2017

PPIAF Climate Change Strategy & Business Proposal for FY18-FY22

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Acknowledgments

This strategic exercise was conducted by the climate change team of the Public Private Infrastructure Advisory Facility (PPIAF) under the directive of Francois Bergere, Program Manager. The work expands on the previous Climate Strategy Note, presented to PPIAF donors during the interim donor council meeting held in Zurich, Switzerland in November 2016 and also incorporates their valuable feedback and recommendations.

The high-level objective of this exercise was to identify PPIAF's climate change strategic priorities (regional and sectoral) and clearly outline a transformative programmatic approach leveraging key partnerships in order to facilitate private sector led sustainable infrastructure development. For the upcoming 5-year business cycle (FY18-FY22), PPIAF's dedicated Climate Change Non-Core Trust Fund will be renamed as the **Climate Change Trust Fund for Infrastructure (CCTFI).**

Thought leadership to conceptualize programmatic initiatives and identify key partners for PPIAF's transformative climate change strategy was provided by Nuwan Suriyagoda, Senior Climate Change Program Coordinator at PPIAF. He was also the lead author of this report. Valuable contributions to the report including research and editorial support was provided by Fern Gray, Climate and Energy Specialist at PPIAF. Team coordination and key management inputs were provided by Philippe Neves, Senior Infrastructure Specialist at PPIAF. Additionally, a special thank you goes to Jeanine Delay for providing creative graphic design support for the report.

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A. Growth Story of the Future: Climate-Smart Infrastructure

Scale and Urgency of the Climate and Infrastructure Investment Challenge

The world's existing stock of infrastructure and its uses account for more than 60 percent of the world's greenhouse gas (GHG) emissions[1] – the main contributor to global warming causing Climate Change. Estimates suggest that over the next 15 years, approximately $90 trillion of infrastructure investment is needed to meet the global demand to build and maintain infrastructure. This amounts to approximately $6 trillion a year and exceeds the value of the world's existing infrastructure stock by over two-folds. 70% of this projected investment need (around $4 trillion a year), is expected to take place in Emerging Markets and Developing Countries (EMDCs)[2]. These EMDCs are also home to most Middle-Income Countries (MICs), especially within Latin America, as well as several major Asian economies.

City infrastructure in these EMDCs in particular will need to be newly built or rehabilitated to accommodate urbanization pressures brought on by population surges, and to bolster current and future resilience to climate change. In the coming decades, cities are expected to account for 80% of global GDP growth along with **two-thirds (66%) of global energy consumption,** including 70% in anticipated greenhouse gas (GHG) emissions. Thus, cities will be epicenters for developing climate-smart (sustainable) infrastructure solutions. If done right, this sustainable infrastructure will help mitigate GHG emissions, while building resilience to adapt to uncertain and more permanent effects of climate change. Therefore, most MICs will see a surge in demand over the next 15 years to modernize and retrofit existing energy infrastructure as well as scale-up energy efficiency (EE) measures to manage exponential growth in energy demand while increasing their resilience to climate threats. There will also be a strong impetus to decarbonize the transport sector through **cleaner and efficient transport modal shifts** (e.g. introduction of electric or low-emission bus fleets, trucks and cars) to lower the current 23% GHG emissions trajectory within this sector. Additionally, mainstreaming transport sector resilience across road, port and rail networks will also be a key priority. In the water supply and sanitation (WSS) sectors, **integrating resilience** to meet growing threats from sea-level rise, storm surges and flooding brought on by increased and unseasonal precipitation will also be a key focus, especially **across urban and coastal WSS infrastructure**. Therefore, it will be paramount to transform infrastructure assets in most MIC cities and urban areas, especially across Latin America and Asia. Similarly, in Sub-Saharan Africa (SSA), home to a majority of Low-Income Countries (LICs) and Fragile & Conflict States (FCS) – including 33 of the 77 IDA Countries – rapid urbanization into cities is accelerating and exposing populations to extreme climate events such as floods, heavy rains or droughts that amplifies the need to build resilience across power, transport and WSS infrastructure. Additionally, the region is projected to have significant GDP growth with rising income levels that will increase demand for energy access. Nevertheless, SSA is well endowed with ample renewable energy resources such as solar, wind, hydro and geothermal, and is expected to have significant growth, particularly in the development of Solar Photovoltaic (PV) infrastructure to power most of the region over the next 15 years. These affordable Solar PV off-grid solutions combined with well-planned rural mini-grids can transform the region's energy landscape and stimulate new markets to provide energy access to the poor. Such transformations can help SSA leapfrog to modern energy infrastructure, similar to the African mobile-phone revolution.

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[1] *Delivering on Sustainable Infrastructure for Better Development and Better Climate,* June 2016 – Bhattacharya, Amar et al.

[2] ibid

Thus, to avoid the lock-in effects of fossil fuel dependent infrastructure – more coal plants to meet rising energy demand or more oil for transportation needs – **governments will have to make urgent sustainable infrastructure planning and policy decisions over the next 3-5 years (now to year 2022)**. These upstream public sector decisions will have great impact in igniting sustainable and inclusive economic growth that is only achievable through private sector led climate-smart infrastructure development over the 2020-2030 period.

Central Role of Private Sector and Rising Demand for Climate-Smart PPP Frameworks

Given the scale and urgency, governments and development funding will not be able to meet the estimated EMDC target of $4 trillion per year for climate and infrastructure investment. The challenge therefore becomes attracting significant private capital and expertise at scale, recognizing as well the direct impact of private sector led innovation in the transition to clean technology infrastructure. Moreover, the recent exponential growth in technologies such as solar photovoltaic (PV)[3] and wind has resulted in dramatic price reductions that have now revolutionized renewable energy technologies as mainstream private sector investments. Thus, these new technologies are outcompeting traditional fossil-fuel based options like coal and natural gas and transforming power sector infrastructure. *For example, 2015 was another record-breaking year for investment in new wind, solar and hydropower plants, where 152 gigawatts (GW) of renewables became operational with global clean energy investments increasing to $348.5 billion – more than twice as much as coal and gas fired power generation.*[4] Innovations in urban transport systems as well as water and sanitation infrastructure are also seeing significant green transformations led by the private sector. This combination of **technological innovations** and **price reductions** is already a **game-changer** that is shifting the flow of private investment capital from carbon intensive infrastructure towards more sustainable infrastructure.

Despite these milestones, in EMDCs, the high perceived and real risks by private sector investors coupled with daunting market barriers translate into **high risk premiums** and **high cost of capital** leading to **high financing costs** for local project developers to build climate-smart infrastructure projects. This high cost of capital in turn is making it extremely difficult for EMDC governments to attract and tap into much needed private capital and regional and global expertise, to structure "bankable" project pipelines across key infrastructure sectors. In the current investment landscape, the annual public sector investment in infrastructure is at about $1.5 trillion with Public-Private Partnerships (PPPs) only contributing around $120 billion. In this present state, the extremely limited public budgets of EMDCs combined with decreasing development aid from donors exacerbates the challenge to raise approximately $4 trillion a year for projected infrastructure investments across EMDCs.

Contrary to this EMDC challenge, **global assets under management by private sector banks and institutional investors amount to more than $120 trillion** with only around 5% of this amount currently allocated to infrastructure investments. This presents an interesting value proposition for institutional investors that are seeking to match their large pools of long-term capital ideal for long-term infrastructure investments. Moreover, EMDC governments with limited fiscal space are seeing this as a triple win opportunity to simultaneously leverage public and private institutional capital, engage private sector expertise and stimulate economic growth through climate-smart infrastructure development. **This scenario puts the private sector at the center of sustainable infrastructure development agenda from now to 2030.** As a result, it creates a deep need for Public-Private collaborative initiatives including **Climate-Smart PPP Frameworks**, where both public

[3] Driven by technological improvements and manufacturing advances, and with overcapacities in the market peaking in 2011, **PV module prices decreased by around 80% between 2009 and 2015 (IRENA, 2016)**.

[4] Climate Investment Opportunities in Emerging Markets – An IFC Analysis, November 2016

and private parties can jointly-develop sustainable infrastructure solutions to mitigate and adapt to increasing climate threats. Such Public-Private collaborative initiatives will also drive innovations in technology and financing including optimal risk sharing arrangements to crowd-in private investment at scale. Additionally, climate-smart PPP arrangements can deliver sustainable infrastructure projects with **efficiency gains** and **value-for-money** through cutting-edge private sector solutions that better manage **climate risks** through optimal engineering and technology innovations across energy, transport and WSS sectors. However, to attract the private sector at scale, especially through PPPs, EMDC governments will need to address **root causes** of systemic market failures that can only be achieved through targeted upstream reforms. This will also mean that countries will have to align these upstream policy and institutional reforms to fast-tracking priority infrastructure projects to achieve practical results within a reasonable time frame. This underscores the need to carefully plan upstream reforms across MICs and LICs to specifically meet their local country challenges.

Urgent Need to Mainstream the Upstream in MICs and LICs

If governments are serious in attracting private sector investment at scale, mainstreaming the upstream by strengthening **country and sector policies, regulations and legal frameworks – the enabling environment –** along with **reforms to utility business models** will be the key to addressing systemic market failures and pricing distortions (e.g. fossil fuel subsidies). In addition, aligning Climate Policies, PPP Laws and Financial Sector Innovations including Fiscal Policy Tax Reforms (e.g. introducing Carbon Taxation policies) will all be critical elements to unlock billions to trillions and channel investments towards sustainable infrastructure. Improving institutional frameworks and building capacity of the public sector will be of utmost importance to develop and effectively manage long-term climate-smart infrastructure PPP projects led mostly through public-private initiatives with PPP contractual arrangements. Such comprehensive upstream reforms and measures will help address **high perceived and real risks** and build **investor confidence** in EMDC markets and simultaneously align **market incentives** towards clean technologies to develop strong pipelines of bankable climate-smart projects. This proactive approach will ultimately result in reduced financing costs for clean technology project developers across key energy, transport and WSS sectors.

