Report and Recommendation of the President to the Board of Directors

Project Number: 49419-001
September 2016

Proposed Multitranche Financing Facility and Administration of Technical Assistance Grant
Punjab National Bank
Solar Rooftop Investment Program
(Guaranteed by India)

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 17 August 2016)

Currency unit	–	Indian rupee (Re/Rs)
Re/Rs1.00	=	$0.0150
$1.00	=	Re/Rs 66.868

ABBREVIATIONS

ADB	–	Asian Development Bank
CTF	–	Clean Technology Fund
FAM	–	facility administration manual
JNNSM	–	Jawaharlal Nehru National Solar Mission
MFF	–	multitranche financing facility
MNRE	–	Ministry of New and Renewable Energy
OCR	–	ordinary capital resources
PNB	–	Punjab National Bank
SRIP	–	Solar Rooftop Investment Program
TA	–	technical assistance

WEIGHTS AND MEASURES

GW	–	gigawatt
kWh	–	kilowatt-hour
MW	–	megawatt
MWp	–	megawatt peak

NOTES

(i) The fiscal year (FY) of the Government of India and its agencies ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2016 ends on 31 March 2016.

(ii) In this report, "$" refers to US dollars.

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INVESTMENT PROGRAM[a] AT A GLANCE

1. Basic Data — **Project Number:** 49419-001

Project Name	Solar Rooftop Investment Program	**Department /Division**	SARD/SAPF
Country	India	**Executing Agency**	Punjab National Bank
Borrower	Punjab National Bank		

2. Sector	**Subsector(s)**	**ADB Financing ($ million)**
✓ **Finance**	Infrastructure finance and investment funds	330.00
	Total	**330.00**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Mitigation ($ million)	330.00
		CO_2 reduction (tons per annum)	291,522
Environmentally sustainable growth (ESG)	Eco-efficiency	Climate Change impact on the Project	Low
	Environmental policy and legislation		
	Global and regional transboundary environmental concerns		
	Natural resources conservation		
	Urban environmental improvement		

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Governance and capacity development (GCD)	Institutional development	Some gender elements (SGE)	✓
	Organizational development		
Knowledge solutions (KNS)	Application and use of new knowledge solutions in key operational areas		
	Knowledge sharing activities		
Partnerships (PAR)	Bilateral institutions (not client government)		
	International finance institutions (IFI)		
	Official cofinancing		
	Private Sector		
Private sector development (PSD)	Conducive policy and institutional environment		
	Promotion of private sector investment		
	Public sector goods and services essential for private sector development		

5. Poverty and SDG Targeting		**Location Impact**	
Project directly targets poverty and SDGs	No	Nation-wide	High

6. Risk Categorization: Complex

7. Safeguards Categorization [Tranche 1] **Environment:** FI-C **Involuntary Resettlement:** FI-C **Indigenous Peoples:** FI-C

8. Financing

Modality and Sources	**Indicative Tranches ($million)**			**Amount ($million)**
	I	II	III	
ADB				**330.00**
Sovereign MFF-Tranche (Loan): Ordinary capital resources	0.00	80.00	250.00	330.00
Cofinancing				**175.00**
Clean Technology Fund - Loan	100.00	70.00	0.00	170.00
Clean Technology Fund - Technical Assistance	2.00	2.00	1.00	5.00
Counterpart				**500.00**
Others	40.00	60.00	100.00	200.00
Project Sponsor	60.00	90.00	150.00	300.00
Total	**202.00**	**302.00**	**501.00**	**1,005.00**

9. Effective Development Cooperation

Use of country procurement systems	No
Use of country public financial management systems	Yes

INVESTMENT PROGRAM[a] AT A GLANCE

10. Country Operations Business Plan

CPS	http://www.adb.org/sites/default/files/institutional-document/34003/files/cps-ind-2013-2017.pdf
COBP	http://www.adb.org/sites/default/files/institutional-document/175399/cobp-ind-2016-2018.pdf

11. Investment Program Summary

The proposed $505 million sovereign-guaranteed Solar Rooftop Investment Program (SRIP) is a multitranche financing facility, consisting of $500 million financial intermediation loans and a $5 million capacity development technical assistance. As requested by the Government of India, Punjab National Bank would be the borrower, and the India would provide a sovereign guarantee to the Asian Development Bank for the SRIP. The SRIP intends to primarily finance large solar rooftop systems on industrial and commercial buildings on standalone or aggregated basis. Punjab National Bank's loans to subborrowers will be priced based on Punjab National Bank's cost of funds and subproject-specific risks. The proposed accompanying technical assistance for $5 million is critical to integrate the building blocks of the Government of India's sector development initiative to ensure a viable market demand, by strengthening (i) Punjab National Bank's institutional capacity, and (ii) certain market development elements. SRIP's value addition, inclusive of $330 million from ordinary capital resources and $170 million from Clean Technology Fund, is to facilitate India's transition to a low carbon economy and therefore contribute to the climate change goal of reducing greenhouse gas emissions by 441,700 tons of carbon dioxide equivalent annually, or about 11 million tons of carbon dioxide equivalent over the typical 25-year lifetime of rooftop solar systems.

Impact: Energy security provided to all in an environmentally sustainable manner, and renewable energy developed
Outcome: Solar rooftop capacity in India increased.

