[51] for example in Malawi, to help financial institutions establish business lines for sustainable cooling investments. Credit lines can be well-suited in less mature markets; they help mitigate the perceived high financial risk of energy efficient and clean cooling, which may be carried out by energy service companies (ESCOs). An ESCO is an organization that provides a range of services to energy users to design and implement cooling and energy efficiency measures. The services may also include providing or arranging financing. Such services are provided by the ESCO using a performance-based contract under which the payments from the energy user to the ESCO are contingent upon achieving certain pre-specified performance levels. Also, the ESCO generally allows energy users to pay for its services using the energy cost savings that result from the cooling/energy efficiency project. This approach allows energy users to transfer much of a project's technical, construction, and performance risks to the ESCO. The concept of energy savings performance contracts (ESPCs) implemented by ESCOs has been recognized as a promising approach to overcome some of the most intractable market barriers. Under an ESPC, an ESCO identifies and selects, develops, implements, and finances a cooling and energy efficiency project (at the customer level), and uses the stream of income from the cost savings to repay the costs of the project, including the costs of the investment).

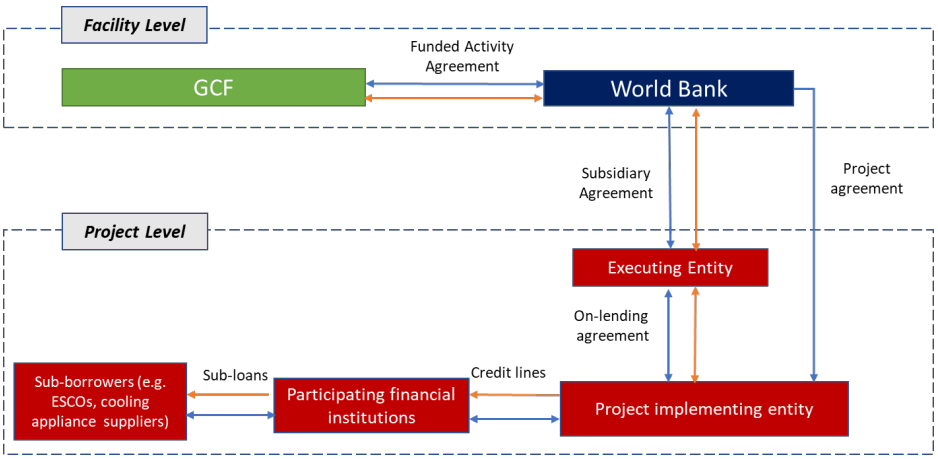
The WB would channel GCF finance along with World Bank co-financing to the EE (the Host Country as the Borrower/Recipient), through a Subsidiary Agreement. The EE would extend the credit line to one or more participating financial institutions (PFIs), which would typically be banks or micro-lending institutions, for on-

[50] At the minimum, investment rates of return should cover the cost of debt incurred by private actors, and the cost of equity. While the cost of debt can be easily determined as the cost at which commercial banks would lend to cooling projects, the cost of equity depends on the financial robustness of the prospective investor and its risk appetite (investors with an international footprint and a well-diversified portfolio would tend to be less risk averse than local investors). As a general rule, it would be higher than the rate that can be earned through a passive investment (for example, a AAA-rate sovereign bond) plus premia for the additional risks incurred (for example, investments with longer payback periods will command and higher maturity premium).

[51] See for example, World Bank-ESMAP livewire (2014) "Designing Credit Lines for Energy Efficiency", by Ashok Sarkar, Jonathan Sinton and Joeri de Wit. (https://openknowledge.worldbank.org/handle/10986/18410)

lending to eligible sub-borrowers (for example, industry and other private sector entities). In doing so, the PFIs will select and approve sub-loan applications based on the agreed investment criteria Subsidiary Agreements would require the EE to ensure that the PFIs comply with the sub-lending and other terms, and monitor the performance of the PFIs. As such, the EE has contractual control and oversight responsibility over the implementation of the Funded Activity. Repayment occurs through the same channels followed to disburse the credit line. Where the EE designates a Project Implementing Entity (PIE) to provide credit lines to the PFIs, the World Bank would require the EE to enter into an on-lending agreement with the PIE. In addition, it may enter into a project agreement with the PIE, outlining the obligations of the EE that are passed down to such PIE with respect to the implementation of the funded activities (as shown in Figure 6).

Figure 6: Implementation arrangement for credit lines



GCF concessional funds would be critical to help create markets for clean cooling. For illustrative purpose, the example of Malawi is provided below.

An agriculture-driven economy, Malawi is adversely impacted by climate change impacts such as floods and droughts. Energy is one of the priorities of the third Malawi Growth and Development Strategy (MGDS III), which has identified promoting the use of energy efficient technologies and systems as an enabling strategy. As the agriculture sector is one of the largest contributors of GHG emissions in the country, facilitating the deployment of low carbon cooling technologies would contribute to achieving a climate-resilient economy. However, commercial banks in Malawi seldom provide loans for agricultural activities. There is overdependence on firewood and charcoal for heating and domestic use and knowledge and availability of cooling services is limited. Limited awareness and access to financing ultimately affect the deployment of much needed investments and income generating activities. Malawi is considering the provision of credit lines to participating financial institutions to stimulate the market adoption of cooling solutions.

GCF and WB funds will be used to extend credit lines to commercial banks, micro-finance institutions, and licensed Savings and Credit Cooperatives (collectively referred to as “participating financial institutions” or “PFIs), for on-lending to micro-, medium and small-scale enterprises (“MSMEs”). The GCF funds would supplement IDA funds mobilized through a recently approved project[52] to promote access to climate friendly refrigeration and cold storage by rural farmers.

Flow of GCF funds**.** The World Bank would enter into a financing agreement with the Republic of Malawi through the Ministry of Finance, Economic Planning and Development (the Executing Entity), which will in turn sign an on-lending agreement with the Reserve Bank of Malawi (the RBM) for the administration of the funds. In such a case, the World Bank would also sign a project agreement with the RBM setting forth the obligations

[52] The project, approved in August 2020, aims to increase access to financial services, entrepreneurship and capabilities for micro small and medium enterprises. Additional financing from the Facility is critical to introduce sustainable cooling among the target development areas.

of the Republic of Malawi that are transferred to RBM with respect to the implementation of the funded activities . The RBM has a track record of managing World Bank-funded projects and has the legal mandate to extend wholesale financing to PFIs for on-lending to MSMEs. Moreover, the RBM's banking and micro-finance institutions supervision functions give it an added advantage in terms of its ability to manage the implementation of the credit lines.

Selection of participating financial institutions (PFIs). The selection of the participating financial institutions is an important aspect of the credit lines model, and is made according to criteria acceptable to the World Bank. For example, in the case of Malawi, criteria to assess the participating financial institutions include, *inter alia*, (i) proof of possessing a license to operate in the country; (ii) compliance with all national prudential and other applicable laws and regulations; (iii) compliance with total capital to risk-weighted assets ratio prescribed by national prudential regulations; (v) adequate liquidity; (vi) adequate internal audit and control systems; (vii) adequate management information systems; as well as (viii) commitment and previous experience lending out to MSMEs, preferably with a focus on businesses owned by women.

For the purposes of the FAA, this model may be used for credit lines to participating financial institutions under Component 2.

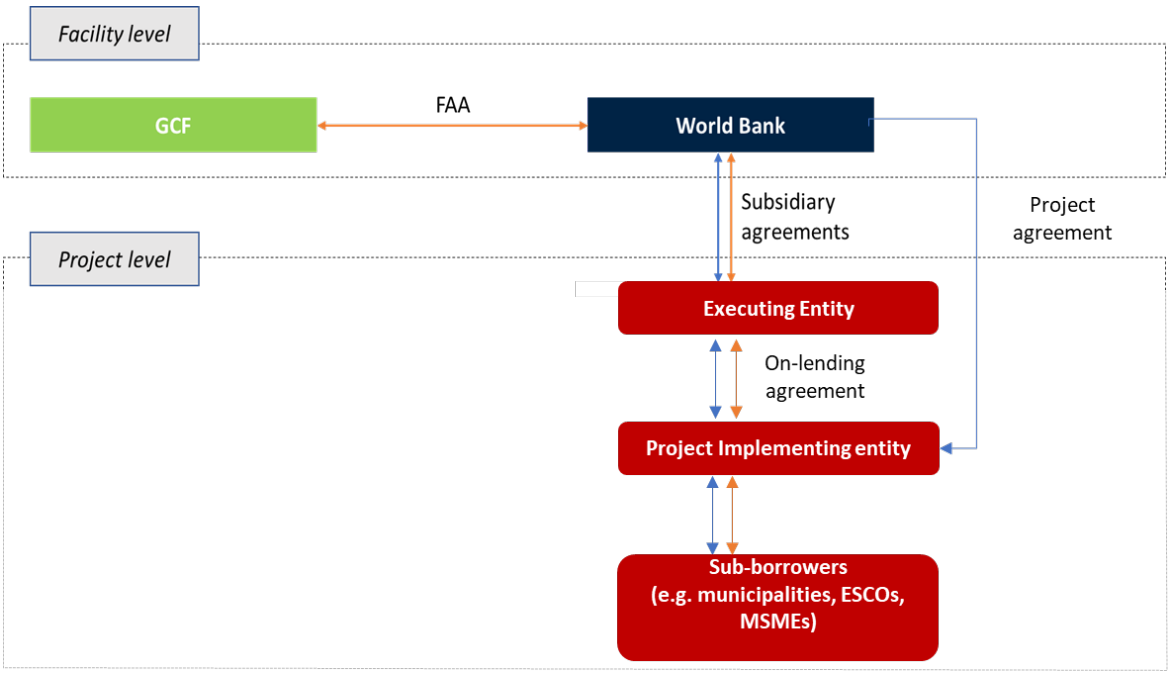
(iii) Energy Efficiency Financing Facility

Under this model, the GCF proceeds are channeled through the Executing Entity (the Host Country as the Borrower) according to the terms of the Subsidiary Agreement signed with the World Bank. The EE either directly, or through an entity that it designates (the Project Implementing Entity or PIE), on-lends the funds to sub-borrowers (for example, private energy service companies, cooling as a service operators [53], municipalities, small- and medium-enterprises) to undertake eligible cooling investments. Where there is a PIE, the World Bank would require the Host Country to enter into an on-lending agreement with the PIE which would include provisions that require the PIE to execute the funded activities in accordance with the requirements of the Subsidiary Agreement. In this manner, the EE has contractual control and oversight responsibility over the PIE. In addition, the World Bank may enter into a project agreement with the PIE setting forth the obligations of the Host Country that are passed down to the PIE with respect to the implementation of the funded activities. The PIE would extend sub-loans, partial guarantees, or grants, as applicable, to sub-borrowers (e.g., energy service companies or cooling-as-a-service companies), as shown in

Figure **7**. Where there is no PIE involved, the Executing Entity directly provides financing to the sub-borrowers and there is no project agreement or on-lending agreement.

[53] For example, Community Cooling Hubs may adopt cooling as a service model.

Figure 7: Energy efficiency financing facility implementation arrangement

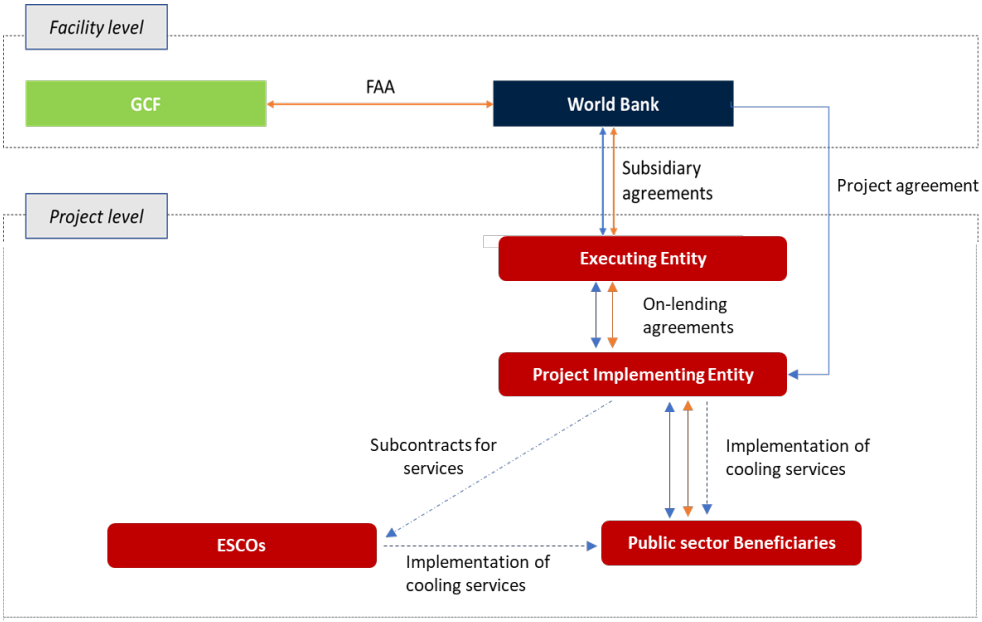


For the purposes of the FAA, this model may be used for financing of climate-friendly cooling investment under Component 2.

The energy efficiency financing facility implementation arrangement involves two main variations, as presented below.

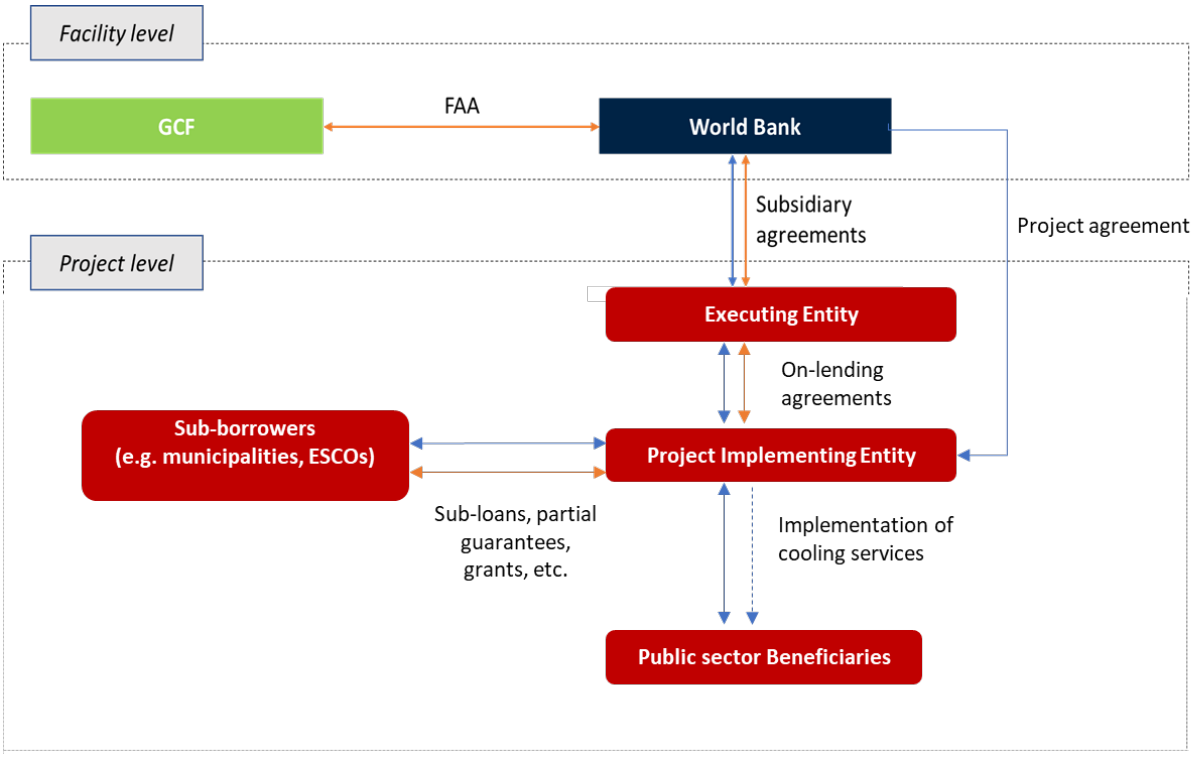
(iii-a) Public super ESCO model. In this variation of the Eff financing facility model, the Host Country designates a public energy service company (the public super ESCO) as the PIE. The public super ESCO would typically be a public entity established by the government to (a) support cooling and energy efficiency investments in the public sector (public buildings and sustainable cooling projects) and (b) strengthen private sector ESCOs through demand aggregation, bulk procurement of equipment (therefore reducing the cost of equipment for ESCOs), standardization of ESPCs, M&V templates and capacity building, project development, and facilitation. Figure 8 illustrates a potential structure for a public super ESCO implementation model. As shown in Figure 8, such PIE may even sub-contract with private ESCOs to implement energy efficiency projects through ESPCs in public buildings and facilities. The functions of public sector ESCO acting as a PIE are multifaceted and can potentially cover all the building blocks of an energy efficiency ecosystem, from energy audits to project design to performance contracting, procurement of cooling and energy efficiency measures or services (including through private ESCOs), installation, and M&V of energy savings to operations and maintenance. Thus, the PIE would not only moderate stakeholders' risks but also would help build trust, including between private ESCOs and public sector end users. This variation of the energy efficiency financing facility arrangement is envisaged in Bangladesh.