For example, in Chile, continuous reforms to change the legal framework through targeted Technical Assistance support (provided by GIZ) from 2006-2012 coupled with Climate and Concessional Finance (provided by KfW and other DFIs) has helped catalyze and mobilize private investment at scale towards renewable energy projects. In parallel to these legal reforms, the government also introduced a series of policy and regulatory reforms that set clear renewable energy targets (e.g. renewable energy law 20/25), quota obligations and auction system rules including prioritizing grid access and preferential dispatch. *This combination of favorable policies with strong institutional frameworks have* ***resulted in high investor confidence*** *and since 2012, Chile has witnessed private sector led renewable energy commitments of US$9.2 billion.*[5] *This trend is accelerating rapidly with private investments going up 151% in 2015 relative to 2014 and reaching US$3.4 billion in just one year.*[6] Moreover, these timely reforms in Chile's enabling environment have positioned the country to become a global leader in deploying solar and wind technologies at scale. ***In August 2016, Chile contracted 23% of the country's projected energy demand for the next decade, with an average price of $0.04 cents/kWh through renewable energy auctions.***[7] Similar private investment trends channeled through PPP arrangements and combined with upstream reforms to scale-up renewables were also witnessed in India, South Africa and Mexico during 2015 – ***India (up 22% to $10.2 billion), South Africa (up 329% to $4.5 billion) and Mexico (up 105% to***

[5] Chile Rethinks Renewables and Gets Results – World Bank PPP blog, April 2016
[6] Climate Investment Opportunities in Emerging Markets – An IFC Analysis, November 2016
[7] Renewable Energy Auctions: Analyzing 2016 – IRENA, March 2017

$4 billion).[8] All of these countries were MICs across different geographies – the common thread – and were **ready** to move to the next level to put-in-place **climate-smart enabling environments**. This underscores the urgency across MICs and their position in the development spectrum to mainstream the upstream as soon as possible. In contrast, most LICs who are still in early stages of development and need more customized approaches to gradually transform their enabling environments that fit with their local country situations. For example, customizing new policy frameworks to scale-up mini-grid markets using off-grid Solar PV solutions will be more applicable in SSA, as opposed to reforming existing policies to improve already advanced grid infrastructure in Latin America. Furthermore, MICs provide the added benefit of transferring best practices and lessons learned to LICs and help them avoid common pitfalls experienced in MICs during the process of transforming their enabling environments. Thus, mainstreaming the upstream across MICs and LICs through different approaches will be the way forward to jump-start EMDC's infrastructure priorities.

Importance of Paris Agreement, NDCs, World Bank Climate Change Action Plan & Cascade

The ratification of the Paris Climate Agreement in 2016 generated valuable political momentum and **shifted the global infrastructure agenda** to move away from carbon intensive infrastructure towards sustainable infrastructure – low-carbon and climate-resilient solutions to limit global warming to 2-degree Celsius by 2050. These shifts have now catalyzed a movement to **align policy, sector and fiscal reforms with climate goals** outlined in the **Paris Agreement**. Moreover, the private sector which is driving these sustainable infrastructure changes primarily through technology innovations is already shifting its flow of private investment capital. For example, *The **Green Bond market** which took around nine years to raise its first $100 billion following the first green bond issued in 2007, took a little over a year from 2016 – Paris Agreement ratification – to early 2017 to double its **market capital to $200 billion**.*[9] In addition, governments are also starting to see the benefits of reforming fiscal policies to meet climate goals. Thus, **Carbon Taxes (e.g. fiscal policy action for carbon pricing)** are gaining popularity among policy makers and city planners, especially due to their ability to raise substantial revenues while improving national and city tax structures. For example, *today, 40 countries and over 20 cities, states, and provinces are already putting a price on carbon. They include seven out of the 10 largest global economies. All these instruments cover 13 percent of global emissions and have a collective value of $50 billion, allowing governments to raise about $26 billion in revenues in 2015.*[10]

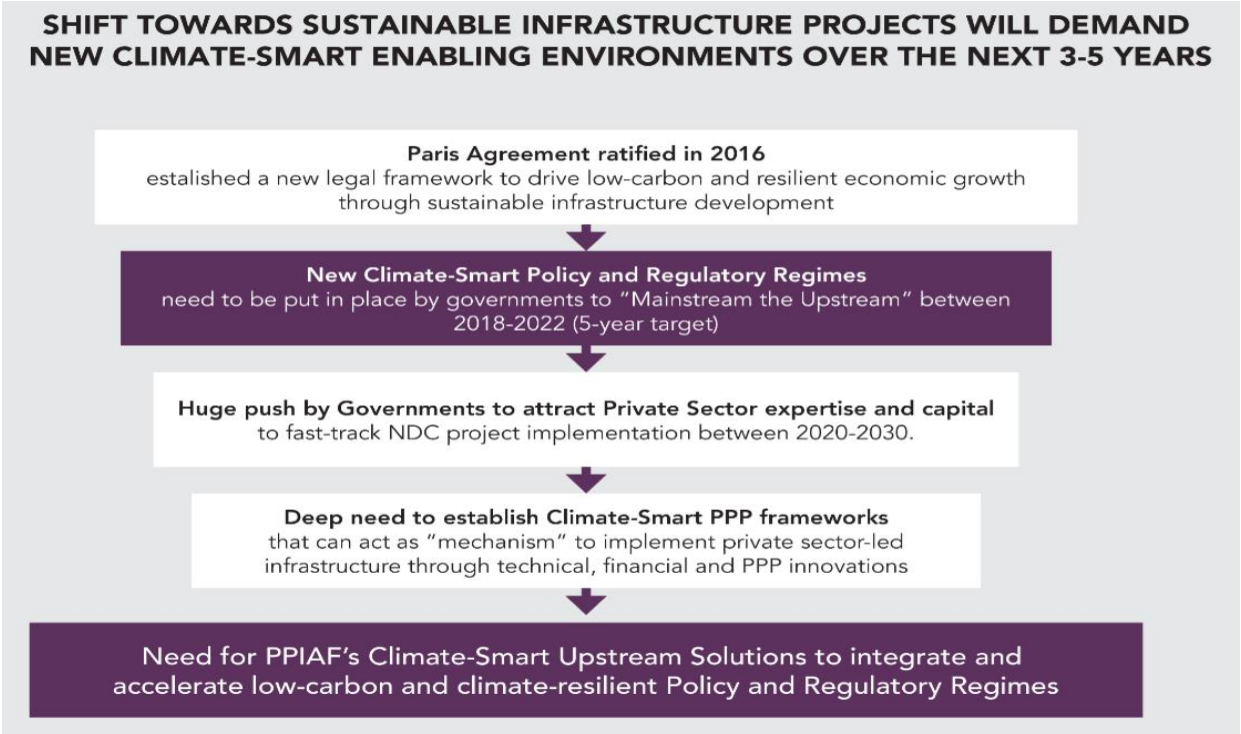
The driving force behind the binding Paris Agreement has been its intended Nationally Determined Contributions (iNDCs). iNDCs which have now been updated to become **NDCs** by most countries, primarily target renewable energy, energy efficiency including key urban transport and water and sanitation solutions that would build resilience into city or urban infrastructure to mitigate and adapt to growing climate change threats. Moreover, these NDCs will give governments direct access to timely Climate Finance to help de-risk and lower the high upfront capital costs associated with sustainable infrastructure projects. This will further help attract and mobilize private investments. Based on the Paris Agreement timeline, countries are now racing to formally finalize their NDCs over the next 3-5 years and move from talk to action to make them investible NDC action plans. This creates a greater urgency for governments to act quickly to integrate NDC commitments into national policies, infrastructure development strategies and budget processes. Therefore, **a top priority for governments will be to urgently reform their upstream enabling environments in the next 3-5 years to remove key barriers and risks** before trying to speed-up implementation of private sector led NDC projects starting from 2020-2030 period. Such a targeted upstream reform approach will help countries address

[8] Climate Investment Opportunities in Emerging Markets – An IFC Analysis, November 2016
[9] Green Bond Round-Up – Environmental Finance, April 26, 2017
[10] Climate Investment Opportunities in Emerging Markets – An IFC Analysis, November 2016

downstream investor risks and market failures systematically and crowd-in private capital at scale to fast-track NDC targets to develop bankable climate-smart project pipelines.

The World Bank (WBG) Climate Change Action Plan (CCAP) is closely aligned to help countries achieve their NDC targets. By working closely with client governments, the WBG will help integrate climate considerations into its client countries' national policies, planning and budgets to fast-track NDC implementation. The implementation of the CCAP within the WBG will be done through select **Global Practices (GPs)** – Energy, Transport, Water, Urban, Environment, Agriculture and Financial Markets GPs as well as key **Cross-Cutting Solutions Areas (CCSA)** – Climate Change and PPP CCSAs. Through this model, the Bank is already providing a range of lending, technical assistance (TA) and advisory support to governments to mobilize critical private capital and fast-track NDC project implementation. Given the prominence of private sector participation in infrastructure, the WBG is also transforming its operational practices to create new markets and **redefine development finance by** combining sustainable infrastructure development with NDC priorities. In this context, the **WBG Cascade Approach** to infrastructure financing will aim to prioritize the use of private investment first, followed by upstream reforms to enabling environments linked with de-risking priority infrastructure project pipelines and if required, as a last resort, use public/concessional finance to deliver key sustainable infrastructure projects.

The Public-Private Infrastructure Advisory Facility (PPIAF), which is housed inside the WBG, is well-positioned to leverage the World Bank's combined **GP-CCSA-Cascade implementation model** to effectively structure and implement upstream climate-smart TA and Knowledge interventions. Furthermore, PPIAF recognizes the massive need by governments to set up climate-smart enabling environments over the next 3-5 years to fast-track NDC implementation through Public-Private collaboration. Moreover, PPIAF is in a formidable position to provide **upstream thought leadership** due to their successful track-record in reforming enabling environments while accelerating climate-smart infrastructure solutions involving public-private collaboration, mostly via PPP frameworks. The figure outlines this logic:



B. Window of Opportunity for PPIAF to Deliver Climate-Smart Upstream Solutions

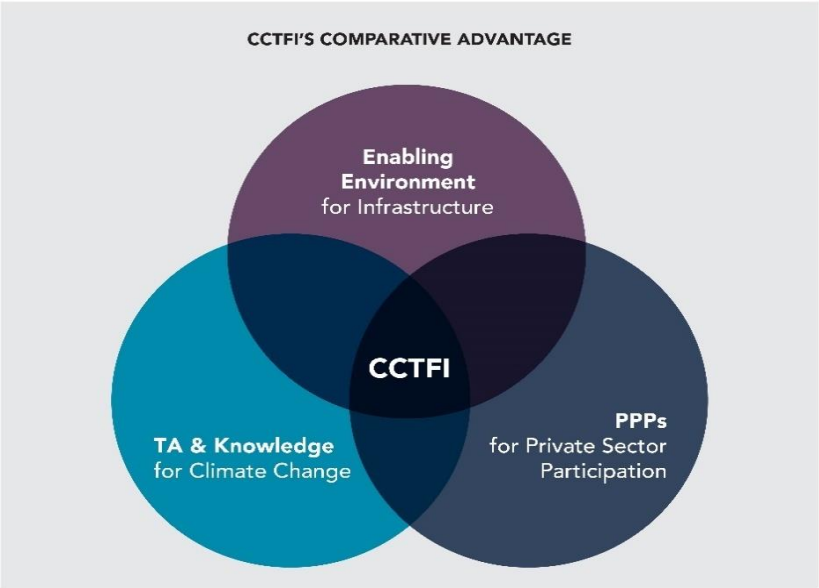
PPIAF Climate Change Strategy for FY18-FY22 and CCTFI Priority Areas (Pillars)

The recent exponential advances in clean technologies combined with their dramatic drop in prices in 2016 have ushered in a new era for private sector led climate-smart infrastructure development. These changes have now brought public policy makers, national infrastructure planners, private investors and project developers to the brink of a new **Sustainable Infrastructure Revolution**. This new revolution has the scale and magnitude of the **Industrial Revolution** but at the speed of the **Digital Revolution**. EMDCs are recognizing these transformations and beginning to develop "Investible" NDC Action Plans with the aim of crowding-in private capital to develop sustainable infrastructure assets over the 2020-2030 period. In addition, the global capital markets and private investor community are also shifting their investment capital towards sustainable investments, channeled primarily through green bond markets. The missing element in this sustainability landscape is upstream climate-smart enabling environments that must be put in place in the next 3-5 years.

