Draft Report and Recommendation of the President to the Board of Directors

India
Project Number: 45224-001
June 2013

Proposed Multi-tranche Financing Facility and Technical Assistance Grant and Administration of Loan

India: Rajasthan Renewable Energy Transmission Investment Program

Asian Development Bank

DRAFT FOR CTF SUBMISSION

CURRENCY EQUIVALENTS

(as of 15 March 2013)

Currency unit	–	Indian rupee/s (Re/Rs)
Re 1.00	=	$ 0.019
$1.00	=	Rs 53

ABBREVIATIONS

ADB	–	Asian Development Bank
ASEI	–	Asia Solar Energy Initiative
EMF	–	environmental management framework
GOR	–	Government of Rajasthan
JNNSM	–	Jawaharlal Nehru National Solar Mission
RERC	–	Rajasthan Electricity Regulatory Commission
RREC	–	Rajasthan Renewable Energy Corporation
RRVPNL	–	Rajasthan Vidyut Prasaran Nigam Limited
TA	–	technical assistance

WEIGHTS AND MEASURES

km	–	kilometer
kV	–	kilovolt
kWh	–	kilowatt-hour
MVA	–	megavolt-ampere
MW	–	Megawatt

NOTE

(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., FY2013 ends on 31 March 2013.

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

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PROJECT AT A GLANCE

1. Project Name: Rajasthan Renewable Energy Transmission Investment Program **2. Project Number:** 45224-001

3. Country: India **4. Department/Division:** South Asia Department/Energy Division

5. Sector Classification:

Sectors	Primary	Subsectors
Energy	√	Renewable energy, electricity transmission and distribution

6. Thematic Classification:

Themes	Primary	Subthemes
Economic growth		Widening access to markets and economic opportunities
Environmental sustainability		Natural resources conservation
Private sector development	√	Policy reform, public private partnerships

6a. Climate Change Impact

Adaptation	Low
Mitigation	High

6b. Gender Mainstreaming

Effective gender mainstreaming (EGM)	√ (Tranche 1)
Gender equity theme (GEN)	
No gender elements (NGE)	
Some gender benefits (SGB)	

7. Targeting Classification:

General Intervention	Targeted Intervention		
	Geographic dimensions of inclusive growth	Millennium development goals	Income poverty at household level
√			

8. Location Impact:

National	High
Rural	Low
Urban	Low

9. Project Risk Categorization: Complex

10. Safeguards Categorization:

Environment	B(Tranche1)
Involuntary resettlement	B(Tranche 1)
Indigenous peoples	C(Tranche 1)

11. ADB Financing:

Sovereign/Nonsovereign	Modality	Source	Amount ($ million)
Sovereign	MFF (Loan)	Ordinary capital resources	300.0
Total			**300.0**

12. Cofinancing:

Sovereign/Nonsovereign	Modality	Source	Amount ($ million)
Sovereign	MFF (Loan)	ADB Clean Technology Fund	198.0
Sovereign	MFF (Grant)	ADB Clean Technology Fund	2.0
Total			**200.0**

13. Counterpart Financing:

Source	Amount ($ million)
Government of Rajasthan	300.0
Total	**300.0**

14. Aid Effectiveness:

Parallel project implementation unit	No
Program-based approach	Yes

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation for (i) a proposed multi-tranche financing facility (MFF) and (ii) proposed administration of a loan to be provided by ADB Clean Technology Fund (CTF)[1], both to the Government of India (the Government) for the Rajasthan Renewable Energy Transmission Investment Program (the Program).[2] The report also describes proposed technical assistance (TA) for the Rajasthan Renewable Energy Capacity Development and Implementation Support, and if the Board approves the proposed MFF, I, acting under the authority delegated to me by the Board, will approve the TA.