Figure 8. Public super ESCO implementation model



(iii-b) Energy efficiency revolving facilities. This modality combines the features of the plain-vanilla financing facility and the super ESCO model in that, in addition to providing financing to eligible sub-borrowers, the PIE would invest in energy efficiency activities using its own capital (for example, retrofitting of existing buildings) as shown in Figure 9

Figure 9: Energy efficiency revolving facility (EERF) model



Under the EERF model, the PIE uses revolving mechanisms to recover its investment and operating costs based on contracts such as Energy Service Agreements (ESAs) [54] or also uses more traditional revolving financing mechanisms such as debt financing and budget capture.[55] Under an ESA, the facility finances and undertakes the investment on behalf of the beneficiary. In return, the beneficiary makes regular payments based on the energy savings generated by the investments to the EERF over an agreed period so that the EERF can recover the investment and operating costs. For the beneficiaries, the recurring payment (consisting of the reduced energy bill and the payment to the EE or PIE, as applicable) is equal or lower to their pre-investment baseline energy bill. The ESA covers an agreed period, typically up to 15 years depending on criteria including, but not limited to, the size of the investment, the amount of energy saved and the price of energy. As ESAs represent long-term term contractual commitments and are typically not classified as debt, they provide major advantages to the beneficiary since they are relatively simple to carry out, do not require debt financing, and pose little risk, thereby addressing key barriers to public investments in efficient space cooling and energy efficiency.

The World Bank does not bear the risk associated with the performance of these investments and the associated recovery mechanism. That is, in any case, the Host Country is obligated to make repayments, as per the terms of the Subsidiary Agreements, in line with the provisions of the FAA between the GCF and the World Bank. Energy efficiency revolving facilities (EERFs) can be effective financing and implementation mechanisms to incentivize efficient, clean cooling where there are market failures, where commercial financing for energy efficiency/sustainable cooling is under-developed, and where local banks perceive energy efficiency – and sustainable cooling – as too risky. It helps stimulate the market for sustainable cooling – mostly for space cooling (e.g., improve the thermal efficiency of buildings and the efficiency of cooling equipment/appliances, stimulate investments in new energy and cooling efficient buildings) in the target country by building capacity, establishing confidence in the energy savings, introducing new financing approaches, and encouraging the establishment of supply chain contractors, suppliers, and financial and legal experts in this area The World Bank has experience in various countries with the establishment of EERFs that have been in operation for many years.[56]

North Macedonia envisages to deploy GCF funds through the EERF model. The North Macedonia Ministry of Finance will establish the EERF within the Development Bank of North Macedonia (DBNM), a development and export bank wholly owned by the Republic of North Macedonia. GCF funds along with WB funds will be provided to the Host Country (the Borrower). The Host Country, through the Ministry of Finance, will make part of the GCF proceeds available to the DBNM to support the initial capitalization of the EERF. In so doing, the Host Country will (i) ensure that the on-lending agreement is on the terms and conditions acceptable to the World Bank and the GCF, particularly ensuring that the GCF concessionality of the loan financed out of the GCF Reimbursable Funds is substantially passed on for the financing of the GCF funded activities, and (ii) cause the DBNM to carry out the funded activities in accordance with the provisions of the Subsidiary agreement between the World Bank and the Republic of North Macedonia.

The DBNM would use the GCF proceeds to finance and implement efficient cooling and other energy efficiency investments and offer the full package of services required to (i) identify and select subprojects presented by the participating municipalities in response to calls for proposals; (ii) finance eligible subprojects through various mechanisms (including ESAs, loans, budget capture, partial guarantees and grants); (iii) procure and manage all required consultants to conduct energy audits and prepare technical designs, and contractors to

[54] Details about EERFs using ESAs can be found at https://openknowledge.worldbank.org/handle/10986/30388
[55] Budget capture: After the EERF completes an investment for a public agency, the government reduces its budgetary transfers to the public client by an amount equivalent to the energy cost savings (thereby capturing the savings gained through energy efficiency) and transferring this amount to the EERF.
[56] The World Bank will incorporate lessons-learned from its experience in supporting such mechanisms in, e.g., Kosovo, Armenia, Bulgaria, and India. See World Bank-ESMAP Livewire (2018) “Financing Energy Efficiency, Part 1: Revolving Funds” (https://www.esmap.org/node/170491).

carry out the building retrofits and installation or upgrade of equipment of central government buildings[57] (i.e. primary healthcare facilities identified in consultation with the Ministry of Health); and (iv) carry out and monitoring and evaluation activities. Investments financed by the DBNM, through the EERF, would need to meet the eligibility criteria for investments under the Cooling Facility and eligible beneficiaries would include government owned buildings (e.g., schools, universities, government administration buildings, health facilities).

B.5. Justification for GCF funding request (max. 1000 words, approximately 2 pages)

Sustainable cooling will remain a small, boutique niche unless targeted efforts are made to mainstream it and catalyze a paradigm shift. As documented by the IEA, SEForAll, and others, current trends are neither sustainable or adequate to support development goals. If current trends continue, the rapid growth in purchases of residential and industrial air conditioners using inefficient technologies, often with high GWP refrigerants, will make the Paris climate goals unattainable. Current trends are also far from sufficient to support the cooling services needed if health, food security, and other SDGs are to be achieved. Opportunities for triggering a sustainability shift in traditional cooling approaches are often found within different sectors (e.g. agriculture, fisheries, health, cold chains, buildings, etc) and may be missed, as countries face competing priorities - especially as they respond and navigate the health and economic challenges exacerbated and caused by the emergence of the COVID-19 pandemic.

The GCF loan and grant are required for the development of the anticipated implementation models in the selected countries under the Facility, which involves adapting the models to the specific country context; testing, improving, and increasing the scale of the models; capacity building of government and private sector stakeholders; awareness raising among beneficiaries; development of investment pipelines; and dissemination of results; etc. This phase of developing the models and the associated policy and regulatory support to enhance institutional and technical capacity require concessional financing before the models can be scaled-up relying on non-concessional financing and private sector financing. Without the availability of long-term, concessional finance from the GCF, the initial costs to develop these models would be too high for the governments and result in either no, insufficient, or delayed adaptation in the critical area of cooling. Without appropriate adaptation mechanisms, rising temperatures would translate into higher electricity demand to meet cooling needs and consequently, higher cooling-related GHG emissions. GCF funding is critical to remove barriers and address market failures identified and demonstrate ways in which countries can adapt to rising temperatures in a climate-friendly manner.

GCF funding will be allocated to eligible Facility projects in accordance with the WBG's Guiding Framework on Strategic Use of Climate Finance to Maximize Climate Action[58] which advises that to maximize the impact of climate finance, the degree of concessionality allocated to a program or project should be equal to what is needed to overcome the identified barriers to implementation and make the program/project viable.

Different financing instruments will be assembled to form a cascade of concessionality or risk tolerance, which entails leveraging the private sector in ways that optimize the use of scares public resources. Consistent with GCF criteria, projects will be selected and designed so as to provide the least concessionality needed to make the proposal viable without crowding out other funding sources.

[57] These investments would be done on a grant basis, i.e., there would not be any sub-loan agreement signed with the beneficiaries.

[58] World Bank Group, *Strategic Use of Climate Finance to Maximize Climate Action: A Guiding Framework.* 2018

The following factors justify the use of concessionality:

- Misaligned national and global incentives to reduce GHG emissions. This explains the lack of incentives for governments to invest adequately in climate action; more specifically, the fact that national and global incentives to invest in mitigation do not necessarily overlap accounts for much of the underinvestment. As decarbonization is considered a GPG, concessionality should support mitigation projects and help align national and global plans for climate action.
- Developing countries lack the resources to implement the projects required to achieve deep decarbonization. Even though many climate policies bring significant domestic co-benefits, they often do incur significant short-term costs, e.g. investments required for deep decarbonization and the social costs linked to any economic transition (e.g., retraining of workers in declining industries).
- In countries with limited access to capital markets, finance with a concessional component helps leverage private sector finance and helps reduce the funding gap that hamper mitigation and adaptation efforts.
- Temporary interventions financed on grants or concessional terms can ease policy transitions and create new markets for low-carbon technologies. Without concessional support, nascent technologies will not break through fast enough and certainly not at the scale needed to avoid a higher than 2°C global temperature rise.

Several factors specific to cooling technologies add to the rationale for concessionality described in the Guiding Framework:

- First, is the reality that there are market failures leading consumers to favor less climate-friendly solutions, even if the lifecycle cost, and impact on consumers and households' pockets, is greater. As highlighted in ESMAP's Primer for Space Cooling (2020), expenditures to achieve space cooling already account for an estimated 5-15 percent of the median household income in many parts of the world. With rising temperatures and increased demand for comfort, the operation of air conditioning units to provide cooling will only increase. A less efficient entry-level room AC can cost one-and-a-half to two times more over its lifetime compared with commercially available high efficiency room AC units..
- Second, the lack of capital access and large transaction costs that many developing countries face and, in particular, hinders affordability for poorer communities, see below. (This, and other barriers are further highlighted in the feasibility study)
- Third, waiting for markets to evolve without support, risks missing cost-effective opportunities and can lead to substantial avoidable increases in GHG emissions; action is urgently needed to mobilize concessional climate finance, as well as to better coordinate and create synergies between climate finance for cooling with funding from the Multilateral Ozone Fund supporting refrigeration replacement projects. Proving performance and expanding the size of markets for efficient equipment, regulatory and fiscal incentives, and consumer awareness efforts can accelerate the time-frame for economies of scale that are necessary to lower costs and achieve sustainability.
- Another factor is the need to bridge the affordability gap, a major barrier in large urban slums, a category that according to the most recent SEForAll estimate includes 680 million people. Another 2.2 billion people are at risk because income limitations only allow purchase of the cheapest and typically least efficient air conditioners. (SEForAll 2019) Finally, concessional financing is necessary to enable a programmatic approach with opportunities for synergies, knowledge sharing, and dissemination of lessons learned, thereby accelerating the transition to sustainable cooling across regions and countries.
- There is also the need to accompany physical cooling-related investments with non-revenue generating financing to build and/or strengthen the policy, regulatory, institutional and general enabling framework needed to ensure the sustainability and scaling up of the physical cooling investment and the climate and other co-benefits.
- Priority for grants will be given to cooling solutions whose beneficiaries are the poorer marginalized communities.
- The **learning generated by efforts to test and put in place new models and create a new market demand for climate friendly cooling solutions.** When a climate initiative involves new approaches, tools, or solutions, it entails a *risk* for the implementing country, and *benefits* for all others—a key

characteristic of global public goods. The lack of (historical) data, uncertainties regarding future climate conditions, and the need for new strategies and technologies imply a need for capacity and financial resources.

- **International *transfer* of knowledge about factors accounting for success/failure in climate action related to cooling could reduce the cost of a low carbon cooling pathway globally**. However, it also creates perverse incentives. Being able to learn from the mistakes of others creates an incentive to delay action and stick to proven solutions rather than experiment. Knowledge transfer does not happen automatically and is facilitated by financial support.
- There is a real risk of **negative global spillovers from low access to sustainable cooling which will hinder populations' resilience and livelihoods as a result of climate change.** Climate change impacts often spill over internationally and do not remain within country borders. Examples include health-related impacts, with the possible spread of communicable diseases on a global scale, and food security impacts caused by lower agricultural yields in one region leading to higher food prices worldwide. Other, more uncertain but potentially very large sources of spillovers are:
    - *Migration:* If some places become unable to provide food security and jobs to the population; significant internal displacement and migrations could result, with large negative impacts on regional or even global stability;
    - *Conflict:* Some evidence suggests that climate change may increase local and subnational conflicts, again with impacts that could extend throughout a region and globally;
    - *Humanitarian crisis* cost.

In summary, the proposed level of concessionality is justified by the significant role of public goods; the presence of both substantial market and non-market barriers; the expected transition to sustainability over the life of the project; and the large leverage of investment expected from GCF funds.

B.6. Exit strategy and sustainability (max. 500 words, approximately 1 page)

The Facility will help the recipient countries to develop adequate systems to sustain the results and benefits beyond project closure, where possible. As provided in the Guiding Framework for the Use of Climate Finance, in its use of concessional funds, the WB is prepared to stay the course to support a change in trajectory up to the tipping point, where the targeted barriers to implementation are overcome and commercial finance can take over. Projects will signal that concessionality is timebound, delimited by a clear exit strategy, and intended to encourage and support policy changes that promote the adoption of nascent technologies and solutions.

Financial. The financing package (including the GCF portion of the financing) will be designed to ensure that it does not distort the market or displace other sources of funds. Depending on the nature of the project, the design will incorporate actions that aim to stimulate the participation of the private sector and provide economic opportunities for end-user beneficiaries.

Knowledge exchanges will be organized to foster cross-pollination and the dissemination of best practices at local, national and regional levels and help leverage the lessons learned. The experience shows that events that involve experience sharing among different communities, institutions or countries sharing their experience with cooling is a proven and rich instrument to support continuity, dissemination of best practices and replication at a larger scale.

Technical and implementation arrangements. The World Bank will help EEs develop and put in place implementation arrangements with features (e.g., structure, budget and capacity requirements) that can be sustained beyond the life of the respective projects. In order to ensure the sustainability of the investments, the EEs will ensure that the beneficiaries receive adequate training to conduct O&M to ensure continuous operation of the equipment and infrastructure and/or may subsequently enter into an O&M contract. A key area of focus will be contributing to the development of local technical capacity, taking into account gaps, needs and context relevant to each project. Further, and importantly, the Facility will provide support to strengthen EE's enabling environments, including, for example, the development and adoption technical standards, policies and practices for sustainable cooling that can be sustained, as well as expanded over time.

C. FINANCING INFORMATION

C.1. Total financing

(a) Requested GCF funding (i + ii + iii + iv + v + vi + vii)	Total amount	Currency
	157	million USD ($)

GCF financial instrument		Amount	Tenor	Grace period	Pricing
(i)	Senior loans	29	40 years	10 years	No interest
(ii)	Senior loans	96	20 years	5 years	0.75% interest rate
(iii)	Equity				
(iv)	Guarantees	-	-		
(v)	Reimbursable grants	-	-		
(vi)	Grants	32			
(vii)	Results-based payments				

(b) Co-financing information[59]	Total amount	Currency
	722.84	million USD ($)

Name of institution	Financial instrument	Amount	Currency	Tenor & grace	Pricing	Seniority
World Bank (IBRD)	Senior Loans	130	million USD ($)	tbd	tbd	Options
World Bank (IBRD)	Senior Loans	27.4	million USD ($)	10 years 3 years	Floating interest rate 0.25% front end fee 0.25% commitment fee	Options
World Bank (IBRD)	Senior Loans	20	million USD ($)	25 years 5 years	Floating interest rate 0.25% front end fee 0.25% commitment fee	Options
World Bank (IDA)	Senior Loans	86	million USD ($)	38 years 7.5 years	no interest 0.75% service fee 0.5% commitment fee	Options
World Bank (IDA)	Senior Loans	150	million USD ($)	30 years 5 years	0.71% interest rate 0.75% service fee 0.5% commitment fee	Options
World Bank (IDA)	Senior Loans	150	Million USD ($)	tbd	tbd	
World Bank (IBRD)	Guarantee (TBD)	50	Million USD ($)	tbd	tbd	
World Bank (IDA)	Grants	80.5	million USD ($)			
Global Financing Facility	Grants	25	million USD ($)			
Health Emergency Preparedness and Response Trust Fund	Grants	3	million USD ($)			
Pandemic Emergency Facility	Grants	0.94	million USD ($)			
	Amount		Currency			

[59] The World Bank (IBRD/IDA/TF) co-financing amounts are indicative and subject to approval by the World Bank Board and agreement with the EEs.

(c) Total financing (c) = (a)+(b)	879.84	million USD ($)
(d) Other financing arrangements and contributions (max. 250 words, approximately 0.5 page)	Not applicable.	