Outputs: (i)Debt funding to the solar rooftop sector increased, (ii)PNB institutional capacity improved, and (iii)Solar rooftop market infrastructure and bankable subproject pipeline developed

Implementation Arrangements: Punjab National Bank will be the executing agency.

Project Readiness: The proposed technical assistance, funded by Clean Technology Fund, would be provided to the Government of India to develop the strategic building blocks of the multitranche financing facility. Ministry of New and Renewable Energy and Punjab National Bank would be the executing agencies for the technical assistance. The proposed technical assistance would have three main components: (i) Punjab National Bank's institutional capacity development, (ii) market development, and (iii) awareness campaign, all of which focus on the necessary conditions to develop a viable subproject pipeline and catalyze market demand for funds. Concurrently, Ministry of New and Renewable Energy is preparing an initial list of solar rooftop subprojects to be funded by Punjab National Bank, which is also developing subprojects from its existing industrial and commercial borrowers.

12. Milestones

Modality	Estimated Approval	Estimated Completion[b]
Multitranche financing facility	30 September 2016	31 December 2022
Tranche I	10 October 2016	31 December 2018
Tranche II	30 June 2018	31 December 2020
Tranche III	30 June 2020	31 December 2022

13. Project Data Sheet (PDS)

PDS[c]	http://www.adb.org/projects/49419-001/main

[a] Multitranche Financing Facility (MFF).
[b] For MFF, this refers to the end of the availability period; for tranches, this refers to the tranche closing date.
[c] Safeguard documents can be viewed by clicking the Document's hyperlink in the Project Data Sheet (PDS) page.

CONTENTS

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed multitranche financing facility (MFF) to Punjab National Bank (PNB), to be guaranteed by India, for the Solar Rooftop Investment Program (SRIP). The report also describes the proposed administration of the technical assistance (TA) to be provided by the Clean Technology Fund (CTF) for institutional capacity and market development, and if the Board approves the proposed MFF, I, acting under the authority delegated to me by the Board, approve the TA.[1]

2. The proposed SRIP would (i) establish a solar rooftop financing facility at PNB to provide dedicated debt financing to help the country meet its 40 gigawatts (GW) solar rooftop capacity target by 2022; and (ii) provide associated institutional capacity and market development support, leading to a pipeline of bankable subprojects.

II. THE INVESTMENT PROGRAM

A. Rationale

3. **Road map**. The Government of India (government) plans to expand the country's solar rooftop capacity by 40 GW by 2022. To fuel India's economic growth, its power system will have to expand rapidly over the next decade. This is also to maintain national energy security and expand energy access to all people in India.[2] To ensure environmental sustainability, the government places a high priority on renewable energy development. India's National Action Plan on Climate Change (prepared in 2008) outlines existing and future policies and programs addressing climate mitigation and adaptation. Under the plan, the government launched the Jawaharlal Nehru National Solar Mission (JNNSM) in 2010 to add 20 GW of grid connected solar energy by 2022. On 17 July 2015, the Union Cabinet approved a revised JNNSM proposal to increase the original 20 GW solar energy target to 100 GW by 2022, including 40 GW of rooftop solar energy generation.[3] This government target and the ongoing government sector development initiative establish the road map that is required by the MFF.

4. **Solar rooftop market development.** The basic elements to support development of the solar rooftop market are in place, as reflected by the unbundling of state electricity boards and the presence of open access and competition among transmission and distribution companies. However, the solar rooftop market is at an early stage of development, and there is low market awareness of the latest solar photovoltaic technology and its financial benefits. Local power distribution companies have yet to achieve profitability, due to persistently low electricity tariffs, to become offtakers (purchasers) of rooftop solar power. Commercial banks perceive solar rooftop projects as having a high credit risk due to the sector's limited track record. Banks' capacity to evaluate, price, and monitor solar rooftop projects is also limited. There are primarily two types of solar rooftop models: (i) the standalone, and (ii) aggregated (from multiple

[1] "Rooftop" generally refers to the roofs of immovable building structures. In the case of the roofs of other types of structure, the Asian Development Bank (ADB) would evaluate them on a case-by-case basis by ensuring their compliance with the selection criteria outlined in the facility administration manual and legal agreements to be eligible for ADB financing.

[2] India's current primary energy mix is coal (44%), biomass (24%), oil (23%), natural gas (6%), other renewables (2%), and nuclear (1%). International Energy Agency. 2015. *India Energy Outlook*. Paris.

[3] Government of India. 2015. *Revision of cumulative targets under National Solar Mission from 20,000 MW by 2021–2022 to 100,000 MW.* http://pib.nic.in/newsite/PrintRelease.aspx?relid=122566

properties to achieve greater economies of scale). The two prevailing business models for large industrial or commercial properties are (i) capex, and (ii) opex.[4]

5. **Commercial viability**. Despite the challenges, solar rooftop projects are increasingly achieving commercial (technical and financial) viability and/or grid parity. The photovoltaic technologies are maturing and the cost of manufacturing photovoltaic panels has declined drastically over the past 40 years. In industrial and commercial sectors in India, the levelized cost of electricity has steadily declined, and is now about Rs7–9 per kilowatt-hour (kWh). In some cases (e.g., solar parks), it can even fall below Rs5 per kWh, compared to utility tariffs between Rs6–12 per kWh. The levelized cost of electricity from solar rooftop systems is expected to continue declining, and reach grid parity in an increasing number of states. A feed-in-tariff is also available in some states (e.g., Karnataka, Madhya Pradesh, and Uttar Pradesh, with a range from about Rs5–Rs7 per unit). In the institutional (e.g., government, schools, and hospitals) and residential sectors, where the grid parity may not be achieved immediately, the government provides capital subsidy of 30% of system costs to ensure project commercial viability.[5] Currently, successful solar rooftop projects also rely on the strong balance sheets of profitable industrial and commercial clients for their captive use, without relying on power distribution companies to purchase the electricity.