2. Rajasthan completed the installation of about 1767 MW of wind and 45 MW of solar generation at the end of 2011 using surplus transmission capacity in the grid. The state's investment plan for renewable energy targets installation of about 8,000 MW of solar and wind projects by 2018.[3] These include private solar and wind power projects to be set up primarily in the renewable energy rich resource areas of Western Rajasthan (in Jodhpur, Bikaner, Barmer and Jaisalmer) including in the solar park being developed in Bhadla by the Rajasthan Renewable Energy Corporation. The Program would support transmission facilities for evacuation of renewable energy to the state and national grid.[4]

II. THE PROGRAM

A. Rationale

3. **Background.** India has an annual electricity deficit of 8% and nearly 350 million people without access to electricity. The country is heavily dependent on fossil fuel imports (coal, gas, oil) to meet its electricity requirements.[5] The Government in its Integrated Energy Policy (IEP) 2006 estimated that the country would need to increase its electricity generation by at least 5 times, and change the sources mix, to meet the increase in demand expected by 2032. India's tropical position bestows it with solar irradiation ranging from 4-7 kWh/square meter/day across the country and certain regions, particularly the western region (including Rajasthan), have even higher solar incidence. Given this background, India has decided to invest in renewable energy (RE).

4. **Policy Framework.** The federal and state governments have sound policy frameworks and strategies for RE. The IEP sees the RE sector as a means to not only increase energy security, but also to generate more clean energy and capacity to meet the fast rising electricity demand. The National Action Plan for Climate Change (NAPCC) of 2008 places solar energy as an important part of the strategy. In 2010, the Government launched a special program called the Jawaharlal Nehru National Solar Mission (JNNSM), the aim of which is to create an enabling framework for the deployment of 20,000 MW of solar power across India by 2022. Rajasthan has followed suit with its own framework by adopting a Solar Policy in 2011 and Wind Policy in 2012. These policies emphasize private and public sector investments including partnerships to streamline the development timeline, reduce development costs, and address some of the

[1] Under the Climate Investment Fund. India's CTF Investment Plan was endorsed in Nov. 2011 by CTF Trust Fund Committee. http://www.climateinvestmentfunds.org/cifnet/country-program-info/indias-ctf-programming

[2] The design and monitoring framework is in Appendix 1.

[3] This capacity is expected to be developed by the private sector to supply to utilities and obligated entities within and outside Rajasthan. This includes solar projects awarded under the Jawaharlal Nehru National Solar Mission.

[4] The Asian Development Bank (ADB) provided project preparatory technical assistance. ADB. 2011. *Technical Assistance to the Government of India for Preparing the Rajasthan Renewable Energy Program,* Manila.

[5] Coal imports for electricity sector are presently 15-20% at national level.

replication and scale-up issues faced by stand-alone project approaches. The Rajasthan Electricity Regulatory Commission (RERC) has set renewable procurement obligations for the utilities in the state[6] and is regulating the working of the electricity transmission and distribution companies.

5. **Roadmap.** At the national level, the Ministry of New and Renewable Energy has targeted additional installations of nearly 30,000 MW of wind power and 10,000 MW of solar power over a five year period from 2012 of which 5,700 MW is expected in Rajasthan. Nearly 1,100 MW of solar power is expected to be commissioned by the end of 2013 under Phase 1 of the JNNSM[7]. Up to 9,000 MW will be setup under Phase 2 of the JNNSM. In the case of Rajasthan, the state's renewable energy investment program for a green grid includes solar and wind power generation in parks, transmission, smart grid, associated infrastructure and community schemes. The park model is a departure from the traditional model of renewable energy project development and represents a plan to achieve greater economies of scale. The solar park model in Rajasthan is expected to accelerate generation investment by developing enabling infrastructure through the public sector including transmission, construction power, roads, site development and security while also facilitating permits including land allocation for the development of private sector owned generation projects that would be financed by banks such as the Indian Renewable Energy Development Agency (IREDA) and others. The Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL), the state transmission licensee, is mandated to evacuate the renewable energy produced in the solar and wind parks. The solar park will also host concentrated solar power (CSP) projects including those led by the Solar Energy Corporation of India Limited (SECI). The overall investment plan for RE development in the state is provided in Table 1 and amounts to over $11 billion over 2012-2018 of which about $9.5 billion would be for generation while over $1.6 billion would be for investments in inter-state transmission, intra-state transmission and last mile connectivity to be financed from various sources including the proposed investment program[8] About $50 million would be the investment in the first 2 phases of the Bhadla solar park.