C.2. Financing by component

Table - *Financing by Component*

Component	Indicative cost million USD ($)	GCF financing		Co-financing[60]		
		Amount million USD ($)	Financial Instrument	Amount million USD ($)	Financial Instrument	Name of Institutions
Component 1 – Policy, regulatory and enabling environment support	91.6			46.1	Senior loans	World Bank
		15.7	Grants	21.6	Grants	World Bank
				0.25	Grants	Health Emergency Preparedness and Response Trust Fund
				8	Grants	Global Financing Facility
Component 2- Financing for cooling investments	769.04	125	Senior loans	509.8	Senior loans	World Bank
		16.3	Grants	47.5	Grants	World Bank
				50	Guarantee (TBD)	World Bank
				2.5	Grants	Health Emergency Preparedness and Response Trust Fund
				0.94	Grants	Pandemic Emergency Facility
				17	Grants	Global Financing Facility

[60] The World Bank (IBRD/IDA/WB-administered TFs) co-financing amounts are indicative and subject to approval by the World Bank Board and agreement with the EEs.

Component 3 – Project management	19.2			7.5	Senior loans	World Bank
				11.45	Grants	World Bank
				0.25	Grants	Health Emergency Preparedness and Response Trust Fund
Indicative total cost (million USD)	879.84	157		722.84		

C.3 Capacity building and technology development/transfer (max. 250 words, approximately 0.5 page)

C.3.1 Does GCF funding finance capacity building activities?	Yes ☒ No ☐
C.3.2. Does GCF funding finance technology development/transfer?	Yes ☒ No ☐

GCF funds will be used to support activities that aim to strengthen policy, regulatory and enabling environments that support scaling up and sustaining cooling-informed investments and building the capacity of key stakeholders. This includes inputs and learnings relevant for inclusion in cooling action plans as well as in the NDC revision process. Important co-benefits such as increasing resilience and adaptive capacity would also be highly relevant to inform national adaption and disaster risk strategies and plans. Activities linked to capacity building will be important and can take various forms, including, for example for the testing, labelling and standards for cooling technologies (e.g., different appliances and equipment for space cooling and/or cold chains), the labelling of energy efficient buildings. A key feature will be supporting the removal of barriers in order to help increase the demand for efficient cooling technologies and investments and stimulate self-sustaining markets in the relevant sectors. Experiences and lessons will be documented to contribute to building capacity even beyond the context of countries supported by the Facility.

The Cooling Facility will be technology agnostic and support continued technological innovations, as long as the proposed technologies lead to more energy-efficient and climate-friendly cooling services and are in line with the criteria established for the Cooling Facility. The performance of proposed cooling solutions should have been demonstrated through laboratory testing and/or field-based data.

D. EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA

This section refers to the performance of the project/programme against the investment criteria as set out in the GCF's Initial Investment Framework.

D.1. Impact potential (max. 500 words, approximately 1 page)

- *Programme level*

The proposed Facility is designed as an innovative, multi-sector and multi-country programmatic financing mechanism with the goal of transforming the cooling sector in the target countries. With a cross cutting-adaptation and mitigation- approach, the Facility will bring about access to cooling which is essential in a warming world and especially critical to help build resilience in countries facing risks of extreme heat hazards, as well as help chart a sustainable path to low carbon development (impact potential).

- *Adaptation*

In the Facility countries at high risk of facing extreme heat hazards- Bangladesh, El Salvador, Malawi, and Somalia - the impact of the Facility-supported sustainable cooling investment are expected to reach over 8 million direct (and over 16 million indirect) beneficiaries[61]. It is estimated that the expected direct beneficiaries will amount to approximately 0.44 million in Bangladesh (and more than 4.5 million indirect beneficiaries), 1.3 million in El Salvador (and almost 4 million indirect beneficiaries), 251 thousand in Malawi (and 1.7 million indirect beneficiaries) and 2.2 million in Somalia (and 6.6 million indirect beneficiaries)[62]. The Facility's projects will increase resilience to climate impacts of buildings in Bangladesh, of agriculture cold chains in Malawi, and of health cold chains and facilities in El Salvador and Somalia. These climate-resilient cooling assets (more than 16,000 cooling assets) will also contribute to the Facility's mitigation impact (along with the cooling investments in the Facility's 5 other countries).

- *Mitigation*

Overall, it is conservatively estimated that the Cooling Facility will lead to approximately 1 million ton of avoided or reduced GHG emissions (compared to BAU) per year across the sustainable cooling investments made in the 9 countries that are part of the Cooling Facility. This amounts to over 10.7 MtCO2e over the 10-year implementation lifetime of the Facility, and over 18 Mt CO2e over the lifespan of the cooling assets (which represents about 2% of today's global cooling-related emissions). This estimated GHG mitigation potential for the Facility is calculated based on an ex-ante assessment of each of the identified project in the different cooling target areas utilizing best-practice and publicly available tools and methodologies and conservative assumptions. The program's impact potential stems from the combination of interventions of different types of projects that engage different business, financing and delivery models based on the barriers faced in different markets. The program encompasses projects that, for example,

- promote passive measures to provide comfort while avoiding the need for mechanical cooling (for example, advanced thermal protection in building envelope, natural ventilation and cool roofs) – *space cooling*;
- increase energy efficiency by deploying energy-saving cooling technologies in buildings (for example, super-efficient air conditioners, energy-efficient chillers) – *space cooling*;
- promote sustainable refrigeration and cold chain infrastructure – *refrigeration and cold chains*; or
- promote the deployment of renewable energy to power cooling such as solar refrigerators and agriculture chillers– *refrigeration and cold chains*.

Given the diversity in the types of projects/sectors covered under the two target cooling areas, different calculation models and resources are required to estimate GHG emissions reductions, complemented by empirical data to derive assumptions. The main tools used to calculate GHG emissions are consistent with the International Financial Institution Technical Working Group (IFI-TWG) Guidelines for Harmonized Approaches to GHG Accounting. These tools are:

1) IFC EDGE "Excellence in Design for Greater Efficiencies" software application to estimate (EEff buildings)[63]
2) HOMER Powering Health (vaccines cold chains and health facilities)[64]

Annex 23 of the funding proposal outlines in more detail the GHG calculations for each of the projects covered by the Facility and Annex 24 describes the methodology and assumptions considered to perform the calculations.

[61] Initially the supported climate-friendly and heat resilient health cold chains and facilities will support health system strengthening for the countries' COVID-19 response, but later in the life of the assets potentially for vaccines and treatments to combat other existing and new diseases, including possible climate induced diseases

[62] See Annex 17 as well as Annex 23 for an overview of the assumptions and methodology to estimate the projects' beneficiaries.

[63] See https://app.edgebuildings.com

[64] See https://poweringhealth.homerenergy.com

The Facility's experience and approach in assessing and achieving significant GHG impact through its 2 cooling target areas in different countries and sectors will contribute to building the information and know-how basis to facilitate and stimulate the expansion of sustainable cooling more systematically in climate change plans and strategies more broadly.

- *Space cooling*

Through the Facility's support, space cooling projects will be promoting both higher efficiency and lower GWP refrigerants uses, thereby shifting the BAU trajectory of cooling GHG impact towards sustainable high efficiency/low GWP cooling. It is expected that the largest share (more than three quarter, i.e. 12.6 MtCO2e from energy efficiency in space cooling) of the program's GHG mitigation impact over its lifespan[65] will be achieved from EEff space cooling – in line with the large contribution of this cooling target area to global emissions (amounting to 1,135 MtCO2e/yr worldwide and growing significantly to about 2,070 Mt Co2e in 2050 – representing 18% of the increase in the total CO2 emissions associated with global electricity consumption to 2050[66]) and the significant potential to shift downward that global space cooling emissions curve[67]. The GHG impact is further enhanced when adding the lower and lower GWP refrigerant use, considering that refrigerants are powerful GHGs in their own right.

The space cooling projects under the program assume a **minimum energy efficiency improvement of 20%** compared to BAU, with ex-ante calculations for EEff buildings projects using the internationally recognized IFC "EDGE" green buildings software application[68] to calculate energy savings for different types of buildings. The EDGE software and methodology has been customized to the specific local circumstances providing base cases for typical buildings by using empirical data from actual buildings reflecting current practice and taking into account climatic conditions of the location, building type and occupant use, with assumptions updated as the market evolves[69].

- *Refrigeration and cold chains*

The Facility will help catalyze a greening of the cold chain by improving the efficiency of refrigeration, storage and distribution infrastructure for agriculture and health using low GWP refrigerants.

The Facility aims to also support climate friendly cooling in the context of health facilities and cold chains to safely store vaccines and medicine. Some of the cold chain investments will involve solarization to meet cooling needs of the health facilities and cold chains. To estimate the energy requirements (to be provided by renewable energy), the energy savings, the lower GWP refrigerants and the overall GHG impact, the following well known known tools will be used: the IFC EDGE tool; the HOMER (Hybrid Optimization of Multiple Energy Resources) Powering Health tool[70] (for the assessment of distributed solar power).

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[65] The lifespan of the program – the estimated period during which the impact of the program will be felt) is 27 years. This is different from the program's implementation period (10 years) which is the basis for calculating the Facility's indicators.

[66] IEA (2018) *The Future of Cooling*.

[67] In fact, it is estimated that the current global emissions from space cooling could have been less than half with more efficient buildings and efficient cooling appliances (ESMAP 2020). The IEA estimates that EEff space cooling – as represented in its "Efficient Cooling Scenario" , would lead to less than half of the energy used for space cooling under the Baseline Scenario.

[68] See https://edgebuildings.com/. The EDGE software can be used for free to help design an energy and resource efficient building in more than 160 countries. The EDGE software calculates utility savings and reduced carbon footprint of a buildings. (A building achieving a minimum projected reduction of 20% in energy, as well as water use and embodied energy in materials compared to a standard BAU building in that same market may be eligible for EDGE certification.)

[69] More information on the EDGE methodology can be found here: https://edgebuildings.com/learning/methodology/ /

[70] Information on Homer Powering Health Tool is publicly available on their website: https://poweringhealth.homerenergy.com/. The tool is free online and can be used to create initial designs of electric power systems for health care facilities that have no other power supply or have grid electricity available for a predictable period of hours each day.

The GHG emissions reductions associated with the promotion of more climate-friendly refrigeration and cold chain through the Facility's projects are estimated to reach about 2.7 MtCO2e over the lifespan of the program, accompanied by important co-benefits (see below).

- *Off-grid cooling powered by renewable energy*

Enabling the expansion of affordable cooling in off-grid contexts will help reach some of the poorest communities and to contribute to enhancing their resilience to the impact of climate change. Indigenous and non-GHG emitting renewable energy (solar) will mostly power (126 MW) these critical cooling services.

- *Kigali Amendment and Refrigerants*.

The Facility will also support the goals and requirements of the Kigali Amendment to the Montreal Protocol by helping countries in the transition to more climate-friendly refrigerants by catalysing more energy efficient cooling equipment (air conditioners and refrigeration) in parallel with HFC phase down. The more climate-friendly refrigerant for specific projects would be determined based on the specific market and application of the more efficient cooling application and guided by the May 2019 Report of the Technology and Economic Assessment Panel (TEAP) to the Montreal Protocol Parties Report on *Cost and Availability of Low-GWP Technologies and Equipment that Maintain/Enhance Energy Efficiency* [71]. The GHG benefits from this refrigerant transition supported by the Facility have been estimated ex-ante, in line with global estimates indicating that GHG emissions from the refrigerants represent about 20 percent of cooling equipment's overall GHG emissions. These GHG reductions achieved under the Facility's projects are estimated to amount to about 1.1Mt CO2e over the lifespan of the Facility.

- *Other impacts*

The Cooling Facility is expected to generate a number of co-benefits, notably in terms of health. The Facility's support for expanding and retrofitting the climate friendly vaccine cold chains in 3 countries (El Salvador, Sao Tome and Principe and Somalia) will help them respond to the current COVID-19 pandemic, increasing the capacity to store vaccines and lower the incidence of wasted vaccines and help reach larger shares of their populations in different parts of the country – which is critical for ensuring equity in their vaccination efforts. Health co-benefits – albeit of a different nature are also expected from the Facility's support for more sustainable space cooling (in Bangladesh, Panama, and Sri Lanka). These investments will help lower the incidence of heat-related illnesses[72], as well as mental stress[73].

Other expected co-benefits are linked to improved local air quality through the displacement/avoidance of diesel generators, especially in the context of support going towards the solarization of cold chains.

The Cooling Facility's support in sustainable cooling in the agriculture sector in Malawi as well as Kenya, will also contribute to efforts to lower current high rates of food loss and indirectly to help boost efforts to address malnutrition.

As countries' face economic downturns associated from the COVID-19 pandemic, investments in sustainable cooling supported by the Cooling Facility will contribute to countries' efforts to address unemployment and efforts to build back better. In fact, space cooling investments in new buildings and retrofits in particular have been identified in several countries to help boost local employment opportunities[74].

D.2. Paradigm shift potential (max. 500 words, approximately 1 page)

[71] Volume 4: Decision XXX/3 Task Force Report on Cost and Availability of Low-GWP Technologies and Equipment that Maintain/Enhance Energy Efficiency (https://ozone.unep.org/science/assessment/teap)
[72] Heat stress starts to occur when the human body reaches a temperature above 38oC (i.e., 1oC above its normal temperature of 37oC). (Steffan, Hughes and Perkins 2014, as reported in ESMAP 2020).
[73] Experts have found links between heat and aggressive or violent behavior, which also has implications for domestic violence, with women and children bearing the brunt of such situations (Cooper 2019; Anderson and DeLisi 2011. Discussion also reported in ESMAP 2020)
[74] For example, see the IEA December 2020 report on Energy Efficiency 2020 (https://www.iea.org/reports/energy-efficiency-2020/energy-efficiency-jobs-and-the-recovery) and IRENA (https://www.irena.org/publications/2020/Apr/Global-Renewables-Outlook-2020)

At a time when the needs for cooling are intrinsically linked with efforts to meet SDGs and to build resilience to impacts from a dangerously warming planet, and when the global cooling demand is increasing exponentially, but on a trajectory that is costly, inefficient and high in GHGs, there is an opportunity now to set the stage for changing course and support a paradigm shift. The potential is huge: maximizing energy efficiency in the cooling sector (refrigeration and space cooling) while simultaneously phasing down HFCs contained in refrigerants, the world can potentially avoid close to 1°C by 2100.

The Cooling Facility proposes to catalyze a paradigm shift by working across key cooling target areas and with a range of countries from different parts of the developing world to amplify the potential to leverage its experiences and learnings. In so doing, the Facility seeks to provide pioneering examples that can be emulated through development and demonstration of models and approaches that can be scaled up and be fit-for-purpose in more countries with similar circumstances, and thus further stimulate scaling-up the shift to sustainable cooling investments. Through a combination of targeted technical assistance and policy dialogue offered in conjunction with investment support for country-identified national priority sectors, the Facility seeks to build evidence and generate a track record, working with local leaders and champions to elevate sustainable cooling as a multi-focal investment and regulatory, administrative and policy action area at national level that can contribute to – and has synergies with – key climate and development goals (including efforts to respond to the COVID-19 pandemic and to build back better). The investment component will allow governments to see how the policy activities are delivering at sector level, put in place implementation structures and financial mechanisms that can be scaled up and/or see their scope broadened, and ensure that valuable lessons are learned while technology to enable achievement of ambitious objectives at country level is being transferred. In order to shift from one-off investments to financially sustainable and scaled-up investments, the Facility includes projects adopting different implementing models that aim at (i) revolving-financing that allow financing to continue after the end of the projects and (ii) enabling private sector entities to engage and invest in project activities in the longer term, as well as (iii) sending strong market signals for shifts towards sustainable cooling through public procurement (in the case of the health sector in particular) and incentives.

For example, credit lines help local banks develop a business line for cooling-investments and build their capacity to identify, assess, and originate loans for cooling-investments so that local banks can continue supporting these investments beyond the project duration. Developing ESCOs that provide financing as well as services to design and implement cooling and energy efficiency measures would address both the financing and capacity barriers that prevent cooling-investments from being implemented. EERFs collect energy cost savings to recover the capital expenditure for cooling-investments so that the funds can be re-invested and the EERF can become a sustainable entity. In addition, the EERF sustains its staff over the long term and builds its capacity – in contrast to project management units that are usually dissolved after the project end. The development, implementation, and demonstration of such models will allow investments to continue and scale-up and create experience that can be shared with and replicated in other countries after tailoring the solutions to the specific context.

Moreover, the Facility will help countries mainstream sustainable cooling into development and climate plans, procurement strategies and policy/regulatory frameworks and also help train and build the capacity of relevant stakeholders, while also helping raise awareness of the availability and benefits of sustainable cooling measures and technologies. These efforts are aimed at building an enabling environment for further scale-up of sustainable cooling beyond the Facility's investments.

