Funding Proposal

FP081: Line of credit for solar rooftop segment for commercial, industrial and residential housing sectors

India | National Bank for Agriculture and Rural Development (NABARD) | Decision B.19/12

16 March 2018

GREEN CLIMATE FUND

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Funding Proposal

Version 1.1

The Green Climate Fund (GCF) is seeking high-quality funding proposals.

Accredited entities are expected to develop their funding proposals, in close consultation with the relevant national designated authority, with due consideration of the GCF's Investment Framework and Results Management Framework. The funding proposals should demonstrate how the proposed projects or programmes will perform against the investment criteria and achieve part or all of the strategic impact results.

Project/Programme Title:	**Line of Credit for Solar rooftop segment for commercial, industrial and residential housing sectors**
Country/Region:	India
Accredited Entity:	National Bank for Agriculture and Rural Development (NABARD)
Date of Submission:	31.12.2017

Contents

Note to accredited entities on the use of the funding proposal template

- Sections **A, B, D, E** and **H** of the funding proposal require detailed inputs from the accredited entity. For all other sections, including the Appraisal Summary in section F, accredited entities have discretion in how they wish to present the information. Accredited entities can either directly incorporate information into this proposal, or provide summary information in the proposal with cross-reference to other project documents such as project appraisal document.
- The total number of pages for the funding proposal (excluding annexes) is expected not to exceed 50.

Please submit the completed form to:

fundingproposal@gcfund.org

Please use the following name convention for the file name:
"[FP]-[TCCL-NABARD]-[20171231-[1]"

A.1. Brief Project / Programme Information			
A.1.1. Project / programme title		**Line of Credit for Solar rooftop segment for Commercial, Industrial and Residential Housing sectors**	
A.1.2. Project or programme		programme	
A.1.3. Country (ies) / region		India	
A.1.4. National designated authority (ies)		Ministry of Environment, Forests & Climate Change (MoEF&CC)	
A.1.5. Accredited entity		National Bank for Agriculture and Rural Development (NABARD)	
A.1.5.a. Access modality		☒ Direct ☐ International	
A.1.6. Executing entity / beneficiary		Executing Entity: Tata Cleantech Capital Limited Beneficiary: Commercial, Industrial & Residential housing sectors ("Customers")	
A.1.7. Project size category (Total investment, million USD)		☐ Micro (≤10) ☒ Medium (50<x≤250) *	☐ Small (10<x≤50) ☐ Large (>250)
A.1.8. Mitigation / adaptation focus		☒ Mitigation ☐ Adaptation ☐ Cross-cutting	
A.1.9. Date of submission		31.12.2017	
A.1.10. Project contact details	Contact person, position	For: Accredited Entity: Mrs. T S Raji Gain Chief General Manager	For Executing Entity: Mr. Bhawin Shah, Head – Credit Underwriting
	Organization	National Bank for Agriculture and Rural Development (NABARD)	Tata Cleantech Capital Limited
	Email address	tsr.gain@nabard.org, fspd@nabard.org, climate.change@nabard.org	Bhawin.Shah@Tatacapital.com
	Telephone number	+91 22 26530094, +91 9163338400 Fax: +91 22 26539012,	+91 9870102082
	Mailing address	Farm Sector Policy Department (FSPD), NABARD Head Office, C-24, G Block, Bandra Kurla Complex, Bandra East, Mumbai 400 051 (INDIA)	3rd Floor, A Wing, iThink Techno Campus, Adjacent to TCS Yantra Park, Off Pokharan Road No. 2, Thane (W) 400 607, India

**Project size category for the programme classified at Medium since total programme size is USD 250 million. Category of individual projects under the programme shall be Micro.*

A.1.11. Results areas *(mark all that apply)*

Reduced emissions from:

- ☒ Energy access and power generation
  (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)
- ☐ Low emission transport
  (E.g. high-speed rail, rapid bus system, etc.)
- ☐ Buildings, cities and industries and appliances
  (E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)
- ☐ Forestry and land use

(E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)

Increased resilience of:

☐ Most vulnerable people and communities
(E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)

☐ Health and well-being, and food and water security
(E.g. climate-resilient crops, efficient irrigation systems, etc.)

☐ Infrastructure and built environment
(E.g. sea walls, resilient road networks, etc.)

☐ Ecosystem and ecosystem services
(E.g. ecosystem conservation and management, ecotourism, etc.)

A.2. Project / Programme Executive Summary (max 300 words)

I. Background:

The challenge of climate change calls for extraordinary vision, leadership, compassion and wisdom as the cumulative accumulation of greenhouse gases (GHGs) historically since industrial revolution has resulted in the current problem of global warming. Government of India has been an active and constructive participant at global level in the search for location specific solutions. The per capita emissions of many developed countries vary between 7 to15 metric tonnes, the per capita emissions in India were only about 1.56 metric tonnes in 2010. Climate change is a major challenge for developing countries like India that face large scale climate variability and are exposed to enhanced risks from climate change. Few countries in the world are as vulnerable to the effects of climate change as India because of its' vast population that is dependent on the growth of its agrarian economy, its expansive coastal areas and the Himalayan region and islands. In recognition of the growing problem of Climate Change, Govt of India declared a voluntary goal of reducing the emissions intensity of its GDP by 20–25%, over 2005 levels, by 2020, despite having no binding mitigation obligations as per the Convention. A slew of policy measures were launched to achieve this goal. As a result, the emission intensity of our GDP has decreased by 12% between 2005 and 2010. It is a matter of satisfaction that United Nations Environment Programme (UNEP) in its Emission Gap Report 2014 has recognized India as one of the countries on course to achieving its voluntary goal.

The largest renewable capacity expansion program in the world is being taken up by India to reduce CO_2 emissions. The Government of India is aiming to increase share of clean energy through massive thrust in renewables. A capacity addition of 14.30 GW of renewable energy has been reported during the last two and half years under Grid Connected Renewable Power, which include 5.8 GW from Solar Power, 7.04 GW from Wind Power, 0.53 GW from Small Hydro Power and 0.93 GW from Bio-power. Going by the growth rate in clean energy sector, the Government of India in its submission to the United Nations Frame Work Convention on Climate Change on Nationally Determined Contribution (NDC) has stated that India will achieve 40% cumulative Electric power capacity from non-fossil fuel based energy resources by 2030. The Government of India has set a target of 40 GW of rooftop solar power by 2022 which will require substantial financial resources, estimated at USD 34 billion. However, availability of long-term debt financing remains a major constraints for expansion of rooftop solar power in India.

Indian Solar Rooftop: installed capacity stood at 1.4 GW as on March 2017 with Tamil Nadu, Maharashtra and Rajasthan being the leading states in terms of installed Rooftop Solar capacity. The solar rooftop market has grown at a CAGR of 98% over the last 4 years. Historically, Solar Rooftop has always maintained a 10-12% share of the overall Solar Capacity. With 65% of total installed capacity, Commercial & Industrial remains the biggest market segment. These consumers account for more than 50% of India's total power demand and make savings of up to 50% through rooftop solar systems

as their grid tariffs are typically between INR 7-10 (US¢ 11-16)/ kWh. Public sector segment is also expected to show robust growth in the coming years because of a strong government push combined with 25-30% capital subsidy. In contrast, the residential segment is expected to grow relatively slowly because of limited economic incentive to set up solar rooftop systems.

II. Executing Entity:

Tata Cleantech Capital Limited (TCCL) is a joint venture between Tata Capital and International Finance Corporation (IFC), Washington DC, US. Tata Capital is a part of USD 103 billion Tata Group, one of India's biggest and most respected business conglomerates. TCCL, rated AA+ by CRISIL (a Standard & Poor's company), has funded over 3 GW renewable energy projects saving approximately 4.5 million tonne CO_2 emission annually. TCCL specialises in end to end business solutions in the clean technology space. It identifies, evaluates & funds projects in renewable energy (solar, wind, small hydro, biomass etc), energy efficiency and water treatment sectors.

III. Programme:

The programme, titled 'Line of Credit for Solar rooftop segment for commercial, industrial and residential housing sectors', seeks a total of USD 100 million of GCF resources in the form of Senior Loans to overcome identified barriers to low-carbon investment. Additionally, TCCL shall also contribute USD 100 million in to the programme. With the assistance of the GCF, TCCL will receive the necessary assistance to develop a fit-for-purpose framework to allow the ambitious scale-up of solar roof top capacity in India. The programme shall, among others, enable an expected lifetime emission reduction of ~5,200,000 tCO_2eq (indicative) over the lifetime of the project. The supervision of the projects financed by the GCF will be based on a detailed Monitoring and Evaluation plan that will be implemented to track project performance and achievement of results. Project level results will be aggregated to assess the impact of the GCF's programme in addition to the GCF's project-specific indicators.

GCF's financial assistance (USD funds via its Interim Trustee World Bank) to TCCL shall be routed through NABARD, the AE with GCF. NABARD shall then on-lend the same to TCCL in local currency (Indian Rupees). TCCL shall provide project loans to various solar rooftop developers after a detailed technical, financial and economic due diligence for the project and the developer. TCCL will have a detailed project monitoring evaluation and reporting framework dedicated to the programme. The monitoring evaluation reports (in accordance with the FAA and AMA) shall be submitted with NABARD for onward submission to GCF after being appraised by NABARD and/or NABARD appointed Independent Consultants. NABARD would ensure necessary monitoring and reporting as per the GCF requirements indicated in the AMA and FAA. The mechanism would be independent mechanism apart from the concurrent mechanism proposed by the TCCL.

IV. Objectives:

The proposed programme by TCCL would support Government of India's initiative in fulfilling renewable energy targets by enabling access to solar rooftop developers to the required means of finance. The programme aims to tap around 250 MW of solar rooftop capacity in the initial phase over 2018-2022. TCCL, through its expertise, aims to cater to the specific market needs and be a facilitator to bridge existing gaps/current barriers in the rooftop solar sector. This will lead to creation of a viable economical model in the solar rooftop space and will attract competitive financing in the currently unbanked sector.

A.3. Project/Programme Milestone

Expected approval from accredited entity's Board (if applicable)	Not Applicable*

Expected financial close (if applicable)	Not Applicable
Estimated implementation start and end date	Start: 01/04/2018 End: 31/03/2023
Project/programme lifespan	20 years __0__ months

* *NABARD would obtain necessary approval.*

* *Approval from the Board of TCCL (the EE) shall be submitted post sanction of the programme.*

B.1. Description of Financial Elements of the Project / Programme

Component	Sub-component (if applicable)	Amount (for entire Programme)	GCF funding amount	Co-financing by TCCL	Project Developer's equity	Currency	Amount (for entire Programme)	GCF funding amount	Co-financing by TCCL	Project Developer's equity	Local currency	Currency of disbursement to recipient
Development of 250 MW of Solar Rooftop Capacity	PV modules	112.50	45	45	22.5	million USD ($)	7,313	2,925	2,925	1,463	Million INR	Million INR
	Inverters	75.00	30	30	15	million USD ($)	4,875	1,950	1,950	975	Million INR	Million INR
	Mounting Structures	37.50	15	15	7.5	million USD ($)	2,438	975	975	488	Million INR	Million INR
	Other BOS (Junction box, cables, meters etc.)	12.50	5	5	7.5	million USD ($)	813	325	325	163	Million INR	Million INR
	Soft Costs #	12.50	5	5	2.5	million USD ($)	813	325	325	163	Million INR	Million INR
Total programme financing		**250.00**	**100**	**100**	**50**	million USD ($)	**16,250**	**6,500**	**6,500**	**3,250**	Million INR	Million INR

**USD 1 = INR 65*

 # Soft Costs include Interest During Construction, Preliminary and Pre-Operative Expenses

- The Government of India has set a target of 40 GW of rooftop solar power by 2022 which will require substantial financial resources, estimated at USD 34 billion.
- The payback period for any rooftop solar project, considering the technology, price of grid, etc. ranges typically from 7-9 years. Limitations in the availability of long-term debt financing (i.e. with tenors of at least 12-15 years) may be encountered relative to the investment needs associated to the proposed 40 GW capacity.
- This type of tenor seems to be available only from a limited number of financing institutions.
- Commercial lenders have limitations in long term financing they can provide. Through this programme, GCF will help, as combined with TCCL, to fund up to 80% of the investment cost of the capacity targeted by the customers.
- This will be a key contribution for the success of the programme, in helping ensure the viability of solar rooftop projects.
- GCF's possibility of providing concessional pricing for this programme is critical for its chances of success to effectively benefit from the financial effect of increased leverage that is fundamental for the competitiveness and financial viability of renewable energy projects.

- In addition, the programme will help introduce – besides long term project debt- a financial product for this type of investments.
- The proposed programme will finance an initial set of projects supporting short term objectives with longer term impacts, i.e. to allow the financial close, construction and operation of these projects to demonstrate their technical and financial viability.
  It will act as a validation for investors and lenders that the scheme of such projects (the contractual arrangements, support scheme, etc.) is adequate as required by the several players essential to carry these projects forward (sponsors, services companies, lenders), helping pave the way for future participants.

B.2. Project Financing Information

	Financial Instrument	Amount	Currency	Tenor	Pricing
(a) Total project financing	**(a) = (b) + (c)**	250	million USD ($)		
(b) GCF financing to recipient	Senior Loans (ii) Subordinated Loans (iii) Equity (iv) Guarantees (v) Reimbursable grants * (vi) Grants *	100 …… …… …… …… ……	million USD ($) Options Options Options Options	As outlined in the Term Sheet	As outlined in the Term Sheet
	** Please provide economic and financial justification in section F.1 for the concessionality that GCF is expected to provide, particularly in the case of grants. Please specify difference in tenor and price between GCF financing and that of accredited entities. Please note that the level of concessionality should correspond to the level of the project/programme's expected performance against the investment criteria indicated in section E.*				
	Total requested (i+ii+iii+iv+v+vi)	100	million USD ($)		

	Financial Instrument	Amount	Currency	Name of Institution	Tenor	Pricing	Seniority
I Co-financing to recipient	Senior Loans Equity Options Options	100 ……50…… …… ……	million USD ($) million USD ($) Options Options	TCCL Private sector sponsors …… ……	Market based	Market based	pari passu Options Options Options
	Lead financing institution: TCCL						
	** Please provide a confirmation letter or a letter of commitment in section I issued by the co-financing institution.*						

(d) Financial terms between GCF and AE (if applicable)	For the financing of the program, the GCF will enter into an agreement with NABARD, which will regulate the terms and conditions described in the term sheet and any necessary deviations from the AMA. In accordance with the FAA, NABARD shall administer the funds disbursed by the GCF.

B.3. Financial Markets Overview (if applicable)

- India's financial system remains stable, even though the banking sector continues to face significant challenges. While the global growth outlook and market sentiments have improved, political stability on the domestic front has further reinforced expectations of accelerated reforms, overall positive business sentiment and macroeconomic stability.
- Recently, Moody's Investors Service ("Moody's") has upgraded the Government of India's local and foreign currency issuer ratings to Baa2 from Baa3 and changed the outlook on the rating to stable from positive.
- During 2016-17, while deposit growth of scheduled commercial banks (SCBs) picked up, credit growth remained sluggish putting pressure on net interest income (NII), particularly of the public sector banks (PSBs).
- While, profitability ratios of SCBs showed a marginal increase, PSBs continue to show a negative return on assets (RoA).
- Overall, capital to risk-weighted assets ratio (CRAR) improved from 13.4 per cent to 13.6 per cent between September 2016 and March 2017.
- The Government of India has set a target of 40 GW of rooftop solar power by 2022 which will require substantial financial resources, estimated at USD 34 billion.
- Limitations in the availability of long-term debt financing (i.e. with tenors of at least 12-15 years) may be encountered relative to the investment needs associated to the proposed 40 GW capacity.
- This type of tenor seems to be available only from a limited number of financing institutions. For instance, State Bank of India in collaboration with World Bank has recently rolled out rooftop solar PV program.
- Commercial lenders have limitations in long term financing they can provide. Banks are cautious in lending to rooftop solar projects because there are high perceived risks and limited information on the track records of rooftop solar investments. Even when banks lend to rooftop solar projects, the high-risk perception and high per unit transaction cost has led to high costs of borrowing, thereby negatively impacting IRR of the project.
- Through this programme, GCF will help, as combined with TCCL, to fund up to 80% of the investment cost of the capacity targeted by the customers.
- This will be a key contribution for the success of the programme, in helping ensure the viability of solar rooftop projects.
- GCF's possibility of providing concessional pricing for this programme is critical for its chances of success to effectively benefit from the financial effect of increased leverage that is fundamental for the competitiveness and financial viability of renewable energy projects.
- In addition, the programme will help introduce – besides long term project debt- a financial product for this type of investments.
- The proposed programme will finance an initial set of projects supporting short term objectives with longer term impacts, i.e. to allow the financial close, construction and operation of these projects to demonstrate their technical and financial viability.
- It will act as a validation for investors and lenders that the scheme of such projects (the contractual arrangements, support scheme, etc.) is adequate as required by the several players essential to carry these projects forward (sponsors, services companies, lenders), helping pave the way for future participants.

Please fill out applicable sub-sections and provide additional information if necessary, as these requirements may vary depending on the nature of the project / programme.

C.1. Strategic Context

Please describe relevant national, sub-national, regional, global, political, and/or economic factors that help to contextualize the proposal, including existing national and sector policies and strategies.