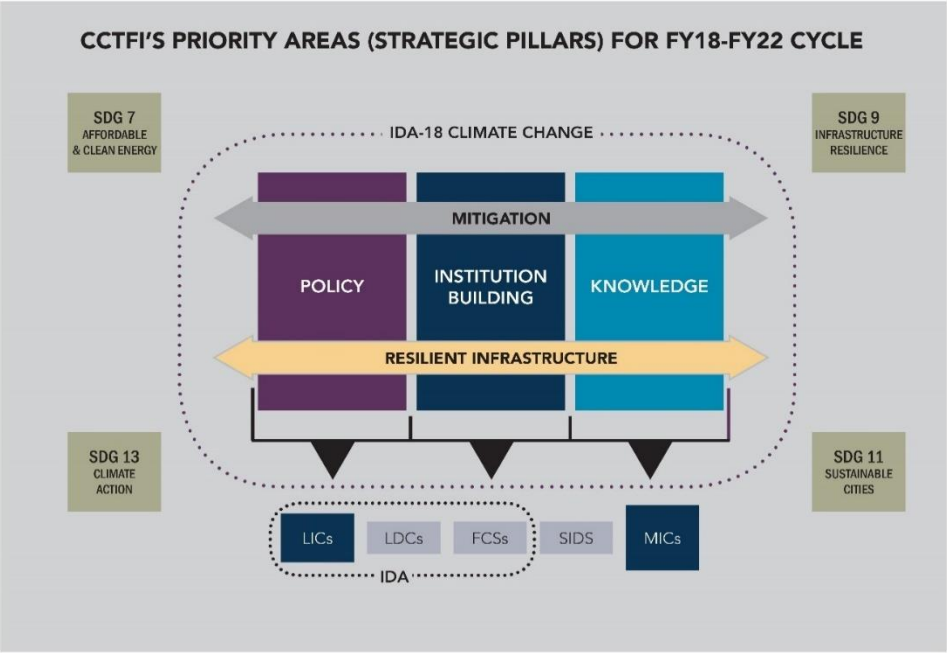
PPIAF recognizes these significant shifts and the short window of opportunity to scale-up upstream reforms. Thus, **Sustainability** is identified as a primary Strategic Area under PPIAF's broader 5-year Strategic Plan for the FY18-FY22 cycle. Within Sustainability, PPIAF identifies three (3) defining factors to help countries to systematically address future infrastructure and development challenges. Climate Change is one of these three, defining factors with Fragility and Local PPP Development being the other two. As such, PPIAF has defined **Climate Change** as a Strategic Priority for the FY18-FY22 cycle. For this upcoming 5-year business cycle, PPIAF's dedicated Climate Change Non-Core Trust Fund will be **renamed as the Climate Change Trust Fund for Infrastructure (CCTFI) to align specifically with climate-smart infrastructure priorities**. Funding for this transformative Climate Change agenda will be channeled through PPIAF's CCTFI. This CCTFI work will differentiate from PPIAF's broader Sustainability agenda that will be funded through its core Multi-Donor Trust Fund (MDTF). MDTF will systematically embed climate change activities in its sectoral technical assistance and knowledge work while also focusing on climate change initiatives in the MENA and ECA Regions. These regions are largely characterized with existing infrastructure that often requires different upstream intervention solutions (e.g. fossil fuel subsidy reforms and natural gas infrastructure planning and integration).

Thus CCTFI will focus on leveraging funding and expertise to develop a ***Center for Innovation*** *to promote* ***climate-smart enabling environments****, combined with upstream thought leadership to catalyze climate-smart infrastructure Public-Private models.* This will include innovative financing mechanisms that help unlock private sector investments at scale (going from billions to trillions) to deliver sustainable infrastructure across EMDCs. As a result, this body-of-work under CCTFI will be Transformative and specifically target Mitigation as well as Adaptation (Resilient Infrastructure) solutions that directly address Climate Change. The high-level objective of this work will be to target upstream Climate-Smart TA and Knowledge solutions that ultimately address *root causes* of downstream *market failures* and *investment risks* (perceived and real), which currently obstruct the scale-up of new sustainable infrastructure assets across EMDCs.

PPIAF's new Climate Change (CC) Strategy aims to leverage **CCTFI's Comparative Advantage** to combine expertise across delivering i) Climate-Smart Reforms to Infrastructure Enabling Environments with ii) Private Sector Participation through PPPs and iii) TA and Knowledge targeting Climate Change to help structure *Innovative Climate-Smart Infrastructure PPP Interventions*. See below:



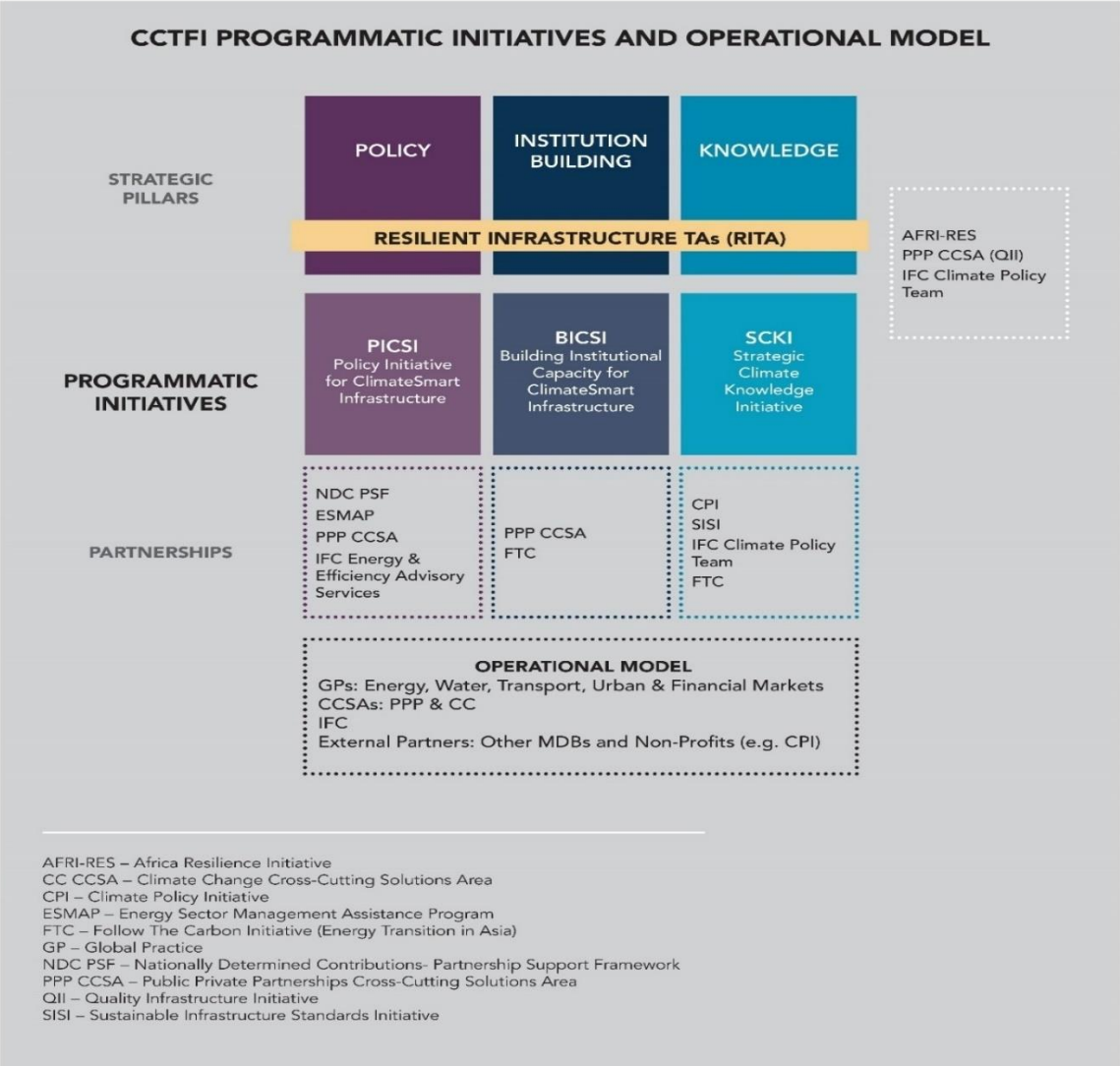
The new CC Strategy under CCTFI will have four (4) priority areas organized as three (3) Strategic Pillars together with a cross-cutting priority area dedicated for Resilience – see figure below. These areas are *Policy, Institution Capacity Building,* and *Knowledge* that target upstream reforms for climate change **Mitigation** as well as **Resilient Infrastructure** solutions across Energy, Transport, Water and Sanitation (WSS) sectors. The figure below shows CCTFI's Priority Areas structure:



Furthermore, within these Priority Areas, the CC Strategy has further defined key *Programmatic Initiatives* along with pre-identified *Strategic Partners* – see figure in next page – to optimize, leverage and catalyze the implementation of expertise, co-financing and human resources. The CC Strategy will target MICs and LICs including key IDA, FCS and Small-Island Developing States (SIDS). The idea will be to align CCTFI support with broader World Bank initiatives to facilitate climate-smart upstream enabling environments to develop private sector led bankable sustainable infrastructure project pipelines; which are also closely aligned with NDC priorities and Sustainable Development Goals (SDG) – SDG 7, 9, 11 and 13 – as outlined in the figure above.