The Facility's support to El Salvador, Sao Tome and Principe, and Somalia is targeting efficient and climate friendly cooling in the health sector, seeking to internalize sustainable cooling in efforts to strengthen health systems to leave countries better prepared for current and any future public health emergencies with greater sustainability.

In the buildings and cooling appliances sectors (e.g., in Bangladesh, North Macedonia, Panama, Sri Lanka), the Facility also seeks to facilitate and mainstream better access to cooling by supporting enabling environments and sustainable implementation mechanisms adapted to local institutional and policy frameworks, working with strong local partners and mobilizing private sector capacity and financing. The pioneering examples are designed to be taken to scale, and with positive results, the expectation is that these examples would inspire others to emulate them.

In the agriculture and off-grid sectors (Kenya, Malawi), the Facility will support new financing mechanisms and help build capacity and awareness and greater affordability highlighting contribution to productivity. Positive results with these projects are expected to provide powerful ammunition for scaling up with the countries and beyond. As many African countries' economies have high reliance on the agriculture sectors and also vulnerable to climate change, the ground is literally fertile for a push for sustainable cooling if we can demonstrate practical mechanisms that can bring greater affordability.

At the same time the Facility's projects are supportive and aligned with each country's climate change priorities and can support further ambition.

D.3. Sustainable development (max. 500 words, approximately 1 page)

The delivery of cooling efficiently is essential for both **Affordable and Clean Energy (SDG 7)** and **Climate Action (SDG 13).** If cooling efficiency remains unchanged, additional power generation capacity of 2,500 GW will be needed to meet electricity demand for air conditioning by 2050 – an estimated cost of ~US$1.7 trillion. Increased access to cold chains is critical to ensuring food safety and reducing food loss and waste. Climate friendly technologies are necessary to reduce associated GHG emission (estimated at 4.4 GT CO2e, i.e., 8% of global GHG emissions). By maximizing energy efficiency in the cooling sector (refrigeration and space cooling) while simultaneously phasing down HFCs contained in refrigerants, the world can potentially avoid close to 1°C by 2100. In addition to climate mitigation, increasing access to sustainable cooling in developing countries, especially those located in the tropics and sub-tropics, will also contribute to SDG 13 by supporting greater resilience and improved health and livelihood of vulnerable people, communities, and regions.

Protecting workers and communities from extreme heat is critical in order to achieve **Decent Work and Economic Growth (SDG 8)** and **Sustainable Cities and Communities (SDG 11).** Higher temperatures and lack of cooling negatively impact performance labor productivity. It is estimated that by 2050, work hours lost due to heat may be as high as 12 percent in the worst affected regions of South Asia and West Africa – representing 6 percent of annual GDP. In urban environments, average temperatures have been increasing at twice the rate of global change, largely due to the Urban Heat Island (UHI) effect. Annual mean air temperatures of cities can be 1-3°C higher than their surroundings (at night, the temperature difference can be as high as 12°C). The need to reduce excess urban heat is one of the key resilience and sustainability challenges of the 21st century.

Cooling and thermal comfort are also key to **Zero Hunger (SDG 2), Good health and well-being (SDG 3,** and **Gender Equality (SDG 5).**

As noted in Section B, in developing countries, many with undernourished populations, around 40 percent of food produced (amounting to more than 250 million tons), including 1 in 4 fish caught, is lost between harvest and market.

• Heat is now the deadliest global natural disaster in an average year, posing the greatest risk for vulnerable populations. High temperatures increase the risk of heatstroke, breathing issues, heart attacks, asthma and kidney problems. Unreliable medical cold chains put at risk the effectiveness of vaccines and other medical supplies

• While more data and analysis are needed to better understand the gender aspect of access to sustainable cooling, gender risks are evident (SEforALL 2019). Women and girls are often disproportionately impacted by a lack of access to sustainable cooling and enhanced access could lead to lower vulnerability to mortality

risk and poverty. Furthermore, through the Facility, has a unique opportunity to pro-actively address gender gaps across entrepreneurs, employees and at the consumer level.

There are numerous examples of potential contributions to support of the SDGs from possible projects. For example, the support to cooling appliances in Panama would lead to multiple benefits for consumers including cost-savings for households, particularly women, who typically spend more time homes, reduced food waste, and lower electricity bills. There are also significant health benefits associated with access to refrigeration in health care from the safe-storage of vaccines and other temperature-sensitive medication. Access to refrigeration will also reduce food waste for agricultural, dairy and livestock farmers, whilst agricultural and commercial refrigeration will boost revenues and incomes, and agricultural cold chains will reduce hunger and malnutrition.

The proposed North Macedonia project will also have significant gender benefits through increased women's representation in the engineering professions with a focus on EEff, by providing targeted training program for women and increasing awareness about employment opportunities under the Project investments. The Project includes an indicator—the percentage of female staff hired under service contracts for technical and design work under the Project—to measure these impacts. The Malawi project seeks to specifically target women-owned enterprises.

D.4. Needs of recipient (max. 500 words, approximately 1 page)

Recipient needs to adapt to rising temperatures vary with the country context. For example, from the energy perspective, countries such as Bangladesh, North Macedonia, Sao Tome and Principe are fossil-fuel dominant. Others face rapidly growing peak energy demand, including for cooling, which strain already unreliable electricity systems and increase the use of high carbon-emitting sources of supply (e.g., Bangladesh, Sri Lanka, Panama, El Salvador)[75]. Finally, countries such as Somalia, Malawi[76], El Salvador, Sao Tome and Principe and Kenya are likely to default to carbon-intensive cooling solutions, as they focus on providing universal access to electricity services.

The Facility-supported interventions would enable these countries to meet their cooling needs in a more climate-friendly way and contribute to lower GHG emissions by: (i) strengthening their institutions and implementation capacity to adapt the rising temperatures; and (ii) addressing the barriers (as outlined in Section B.1[77]), including the absence of adequate sources of financing for climate-friendly cooling investments. Instead of proposing a single solution to all, the Facility takes a bottom-up approach to sustainable cooling solutions, favoring measures, mechanisms and strategies that are grounded on each country's institutional and policy framework and building on countries' priorities, the respective sector context and best suited to address the challenges and needs of the local recipients. The section below summarizes the Facility's alignment with the individual countries' needs.

Bangladesh. Bangladesh is among the World's most vulnerable countries to the effects of climate change. The country is also facing both serious energy security challenges and severe heat stress, equally across its high-income residents, low-income neighborhoods and informal slum settlements. Challenges to mainstreaming sustainable cooling include making solutions affordable among poor populations, overcoming consumer resistance to the higher first cost of more efficient equipment, and enabling greater consideration of cooling in new building design and approval. The share of energy consumption for space cooling, in buildings in particular, is rising rapidly due to increased urbanization and growing income and increased reliance on air conditioning in public, commercial and high-end residential buildings.

Pressures to meet growing demand for sustainable cooling services, could result in significant increases in coal-fired generation by 2030 if nothing changes. Greater use of renewable energy and faster progress to scale-up energy efficiency will be needed to help steer development in a more climate-friendly way. Buildings and appliances EEff are an important part of the EEff efforts under the Environment Conservation Act and

[75] See, for example, World Bank Open Data (data.worldbank.org).
[76] Malawi ranks among the top-10 countries with rural poor at cooling risk (SEforALL, 2020).
[77] Section B.1 also outlines the key challenges from a sector perspective.

the Bangladesh Energy Efficient & Conservation Master Plan. Integrating EEff and passive building design features and energy efficient cooling at scale now is key for building a more sustainable infrastructure at lower costs and lower pressures on the electricity grid.

El Salvador. El Salvador is the smallest country in Central America with a poverty rate (based on a US$5.5 per person per day poverty line) of 29% and extreme poverty (US$3.2 per person per day) of 8.5% as of 2017. Given its tropical geographic location, biodiversity, and topography, El Salvador is particularly vulnerable to increasing temperatures (which are predicted to increase between 1.4 and 2 degrees by 2050) and rising sea levels (a rise of up to 8cm by 2050 is predicted).

The challenges to El Salvador's health system and the Government's ability to implement measures as a response to COVID-19 are exacerbated by the observed and anticipated impacts of climate change. These impacts are expected to lead to more frequent natural disasters, such as floods, droughts, and tropical storms. These disasters in turn could lead to increasing damages to health care facilities, possibly disabling them completely at times when their services are most required. A large proportion of El Salvador's vulnerable population are the elderly (11.7%) and the adult population with underlying risk factors such as obesity and non-communicable diseases (40%). These two groups are those also most at risk to COVID-19.

To ensure an effective COVID-19 response and generate long-lasting resilience and be prepared to handle future health crisis, the Government of El Salvador seeks to strengthen the overall national immunization and related health delivery systems. This includes a variety of issues, including safe and appropriate cold chain and relates services. The key challenges are timing and financial means to enable the Government of El Salvador to take advantage of the window of opportunity of revamping its cold chain to ensure it is safe, as well as climate friendly.

Kenya. Demand for cooling is projected to grow significantly in the Nairobi and Mombasa markets -- 1.8 million cumulative unit sales between 2020 and 2030 for off-grid households alone. In addition, there are an estimated 3.4 million off-grid households in Kenya that could realize a direct net economic benefits from owning a refrigerator. Energy efficiency will help lower the projected energy consumption to meet Kenya's cooling demand, and in doing so reduce utility bills for households and businesses, decrease the need for additional power supply, and increase energy access while also reducing GHG emissions in line with the country's climate mitigation goals. In the off-grid context, furthering access to cooling solutions will contribute to the development of productive uses of electricity, which is necessary for the viability of energy access efforts (with renewable energy). In the context of nearly 40% of food perishing before it reaches a consumer in Sub-Saharan Africa, enhancing access to cooling will contribute to increasing overall climate resilience of the population by improving food security through reduced post-harvest losses, create employment opportunities, enhance resilience to shocks, and stimulate economic growth. Challenges include the need for innovative business models to make cold chains available to small farmers as well as financing for the higher first cost of more efficient AC systems for residential and business applications.

Malawi. Malawi is a small, low-income landlocked country in south-eastern Africa, with most of its people living below the poverty line. The country is subject to frequent macroeconomic and climatic shocks. Malawi's private sector is mostly informal with a few largescale companies capturing most economic opportunities. Micro, small and medium enterprises (MSMEs) often operate in the informal sector, have low capacity, and are primarily concentrated in the service sector, such as wholesale, retail and trade. A key constraint indicated by MSMEs is the lack of access to financing and perceptions of risk for new technologies and innovative business models within the financial sector. MSMEs can potentially drive employment; yet, they face numerous challenges that constrain their ability to contribute to economic growth. Lack of access to cooling, in particular more sustainable cooling solutions with lower operational costs, is hindering

economic opportunities for MSMEs involved in a number of important sectors, such as dairy and horticulture (fruits and vegetables).

Many firms, especially smaller ones, face capacity and capability gaps, going from attitude/mindset to skills with respect to financial literacy, management practices, business language, market assessment, and behavioral characteristics of successful entrepreneurs. The majority of MSMEs (89 percent) are informal, 36 percent do not keep records, and 45 percent lack innovation and diversification (FinScope survey 2019). Among several challenges, most women and youth-led entrepreneurships are said to be unaware of the process or the importance of formalizing their activity. Promoting investment opportunities in sustainable cooling investments, with a focus on women and the youth, will contribute to providing economic opportunities and strengthening the resilience to climate change of vulnerable and marginalized population groups, while also avoiding expensive and polluting energy consumption. In this context and given barriers mentioned earlier, Malawi is looking at credit lines as a suitable implementation model that can kick start the transformation towards more sustainable cold chains in its agriculture sector targeted at MSMEs by facilitating access to financing among MSMEs.

North Macedonia. North Macedonia is a landlocked country at the heart of the Balkans, characterized by its mountainous terrain that is intersected by valleys and lowlands. Many public buildings (including schools, health care centers/clinics, universities, etc.) are 50+ years old and classified as underheated, unsafe (due to structural instability and seismic risks) and dilapidated. In fact, buildings, which consume about 39 percent of the energy, have been identified in the country as a major priority, with estimates of savings from 20-40 percent. The public sector has the greatest potential, with about 35-40 percent savings, mostly in the health and education sectors. While the focus in the past has been on heating, projected increases in summer temperatures in Europe are expected to substantially increase the demand and need for cooling, especially in schools and hospitals. Improving thermal renovations of public buildings will substantially reduce their future cooling loads, which will contribute to the country's adaptation to the changing climate.

Several challenges need to be addressed for the public sector to invest in sustainable cooling. Central government buildings typically have very limited budgetary provisions for capital improvements, if any, and usually are not allowed to borrow. Municipalities must undergo the fiscal decentralization process and, even then, have stringent debt limitations which many have already reached. Few have formal credit ratings. Thus, while energy efficiency investments can pay for themselves through cost savings, traditional debt financing has been difficult to mobilize for the public sector, effectively forming a barrier to EEff renovations in public buildings. A combination of capacity building, institutional reforms, and demonstration, along with a financing mechanism designed specifically for the public – including municipal – context, will be needed to overcome these barriers. In the context of the COVID-19 situation, rehabilitation of health care facilities, with adequate air conditioning systems, are expected to become higher priorities. Given the specific conditions and barriers mentioned above, North Macedonia is seeking to tackle space cooling in the public sector – and lower its energy consumption and associated GHG emissions - through the establishment of an energy efficiency fund, a sustainable financing mechanism that is well suited for its circumstances and targeted sector.

Panama. In the past ten years, Panama´s cooling appliances market has been growing rapidly for both ACs and refrigerators technologies. AC penetration in the residential sector is relatively low but is expected to rapidly increase in line with the country's dynamic economic development (e.g., residential household AC ownership stood at 8.9 percent in 2000, compared to 15.6 percent in 2010 and is expected to grow to an estimated 66 percent in 2050). According to the National Energy Plan of Panama (Plan Energético Nacional 2015-2050), cooling systems´ consumption currently represent about 40 percent of the overall electricity consumption in Panama. The electricity sector is facing serious challenges in keeping up with rising electricity demand, which is growing at an average annual rate of 8.5 percent per year mainly due to an increased use of cooling equipment in the residential and commercial sectors. In order to align with Panama's climate change objectives and commitments (NDC), the pace of energy demand growth needs to be reduced from an average 6 percent in the business-as-usual scenario to around 4 percent, which would reduce the need of capacity additions by 38 percent.

Several barriers must be addressed to respond to this rapidly growing problem. Though Panama has a sophisticated banking sector, the absence of i) dedicated EEff credit lines priced to incentivize investments in EEff and ii) local long term capital market for mortgages (access of local banks to capital markets is limited to up to 5-years bonds), and iii) limited technical capacity in local banks to assess EEff products and investments, represent a major barrier for EEff in Panama. The higher initial cost of EEff equipment and lack of access to affordable financing are hindering the adoption of more sustainable cooling solutions and could lock-in large quantities of inefficient, polluting but cheaper (on a first cost basis) cooling equipment. Law 69-12 mandates the establishment of an energy efficiency fund. The national Fondo de Eficiencia Energética (UREE Fund) aims to be transformational by catalyzing private investment, reducing the high-risk perception associated with green buildings and energy efficient cooling appliances, and improve market liquidity for energy efficiency initiatives. Credit lines facilities will help transform the residential and commercial sectors and leverage private sector capital.

Sao Tome and Principe. The Republic of Sao Tome and Principe is a small low-middle-income country comprised of two main islands. It has a total population of approximately 200,000 people, 42.6% of whom are 14 years of age or younger. In addition to having a small population and a remote location, there is a high fixed cost of public goods— all factors that affect the country's trade, fiscal accounts and human development outcomes.

With 1,054 COVID-19 confirmed cases as of January 8, 2020, Sao Tome and Principe showed one of the highest contamination rates (441/100,000 people) in the region and still has limited capacity to handle the COVID-19 outbreak. The Government was unable to quickly establish laboratory capacity to diagnose COVID-19 due to the interruption of commercial flights to the island in the begging of the pandemic. After several months without having laboratory capacity to diagnose COVID-19, early efforts to contain local transmission (first case diagnosed in early April) were hindered by incapacity to confirm diagnosis and isolate cases, perform contact tracing and slow transmission. This capacity was finally established in July, alongside with improved hospital capacity to manage cases and trained surveillance teams to perform contact tracing. Notwithstanding the fact that the country is now better prepared to diagnose, isolate, treat and track COVID-19 contacts, a significant and more comprehensive strategy to strengthen the public health systems will be key in ensuring that COVID-19 and future epidemics will be properly managed. As highlighted by the WHO, the investments and expenditures for COVID-19 should also lead to longer-term, wider benefits, in line with national needs for sustainable capacities. International collaboration and support to the Government will be crucial to continue mitigations measures to contain the spread of the pandemic in the country and to design and implement its National COVID-19 Immunization Plan.