Ambitious Targets

The largest renewable capacity expansion program in the world is being taken up by India. The Government of India is aiming to increase share of clean energy through massive thrust in renewables. Core drivers for development and deployment of new and renewable energy in India have been Energy security, Electricity shortages, Energy Access, Climate change etc. A capacity addition of 14.30 GW of renewable energy has been reported during the last two and half years under Grid Connected Renewable Power, which include 5.8 GW from Solar Power, 7.04 GW from Wind Power, 0.53 GW from Small Hydro Power and 0.93 GW from Bio-power. Confident by the growth rate in clean energy sector, the Government of India in its submission to the United Nations Frame Work Convention on Climate Change on Nationally Determined Contribution (NDC) has stated that India will achieve 40% cumulative Electric power capacity from non-fossil fuel based energy resources by 2030 with the help of transfer of technology and low cost International Finance including from Green Climate Fund.

The government is playing an active role in promoting the adoption of renewable energy resources by offering various incentives, such as generation-based incentives (GBIs), capital and interest subsidies, viability gap funding, concessional finance, fiscal incentives etc. The National Solar Mission aims to promote the development and use of solar energy for power generation and other uses, with the ultimate objective of making solar energy compete with fossil-based energy options. The objective of the National Solar Mission is to reduce the cost of solar power generation in the country through long-term policy, large scale deployment goals, aggressive R&D and the domestic production of critical raw materials, components and products. Renewable energy is becoming increasingly cost-competitive as compared to fossil fuel-based generation.

Government Support

In order to achieve the renewable energy target of 175 GW by the year 2022, the major program/schemes on implementation of Solar Park, Solar Defence Scheme, Solar scheme for CPUs, Solar PV power plants on Canal Bank and Canal Tops, Solar Pump, Solar Rooftop etc. have been launched during the last two years.

Various policy measures have been initiated and special steps taken in addition to providing financial support to various schemes being implemented by the Ministry of New and Renewable Energy (MNRE) for achieving the target of renewable energy capacity to 175 GW by the year 2022. These include, inter alia, suitable amendments to the Electricity Act and Tariff Policy for strong enforcement of Renewable Purchase Obligation (RPO) and for providing Renewable Generation Obligation (RGO); setting up of exclusive solar parks; development of power transmission network through Green Energy Corridor project; identification of large government complexes/ buildings for rooftop projects; provision of roof top solar and 10 percent renewable energy as mandatory under Mission Statement and Guidelines for development of smart cities; amendments in building bye-laws for mandatory provision of roof top solar for new construction or higher Floor Area Ratio; infrastructure status for solar projects; raising tax free solar bonds; providing long tenor loans; making roof top solar as a part of housing loan by banks/ NHB; incorporating measures in Integrated Power Development Scheme (IPDS) for encouraging distribution companies and making netmetering compulsory and raising funds from bilateral and international donors as also the Green Climate Fund to achieve the target.

C.2. Project / Programme Objective against Baseline

Describe the baseline scenario (i.e. emissions baseline, climate vulnerability baseline, key barriers, challenges and/or policies) and the outcomes and the impact that the project/programme will aim to achieve in improving the baseline scenario.

Being a largely thermal power generating nation, India faces an uphill task in containing its carbon footprint. The fast depleting natural resources like land, water and clean air, give a further impetus to the cause of renewable energy generation. Energy generated from these sources entail a very minimal or nil carbon emission, thus any capacity addition in renewable energy sources gives two fold advantages – independence from fossil based fuels which are limited in resources; reduced carbon emissions means cleaner environment.

Power-for-all

The Indian power system is among the largest in the world, but per capita consumption of electricity is less than one-fourth of the world average. An estimated 55 million households are not connected to the national grid. Even when connected, many face frequent disruptions and get low quality power. In'ia's power system needs to almost quadruple in size by the year 2040 to catch up and keep pace with electricity demand that—boosted by rising incomes and new connections to the grid—increases at almost 5% per year.

India aims to increase the share of installed electric power capacity from nonfossil-fuel-based energy resources to 40 % by 2030. With India setting the ambitious target of 175 GW by the year 2022 for Renewable Power, this sector is now poised for a quantum jump. As a part of clean climate commitments, India plans to install 40 GW of PV Rooftop Solar Systems by 2022. With a market potential of 124 GW, only ~506 MW of Rooftop Solar has been installed up to December 2016.

The financial resources required to set up 40 GW of rooftop solar power by 2022 are estimated at USD 34 billion. However, limitations in the availability of long-term debt financing (i.e. with tenors of at least 12-15 years) may be encountered relative to the investment needs associated to the proposed 40 GW capacity, as this type of tenor seems to be available only from a limited number of financing institutions. Commercial lenders are cautious in lending to rooftop solar projects because there are high perceived risks and limited information on the track records of rooftop solar investments. Even when banks lend to rooftop solar projects, the high-risk perception and high per unit transaction cost has led to high costs of borrowing, thereby negatively impacting IRR of the project.

With the assistance of the GCF, TCCL will receive the necessary assistance to develop a fit-for-purpose framework to allow the ambitious scale-up of solar roof top capacity in India. The programme has proposed to replace 250 MW of grid power with power generated from solar rooftop projects. 250 MW of grid power over a life of 20 years is expected to result in emissions of ~5,200,000 tCO_2eq (Baseline scenario). Since the power generated under the programme is through solar PV systems, it shall not have any emission impact. Thus, the programme shall, among others, enable an expected lifetime emission reduction of ~5,200,000 tCO_2eq over the lifetime of the project. This translates to an estimated cost of reduction of ~USD 47.96 / tCO_2eq *(emission reduction and cost of reduction are indicative and arrived at as per assumptions in E.6.5)*

C.3. Project / Programme Description

Describe the main activities and the planned measures of the project/programme according to each of its components.

Provide information on how the activities are linked to objectives, outputs and outcomes that the project/programme intends to achieve. The objectives, outputs and outcomes should be consistent with the information reported in the logic framework in section H.

Framework

GCF resources will be used to provide loan assistance to commercial, industrial and residential housing sectors ("Customers") to partially cover the upfront cost of investing in solar roof top PV systems. Adopting an equitable approach, for each of the sectors, the GCF resources will cover an average of up to 40% of the upfront system and installation costs with TCCL funding 40% out of its resources. The balance at least 20% coming from customers' own resources. Currently, TCCL has a huge pipeline of rooftop solar proposals for funding which are a various stages of assessment. TCCL shall consider all such pipeline deals for funding under this programme.

GCF funds shall be made available to TCCL through NABARD (the AE with GCF). TCCL seek disbursements of its loan from GCF (through NABARD) in annual tranches in line with the capacity proposed to be deployed every year over the programme implementation period (as indicated in the table under E.1.1.). In case of additional disbursement during the year, TCCL may also be allowed to use the sanctioned amount of subsequent years under the credit line.. TCCL shall have the flexibility to deploy the amounts so drawn over the period of ensuing one year. TCCL shall also have the flexibility to prepay the loan at any point of time without any prepayment penalty.

Deployment/disbursements shall be made by TCCL in accordance with a certified disbursement schedule. Where necessary, TCCL shall stipulate that any request for disbursement by project developers shall be certified by TCCL appointed Lender's Engineer.

TCCL shall obtain a chartered accountant certified end use certificate with respect to the funds deployed from the project developers. Periodic reports shall be submitted by TCCL to AE - NABARD with regards to the amounts deployed by TCCL to facilitate NABARD's monitoring activity as AE. While supporting the project developers, the approved technical standards of Ministry of New and Renewable Energy (MNRE), Govt. of India will be strictly followed to ensure the quality parameters.

Demand Centres

Historically, the C&I segment has constituted over 50% demand for solar rooftop and the trend is likely to continue in near future. Accordingly, out of total loan funds of up to USD 200 million (GCF and TCCL combined), around USD 130 million is expected to be channelized towards the C&I sector. With the Government of India announcing the Solar Rooftop Subsidy Scheme *(elaborated in C.5. below)* being applicable to institutional and social sector, an uptick in demand from these sectors for installation of solar rooftop systems is expected. Accordingly, around USD 50 million is expected to be channelized towards the institutional and social sector. Though the focus shall be on the projects from C&I and social segment, the programme shall be open to solar rooftop projects from all Customer segments including the residential segment. The programme envisages channelizing around USD 20 million towards the residential segment.

With the mitigation focus of the programme, an endeavor shall be made to provide at least around USD 100 million of the total loan funds towards the most vulnerable communities – MSMEs, households not connected to national grid/with poor grid availability (providing last mile connectivity), states with low gender ratio and so on. It is often observed that MSMEs find it difficult to avail affordable funding options from conventional lenders due to the rigid lending parameters set by such lenders. It is worthwhile to note that affordable and continuous power supply is the key resource for such MSMEs to carry out their business activities. Thus, the MSMEs are less likely to default on power supply costs. With this postulation the programme aims to provide affordable financing options to MSMEs to set up solar rooftop capacities subject to its commercial viability within their scale of operations. Options to set up offgrid projects with educational, health, clusters of MSMEs, industrial estates, will be explored. As per the Population Census of India for 2011, the country average gender ratio in India is 933 women to that of 1000 men. The programme shall endeavor to target the states with lower than average gender ratio but with significant potential for growth of solar rooftop such as Delhi (gender ratio of 868), Gujarat (919), Maharashtra (894), Rajasthan (928), Punjab (895), etc. Further, concentration of the projects is expected to be in states with high growth potential for solar rooftop such as AP, Telangana, Karnataka and Tamil Nadu. Nevertheless, the programme shall be open to projects across India.

Business Models

Currently majority of the rooftop capacity in India is based on the CAPEX model, where the user has invested in the capital himself. The alternate model is the OPEX model where the developer builds a solar energy system on the customer's property for no significant upfront charges. The generation from the solar energy system offsets the customer's electric utility bill, and the developer sells the power generated to the customer at a fixed rate. In March 2017, around 80% of the installed solar rooftop capacity was under the CAPEX model. Despite concerns around bankability of OPEX projects in the Indian context, the OPEX model has been gaining traction in recent years. The share of OPEX projects developed during the year has increased from 3% in 2012 to 23% in 2016. Given the fiscal constraints of government departments and their more urgent priorities for deployment of capital, the government segment is expected to play a very important role in scaling up of the OPEX market in India. Developers are understandably satisfied with government entities as reliable off-takers in comparison to most private businesses. It is estimated that by 2022, 44% of the total OPEX market will be accounted for by the government segment.

An emerging model which takes care of the economies of scale is aggregation or pooling of solar rooftop assets. This helps in raising lower cost debt and reduces overall soft costs involved through shared services concept. This is an upcoming model.
Accordingly, around 70% of the total loan funds under the programme are expected to be utilized towards projects under the CAPEX model. OPEX model shall form majority of the balance 30% till the pooling of solar rooftop assets model gains traction.

Pricing
Solar rooftop projects are riskier than conventional ground mounted solar PV projects due to additional factors such as shadow risk, rooftop structure analysis, etc. As a result, banks usually charge a high risk premium over their cost of funds in the rate of interest charged to such project loans.
To promote the investments in the sector it is proposed to avail concessional financial resources from GCF to which would be blended with the domestic resources such a way so that financial product of TCCL can compete with existing lending institutions (like SBI, PNB). The concessionality extended by GCF would be used to price programme competitive with the lending institutions. The concessionality received by TCCL shall be passed on to the project developers in the rate of interest charged on the project loans.

Repayment Mechanism (for loans granted by TCCL to project developers)
a) In case of grid-connected system; borrower enters into long-term PPA (power purchase agreement) with state utility (duly assigned in favor of TCCL till the tenure of funding). The borrower owns the assets, is liable for its operations and maintenance (by itself and/or through reputed O&M contractors), sells the power to utility as per said PPA and pays the interest and principal to TCCL as per the sanctioned Terms & Conditions.
b) Projects where the entire capacity is being utilized by the borrower for its captive use, TCCL shall estimate the probable amount of electricity cost savings which the borrower is expected to realize by replacing conventional grid power with power generated from the rooftop project. The repayments for such borrowers shall be so covered by the amount of savings realized that the borrower too retains a minor portion of the savings. In case of off-grid systems, the programme will involve project funding on the Balance Sheet of the borrower. The eligibility of each of the Customers will be determined by TCCL using established rules and criteria for business, operational and credit risk evaluation.

An indicative list of benchmark parameters, terms and conditions that TCCL envisages to follow while granting loans to individual project developers is as under:

Borrower Profile	• Company (private and public limited) • Partnership firm (including limited liability partnerships) • Individuals and Proprietary firms
Eligible Projects	Grid-connected as well as Off-grid rooftop solar projects
Type of Facility	Option 1: Master Line of Credit Option 2: Project Mode *(described in the ensuing para below the table)*
Security	Including but not restricted to the following: • First and exclusive charge on project assets, cashflows, rights, benefits, etc. • Assignment by way of security interest of all the Borrower's rights, titles, interest, benefits in the existing and future Project documents • First charge by way of hypothecation of all present and future movable assets of the borrower pertaining to the Project including but not limited

	to solar modules, plant and machinery, machinery spares, tools and accessories, furniture, fixtures, vehicles, etc., • First charge on the borrower's book debts, operating cash flows, receivables, commissions, revenue of whatsoever nature and wherever arising, present and future pertaining to the Project. • First charge on all intangibles including but not limited to goodwill, uncalled capital, present and future of the borrower pertaining to the Project • First charge on all bank accounts of the borrower including but not limited to Escrow/ Trust & Retention account (TRA) and Debt Service Reserve Account (DSRA) pertaining to the Project • Assignment by way of security interest of all the Borrower's rights, titles, interest, benefits in the existing and future Project documents, letter of credit, guarantee (including guarantees issued by EPC contractor) and insurance policies in favour of the Borrower pertaining to the Project • The Borrower to create and maintain a Debt Service Reserve Account (DSRA) for an amount equal to the principal and interest payment due to the Lender(s) for ensuing 6 months.
Collateral	TCCL may stipulate additional collateral on case to case basis as under: • Corporate Guarantee of Sponsors • Personal Guarantee of key promoters • Sponsor's Undertaking to meet debt service, cost overrun, etc. • Additional collateral in the form of Fixed Deposits, Bank Guarantee, Land or any other liquid security
Technology under use	• Commercially proven, independently certified solar panels (from Tier I suppliers) and inverters. • Emphasis on selection of latest available solar PV technology • Minimum generation guarantee factored in the module supply / O&M agreements
Pre-disbursement Conditions (PDCs)	PDCs to be decided on case to case basis depending on the nature of facility. An indicative list of generalized PDCs is as follows: • Satisfactory report from Lenders' Independent Engineer • All applicable approvals and permits to be obtained prior to disbursement • Satisfactory site visit by TCCL officials • Security creation and perfection *(unless a certain timeline is necessitated on account of technical, regulatory or practical considerations)* • 50% of equity contribution to be infused up front and to be certified by a practicing Chartered Accountant.
Take out Options	• Embedded put option (on Borrower/Sponsor) at frequent intervals on case specific basis • Cash sweep option on surplus project cash flows as per pre-determined Cash Waterfall Mechanism • Partial prepayment out of Promoter's equity/sub-debt infusion
Prudential, Financial & General Credit Norms	• Moratorium for principal repayment not to exceed 12 months • Principal repayment shall through equated/structured monthly/quarterly installments • Credit rating of the borrower shall not be below the minimum investment grade category in case the borrower carries a credit rating from external credit rating agency.

	• In case the borrower is not rated by any external credit rating agency, internal rating of the borrower as per TCCL credit rating criteria shall not be below BBB- • Borrowers rated lower than the minimum investment grade rating (external and/or internal rating) shall be considered subject to availability of collateral as mentioned above. • Average Debt Service Coverage Ratio (as per base case financial projections for loan tenure) of at least 1.15x • Interest Coverage Ratio (as per latest available audited financials) of at least 2.00x • Ratio of Total Debt to EBITDA (as per latest available audited financials) equal to or lower than 4.00x • Ratio of Total Debt to Tangible Net Worth (as per latest available audited financials) equal to or lower than 3.00x

The benchmark parameters, terms and conditions as stated above are indicative and may vary based on identified risk parameters of individual loan proposals as well as extant TCCL guidelines.

Option 1: Master Line of Credit
A Master Line of Credit/loan facility will be sanctioned to the customer to execute multiple rooftop solar projects. Master Line of Credit is proposed since normally rooftop solar projects would be of small size and it would be difficult for the customer to approach for approval of all projects at one go.

The facility can be sanctioned to the customer based on following indicative parameters:

- Past financials of the customer
- Experience in rooftop Solar PV projects
- Number of projects executed in the past
- Projected pipeline of the rooftop solar PV projects
- A Master Loan Agreement (MLA) will be signed between TCCL and the customer.

MLA will have all legal terms and condition applicable for both Master facility (for Line of Credit) and individual facilities (for individual projects).

Subsequently, individual loan agreements will also be signed for individual loans (containing details about the project, tenor, interest rate and condition precedents e.g. legal opinion on lease agreement & PPA and all regulatory and environment approval).

Individual loan agreements will refer to the Master Loan Agreement and will not repeat all the legal clauses.
Off-taker credentials should normally be assessed at the time of sanctioning master loan facility. However, if the details of future off-takers are not known at the time of sanctioning master loan facility, then the off-taker credit risk shall be analyzed at the time of appraisal of individual projects.

In case of any deviation from sanctioned terms and conditions of Master loan facility, the same would need to be approved by the Sanctioning Authority that has sanctioned the master loan facility.

Option 2: Project Mode
Customer will develop a single project and avail funds for this particular project only.

The facility would be sanctioned by sanctioning authority and a single loan agreement with all applicable terms and conditions would be executed.

Proposal will usually include projects from single roof owners. However, if the roof owner owns multiple roofs at the same/multiple locations and wants to install rooftop solar project on all the roofs at a single time or in phases, then the proposal shall fall under project mode.

Eligibility Parameters for both Options

For Master Line of Credit Option:

- Proposal shall include aggregate multiple projects
- Minimum aggregate projects capacity to be submitted shall be at 1 MWp.
- Minimum capacity of sub projects under this mode shall be 100 kWp.