Table 1: Rajasthan renewable energy investment plan

Investment Plan (Billion $)	2012 to 2018
Renewable energy generation	9.5
Regional transmission infrastructure	0.6
State transmission infrastructure	0.8
Other related infrastructure	0.3
TOTAL	**11.2**

Tentative Financing Plan (Billion $)	2012 to 2018
Private renewable energy sponsors	2.9
Renewable energy lenders	6.8
Inter-state transmission utility (Debt. Equity,Internal)	0.6
RRETIP (MFF)	0.8
Other Government Support	0.1
TOTAL	**11.2**

Source: Estimates based on Ministry of New and Renewable Energy Report, 2012 and ADB staff estimates.

6. The policy framework, roadmap and the investment program for renewable energy in the country and the state of Rajasthan are fully consistent with ADB's strategy for the energy sector and the draft Country Partnership Strategy (2013-2018). The development of renewable energy is also one of the priorities under the new Country Partnership Strategy being prepared.

[6] The utilities in Rajasthan are mandated to procure 5.7% of their overall power requirement from wind and 1.0% from solar power projects in 2013-2014.

[7] Over 800 MW of the 1100 MW under the Phase 1 of the JNNSM is expected to come up in Rajasthan.

[8] Staff estimates based on the Ministry of New and Renewable Energy Report that plans for a transmission system to support evacuation of 2000 MW of wind, 3700 MW of solar expected to be set up in Rajasthan over this period.

7. **MFF.** In May 2010, ADB announced the Asia Solar Energy Initiative (ASEI), the aim of which is to catalyze 3,000 MW of solar projects from 2010 to 2013 through innovative public-private partnerships. ADB's public and private sector departments have been active in this strategic space for some time. The private sector team has financed stand-alone solar power projects across India including Rajasthan.[9] The public sector side has supported mainly transmission facilities including for solar parks in the recent past in Gujarat. The pipeline of projects for the future is strong and growing.

8. India and Rajasthan have requested ADB to support development of RE projects in Rajasthan (including the solar parks) and finance through a multi-tranche financing facility (MFF) to set up transmission and smart grid infrastructure. The preconditions for the use of the MFF modality are all in place (roadmap and strategy, policy framework, investment and financing plans and reliable safeguard arrangements). The MFF is the most suitable modality for a long term partnership given the phased nature of generation investments and is possibly the best to provide continuity when trying to combine physical and nonphysical investments. It also allows Rajasthan and ADB teams to spend more time on implementation work.

B. Impact and Outcome

9. The Investment Program will expand the development of renewable energy sources in Rajasthan and contribute to national energy security. The outcome would be a cleaner energy mix and more efficient and effective generation and transmission system in Rajasthan over time.

10. Physical outputs under the Program include the construction of three grid substations (400/220/132 kilo Volt [kV]) and associated facilities at Bhadla, Ramgarh and Jaisalmer; the construction of associated automation and control infrastructure, the construction of nine grid substations (9 220/132 kV) and associated facilities at Bap, Kanasar, Chhatrail, Pokaran, Kolayat, Ramdev Nagar, Badisid, Aau and Bajju; the augmentation of four 400 kV grid substations at Akal, Jodhpur, Barmer, Bikaner; the upgradation of 3 substations to 132 kV in Bhadla; and the construction of nearly 1850 kilometers (km) of 400 kV, 220 kV and 132 kV of transmission lines primarily in Western Rajasthan. Non-physical outputs include infrastructure planning for the Bhadla solar park, community development, improving institutional capacity and effectiveness including planning, project management, financial management, and improved monitoring and reporting. The program will deliver skills training interventions, pilot community models for RE-based water supply, and implement an asset accounting system for RRVPNL.[10]

11. The first project under the Program (Project 1) will include physical and nonphysical investments. Physical investments comprise the construction of the transmission system, including two grid substations (400/220/132kV) and associated facilities at Bhadla and Ramgarh; two substations (220/132 kV) and associated facilities at Bap and Kanasar; and associated automation and control infrastructure. The investments also include the augmentation of two 400 kV grid substations at Akal and Bikaner, the upgradation of 3 substations to 132 kV in Bhadla, and the construction of nearly 600 km. of 400 kV, 220 kV, 132 kV transmission lines in Bhadla and Ramgarh. The non-physical outputs include project management and capacity building. Project 1 will also finance the services of experts to prepare

[9] ADB.2012. *Report and Recommendation of the President to the Board of Directors: Dahanu Solar Power Project.* Manila.