Programmatic Initiatives and Strategic Partnerships

The driving force behind PPIAF's new CC Strategy is its **Programmatic Initiatives** and **Strategic Partnerships** – the operational model – that feeds into CCTFI's 4 Strategic Priority Areas. This model has been carefully thought-through to incorporate latest market transformations and technological innovations across EMDCs. It also aims to incorporate new thinking by World Bank's Senior Management to *Mainstream the Upstream* by leveraging its **GP-CCSA-Cascade model** to **redefine development finance objectives** and create new markets by addressing root causes of market failures. The figure below shows CCTFI's new Operational Model:



The four (4) Programmatic Initiatives inside CCTFI's operational model are as follows:

1. **PICSI** – Policy Initiatives for Climate-Smart Infrastructure
2. **BICSI** – Building Institutional Capacity for Climate-Smart Infrastructure
3. **SCKI** – Strategic Climate Knowledge Initiatives
4. **RITA** – Resilient Infrastructure Technical Assistance

Each of these 4 Initiatives target specific sectoral and/or regional infrastructure gaps and bottlenecks from both Mitigation and Resilience (Adaptation) perspectives. The rationale for supporting these Programmatic Initiatives including their key Implementing Partners are outlined below:

1. **PICSI** – Policy Initiatives for Climate-Smart Infrastructure **($8 million) – Flagship "Mitigation" Initiative**
   Sectors: Energy and Transport
   Regions: Latin America, East and South Asia, Sub-Saharan Africa and Small-Island Developing States (SIDS)

Energy Sector – Renewable Energy (RE) and Energy Efficiency (EE):
Due to technological and market advances in Solar PV and Wind technologies resulting in dramatic drops in their prices in 2016, the energy sector will see explosive growth of Non-Conventional Renewable Energy (NCRE) solutions in the next 15 years.

In SSA and SIDS, there is an acute need for Energy Access (EA) due to weakly built or insufficient energy infrastructure. This structural deficiency combined with rapidly growing energy demands due to urbanization and rise in income levels will also drive demand for innovative upstream reforms through changes to existing policy, regulatory and legal frameworks to develop new business models for affordable Solar PV solutions. Such upstream interventions, when combined with Mini-Grid Solar PV solutions can offer EA options that can bridge the energy infrastructure gaps and help move away from expensive diesel and heavy fuel oil options to leap frog power infrastructure solutions across SSA and SIDS.

In Asia*, six major economies are beginning to install 80% of the world's new coal-fired power plants from 2016 to 2020 to supply their rapidly growing energy needs in the region.* ***If built as planned, these six MICs*** *– China (**200GW**), India (**130GW**), Vietnam (**28GW**), Indonesia (**27GW**), Philippines (**7GW**) and Pakistan (**6GW**) – will all have large amounts of newly installed coal capacities that will "lock-in" carbon-intensive infrastructure with huge CO_2 emissions trajectories over their lifetimes. This will also jeopardize the valuable momentum gained through the Paris Agreement in 2016.*[11] Recognizing this significant challenge, the World Bank has launched the ***Follow-the-Carbon (FTC): Clean Energy Transition in Asia*** initiative to work closely with these countries to limit the number of future coal installations and swiftly transition towards rapid scale-up of clean energy solutions. This initiative is led by World Bank's Energy GP and closely linked to the CC CCSA's Climate Change Action Plan targets including NDC prioritization agenda.

In Latin America, home to a majority of MICs, there will be a huge shift towards integrating more Wind and Solar PV resources to reduce dependence on already installed large hydropower capacities that have dominated the power supply-mix over the years across the region. This significant push is mainly due to rapidly growing climate risks from prolonged droughts in the region that are negatively impacting long-term energy supply and security, both from Mitigation as well as Adaptation angles. *To this extent, CCTFI is already funding a $690,000 TA grant activity in Colombia in its current FY15-FY17 cycle to support structural reforms in institutional, policy and regulatory frameworks to help integrate higher share of Wind and Solar PV into the*

[11] World Bank Energy GP Discussion Note, November 2016 – Follow the Carbon: Clean Energy Transition in Asia

country's energy supply-mix (see Section C – Annex: CCTFI Track-Record). Support towards similar TA interventions across Latin America region are anticipated during CCTFI's new FY18-FY22 funding cycle.

Furthermore, both the Latin America and Asia regions due to their rapid growth of NCRE infrastructure will give rise to a new set of policy, regulatory and institutional barriers linked mainly to **renewable energy dispatch and utilization challenges** due to systemic limitations of existing grid infrastructure that currently limits the uptake of variable renewable integration (VRE) technologies like solar and wind at significant scale. Similarly, for hydropower development across Asia-Pacific and SSA regions, there will be a massive need for upstream reforms to expedite market transformations to develop vastly untapped hydro resources at scale. These hydropower sector reforms will also need to be combined public-private models to develop new interconnections for regional power trade solutions.

In addition, EE investments across Asia and Latin America will also become a major priority for governments to lower energy intensity and modernize infrastructure assets to manage growing regional energy demands as well as shift to "digital infrastructure" supported by smart grids and the Internet of Things (IoT). In this EE context, **upstream reforms to remove EE financing bottlenecks** that currently obstruct private sector led EE improvements through public-private collaborative models (e.g. Energy Service Performance Contracts or ESPC to implement public street lighting) will be key to develop new ESCO markets and mainstream EE solutions. Such EE interventions will also be critical to reduce new capital investments for building new power plants. Given the nature of the EE market, employing innovative public-private collaborative schemes, new financial solutions and infrastructure concepts, will require the promotion of flexible and innovative upstream solutions.

As outlined above, the need for upstream policy reforms across these different markets to transform their energy infrastructure can only be accelerated through targeted upstream reforms. Thus, the **PICSI Initiative** will aim to address these **Energy Sector** regional and market challenges outlined above by targeting upstream TA interventions that accelerate the scale-up of RE and EE infrastructure. To this effect, the strategic partnerships with NDC Partnership Support Facility (NDCP-SF) and ESMAP under the PICSI initiative will be critical for not only fast-tracking NDC goals but also transforming the energy sector to integrate low-carbon solutions to limit global warming to 2-degree Celsius by 2050.

Key Partnerships: World Bank Energy GPs, NDC Partnership Support Facility (NDCP-SF) and ESMAP

PICSI – TA interventions for Energy Sector (List not exhaustive)**:**

- Develop new RE and/or EE policies, regulations and legal frameworks vis-à-vis incentive structures to attract private investments (e.g. regulations that set priority grid access, integration and dispatch for RE)
- Strengthening PPP policies/contractual frameworks to scale-up RE and EE infrastructure and attract private investment (e.g. integrate design & construction standards that directly address climate risks in PPPs)
- Energy Systems Planning to shift the share of hydropower/coal to include more solar and wind
- Pre-Feasibility Studies to structure new utility business models to scale-up and integrate RE/EE
- Pioneering Transactions/Initiatives to address upstream financing bottlenecks for PPP focused EE models
- Market Studies: Variable Renewable Energy (VRE) Grid Integration, Tariff Reforms and Power Trading

Transport Sector:

In most MIC and LIC economies, large amounts of transport emissions come from heavy-duty vehicles (trucks) and light-duty vehicles (cars and buses) which are old and fuel inefficient. Motorization rates across MICs and LICs are also growing fast due to rapid urbanization, economic growth and rising income levels. In order to decarbonize the transport sector and reduce traffic congestion as well as air pollution, EMDC governments across Asia, Latin America and SSA will require significant upstream planning and policy reforms. This will encompass developing **Transport Master Plans** that capture overarching strategic principles of on how to Avoid, Shift, Improve and Fuel (ASIF). For example, in Latin America or Asia, Master Plans that incorporate **Transit Oriented Development (TOD)** by introducing new BRT or LRT fleets to avoid unnecessary/additional motorization – ***Modal Shifts to new BRTs to avoid more Cars*** – can not only improve *connectivity* but also improve *mobility* to improve public transportation systems. Such modal shifts combined with vehicle emission standards that "improve" fuel efficiency through low-emission bus or car fleets will be key strategies to improve **Urban Transport** systems across EMDCs. **Freight Transport** systems can incorporate similar modal shifts to move away from inefficient trucking fleets by shifting to in-land waterway and/or rail transport options to move goods. In addition, policies promoting cleaner fuels (e.g. low sulfur diesel) for truck fleets will be equally important from a mitigation angle. Nevertheless, limited public sector budgets restricts these fleet upgrade. This makes the role of the private sector central to attract new investments. Thus, forward looking transport policy frameworks are a mandatory requirement to attract private sector participation by establishing new financial mechanisms, incentive structures and business models to introduce these significant model shifts.

The **PICSI Initiative** will aim to address **Transport Sector** challenges outlined above by targeting upstream TA interventions that accelerate modal shifts including efficient vehicle fleets through innovative business models and market mechanisms.

Key Partnerships: World Bank Transport GPs; Urban GP; Energy GP; NDC Partnership Support Facility (NDCP-SF) and ESMAP

PICSI – TA interventions for Transport Sector (List not exhaustive)**:**

- Develop new transport policies that introduce strict vehicle emission standards as well as new technologies such as Electric Cars, low-emission Buses or Trucks
- Pre-Feasibility Studies to develop Transport Master Plans that consider Transit-Oriented Development (TOD) to introduce BRT and LRT options as well as innovative Mitigation and Adaptation solutions
- Pre-Feasibility Studies to structure new business models to finance low-emission bus fleets through innovating financing mechanisms that catalyze and mobilize public-private investments via PPP models

2. **BICSI** – Build Institution Capacity for Climate-Smart Infrastructure **($4 million)**
   Sectors: Energy, Transport, and Water Supply & Sanitation (WSS);
   Regions: Latin America, East and South Asia, Sub-Saharan Africa and Small-Island Developing States (SIDS)

The **BICSI Initiative** will aim to address gaps in **institutional frameworks** as well as **build capacity** of the Public Sector to better manage Climate-Smart PPP arrangements across Energy, Transport and Water & Sanitation sectors. To this extent, BICSI Initiative's primary partner will be the World Bank **PPP CCSA** to leverage their expertise and **suite of tools to build PPP capacity of governments and develop robust PPP frameworks to accelerate sustainable infrastructure development through a climate lens.** These tools include: i) PPP Country Readiness Diagnostic (**CRD**) tool ii) Infrastructure Prioritization Framework (**IPF**) tool iii) Infrastructure Sector Assessment Program (**InfraSAP**) tool and iv) PPP Project Screening tool.