For Project Mode Option:

- Proposal shall include single/individual projects
- Minimum project capacity to be submitted shall be 100 kWp
- Systems lower than 100 kWp may be considered on exceptional basis

Disbursement Pattern

The terms of sanction under both the aforesaid Options shall stipulate that the project equity be infused into the project prior to the developer seeking any disbursement from TCCL. Post confirmation of the equity infusion, TCCL shall disburse the loans such that the approved project debt (TCCL + GCF portion) to project equity ratio is maintained. In exceptional cases, only a part of the project equity may be brought in upfront by the developer. In such cases, disbursement by TCCL shall be in proportion to agreed project debt : equity ratio.

Though TCCL shall disburse loans to developers according to the individual project's disbursement schedule, TCCL shall seek disbursements of its loan from GCF (through NABARD) in annual tranches in line with the capacity proposed to be deployed every year over the programme implementation period (as indicated in the table under E.1.1.). Option to be available with TCCL to seek an additional disbursement during the year. TCCL shall have the flexibility to deploy the amounts so drawn over the period of ensuing one year. TCCL shall also have the flexibility to prepay the loan at any point of time without any prepayment penalty.

Monitoring Practices (for loans granted by TCCL to project developers)

TCCL shall engage Lender's Engineer for monitoring and quality assurance, safety issues in project construction and operational monitoring. Broad Roles and Responsibilities of LE shall include the following.

a) Lender's engineer shall also provide its independent recommendations/comments on the quality and performance of project for minimum three instances i.e. one each at pre-sanction, during construction and project commissioning.

b) Lender's Engineer shall review pre-sanction techno commercial feasibility including existing shadow profile, construction progress, and project commissioning & completion report.

c) Lender's Engineer shall monitor compliance of applicable EHS norms including fire safety clearance on project site during construction and post commissioning.

d) Lender's Engineer shall submit performance review of commissioned projects vis-a-vis envisaged at the time of appraisal/EPC contract and give its final Completion Report including its Recommendations and Observations.

TCCL's sanction terms shall also stipulate appointment of reputed Operations & Maintenance ("O&M") contractors. The Lender's Engineer's scope of work may also be expanded to review the periodic O&M activity.

C.4. Background Information on Project / Programme Sponsor (Executing Entity)

Describe the quality of the management team, overall strategy and financial profile of the Sponsor (Executing Entity) and how it will support the project/programme in terms of equity investment, management, operations, production and marketing.

Tata Cleantech Capital Limited:

Tata Cleantech Capital Limited (TCCL) is a joint venture between Tata Capital and International Finance Corporation (IFC), Washington DC, US. It is registered with the Reserve Bank of India (RBI) as a systemically important non depositing accepting non-banking financial company (NBFC).

Tata Capital is a part of Tata Group, one of India's biggest and most respected business conglomerates. Today the Tata name is synonymous with trust and is a unique example of entrepreneurship, passion and conscientious corporate citizenship. The Tata Brand touches the lives of more than a billion people all over the world daily, with its companies across seven key sectors - communications and information technology, engineering, materials, services, energy, consumer products and chemicals. Tata is India's largest multinational conglomerate with revenues of USD 103 billion as of 2015-16.

International Finance Corporation: TCCL's Strategic Investor

International Finance Corporation (IFC) finances private sector investments in the developing world, mobilizes capital in the international financial markets, helps clients improve social and environmental sustainability, and provides technical assistance and advice to governments and businesses.

TCCL, in partnership with IFC provides suitable solutions to its clientele and displays Tata promise of quality, world-class service, reliability and trust for all their customer needs. It identifies, evaluates & funds projects in renewable energy (solar, wind, small hydro, biomass etc), energy efficiency and water treatment sectors. Since its inception, it has provided financial and advisory services to more than 50 clients. Through its industry knowledge & unmatched expertise, TCCL has managed to participate in funding of over 3 GW renewable energy projects within a short span of time and saving approximately 4.5 million tonne CO2 emission annually. Largely driven by its excellent asset book size, the company is rated AA+ by the CRISIL (a Standard & Poor's company).

In October 2015, TCCL has received the Infrastructure Finance Company license from the RBI and would extend it services in the infrastructure segment too. TCCL is the only Indian company to be featured in United Nations Global Compact survey on CEO's perspectives on climate change released in November, 2015, as a leader in facilitating sustainable business.

Major Rooftop Projects:

- **Largest solar rooftop project in Mumbai:**
  TCCL has solely funded the **largest solar rooftop project in Mumbai** at the National Centre for Performing Arts (NCPA), established and installed by Avesta Solar Private Limited, in Mumbai. The NCPA plays host to over 600 performances annually and will stand to benefit greatly from this - given that the project has a capacity of over 450 KW, with an effective reduction in Greenhouse gases to the tune of 15,000 Metric tonnes over its life span of 25 years. The installation, which has a life span of over 20-25 years, is capable of generating around 6.5 lakh units and is estimated to save NCPA's exchequer around INR 50 lakhs per year.
- **Rooftop project with Indian Railways:**
  TCCL has solely funded the 2.4 MWp of rooftop solar project on rooftops of Rail Wheel Factory installation in Bangalore, Karnataka. Indian Railways had resolved to execute rooftop solar generation project of 2000kWp located on rooftops of Rail Wheel Factory in Bangalore. Railways had accepted the bid of M/s. Vivaan Solar Private Limited and issued letter of award. The Project is expected to achieve commissioning by March 24, 2018.
- **Institutional presence - Rooftop projects across 27 locations in 7 states**

TCCL is the sole lender for ~10 MWp rooftop solar Projects across 27 locations in 7 states in India under the Solar Energy Corporation of India (SECI) BID. Projects are installed on the roofs of various educational institutions and hospitals.

- **Rooftop project with leading auto component company in India:**
  TCCL had solely funded the 400 KW of rooftop solar project on rooftop of Gabriel India Limited in Pune, Maharashtra.

Additionally, TCCL has a huge pipeline of rooftop solar proposals for funding which are a various stages of assessment. TCCL shall consider all such pipeline deals since September 30, 2017 for funding under this programme.

Robust Credit Portfolio:
TCCL has extremely healthy credit portfolio with great emphasis on quality and high standards of due diligence assisted by an experienced management team. Below table depicts TCCL's portfolio performance in India:

As on Mar 2017	TCCL	BANKS	NBFCs
GNPA	0.00%	9.60%	4.40%
NNPA	0.00%	5.50%	2.30%
Stressed Assets	0.00%	12.00%	NA
NIM	5.10%	2.70%	NA

Source: Reserve Bank of India

Emphasis on Social & Environment Management System (SEMS):
TCCL has a well adopted SEMS policy which is in line with IFC Performance Standards. TCCL has strong focus on Social and Environmental assessment including health, safety, wild-life protection for the management of relevant social and environmental issues, and the risks inherent therein, into TCCL's business processes and operations. This policy is an integral part of the TCCL's Social and Environmental Management System and underscores its commitment to sustainable banking and sustainable finance in its business relationships and as a good corporate citizen. The Policy sets the pace for suitable procedures and workflows, within the framework of the SEMS, which ensures TCCL compliance with applicable environmental and social legislations. This is facilitated by an experienced in-house team backed by access to IFC and Tata group expertise.

Proposed Programme vis-à-vis the State Bank of India ("SBI") – World Bank rooftop program:

1. **Solar Rooftop Capacity – Huge Market Potential**
   - The Government of India has set a target of 40 GW of rooftop solar power by 2022 which will require substantial financial resources (estimated at USD 34 billion).
   - The said World Bank aided programme of SBI aggregating to USD 625 million aims to fund ~400 MW of rooftop solar capacity.
   - Considering the balance huge potential and the same intent of contributing to support the Government of India's target of 40 GW, the proposed GCF aided facility of TCCL shall complement the SBI facility.
2. **Complete Business Solutions**
   - TCCL specializes in providing end to end business solutions in the clean technology space. In addition to providing financial support, TCCL has also provided financial and technical advisory services to over 50 clients.

- Through its industry knowledge & unmatched expertise, TCCL has managed to participate in funding of over 3 GW renewable energy projects within a short span of time.
- In addition to merely providing financial solutions, TCCL has the potential to partner the rooftop solar developer by sharing technical knowledge through technical and/or financial advisory services.

3. Flexibility in selection of Projects/Borrowers

- SBI programme provides funding for up to 75% of the Project Cost. Under the proposed TCCL programme, TCCL has envisaged to contribute equally with GCF and fund up to 80% of the Project Cost
- The SBI programme envisages to fund entities with at least 1 year experience/past track record in power sector and with Investment Grade rating by an external credit rating agency. TCCL programme shall evaluate each borrower / proposal with no such rigid parameters.
- It is observed that very few MSMEs are likely to qualify as eligible borrowers under the SBI programme. TCCL programme envisages to cater to the most vulnerable communities who at the present juncture do not have the access to resources to set up rooftop solar projects.
- Maximum loan tenure under SBI programme is 15 years. Where the merits of the case permit, TCCL may consider slightly longer tenures
- The SBI programme envisages to fund the development of only Grid Connected Rooftop Solar Projects. TCCL programme shall have the flexibility to consider funding of viable Off Grid Rooftop Solar Projects as well.

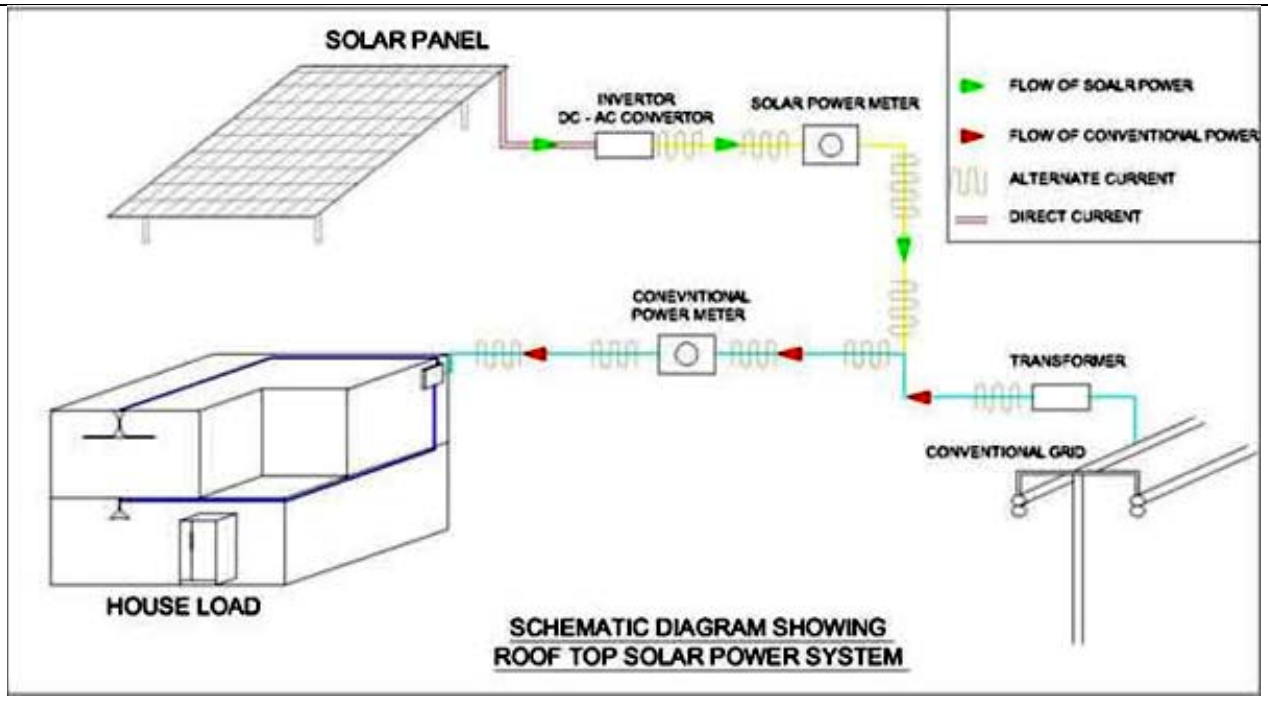
4. Faster Turnaround Time (TAT)

As per market feedback, TCCL scores over conventional lenders in terms of quick turnaround in all its processes such as structuring, sanctioning, disbursement etc. of loans. Due to bureaucratic approach and long hierarchy of authority, it has been observed that conventional lenders may take around 90-120 days to sanction a loan proposal.

C.5. Market Overview (if applicable)

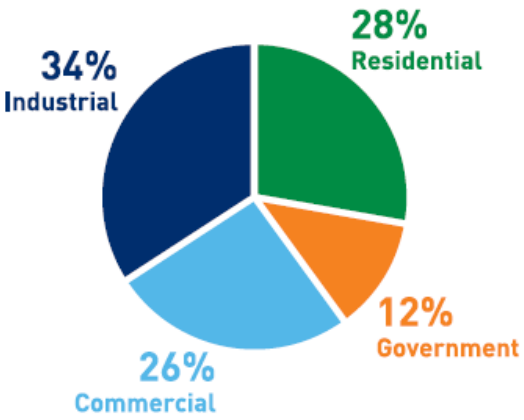
Describe the market for the product(s) or services including the historical data and forecasts.

Describe the competitive environment including the list of competitors with market shares and customer base and key differentiating factors (if applicable).



SOLAR ROOFTOP SEGMENT: KEY FACTS & FIGURES

- Indian solar rooftop installed capacity stood at 1.4 GW as of March 2017.
- Rooftop solar market in India has grown at 81% y-o-y
- Share of segments:



Source: BRIDGE TO INDIA research

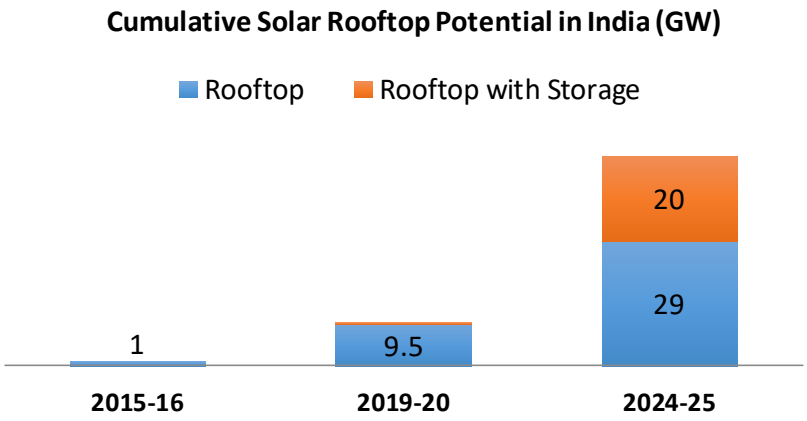
- Historically, rooftop solar has maintained a 10-12% share of overall solar capacity addition in India. This is much lower than other key markets such as US (46%), Germany (73%), China (18%) and Australia (97%).
- Government has laid much focus on rooftop solar, targeting a whopping 40% of 100 GW solar capacity target under National Solar Mission (NSM) by 2022.
- Industry experts Bridge To India (B2I) and CRISIL conjectures that capacity addition is expected to be concentrated in 7 states – Delhi, Gujarat, Maharashtra, AP, Telangana, Karnataka and Tamil Nadu.
- B2I projects that in order to achieve the 40 GW target in solar rooftop space, over USD 34 billion investment is required which in turn translates to over USD 24 Billion debt requirement.

- Partial Battery Backup based systems could increase system cost of a rooftop solar project by ~30%-35% but battery prices have fallen from USD 1,000/kWh to USD 350/kWh from FY10 to FY16 and are expected to fall to USD 125/kWh by FY22 due to oversupply from Tesla.
- CRISIL expects rooftop based capacity additions to rise post FY20, led by declining battery prices.
- As per MNRE, Benchmark Project Cost for Grid Connected Rooftop Solar Power Plants for the year 2017-18 is as under:

Type	Category	Benchmark Cost (INR per Wp)
Grid Connected Rooftop Solar PV System	upto 10 kWp	70
	>10 k;Wp upto 100 kWp	65
	>100 kWp upto 500 kWp	60

- In line with the aforesaid benchmark project cost, the programme is based on project cost assumption of INR 65 per Wp *(considering exchange rate of INR 65 / USD, the total project cost for the programme of 250 MW translates to USD 250 million – indicative nos. based on assumptions which may vary depending on market conditions)*

Solar Rooftop Potential in India:



I. Background

The climate change threats are driving world's dependence on pollution free sources of energy to minimize greenhouse gas emissions. Solar PV energy is one of the cleanest sources of electricity and is being considered as next to fossil fuel based conventional electricity systems. World cumulative installed solar energy capacity of 3.7 GW in 2004 has reached 177 GW in 2014 i.e., increasing almost 50 times in ten years.

Global investment in Renewable Energy (RE) has been growing steadily and increased five times since 2004, from USD 62 bn to USD 316 bn in 2014 in ten years. The share of investment in the solar rooftop and other solar PV projects is increasing more rapidly and was 12% higher than in the previous year and became USD 67.4 bn in 2015, thus making it one of the fastest growing industries worldwide. International Energy Agency (IEA) Technology Roadmap: Solar PV Energy envisions total production of SPV electricity to increase to 16% in 2050 (in place of 11% projected earlier) with China and India having major shares.

Looking inwards, India is having fourth largest electricity generation capacity in the world after US, China and Russia. Its Renewable Energy (RE) share was 15.86% in February 2017 with solar energy having a share of 19% in it. Between 2005 and 2016 the renewable grid connectivity has increased from 6.2 GW to over 50 GW for both solar and wind.

Being a tropical country, India is solar rich country having on average 300 sunny days in a year. India has higher solar irradiance compared to many other countries and solar electricity potential is between 4 and 7 kWh per sq. m per day in its most parts. Government of India has revised Solar Mission in 2014 with a target of 100GW installed capacity of solar electricity by 2022. Out of which 40 GW is now projected to come through grid connected rooftop solar systems. Centralized grid connected and standalone solar energy strategy development is aiming towards energy security of nation for achieving '24x7 power to all'.