[10] Includes provision for technical assistance funds that would support some of the non physical outputs.

future MFF investments and supervise the first generation of capital investments. Project 2 will add to these investments and is expected to be taken up in 2014. Project 3 is expected in 2015.

C. Investment and Financing Plans

12. The investment plan for generation capacity addition in Table 1 is large, but modular and phased. Private sector investment in Rajasthan would be backed up by public sector-led transmission networks under the Program with an estimated cost of $ 800 million over a five year period of which $ 279 million would be over 2013-2016. The transmission and project management costs for the Program are summarized in Table 2.

Table 2: Rajasthan Renewable Energy Transmission Investment Program ($ million)

		Program	Project 1
A.	**Base Cost** [a,b]		
	1. Land	4	1
	2. Equipment and Materials	626	219
	3. Environment and Social Costs	17	6
	Subtotal (A)	**647**	**226**
B.	**Project management and capacity building** [c]	**27**	**16**
C.	**Contingencies**[d]	**110**	**29**
D.	**Financing Charges During Implementation**[e]	**16**	**8**
	Total (A+B+C+D)	**800**	**279**

[a] Includes taxes, duties, freight and insurance to be financed from ADB and CTF resources.
[b] In 2013 prices
[c] Includes overhead costs associated with project management, implementation, monitoring and capacity building
[d] Physical contingencies computed at 10% for lines and 3% for other equipment; Price contingencies are computed in accordance with ADB. 2005. *Financial Management and Analysis of Projects*. Manila. The impact of foreign currency fluctuation has been computed following the purchasing power parity method.
[e] Includes interest and commitment charges. Interest on the ADB OCR loan has been computed following the 5-year swap rate for the London Inter Bank Offered Rate, a spread of 0.40% and a maturity premium of 0.10%. A commitment charge of 0.15% is applied to the undisbursed balance. For the ADB CTF loan, a commitment fee of 0.18% on the undrawn balance, and a fixed interest rate of 0.25%, has been applied.

Source: Asian Development Bank estimates

13. The Government has requested a MFF amounting to $500.0 million for the Program. The financing plan will include $300 million from ADB through its ordinary capital resources (OCR) and $200 million from CTF administered by ADB. The MFF will be drawn down in three tranches, subject to the submission of periodic financing requests, execution of loan and project agreements for each tranche, and fulfillment of terms and conditions and undertakings set forth in the framework financing agreement. The first tranche amounts to $150 million - $62 million from ADB OCR and $88 million from ADB CTF. Financing from ADB OCR would be for a twenty five year term, including a grace period of five years, at an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, a commitment charge of 0.15% per year and such other terms and conditions set forth in the draft loan and project agreements. ADB CTF loan financing comes with a forty year term, including a grace period of ten years, an annual interest rate of 0.25%, and such other terms and conditions set forth in the draft loan and project agreements. The remaining financing will be mobilized by RRVPNL, including debt from lenders and equity support from Rajasthan. A grant in the amount of $ 2 million is sought from CTF to support technical assistance to RRVPNL and RREC outlined in Section III.

Table 3: Financing Plan ($ million)

Source	Project 1	Project 2	Project 3	Total	Share of Total (%)
ADB – Ordinary Capital Resources	62.0	150.0	88.0	300.0	37.5
ADB - Clean Technology Fund[a]	90.0[b]	70.0	40.0	200.0	25.0
Rajasthan	127.0	104.0	76.0	300.0	37.5
Total	**279.0**	**324.0**	**203.0**	**800.0**	**100.0**

[a] Under the Climate Investment Funds
[b] Comprising $ 88 million loan to finance transmission investment and $2 million grant including MDB fee from ADB Clean Technology Fund for technical assistance (see paragraph 17)
Source: Asian Development Bank estimates.

D. Implementation Arrangements

14. RRVPNL, the state transmission licensee of Rajasthan, and the Energy Department, Government of Rajasthan will be the executing agencies (EA) for the Investment Program. Rajasthan Renewable Energy Corporation (RREC), the nodal agency responsible for developing renewable energy in Rajasthan, including the Bhadla solar park, will coordinate with the state government to provide the necessary land for power project developers. RRVPNL has the capacity to execute and monitor the implementation of transmission projects. This capacity will be underpinned by the establishment of a dedicated project management unit (PMU) for design, supervision and procurement at RRVPNL while project implementation would be handled by RRVPNL regional office in Jodhpur. Private sector investment proposals and the related bidding process will be handled by a committee of secretaries supported by RREC.