6. **Demand analysis**. The solar rooftop market potential in India is substantial, with an estimated total capacity potential of 124 GW.[6] The present installed solar rooftop capacity in India is only 221 megawatts (MW), or 0.2% of the potential.[7] Based on a $40–$50 billion cost estimate to develop the 40 GW solar rooftop capacity,[8] the proposed $1 billion SRIP would only contribute 2.0–2.5% of the total solar rooftop target potential. Given strong government support, the solar rooftop market in India is expected to grow rapidly. Based on the existing government mandate to install solar rooftop systems on government buildings and other public sector properties, it is estimated that the rooftop solar system installation potential on public sector buildings alone was 7.2 GW.[9] In addition, the Solar Energy Corporation of India has successfully tendered 500 MW of solar rooftop energy in early 2016, illustrating positive developments in market demand. In terms of other market conditions, solar and net-metering policies have been issued and enacted in numerous states and the government has set renewable energy purchase obligations targets.[10] In June 2015, the Reserve Bank of India identified renewable energy as a priority lending sector to facilitate bank lending to solar rooftop projects.[11]

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[4] Under the capex model, the solar rooftop system is owned by the property owner; under the opex model, the system is owned by the developer. Sector Assessment (Summary): Energy (Renewable Energy Generation—Solar) (accessible from the list of linked documents in Appendix 2).

[5] Ministry of New and Renewable Energy (MNRE). 2014. *Operational Guidelines for Implementation of Off-Grid and Decentralised Solar Applications Subscheme "Off-Grid and Decentralised Solar PV Applications" During 12th Plan Period*. Delhi.

[6] The Energy and Resources Institute. 2014. *Reaching the Sun with Solar Rooftop*. Delhi.

[7] Bridge to India. 2015. *India Solar Handbook*. Delhi.

[8] It is expected that 70% (28 GW) would be solar rooftop projects on large commercial, industrial, and institutional buildings and 30% (12 GW) would be for residential properties.

[9] The estimate is provided by The Energy and Resources Institute (India) in 2016.

[10] MNRE. 2015. *Solar Power Capacity Requirement (FY12-FY22)*. http://mnre.gov.in/file-manager/UserFiles/Solar%20RPO/solar-RPO-requirement-by-2022.pdf

[11] Reserve Bank of India. 2015. *Priority Sector Lending Targets and Classification*. https://rbidocs.rbi.org.in/rdocs/notification/PDFs/PSLGUID0A65BF4E0A884F60999E748C58EA7F88.PDF

7. **Proposed investment program.** As requested by the government, PNB would be the borrower[12] and India would provide a sovereign guarantee to the Asian Development Bank (ADB) for the SRIP. The SRIP intends to primarily finance large solar rooftop systems on industrial and commercial buildings on standalone or aggregated basis.[13] PNB's loans to subborrowers will be priced based on PNB's cost of funds and subproject-specific risks. The proposed accompanying TA for $5 million is critical to integrate the building blocks of the government's sector development initiative to promote market demand, by strengthening (i) PNB's institutional capacity, and (ii) market infrastructure. SRIP's value addition is to facilitate India's transition to a low carbon economy and therefore contribute to the climate change goal of reducing greenhouse gas emissions by 441,700 tons of carbon dioxide equivalent annually, or about 11 million tons of carbon dioxide equivalent over the typical 25-year lifetime of rooftop solar systems.

8. **The proposed financial intermediary**. PNB has total assets of Rs6.3 trillion ($95.6 billion), making it India's fifth-largest bank in terms of total assets. PNB is a systemically important financial institution. It was established in 1895 and nationalized in 1969. As of 31 March 2016, the government held a direct 62.1% stake in the bank. PNB has a nationwide network of 6,760 branches and is able to finance solar rooftop subprojects throughout India. In 2016, major credit rating agencies in India gave PNB an investment grade rating on par with the sovereign. PNB has a strong energy sector team. However, it would require support to develop its specific solar rooftop credit risk assessment skills to facilitate subloan selection, credit review, pricing, and approval.