Provide pricing structures, price controls, subsidies available and government involvement (if any).

II. Policy Support

a) **Model Building Bye-Laws:** The Central Government has released the model building bye-laws, 2016 that mandate rooftop PV installations for both old and new buildings exceeding a specific size and power consumption threshold.

b) **Energy Conservation Building Code (ECBC) 2017:** To achieve greater energy efficiency in the construction sector, the ECBC was launched in March 2017, prescribing energy performance standards for new commercial buildings. The ECBC emphasizes the use of passive design strategies, such as using natural ventilation and solar energy for building energy needs. To comply with the code, buildings must demonstrate minimum energy savings of 25%. Higher energy savings of 35-50% would allow buildings to also achieve ECBC Plus or Super ECBC status. The government has estimated that adoption of the ECBC 2017 for all new commercial constructions will bring down energy use by 50%, translating to energy savings of about 300 billion units by 2030 and a peak demand reduction of over 15 GW (gigawatt) in a year.

c) **Capital Subsidies:** Solar Rooftop Subsidy Scheme is a Government of India initiative to promote use of solar rooftops in the country. The scheme encourages the use of renewable energy by providing subsidy on solar rooftop installations to the consumers. Capital subsidy of 30% is applicable to residential, institutional and social sector rooftop solar power plants for General Category States/UTs and upto 70% of the benchmark cost for Special Category States i.e. North Eastern States including Sikkim, Uttarakhand, Himachal Pradesh, Jammu & Kashmir and Lakshadweep, Andaman & Nicobar Island. Industrial and Commercial sector would not get any subsidy under the scheme. The central government, in December last year has increased the budget from INR 6,000 million to INR 50,000 million for implementation of Grid Connected Solar Rooftop systems over a period of 5 years upto 2019-20 under National Solar Mission (NSM). The increased budget is enough to support the installation of 4200 MW Solar Rooftop systems in the country in next five years. However, it is worthwhile to note that such Capital subsidy shall be received only post successful implementation of the solar rooftop project. Thus, through the programme, TCCL intends to fund the gap owing to time involved in receipt of capital costs required for setting up the rooftop project. The developer may, where applicable, post successful implementation of the respective project, seek subsidy from the Government which will be restricted to 30% of the benchmark capital cost or actual cost, whichever is lower. Further the funding arrangement of TCCL shall entail the receipt of subsidy and/or any other such assistance in an Escrow account. The subsidy funds so received shall then be applied to repay project debt by the project developer in the ratio of project cost funding (i.e. 75:25). The receipt of such subsidy is subject to the project satisfying all terms and conditions specified by the Government in this regards.

d) **Tax Benefits:** Direct and indirect tax benefits such as sales tax, excise duty exemptions and custom duty exceptions have been given. Project developers were exempted from income tax on all earnings from a project in its first 10 years of operation and accelerated depreciation (AD) for solar energy producers to claim 40% of the costs in the first year itself.

e) **Net Metering Incentives:** A metering policy has been introduced to encourage self-consumption of electricity generated from the solar rooftop. Almost all states have notified their regulations to provide net metering/gross metering facilities. Net metering allows consumers who generate some or all of their own electricity to use that electricity anytime, instead of when it is generated. This is particularly important with wind and solar, which are non-dispatchable. Net metering systems are primarily aimed at providing an opportunity to consumers to offset

their electricity bills, wherein a single meter records both import of conventional energy from distribution grid and export of solar energy into distribution grid. Thus, net metering allows the final user to credit produced energy in the grid and is also promoted as a preferred option.

f) **Priority Sector Lending:** Solar rooftop is an identified priority sector lending by RBI (Reserve bank of India).

g) **Financial Support to DISCOMs:** The Ministry of New and Renewable Energy (MNRE) has announced financial incentives for Power Distribution Companies (DISCOMs) to support rooftop solar installations. The notification proposes a financial support of up to INR 3.75m (USD 55,000)/MW for up to 1,350 MW of rooftop solar capacity. The funds can be used by DISCOMs for multiple activities including upgradation of distribution network and IT infrastructure, building consumer awareness campaigns, setting up consumer helplines, training employees, rating installers etc.

h) **Induced Demand from Central Government:** Various Central Government institutions have identified potential to install about 6 GW of solar capacity to meet their captive requirement for power. Public sector companies such as Solar Energy Corporation of India (SECI), Central Electronics Limited (CEL) and PEC Limited have been given responsibility to identify viable opportunities and allocate capacities on behalf of various departments through a tendering process. While bulk of the demand is coming from private sector, the government is also helping by creating substantial demand in the public sector, where MNRE is providing subsidy of 25% for government buildings and giving stiff targets to government departments for rooftop adoption. Several government departments have carried out an assessment and recently provided commitments to install 1.5 GW of rooftop solar capacity. SECI has already announced a scheme for allocating 1,000 MW of rooftop solar capacity on various government buildings.

It is also proposed to make solar rooftop mandatory for properties with connected loads greater than 20 kW.

III. Outlook – <u>POSITIVE</u>:

a) **Falling capital costs:** Rooftop solar system costs have fallen by 12% p.a. on an average in the last four years. In 2016, the rooftop solar system costs stood at ~INR 52/Wp, fallen from INR 87/Wp in 2012.

b) **Favourable economics:** In FY17, cost of generating solar power from rooftop projects is estimated to be INR 5.3 – 5.6 / unit (without any capital subsidy) for projects not claiming accelerated depreciation and INR 4.3 – 4.8 / unit for those claiming accelerated depreciation benefits. By FY22, cost of generation is expected to fall to INR 3.3 – 3.5 / unit (without capital subsidy or accelerated depreciation) levels. High tariffs and rising energy prices are driving the Commercial and Industrial consumers toward solar power.

c) **Affordable Storage Solutions:** Faster-than-anticipated technological disruptions in battery storage solutions at affordable prices can provide upside to rooftop solar adoption.

d) **New Business Models:** High capital cost of PVRT system which is estimated as INR 50,000/kW (on the lower side) has been a key challenge for its adoption by the industry or small consumers. The payback period is 6 to 7 years and 9 to 10 years in commercial and residential sectors, respectively. The success of RTPV therefore remains dependent on new business models evolved from time to time to overcome the cost barrier. At present three types of business models are envisaged:

   (i) Self-owned, the roof owners own the PV system and electricity generated. It is called **CAPEX model** and the risk is of the owner who invests in the system.

   (ii) Third party ownership, in which third party or a developer bears the cost of solar rooftop and sells to customer at a rate lower than grid tariff. This is called **OPEX (operational expenditure) model** because developer which is also Renewable Energy Service Company (RESCO) pays for the system for specified number of years and also owes the risk. *Third party investment model has only 10% share at present*.

   (iii) The third is **Lease model** in which customer leases the system and pays for it overtime. This type of arrangement may suit multi-storey flat owners but not yet implemented extensively.

e) **Energizing villages** – New business model for rural areas & villages are proposed to increase coverage of RTPV in the country. Generally, losses due to longer transmission lines required to reach remote villages increase the

cost of electricity in rural areas. The government or utility has to bear the loss as the tariff is normally lower there than in urban areas. Karnataka state in South India has set an example by introducing ambitious 'Surya Ratha Programme' wherein a farmer can install SPV pump set on his farm with 90% subsidy and government can purchase excess power. The states of Punjab and Haryana are also proposing similar farmer friendly schemes. In remote and rural areas where there is no access to grid, development of off-grid systems that are 'Grid ready' is therefore another business model opportunity.

f) **Role of Residential Segment**
   - o Solar PV Rooftop market potential for India has been assessed as 124 GW by taking the total area under urban settlements as 77,370 sq.km.
   - o The residential sector has a share of 38%, commercial/institutional 4% and industry 3% of the total usable area for RTPV, remaining 55% is other area.
   - o Emergence of domestic sector as the second largest energy consuming sector after industries is seen in India in the last few years. The electricity consumption in residential sector which was at 32 grams/kilowatt-hour ("g/kWh") in 1990 is expected to increase to 1270 g/kWh in 2040. In growing cities as the number of households is increasing, the residential sector electricity needs are growing rapidly. It is anticipated that about 30% of the solar rooftop target capacity of 40 GW can be met from the residential sector provided integration with grid is made.
   - o There are 331 million households according to 2011 census. On an average a 3 kW system per household will require approximately 4 million RTPV households, which is less than 0.01% of the total.
   - o The scenario analysis suggests aggressive market supports with tax incentives and consumer centric regulations such as; amendment in building by-laws for considering solar rooftop structure as temporary structure so that it does not need fresh approval for raising height of the building by local municipalities will be important drivers for achieving the goal.
   - o Most cities in India have flat structure low height buildings with lesser number of high rise buildings at present. DISCOMS can facilitate by providing grid interconnection and reduction in electricity bills by selling at lower rate in proportion to higher wattage achieved from solar installation.

C.6. Regulation, Taxation and Insurance (if applicable)

Provide details of government licenses, or permits required for implementing and operating the project/programme, the issuing authority, and the date of issue or expected date of issue.
Describe applicable taxes and foreign exchange regulations.
Provide details on insurance policies related to project/programme.

I. Evolution of Solar energy policies in India

Policy infrastructure in renewable energy sector in India took shape when Commission of Alternate Sources of Energy (CASE) was created in 1981 in the Department of Science & Technology. It became independent Department of New Energy Sources (DNES) in 1982 and full-fledged Ministry in 1992. Ministry's guidelines to various States to purchase RE power at INR 2.25 per unit with 5% annual escalation with 1993 as base year triggered early development of RE sector especially the wind energy. The government has announced several policies to promote solar energy. Direct and indirect tax benefits such as sales tax, excise duty exemptions and custom duty exceptions have been given. Project developers were exempted from income tax on all earnings from a project in its first 10 years of operation and accelerated depreciation (AD) for solar energy producers to claim 80 per cent of the costs in the first year itself. Policies and acts impacting direct solar energy development 2000 onwards are discussed below.

a) Electricity Act 2003 – The Act provides a framework for overall growth of electricity sector in India. Provisions for preferential tariff and quotas for integration with renewable energy have been made. Mandatory Procurement of RE power for Distribution Licensees and facilitation of grid connectivity were incorporated. Based on optimal

utilization of resources including renewable sources of energy, it suggested that a policy for permitting standalone systems would be prepared.

b) National Electricity Policy 2005 – The policy allowed preferential tariff for electricity produced from renewable energy sources. In order to reach the areas where no grid connectivity was there it aimed to provide access to electricity to all, 'Power to all by 2012' and increase minimum per capita availability to 1000 kWh per year by 2012.

c) Tariff Policy 2006 – The mechanism of Renewable Energy Portfolio (RPO) to fix a minimum percentage of purchase of energy consumption by the States from renewable energy sources and giving special tariff for solar energy among others were its main contribution.

d) Integrated Energy Policy 2006 – This integrated policy document while giving overall policy guidelines for action recommended special focus on RE development and set specific targets for capacity addition.

e) National Action Plan on Climate Change (NAPCC) 2008 – Government of India enunciated mission mode action plans for sustainable growth under NAPCC to address climate change. Its first mission was intensification of solar energy development. It also advised that RPO's be set at 5% of total grids purchase, and be increased by 1% each year for 10 years.

f) Generation based Incentives (GBI) for Solar – Introduced in 2009 for small grid solar projects below 33 kV, GBIs are provided for bridging the gap between a base tariff of INR 5.5 (by 2010–2011, with an annual escalation of 3 per cent) and the tariff determined by the Central Electricity Regulatory Commission (CERC) as a fiscal incentive.

g) Jawaharlal Nehru National Solar Mission (JNNSM) 2010 – The mission gave specific targets of 20,000 MW of grid-connected and off-grid solar power capacity by 2022 with 2000 MW as share of off-grid capacity.

h) Renewable Energy Certificates (RECs) – A market based mechanism, RECs was introduced in 2011 to enhance renewable energy capacity by leveling the inter-state divergences of renewable energy generation and the requirement of the obligated entities to meet their RPOs with differentiated price for solar and non-solar.

i) Clean Energy Cess – Introduced in 2010 to levy the amount of INR 50 to every tonne of national or imported coal used in the country. A National Clean Energy Fund (NCEF) created from the cess aims to fund clean energy projects and provide up to 40 per cent of the total costs of RE projects through the Indian Renewable Energy Development Agency (IREDA). The cess has now been increased to INR 400 per tonne of coal used.

j) Joint Liability Group (JLG) for Off-grid installations – By synthesizing business and social potential a small group of 4–10 local entrepreneurs as JLG to avail loans for non-farming activities which could be applied for micro-grid installations.

k) Corporate Social Responsibility (CSR) – To encourage the private sector participation in the national growth and for meeting social goals such as pollution free generation the CSR funds are channelized by top 500 companies as 2 per cent of their profits towards off-grid solutions.

Approvals and Permits

Depending on the state jurisdiction, installation of a solar rooftop PV system may require an electrical permit, a building permit, zoning approval, or some combination of these. The permit fee and turnaround time vary vastly for residential and commercial rooftop installations.

a) Electrical permit: The electrical permits for rooftop projects can be obtained by filling out forms at the electricity board (DISCOM) and paying the required permit fee. Either the site-owner or an electrical contractor can apply for the permit. The process is completed with an inspection by the state electrical inspector assigned to that region of the state.

b) Building permit: Rooftop solar PV project owners contact the state building inspector who covers their region of the state. The inspector will come to the site, review the plans, and issue the building permit onsite. In some regions, a building permit for residential solar PV systems isn't required under any conditions. Commercial PV systems are more likely than residential PV systems to require both electrical and building permits.

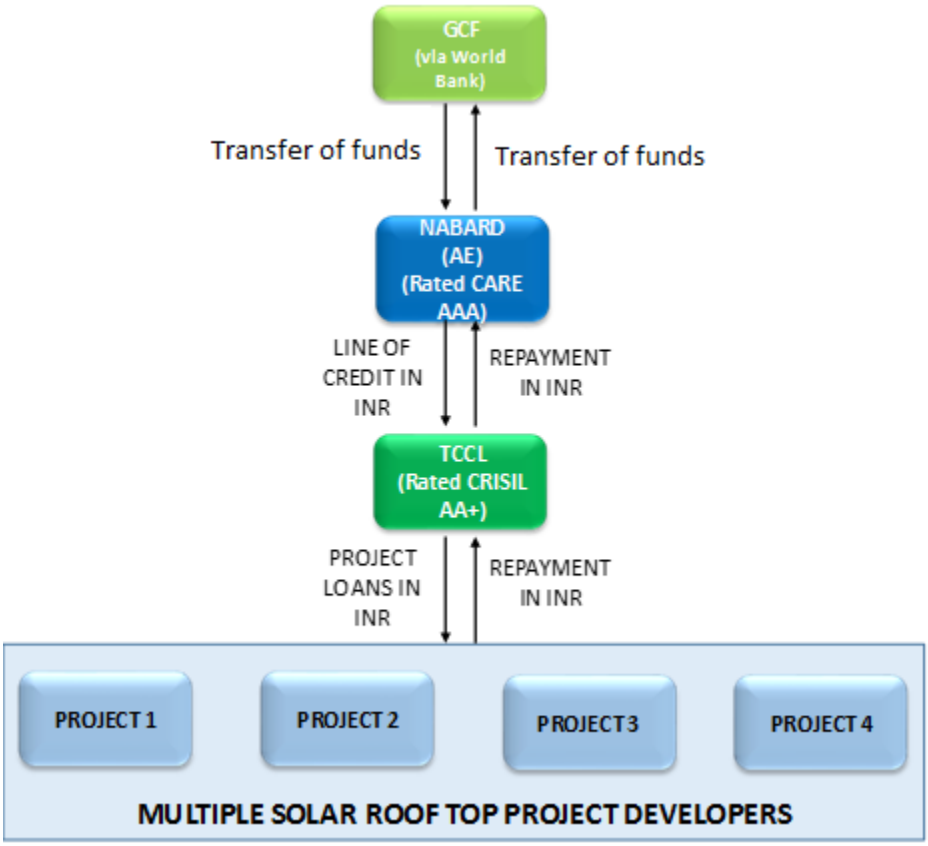
c) Zoning permits: In most of the regions, an electrical permit and, in some cases, a building permit, are the only permits required to install a solar PV system. However, a few cities have additional zoning permits that apply to solar PV projects. For example, any exterior change to a building which includes the historical area and main corridors requires review by the Planning Department for a Certificate of Appropriateness.

TCCL sanction terms shall stipulate obtaining of all the requisite approvals and permits that shall apply to the respective solar rooftop implementation prior to disbursement of any loan funds to the Borrower.

C.7. Institutional / Implementation Arrangements

Describe construction and supervision methodology with key contractual agreements.