Somalia. Somalia has experienced prolonged conflict beginning in 1991 and is among the poorest countries in the world with a per capita GDP of US$819 in 2019. An estimated 69% of the Somali population live in poverty (below US$1.9 per day, 2018 estimate) with many more living just above the poverty line. Somalia's struggling health outcomes reflect the country's insecurity, vulnerability and deep-rooted poverty, limiting opportunities for people to access basic social services, including education and health. Health service delivery data indicate weak health systems. The most recent reliable health service delivery data are from the recently released 2019 Somalia Health and Demographic Survey (SHDS). While geographically disaggregated SHDS are only available for Puntland and Somaliland, national-level and the limited disaggregated data show tremendous service delivery gaps. Health service utilization is low, particularly in the public sector, estimated at 0.23 outpatient visits per person per year and 0.81 hospital discharges per one hundred people per year (SARA, 2016). Clan structures are believed to have major impacts on service utilization, dictating which facilities people visit.

The global COVID-19 pandemic is a pressing problem in Somalia, exacerbated by an extremely weak primary health system, inadequate surveillance and laboratory capacity, and limited hospital services. As of January 7, 2021, Somalia had 4,726 confirmed coronavirus cases and 130 deaths, with anecdotal reports of additional, unconfirmed cases and quickly rising deaths. The government and development partners have taken important steps to improve Somalia's COVID-19 response, including establishing testing capacity at the National Public Health and Reference Laboratory in Mogadishu, constituting rapid response teams, and

increasing intensive care unit bed capacity from 15 early in the outbreak to 47. However, very weak health system capacities in Somalia severely constrain the response. Moreover, pharmaceuticals and medicines expire and become ineffective more quickly in the very hot climactic conditions experienced in Somalia. There are major gaps in cold-chain capacity, which prevents expanding the currently extremely low vaccine coverage and will make distribution of COVID-19 vaccines difficult. Moreover, without support, it is expected that kerosene and petrol / diesel generator fueled equipment will be moved to increase cold storage capacity

Sri Lanka. Commercial (including government buildings) and industrial buildings contribute 60% of the electricity consumption in the country. Driven by economic growth, increasing income, rapid urbanization, and an expanding middle class, buildings also represent the fastest growing source of energy consumption in Sri Lanka. This rapid growth in the building sector also has significant implications for the power sector. Despite commendable progress in the last decade, development of the energy sector faces major challenges that, if not addressed, could bring into question its sustained long-term viability.[78] With inefficient energy consumption typical of existing buildings, there is a large untapped potential for energy efficiency improvement, estimated to be 30-50% across the public, commercial, industrial, and residential sectors. Air conditioning and ventilation are main energy uses. A large share of the commercial building stock is old and uses chillers that can be replaced with much more efficient and more climate friendly equipment.

In view of the above developments, the Sustainable Energy Authority (SEA) has identified the commercial buildings sector – where a large stock of existing buildings has old, inefficient chillers for space cooling – as one of the key targets for achieving its EEff improvement goals. SEA also has defined an ambitious Demand Side Management (DSM) program that includes chillers, fans, refrigerators, air conditioning and green buildings (including the potential of nature-based solutions such as green roofs and green walls). The key investment barriers are: lack of suitable financing, resistance to the higher initial cost of efficient equipment, and insufficient public awareness. Dedicated Eff credit lines, capacity building and enabling environment support would help address these concerns. Sri Lanka's selection of suitable implementation model needs to be applicable to commercial, residential as well as public buildings, enable greater energy efficiency space cooling at scale and foster the development and strengthening of the national ESCO (Energy Sector Companies) market in the country, and thereby establish the foundation for the transformation of space cooling.

D.5. Country ownership (max. 500 words, approximately 1 page)

Each of the proposed projects in the Facility has been discussed with relevant local authorities (usually line ministries) and has been presented to the relevant GCF National Designated Authorities (NDAs) who have issued no-objection letters. Engagements with several local stakeholders and partners to discuss issues related to the project have also occurred (as outlined Annex 7), although the extent and format of these engagements have had to take into account the disruption and restrictions linked to the COVID-19 pandemic.

The alignment of the Facility with the policy and strategy context of the beneficiary countries is summarized below:

- **Bangladesh**: The Government has prepared the Energy Efficiency Conservation Master Plan 2015-2030, which describes the adoption and implementation of EEff and conservation regulatory measures. In addition, the project will inform the Government's efforts in developing a national Cooling Action Plan. These efforts are aligned with the Facility's support of space cooling and EEff measures in buildings.
- **Kenya**: Under the Paris Agreement, Kenya has committed to reducing GHG emissions by 30%, or 142 MTCO2e, by 2030. The National Electrification Strategy presents a roadmap for achieving universal access to electricity by 2022. Supporting off-grid cooling appliances and access under the

[78] World Bank and International Finance Corporation 2019. Sri Lanka Energy InfraSAP © World Bank, http://documents.worldbank.org/curated/en/843901561438840086/pdf/Sri-Lanka-Energy-Infrastructure-Sector-Assessment-Program-Executive-Summary.pdf

Facility will contribute to both of these goals. Kenya is also in the process of developing a National Energy Efficiency and Conservation Strategy, which includes targets for energy savings in households, buildings and industry.

- **Malawi**: Promoting the use of energy efficient technologies and designs is one of the strategies advocated for in the Government's priority areas under the Malawi Growth and Development Strategy (MDGS III). Since agriculture is one of the major contributors to GHG emission, the Facility's support of clean and sustainable cold chains in agriculture will contribute to the achievement of the MDGS III goal.
- **North Macedonia**: As a contracting party of the Energy Community Treaty , the Government has committed to reduce energy use by 12% (about 200 ktoe) by 2018 in its 2020 Energy Efficiency Strategy (based on a 2010 baseline), more than the 9% required under the ECT's National Energy Efficiency Action Plans. Buildings, which consume about 39% of the energy, have been identified in the country as a major priority, with estimates of energy savings from 20-40%. The Facility will support achieving the Government's energy saving commitments through establishing a financing mechanism and investing into efficient space cooling of buildings.
- **Panama**: In 2012, the Government made a national commitment to EEff by approving the Law 69-12 "Rational and Efficient Use of Energy". In 2015, the National Secretariat of Energy published the National Energy Plan 2015-2050, which contemplates the design and implementation of the Rational and Efficient Use of Energy Program, as one of the key actions to meet the sector objectives. The country also ratified the Kigali Amendment in 2017, which aims to phase-down hydrochlorofluorocarbons (HFC). Panama is currently implementing the Stage II of its HFC Phase-out Management Plan (HPMP) under the Montreal Protocol. The Facility will support achieving the Government's commitments through its support for efficient space cooling.
- **El Salvador**: The Government is integrating climate friendly investments in its national programs and its NDC includes health as a sector affected by climate change and the promotion of a larger use renewable energy. This is aligned with the Facility's support for climate friendly health facilities and cold chain, which will help develop a more sustainable and resilient health system in the country to be able to respond to the COVID-19 pandemic as well as future public health crisis and challenges.
- **Sao Tome and Principe**: The country's NDC include promoting the greater use of renewable energy and list health as one of the sectors negatively impacted by climate change. The Facility will contribute to the Government's NDC through supporting space cooling and cold chains in the health sector, including through the increased use of solar power.
- **Somalia:** Somalia's NDC related to scaling up the use of solar energy is consistent with the Facility's to support for more climate friendly health facilities and cold chain, including through greater use of solar power.
- **Sri Lanka**: Demand Side Management is identified as one of the seven mitigation actions of the energy sector NDC of Sri Lanka to be implemented during 2020-2030. Regarding the regulatory framework, the Energy Efficiency Building Code was first introduced in 2002 and revised in 2008. The code sets standards for EEff in design and retrofits in buildings, at the same time providing methods for determining compliance. These efforts are aligned with the Facility's support of space cooling and EEff measures in buildings.

D.6. Efficiency and effectiveness (max. 500 words, approximately 1 page)

The financial structure of the Facility adequately balances the need to support low-carbon cooling investments, leverage additional resources from private and commercial investors, and enhance the enabling environment for cooling. The facility's requested level of concessionality from GCF is in line with providing the minimum level required to successfully address market failures. A more detailed justification of GCF funding is provided in section B5.

I. Co-financing and leverage

The US$157 million from GCF will be complemented by an expected US$ 722.8 million in World Bank[79] co-financing.

Cost-effectiveness

According to the International Energy Agency's Energy Technology Perspectives 2008 Report, a marginal cost of reducing a ton of carbon dioxide-equivalent of $200 is the lower-end estimate of the incentive needed to achieve the objectives of the "BLUE Map Scenario."[80] The Facility provides a cost-effective way to reduce GHG emissions with an overall cost-effectiveness ratio of $54.2 per ton of carbon dioxide equivalent avoided or reduced (accounting for the total investment, i.e. GCF plus World Bank co-financing).

II. Economic viability

An economic analysis was prepared for the cooling facility to assess its economic net value. The analysis considered the following costs and benefits: (i) investment outlays to the supported projects; (ii) reflows from the funds provided through the facility; (iii) avoided or reduced greenhouse gas emissions; and (iv) recycling and/or disposal of cooling appliances. Other economic outcomes such as improvement in health conditions of people living in underserved areas, or reduced food loss and waste due to efficient cold chains, have not been monetized. However, they are expected to significantly drive the economic viability of the proposed program. The results of the analysis show that the program yields a financial and an economic internal rate of return of -0.8 and 16.3 percent, respectively. The economic value add of the Facility is largely due to its contribution to GHG emission reduction potential of the Funded Activities. Further, the economic value of is very sensitive to the estimated cost of recycling (otherwise conducting environmental remedial actions) for appliances that have exceeded their useful lives. This finding highlights the importance of disposing of appliances in a climate-friendly and economic manner. The following table presents a summary of the results of the analysis.

Table 3: Economic Model Spreadsheet Summary[81]

Facility total financing				**Core indicator targets**			**Financial value add**		
Grant	$M	32	20.4%				Financial discount rate		3.0%
Loan	$M	125	80%	Total project financing	$M	879.8	PV of cash outlays	$M	(151.5)
Guarantee	$M	0	0%	Total public financing leveraged	$M	722.8	PV of cash inflows	$M	90.6
Total	$M	157	100%	Total private financing leveraged	$M	-	Financial net present value	$M	(61.0)
							Financial internal rate of return		-0.8%
IBRD/IDA/TrustFund co-financing				Expected lifetime emmis. reduction	MtCO2eq	16.2			
Grant	$M	109.4	15.1%	Est. total cost per tCO2eq	$	54.2			
Loan	$M	563.4	78%	Est. GCF cost per tCO2eq	$	9.7	**Sensitivities**		
Guarantee	$M	50	7%	Total leverage ratio	times	4.6	Unit cost of recycling/disposal	$	375.0
Total	$M	722.8	100%	Public co-financing ratio	times	4.6	Economic net present value	$M	504.2
Private sector funds lev	$M	0		Private co-financing ratio	times	0.0			
Facility cash inflows				**Economic value add**			Economic discount rate		5%
Loan repayment	$M	125.00		Economic discount rate		1.0%	Economic net present value	$M	248.8
Interest payment	$M	9.00		PV of economic benefits	$M	792.4			
Service charge	$M	4.13		PV of economic costs	$M	407.4			
Reflows from guarantee	$M	-		Net present economic value	$M	385.0	Economic discount rate		15%
Total	$M	138.13		Economic internal rate of return		16.7%	Economic net present value	$M	19.6

The detailed calculations, underlying inputs and assumptions are presented in Annex 3.

[79] The World Bank (IBRD/IDA) co-financing amounts are indicative and subject to approval by the World Bank Board and agreement with the EEs."

[80] IEA BLUE Map scenario explores a reduction of global GHG to 50 percent of current levels by 2050.

[81] The model considers the economic benefits of the assets over their economic lives. Such economic lifespan may exceed the implementation period of the Facility.

E. LOGICAL FRAMEWORK

This section refers to the project/programme's logical framework in accordance with the GCF's Performance Measurement Frameworks under the Results Management Framework to which the project/programme contributes as a whole, including in respect of any co-financing.

E.1. Paradigm shift objectives

☒ Shift to low-emission sustainable development pathways

☒ Increased climate resilient sustainable development

E.2. Core indicator targets

E.2.1. Expected tonnes of carbon dioxide equivalent (t CO_2 eq) to be reduced or avoided (mitigation and cross-cutting only)	Annual	912,658 t CO_2 eq
	Lifetime[82]	16,240,201 t CO_2 eq
E.2.2. Estimated cost per t CO_2 eq, defined as total investment cost / expected lifetime emission reductions (mitigation and cross-cutting only)	(a) Total project financing	879,840,000 USD
	(b) Requested GCF amount	157,000,000 USD
	(c) Expected lifetime emission reductions	16,240,201 t CO_2eq
	(d) Estimated cost per t CO_2eq (d = a / c)	54.18 USD
	(e) Estimated GCF cost per t CO_2eq removed (e = b / c)	9.67 USD
E.2.3. Expected volume of finance to be leveraged by the proposed project/programme as a result of the Fund's financing, disaggregated by public and private sources (mitigation and cross-cutting only)	(f) Total finance leveraged	922,840,000 USD
	(g) Public source co-financed	722,840,000 USD
	(h) Private source finance leveraged	-
	(i) Total Leverage ratio (i = f / b)	5.9
	(j) Public source co-financing ratio (j = g / b)	4.6
	(k) Private source leverage ratio (k = h / b)	-
E.2.4. Expected total number of direct and indirect beneficiaries, (disaggregated by sex)	Direct	4.22 million (of which 2.15 million are female)[83]
	Indirect	16.85 million (of which 8.51 million are female)[84]
	For a multi-country proposal, indicate the aggregate amount here and provide the data per country in annex 17.	
E.2.5. Number of beneficiaries relative to total population (disaggregated by sex)	Direct	
	Indirect	

[82] The lifespan of the Facility is 27 years based on the lifetime of the sustainable cooling assets (15 years for appliances and cold chains and 20 years for buildings) and the distribution of funds per year (See Annex 4 on Budget) .

[83] Direct beneficiaries estimated only for the projects in 4 countries at high risk of extreme heat hazard. See Annex 23 for calculations and Annex 24 for explanation of methodology

[84] Indirect beneficiaries for the projects in 4 countries at high risk of extreme heat hazard

For a multi-country proposal, leave blank and provide the data per country in annex 17.

E.3. Fund-level impacts

Select the appropriate impact(s) to be reported for the project/programme. Select key result areas and corresponding indicators from GCF RMF and PMFs as appropriate. Note that more than one indicator may be selected per expected impact result. The result areas indicated in this section should match those selected in section A.4 above. Add rows as needed.

Expected Results	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
M3.0 Reduced emissions from buildings, cities, industries and appliances	M3.1 Tonnes of carbon dioxide equivalent (t CO2 eq) reduced or avoided - buildings, cities, industries, and appliances	Ex-ante and ex-post analyses conducted by an independent contractor – calculations of annual CO2e reduced or avoided associated with energy savings; procurement documents[85]; energy audit/assessments reports	0	3.65 Mt (assuming 40% of final target to be achieved at mid-term)	9.13 Mt CO_2e	Target defined as the ex-ante GHG impact expected from Facility projects targeting EEff in space cooling, and cold chains compared to BAU over a 10 year period (i.e., the Facility's implementation period)[86] . See D.1 and Annex 23 for more details Main assumptions: Methodology[87]: IFI Guidelines for a Harmonized Approach to Greenhouse Gas Accounting, IFC EDGE and HOMER Powering Health Tools are applied. Lifespan of the Cooling Facility: 27 years Lifetime of assets: 15 years for appliances and 20 years for buildings Annual emission reductions[88]: 912,589 tCO2eq

[85] Procurement documents will be used to verify, for example, energy efficiency investments in buildings, as well as number and types of space cooling and refrigeration/cold chain appliances procured.
[86] Estimates calculated based on the implementation period of the Cooling Facility. However, over the lifespan of the cooling appliances and equipment (15 years) and energy efficient buildings (20 years), the investments are estimated to reduce emissions by 18.6 MtCO2e
[87] See Annex "A24. Methodology" for more details
[88] This is the annual average number. The distribution of GHG emissions savings per year is included in Annex 23 (GHG calculations)

						Lifespan emission reductions: 16,240,201 tCO2eq
A3.0 Increased resilience of intrastructure and the built environment to climate change	*A3.1 Number and value of physical assets made more resilient to climate variability and change considering human benefits*	Ex-ante and ex-post analyses conducted by an independent contractor Procurement documents[89];	0 Physical assests 0 USD million	7,223 physical assets (USD 121.7 million) of which: 681 are resilient buildings (USD98 million), 5,669 are agricultur e cold chains (USD19. 1 million), and 872 are health cold chains (USD4.8 million)	18,057 physical assets (USD304. 4 million) of which: 1,703 are resilient buildings (USD244. 7 million), 14,173 are agricultur e cold chains (USD47.7 million), and 2,181 are health cold chains (USD11.9 million)	Value target based on (i) estimate cost of equipment and appliances and (ii) estimated cost of building retrofits. Target defined as the number (and estimated value) of the more heat resilient cooling assets in the 4 countries in the Facility facing high risk of extreme heat hazard (Bangaldesh, Malawi, Somalia and El Salvador). [90] Number and value of assets derived from GHG calculation model (Annex 23).