9. **Multitranche financing facility**. The government requested large financing packages from ADB, New Development Bank, and the World Bank[14] to catalyze greater commercial finance and support solar rooftop sector development. However, the solar rooftop market is still evolving and would require a series of support measures from 2016–2022 to achieve the stated 40 GW target. A financial intermediation MFF represents a commitment to the government on an appropriate funding and TA support, while ensuring flexibility to accommodate the varying funding needs for (i) more generally, the solar rooftop sector development process (e.g., from initial early market development stage to subsequent rapid deployment stage); and (ii) more specifically, the support to PNB's dedicated onlending requirements. There will be no differences in the nature of solar rooftop projects financed across tranches. Compared to a standalone project, an MFF is a more suitable funding modality to support integrated market development in the solar rooftop sector in India. The benefits of an MFF modality are demonstrated by ADB's successful implementation of a number of recent MFF financial intermediation loans in India including in the renewable energy space.[15]

10. **Strategic context.** The SRIP contributes significantly to the ADB objective of doubling annual climate financing from the current level of $3 billion to $6 billion by 2020, of which $4 billion would be dedicated to mitigation, including through increased support for renewable

[12] Punjab National Bank was selected by the Ministry of Finance to be the sole direct participating financial institution under the proposed investment program (para. 13).
[13] SRIP may consider supporting smaller residential solar rooftop financing when that market further matures.
[14] The World Bank's Grid-Connected Rooftop Solar Program of $625 million was approved on 13 May 2016.
[15] This includes: (i) India Infrastructure Finance Company: ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to India for Accelerating Infrastructure Investment Program*. Manila (MFF 0077-IND for $700 million approved on 27 September), and (ii) Indian Renewable Energy Development Agency: ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to India for Clean Energy Finance Investment Program*. Manila (MFF 0087-IND for $500 million approved on 30 October).

energy. The entire $500 million MFF is considered as climate financing. The investment program is consistent with the ADB Energy Policy (2009) by (i) promoting energy efficiency and renewable energy; (ii) maximizing access to energy for all; and (iii) promoting energy sector reform, capacity building, and governance.[16] The investment program is also consistent with (i) the ADB Financial Sector Operational Plan, which recognizes financial intermediation as an important instrument for on-lending including for infrastructure; and (ii) ADB's country partnership strategy for India, 2013–2017, which includes an energy sector road map to expand clean and renewable energy capacity and financial sector development to catalyze infrastructure investments, including through credit lines.[17] Finally, the SRIP supports India's Intended Nationally Determined Contribution, which includes targets to lower the emissions intensity of India's gross domestic product by 33% below 2005 levels (to 35% by 2030), and to increase the share of nonfossil-based power generation capacity to 40% of installed electric power capacity by 2030.

B. Impacts and Outcome

11. The impacts of the program would be energy security provided to all in an environmentally sustainable manner and renewable energy developed, aligned with the government's Integrated Energy Policy.[18] The outcome would be increased solar rooftop capacity in India.

C. Outputs

12. The MFF and tranche 1 outputs would be (i) debt funding to the solar rooftop sector increased, (ii) PNB institutional capacity improved, and (iii) solar rooftop market infrastructure and bankable subproject pipeline developed.

D. Investment and Financing Plans

13. The government program has a target of 40 GW of solar rooftop capacity with estimated costs of $40 billion (Table 1). ADB's investment program will contribute $1 billion (Table 2) comprised of $330 million loans from ordinary capital resources (OCR), $170 million loans from CTF,[19] equity of $300 million from developers, and commercial debt financing of $200 million. PNB has requested ADB financing through this MFF consisting of three tranches (tranche 1 loan of $100 million from 2016–2018, tranche 2 loan of $150 million from 2018–2020, and tranche 3 loan of $250 million from 2020–2022), subject to PNB's submission of related periodic financing requests, execution of the related loan agreement and guarantee agreement with India for each tranche, and fulfillment of terms and conditions and undertakings set forth in the framework financing agreement. The first tranche of the MFF will be a loan in the amount of $100 million to be financed entirely by CTF and administered by ADB. The CTF loan has a maturity of 40 years with a 10-year grace period. Principal repayments would be 2% for years 11–20 and 4% for years 21–40. CTF's multilateral development bank fee is 0.18% and annual service charge is 0.25%.

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[16] ADB. 2009. *Energy Policy*. Manila.
[17] ADB. 2013. *Country Partnership Strategy: India, 2013–2017*. Manila.
[18] Government of India, Planning Commission. 2006. *Integrated Energy Policy*. Delhi.
[19] The Clean Technology Fund (CTF) is a $5.2 billion fund providing middle-income countries with resources to scale up demonstration, deployment, and transfer of low-carbon clean technologies. CTF financing approvals for the investment program were received on 17 May 2016.

Table 1: Government's Financing Plan for the Solar Rooftop Program (2015–2022)[a]

Source	Amount ($ million)	Share of Total (%)
Asian Development Bank Loans [b]	500	1.25
Other multilateral development bank foreign borrowing [c]	875	2.19
Government contribution [d]	750	1.88
Equity (assuming 30% of total)	12,000	30.00
Remaining debt financing	25,875	64.68
Total	**40,000**	**100.00**

[a] The projections made in the table above, with respect to the borrowers' equity and remaining debt financing, are estimates based on the government's 40 gigawatts solar rooftop investment target.
[b] Which comprises of $330 million loans from OCR and $170 million loans from CTF.
[c] Including $625 million from the World Bank to State Bank of India and proposed $250 million from New Development Bank to Canara Bank.
[d] Government allocated Rs50 billion (roughly $750 million) for 30% capital subsidy.
Source: Asian Development Bank estimates.