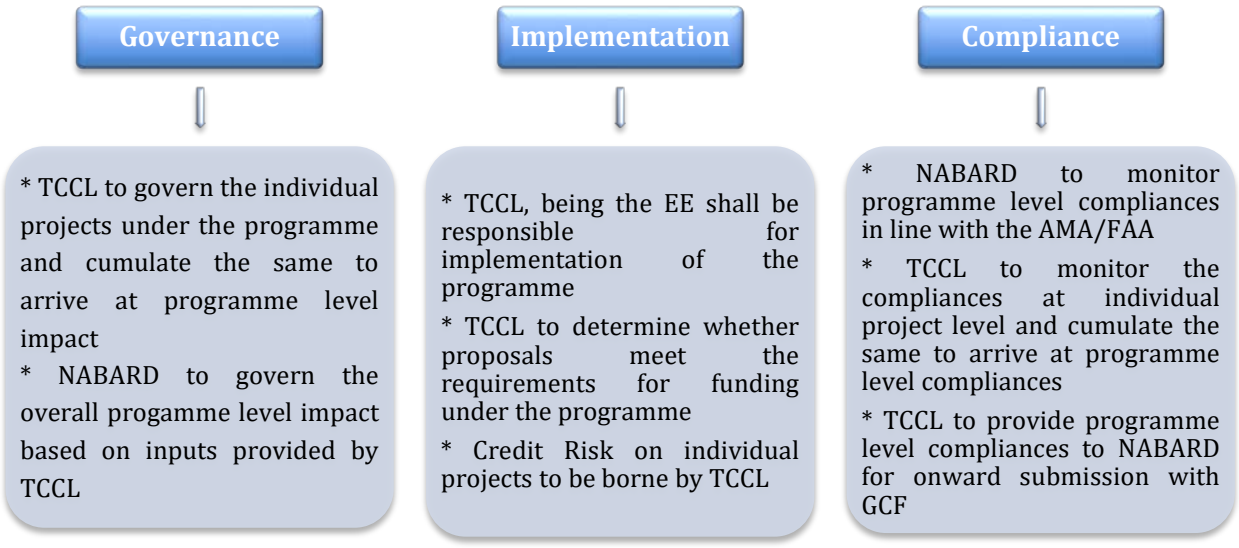
Describe operational arrangements with key contractual agreements following the completion of construction.



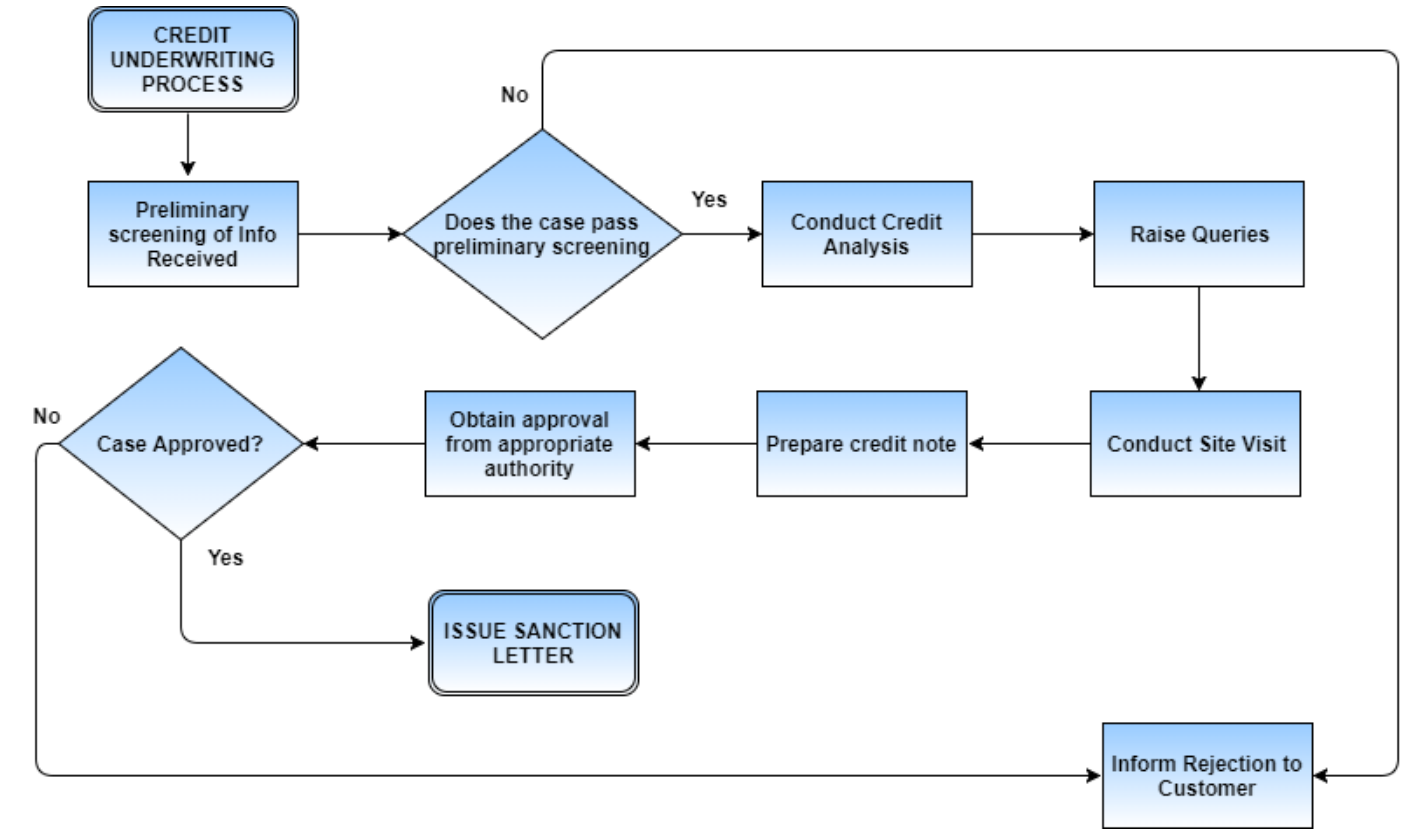
- The Programme aims to provide competitive financing options to the solar rooftop project developers. TCCL, considering its sector expertise and market reach shall facilitate this.
- GCF's line of credit shall be the key source of finance for the Programme.

- GCF's financial assistance (USD funds via its Interim Trustee World Bank) to TCCL shall be routed through NABARD, the AE with GCF. NABARD shall then on-lend the same to TCCL in local currency (Indian Rupees). Thus NABARD shall assume the Forex Risk on repayment of these USD funds. *(Key Contracts Executed: FAA, AMA between GCF and NABARD, Loan Agreement between NABARD and TCCL which shall lay down the arrangement being proposed for providing GCF funds to TCCL).*
- TCCL shall provide Project Loans / Master Line of Credit to various solar rooftop developers after a detailed technical, financial and economic due diligence for the project and the developer. Thereby assuming the credit risk on the ultimate Borrowers.
  (Key Contracts Executed: Loan Agreement between TCCL and project developers, project agreements such as Power Purchase Agreement between project developer and power offtaker which lays down the arrangement of power sale with the offtaker, O&M Agreement between project developer and O&M contractor which lays down the terms and conditions as per which the O&M for the project shall be carried out, and all such other project related agreements entered in to by project developers with respective authorities/vendors. Such agreements shall be assigned in favour of TCCL)
- Post sanction and execution of the projects, TCCL will have a detailed project monitoring evaluation and reporting framework dedicated to the programme.
- The monitoring evaluation reports (in accordance with the FAA and AMA) shall be submitted with NABARD for onward submission to GCF after being appraised by NABARD and/or NABARD appointed Independent Consultants.
- NABARD would ensure necessary monitoring and reporting as per the GCF requirements indicated in the AMA and FAA. The mechanism would be independent mechanism apart from the concurrent mechanism proposed by the TCCL.

PROJECT MANAGEMENT STRUCTURE:



Credit Risk Evaluation Process at TCCL:



C.8. Timetable of Project/Programme Implementation

Please provide a project/programme implementation timetable in section I (Annexes). The table below is for illustrative purposes. If the table format below is used, please refer to the activities as numbered in Section H. In the case of outputs, please mark when all the required activities will be completed.

Task	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023	Q3 2023
Output 1: Funding Proposals received by TCCL																						
Activity 1.1. Receipt of funding proposal from various rooftop developers	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Output 2: Proposals Sanctioned																						
Activity 2.1. Evaluation of developer's profile in terms of agreed parameters	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Activity 2.2. Detailed Technical and Financial assessment of the funding proposal	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Activity 2.3 Sanctioning	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		

of Loans to Borrowers																						
Output 3: Disbursement of Loans to project developers																						
Activity 3.1. Disbursement of Loan to the Borrower	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Output 4: Installation of solar rooftop systems																						
Activity 4.1. Installation of the solar rooftop project by the developers	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Monitoring & Reporting																						
Submission of Interim Evaluation Report													x									
Submission of Annual Performance Report				x				x				x				x				x		
Submission of Project Completion Report																					x	
Submission of Final Independent Evaluation																						x

* The Monitoring requirements (as guided by AMA/FAA) shall be part of the Monitoring and Reporting activity of the programme which shall commence once the FAA is effective.

D.1. Value Added for GCF Involvement

Please specify why the GCF involvement is critical for the project/programme, in consideration of other alternatives.

Solar Rooftop - Benefits to Government/Discoms

- Potential to cater to the ~300 million people who have no reach to grid power in India
- Savings in land requirement
- No development of new transmission infrastructure required
- Reduction in Day Peak Demand issues
- Transmission & Distribution losses minimized

Solar Rooftop - Benefits to Commercial Establishments

- Maximum generation during peak usage time
- Parity – Solar power cost close to commercial power cost
- Solar power cost fixed for ~25 yrs
- With decline in storage costs, can become grid independent

GCF's eminent role

GCF involvement in financing the Solar Rooftop Programme in India is critical for the following reasons:

i. **Fill the financing gap:** The financing required to scale-up the solar rooftop energy base in India significantly exceeds available sovereign financing sources through traditional multilateral and bilateral sources. In addition, attracting private sector interest is difficult, and commercial financing has its own limitations in volume and tenor terms. As on date, very few conventional financers such as public sector banks (with the aid of World Bank / Asian Development Bank) have shown interests in funding such projects. GCF is uniquely positioned to introduce financing at scale to overcome the initial renewable energy investment hurdle (renewable energy has a high investment hurdle but are inexpensive to operate). Without GCF, India is unlikely to access sufficient financing to reach its renewable energy targets and will continue to rely on fossil fuels for power generation.

ii. **Improve access to financing:** Many of the middle and lower segment customers are unable to secure debt due to their relatively unattractive position to avail funds. They are therefore unable to undertake infrastructure development (solar rooftop system) and explore the rooftop potential to the fullest.

iii. **Pave way for sustainable market development:** The GCF programme will help introduce – besides long term project debt- a financial product for this type of investments. The proposed programme will finance an initial set of projects supporting short term objectives with longer term impacts, i.e. to allow the financial close, construction and operation of these projects to demonstrate their technical and financial viability. This programme, rather than creating market distortion, will act as a validation for investors and lenders that the scheme of such projects (the contractual arrangements, support scheme, etc.) is a bankable model as required by several players essential to carry these projects forward (sponsors, services companies, lenders), helping pave the way for future participants.

iv. **Accomplishment of GCF objectives:** The GCF is aligned with the UNFCCC and has an objective to reduce GHG emissions. India is committed to implementing the UNFCCC and reducing GHG emissions, however,

it is widely recognized that India shall require political and financial support from within the UNFCCC framework. As a UNFCCC associated mechanism, GCF assistance shall receive full political support to help obtain the stated objectives for both climate change adaptation and mitigation.

v. **GCF neutral facilitator to bring reforms:** Various regulatory bodies and stakeholders in India recognize that GCF is neutral and this gives it the ability to facilitate many initiatives and reforms in the country that other development partners cannot. This also gives it the ability to convene all the stakeholders involved including development partners towards attainment of common goals.

D.2. Exit Strategy

Please explain how the project/programme sustainability will be ensured in the long run, after the project/programme is implemented with support from the GCF and other sources, taking into consideration the long-term financial viability demonstrated in E.6.3. This should include a description of strategies for longer term maintenance of physical assets (if applicable).

Programme Sustainability (Exit Strategy):

- The GCF support is required at this stage given the challenges associated to long-term financing options to the solar rooftop segment. As the Government continues to advance on various macroeconomic and sector reforms, policy related hurdles are expected to be overcome in the mid-term, resulting in a sector that can be financed on a fully commercial basis. Existing renewable energy resources in India, adequate availability of other required resources (such as land, roof space, grid connectivity, etc.) and the continued decrease in technology cost should ensure financial viability of these investments once the sectorial and general investment challenges are overcome.
- The proposed programme will finance an initial set of projects under the Government's new renewable energy programme and regulatory framework, supporting short term objectives with longer term impacts, i.e. to allow the financial close, construction and operation of these projects to demonstrate their technical and financial viability.
- It will act as a validation for investors and lenders currently unable to participate in funding arrangements that the new framework (contractual arrangements, support scheme, etc.) is found to be adequate by the several players required to carry these projects forward (sponsors, services companies, lenders) and who take the lead in the initial rounds, helping pave the way for future participants.
- A key element of the programme is the providing a basis for predictability of the revenue model that is key for its commercial bankability and long term financial sustainability.
- The programme will not only be an economic enabler, but also from the point of view that the terms of financing and key contractual requirements will follow market-based parameters and best practices.
- Any concessionality considered in this programme will be targeted at overcoming short term risk or cost barriers. The concessionality in interest rates offered by GCF will be passed on to the end borrowers especially from vulnerable communities. Further, normally the loans offered by conventional banks to solar rooftop projects have an average maturity of 5 - 7 years. However, with long tenure loans made available by GCF to TCCL, TCCL shall be able to provide loans with longer tenures such as 12 -15 years.
- The supervision of the projects financed by the GCF will be based on a detailed Monitoring and Evaluation plan that will be implemented to track project performance and achievement of results. Project level results will be aggregated to assess the impact of the GCF's programme in addition to the GCF's project-specific indicators.

In this section, the accredited entity is expected to provide a brief description of the expected performance of the proposed project/programme against each of the Fund's six investment criteria. Activity-specific sub-criteria and indicative assessment factors, which can be found in the Fund's Investment Framework, should be addressed where relevant and applicable. This section should tie into any request for concessionality made in section B.2.

E.1. Impact Potential

Potential of the project/programme to contribute to the achievement of the Fund's objectives and result areas

E.1.1. Mitigation / adaptation impact potential

Specify the mitigation and/or adaptation impact, taking into account the relevant and applicable sub-criteria and assessment factors in the Fund's investment framework.

When applicable, specify the degree to which the project/programme avoids lock-in of long-lived, high emission or climate-vulnerable infrastructure.

India ratified the Paris Agreement to the United Nations Framework Convention on Climate Change (UNFCCC) in October 2016 and has submitted its Nationally Determined Contributions (NDCs) to the UNFCCC for the period 2021–2030. Government of India enunciated mission mode action plans for sustainable growth under NAPCC to address climate change. Its first mission was intensification of solar energy development. It also advised that RPO's be set at 5% of total grids purchase, and be increased by 1% each year for 10 years.

Specifically, India has indicated its intention to:

i. Reduce Green House Gas (GHG) emissions intensity of its Gross Domestic Product (GDP) by 33 to 35 per cent by 2030 from the 2005 level,

ii. Achieve about 40 per cent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030 with the help of transfer of technology and low-cost international finance, including from the Green Climate Fund (GCF), and

iii. Create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover by 2030.

Total CO_2 emission reduction (assuming replacement of 250 MW grid power) from the programme is estimated to be as under:

Year	Cumulative Capacity (MW)	Net electricity supply (MWh/y)	Grid Emission Factor (tCO_2) *	Baseline Emissions (tCO_2)	Programme Emissions (tCO_2) **	Emission reduction per year (tCO_2)
1	25.00	37,230.00	0.8	29,784	0	29,784
2	62.50	93,075.00	0.8	74,460	0	74,460
3	112.50	167,535.00	0.8	134,028	0	134,028
4	175.00	260,610.00	0.8	208,488	0	208,488
5	250.00	372,300.00	0.8	297,840	0	297,840
6	250.00	372,300.00	0.8	297,840	0	297,840
7	250.00	372,300.00	0.8	297,840	0	297,840
8	250.00	372,300.00	0.8	297,840	0	297,840
9	250.00	372,300.00	0.8	297,840	0	297,840
10	250.00	372,300.00	0.8	297,840	0	297,840
11	250.00	372,300.00	0.8	297,840	0	297,840
12	250.00	372,300.00	0.8	297,840	0	297,840
13	250.00	372,300.00	0.8	297,840	0	297,840
14	250.00	372,300.00	0.8	297,840	0	297,840

15	250.00	372,300.00	0.8	297,840	0	297,840
16	250.00	372,300.00	0.8	297,840	0	297,840
17	250.00	372,300.00	0.8	297,840	0	297,840
18	250.00	372,300.00	0.8	297,840	0	297,840
19	250.00	372,300.00	0.8	297,840	0	297,840
20	250.00	372,300.00	0.8	297,840	0	297,840
	Total			**5,212,200**	**0**	**5,212,200**

**Source: CO2 Baseline Database for the Indian Power Sector released by Central Electricity Authority, Ministry of Power, Government of India*

***since programme involves generation of electricity using solar power, emissions are expected to be 0*

The aforesaid emission reductions are indicative and arrived at based on assumptions mentioned E.6.5.

E.1.2. Key impact potential indicator

Provide specific numerical values for the indicators below.

GCF core indicators	*Expected tonnes of carbon dioxide equivalent (t CO_2 eq) to be reduced or avoided (Mitigation only)*	*Annual*	260,610 tCO_2eq
		Lifetime	5,212,200 tCO_2eq
	• *Expected total number of direct and indirect beneficiaries, disaggregated by gender (reduced vulnerability or increased resilience);* • *Number of beneficiaries relative to total population, disaggregated by gender (adaptation only)*	*Total*	
		Percentage (%)	
Other relevant indicators	• Installed effective capacity of 250 MW		

Describe the detailed methodology used for calculating the indicators above.

Key Assumptions:

Scenario	Source	GHGs	Included?	Remarks
Baseline Scenario	CO_2 emissions from coal power electricity generation	CO_2	Yes	Major source of emission
		CH_4	No	Minor source. No material impact
		N_2O	No	Minor source. No material impact
Programme Scenario	Solar PV projects	CO_2	No	Being Solar PV projects, does not involve emissions
		CH_4	No	
		N_2O	No	

Please refer to section E.6.5 for the calculation methodology

Describe how the project/programme's indicator values compare to the appropriate benchmarks (i.e. the indicator values for a similar project/programme in a comparable context).