The **Follow-the-Carbon (FTC) Initiative** will also be a flag-ship partnership under the **BICSI Initiative**. This FTC work will promote South-South Knowledge Exchange and Capacity Building between governments of the six FTC countries. The high-level objective of this targeted FTC work will be to limit or avoid future coal plant installations across China, India, Vietnam, Indonesia, Philippines and Pakistan by building institutional capacity and knowledge of governments to swiftly transition to deploy Renewable and Energy Efficiency solutions. This approach will avoid new coal plants being built. This BICSI work in Institutional Building will go hand in hand with the **SCKI Initiative** work in leveraging Global Best Practices and Lessons Learned to promote Renewable Energy development through **Renewable Auctions and Energy Efficiency knowledge-exchange workshops** supported by CCTFI funds. This work will be closely collaborated and implemented by World Bank's Energy GP and linked to the CC CCSA's Climate Change Action Plan targets/NDC prioritization agenda.

Key Partnerships: PPP CCSA; World Bank Energy GP's – Follow-the Carbon (FTC Initiative) team; ESMAP; NDC Partnership Support Facility (NDCP-SF) and ESMAP

BICSI – TA and Knowledge interventions (List not exhaustive)**:**

- The BICSI Initiative will be expanded in the future as key strategic partnerships are identified over 5 years
- Capacity and Consensus Building initiatives to improve the management of Climate-Smart PPPs
- Capacity and Consensus Building initiatives to build South-South Knowledge Exchange across FTC countries and help build Climate-Smart PPP Frameworks that support low-carbon infrastructure development in Asia

3. **SCKI** – Strategic Climate Knowledge Initiatives **($3 million)**
   Sectors: Energy, Transport and Water Supply & Sanitation (WSS);
   Regions: All Regions - Latin America, East and South Asia, Sub-Saharan Africa, Middle East & North Africa, Europe & Central Asia and Small-Island Developing States (SIDS)

The **SCKI Initiative** will aim to address critical knowledge gaps including looking at innovative knowledge solutions combining new market mechanisms that target **innovative climate-smart infrastructure financing models** to help unlock private sector investments including institutional investor capital to develop new sustainable infrastructure at scale; thus, going from billions to trillions. The **SCKI Initiative** work will primarily be creating **Thought Pieces** in effectively leveraging TA/Knowledge targeting upstream policy and infrastructure financing reforms. In this context, the SCKI will aim to leverage Global Best Practices and Lessons Learned to promote **RE Financing mechanisms (e.g. RE Auctions, Carbon Pricing mechanisms and legal frameworks), EE Financing mechanisms (e.g. setting-up Public-Private EE Funds), Urban EE transport and WSS sector financing solutions**. This body of work will aim to help governments fund low-emission or climate-resilient investments mainly in urban infrastructure setting through **new Public-Private funding mechanisms** that can be structured through knowledge grants to pool and securitize funds at significant scale for new infrastructure solutions.

The **Follow-the-Carbon (FTC) Initiative** will also be a flag-ship partnership under the **SCKI Initiative**. This FTC work will promote South-South Knowledge Exchange and Capacity Building between governments of the six FTC countries. The high-level objective of this targeted FTC work will be to limit or avoid future coal plant installations across China, India, Vietnam, Indonesia, Philippines and Pakistan by building institutional capacity and knowledge of governments to swiftly transition to deploy Renewable and Energy Efficiency solutions. This approach will avoid new coal plants being built. This SCKI work will leverage Global Best Practices and Lessons Learned to promote Renewable Energy development through **Renewable Auctions and Energy Efficiency knowledge-exchange workshops** supported by CCTFI funds. This work will be closely collaborated and implemented by World Bank's Energy GP and linked to the CC CCSA's Climate Change Action Plan targets/NDC prioritization agenda.

Key Partnerships: Climate Policy Initiative (CPI); World Bank GPs; NDC Partnership Support Facility (NDCP-SF); IFC Investments and Advisory teams

SCKI – Knowledge Products for Low-Carbon and Climate-Resilient Infrastructure Finance (List not exhaustive)**:**

- The SCKI Initiative will be expanded in the future as key strategic partnerships are identified over 5 years
- Develop Knowledge Products that explore the role of Green Finance for low-carbon and climate-resilient infrastructure as well as developing innovative instruments for scaling-up Cities Finance
- Develop Knowledge Products in Renewable Auctions studies that facilitate global knowledge exchange
- Develop Knowledge Products that explore the role of Resilient Financing models in PPP frameworks

4. **RITA** – Resilient Infrastructure Technical Assistance **($5 million) – Flagship "Resilience" Initiative**
   Sectors: Urban Transport and Water Supply & Sanitation (WSS); Energy Sector (Resilience Planning)
   Regions: Latin America, East and South Asia, Sub-Saharan Africa and Small-Island Developing States (SIDS)

The **RITA Initiative** is not only a **Programmatic Initiative** but also one of the 4 main **Strategic Priority Areas** under PPIAF's new CC Strategy for the FY18-FY22 cycle. The high-level objective of the RITA Initiative will be to help EMDC governments mainstream and integrate resilience measures (i.e. resilience toward permanent effects of climate change and more frequent and severe adverse climate events) **across key urban and coastal, inland waterway Transport infrastructure as well as WSS infrastructure**. From a regional perspective, RITA initiatives will primarily focus on **SSA, South Asia** and **Small-Island States (SIDS)**, where the damage to infrastructure assets from sea-level rise, storm surges and flooding brought on by extreme and unpredictable precipitation will be greatest over the coming years based on regional climate models. The key ingredients for success of this RITA work will be the leverage of strategic partnerships (e.g. World Bank Transport and Water GPs, PPP CCSA, IFC and External Partners) including World Bank's convening power to develop integrated solutions.

Thus, RITA will primarily target TA Resilience solutions across ***Urban Transport*** and ***Urban Water Supply and Sanitation (WSS)*** sectors. Given the impact of extreme weather events on power generation, particularly in the hydropower sector for example, there will also be some focus on power systems and contingency planning to reinforce resilience to specific extreme weather events in certain geographic areas. Therefore, anticipated upstream reforms for hydropower infrastructure across Asia-Pacific and SSA regions to develop vastly untapped hydro resources, combined with new interconnections for regional power trade will also factor in measures for resilience. Overall, the RITA Initiative will look at ***upstream Resilience Planning, Policy and Knowledge solutions*** (PPP CCSA as partner) as well as developing ***Resilience Metrics*** (IFC Climate Business as partner) linked to critical infrastructure assets. In addition, this work will also directly feed-in to the work done through the Policy, Institutional Capacity Building and Knowledge priority areas to provide holistic upstream resilience solutions over the 5-year strategic cycle.

Given the growing importance of climate threats to urban infrastructure assets from heavy rains, city-level flooding, storm surges and sea level rise that primarily impact coastal and rural road networks as well as urban and coastal city water utility infrastructure, the **RITA Initiative** will look at **upstream cross-sector planning and policy** (e.g. water and power systems planning) as well as **mainstreaming resilience measures through design and construction standards in PPP Contracts to specifically target climate risks** particularly across transport networks spanning roads, bridges, ports and rail. In addition, there will be a TA component that focuses on **Country Case Studies** that looks at **Quality Infrastructure Initiatives** (PPP CCSA as partner) and how to replicate such work using TA grant funding across EMDCs.

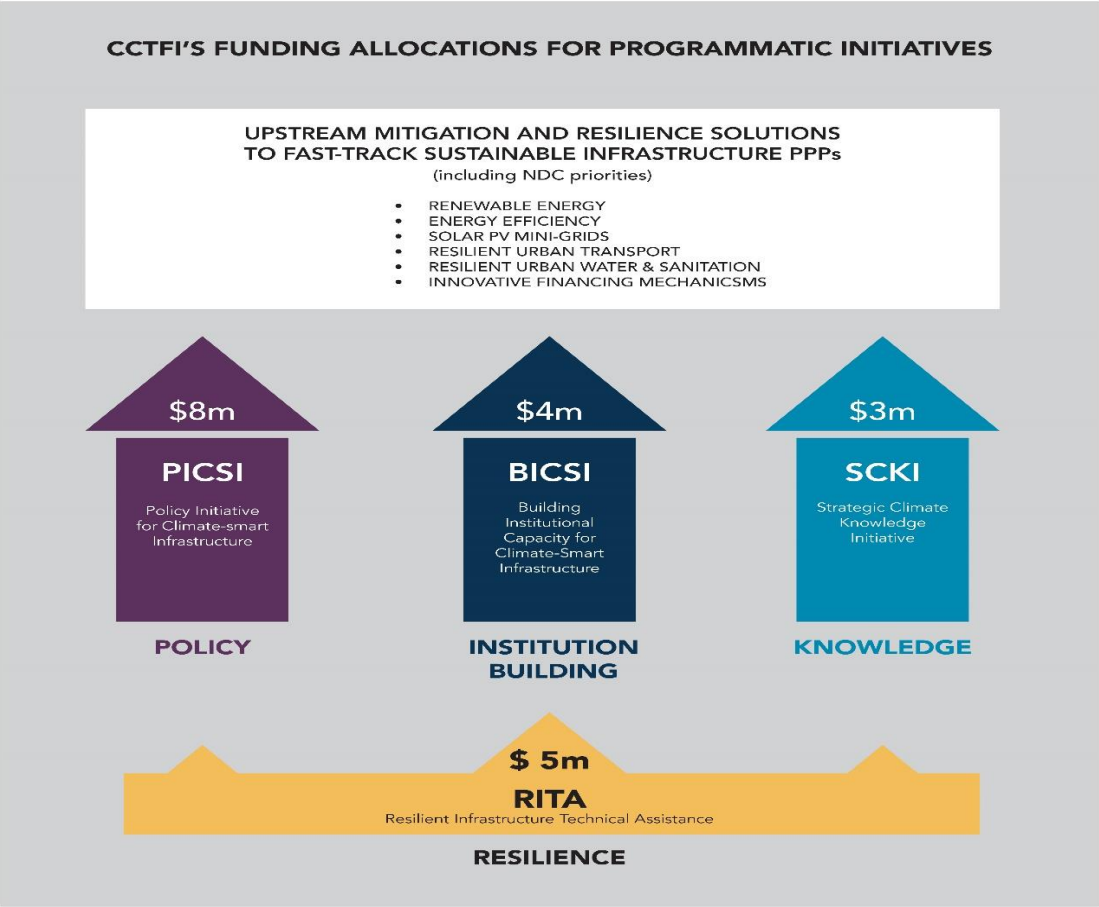
Key Partnerships: Transport GP; WSS GP; PPP CCSA; IFC and NDC Partnership Support Facility (NDCP-SF)