15. **Procurement**. Goods, equipment, and civil works financed by ADB will be procured in accordance with ADB's *Procurement Guidelines, 2010* (as amended from time to time). The EA will undertake advance procurement actions, including the placement of bidding documents in the market, and requested ADB to authorize these and to allow for retroactive financing. ADB advised the authorities that approval of advance procurement does not commit ADB to finance the projects. RRVPNL will follow international competitive bidding procedures acceptable to ADB. Private sector renewable energy developers selling power to utilities will be selected through a competitive process and will enter into supply contracts with their clients.[11] The construction of their facilities will most likely follow turnkey contracts selected through a competitive process. RREC will coordinate with RRVPNL on the development and sequencing of the transmission lines to evacuate the energy produced in the region including the parks. The implementation arrangements are summarized in Table 4 and are described in detail in the facility administration manual.[12] Retroactive financing for up to 20% of the individual loan amount for expenditures incurred prior to 12 months before loan signing will be allowed.[13]

Table 4: Implementation Arrangements

Aspects	Arrangements
Implementation period	June 2013 – May 2018
Estimated completion date	October 2018
Management	
(i) Oversight body	State Empowered Committee, Government of Rajasthan
(ii) Executing agency	Energy Department, Government of Rajasthan and RRVPNL

[11] Private sector bidding has commenced for Phase 1 of the Bhadla solar park in 2013. The lowest bids received are at 6.45 INR/kWh and PPA are signed in 2013.
[12] Project Administration Manual (accessible from the list of linked documents in Appendix 2).
[13] Approved at management review meeting in June 2012.

(iii) Management Unit	PMU to be set up in RRVPNL and to coordinate with RREC. PMU includes full time staff for design, procurement, supervision, monitoring and reporting. Implementation would be handled through field office of RRVPNL in Jodhpur.		
Procurement (tranche 1)	International competitive bidding	4 contracts	$150 million
Retroactive financing and/or advance contracting	Advanced contracting and retroactive financing approved.		
Disbursement	In accordance with ADB's *Loan Disbursement Handbook* (2012, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.		

ADB = Asian Development Bank, RRVPNL = Rajasthan Rajya Vidyut Prasaran Nigam Limited, MFF = multi-tranche financing facility, PMU = project management unit, QCBS = quality- and cost-based selection.
Sources: Asian Development Bank.

III. PROJECT MANAGEMENT AND CAPACITY BUILDING

16. The Investment Program will be supported by a project team working out of a project management unit set up and financed by RRVPNL in coordination with RREC. The overall management function includes (i) supervision of investments under Project 1, (ii) preparation of investments for Project 2 and 3, and subsequent supervision needs, (iii) community development schemes, and (iv) specialized training, monitoring and reporting.

17. Technical assistance for the Rajasthan Renewable Energy Capacity Development and Implementation Support is included in the 2013 country operations business plan for the Energy Department, Government of Rajasthan and RRVPNL. ADB will fund up to $ 2,000,000 on a grant basis from ADB Clean Technology Fund (ADB-CTF) to provide support for infrastructure planning for the subsequent phase of the Bhadla solar park, community development initiatives around the solar park and to support institutional capacity development of RRVPNL and RREC on the master-plan for Phase 2 of the Bhadla solar park, system strengthening studies for the implementation of the RE integration roadmap, identification of enterprise resource planning tools, asset accounting and also for pilot water schemes for remote communities located near the solar park in Western Rajasthan.[14] The TA is attached to Project 1. Consultants will be recruited by ADB in accordance with the ADB Guidelines on the use of Consultants, 2010 (as amended from time to time). Other activities would be financed by Rajasthan.

IV. DUE DILIGENCE

18. The immediate investment projects under the Program were first examined by RRVPNL, the Central Electricity Authority (CEA), and the Rajasthan Electricity Regulatory Commission. These assessments covered technical, commercial, financial, safeguards, management, economic and community related matters. ADB also conducted its own independent due diligence on these areas.