Not Applicable

E.2. Paradigm Shift Potential

Degree to which the proposed activity can catalyze impact beyond a one-off project/programme investment

E.2.1. Potential for scaling up and replication (Provide a numerical multiple and supporting rationale)

Describe how the proposed project/programme's expected contributions to global low-carbon and/or climate-resilient development pathways could be scaled-up and replicated including a description of the steps necessary to accomplish it.

Far-reaching influence

The financing support provided by the GCF to various categories of customers will enable installation of at least 250 MW of solar roof top capacities. Further, it shall render rooftop solar PV a viable alternative for their energy needs. The highly-visible installations will have a cascading effect in terms of sensitisation and awareness of the population. This impact is difficult to quantify but can conservatively be estimated as a replication multiple of 1.5

In addition, the first few projects will help establish links with international investors, lenders, specialized consultants (engineering, legal, etc.), equipment suppliers, and further develop the capacities of local partners across the supply chains of the technologies involved in the program.

E.2.2. Potential for knowledge and learning

Describe how the project/programme contributes to the creation or strengthening of knowledge, collective learning processes, or institutions

Propagation

Although India is moving ahead to achieve the target of 175 GW of RE by 2022 and 100 GW solar based installed power capacity, new challenges are being faced in RTPVs target of 40 GW at different stages of installation and use. Several policy analyses have been made by various multi-lateral agencies. The Climate Group while suggesting that performance of commercial and industrial sector would play a greater role towards meeting the target, strongly recommends greater partnership of private sector so as to double the current capacity. The Government of India (vide MNRE, SECI), various public sector institutions such as IREDA, industry councils, etc. arrange various seminar and workshops for promotion and dissemination of product knowledge of the solar rooftop segment. TCCL has been partnering and/or participating in such programs. TCCL shall leverage such events to further promote the programme being offered for solar rooftop. This programme will provide will allow to close financing, construct and operate the projects, thus providing an opportunity to downward transfer such knowledge to local participants. The technical cooperation activities will help further develop additional capacity and skills for successful implementation and replication of investments of the programme.

Apart for monitoring, reporting, evaluation and delivery of desired results under the programme as per the GCF requirement, NABARD would make necessary efforts to disseminate the learnings from solar rooftop financing under the programme to wider banking community through existing network of institutions of NABARD such as Banker's Institute of Rural Development (BIRD), wherein NABARD conducts trainings for banking professionals on project financing and related aspects.

E.2.3. Contribution to the creation of an enabling environment

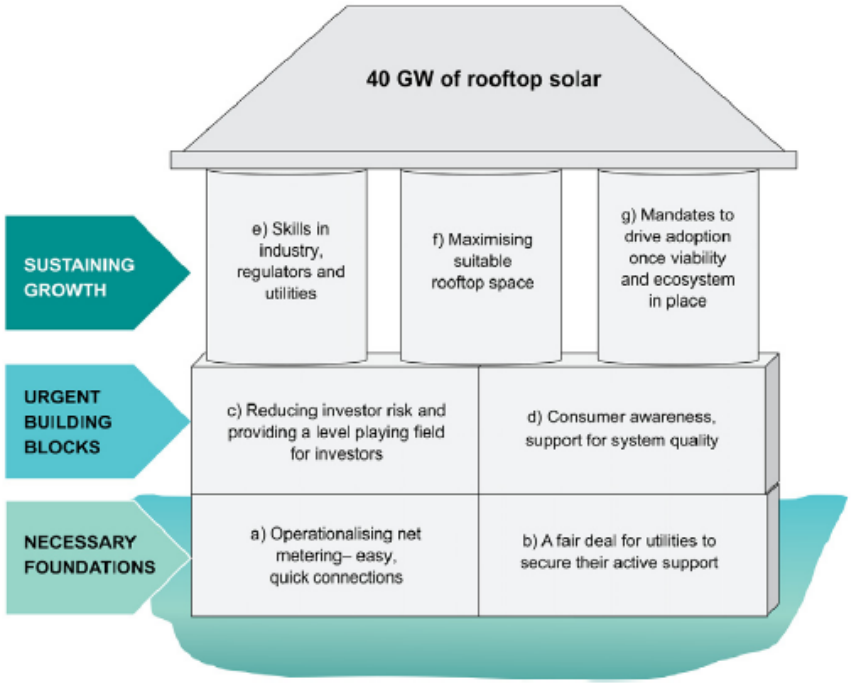
Describe how proposed measures will create conditions that are conducive to effective and sustained participation of private and public sector actors in low-carbon and/or resilient development that go beyond the program.

Describe how the proposal contributes to innovation, market development and transformation. Examples include:

- *Introducing and demonstrating a new market or a new technology in a country or a region*
- *Using innovative funding scheme such as initial public offerings and/or bond markets for projects/programme*

Theory of Change

Several analyses have been made by various multi-lateral agencies. The Climate Group while suggesting that **performance of commercial and industrial sector would play a greater role** towards meeting the target, strongly recommends greater partnership of private sector so as to double the current capacity. The various pillars of growth are schematically depicted below.



New market segments

By providing the technical, legal and financial incentives for the promotion of renewable energy, the GCF programme will encourage both public and private participants to invest in renewable energy sources. The programme, in enabling the construction and commercial operation of an initial set of projects, will contribute to testing and validating the suitability of the new regulatory framework (adequacy of tender/PPA models and parameters, sufficiency of fiscal incentives, adequacy of risk mitigation support scheme developed, interconnection and dispatching arrangements, etc.) while also providing lessons for their improvement in the continued implementation of the government schemes. In addition, the first few projects will help establish links with international investors, lenders, specialized consultants (engineering, legal, etc.), equipment suppliers, and further develop the capacities of local partners across the supply chains of the technologies involved in the program.

E.2.4. Contribution to regulatory framework and policies

Describe how the project/programme strengthens the national / local regulatory or legal frameworks to systematically drive investment in low-emission technologies or activities, promote development of additional low-emission policies, and/or improve climate-responsive planning and development.

The programme intends to contribute to the National Solar Mission of the Government of India by initiating a change in the pattern of investment in expansion of generation capacity, from the fossil-based solutions that have prevailed in the last decade to the ambitious renewable energy penetration targets (175 GW of RE by 2022 and 100 GW solar based installed power capacity). The proposed programme is the first of various support interventions that will be designed over the next few years to achieve such transformation.

E.3. Sustainable Development Potential

Wider benefits and priorities

E.3.1. Environmental, social and economic co-benefits, including gender-sensitive development impact

- Economic co-benefits
  - Job creation: The programme is estimated to help create between 5000 and 7500 jobs, between manufacturing, construction and installation (MCI) jobs, and operation and maintenance (O&M) jobs. These are indicative nos based on current market practices.
- Environmental co-benefits
  - Improved air quality. To overcome power deficits, over the last few years there has been increased use of diesel-based distributed generation solutions, some of which were placed in urban areas, creating direct exposure to air and noise pollution. As renewable energy projects to be developed under this programme follow adequate environmental and social safeguards, the need for these diesel based solutions will be reduced, resulting in associated local environmental benefits.
- Social co-benefits
  - Gender-sensitive development impact. While we do not have a sound basis to estimate ex ante impact possible on gender-equity, the programme will offer support for implementation of various type of activities aimed at improving job opportunities for women in the emerging renewable energy sector.

E.4. Needs of the Recipient

Vulnerability and financing needs of the beneficiary country and population

E.4.1. Vulnerability of country and beneficiary groups (Adaptation only)

Describe the scale and intensity of vulnerability of the country and beneficiary groups, and elaborate how the project/*programme addresses the issue (e.g. the level of exposure to climate risks for beneficiary country and groups, overall income level, etc).*

Findings of IPCC – Fifth Assessment Report (AR5)

Since the mid-19th century, the average increase in the temperature of the Earth's surface has been 0.85 degrees Centigrade. The IPCC finds many observed changes in South Asia's climate. The Asia region as a whole experienced the most weather and climate-related disasters in the world between 2000 and 2008 and suffered the second highest proportion (almost 30%) of total global economic losses. Warming has occurred, at a country scale, across most of South Asia over the 20th century and into the 2000s. Records indicate that it is likely that the numbers of cold days and nights have decreased and the numbers of warm days and nights have increased across most of Asia since about 1950. Heat wave frequency has increased since the middle of the 20th century in large parts of Asia.

AR5 – India Perspective:

The largest chunk of the IPCC synthesis report focuses on the changes in weather patterns and projections related to extreme weather events. These changes are expected to have a cascading effect on the health of the economy as well as that of the people.

- Net annual temperatures in India in 2030s, with respect to 1970s, will increase from 1.7-2.2°C. Extreme temperatures are expected to increase by 1-4°C, with maximum increase in coastal regions.
- The number of monsoon break days has increased while the number of monsoon depressions has declined.
- Mean and extreme precipitation during the Indian summer monsoon is expected to increase.
- The Himalayan region will see maximum increase in precipitation, while the north-eastern region will experience the minimum increase.
- An increase in extreme rainfall events occurred at the expense of weaker rainfall events over the central Indian region and in many other areas.
- Projections indicate that the frequency of cyclones is likely to decrease in 2030s, with increase in cyclonic intensity.
- People living in districts along the eastern coast of India are expected to be especially vulnerable to the impact of extreme weather events because of poor infrastructure and demographic development
- Floods and droughts are likely to increase in India since there will be a decline in seasonal rainfall, coupled with increase in extreme precipitation during monsoon.
- For example, the Mahanadi river basin in India will see an increased possibility of floods in September while an increased possibility of water scarcity in April.
- Delhi is one of the world's five most populated cities that are located in areas with high risk of floods.

Improved Resilience of Power availability:

The GCF programme targets the entire population of India. By increasing the use of local renewable energy and reducing the reliance on imported fossil fuels, India will benefit economically and will be less vulnerable to economic shocks from price fluctuations, as well as benefiting from fewer supply chain interruptions due to climate change-induced extreme weather events. At a higher level, policy-makers will benefit from an enhanced policy context as well as an understanding of climate relatedness of specific policy actions to better incorporate the issues connected with climate change mitigation into long-term planning in the energy sector. Rooftop PV will provide customers with an energy source when the grid is unavailable and thus contribute to improving the resilience of electricity production nationally.

Easy availability of long-term debt:

The proposed GCF programme is aimed at helping solar rooftop awardee projects secure long-term debt financing, to allow them to timely reach financial close and advance to construction and operation. As contracts are awarded, projects will need to secure consistent types and volumes of debt financing to successfully carry projects forward. Per TCCL's market sounding, limitations in the availability of long-term debt financing (i.e. with tenors of at least 12-15 years) may be encountered relative to the investment needs associated to the proposed 100 GW solar capacity. This type of tenors seems to be available only from a limited number of Domestic Financing Institutions. Appetite from the range of commercial banks consulted by TCCL seems to be for much shorter tenors (5-7 years). The economic and financial analysis hereby assesses the effect on tariffs and projects economics (equity, financial and economic rates of returns) of projects financed under these different tenor scenarios, to evaluate the impact that the proposed GCF's financial support and TCCL's additional mobilization efforts to secure sufficient long-term project debt could have.

E.4.2. Financial, economic, social and institutional needs

Describe how the project/programme addresses the following needs:

- *Economic and social development level of the country and the affected population : Programmme would help in outreaching of solar energy to various users and will benefit the users in terms of cheaper & timely availability of power,,employment generation through micro enterprises ,improvement in health facilities, enhanced facilities in schools will create better environment for education, etc.*
- *Absence of alternative sources of financing (e.g. fiscal or balance of payment gap that prevents from addressing the needs of the country; and lack of depth and history in the local capital market)*
- *Need for strengthening institutions and implementation capacity.*

E.5. Country Ownership

Beneficiary country (ies) ownership of, and capacity to implement, a funded project or programme

E.5.1. Existence of a national climate strategy and coherence with existing plans and policies, including NAMAs, NAPAs and NAPs

Please describe how the project/programme contributes to country's identified priorities for low-emission and climate-resilient development, and the degree to which the activity is supported by a country's enabling policy and institutional framework, or includes policy or institutional changes.

India ratified the Paris Agreement to the United Nations Framework Convention on Climate Change (UNFCCC) in October 2016 and has submitted its Nationally Determined Contributions (NDCs) to the UNFCCC for the period 2021–2030. Government of India enunciated mission mode action plans for sustainable growth under NAPCC to address climate change. Its first mission was intensification of solar energy development. It also advised that RPO's be set at 5% of total grids purchase, and be increased by 1% each year for 10 years.
Specifically, India has indicated its intention to:

i. Reduce Green House Gas (GHG) emissions intensity of its Gross Domestic Product (GDP) by 33 to 35 per cent by 2030 from the 2005 level,
ii. Achieve about 40 per cent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030 with the help of transfer of technology and low-cost international finance, including from the Green Climate Fund (GCF), and
iii. Create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover by 2030.

The Government of India (GOI) has launched the National Action Plan on Climate Change (NAPCC), comprising eight missions out of which one of the missions is specifically relating to increasing the share of solar energy in India's total energy mix.

In this regards, India has adopted one of the largest renewable energy capacity expansion programmes in the world having a target of 175 GW installed capacity as contribution of RE by 2022 with solar contributing to 100 GW. Out of this 100GW, 40 GW is planned from the solar rooftop segment.

Propagation

Although India is moving ahead to achieve the solar rooftop target of 40 GW by 2022 new challenges are being faced in RTPVs segment at different stages of installation and use. Several policy analyses have been made by various

multi-lateral agencies. The Climate Group while suggesting that performance of commercial and industrial sector would play a greater role towards meeting the target, strongly recommends greater partnership of private sector so as to double the current capacity. The MoEF&CC (the NDA) has highly appreciated the intent of TCCL and Tata Group to formulate this programme. MoEF&CC noted that the objective of the proposed programme is in line with the NDC and shall be contributing towards achievement of the solar rooftop target. The NDA has thus provided its unconditional support to the programme.

New market segments

By providing the technical, legal and financial incentives for the promotion of renewable energy, the GCF programme will encourage both public and private participants to invest in renewable energy sources. The programme, in enabling the construction and commercial operation of an initial set of projects, will contribute to testing and validating the suitability of the new regulatory framework (adequacy of tender/PPA models and parameters, sufficiency of fiscal incentives, adequacy of risk mitigation support scheme developed, interconnection and dispatching arrangements, etc.) while also providing lessons for their improvement in the continued implementation of the government schemes. In addition, the first few projects will help establish links with international investors, lenders, specialized consultants (engineering, legal, etc.), equipment suppliers, and further develop the capacities of local partners across the supply chains of the technologies involved in the program.

E.5.2. Capacity of accredited entities and executing entities to deliver

Please describe experience and track record of the accredited entity and executing entities with respect to the activities that they are expected to undertake in the proposed project/programme.

The executing entity - TCCL, in partnership with IFC, provides suitable solutions to its clientele and displays Tata promise of quality, world-class service, reliability and trust for all their customer needs. It identifies, evaluates & funds projects in renewable energy (solar, wind, small hydro, biomass etc), energy efficiency and water treatment sectors. Since its inception, it has provided financial and advisory services to more than 50 clients. Through its industry knowledge & unmatched expertise, TCCL has managed to participate in funding of over 3 GW renewable energy projects within a short span of time and saving approximately 4.5 million tonne CO2 emission annually. Largely driven by its excellent asset book size, the company is rated AA+ by the CRISIL (a Standard & Poor's company).

It may be mentioned that TCCL is backed by strong sponsors like Tata Group and IFC, which would support the capital requirement of the company to finance is growth.

Basis its established presence and expertise in the renewable energy sector, TCCL (the Executing Entity) shall solicit/identity opportunities for funding of solar rooftop projects. Currently, TCCL has a huge pipeline of rooftop solar proposals for funding which are a various stages of assessment. TCCL shall apply its established evaluation policies/practices as well as the methodology laid down in C.3 earlier to assess the viability of each such opportunity. Up on successful assessment, TCCL shall proceed to on-lend GCF funds to solar rooftop project developers.

E.5.3. Engagement with NDAs, civil society organizations and other relevant stakeholders

Please provide a full description of the steps taken to ensure country ownership, including the engagement with NDAs on the funding proposal and the no-objection letter.

Please also specify the multi-stakeholder engagement plan and the consultations that were conducted when this proposal was developed.

- Stakeholder engagement in the said programme will be on an ongoing basis and relevant feedback shall be incorporated into the programme at intervals to ensure sustainability and fulfilment of programme objectives.
- TCCL shall participate in workshops and conferences to be in sync with various stakeholders such as Government Officials, industry participants and end consumers regarding their expectations and recommendations on the programme.
- Below is a summary of the feedback received during the formulation of the funding proposal –

STAKEHOLDER GROUP	TYPE OR OBJECTIVE OF CONSULTATION	KEY OUTCOMES/FEEDBACK
Government of India: • Ministry of Environment, Forests & Climate Change (MoEF&CC) • Ministry of New and Renewable Energy (MNRE)	• Application to the Green Climate Fund • Pre-clearance of funding proposal • Discussion on Concept Note	• Objective of the proposed programme is in line with the NDC • Proposal cleared for submission to GCF. NOL dated 15/12/2017
Co-Lenders: Public Sector Banks (PSBs)	• Outlook on renewable energy financing • Assessment of financing options for rooftop solar segment	• Given the size of rooftop solar power target set by the Government of India, funding avenues beyond the conventional bank financing are essential • Limitations faced in lending to solar rooftop projects in terms of requirement of long tenure loans • This helped confirm the relevance of mobilizing additional financial support from the GCF to help fund the solar rooftop projects
Co-Lenders: Private Sector Banks	• Outlook on renewable energy financing • Assessment of financing options for rooftop solar segment	• Positive outlook towards the sector and willingness to lend commercially viable projects • Willingness to participate in the programme as co-financing institution • Limitations faced in terms of loan pricing, interest rates offered are usually very high • This again helped confirm the relevance of mobilizing affordable financial support to project developers

NABARD (AE)	• Submission of proposal to GCF	• Guidance received on formulation of funding proposal vis-à-vis GCF objectives
Project Developers	• Capacity expansion plans • Expectations from financers	• Huge market potential in Commercial & Industrial segment • Favourable policies in most states for setting up rooftop solar projects • CAPEX being entirely front ended developers are seeking long tenure loans • TCCL shall fund project developers with reputed promoters / PE funds, sound financial profile and technical expertise in setting up rooftop solar projects.