E.4 Fund-level outcomes

Select the appropriate outcome(s) to be reported for the project/programme. Select key expected outcomes and corresponding indicators from GCF RMF and PMFs as appropriate. Note that more than one indicator may be selected per expected outcome. Add rows as needed.

Expected Outcomes	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term)	Final	
M7.0 Lower energy intensity of buildings, cities, industries and appliances	M7.1 Energy intensity/improved efficiency of buildings, cities, industries and appliances as a result of Fund support	Ex-ante and ex-post analyses conducted by an independent contractor; energy audits and energy/market assessments reports - Annual	0	5,936 GWh energy saved Share of energy savings from space cooling =	14,841 GWh energy saved Share of energy savings from space cooling	Facility-funded projects supporting improvements in energy efficiency of space cooling (buildings and cooling systems) and cold chains by at least 20% compared to BAU. The target value is

[89] Procurement documents will be used to verify, for example, energy efficiency investments in buildings, as well as number and types of space cooling and refrigeration/cold chain appliances procured, along with the costs.

[90] This actually under-estimates the value of the entire building, which is dependent on local market conditions.

		calculations of energy savings resulting in lower energy intensity of project-supported EEff cooling activities		5,249 GWh Share from cold chains = 687 GWh	=13,122 GWh Share from cold chains = 1,718 GWh.	cumulative, assuming Cooling Facility's implementation period of 10 years[91] See D1 and Annex 23 for more details.
M5.0 Strengthened institutional and regulatory systems	M5.1 Institutional and regulatory systems that improve incentives for low-emission planning and development and their effective implementation	planning and policy instruments developed in each country; surevys, consultant reports	0 (no incentive mecha-nism in place)	6 countries adopt policy or decision to introduce incentive mechanism or regulation promoting sustainable cooling	6 policies or incentive mechanisms to incentivize sustainable cooling are operationalized[92] [target to be re-assessed at the Interim Evaluation stage]	By mid-term, with TA support provided through the Cooling Facility for necessary assessments, consultations and design work, assume 6 countries adopt policy or decision to introduce policy or incentive mechanisms for more climate friendly cooling-related investments/purchases. By end of project, expect 6 policies or incentive mechanisms to be in place and operational, but this target will be re-assessed at the Interim Evaluation Stage and updated accordingly
	Number of technologies and innovative solutions	Ex-ante and ex-post analyses;	0	1 (out of the 3 types outlined	3 (out of the 3 types outlined in	Assessments confirm suitability of technologies.

[91] Estimates calculated based on the duration of the Cooling Facility. However, over the lifespan of the cooling appliances and equipment (15 years) and energy efficient buildings (20 years), the investments are estimated to save a total of 31,676 GWh.

[92] E.g., applications for sustainable cooling-related financing are received/accepted; energy efficient/green buildings certifications/labelling.

	transferred or licensed to support low-emission development as a result of GCF	procurement documents		in the assumption column)	the assumption column)	Technologies and innovative solutions are the following: (i) solar based efficient cooling solutions for health, (ii) solar based efficient cooling solutions for agriculture, and (iii) innovative solutions for cool roofs.
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	A7.1 Use by vulnerable households, business and public sector services of GCF-supported tool, instruments, strategies and activities to respond to climate change and variability.	Ex-ante and ex-post analyses conducted by an independent contractor; surveys (surveys will be designed and adapted to each specific project and target beneficiaries, including participants in trainings and workshops)	0 people	8,020entities 6,000 farmers, 2,000 households and business in the buildings sector, and 20 hospitals and clinics have received information through the GCF tool, have implemented at least 1 sustainable cooling measure (installation of EEff equipment and/or practice) and have reported benefits (e.g., enhance	20,050entities 15,000 farmers, 5,000 households and business in the buildings sector, and 50 hospitals and clinics have received information through the GCF tool, have implemented at least 1 sustainable cooling measure (installation of EEff equipment and/or practice) and have reported benefits (e.g., enhanced comfort, reduced operational costs,	The indicator will be counted in countries at high risk of extreme heat hazard. Targets based on farmers, households, commercial buildings, hospitals and clinics benefitting from the Facility. The communications tool/activities will inform of: (i) agriculture sustainable practices and efficient equipment to improve agriculture production, (ii) cooling sustainable practices and efficient equipment to improve comfort levels in buildings, and (iii) cooling sustainable practices and efficient equipment to

				d comfort, reduced operational costs, reduced wastage of vaccines/ medicine or food, and/or increased income)	reduced wastage of vaccines/ medicine or food, and/or increased income)	optimize vaccines conservation

E.5. Project/programme performance indicators

The performance indicators for progress reporting during implementation should seek to measure pre-existing conditions, progress and results at the most relevant level for ease of GCF monitoring and AE reporting. Add rows as needed.

Expected Results	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
Result 1: Strengthened capacity of state and non-state actors (for example, banks, energy service companies, off-grid-distributors) to assess and deploy climate-friendly cooling solutions	1.1Number health,financial and energy institutions integrating climate-friendly cooling solutions in procurement/lending/bidding documents	Ex-ante and ex-post analyses conducted by an independent contractor; surveys; procurement documents; supervision mission reports	0	9 countries conduct capacity building and training activities on sustainable cooling	9 institutions/agencies integrate provisions for reliable and climate friendly cooling in procurement/ bidding/lending ng documents. At least four also develop provisions/guidelines for O&M of cooling equipment.	Capacity building and training is provided to officials and stakeholders in health sectors of 3 countries and to financial institutions and energy agencies in 6. TA to support development of procurement documents and O&M guidelines for well functioning, sustainable cooling.
	1.2 Number of legal/regulatory/policy instruments drafted/amended [93]	Planning and policy instruments developed in each country	0	1	3	Legal/regulatory instruments (e.g., code/standard/ green or energy efficient procurement) drafted

[93] In some cases, entirely new legal/regulatory/policy instruments may be drafted; in others, where there is already a basis, we may see amendment (e.g., we may see an update to a building code/ procurement strategy or Minimum Energy Performance Standard).

						(or amended/updated) in at least 3 countries
Result 2: Increased public awareness of the benefits of climate-friendly cooling	2.1 Number of people adopting/ switching to climate friendly cooling facilities compared to baseline at home or at the workplace.	Ex-ante and ex-post analyses conducted by an independent contractor; surveys	0	1.26 million of which: 0.7 million are people living in improved homes, and 0.56 million are people working in improved workspaces	3.15 million, of which: 1.74 million are people living in improved homes, and 1.41 million are people working in improved workspaces	Target based on estimated (i) people living/working in green/retrofitted buildings in space cooling projects, (ii) farmers and households purchasing climate friendly cooling equipment/appliances
Result 3: New or rehabilitated climate-friendly cooling infrastructure and equipment	3.1 Number of health facilities (clinics, hospitals) with improved cooling and refrigeration operating as a result of the project.	Ex-ante and ex-post analyses conducted by an independent contractor; reports from supervision missions	0	69	172	Target based on estimated health facilities (hospitals and clinics) in the 3 countries over the project lifetime having more reliable and climate friendly equipment that is functioning
	3.2 MW of solar power installed through the solarization of cooling as a result of Cooling Facility support	Ex-ante and ex-post analyses conducted by an independent contractor; Bidding documents	0	50MW	126 MW	Solarization of cooling services in the Facility's cooling investment in agriculture and health sectors (in 5 countries).
	3.3 Number of energy efficient buildings financed through the Cooling Facility	Ex-ante and ex-post analyses conducted by an independent contractor; Bidding documents	0	941 buildings	2,354 buildings	Target based on number of energy efficient buildings in 4 countries targeting space cooling (i.e., Sri Lanka, Bangladesh, Panama and North Macedonia). (Multi-family buildings are considered as one building)
	3.4 Number of energy efficient space cooling	Ex-ante and ex-post analyses	0	0.21 million appliances	0.53 million appliances	Target based on number of space cooling appliances (air

	appliances deployed	conducted by an independent contractor; procurement documents				conditioners) in four countries targeting space cooling. (Note: where appliances are included in the new EEff buildings above, they are *not* counted here).
	3.5 Energy expenditure savings by users ($)	Ex-ante and ex-post analyses conducted by an independent contractor ; energy audits/assessment reports	0	$712 million	$1,781 million	Target refers to all Facility countries and is based on: Estimated energy savings per country (kWh) * Energy source price per country ($/kWh) [94] over the program implementation period (10 years).
	3.6 Percentage of priority population vaccinated	Ex-ante and ex-post analysis conducted by an independent contractor; ministry of health reports;	[to be determined for each project during project preparation]	[x% - to be determined during project preparation for each country]	[50% - to be confirmeddur ing project preparation and refined at Interim Evaluation stage]	This indicator is relevant for El Salvador, Sao Tome and Principe, and Somalia. Priority population will be determined according to each country's national plans during project preparation, along with targets. Targets will be updated in annual performance reports and finalized by midterm.
	3.7 Improved thermal comfort	Building occupant surveys and/or building measurements	Occupant survey and/or Ex-ante indoor air temperature and indoor humidity measurements	Majority of building occupants (disaggregated by gender) expressing improvement in thermal comfort; [XX]% of total renovated buildings with improved	Majority of building occupants (disaggregated by gender) expressing improvement in thermal comfort; [YY]% of renovated buildings with improved indoor air	For Bangladesh (country at high risk of extreme heat hazard with Cooling Facility intervention targeting space cooling), surveys will be prepared for building occupants (gender disaggregated). This can be complemented with ex-ante and ex-post measurement of ambient temperature;

[94] See Annex 23 (GHG Calculations) for estimates for individual countries and data sources.

			To be determined during project preparation	indoor air temperature and indoor humidity measurement	temperature and indoor humidity measurement	ex-ante and ex-post measurement of indoor air temperature (dry-bulb temperature (DBT) and indoor air humidity (wet- bulb temperature) The targets will be defined during project preparation and updated in annual performance reports (starting when completion of first EE building renovation works)and finalized at mid-term (Interim evaluation stage)
	3.8 Proportion of agriculture production stored in cold chain equipment/ facilities	Ex-ante and ex-post surveys with farmers (disaggregated by gender) conducted by an independent contractor.	Proportion of agriculture production stored in cold chain equipment/ facilities [baseline to be determined during preparation]	[x]% of agriculture production stored in cold chain equipment/facilities	[x]% of agriculture production stored in cold chain equipment/facilities]	For Malawi (country at high risk of extreme heat hazard, the baseline will be determined with country statistics and surveys during project preparation and targets will be defined during project preparation and updated in annual performance reports and finalized at mid-term (Interim evaluation stage)
Result 4: Financing mobilized for cooling investment	4.1Additional public and private capital for climate-friendly cooling investments mobilized by the GCF through programmatic Cooling Facility	Ex-ante and ex-post analyses conducted by an independent contractor; disbursement reports	$0	$0.38 billion (24% private sector)	$0.95 billion (24% private sector)	Target based on expected financing to be mobilized for climate friendly cooling (all target areas and sectors) in the countries included in the Facility. This includes government own funds; IBRD/IDA; other WB administered trust fund; and private capital

E.6. Activities

All project activities should be listed here with a description and sub-activities. Significant deliverables should be reflected in the implementation timetable. Add rows as needed.

Activities	Description	Sub-activities	Deliverables[95]
Component 1: Policy, regulatory and enabling environment support			
Activity 1: Capacity building of key stakeholders (for example, on technologies, business models, cooling project appraisal, implementation and evaluation)	Activities that help strengthen the capacity of state and non-state actors (such as commercial banks, energy service companies and off-grid distributors)	- Technical and economic assessments - Review of procurement documents and technical specifications - Survey development and administration - Development of training materials	- At least 15 training events/workshops - Training material linked to assessment, financing, procurement, design and/or operation and maintenance of sustainable cooling solutions developed/used in at least 8 countries
Activity 2: Technical assistance for enabling plans strategies, policies, regulations, and standards	Activities that support the preparation of relevant plans, strategies, policy and regulatory instruments and that promote gender equality in cooling-related sectors	- Advisory services - Market assessments - Policy analyses - Regulatory review - Measures to address sustainable cooling included in NDCs and other national policy documents - Assessment of options to advance gender equality (data, policy reform, finance and skills development/employment)	- Regulatory/legal/institutional assessments (including, e.g., labeling and certification of energy efficient buildings/equipment) and recommendations for development and/or implementation of sustainable cooling in at least 4 countries - Recommendation and input towards development of National or local climate/adaptation/cooling plans and/or strategies in at least 4 countries - Gender assessments in 9 countries. - Guidelines for procurement and/or design/implementation of programs for sustainable cooling in at least 3 countries - Monitoring and evaluation mechanisms developed in at least 4 countries.
Activity 3: Designing sustainable market mechanisms and business models	Activities that support the planning and development of context-specific business models and financing/implementation	- Advisory services (for example, for auction design, to establish dedicated financing windows, or to design sustainable financing schemes) - Technical, legal, financial due diligence for cooling investments	- Assessments and designs of cooling-related financing/implementation mechanisms/business models in at least 4 countries - Market assessments (which may include baseline context and willingness to pay) in at least 2 countries.

[95] Deliverables are indicative.

	mechanisms climate-friendly cooling deployment	- Consultations with stakeholders - Cooperation with other global initiatives, financiers, think thanks, universities, etc.	
Activity 4: Communication and awareness campaigns	Activities that increase public awareness and promote behavior change	- Survey development and administration - Opinion research - Public consultations - Focus group discussion - Message design and testing - Market assessments - Gender gap analyses	- At least 5 countries will develop and implement at least 1 communications/awareness campaigns
Component 2: Financing for cooling investments			
Activity 5: Financing of climate-friendly cooling investment	Financing of public and private stakeholders of investment cooling infrastructure equipment	- Engineering, procurement and construction of cooling infrastructure - Procurement, installation and maintenance of cooling equipment including operations and maintenance arrangements - Provision of loans and grants to public and private stakeholders for cooling investment - Coordination with other public and private financiers, technical partners and investors	- Financing mechanisms that engage private sector designed in at least 6 countries. - Public procurement documents of cold chains integrate climate-friendly features in 3 countries.
Activity 6: Credit lines to financial intermediaries	Design and implementation of credit lines for cooling investments and equipment	- Advisory services - Analytical support - Provision of credit lines - Coordination with other public and private financiers, technical partners and investors	- Credit lines designed in at least 3 countries.

E.7. Monitoring, reporting and evaluation arrangements (max. 500 words, approximately 1 page)

Besides the arrangements laid out in the AMA between the World Bank and the GCF, the implementation of the Cooling Facility involves (a) monitoring of program performance indicators (as per Section E5); (b) periodic progress reports; and (c) midterm review of implementation progress. It is noted that the end targets of the Program are best estimates as it is not known upfront exactly the results from each project that will be financed and the targets may be revised during AE's due diligence, project preparation and the mid-term review as necessary. The AE will report to GCF the implementation status at both Facility and country level by aggregating specific country-level information and data.

- **Monitoring**

The implementation of each project under the Cooling Facility will be managed, monitored and reported on at project level by the Executing Entities and the Project Management Units (which may include staff and consultants). The World Bank has dedicated staff in its sectoral teams, operation departments, Environment and Social departments and country offices that will conduct due diligence, monitor compliance and

performance risks, implementation of the Environmental and Social Commitment Plans and the stakeholder engagement plans.

The World Bank will follow its standard monitoring and reporting policies and procedures, which will include semi-annual reports on the implementation status and performance of each project. By the end of each project supported by the Cooling Facility, the Bank will conduct jointly with each respective Executing Entity an implementation completion assessment and prepare an implementation completion report (ICR) which will review the performance of the project, assess effectiveness and efficiency of project implementation, the achievement of the project development objective, and provide relevant lessons learned. Financial reporting is further discussed in Section G3.