Table 2: Financing Plan for ADB's Investment Program

Source	Amount ($ million)	Share of Total (%)	Tranche 1 ($ million)	Tranche 2 ($ million)	Tranche 3 ($ million)
Asian Development Bank Loans					
Ordinary Capital Resources	330.0	33.0	0.0	80.0	250.0
Cofinancing by Clean Technology Fund (loans)	170.0	17.0	100.0	70.0	0.0
Equity (assuming 30% of subtotal)	300.0	30.0	60.0	90.0	150.0
Commercial Banks and Financiers (debt)[a]	200.0	20.0	40.0	60.0	100.0
Subtotal	1,000.0	100.0	200.0	300.0	500.0
Technical Assistance (TA)					
Clean Technology Fund (TA grant)	5.0	NA	2.0	2.0	1.0
Total	**1,005.0**	**100.0**	**202.0**	**302.0**	**501.0**

NA = not applicable, OCR = ordinary capital resources.
[a] Any financial sources other than subproject equity and Asian Development Bank funds. The purpose is to leverage financing from the market.
Source: Asian Development Bank estimates.

E. Implementation Arrangements

14. PNB would be the executing agency. PNB would establish a designated solar rooftop unit during implementation, associated counterpart resources, and dedicated internal capacity to implement the SRIP. The facility administration manual (FAM) would provide the detailed implementation arrangements and compliance requirements.[21]

15. **Retroactive financing**. Retroactive financing would be allowed for eligible expenditures described in the FAM, not exceeding 20% under each tranche, incurred before loan effectiveness, but not earlier than 12 months before the signing of the loan agreement. Any retroactive financing would comply with the same ADB requirements as applied to any other subprojects funded under the SRIP.

16. **Takeout financing**. PNB may also use up to 20% of the ADB funds to buy out qualified solar rooftop loans from other financial institutions under each tranche in order to better consolidate sector assets. Takeout finance may include subprojects that are financially closed or under construction. Any takeout financing would follow prevailing national norms, and comply with the same ADB requirements as applied to any other subprojects funded under the SRIP.

[21] Facility Administration Manual (accessible from the list of linked documents in Appendix 2).

17. **Maximum ADB financing**. ADB funds can be used to finance up to 50% of the total subproject cost. There is no maximum subproject size.

18. **Procurement from nonmember countries of ADB**. Although the MFF will be jointly financed by ADB and CTF, the individual tranche under the MFF may be financed solely by either CTF or ADB. In view of the multisource financing, a waiver[22] of ADB's member country procurement eligibility for the loans is sought to allow for procurement from nonmember countries of ADB[23] under the MFF.

19. **Statement of expenditure and/or free limit**. Under tranche 1, ADB would review at least the first three subprojects approved by PNB under both the imprest and reimbursement arrangements, regardless of the subproject size, until ADB is satisfied with PNB's ability to manage the subproject review and disbursement process. Following ADB's satisfactory review of a representative sample of subprojects, ADB may permit a $1 million statement of expenditure limit per subloan, under which amount no supporting documentation would be required, except basic subproject information for the purpose of ADB disbursement (footnote 20). For any subloan exceeding $1 million, ADB approval would be required. ADB reserves the right to request any supporting subproject documents and to not reimburse or liquidate any subprojects that do not comply with the SRIP implementation requirements.

20. **Eligibility criteria**. ADB funds shall be used to finance all types of solar rooftop subprojects that are financially sound and comply with the subproject eligibility criteria set forth in the framework financing agreement and approval procedures as outlined in the FAM.

21. The implementation arrangements are summarized in Table 3 and described in detail in the FAM.

Table 3: Implementation Arrangements

Aspects	Arrangements
Implementation period	December 2016–December 2022 (MFF); December 2016–December 2018 (Tranche 1); December 2018–December 2020 (Tranche 2); and December 2020–December 2022 (Tranche 3)
Loan closing date	30 June 2023 (MFF); 30 June 2019 (Tranche 1); 30 June 2021 (Tranche 2); and 30 June 2023 (Tranche 3)
Management	
(i) Oversight body	Board of Directors, PNB
(ii) Executing agency	PNB
(iii) Key implementing agency	PNB
(iv) Implementation unit	New Delhi, number of staff deemed appropriate to PNB and ADB
Procurement	In accordance with ADB's Procurement Guidelines (2015, as amended from time to time) as applicable to financial intermediation loans
Consulting services	In accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time)
Retroactive financing	Permitted up to 20% of each tranche and total SRIP amount.
Disbursement	The loan proceeds would be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2015, as amended from time to time) and detailed arrangements agreed upon between PNB and ADB.

ADB = Asian Development Bank, PNB = Punjab National Bank, SRIP = Solar Rooftop Investment Program.
Source: Asian Development Bank.

[22] This would permit procurement of goods, works, and consultant services from nonmember countries of ADB. The Board of Directors must approve the waiver by a vote representing not less than two-thirds of the total voting power of the members of the Board.

[23] On 18 March 2013, the Board approved a blanket waiver of member country procurement eligibility restrictions in certain cases of cofinanced ADF operations.