RITA – TA and Knowledge interventions (List not exhaustive)**:**

- The RITA Initiative will be expanded in the future as key strategic partnerships are identified over 5 years
- TA for Regional Integration of Coastal Road Corridors and mainstreaming Resilience for Coastal Road Infrastructure;
- Policies & Regulation to integrate and mainstream Resilience across Energy (Hydropower) and Water Sectors to support National Infrastructure Plans in line with NDCs;
- Pre-Feasibility Studies and Cost-Benefit Analysis;
- Develop Knowledge Products and Thought Pieces on how to mainstream Resilience in Infrastructure PPPs;
- Climate Risk Assessments (CRA) for Sustainable Infrastructure Development Actions Plans;

Business Proposal for FY18-FY22 Cycle – Statement of Funding Need

Given the scale and urgency of the response needed to the immediate and systematic threat of climate change, the new CC Strategy for FY18-FY22 (as explained in Section B) focuses more intently on several coordinated Programmatic Approaches for the scale up of climate related TA and Knowledge interventions. Through the implementation of new programmatic initiatives, PPIAF can more optimally demonstrate the ability to develop and leverage strong strategic partnerships that complement its own resources and boosts its development impact. In this context, PPIAF – through the CCTFI – intends to leverage both internal WBG and external partnerships along its three (4) Priority Areas. Together with the partners, PPIAF will specifically deliver upstream reforms that address downstream market barriers and investment risks associated with attracting private capital for low-carbon and climate resilient infrastructure development through PPP frameworks. In addition to Programmatic Initiatives, PPIAF will also continue 'coverage' support through 'Activity' & 'Sector' level interventions that target specific market failures/inefficiencies that can specifically target upstream interventions to stimulate innovative financing mechanisms (e.g. putting in place legal frameworks or prefeasibility studies for setting up innovative EE Funds to attract private sector investment at scale through PPP models). This ***transformative*** model will provide sufficient flexibility to engage with pre-identified partners, forge new partnerships as the program develops, and leverage PPIAF and partner resources and co-financing optimally. To this end and for the upcoming FY18-FY22 business cycle, CCTFI is requesting a **$20 million funding envelope** to implement its four (4) flagship programmatic initiatives. The allocation of these funds are as follows:



C. ANNEX

Climate Change Strategic Milestones during FY15-FY17 Cycle – CCTFI Track Record

PPIAF's on-going Climate Change Strategy for the FY15-FY17 cycle has been primarily driven by case-by-case country-specific TA and Knowledge requests including one large Programmatic Initiative in Nepal. It is important to recognize the evolution of PPIAF's work in Climate Change since its inception in 2009. This work has picked-up significantly over the last year. Moreover, the dramatic shifts in the global infrastructure and climate policy landscape have now shifted the default to aggressively reform the upstream enabling environment over the next five years (FY18-FY22). Therefore, going forward, this case-by-case strategic approach will no longer be adequate to meet the growing demand for climate-smart TA and Knowledge solutions where PPIAF's CCTFI has a successful track record. Below are some of CCTFI's flagship Climate Change TA and Knowledge interventions:

PPIAF Climate-Smart TA supports reforms to Colombia's Institutional, Policy and Regulatory Framework for Private Sector Participation in Clean Energy

Recently, Colombia endured a prolonged and intense drought that illuminated major structural issues affecting the performance of the electricity market in Colombia. PPIAF, through CCTFI is currently providing a $690,000 grant to the Government of Colombia (GoC) to initiate an extensive review of the overall performance of the wholesale electricity market in Colombia. This activity consists of several studies focusing on how new structural changes (institutional, policy, regulatory) affect the emergence of clean energy solutions including renewable energy and energy efficiency across the value chain; what policy and regulatory solutions should be considered to attract private sector participation in clean energy; and support to the GoC in the development of a pipeline of private sector led clean energy projects. This climate-smart TA support is therefore both critical and timely as the GoC attempts to mitigate and build resilience (adaptation) to climate change shocks through diversification of its power generation mix.

PPIAF TA Transforms Odisha's Enabling Environment to Tackle Climate Change through 1,000 MW Solar Park

PPIAF grant support of $291,000 was instrumental in transforming the enabling environment in the State of Odisha to scale-up renewable energy and catalyze the development of a 1,000 megawatt (MW) solar park through public-private partnerships (PPPs). The technical assistance (TA) grant provided by CCTFI was critical in developing the states Renewable Energy Policy (subsequently passed in November 2016), while helping to remove key barriers for private-sector participation (e.g., land acquisition) and building local institutional capacity (e.g., operationalization of the Green Energy Development Corporation [GEDCOL]). In April 2017, PPIAF through CCTFI funding followed up with additional $75 grant for a series of consensus building workshops to further support the Government of Odisha (GoO) in sensitizing and disseminating the Odisha State Renewable Energy Policy to local utility stakeholders including a closed round table for prospective solar park investors. The workshops identified concrete next steps for GoO on the policy implementation, such as meeting renewable energy policy targets, setting up the Odisha's Renewable Energy Development Fund, and defining the State's role on meeting national climate change commitments with ambitious renewable energy targets.

PPIAF lays the Foundation for an Overhaul of Nepal's Energy Sector through significant Upstream Policy, Regulatory and Institutional Reforms

In the current FY15-FY17 Climate Strategy cycle, PPIAF provided a landmark upstream TA grant through CCTFI for $2.1 million to the Government of Nepal (GoN), dedicated to transforming the country's energy sector from the ground-up. This complex TA implemented by World Bank's Energy Global Practice addresses critical power sector issues including advisory support for key sector regulations (power trading and tariff reform) and readiness of hydropower infrastructure including upstream support to develop pipeline projects. CCTFI's funding will bring international experiences, lessons, advise to GoN, technical inputs, development of a renewable energy training programme and facilitating consensus and capacity building workshops. PPIAF activities, closely coordinate with components of other trust funds as well as World Bank IDA credit to collectively improve Nepal's energy sector performance. By putting in place the appropriate institutional, regulatory and policy reforms and national infrastructure development plans, this Nepal TA is a flag ship demonstration of CCTFI's strategic programmatic approach to climate-smart TA support. This work will continue to grow in the next business cycle. This multi-million grant has made it possible for Nepal to design initial framework for energy sector reforms, that will act as trigger to unlock funding for a broader $1 billion Development Policy Credit (DPC) to be jointly supported by World Bank and the Asian Development Bank.

PPIAF Publishes Thought Piece on Climate Risks and Resilience in Infrastructure PPPs: Issues to be Considered

As part of PPIAFs goal to provide thought leadership and technical insights on critical areas of importance for climate-smart infrastructure and resilience, this issue brief, published by PPIAF's Senior Infrastructure Finance Specialist and Climate & Energy Portfolio Coordinator, examined issues to be considered in integrating climate risk and resilience in infrastructure PPPs. It also reviewed PPP contractual arrangements and their existing protection measures as well as challenges in managing climate risks. In essence, the issue brief highlights the need for a paradigm shift on how PPPs incorporate climate risks in long-term resilience in infrastructure investments. This paradigm shift includes the alignment of PPP and climate-change policies; partnering with the private sector and the insurance industry at a strategic level to find innovative and cost-effective solutions; using information technology and satellite imaging to collect and analyze climate data to assess potential risks; leveraging global climate finance sources; and taking an overall multi-sector, systems-wide approach to developing climate-smart infrastructure. Furthermore, the report emphasized the need to mainstream resilience through the integration of various policy areas to create enabling environments for the active management of climate risks in PPPs.

PPIAF Explores Emerging Trends in Mainstreaming Climate Resilience in Large Scale, Multi-sector Infrastructure PPPs

A PPIAF grant of $57,500 funded the development of a knowledge product that provides practical information on how to mainstream climate resilience into PPP frameworks in the context of multi-sector investment planning and implementation in developing countries. The knowledge product convincingly clarified what climate resilience means in terms of developing PPPs for infrastructure and what is currently being done in this area. Additionally, it provided practical advice and recommendations to international development stakeholders, including the World Bank Group staff, on how to aid countries in developing multi-sector and regional infrastructure PPPs that incorporate climate resilience planning. This much needed report has enhanced the body of knowledge disseminated by PPIAF and the PPP CCSA in this arena.

CCTFI TRACK RECORD & PIPELINE IN DELIVERING CLIMATE CHANGE TA & KNOWLEDGE SOLUTIONS (FY15-FY17)

REGION	ACTIVITY	SECTOR	APPROVAL DATE	APPROVAL VALUE ($)
South Asia	INDIA: Promoting Private Sector Participation for Renewable Energy Development in Odisha	Energy	2-Mar-2017	$ 75,000
Africa	NIGER: Private Sector-based Delivery of Electricity Services in rural areas*	Energy	23-Jan-2017	$ 397,356
Latin America and Caribbean	COLOMBIA: Review of institutional, policy and regulatory framework to support private sector participation in clean energy	Energy	13-Dec-2016	$ 690,000
Middle East and North Africa	WEST BANK AND GAZA: Palestine Energy and Natural Resources Authority (PENRA) in West Bank Gaza	Energy	23-May-2016	$ 299,000
South Asia	NEPAL: Power Sector Reform and Sustainable Hydropower Development Project	Energy	13-Aug-2015	$ 2,100,157
Global	KNOWLEDGE: Emerging Trends in Mainstreaming Climate Resilience in Large Scale, Multi-sector Infrastructure PPPs	Multi-sector	23-Jan-2015	$ 57,650
South Asia	INDIA: Renewable Energy Development in Odisha	Energy	9-Jan-2015	$ 291,000
Global	KNOWLEDGE: Innovative Approaches to PPPs in Smart Grid Investments	Energy	Pending non-objection	$ 150,000
Global	KNOWLEDGE: Global benchmarking study of Trucking sector productivity, PPP potential & carbon sector emissions	Transport	Pending non-objection	$ 200,000
Global	KNOWLEDGE: Fostering PSP in Nascent Sectors through Data Sharing and Reporting Standards: The Off-Grid PAYG Solar Case Study	Energy	Pending non-objection	$ 200,000
Latin America and Caribbean	PANAMA: Towards NDC implementation through public – private energy efficiency initiatives	Energy	Pending non-objection	$ 340,000
East Africa*	REGIONAL: Lighting Africa: Off-grid solar standards implementation	Energy	Application Pending	$ 375,000
Global*	KNOWLEDGE: Assessment of the effectiveness of public financing instruments in leveraging private sector investment for grid connected solar project	Energy	Application Pending	$ 100,000
			TOTAL	$ 5,275,163

*Concept Notes Approved by PPIAF Technical Review Panel In April 2017, Applications pending

PPIAF-NDC Partnership Support Facility Partnership on Climate Change

PPIAF Overview

The Public-Private Infrastructure Advisory Facility (PPIAF) is a multi-donor facility aimed at helping developing countries improve the quality of their infrastructure through private sector participation (PSP). The facility is managed by the World Bank on behalf of its donors. The Program Management Unit (PMU) is based at the World Bank's headquarters in Washington, DC and has Regional Offices in Kenya (Nairobi), Senegal (Dakar) and Singapore. PPIAF is mapped within the World Bank Group (WBG) to the PPP Cross-Cutting Solutions Area (PPP CCSA). The WBG is also PPIAF's primary implementing partner of TA grants.