A. Technical

19. Several technical studies were prepared by RRVPNL and reviewed by CEA and Power Grid Corporation of India Limited. The work focused on technology aspects, the nature and characteristics of the investment plan and the most appropriate electricity evacuation

[14] Based on the studies undertaken under the Technical Assistance, additional support could be considered in subsequent tranches of the MFF.

arrangements and smart grid proposals. ADB followed up these assessments with its own and found the technical studies acceptable. A technical assistance (TA) for the Capacity Development of Rajasthan Solar Park[15] provided support to RREC with respect to the studies for the establishment of the first phase of the Bhadla solar park. The work done indicated that the sequencing of the generation under the investment plan and transmission under the Program are technically feasible and execution arrangements are satisfactory. A roadmap for renewable energy integration prepared for RRVPNL (including renewable energy forecasting and power compensation) will be refined under Project 1 and implemented under the Program. Support for the development of the master plan for the second phase of the Bhadla solar park would be taken up in 2013.

B. Commercial, Financial and Economic

19. The due diligence process included an assessment of the likely level of investor take-up in RE projects in Rajasthan including the Bhadla solar park. Nearly 800 MW of solar and wind power is expected to be commissioned in 2013 by the private sector that would constrain the grid. As part of counterpart financing, RRVPNL is undertaking physical investment at lower voltages to remove immediate constraints for projects near completion. Bidding for 400 MW of wind power will be carried out annually to meet the requirement of Rajasthan distribution utilities over the next three years. Under the JNNSM, capacities of at least 3,000 MW are to be installed by 2017 through competitive bidding of which a significant slice is expected in Rajasthan.[16] Procurement for 100 MW of solar PV power at Bhadla solar park for Rajasthan distribution utilities was carried out while tendering for 150 MW of CSP is expected later in 2013. At least 200 MW of solar power capacity is expected to be tendered out annually for the next five years at Bhadla solar park. Private generators are also setting up wind and solar projects to supply power purchasers outside Rajasthan through long term contracts and the renewable energy certificate (REC) mechanism. Due diligence shows that private sector generation projects are financially viable[17] and there is ample demand from private operators with sufficient access to finance and financers, both in India and elsewhere. The financial analysis for the transmission infrastructure (a pre-requisite and integral part of the overall investment plan) was conducted using standard ADB approaches and found to be viable, with the FIRR for Project 1 at 3.5% and WACC of 1.3%[18].

20. The economic evaluation of the Program and project 1 compares benefits and costs under “with” and “without” investment scenarios. Investment is assumed to take place between 2012 and 2018.[19] Project 1 is economically viable with an EIRR of about 16%.

C. Governance

21. A governance assessment of RRVPNL, including financial management and procurement capacities, was carried out. The financial management assessment concluded that RRVPNL’s has the ability to fulfill ADB’s fiduciary requirements. RRVPNL has a procurement unit with over 40 qualified staff. This team has capacity and experience to handle international competitive bidding operations, as well as full familiarity with ADB rules and procedures. ADB provided support to RRVPNL with the preparation of bidding documents for the first set of

[15] ADB.2011. *Technical Assistance for the Rajasthan Solar Park Capacity Development Project* . Manila.
[16] Under JNNSM, between 3000-9000 MW of solar power is expected to be commissioned between 2013-2017.
[17] ADB.2012. *Report and Recommendation of the President to the Board of Directors: Dahanu Solar Power Project.* Manila.
[18] Financial Analysis: Project 1 (accessible from the list of linked documents in Appendix 2).
[19] Economic Analysis: Project 1 (accessible from the list of linked documents in Appendix 2).

investments and staff have participated in ADB procurement seminars. RRVPNL will set up a PMU to report on the Investment Program. ADB's Anticorruption Policy was explained and discussed in full with the government, RRVPNL and other agencies.

22. A state level empowered committee has been set up in Rajasthan to promote coordination with respect to all solar power projects. RREC will support this committee and report on the performance of private sector-led investments. RREC will oversee the private generation program and report accordingly to the authorities and through the PMU to ADB.