- **Reporting**

Reporting of Executing Entities to World Bank. As specified in the subsidiary agreements between the Executing Entities and the World Bank, the Executing Entities are obliged to report on the implementation of the Project and the use of the financing proceeds, as applicable. This reporting includes the environmental and social performance of the project and the achievement of the indicators agreed between the WB and the Executing Entity. For each project supported by the Cooling Facility, the respective Executing Entity will be responsible for overall M&E of the project, including collection of project performance information and reporting on project impacts and results.

Reporting of World Bank to GCF. The World Bank will provide to the GCF (i) annual activity performance reports (APRs) on the status of the Facility throughout the relevant reporting period, (ii) mid-term evaluation report at the midpoint of the implementation period of the Facility and (iii) final evaluation report at the end of the implementation period of the Facility as per the FAA provisions.

- **Evaluation**

The evaluation methods for mid-term and final evaluations will include:

a. Key informant interviews with relevant beneficiary staff and clients, as well as other key stakeholders, based on stakeholder mapping; and.
b. Desktop review of relevant Facility documentation, including Project Management Unit reports, based on an agreed list of evidence to be provided by the client.

Please refer to Annex 11 for further details.

As described earlier, each country's cooling operation, a PMU will be established with a team expected to include at least a team lead, technical expert, procurement specialist, financial management specialist, environmental specialist and social/gender specialist, and a lawyer. Each project will have its own monitoring and evaluation (M&E) and reporting process, and the EE will be accountable for its implementation.

The Bank's evaluation of projects included in the Cooling Facility is done in the context of the Bank's standard Implementation Status and Results (ISR) report[96], which is the key tool used for internal reporting on the implementation performance and prospective outcomes of projects. It is through this tool that the Bank's project team leader conducts the evaluation of the project's implementation status and performance, progress toward reaching its development objective, and evolution of risks. Safeguards, financial management, and procurement specialists advise the team leader on evaluation of project's performance from a fiduciary and safeguards perspective.

[96] See The Bank Guidance on Investment Project Financing: Implementation Support (2017) - https://worldbankgroup.sharepoint.com/sites/ppfonline/PPFDocuments/ee96edefb68040df8af93027280ab4e1.pdf

The Bank's operational task team will document progress toward meeting project objectives by tracking and updating the project's cooling or cooling-informed indicators as outlined above through the Bank's periodic Implementation Status and Results reporting (ISR) process[97]. The Bank will draw on these inputs to report aggregate data annually across the portfolio as part of the AE's agreed obligations to the GCF. It is noted that the end targets of the Facility are best estimates as it is not known upfront exactly the results of each investment that will be financed, and the targets may be revised during AE's due diligence, project preparation and the mid-term review as necessary.

At the end of the project, the Bank will conduct jointly with each PMU, an implementation completion assessment and prepare and Implementation Completion and Results (ICR) report which will review the performance of the project, assess effectiveness and efficiency of project implementation, the achievement of the development objective, and provide relevant lessons learned. The individual project ICR reports will form the basis of the Facility terminal evaluation report.

[97] The ISR is the Bank's key tool used for internal reporting on the implementation performance and prospective outcomes of projects. It is through this tool that the Bank's project team leader conducts the evaluation of the project's implementation status and performance, progress toward reaching its development objective, and evolution of risks.

F. RISK ASSESSMENT AND MANAGEMENT

F.1. Risk factors and mitigations measures (max. 3 pages)

For probability: High has significant probability, Medium has moderate probability, Low has negligible probability
For impact: High has significant impact, Medium has moderate impact, Low has negligible impact
Prohibited practices include abuse, conflict of interest, corruption, retaliation against whistleblowers or witnesses, as well as fraudulent, coercive, collusive, and obstructive practices

Selected Risk Factor 1: Project readiness risk

Category	Probability	Impact
Operational	Medium	Medium

Description

There is a risk that some of the early stage projects do not mature and thus, are not able to mobilize funding from the Facility. Developing the relatively new concepts of cooling for some projects, may take significant time during the start-up phase, especially for activities that involve cold chain or mobile cooling where beneficiaries have limited experience and/or data and information on technology and related cost savings are missing.

Mitigation Measure(s)

To mitigate this risk, the Facility is designed to leverage the ESMAP multi-sectoral Efficient, Clean Cooling Technical Assistance Program. The TA is intended to help beneficiaries and Bank operational teams in the design of cooling informed projects including activities such as cooling market studies, sector gap analysis and strategies, knowledge sharing, stakeholder consultations, business models identification, etc. The TA will provide dedicated grants and tailored technical experts to ensure a solid pipeline of well-prepared projects, designed to meet the eligibility criteria of the Facility. Continued dialog with national stakeholders will support the preparation of cooling projects aligned with the goals and criteria of the Facility.

Selected Risk Factor 2: Political Risk

Category	Probability	Impact
Political	Medium	Medium

Description

If project investments result in direct or indirect increases in tariffs, fees, consumer product prices, or other cost increases where constituents might bear the cost burden (in order to ensure the financial sustainability of project investments), this may prove politically unattractive for client governments to adopt, especially with respect to reelection.

Mitigation Measure(s)

WB mitigates this risk by ensuring that the design of the projects consider the affordability constraints of the end user beneficiaries. For example, the WB will ensure that low income groups are provided with financial support if affordability thresholds are surpassed, and, whenever possible, combine tariff/product increases with measures to improve the payback efficiency of the utility/supplier in order to ensure a positive impact on costs and reduce the cost passed on to consumers. These efforts will be sustained to lower risk level to Low as much as possible for all projects under the Facility.

Selected Risk Factor 3: COVID-19 risk

Category	Probability	Impact
Operational	High	Medium

Description

Given the size and scope of the economic impact of the pandemic, there is a growing concern that developing countries will be hit the most which will cause disruptions in various economic and social sectors. There is a risk that client countries will shift their priorities to focus on immediate emergency response and recovery interventions to address the COVID crisis and investment in cooling could be deterred.

Mitigation Measure(s)

The World Bank teams will closely monitor the current COVID-19 crisis and its potential impacts on the progress of the projects supported by the Facility. In addition, the WB operational teams take part of the ongoing dialogue with the governments on the C-19 and will ensure to position the cooling agenda as part of the solutions to help client countries in the immediate response as well as in their economic recovery from the current difficult situation. The need for cooling will be even more critical in the current situation for instance in hospitals, warehouses and testing facilities, cold chains supply for food and/or pharmaceutical/medical goods storage, etc. The technical assistance activities provided through ESMAP will ensure continued engagement with the various countries as listed in this proposal.

Selected Risk Factor 4: Limited uptake of EEff Clean Cooling technologies

Category	Probability	Impact
Operational	Medium	Medium

Description

The penetration of energy efficient and clean cooling solutions may be very low particularly in sectors such as residential and commercial as end-users often undervalue energy savings due to lack of information and awareness about the energy savings, reluctance to pay for a higher initial cost, etc. Therefore, the implementation of some of the projects could be exposed to the risk of a lack of market demand for efficient clean cooling solutions.

Mitigation Measure(s)

This risk can be mitigated through dedicated capacity building activities targeting relevant stakeholders, awareness raising, and communication combined with market studies that would identify and recommend policy options and business models adapted to the country circumstances to facilitate the rapid uptake of the EEff clean cooling technologies. The World Bank has a longstanding experience working with developing countries on EEff, and the teams will build on the lessons learnt from these experiences as well.

Selected Risk Factor 5: Lack of technical capacity

Category	Probability	Impact
Operational	Medium	Medium

Description

The lack of technical capacity, in some countries, could negatively affect the implementation of the projects, continuous operation of the equipment and infrastructure, and thus the expected outcomes. A proper installation, operating, and maintenance is key to ensure the projects are not underperforming, hence the results are not compromised.

Mitigation Measure(s)

The risk will be mitigated through the M&E framework that will be developed during the preparation phase and is an integral part of the project documentation and specific to each country. M&E arrangements will be used to assess periodically the project performance and impact as expected. In order to ensure the sustainability of the investments, the EEs will ensure that the beneficiaries receive adequate training to conduct O&M to ensure continuous operation of the equipment and infrastructure and/or may subsequently enter into an O&M contract

Selected Risk Factor 6: Credit risk

Category	Probability	Impact
Credit	Low	Medium

Description
GCF loans are provided to sovereign entities and will not bear any credit risk beyond that the sovereign risk of the Borrowers. In those projects where GCF loans are deployed, and where qualified PFIs on-lend, they, not the GCF, will be exposed to the credit risk of their customers and will employ their risk management processes.
Mitigation Measure(s)
The GCF credit exposure is limited to EE listed in Section A.20. As such, the GCF would only bear the sovereign risk of the countries in which the loans will be deployed.

Selected Risk Factor 7: Risk of co-financing not materializing		
Category	Probability	Impact
Financial	Low	Medium
Description		
Risk of IBR/IDA co-financing not materializing or being lower than specified in this Funding Proposal and its impact on the proposed target for adaptation and mitigation. .		
Mitigation Measure(s)		
About 54 percent (or $392.84 million of $722.84 million) of the co-financing amount has already materialized, with WB and WB-managed trust funds approved and the corresponding legal agreements signed with the recipient countries for six of the nine projects envisaged. Should the balance the remaining projects materialize albeit with a ratio of GCF funds to IDA/IBRD funds not greater than 1:1 (the minimum level set in the eligibility criteria), the Facility would achieve 71% of its mitigation target (as measured by GHG emissions reduced or avoided) and reach 96% of the target direct beneficiaries. In the very unlikely case that none of the remaining projects take place (and this GCF counterpart financing is not provided) the facility will only achieve 33% of its mitigation impact but reach 90% of the direct adaptation beneficiaries. The risk is mitigated by (i) the strong alignment of the objectives supported by the Cooling Facility, with the country needs as expressed in national strategies, policies and plans; (ii) the country ownership reflected through the non-objection letters received from each National Designated Entity; and (iii) the robust sector-level dialog led to the World Bank in the supported countries.		

G. GCF POLICIES AND STANDARDS

G.1. Environmental and social risk assessment (max. 750 words, approximately 1.5 pages)

The main aspects considered from an E&S perspective are summarized below. However, each project under the Cooling Facility will have its own assessment completed at concept/appraisal stage. The ESMF will include a list of expected environmental and social impacts and suggest mitigation and monitoring measures for each potential impact due to the project activities.

- **ESS1 (Assessment and Management of Environmental and Social Risks and Impacts)**

The Facility's cooling-informed projects are expected to generate substantial direct social and environmental benefits by increasing energy efficiency in buildings and cold chain infrastructure and deploying climate-friendly cooling equipment including off-grid cooling solutions that use renewable energy. Environmental benefits include, inter alia: (i) reduced greenhouse gas emissions due to energy savings and reduction or avoidance of food losses/waste which will ultimately contribute to climate change mitigation; (ii) reduced local air pollutants (fine particulates, SOX, NOX); and (vi) reduced emissions of ozone depleting substances and/or high GWP chemicals used as refrigerants in cooling equipment.

The projects also generate significant positive social impacts through job creation and market development for energy efficiency products and services; reduction in consumer electricity bills thus, improving affordability and increasing competitiveness and income of small businesses/farmers; increased comfort and well-being including a better overall working environment in buildings. By improving and expanding access to cooling solutions including cold chain, the projects will reduce the vulnerability to extreme heat events, increase access to vaccines and medicines as well as to nutritional food; hence generating positive impacts on health and food security.

Some of the projects may cover geographically remote, politically sensitive and socially marginalized areas and communities. The projects therefore benefit not only mainstream communities, but also those that are often marginalized or maybe subject to discrimination. Improved cooling services and access to affordable energy efficient cooling products and increased employment opportunities are likely to also provide benefits to women and disadvantaged or vulnerable individuals or groups. The E&S risks and impacts assessment of the projects will include impacts on gender and disadvantaged or vulnerable individuals or groups. Differentiated measures will be adopted so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and that they are not disadvantaged in sharing development benefits and opportunities resulting from the project, which would enhance project development outcomes by promoting inclusion, equality and non-discrimination. The Facility will work with countries to collect data and generate crucial knowledge of actions and design interventions needed to avoid or minimize gender impacts and impacts on the poor and vulnerable. Particularly, the actions will be guided by the WB Good Practice Notes (GPNs) on: (i) Gender; (ii) Non-Discrimination and Disability; (iii) Non-Discrimination: Sexual Orientation and Gender Identity (SOGI)98.

If not properly managed, construction of new buildings and cold chain facilities may result in potential adverse environmental and social impacts associated with land acquisition or land conversion. During the construction or retrofitting of buildings, common risks are safety and health hazards on workers and the community, which are due to noise, dust, handling and disposal of old parts and equipment which may contain hazardous waste and materials.

98 http://pubdocs.worldbank.org/en/158041571230608289/Good-Practice-Note-Gender.pdf
http://documents1.worldbank.org/curated/en/573841530208492785/Environment-and-Social-Framework-ESF-Good-Practice-Note-on-Disability-English.pdf
http://pubdocs.worldbank.org/en/590671570796800429/Good-Practice-Note-SOGI.pdf

However, these potential impacts can vary in terms of intensity/significance and are localized in nature. For each project, an assessment of environmental and social risks and impacts will be carried out and measures to address them will be identified in accordance with the mitigation hierarchy as described in the previous section. For example, some of the impacts can be prevented by aligning site selection for buildings with ESF requirements and mitigated by sound operational practice and consistency with ESS3 principles during operation.

- **ESS2 (Labor and Working Conditions)**

Project workers are expected to be mobilized under most projects. This will include direct workers and contracted workers. The Government will have to comply with the ESS2 requirements as specified in Labor Management Procedures (LMP) to be prepared for each project. Occupational health and safety (OHS) plans will need to be prepared as per the World Bank Group EHS guidelines. The labor influx would have a series of impacts, including labor conditions, health, safety, GBV, conflict etc., not only among the project workers but also upon local communities. These risks need to be assessed as part of the E&S assessment and managed in accordance with the LMP and other E&S documents. All relevant measures will be reflected in the bidding and contractual documents. A dedicated grievance redress mechanism for project workers needs to be established under each project. This mechanism is separate from the overall project Grievance Redress Mechanism.

- **ESS3 (Resource Efficiency and Pollution Prevention and Management)**

Construction of new buildings or retrofitting existing buildings are expected to generate typical construction impacts such as, dust; construction waste generation, transportation, transfer and disposal due to demolition; and handling, and disposal of asbestos waste, resulting in negative impacts on air quality and occupational and community health and safety. These risks will be assessed for each project. However, most of these potential impacts are low to moderate in intensity/significance and are reversible and localized in nature, and therefore can be mitigated.

Other hazardous waste generation is specifically associated with the dismantling and disposal of old cooling equipment and refrigerant gases. These gases could be ozone depleting substances or have a high GWP and if not properly handled, they risk to be released into the atmosphere. These impacts require appropriate mitigation assessments and management measures and include adequate and safe management of refrigerants (e.g. recovery, recycling or storage) in line with national legislation and countries' obligations under the Protocol of Montreal and relevant Good International Industry Practice (GIIP).

- **ESS4 (Community Health and Safety)**

ESS4 requirements will be considered in the implementation of project's activities. During the construction works of the buildings (including cold chain buildings), potential risks may arise from noise, dust, labor safety, and disposal of old parts and equipment which may contain hazardous waste. In the case where the construction works are carried out in existing facilities used by employees or neighboring communities, there may be a temporary transitional impact for these users. These impacts require appropriate mitigation assessment and management measures to contain them.

Additional risks are associated with the type of refrigerants used in cooling equipment. Some can be to toxic and/or flammable and may result in accidents during their handling and installation. These safety risks can be minimized through proper mitigation assessments and management measures to contain them.

- **ESS5 (Land Acquisitions, Restrictions on Land Use and Involuntary Settlements)**

Land acquisition for construction of new buildings or cold storage facilities will need to be done in a consistent manner with ESS5 requirements - to avoid, minimize, reduce/mitigate and compensate at replacement cost land acquisition based on due diligence and plans prepared in accordance with ESS5. An indicative outline of a resettlement policy framework is presented in Annex 5 (in ESSF Annex). The Executing Entities will be responsible for preparing, in a manner and substance satisfactory to the Bank, the project-specific resettlement policy frameworks and/or resettlement action plans in line with ESS5 requirements

- **ESS6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources)**

Impacts, arising out of the siting and selection of land for the future cold storage facilities, may include loss of habitats and other adverse encroachment impacts, depending on the scale of the projects. Care should be taken by these future projects to ensure that their impacts on natural habitats, terrestrial and aquatic ecosystems and species are well assessed and managed.