III. TECHNICAL ASSISTANCE

22. A proposed $5 million TA grant, funded by CTF,[24] would be provided to the government to develop the strategic building blocks of the MFF, from 2017–2022. MNRE and PNB would be the executing agencies for the TA. The proposed TA would have three main components: (i) PNB institutional capacity development, (ii) market development, and (iii) awareness campaign, all of which focus on the necessary conditions to develop a viable subproject pipeline and catalyze market demand for funds. While ADB will administer the proposed TA, the training component will be delegated to and implemented by MNRE and PNB. The amount for the delegated TA component is estimated at $2.5 million. MNRE, PNB, and/or associated (MNRE) partner training institutions and (PNB) regional training centers would have the fiduciary responsibility for implementing the training programs in accordance with the ADB Guidelines on the Use of Consultants (2013, as amended from time to time) and ADB Procurement Guidelines (2015, as amended from time to time), and those pertaining to financial management and monitoring and review. Institutional capacity assessments have been conducted on MNRE, PNB, and selected training institutions and regional training centers, and are satisfactory.[25] With the engagement of an ADB procurement consultant to support the TA implementation, MNRE and PNB would have the required capacities to ensure compliance of the delegated TA component with the ADB procurement guidelines. An agreement will be signed between ADB and MNRE and PNB respectively on the arrangements of this delegated training component.[26] ADB will regularly monitor and review the delegated TA components.

IV. DUE DILIGENCE

23. ADB's due diligence consists of detailed institutional, financial, economic, technical, market, and related capacity assessments to ensure PNB's ability to successfully implement SRIP and comply with the associated requirements. ADB conducted comprehensive institutional capacity reviews on PNB, including credit procedures, risk management, technical capacities, and compliances, among others. ADB has also conducted integrity due diligence. Project safeguards due diligence included site visits, and interactions with the project promoters, property owners, and the communities to ensure minimal safeguard risk. It is determined that PNB's internal approval procedures are sufficient to minimize potential implementation risks to ensure subproject compliance with ADB requirements. PNB has a strong project finance team and an extensive branch network to reach out to developers and solar rooftop owners.

A. Technical

24. The technical viability of solar rooftop systems has been well established throughout the world over the past 20 years. However, there are still technical issues in India. For example, because of constant load shedding, inverters must be capable of disconnecting from the grid in case of grid failure, while still being able to operate and provide solar energy for captive use. The overall technical risk is inherent to the state of market development in India. In addition, ADB assessed PNB's ability to appraise the technical viability of renewable energy subprojects and found its technical assessment process to be adequate. PNB has limited subproject

[24] For the CTF grant of $5 million, there is a multilateral development bank fee of 5% or $250,000. Clean Technology Fund Implementation Guidelines (accessible from the list of linked documents in Appendix 2).

[25] The institutional capacity assessments will continue into the TA implementation phase for any remaining PNB training centers and MNRE partner institutions whose capacities have not been assessed, when engaged for the first time.

[26] Attached Technical Assistance (accessible from the list of linked documents in Appendix 2).

financing experience, and its solar rooftop technical and financial review capacity will need to be strengthened, as proposed under the TA.

B. Economic and Financial

25. The viability of PNB as a financial intermediary for the proposed solar rooftop business model is an indicator of the viability of the overall project. According to ADB guidelines,[27] the most important criteria for determining the appropriateness of a financial intermediary's performance are capital adequacy, asset quality, management quality, earnings, liquidity, and sensitivity to market risk. In summary, the financial indicators are generally satisfactory during FY2010–FY2015, despite a decline in profitability and rise in nonperforming assets from 2015 to 2016, as manifested in the entire Indian banking sector during the same period as a result of the reform measures. Economic and financial internal rates of return on a set of sample subprojects are provided for illustrative purposes under both capex and opex models. Economic benefits are non-incremental. Non-incremental benefits include avoided costs and environmental benefits from rooftop solar systems' replacement of backup diesel generators and conventional grid power. Additional non-incremental benefits are savings from power distribution companies' technical losses. [28]

C. Governance

26. **Financial management.** PNB has the financial management capability to administer the MFF. PNB's board of directors oversees all operations. PNB has adequate capacity for budgeting, accounting, finance, assets and liabilities management, internal controls, and reporting functions. PNB is subject to the Reserve Bank of India's prudential regulations for commercial banks in India, and its capital adequacy ratio of 12.2% as of FY2015 is above the regulatory requirement of 12.0%. The financial management control risk is moderate.

27. **Procurement and disbursement.** All procurement to be financed under the MFF would be carried out in accordance with ADB's Procurement Guidelines (2015, as amended from time to time), following stated eligibility criteria. ADB encourages PNB to require its subborrowers to adopt internationally competitive bidding procedures to the extent possible when the amount of the investment is unusually large and economy and efficiency can be gained through such procedures. For procurement of goods and services to be financed by subloans from the ADB loan, PNB would ensure that prices are reasonable and that relevant factors—e.g., time of delivery, efficiency, reliability, suitability for the subproject, and (for consulting services) quality and competence—are taken into account. Solar panels procured under the India domestic content requirement would not be eligible for financing under the SRIP. ADB loan proceeds would be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2015, as amended from time to time). ADB may provide PNB with United States dollars as the currency of payment.

28. **Anticorruption policy**. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and PNB. The specific policy requirements and supplementary measures are described in the FAM (footnote 20).

[27] ADB. 2005. *Financial Management and Analysis of Projects*. Manila (Section 6.4. Assessing FI Performance). http://www.adb.org/sites/default/files/institutional-document/31339/financial-governance-management.pdf

[28] The financial analyses are in Financial and Economic Analysis (accessible from the list of linked documents in Appendix 2).