E.6. Efficiency and Effectiveness

Economic and, if appropriate, financial soundness of the project/programme

E.6.1. Cost-effectiveness and efficiency

Describe how the financial structure is adequate and reasonable in order to achieve the proposal's objectives, including addressing existing bottlenecks and/or barriers; providing the least concessionality; and without crowding out private and other public investment.

Please describe the efficiency and effectiveness, taking into account the total project financing and the mitigation/ adaptation impact that the project/programme aims to achieve, and explain how this compares to an appropriate benchmark. For mitigation, please make a reference to E.6.5 (core indicator for the cost per tCO2eq).

Current Challenges

Although India is moving ahead to achieve the target of 175 GW of RE by 2022 and 100 GW solar based installed power capacity, new challenges are being faced in RTPVs target of 40 GW at different stages of installation and use:

- Weak infrastructure of some power distribution companies in few states
- Lack of standardization of solar solutions and functional net metering policies for rooftop projects across states
- Unavailability of affordable finance and Lack of non-recourse finance. Banks are cautious in lending to rooftop solar projects because there are high perceived risks and limited information on the track records of rooftop solar investments.
- Even when banks lend to rooftop solar projects, the high-risk perception and high per unit transaction cost has led to high costs of borrowing, thereby negatively impacting IRR of the project.
- Lack of cheap storage solutions leading to mismatch in peak demand time vs generation time in most Indian states. Solar power is generated during the day where demand ifs relatively low. This highlight the need for technological disruptions in the storage space.

- Uncertainty regarding wheeling and banking charges, cross-subsidy charges etc.
- Passive Unwillingness of DISCOMs considering potential loss of revenue and in particular, loss of high-paying commercial and industrial consumers; and additional implementation burden of modernising the grid and inspecting, certifying and billing rooftop systems.
- Delay in grid connection, Long wait for installation of net meter (upto 100 days).
- For residential and agricultural consumers, limited economic incentive to set up solar rooftop system on net metering basis as tariffs are low owing to high cross-subsidy in most of the states. For such consumers, economics will be favourable only if they can install projects of size 2.5x+ their connected load. Currently, restriction is at 0.5x – 0.8x their load.

The programme has the potential to introduce a financial product for investments in solar rooftop projects. The proposed programme will finance an initial set of projects supporting short term objectives with longer term impacts, i.e. to allow the financial close, construction and operation of these projects to demonstrate their technical and financial viability. This programme will act as a validation for investors and lenders that the scheme of such projects (the contractual arrangements, support scheme, etc.) is a bankable model as required by several players essential to carry these projects forward (sponsors, services companies, lenders). In addition, the first few projects will help establish links with international investors, lenders, specialized consultants (engineering, legal, etc.), equipment suppliers, and further develop the capacities of local partners across the supply chains of the technologies involved in the programme. Thus, the programme will help establish 250 MW of solar rooftop capacities and enable future capacity development.

E.6.2. Co-financing, leveraging and mobilized long-term investments (mitigation only)

Please provide the co-financing ratio (total amount of co-financing divided by the Fund's investment in the project/programme) and/or the potential to catalyze indirect/long-term low emission investment.

For this programme, TCCL's co-financing ratio in each individual project being funded under the programme shall be as under:

Expected programme costs: USD 250 mn, of which:

- Project sponsors/equity investors: USD 50 mn
- TCCL: USD 100 mn
- GCF: USD 100 mn

Thus, expected private sector leverage stands at 1.5:1

TCCL is backed by strong sponsors like Tata Group and IFC, which are committed to support the capital requirement of the company to finance is growth. Further, being a NBFC, TCCL also has adequate line of credit from leading banks and has also raised long term funds through issuance of bonds. TCCL has thus committed an equal amount of contribution with GCF, which provides substantial comfort to GCF and AE.

TCCL shall draw the loan assistance from GCF in annual tranches (with an option to draw additional tranche during the year) in line with the capacity deployment schedule indicated in E.1.1. The funds so drawn shall be deployed by TCCL over the ensuing one year period.

Please make a reference to E.6.5 (core indicator for the expected volume of finance to be leveraged).

E.6.3. Financial viability

Please specify the expected economic and financial rate of return with and without the Fund's support, based on the analysis conducted in F.1.
Please describe financial viability in the long run beyond the Fund intervention.

Each project under the programme will be required to meet certain profitability criteria (e.g. IRR > 10%). These assessments will be made for each individual sub-project during the technical eligibility assessment to ensure the economic feasibility of the projects and asset quality.

Please describe the GCF's financial exit strategy in case of private sector operations (e.g. IPOs, trade sales, etc.).

The GCF's exit shall be through the repayments made by TCCL to the GCF back through AE NABARD, based upon the mutually agreed terms and conditions of the financing.

E.6.4. Application of best practices

Please explain how best available technologies and practices are considered and applied. If applicable, specify the innovations/modifications/adjustments that are made based on industry best practices.

TCCL is a renewable energy focused financer, part of Tata Group, one of India's biggest and most respected business conglomerates. It is ably partnered by IFC which finances private sector investments in the developing world, mobilizes capital in the international financial markets, helps clients improve social and environmental sustainability, and provides technical assistance and advice to governments and businesses.
Through its industry knowledge & unmatched expertise, TCCL has managed to participate in funding of over 3 GW renewable energy projects within a short span of time and saving approximately 4.5 million tonne CO_2 emission annually. The programme's activities have been developed with consideration of best practices and lessons learned from past and ongoing. Some of the best practices that shall be followed in this programme are as under:

- Selection of commercially proven, independently certified solar panels and inverters with emphasis on selection of latest available solar PV technology. As is observed in the solar panel technology in the past 5 years, globally solar module prices have reduced substantially owing to advancement in the solar PV space. Vetting of the technology being used in the project being considered for funding shall also form part of the Lender's Engineer's scope.
- Contracting an experienced operation and maintenance (O&M) company, which will ensure proper maintenance of all equipment in accordance with best industry practices.
- O&M contracts that include a minimum plant availability guarantee
- Focused credit monitoring team to continuously evaluate operational and financial performance of each project

E.6.5. Key efficiency and effectiveness indicators

	Estimated cost per t CO_2 eq, defined as total investment cost / expected lifetime emission reductions (mitigation only)

GCF core indicators

(a) Total programme financing	USD250 million
(b) Requested GCF amount	USD100 million
(c) Expected lifetime emission reductions overtime	5,212,200 tCO_2eq
(d) Estimated cost per tCO_2eq (d = a / c)	USD**47.96 / tCO_2eq**
(e) Estimated GCF cost per tCO_2eq removed (e = b / c)	USD**19.19 / tCO_2eq**

Values for indicators (c), (d) and (e) are indicative and were calculated based on programme targets of 250 MW of capacity and assumptions on factors such as:

- Entire capacity of 250 MW expected to be captive power
- expected life of the assets: 25 years
- CAPEX costs: USD 250 million
- Capacity Utilization Factor: 17%
- Annual Degradation Factor: 0.6%
- Programme Emissions: 0 – since programme involves generation of electricity using solar power
- Grid Emission factor: 0.8 kg per 1kWh of solar power based on average emission factors as under:

	Average	**Simple Operating Margin (OM)**	**Build Margin (BM)**	**Combined Margin (CM)**
Excluding cross-border power transfers	0.83	1.00	0.93	0.96
Including cross-border power transfers	0.82	0.99	0.93	0.96

(Source: CO2 Baseline Database for the Indian Power Sector released by Central Electricity Authority, Ministry of Power, Government of India)

Expected volume of finance to be leveraged by the proposed project/programme and as a result of the Fund's financing, disaggregated by public and private sources (mitigation only)

Expected programme costs: USD 250 mn, of which:

Private Sector Funding		**Public Sector:**	
Project sponsors/equity investors	USD 50 mn	GCF	USD 100 mn
TCCL	USD 100 mn		

Sponsor's Equity: based on an estimate of at least 20% across the portfolio.

TCCL: equal commitment with GCF

Private Sector Leverage: 1.5:1

Other relevant indicators (e.g. estimated cost per co-benefit generated as a result of the project/programme)	-

** The information can be drawn from the project/programme appraisal document.*

F.1. Economic and Financial Analysis

Please provide the narrative and rationale for the detailed economic and financial analysis (including the financial model, taking into consideration the information provided in section E.6.3).

As described in previous sections, the proposed GCF programme is aimed at helping solar roof top awardee projects secure long-term debt financing, to allow them to timely reach financial close and advance to construction and operation. As contracts are awarded, projects will need to secure consistent types and volumes of debt financing to successfully carry projects forward. Per TCCL's market sounding, limitations in the availability of long-term debt financing (i.e. with tenors of at least 12-15 years) may be encountered relative to the investment needs associated to the proposed 100 GW solar capacity. This type of tenors seem to be available only from a limited number of DFIs. Appetite from the range of commercial banks consulted by TCCL seems to be for much shorter tenors (5-7 years). The economic and financial analysis hereby assesses the effect on tariffs and projects economics (equity, financial and economic rates of returns) of projects financed under these different tenor scenarios, to evaluate the impact that the proposed GCF's financial support and TCCL's additional mobilization efforts to secure sufficient long-term project debt could have.

Based on the above analysis, please provide economic and financial justification (both qualitative and quantitative) for the concessionality that GCF provides, with a reference to the financial structure proposed in section B.2.

Solar rooftop projects are riskier than conventional ground mounted solar PV projects due to additional factors such as shadow risk, rooftop structure analysis, etc. As a result, banks usually charge a high risk premium over their cost of funds in the rate of interest charged to such project loans.

It is difficult to indicate a firm lending rate as the landed cost of GCF funds for TCCL itself will largely depend on the hedge prevalent at the time of drawal. Also, TCCL's own cost of funds is subject to rates and policies determined by the central bank (Reserve Bank of India). As such, any saving in landed cost of funds on account of concessionality will be passed on to the customer.

Senior Loans from GCF to TCCL shall be priced on concessional terms. The concessionality received by TCCL from GCFshall be passed on to the project developers in the rate of interest charged on the project loans.

Further, normally the loans offered by conventional banks to solar rooftop projects have an average maturity of 5 - 7 years. However, with long tenure loans made available by GCF to TCCL, TCCL shall be able to provide loans with longer tenures such as 12 -15 years.

F.2. Technical Evaluation

Please provide an assessment from the technical perspective. If a particular technological solution has been chosen, describe why it is the most appropriate for this project/programme.

Technical feasibility of each project will be evaluated for each individual sub-project during the technical eligibility assessment to ensure the economic feasibility of the projects and asset quality.

F.3. Environmental, Social Assessment, including Gender Considerations

Describe the main outcome of the environment and social impact assessment. Specify the Environmental and Social Management Plan, and how the project/programme will avoid or mitigate negative impacts at each stage (e.g. preparation, implementation and operation), in accordance with the Fund's Environmental and Social Safeguard (ESS) standard. Also describe how the gender aspect is considered in accordance with the Fund's Gender Policy and Action Plan.

As per the indicative environmental and social risk categorization of TCCL's SEMS policy which is in line with NABARD's Environment & Social Policy which in turn is aligned with **GCF's environmental and social safeguards, solar power projects below 5 MW capacity are likely to be considered as Category C or Category-I3 (low-level intermediation.)** This takes into consideration the environmental and social risks that are mostly benign and arising mostly during the construction and installation. Rooftop solar installations are located in already built-up areas, requiring no land footprint and therefore there are no adverse impacts on biodiversity, natural habitats, land and indigenous peoples are expected.

TCCL will screen its proposals under this program, and avoid lending to projects that are likely to generate moderate or high environmental and social risks. The screening of borrowers and their proposals will be done for each subproject using exclusion list and initial environmental and social screening process as part of TCCL's SEMS. The environmental and social sensitivities considered in siting of the subprojects in this program, will not lead to any major new environmental and social risks, as rooftop solar projects are typically sited only on existing host facilities that are already developed without any additional land requirement, not requiring assessment against Performance Standards relating to land, indigenous peoples, and biodiversity. Moreover, the possibility of individual solar rooftop projects to be above 5 MW, and escalation of environmental and social risks due to increase in the size of bundled rooftop projects aggregating more than 5 MW is very low. Rooftop solar PV system typically requires 100 square feet (about 10 m^2) of shade-free roof area per kW of capacity in India, and weigh 30-60 Kgs/m^2 which is too heavy for asbestos roofed sheds. The installation of metal roofed sheds will be decided on a case-to-case basis. The mounting structure is generally designed to handle cyclones where wind speeds can reach 200 kph (125 mph).

Specific risk parameters under the project and the mitigation strategies are indicated in the Environmental and Social Assessment document of the project. Risks and impacts for the proposed program are benign and are addressed through good international industry practices (GIIP) and through EHS guidelines as applicable for the solar rooftop sector in India. Not requiring additional land footprint for these subprojects, avoids the need for subprojects under this program to be screened against some of most significant Performance Standards of GCF (as that of IFC) and have limited application against the other Performance Standards. TCCL commits to develop environmental and social codes of practice, prior to deciding on financing implementation of subprojects under this programme and NABARD will guide and monitor the overall environmental and social risk management of this program. The code of practice along with the environmental and social screening will support the existing SEMS of TCCL to effectively identify and manage environmental and social risks under this program, and also guide the borrowers of the subprojects to plan their projects. The environmental and social performance of the program will be annually reported by TCCL in standard format, reviewed by NABARD and submitted to GCF.

Stakeholder consultations were undertaken in the course of developing the project and undertaking due diligence. The stakeholders consulted included government agencies, public and private sector banks, and project developers. Stakeholder engagement in the said programme will be on an ongoing basis, and relevant feedback shall be incorporated into the programme at intervals to ensure sustainability and fulfillment of programme objectives. The executing entity, TCCL, shall participate in workshops and conferences to be in sync with various stakeholders such as Government Officials, industry participants and end consumers regarding their expectations and recommendations on the programme.

Gender Consideration:

The programme will benefit women in following ways:

1. Improved energy access and energy security would lead to opening up of new livelihood opportunities and extend gainful working hours.
2. Solar rooftop on school building will lead to enhanced educational outcome for students including girl students.
3. The rural institutions such as primary/ community health centers, would be in position to provide additional health facilities (testing and diagnostic facilities).
4. Job opportunities for women in the emerging renewable energy sector.

Separate Gender Analysis and Action Plan document has been prepared for the project.

Grievance redress mechanism

In line with NABARD's Grievance mechanism, TCCL has a mechanism in place to receive, analyze, record, and respond (if deemed necessary) to views, opinions, concerns (real or perceived), and requests for information from stakeholders regarding its business activities or clients' environmental and social performance. TCCL follows the Tata Code of Conduct (TCoC), a Tata-Group code for ethical conduct across all businesses of the Tata Group. The TCoC, available in public domain (TCCL website) as well as on each issued Sanction Letter, elaborates on "Raising Concerns". A stakeholder can raise a concern with the company's employees or activities, to the officials as designated in Tata Capital's Whistleblower Policy. On receipt of a grievance, further investigation will be undertaken by the Ethics Counselor, and relevant actions as applicable will be taken in accordance with the TCoC and Whistleblower Policy. TCCL commits to engage NABARD on addressing external grievances relating to this program, and safeguard GCF from related reputation risks. The NABARD's grievance redressal mechanism which is available for posting of any grievances would also be open for submitting complaints by any stakeholder.

Programme will offer support for implementation of various type of activities aimed at improving job opportunities for women in the emerging renewable energy sector. Preference to health & educational institutions by Promoters in vulnerable areas to create energy access and security.

F.4. Financial Management and Procurement

Describe the project/programme's financial management and procurement, including financial accounting, disbursement methods and auditing.

TCCL and NABARD shall establish separate accounting and reporting for the programme. TCCL shall establish a dedicated team of professionals to source, evaluate, sanction and monitor projects under the programme.
In its capacity as AE, NABARD shall oversee financial management and procurement of the programme. A formal process to this effect shall be established between TCCL and NABARD. TCCL shall provide the relevant information in this regard to NABARD. TCCL has a robust financial data management system with technological support provided by Tata Consultancy Services, a globally recognized IT infrastructure provider. The system is capable of producing reports and distributes them to the correct departments at the correct intervals. These systems will be customized to facilitate the financial management and reporting of the programme. All reporting shall be done in accordance with internationally recognized Financial Reporting Standards. TCCL has the capacity to implement variable frequencies of reporting to ensure with the utmost transparency that the funds are being used effectively and appropriately.

TCCL will be the executing entity of this program. Therefore, the disbursement will be conducted in accordance with the Credit Policy and the Standard Operating Procedures on loan operations and all other relevant credit activity guidelines and procedures. These procedures also define the monitoring methods on loan disbursement and credit monitoring.

TCCL has an Internal Audit Division. Its mission is to add value through an independent appraisal of all of TCCL's operations and activities and governance. The result of such appraisal is improved operational efficiency, risk analysis and management, and internal control systems so as to aid TCCL in achieving its corporate objectives. Beyond the Internal Audit functions, the regular and on-demand monitoring function also serves as an Internal Control check. Moreover, TCCL is fully audited by internationally recognized auditing firms in accordance with International Standards on Auditing.