PPIAF provides Technical Assistance (TA) grants to governments to build enabling environments (legal, regulatory, policy and institutional frameworks) that facilitate the development of infrastructure through Private sector participation, such as Public-Private Partnerships (PPPs). In addition, through its *Knowledge Products,* PPIAF supports the identification and dissemination of emerging notions of best practices for infrastructure PPPs.

In its current strategy, PPIAF funding focuses on countries and regions with the greatest needs, such as lower-income countries (LICs) and fragile and conflict-affected states (FCS). PPIAF also supports selected priority middle-income countries (MICs) to provide transferable lessons to LICs. The sectoral focus of PPIAF covers Energy, Transport and Water with select support to ICT. PPIAF's regional focus is primarily on Sub-Saharan Africa, with 50% of total grant funding through its core MDTF (Multi-Donor Trust Fund) fund. In addition to its MDTF core-fund, PPIAF houses five other non-core trust funds including one dedicated specifically to Climate Change: The Climate Change Trust Fund for Infrastructure (CCTFI).

The objectives under CCTFI are to promote climate-smart enabling environments and upstream thought leadership on catalyzing climate-smart PPP models including innovative financing mechanisms to unlock private sector investments at scale to develop sustainable infrastructure across EMDCs. Examples of related possible activities can be:

a) Helping governments frame sustainable development strategies to take full advantage of the potential for private sector involvement;
b) Helping governments design and implement specific policy, regulatory and institutional reforms;
c) Consensus Building at the country level on appropriate climate change policy, regulatory and institutional reforms;
d) Capacity Building to help governments design sustainable public-private infrastructure arrangements and regulate private service providers; and
e) Helping governments design innovative PPP solutions for climate-smart infrastructure and disseminate global best practices to mitigate climate change through PPP arrangements.

Urgency and Scale of the Climate-Smart Infrastructure Challenge

Climate Change (CC) poses an enormous global challenge. To meet this challenge, estimates suggest that over the next 15 years, approximately $90 trillion in sustainable (climate-smart) infrastructure investment is needed to

transition the global economy to a low-carbon and climate-resilient growth path. Approximately 70% of this projected investment need for sustainable infrastructure will be required in Emerging Markets and Developing

Countries (EMDCs). Given the scale of investment and expertise needed, the Private Sector's engagement with the Public Sector through PPPs will be paramount to meet this objective.

Going forward, the framework for shaping climate work will be the (Intended) Nationally Determined Contributions (hereafter, NDC) submitted by countries to the UNFCCC in 2015. These NDC documents lay out a country's climate priorities, policy efforts to date, and – in some cases – preferred implementation strategies aimed at delivering on these commitments. The ratification of the global Paris Climate Agreement on Nov 4, 2016 requires countries to scale up "climate-smart" infrastructure plans and policies in line with their NDC priorities at the national, sub-national and sector levels to guide long-term public and private investment towards sustainable infrastructure. PPIAF recognizes this upstream need over the next 5 years to coordinate reforms across policies, institutions and practices to help countries' speed up the development of sustainable and bankable infrastructure project pipelines, and achieve their NDC targets.

As a response to this need, PPIAF under its next 5-year Strategy (FY18-FY22) has identified Climate Change as one of its three Priority Areas for Sustainability. To operationalize this new CC Strategy, PPIAF is aiming to significantly scale-up its work done through its Climate Change Trust Fund for Infrastructure (CCTFI). Specifically, for PPIAF's core sectors, CCTFI will focus on upstream infrastructure PPP solutions that can lead to (i) transformational renewable energy deployment and energy efficiency programs as well as (ii) a strong push to decarbonize the transport sector through cleaner and efficient transport modal shifts (e.g. introduction of electric or low-emission bus fleets, trucks and cars) (iii) integrating resilience in the water supply and sanitation (WSS) sectors, to meet growing threats from sea-level rise, storm surges and flooding especially across urban and coastal infrastructure.

PPIAF-NDC Partnership Support Facility Vision for Climate Change

The WBG NDC Partnership Support Facility (NDCP-SF), under the Climate Change CCSA, is one of the ways the WBG is supporting the NDC Partnership (NDC-P)[1], a global initiative focused on **helping countries achieve their national climate commitments post 2020 and ensuring financial and technical assistance is delivered as efficiently as possible**. The NDCP-SF identifies opportunities and gaps in analytical studies and technical assistance to support countries' implementation of planned policies and actions. The NDCP-SF funds will prioritize activities that result in concrete investment plans supportable by other bi/multilateral aid and/or private finance - including PPP arrangements catalyzed through PPIAF's upstream support. these efforts would serve as a proof-of-concept, which if successful, could be scaled up and supported by a larger multi-donor trust fund housed at the World Bank.

In this context, PPIAF has a proven track record of providing technical assistance and knowledge grants through the development of upstream policies and robust enabling environments that facilitate climate-smart infrastructure PPPs. Thus, a partnership between PPIAF's CCTFI and the NDCP-SF provides a great opportunity to "crowd-in" efforts to address upstream regulatory, policy and institutional gaps for the deployment of mitigation and resilience infrastructure interventions outlined in NDCs across Energy, Transport, and Water sectors. Moreover, CCTFI is able to combine the ***Climate Change - Private Sector and Infrastructure*** angles (through PPP frameworks) to collaborate closely with the NDCP-SF, leverage co-financing and drive climate-smart TA solutions to remove upstream barriers to climate-smart 'bankable' projects pipelines, in-line with NDC priorities.

In addition to CCTFI resources, it is relevant to mention that PPIAF and the PPP CCSA have expertise and tools (e.g. PPP Country Readiness Diagnostic, Infrastructure Prioritization and Infrastructure Sector Assessment Program tools)

[1] http://ndcpartnership.org

that can also be considered and mobilized to better align NDC targets with national infrastructure planning and prioritization initiatives and leverage private sector participation through PPP models.

Both NDC Partnership Support Facility and PPIAF commit to coordinate so that funds from both entities are used in a complementary and optimized way.

As a contribution to support NDC implementation efforts around the world, PPIAF will consider allocating $2.5-$5 million between 2018 and 2022 through its Climate Change Trust Fund for Infrastructure (CCTFI). The size of CCTFI funding will be contingent upon the following:

1. Validation by PPIAF donors of the proposed Climate Change Strategy at the next Donor Council meeting in June 2017;
2. NDCP- SF co-funding of activities on an equal or greater funding commitment basis;
3. PPIAF funded components will be effectively committed once each considered activity under this partnership is approved, and will focus on the private sector participation dimension while targeting jointly defined countries.

This would mean a circa $500,000-$1 million per year commitment contingent upon the NDCP-SF being the primary co-financier and implementer of PPIAF's CCTFI grant funds.

Through two call for proposals, the NDCP-SF has already identified robust projects in selected countries to deliver implementation of NDC policies and targets. PPIAF leverage will increase the number of projects that WBG could implement in the next five years.

Based on the work done through the NDCP-SF, PPIAF sees opportunities to further support countries in areas listed below (list is not exhaustive):

- TA support to design National Infrastructure Plans as well as (Multi)-Sector Plans to promote low-carbon and climate-resilient infrastructure development; such interventions / components could involve:
    - Developing Generation Master Plans with higher share of Renewables in the Energy-Mix;
    - Energy System Planning to shift share of coal/hydropower to include more solar and wind;
    - Pre-Feasibility Studies for Energy, Transport and Water sector project planning;
    - Master Plans to develop Clean Transport Corridors with Fuel Efficiency Standards
- TA support to design Policy, Regulatory and Institutional Reforms to mainstream low-carbon infrastructure solutions, through activities such as:
    - Developing Sustainable Infrastructure frameworks;
    - Tariff Reforms and Power Trading studies
- TA support for Institutional Reforms and Capacity Building, including stakeholder consultation workshops
- Knowledge Products (e.g. White Papers on themes dealing with building resilience for infrastructure projects through private sector participation)
- Developing recommended contractual provisions for Sustainable (climate-smart) Infrastructure PPP projects

See BOX 1 below as an example for potential PPIAF CCTFI and NDCP-SF collaboration

BOX 1 – Renewable Energy Policy Development: Once the NDC Platform engages a country and identifies specific policy or regulatory gaps such as the absence of a renewable energy policy that impedes private sector developers to engage in developing a Solar Park, PPIAF's CCTFI could provide targeted TA grant support to that country to develop a robust renewable energy policy and regulatory framework. In addition, a component of this funding can include hiring of a firm to do a Land Bank Assessment to identify plots of land suitable to build a Solar PV Park.
Real Example: CCTFI TA support with WBG implementation in Odisha, India is transforming its enabling environment to facilitate the development of a 1 GW Solar PV Park through infrastructure PPPs.