D. Poverty and Social

29. The benefits of rooftop solar energy capacity additions include localized improvement of livelihoods and job creation at the subproject sites. The design of the SRIP incorporates some gender elements. ADB would also encourage PNB and the subproject developers to promote gender inclusiveness by (i) increasing the recruitment of women in the construction, operation, and maintenance of systems; and (ii) applying a gender-equal human resources management through the effective application of gender equity laws and regulations. There will be regular reporting regarding the implementation and progress of these measures. The poverty reduction impact of renewable energy projects can be both direct and indirect. The direct impact is through additional power generation which supports economic activities and improves the livelihoods of individuals, such as through the provision of lighting, refrigeration, and other household amenities. The investment also creates economic benefits for other business sectors, service providers, and related industries. Indirectly, rooftop solar energy projects minimize the negative environmental impacts associated with conventional power generation and improve general public health conditions.

E. Safeguards

30. The safeguard categories for environment, involuntary resettlement, and indigenous peoples are all "FI" treated as "C." The solar rooftop systems do not require land, and have no impact on involuntary resettlement and indigenous people. The nature of the solar rooftop systems will improve the environmental conditions in India and mitigate negative impact of global climate change. The environmental and social impacts associated with the implementation of solar rooftop projects, either commercial-scale or residential-scale, is negligible. Therefore, an environment and social safeguard management system is not required, and an environmental assessment review framework will not be prepared. ADB will monitor program implementation to ensure that subprojects financed by the facility do not have negative environmental, involuntary resettlement, and indigenous peoples impacts; and that corrective actions are taken if unforeseen issues arise.

F. Risks and Mitigating Measures

31. The key project risk is the largely supply-driven (e.g., funding) nature of the government's solar rooftop program in a market that has yet to realize its full commercial potential. In line with the incipient nature of the new lending business line, the proposed MFF would help develop building blocks under the first tranche and associated TA, with important sector supports to be followed by subsequent tranche(s) that focus on supplying funding. The major risk and its mitigating measures are summarized in Table 4. The integrated program risks are expected to outweigh the integrated program costs. Other risks are described in detail in the risk assessment and risk management plan.[29]

Table 4: Summary of Risks and Mitigating Measures

Risk	Mitigating Measures
Untested solar rooftop market	(i) Central and/or state level mandates to install solar rooftop systems in new and existing public sector buildings; (ii) government's market development measures (e.g., net metering); (iii) government's financial commitment (e.g., 30% subsidy to certain sectors); (iv) MNRE and/or SECI present tender of large pipeline projects; (v) active donor support

[29] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Risk	Mitigating Measures
demand	(e.g., ADB, German development cooperation through KfW, the World Bank); (vi) positive feedback from the market and project developers; and (vii) ADB TA to enhance capacity.

ADB = Asian Development Bank, MNRE = Ministry of New and Renewable Energy, PNB = Punjab National Bank, SECI = Solar Energy Corporation of India Limited, TA = technical assistance.
Source: Asian Development Bank.

V. ASSURANCES AND CONDITIONS

32. The government and PNB have assured ADB that the implementation of the SRIP shall conform to all applicable ADB policies including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the FAM and loan documents.

33. The government and PNB have given ADB certain undertakings for the MFF, which are set forth in the framework financing agreement. Specific covenants agreed to by the government and PNB with respect to individual tranches under the MFF are set forth in the loan agreement for the respective tranches.

34. Prior to tranche 1 disbursement, the following conditions would be met: (i) PNB establishes a specific solar rooftop unit at its head office and in a select number of its branches with appropriate staff capacity for solar rooftop project origination, development, financial review, approval, and monitoring; (ii) PNB establishes a robust credit risk rating model satisfactory to ADB; (iii) the government provides mandate to certain government entities and public institutions to install solar rooftop systems on their rooftop properties to ensure an initial pipeline of subprojects; and (iv) MNRE provides PNB with an initial list of bankable subprojects from its channel partners.

VI. RECOMMENDATION

35. I am satisfied that the proposed multitranche financing facility would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

(i) the multitranche financing facility to Punjab National Bank, to be guaranteed by India, for the Solar Rooftop Investment Program in an aggregate principal amount not exceeding the equivalent of $500,000,000, which comprises:
   (a) the provision of loans from ADB's ordinary capital resources, with interest and other terms to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; and
   (b) the administration of loan cofinancing to be provided by the Clean Technology Fund;

   and is subject to such other terms and conditions as are substantially in accordance with those set forth in the framework financing agreement presented to the Board; and

(ii) the proposal in para. 18 of this report to permit procurement in nonmember countries of ADB of goods, works, and consultant services produced in nonmember countries of ADB.