In terms of project procurement, TCCL shall stipulate that the project being implemented shall involve use of the latest and commercially viable solar PV technologies. The key component of the project viz. the solar panels shall be sourced strictly from Tier I module suppliers. Further, other components such as inverters shall also be of leading and established make. The list of Tier I Module Suppliers as of Q1 2017 is as under:

Company/ Brand	In-House module capacity (MW/year)	Company/ Brand	In-House module capacity (MW/year)
Jinko Solar	6,500	Renesola	1,500
GCL System	6,000	BYD	1,500
Trina	6,000	REC Solar	1,300
Candaian Solar	5,800	HT-SAAE	1,200
Hanwha Q Cells	5,550	Solar Frontier	1,050
JA Solar	5,500	Phono Solar	1,000
Lerri/ Longi	4,500	ET Solar	1,000
First Solar	2,200	SunPower	900
Risen Energy	3,100	Vikram	900
Talesun	2,800	Hyundai Heavy	600
Suntech	2,900	S-Energy	530
Seraphim	2,100	Tata	500
Chint/ Astronergy	2,000	AU Optronics	435
Eging	2,000	Aleo Solar	250
ZNShine	1,600	Sharp	210
SolarWorld	1,500	Winaico	150

Source: Bloomberg New Energy Finance

G.2. Risk Factors and Mitigation Measures

Please describe financial, technical and operational, social and environmental and other risks that might prevent the project/programme objectives from being achieve. Also describe the proposed risk mitigation measures.

Selected Risk Factor 1

Description	Risk category	Level of impact	Probability of risk occurring
Off Taker and Tariff Risks	Financial	Medium (5.1-20% of project value)	Medium

Potential delay in payments by the off-taker for the energy delivered by the Borrowers may impact the Borrower's ability to serve debt.			
Mitigation Measure(s)			
Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level? • Detailed evaluation of the underlying off-taker and selection of healthy off-taker with no default history • Structured loan payments considering the track record of the off-taker in making payments for the energy delivered • Detailed vetting of the underlying Power Purchase Agreement to ensure no ambiguity in tariff determination • Stipulation of a Debt Service Reserve Account of no less than 6 months of Project debt service, which will be used to pay debt in the event of any cash short fall of the Borrower			
Selected Risk Factor 2			
Description	Risk category	Level of impact	Probability of risk occurring
Resource Risk Lower-than-expected solar irradiation could reduce the ability of the Project to generate enough revenues to service debt	Financial	Low (<5% of project value)	Medium
Mitigation Measure(s)			
Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level? • Use of conservative base-case assumptions for debt sizing that incorporates levels of energy production that will have a high probability of being exceeded. • Maintenance of minimum debt service coverage ratio • Appointment of external technical consultant (the Lenders Engineer, "LE") to independently analyze the solar irradiation using the best performing solar database presently available			
Selected Risk Factor 3			
Description	Risk category	Level of impact	Probability of risk occurring
Implementation Risks Loss of revenues caused by delays in construction and cost overruns.	Technical and operational	Medium (5.1-20% of project value)	Medium
Mitigation Measure(s)			
Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?			

- Selection of sites with easy accessibility (no Right of Way issues)
- Clarity in rooftop configuration. Pre-construction assessment of roof structure, shadow analysis, building condition, future construction plans etc.
- Engaging Consultants to have deeper understanding of regulatory aspects
- Employing EPC reputable contractor. Vetting of EPC arrangements to ensure effective transfer of construction risk to the EPC Contractor. The EPC Contract to have a package of market-standard liquidated damages (the "LDs"), to be sized on a case-by-case basis taking into the account the opinion of the LE and considering the characteristics of project site and construction program. The LDs to be provided by the EPC Contractors or the Sponsor will be credit enhanced with a letter of credit posted by a financial institution acceptable to TCCL.
- Additional support from Sponsor to cover risks that may be excluded by EPC Contractors.

Selected Risk Factor 4

Description	Risk category	Level of impact	Probability of risk occurring
Technology Risk Underperformance of the technology leading to lower production of energy and revenues.	Technical and operational	Low (<5% of project value)	Low

Mitigation Measure(s)

Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?

- Selection of commercially proven, independently certified solar panels and inverters,
- Solar panel degradation guarantee and defects guarantee provided by manufacturers of solar panels and wind turbines,
- Where appropriate, a major maintenance reserve accounts to perform scheduled maintenance and replacement of components.
- Contracting an experienced operation and maintenance (O&M) company, which will ensure proper maintenance of all equipment in accordance with best industry practices.
- O&M contracts that include a minimum plant availability guarantee

Selected Risk Factor 5

Description	Risk category	Level of impact	Probability of risk occurring
Environmental and Social risks Impacts environment and social situations	Social and environmental	Low (<5% of project value)	Low

Mitigation Measure(s)

Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?

- Clearly defined list for type of projects to be excluded under the programme
- Application of the environmental and social safeguards, which require a comprehensive assessment of environmental and social risks and its corresponding action plan to mitigate such risks
- Conduct a flora and fauna survey, including birds during the migratory seasons, before the execution of any works
- Public consultation process to identify and address, as needed, the concerns of the affected communities (if any)

Selected Risk Factor 6

Description	Risk category	Level of impact	Probability of risk occurring
Operating Risks Impacts performance and asset life	Technical and operational	Medium (5.1-20% of project value)	Medium

Mitigation Measure(s)

Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?

- Appointment of Reputable O&M contractor with min. performance efficiency
- Preferably constructor to undertake O&M to avoid disputes
- Project to be adequately insured

Other Potential Risks in the Horizon

Please describe other potential issues which will be monitored as "emerging risks" during the life of the projects (i.e., issues that have not yet raised to the level of "risk factor" but which will need monitoring). This could include issues related to external stakeholders such as project beneficiaries or the pool of potential contractors.

Transmission bottlenecks

The Government of India intends to increase the installed capacity of renewable energy power projects exponentially in the coming 5 years. However further expansion in installed capacity will necessarily require additional investments in transmission capacity. Without it, curtailment may occur in the most congested nodes of the transmission system, potentially affecting the ability of projects to dispatch energy into the grid.

** Please expand this sub-section when needed to address all potential material and relevant risks.*

H.1. Logic Framework.

Please specify the logic framework in accordance with the GCF's Performance Measurement Framework under the Results Management Framework.

H.1.1. Paradigm Shift Objectives and Impacts at the Fund level[1]

Paradigm shift objectives	
Shift to low-emission sustainable development pathways	Please elaborate on the paradigm shift objectives to which the project/programme contributes. The programme intends to contribute to the National Solar Mission of the Government of India by initiating a change in the pattern of investment in expansion of generation capacity, from the fossil-based solutions that have prevailed in the last decade to the ambitious renewable energy penetration targets (175 GW of RE by 2022 and 100 GW solar based installed power capacity). The proposed programme is among the first of various support interventions that will be designed over the next few years to achieve such transformation. GCF's financial support to secure long-term project debt will help in the context of limited availability of such type of financing for the solar roof top segment. In the process of evaluating and closing such financing, the programme will generate valuable insights that will be shared with relevant public authorities to continue to improve regulation, design of tenders and off-taking agreements, and government support instruments, in order to enhance delivery of the Government's long-term renewable energy penetration goals. In addition, programme's dedicated technical cooperation activities will help enhance policy, regulatory, planning and project financing capacities of both relevant public and private sector entities. As an outcome, the programme shall facilitate creation of a smooth end-to-end process for installation of solar rooftop power with long term benefits, among others, being reductions in GHGs leading to tread a sustainable energy path.

Expected Result	**Indicator**	**Means of Verification (MoV)**	**Baseline**	**Target**		**Assumptions**
				Mid-term (if applicable)	Final	
Fund-level impacts						
M1.0 Reduced emissions through increased low-emission energy access and power generation	*Please select relevant GCF indicators from the Fund's performance measurement framework. More than one indicator may be selected per expected impact result.* Tonnes of carbon dioxide equivalent (t CO2eq) reduced or	Aggregated results of projects' annual supervision report verified by an independent engineer and TCCL	0	Indicative reduction of 90,000 ton of CO_2 eq	Indicative reduction of 5,212,200 ton of CO_2 eq	The programme's final target is based on the assumptions indicated in section E.6.5, which are expected to be representative of the programme's

[1] Information on the Fund's expected results and indicators can be found in its Performance Measurement Frameworks available at the following link (Please note that some indicators are under refinement): http://www.gcfund.org/fileadmin/00_customer/documents/Operations/5.3_Initial_PMF.pdf

	avoided as a result of Fund-funded projects/programmes	Social & Environmental specialist				portfolio composition.
M1.0 Reduced emissions through increased low-emission energy access and power generation	Volume of finance leveraged by Fund funding (funding leverage factor)	Aggregated amount allocated to finance low emission energy projects reported by TCCL	0	Indicative Volume: Total USD 100 M GCF leverage ratio:1:1.5	Indicative Volume: Total USD 250 M GCF leverage ratio:1:1.5	TCCL will aim for at least this leverage level through its additional mobilization efforts with own funds, or other private financers, if necessary
M1.0 Reduced emissions through increased low-emission energy access and power generation	Cost per t CO_2eq decreased for all Fund-funded mitigation projects/ programmes	TCCL will calculate this value for each project in the GCF portfolio at the time of financial closing, based on total project cost and GCF financing to each project. TCCL will aggregate results and report to GCF for the whole portfolio.	NA	NA	Total Project: USD 47.96 /ton CO_2 avoided Public Funding (GCF): USD 19.19 /ton CO_2 avoided Private Funding: USD 28.78 /ton CO_2 avoided	As indicated in section E.6.5

* The assumptions stated above factor in the necessary support from regulatory authorities towards the renewable energy sector in general and particularly towards solar PV sector. Any change in regulations such as withdrawal of exemptions, introduction of taxes, approval mechanisms, etc. could affect the results expected from the programme. Further, the programme also expects establishment of a funding product for commercially viable solar rooftop projects. Currently, very few lenders are offering solar rooftop focused financing options. The initial few projects funded under the programme are likely to attract more investors/lenders to the segment. This may result in increased competition in the solar rooftop funding market which may also affect the results expected from the programme.

H.1.2. Outcomes, Outputs, Activities and Inputs at Project/Programme level

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
Project/programme outcomes	**Outcomes that contribute to Fund-level impacts**					
M6.0 Increased number of small, medium and large low-emission power suppliers	MWs of low emission energy capacity installed, generated and/or rehabilitated as a result of GCF support	TCCL portfolio reports, Government / MNRE reports	0	100 MW in initial 3 years	250 MW	Easy availability of desired levels of long term funding and knowledge sharing from this programme to project developers shall attract more no. of players
Project/programme outputs	**Outputs that contribute to outcomes**					
Financing of commercially viable solar rooftop projects Output 1: Funding Proposals received by TCCL	No. of funding proposals received by TCCL	TCCL generated reports indicating no of proposals received	0	Proposals aggregating to ~150 MW in initial 3 years. Indicative Segment wise Composition: C&I: 65-70% Institutional & Social: 25% Residential: 5-10%	250 MW Indicative Segment wise Composition: C&I: 65-70% Institutional & Social: 25% Residential: 5-10%	Expected market demand in the solar rooftop sector Deals in pipeline / under evaluation with TCCL of around 20 MW. TCCL shall consider all proposals for solar rooftop received / sanctioned since September 30, 2017 under this programme Segment wise composition is indicative and may vary based on the extant market dynamics within each segment
Output 2: Proposals Sanctioned	No. of proposals sanctioned by TCCL under the programme	TCCL generated reports indicating no. of	0	USD 120 mn (GCF + TCCL)	USD 200 mn (GCF + TCCL)	Considering TCCL's established operational and credit risk

		proposals sanctioned		in initial 3 years Indicative Segment wise Composition: C&I: 65-70% Institutional & Social: 25% Residential: 5-10%	Indicative Segment wise Composition: C&I: 65-70% Institutional & Social: 25% Residential: 5-10%	evaluation track record Segment wise composition is indicative and may vary based on the risk based evaluation of each proposal within the respective segment
Output 3: Disbursement of Loans to project developers	Amount of loans disbursed by TCCL to project developers under the programme	TCCL generated reports indicating actual amount of loans disbursed	0	USD 90 mn (GCF + TCCL) in initial 3 years Indicative Segment wise Composition: C&I: 65-70% Institutional & Social: 25% Residential: 5-10%	USD 200 mn (GCF + TCCL) Indicative Segment wise Composition: C&I: 65-70% Institutional & Social: 25% Residential: 5-10%	Considering TCCL's established operational track record Segment wise composition is indicative and may vary based on the actual sanctions within the respective segment
Output 4: Installation of solar rooftop systems	MW of solar rooftop capacity installed under the programme	TCCL generated reports indicating aggregate capacity of projects commission	0	Projects aggregating to 100 MW in initial 3 years Indicative Segment	Projects aggregating to 250 MW Indicative	Assuming a project construction period of 5-6 months. Segment wise composition is indicative and may

		ed under the programme		wise Composition: C&I: 65-70% Institutional & Social: 25% Residential: 5-10%	Segment wise Composition: C&I: 65-70% Institutional & Social: 25% Residential: 5-10%	vary based on the actual sanctions within the respective segment
Activities	**Description**		**Inputs**		**Description**	
1.1. Receipt of funding proposal from various rooftop developers	TCCL to receive proposals for funding under the programme		Sourcing tie-ups, referral of proposals		TCCL shall receive requests for funding and/or TCCL shall solicit project developers for funding of solar rooftop projects	
2.1 Evaluation of developer's profile in terms of agreed parameters	Preliminary checks to determine eligibility under the programme		Technical evaluation		Each proposal for funding shall be subject to preliminary evaluation in terms of predetermined eligibility parameters	
2.2 Detailed Technical and Financial assessment of the funding proposal	Detailed assessment up on successful screening under 2.1		Technical & Financial evaluation		Each proposal for setting up solar rooftop project shall be subject to detailed assessment in terms of technical (by independent engineer), financial and commercial viability	
2.3 Sanctioning of Loans to Borrowers	Communication to the project developers regarding the detailed terms and conditions up on which loans are sanctioned		Credit risk assessment and legal due diligence		Up on successful assessment of technical, and financial risks, loans shall be sanctioned to project developers	
3.1 Disbursement of Loan to the Borrower	Disbursement of funds towards setting up of the projects		TCCL's portion – 40% of project cost GCF's portion – 40% of project cost Project Equity – 20% of project cost		Up on successful assessment, TCCL shall proceed to disburse the loan funds to the developer.	

4.1 Installation of the solar rooftop project by the developers	Project implementation	Power generation reports	The solar rooftop developer shall install the project in line with the project implementation schedule assessed in 1.3

H.2. Arrangements for Monitoring, Reporting and Evaluation

Besides the arrangements (e.g. semi-annual performance reports) laid out in AMA, please provide project/programme specific institutional setting and implementation arrangements for monitoring and reporting and evaluation. Please indicate how the interim/mid-term and final evaluations will be organized, including the timing.

Please provide methodologies for monitoring and reporting of the key outcomes of the project/programme.

Outcome analysis

Monitoring, reporting and evaluation arrangements will comply with requirements established by GCF in the FAA and the AMA. Besides, every project supported by the programme will undergo detailed evaluation including identification, eligibility review, due diligence evaluation, credit review, approval, pre-closing review, financial closing, disbursement, supervision, project closing (i.e. once debt has been fully repaid) and evaluation. As part of the approval process, every project supported by the GCF will be subject to an ex-ante assessment on the rationale for the project and its expected development impact. Such assessment will normally include an economic analysis of the main benefits associated with each specific project. The outcome of such assessment shall lay down certain operational and financial parameters which the underlying project will be expected to achieve over the life of the loan.

Post sanction and effectiveness of FAA for the project, NABARD shall monitor the project reporting and evaluation process on behalf of GCF in accordance with the FAA and AMA for which TCCL shall provide the all the requisite information and reports to NABARD. The supervision of the projects financed by the GCF will be based on a detailed Monitoring and Evaluation plan that will be implemented to track project performance and achievement of results. Considering that the projects funded under the programme shall be spread across multiple locations across India, all projects under this programme will be continuously monitored by the dedicated Credit Monitoring Team that shall be set up in TCCL. In addition to the reporting requirements under the FAA and/or AMA, the Credit Monitoring Team shall continue to monitor the projects in line with the TCCL – Credit Monitoring Policy. On a quarterly basis, the Credit Monitoring Team shall review the monthly energy generation reports of each project vis-à-vis the projected generation assessed at the time of granting the loans. Further, every year, the Credit Monitoring Team of TCCL will prepare an Annual Review Report to monitor the progress of the project and update the operational parameters included in the project evaluation and any additional financial indicators included in the loan agreement. Project level results will be aggregated to assess the impact of the GCF's programme in addition to the GCF's project-specific indicators.

I. Supporting Documents for Funding Proposal

☒	NDA No-objection Letter
☒	Feasibility Study
☒	Integrated Financial Model that provides sensitivity analysis of critical elements (xls format, if applicable)
☐	Confirmation letter or letter of commitment for co-financing commitment (If applicable)
☒	Project/Programme Confirmation/Term Sheet (including cost/budget breakdown, disbursement schedule, etc.) – *see the Accreditation Master Agreement, Annex I*
☒	Environmental and Social Impact Assessment (ESIA) or Environmental and Social Management Plan (If applicable)
☐	Appraisal Report or Due Diligence Report with recommendations (If applicable)
☐	Evaluation Report of the baseline project (If applicable)
☐	Map indicating the location of the project/programme
☒	Timetable of project/programme implementation (given at C.8)

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