- **ESS7 (Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local communities)**

The presence of indigenous people in the areas identified for the projects will be screened and confirmed by the World Bank in consultation with the national authorities. Once it is confirmed, consistency with ESS7 objectives and requirements will be integrated into the design of the project and E&S documents, including the development of an indigenous peoples' plan or other types of plans depending on the country and project context, and Free, Prior and Informed Consent in the circumstances specified in ESS7.

- **ESS8 (Cultural Heritage)**

The project will screen the project area and assess potential impacts on cultural heritage, both tangible and intangible. The site selection for each project will be mindful of cultural heritage and the application of ESS8 will be further assessed under each project. In case of no apparent cultural heritage in civil works sites, a chance find procedure will be a part of the E&S instrument.

- **ESS9 (Financial Intermediaries)**

The deployment of funds under the Cooling Facility will be tailored to the needs of the projects. Some projects are expected to channel financing to Financial Intermediaries (FI). For such projects, ESS9 will be applied to the FIs going to receive financial support under the Cooling Facility. In this respect the FI is required to establish and maintain an Environment and Social Management System (ESMS) to identify, assess, manage, and monitor the environmental and social risks and impacts of FI subprojects on an ongoing basis. The ESMS will be commensurate with the nature and magnitude of environmental and social risks and impacts of FI subprojects, the types of financing, and the overall risk aggregated at the portfolio level. Where the FI can demonstrate that it already has an ESMS in place, it will provide adequate documented evidence of such an ESMS, indicating which elements (if any) will be enhanced or modified. The FI's ESMS will include the following elements: (i) environmental and social policy; (ii) clearly defined procedures for the identification, assessment and management of the environmental and social risks and impacts of subprojects; (iii) organizational capacity and competency; (iv) monitoring and review of environmental and social risks of subprojects and the portfolio; and (v) external communications mechanism. An FI may be required to adopt and implement additional or alternative environmental and social requirements, depending on the nature of the FI, its activities, the sector or countries of operation, and the environmental and social risks and impacts of the potential FI subprojects.[99]

- **ESS10 (Stakeholder Engagement and Information Disclosure)**

The Project affected parties include implementing agencies at national level, regional level, local authorities of participating provinces, private investors and concerned communities. In addition, other interested parties include media, local/international NGO and development partners working in the same region.
A Stakeholder Engagement Plan (SEP) will be developed for each project, to ensure transparency and meaningful consultation with the affected and interested parties. Stakeholder engagement and consultations will be conducted throughout the project cycle. This will include discussions of project design and impacts as well as multi-stakeholder discussions on these issues during the preparation phase. The SEP, along with other social and environmental instruments, will be subject to public consultation and disclosure per requirements of ESS10 and will be treated as a live document to be regularly updated along the pace of project implementation.

- **WB Performance Standards for Private Sector Activities**

WB Performance Standards (PSs)[100] apply to activities supported by the Private Entities. For this purpose, a Private Entity is a natural or legal person, whether publicly or privately owned, which is established for a business purpose and operates on a commercial basis, is financially and managerially autonomous, and whose day-to-day operations are not controlled by the government. Private Sector Activities refer to activities (a) designed, constructed, operated and/or owned by Private a Entity (or consists of TA in preparation for such activity), and (b) for which the Private Entity is fully responsible for identifying, assessing and managing the environmental and social risks associated with the activity it carries out or with the subprojects it finances in the case of FIs.

PS1 (Assessment and Management of Environmental and Social Risks and Impacts) applies to all projects that have environmental and social risks and impacts. Depending on project circumstances, other Performance Standards may apply as well. The Private Entity is responsible for developing an ESMS. FIs are required to develop an ESMS, acceptable to the Bank, which the intermediary applies in identifying, assessing and managing environmental and social risks and impacts under its Bank-supported portfolio of subprojects. The Bank reviews the Private Sector Activity, the ESMS, and environmental and social assessment and management plans prepared for activities under the ESMS for consistency with the WB Performance Standards. The Bank categorizes the activity based on the nature of the potential environmental and social risks and impacts of the Private Sector Activity. Finally, the Bank monitors the social and environmental aspects of the Private Sector Activity.

G.2. Gender assessment and action plan (max. 500 words, approximately 1 page)

The Facility aims to strengthen women's roles as employees, entrepreneurs and consumers in cooling-related sectors in project countries, including enhanced female economic participation in cooling-related sectors and increased women's access to services (e.g., energy, cooling, health, financial) and enhanced productivity and income generating opportunities for female-led businesses and women. Proposed interventions under the Gender Action Plan are both aligned with the World Bank Group Gender Strategy (2016-2021): (i) advancing equality between men and women through climate change mitigation and adaptation actions, and (ii) minimizing gender-related risks in climate change actions.

While more data and analysis are needed to better understand the gender aspect of access to sustainable cooling, gender risks are evident (SEforALL 2019). Women and girls are often disproportionately impacted by limited access to sustainable cooling and enhanced access could ensure gains in terms of entrepreneurship opportunities, and enhanced livelihoods.

Taking into account the diversity of projects supported by the Facility, in terms of sectors (e.g., agriculture, buildings, energy etc) and geographies (both in terms of countries and in terms of urban versus rural contexts), **the Facility's gender approach will be adapted to each projects' specific design, local barriers and circumstances**, but issues related to closing gender gaps in terms access to cooling-related services, economic participation, access to finance, as well as opportunities to promote gender equality and inclusion will be effectively identified and embedded throughout each project's cycle.

[99] These will be incorporated into the ESMS, the environmental and social procedures and/or set out in the legal agreement.

[100] These are: Assessment and Management of Environmental and Social Risks and Impacts (PS1), Labor and Working Conditions (PS2), Resource Efficiency and Pollution Prevention (PS3), Community Health, Safety and Security (PS4), Land Acquisition and Involuntary Resettlement (PS5), Biodiversity Conservation and Sustainable Management of Living Natural Resources (PS6), Indigenous People (PS7), and Cultural Heritage (PS8).

These issues will be tackled in a sustainable manner, raising awareness, improving gender policies, building capacities and generating knowledge on the program's differentiated impact on men and women. Preliminary gender assessments for each of the identified countries under the Facility highlighted the following gender gaps and their potential mitigation actions:

- **Entrepreneurship:** Women entrepreneurs often lack information about access to finance options in the country. In addition, development of enterprises requires technical assistance support tailored to women's needs. Partnering with business networks, such as. female exporters or associations under chambers of commerce, is key to creating awareness about credit lines among women entrepreneurs. From a consumer perspective they will also have different needs and wants in terms of cooling technology products and services and the sectors they operate in (e.g. agriculture or transport).
- **Financial services**—not only accounts, but payments, savings, and credit—give women some basic tools they need to enhance their livelihoods and economic status. Under the current ecosystem, bank accounts are key to ensure payments for cooling technologies, and strategies need to be developed to ensure women's participation to the financial sector and cooling market. The use of digital payments can further reduce access for women. Affordability is a key part of this focus.
- **Jobs and Skills Development:** Job creation and livelihood opportunities will be mapped out as part as part job creation and skills development aspects of the Facility. For instance, having women sales agents and local suppliers will create opportunities in terms of jobs or looking at labor force participation gaps between women and men in the e.g. cooling sector and implementing entities.
- **Consumer Engagement:** Growing evidence points to significant differences in the needs and wants of women versus men as e.g. consumers and entrepreneurs, as well as caregivers. For example, differences can be observed in how they use energy on a daily basis, how much they are willing to adopt cooling technology and measures e.g. in agriculture sector), and how they respond to campaigns marketing products and services. Differences have also been observed in the context of caregiving responsibilities in communities and families. It is therefore essential to tailor any efforts toward consumers specific behaviours of men and women. This points to a need for communications strategies in these countries to look beyond written materials, communication mode (e.g. radio, television, internet) as they transmit information related to benefits of cooling-related services, consumption patterns, and so forth. It could also be advisable to leverage women's groups.

- **COVID-19 response and health measures:** Women often lack empowerment and autonomy to access services, sometimes related to health and decision making. Women must not be excluded from accessing services, as they can act as agents of change. Families and communities can benefit from informed actions taken by women to counter the negative effects of the global pandemic.
- **Data and information:** collecting sex-disaggregated data and gender-specific information help to assess the projects' results and impacts on gender equality and also help to scale-up refine activities for future interventions

The Facility will follow a systematic approach and provide support to projects interventions with a focus on data collection, policy engagement, project level actions and capacity-building activities. The Facility will leverage support for the gender-related activities from the ESMAP Gender and Energy Program, the ESMAP Efficient Clean Cooling Program, as well as from the Bank's ecosystem of gender focal points for relevant WB Global Practices. The Facility will encourage the recruitment of a balanced female-to-male employment ratio recruitment of women within the project management unit (PMU) teams.

Obtaining stakeholders buy-in will be key in ensuring that interventions to promote women's employment and enhance their livelihood are effectively implemented with measurable outcomes. Institutional and behavioral change are a long-time process that will require sustained support of all relevant

stakeholders (public and private) throughout the program cycle. Countries adherence to international agreements and national normative frameworks on gender equality, will be a good starting point to strengthen government's support for gender interventions.

At the project and program level, the following approach will be followed:

- **Data collection to document the baseline situation and identify gaps.** Baseline data will be collected to set targets and measure progress during implementation, it will also support existing efforts where baseline sex-disaggregated data are weak. Research will build upon existing country gender diagnostics and action plan when available, to ensure national priorities are understood and considered. To support project design and implementation, stakeholders' consultations will involve female participants, to understand men and women differentiated needs. In addition, initial assessments will include an analysis of the differentiated impact on men and women, through the involvement of gender and energy experts (Environmental and Social Impact Assessment, Resettlement Action Plans etc.). Gaps could be identified but not limited to female labor issue or inadequate access to finance for the cooling-related sectors, and design mitigation measures that minimize gender gaps such as enhanced productive uses of energy, enhanced knowledge and skills of small and micro-business, households and farmers.
- **Identifying and implementing relevant actions**. Based on the initial diagnosis and inclusive stakeholders' consultations, targeted activities will be identified to address key gender gaps. These may include (i) actions to promote female employment (including capacity building and programs for women to gain hands-on experience in the sector such as support for school-to-work transition), (ii) financing local communities projects empowering women in the area of implementation of the projects (such as activities generating revenues), (iii) implementation of prevention measures to mitigate associated incidents or risks in the area of implementation of the projects and (iv) facilitating energy access for female-headed households (including capacity-building workshops to maintain and develop energy services).
- **M&E and Knowledge management**. In 2017, the WBG started implementing the "gender-tag" mechanisms to identify projects that effectively promote equality between men and women and are aligned with the WBG gender strategy. The Cooling Facility will adopt a gender perspective and aim to close key gaps in its supported projects. Results will be monitored throughout the project and be used for real-time adjustments during implementation. To expand the knowledge base, projects will build on lessons learnt from prior projects as well as regional and country base knowledge production and exchange learning opportunities.
- **Engaging stakeholders** with specific needs and risks of gender inequality in meaningful consultation, information disclosure and responsive grievance redress throughout the project life (as set out in the Stakeholder Engagement Plan). Focus will be given to activities to strengthen women's participation and voice during consultations. Consultations and public meetings with stakeholders will be conducted throughout the project cycle in a participatory manner and with a special focus on engaging women. This will help gaining knowledge about community concerns during project preparation and help monitor impact and undertake real-time correction during implementation. Special attention will be paid to using local dialect, cultural concerns when relevant and including women from minority ethnic groups and other socially vulnerable groups.

G.3. Financial management and procurement (max. 500 words, approximately 1 page)

Each project financed through the Cooling Facility will be required to conduct financial management and procurement according to the World Bank policies and procedures.

- **Procurement**

Each project supported by the Cooling Facility will follow the World Bank's Procurement Framework and Regulations (https://www.worldbank.org/en/projects-operations/products-and-services/brief/procurement-new-framework#framework). World Bank procurement staff support borrowers throughout the procurement process. They work with governments to achieve the highest bidding and contract management standards to get the best development results. Each project is developed, designed and monitored by the Executing Entity (or PIE as applicable) with support and supervision by a World Bank task team that includes a procurement specialist.

For each project, a PMU will be established by the relevant Executing Entity (host countries or governments) – or PIE as applicable - with a team expected to include a procurement specialist.

Each project, with the exception of the guarantee operation (see below), is also be subject to the 'World Bank's Anti-Corruption Guidelines, dated July 1, 2016'.

- **Financial Management**

Each project supported by the Facility is required to maintain financial management arrangements (including planning and budgeting, accounting, internal control, funds flow, financial reporting, and auditing arrangements of the borrower and entities responsible for project implementation) acceptable to the World Bank. A financial management specialist is expected to be part of the team forming the PMU established by each relevant Executing Entity (or PIE as applicable) for its respective project.

Moreover, for each project, the World Bank task team includes an accredited Financial Management (FM) specialist who provides support during the entire project cycle (preparation, supervision and implementation) in accordance with the World Bank's operational policies and procedures (to work with partner countries to design financial management and disbursement arrangements and to supervise and support the performance of World Bank-finance operations). The team's FM specialist closely monitors the performance of the Executing Entity's (or PIE as applicable) FM arrangements and their continued capacity to provide reasonable assurance that loan proceeds are being used for the purposes intended.

Financial reporting is also required for each project which is specified in each project's Disbursement and Financial Information Letter (DFIL). Unless otherwise agreed by the World Bank, the Executing Entity must submit annual audited project financial statements six months after the close of the financial year and unaudited interim financial (IFR) reports periodically. Audits are carried out by auditors with independence and capacity acceptable to the World Bank, under terms of reference acceptable to the World Bank.

G.4. Disclosure of funding proposal

The Access to Information Policy (2015) governs the public accessibility of information of operational documents prepared by the World Bank. The policy can be accessed through the following link: http://pubdocs.worldbank.org/en/393051435850102801/World-Bank-Policy-on-Access-to-Information-V2.pdf

☐ No confidential information: The accredited entity confirms that the funding proposal, including its annexes, may be disclosed in full by the GCF, as no information is being provided in confidence.

☒ With confidential information: The accredited entity declares that the funding proposal, including its annexes, may not be disclosed in full by the GCF, as certain information is being provided in confidence.

Accordingly, the accredited entity is providing to the Secretariat the following two copies of the funding proposal, including all annexes:

- full copy for internal use of the GCF in which the confidential portions are marked accordingly, together with an explanatory note regarding the said portions and the corresponding reason for confidentiality under the accredited entity's disclosure policy, and
- redacted copy for disclosure on the GCF website.

The funding proposal can only be processed upon receipt of the two copies above, if containing confidential information.

H. ANNEXES

H.1. Mandatory annexes

☒	Annex 1	NDA no-objection letter(s) **(template provided)**
☒	Annex 2	Feasibility study - and a market study, if applicable
☒	Annex 3	Economic and/or financial analyses in spreadsheet format
☒	Annex 4	Detailed budget plan **(template provided)**
☒	Annex 5	Implementation timetable including key project/programme milestones **(template provided)**
☒	Annex 6	E&S document corresponding to the E&S category (A, B or C; or I1, I2 or I3): **(ESS disclosure form provided)** ☐ Environmental and Social Impact Assessment (ESIA) or ☐ Environmental and Social Management Plan (ESMP) or ☐ Environmental and Social Management System (ESMS) ☒ Environmental and Social Sustainability Framework (ESSF)
☒	Annex 7	Summary of consultations and stakeholder engagement plan
☒	Annex 8	Gender assessment and project/programme-level action plan **(template provided)**
☒	Annex 9	Legal due diligence (regulation, taxation and insurance)
☒	Annex 10	Procurement framework
☒	Annex 11	Monitoring and evaluation plan **(template provided)**
☒	Annex 12	AE fee request **(template provided)**
☒	Annex 13	Co-financing commitment letter, if applicable **(template provided)**
☒	Annex 14	Term sheet including a detailed disbursement schedule and, if applicable, repayment schedule

H.2. Other annexes as applicable

☐	Annex 15	Evidence of internal approval **(template provided)**
☐	Annex 16	Map(s) indicating the location of proposed interventions
☒	Annex 17	Multi-country project/programme information **(template provided)**
☐	Annex 18	Appraisal, due diligence or evaluation report for proposals based on up-scaling or replicating a pilot project
☐	Annex 19	Procedures for controlling procurement by third parties or executing entities undertaking projects financed by the entity
☐	Annex 20	First level AML/CFT (KYC) assessment
☐	Annex 21	Operations manual (Operations and maintenance)
☒	Annex 22	Projects information (confidential)
☒	Annex 23	Greenhouse gas calculations
☒	Annex 24	Methodology and assumptions for greenhouse gas and beneficiaries calculations

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*