D. Poverty and Social

23. Industry and services constitute over 60% of the state's gross domestic product. The state has registered high growth rates of 8% over the last ten years. The power sector plays a key role in contributing to economic growth, development and social well-being. The RE program in Rajasthan will directly and indirectly contribute to poverty reduction through the creation of temporary and permanent jobs, and enhanced energy security.

24. A socioeconomic and poverty assessment was carried out along the transmission routes and area identified for the substations for Project 1 and in the vicinity of Phase 1 of the Bhadla solar park. These areas lack basic infrastructure and other services, including access to good quality water supply, medical facilities and electricity. Economic activity and growth is weaker than it should be due to a lack of income-generating opportunities, low level of skills and limited access to markets. The program will create economic opportunities. A gender action plan (GAP) has been prepared for Project 1. The GAP includes interventions to support sustainable and socially inclusive development in the areas adjacent to such RE parks. As part of its responsibilities, RREC has set up a community development fund through levying an upfront nominal fee on RE projects and allocated land in the Bhadla solar park to be used for social development and economic rehabilitation projects. Associated TA [20] will support EA in developing this approach including making the community development fund operational and supporting pilot water projects and livelihood opportunities. The loan agreement includes a confirmation from the executing agency to implement the GAP. The TA will enhance the impact of the RE investment plan through effective community development and gender mainstreaming.

E. Safeguards

25. An environment assessment and review framework (EARF), a resettlement framework (RF), and indigenous peoples planning framework (IPPF) were prepared outlining the environment and social safeguard principles and requirements [21]. The EA will undertake environmental and social safeguard due diligence on individual investments based on the EARF, RF and IPPF and submit quarterly reports on implementation of environmental management plans (EMP) and resettlement plans (RP) for subprojects, and if required, indigenous peoples plans.

26. The Project 1 investments are classified as environment category B. Major components proposed include supply and installation of transmission substations and transmission lines. The construction work is limited to building foundations for the transmission towers, and substations.

[20] ADB.2013. *Technical Assistance for Rajasthan Renewable Energy Capacity Development and Implementation Support.* Manila.

[21] Environment Assessment and Review Framework, Resettlement Framework, and Indigenous Peoples Planning Framework (accessible from the list of linked documents in Appendix 2).

Based on the environmental assessment and surveys conducted by RRVPNL, associated potential adverse environmental impacts are minimal and can be mitigated through implementation of the EMP. Budgetary provisions have been made to cover the environmental mitigation and monitoring requirements, and the EMP is part of the bidding documents. The EA will supervise the construction contracts and EMP implementation.

27. Project 1 is classified under involuntary resettlement category B and indigenous peoples category C. Social surveys and consultations were undertaken in accordance with ADB's Safeguard Policy Statement 2009.[22] Project 1 will not entail any permanent land acquisition. The proposed grid substations will be built on government land. The transmission line will have temporary impacts at some places for loss of crop during the time of construction. This is also minimal as the transmission routes will mostly follow vacant land. Project 1 will not have any social risks or impacts of a permanent or irreversible nature. A due diligence was also undertaken for the Bhadla solar park and the results are included in an appendix of the Resettlement Plan. Budgetary provisions have been made to compensate these losses as and when they occur. There are no structures or buildings affected and no physical displacement foreseen. The loan agreements include a standard assurance related to core labor standards for contractors (including equal pay for equal type of work), and an awareness program on HIV and sexually transmitted diseases and human trafficking. [23] Additionally, the social impact assessment provided baseline information for the gender action plan.

F. Risks and Mitigating Measures

28. The major risks are (i) cost overruns, (ii) technical integration of renewable energy in the transmission network and (iii) poor financial performance by RRVPNL, which are summarized in Table 5. The EA has significant experience in project management especially in the development of transmission projects. The integration requirements are addressed under the renewable energy integration roadmap and investment support under the Program. Assurances regarding the financial sustainability of RRVPNL have been provided. Risks and mitigating measures are described in detail in the risk assessment and risk management plan.[24]