PPIAF
Enabling Infrastructure Investment

NDC PARTNERSHIP
ACCELERATING CLIMATE AND DEVELOPMENT ACTION

May 16, 2017

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PPIAF-ESMAP Partnership on Climate Change

PPIAF AND ESMAP OVERVIEW

The Public-Private Infrastructure Advisory Facility (PPIAF) is a multi-donor facility aimed at helping developing countries improve the quality of their infrastructure through private sector participation. The facility is managed by the World Bank on behalf of its donors. The Program Management Unit is based at the World Bank's headquarters in Washington, DC and has Regional Offices in Kenya (Nairobi), Senegal (Dakar) and Singapore. PPIAF is mapped within the World Bank Group (WBG) to the PPP Cross-Cutting Solutions Area. The WBG is also PPIAF's primary implementing partner of TA grants.

PPIAF provides Technical Assistance (TA) grants to governments to build enabling environments (legal, regulatory, policy and institutional frameworks) that facilitate the development of infrastructure through Private sector participation such as Public-Private Partnerships (PPPs). In addition, through its Knowledge Products, PPIAF supports the identification and dissemination of emerging notions of best practices for infrastructure PPPs. PPIAF's core Multi-Donor Trust Fund (MDTF) focuses primarily on Sub-Saharan Africa with 50% of total grant funding. In addition to its core-fund, PPIAF houses five other non-core trust funds including the Climate Change Trust Fund for Infrastructure (CCTFI).

The Energy Sector Management Assistance Program (ESMAP) is a global knowledge and technical assistance program administered by the World Bank. It provides analytical and advisory services to low- and middle-income countries to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. Supporting over a hundred activities in countries around the world at any given time, ESMAP is an integral part of the Energy and Extractives Global Practice of the World Bank.

ESMAP services for client countries comprise TA and Policy Advice as well as Knowledge Products and Knowledge Exchange. This includes country-based activities to address specific energy challenges, which are designed to inform policy development and reforms in the country, as well as follow-on investments by the WBG, its development partners, and national governments. As part of the Knowledge Products and Knowledge Exchange, ESMAP also supports the development of global "public goods", reports, decision-support tools and online knowledge resources that are designed to inform policymakers and technical specialists. ESMAP also brings together countries to share experiences and disseminate global good practices on issues of mutual interest.

URGENCY AND SCALE OF THE CLIMATE-SMART INFRASTRUCTURE CHALLENGE

Climate Change poses an enormous global challenge. To meet this challenge, estimates suggest that over the next 15 years, approximately $90 trillion in sustainable (climate-smart) infrastructure investment is needed to transition the global economy to a low-carbon and climate-resilient growth path. Approximately 70% of this projected investment need for sustainable infrastructure will be required in Emerging Markets and Developing Countries. Given the scale of investment, financing and expertise needed, the Private Sector engagement with the Public Sector through PPPs will be paramount to meet this objective.

The ratification of the global Paris Climate Agreement in 2016 has created a new sense of urgency for countries to scale up "climate-smart" infrastructure plans and policies at the national, sub-national and sector levels to guide long-term public and private investment towards sustainable infrastructure. PPIAF aims to coordinate reforms across policies, institutions and practices to help countries' speed up the development of sustainable and bankable infrastructure project pipelines to achieve their climate change goals.

As a response to this need, PPIAF under its next 5-year Strategy (FY18-FY22) has identified the promotion of sustainable infrastructure, including Climate Change as one of its three Strategic Areas of focus. CCTFI, guided by the

Climate Change Strategy (FY18-FY22) will aim to develop innovative infrastructure PPP solutions that can lead to transformational renewable energy deployment and energy efficiency interventions (mitigation) including helping build climate-resilient infrastructure (adaptation) through PPP frameworks over the coming decade.

PPIAF-ESMAP Partnership Vision for Climate Change

ESMAP's renewable energy activities comprise four programs – the Solar Support Program, the VRE Grid Integration Support Program, the Global Geothermal Development Plan and the Renewable Energy Resource Mapping Program. Together, these programs focus on identifying primary sources of renewable energy, helping to adapt power systems to variable sources of electricity and mobilizing larger volumes of capital into renewable energy expansion in low and middle income countries. ESMAP offers support for resource mapping; development of grid-connected solar PV, including carrying out market assessments, preparing feasibility studies and supporting transaction structuring; and grid integration of variable renewable energy (VRE), including capacity development for long-term grid planning, market design, revision of renewable energy support mechanisms, development of rules of access to electricity grids for VRE, and efforts aimed at strengthening the electricity dispatch and transport infrastructure. By maximizing the opportunities to scale-up renewable energy, ESMAP is at the forefront of the transition towards cleaner, cheaper, diverse and more reliable sources of energy.

ESMAP's energy efficiency activities focus on cities, where 80% of global GDP is generated, two thirds of global energy consumption is concentrated, and 70% of GHG emissions are generated. ESMAP's energy efficiency support is delivered through 2 complementary programs: (i) Efficient City Services, which supports the integration of EE in the design, planning, management and implementation of projects that improve city services; and (ii) Efficient and Sustainable Buildings, which provides support for the integration of EE with renewable energy and other sustainability aspects in buildings, including how buildings are constructed, how they are retrofitted, how they use energy and where they are located. These programs provide targeted financial and operational support for client engagement, project identification, project preparation and implementation support across WB Global Practices and IFC for activities such as (i) energy efficiency diagnostics; (ii) energy audits; (iii) pre-feasibility and feasibility studies; (iv) design of implementation mechanisms and business models; (v) strategic planning and sector reforms in the urban/buildings space; as well as (v) advisory services (e.g. on policy, regulatory and institutional framework).

In this context, PPIAF has a proven track record of providing technical assistance and knowledge grants to address such policies and actions through the development of robust enabling environments that facilitate climate-smart infrastructure PPPs.

the envisioned partnership between PPIAF's CCTFI and ESMAP provides an opportunity to "crowd-in" efforts to address upstream regulatory, policy and institutional gaps for the deployment of renewable energy and energy efficiency. Moreover, CCTFI is able to combine the ***Climate Change-Private Sector and Infrastructure*** angles (through PPP frameworks) to collaborate closely and leverage co-financing with ESMAP for TA solutions.

In addition to CCTFI resources, it is relevant to mention that PPIAF and the PPP CCSA have expertise and tools (e.g. PPP Country Readiness Diagnostic, Infrastructure Prioritization and Infrastructure Sector Assessment Program tools) that can also be considered and mobilized to better align with ESMAP's work and leverage private sector participation in the Energy Sector.

Both ESMAP and PPIAF commit to coordinate so that funds from both entities are used in complementary and optimized way

ESMAP and PPIAF have identified opportunities for collaboration to further leverage programs and initiatives such as Solar Africa and Follow-the-Carbon, including in the areas listed below:

- Knowledge Products, Consensus Building and Capacity strengthening for:
    - Renewable energy auction design or other competitive tendering mechanisms;
    - PPP frameworks for renewable energy and energy efficiency infrastructure including smart grid solutions;
    - Development of new utility business models for renewable energy, through TA and knowledge sharing
- Support to integrated resource planning, integration studies and improved system operation, through TA in:
    - Renewable Energy Scale-Up Strategies;
    - Variable Renewable Energy grid integrations studies and generation/transmission expansion plans, with a particular focus on middle income countries in LAC and Asia
- Support to policy and regulatory frameworks, including:
    - Preparation of grid codes and VRE procurement strategies, and market design (e.g., to explicitly value flexibility and capacity in national electricity markets)
- TA to support the design and implementation of solar PV projects and urban energy efficiency projects, including pre-feasibility studies, and development of a set of recommended contractual provisions for renewable energy PPP projects

PPIAF-ESMAP Partnership Joint Grant Funding Process

As a contribution for the PPIAF-ESMAP Partnership, PPIAF will consider allocating approximately $2.5 million between 2018 and 2022 through its Climate Change Trust Fund (CCTFI). The size of CCTFI funding will be contingent upon the following:

- Validation by PPIAF donors of the proposed Climate Change Strategy at the next Donor Council meeting in June 2017;
- ESMAP co-funding of activities on an equal or greater funding commitment basis;
- PPIAF funded components will be effectively committed once each considered activity under this partnership is approved, and will focus on the private sector participation dimension in jointly defined countries and regions.

Funding from the partnership can be obtained through a process that will follow standard ESMAP and PPIAF templates as outlined below.

ESMAP Approval (estimated approval time 4 weeks):

1. World Bank Task Team Leaders (TTLs) complete an ESMAP **Proposal Summary Form (PSF)** in consultation with, and submit through, their respective ESMAP Regional Coordinator, signed off by their Practice Manager.
2. During the review of the PSF, ESMAP staff will assess whether the proposal is suitable for PPIAF co-funding and make a recommendation to the TTL in the review note.
3. Following ESMAP approval, a separate **Grant Funding Requests** will be created and approved for release of funds.

PPIAF Approval (estimated approval time 8 weeks):

1. Subject to a positive outcome of the ESMAP PSF review, the TTL will prepare and submit to PPIAF a **PPIAF Concept Note (CN)**. The CN are evaluated by PPIAF technical review panel (TRP) on a rolling basis every second week.
2. Upon approval of the CN, the TTL will prepare a **PPIAF Application Package**, comprising Application Form; Budget Template; TORs; CMU endorsement Letter; Government Request Letter
3. The application package will be reviewed by TRP and submitted to PPIAF donors. Donors will have 10 business days for non-objection to the approval of the application.
4. Following PPIAF approval, a separate **Grant Funding Requests** will be created and approved for release of funds.

PPIAF-ESMAP Partnership Objective

The PPIAF-ESMAP Partnership is established with the objective to increase the impact of renewable energy and energy efficiency knowledge work and technical assistance activities supported with grant funding from ESMAP and PPIAF. To this end, ESMAP and PPIAF will collaborate on complementary activities, leverage funding and human resources and provide flexible and simplified access to grant funding for World Bank TTLs. Such combination of efforts aims at optimizing resource allocation from PPIAF, the PPP CCSA, ESMAP and the Energy and Extractives Global Practice to deliver results in countries with ambitious renewable energy and energy efficiency targets.

The partnership covers Renewable Energy and Energy Efficiency activities, in particular in the following five areas: i) Knowledge Products and Capacity Building Programs for competitive procurement of renewable energy generation and PPP frameworks for renewable energy and energy efficiency infrastructure, as well as consensus building to support development of new utility business models for renewable energy; ii) TA to support integrated resource planning, integration studies and improved system operation for renewable energy; iii) TA to support policy and regulatory frameworks such as grid codes and market design, and; iv) TA to support the design and implementation of solar PV projects and urban energy efficiency projects, including pre-feasibility studies, and development of a set of recommended contractual provisions for renewable energy PPP projects.

PPIAF
Enabling Infrastructure Investment

ESMAP
Energy Sector Management Assistance Program

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