Takehiko Nakao
President

9 September 2016

DESIGN AND MONITORING FRAMEWORK FOR THE INVESTMENT PROGRAM

Impact the Program is Aligned with
Energy security provided to all in an environmentally sustainable manner, and renewable energy developed (Integrated Energy Policy)[a]

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
Outcome Solar rooftop capacity in India increased.	By 2023 a. 400 MW of solar rooftop power-generating capacity is funded by PNB (2016 baseline: 0).[b] b. An average of additional 441,700 tons of carbon dioxide emission reduced annually from this program (2016 baseline: 0). c. ADB program to catalyze $300 million project equity and $200 million debt financing leveraged by PNB (2016 baseline: $0 project equity and $0 debt).	a–c. MNRE and relevant Government reports.	Protracted economic slowdown in the international and domestic markets to reduce government fiscal capacity to support the sector development. Change of government and solar rooftop policy.
Outputs 1. Debt funding to the solar rooftop sector increased.	At least 500 solar rooftop subprojects approved for financing by 2022 (2016 baseline: 0).	PNB's own program review reports.	Untested solar rooftop market demand. Slow market reaction to government market development efforts and incentives, e.g., feed-in-tariff, renewable energy purchase obligation, and/or direct subsidies.
2. PNB institutional capacity improved.	2a. A designated solar rooftop unit at PNB headquarters and selected branches to screen, review, price, and monitor subprojects established by September 2016 (2016 baseline: not applicable). 2b. Annual ADB program disbursement targets (to be determined during implementation) met from 2016 to 2022 (2016 baseline: not applicable). 2c. ADB program compliance requirements met from 2016 to 2022 (2016 baseline: not	2a–2c. PNB annual reports and ADB review reports.	PNB's declining financial position to implement the ADB program.

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
	applicable).		
3. Solar rooftop market infrastructure and bankable subproject pipeline developed.	3a. Subproject pipeline of 50 MW developed by MNRE channel partners (developers) for PNB financing by 2017 (2016 baseline: 0 MW of subprojects). 3b. Capacity development program at power distribution companies, SNA, CERC, and CEA levels completed by 2021 (2016 baseline: 0). 3c. Extensive marketing and awareness campaign program targeting industrial and commercial sectors, including businesses and properties owned and managed by women, if any, implemented by 2022 (2016 baseline: 0) 3d. Solar rooftop web portal to promote the PNB financing facility developed by 2017.	3a–3d. Government of India (e.g., MOP and/or MNRE) notifications, gazettes, and reports. 3d. Market and sector research and reports.	Inadequate sector-level (power distribution companies, SNA, CERC, and CEA) ownership and commitment to reform and development. Continued power distribution companies' financial position and associated offtaker risk.

Key Activities and Milestones

1. Debt funding to the solar rooftop sector increased.
(Tranche 1 for $100 million available by December 2016, tranche 2 for $150 million available by December 2018, and tranche 3 for $250 million available by December 2020)

1.1 Approve at least 500 solar rooftop subprojects for financing, by 2022.

2. PNB institutional capacity improved.

2.1 Establish a designated solar rooftop unit at PNB headquarters and selected branches to screen, review, price and monitor subprojects, by September 2016.

2.2 Meet annual ADB program disbursement targets (to be determined during implementation) from 2016 to 2022 (2016 baseline: not applicable).

2.3 Meet ADB program compliance requirements from 2016 to 2022.

3. Solar rooftop market infrastructure and bankable subproject pipeline developed.

3.1 MNRE channel partners develop a subproject pipeline of 50 MW for PNB financing by 2017.

3.2 Complete capacity development program at power distribution companies, SNA, CERC, and CEA levels by 2021 (2016 baseline: 0).

3.3 Implement extensive marketing and awareness campaign program targeting industrial and commercial sectors, including businesses and properties owned and managed by women, if any, by 2022 (2016 baseline: 0).

3.4 Develop solar rooftop web portal to promote the PNB financing facility, by 2017.

Inputs	
Loan	
ADB OCR:	$330 million
CTF:	$170 million
Commercial banks and/or financiers:	$200 million (estimated)
Equity	
Subproject Equity:	$300 million (estimated)
Grant	
CTF:	$5 million
Assumptions for Partner Financing	
Outputs not administered by ADB that are necessary to reach the outcome include: USAID train PNB solar rooftop unit staff on solar rooftop-specific financial credit and/or risk model.[c]	

ADB = Asian Development Bank, CEA = Central Electricity Authority, CERC = Central Electricity Regulatory Commission, CTF = Clean Technology Fund, FAM = facility administration manual, GW = gigawatt, MNRE = Ministry of New and Renewable Energy, MOP = Ministry of Power, MW = megawatt, OCR = ordinary capital resources, PNB = Punjab National Bank, SNA = state nodal agency, TA = technical assistance, USAID = United States Agency for International Development.

[a] Government of India, Planning Commission. 2006. *Integrated Energy Policy*. Delhi.

[b] 400 MW of solar rooftop energy is estimated to be generated solely from $500 million ADB financing, without the additional $300 million subproject equity or the $200 million debt financing from other commercial sources.

[c] USAID has developed a solar rooftop-specific financial credit and/or risk model to assist lending institutions in India assess, appraise, and price the solar rooftop lending projects. USAID would administer its funds to provide the relevant capacity to PNB to support the ADB program.

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=49419-001-3

1. Loan Agreement
2. Guarantee Agreement
3. Framework Financing Agreement
4. Periodic Financing Request for Project 1
5. Sector Assessment (Summary): Energy (Renewable Energy Generation–Solar)
6. Facility Administration Manual
7. Contribution to the ADB Results Framework
8. Development Coordination
9. Attached Technical Assistance
10. Financial and Economic Analysis
11. Country Economic Indicators
12. Summary Poverty Reduction and Social Strategy
13. Risk Assessment and Risk Management Plan

Supplementary Documents

14. Comparison of Financing Modalities
15. Financial Management Assessment
16. Clean Technology Fund Implementation Guidelines