Table 5: Summary of Risks and Mitigating Measures

Risks	Mitigating Measures
Possible uncoordinated development of renewable energy generation plants and the transmission system	• Empowered committee with representatives of GOR, RRVPNL, RREC and others for coordinated generation and transmission planning and development. • Asia Solar Energy Forum, Regional Task Force facilitate communication between government agencies and private developers. • Plan review by central government agencies including CEA, PGCIL, state regulator. • ADB's MFF modality to ensure transmission system would be developed in stages and in response to requirement from developers. • 220 kV and 132 kV systems to be developed in advance.
Capacity utilization in Bhadla solar park	• Bidding process under GOR policy commenced in Q1 2013 • TA support for development of the master plan for Bhadla Phase 1 and Phase 2. • Water allocation earmark from nearby canal, soil composition and level land, high levels of solar radiation, proximity to transmission station provide location advantages.
Capacity to manage potential instability of the grid due to large-scale solar and wind	• RRVPNL renewable energy integration roadmap to be implemented starting 2013 • ADB TA to support planning studies, component identification, training • Required investments to be undertaken under the MFF in tranches.

[22] ADB. 2009. *Safeguard Policy Statement.* Manila.
[23] Resettlement Plan (Appendix 2). (accessible from the list of linked documents in Appendix 2)
[24] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

generation	• Changes in regulatory codes and commercial arrangements to manage high level of renewable energy penetration proposed.
Financial position of RRVPNL	• Financial Restructuring Plan of RRVPNL in 2013 • Assurance on contribution to capital investment and return on equity. • TA support on asset mapping to address rate base regulatory disallowances.

ADB = Asian Development Bank, CEA = Central Electricity Authority, GOR = Government of Rajasthan, kV = kilo Volt, PGCIL = Power Grid Corporation of India Limited, RRVPNL = Rajasthan Rajya Vidyut Prasaran Nigam Limited , TA = technical assistance.
Source: Asian Development Bank

V. ASSURANCES

29. The Government, the state government of Rajasthan and RRVPNL have assured ADB that implementation of the projects under the MFF 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 facility administration manual and relevant loan documents

30. The Government, the state government of Rajasthan and RRVPNL have given ADB certain undertakings for the MFF, which are set forth in the framework financing agreement. Specific covenants agreed by the government, the state government of Rajasthan and RRVPNL with respect to individual tranches under the MFF are set forth in the loan agreement and project agreement for the respective tranches.

VI. RECOMMENDATION

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

(i) the provision of loans under the multi-tranche financing facility in the aggregate principal amount not exceeding $ 300 million to Government of India for the Rajasthan Renewable Energy Transmission Investment Program, from ADB's ordinary capital resources, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, and 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 administration by ADB of a loan and grant not exceeding the equivalent of $ 200 million to Government of India for the Rajasthan Renewable Energy Transmission Investment Program to be provided by ADB Clean Technology Fund.

DESIGN AND MONITORING FRAMEWORK FOR THE INVESTMENT PROGRAM

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks[a]
Impact Accelerated development of renewable energy sources in Rajasthan/India.	**National** Grid connected solar power generation capacity across India to increase to at least 20,000 MW by 2022 (2012 Baseline: 500 MW) Renewable energy procurement targets met by 2022 (2012 Baseline: limited compliance) **Rajasthan** Grid connected solar power generation capacity to increase to 10,000 MW by 2022 and over 4,000 MW of wind by 2018 (2011 Baseline: About 45 MW for solar and 1,767 MW for wind) Avoidance of carbon emission on account of renewable energy projects in Rajasthan approx. at-least 5.4 MT annually by 2018 (2011 Baseline: Less than 1 MT annually)	MNRE Annual Report CEA Report RREC Annual Report RREC Annual Report	**Assumptions** Successful development of the bulk transmission system supports renewable generation development in Rajasthan and provide a replicable model for other states in India. A combination of support measures including renewable purchase obligations, penalties for non compliance, feed in tariffs, development of a renewable energy certificate market would support solar and wind energy development.
Outcome Cleaner electricity mix with more efficient and effective generation and transmission system	Transmission network capacity expanded to transmit up to 8000 MW of renewable power generation in Rajasthan by 2018 (2011 Baseline: About 1800 MW) Institutional capacity in RRVPNL to operate high penetration solar and wind power generation in Rajasthan developed by 2018 (2012 Baseline: Limited)[1] Private sector led renewable energy projects developed in solar and wind parks in Rajasthan (2011 Baseline: None)	RRVPNL Annual Reports RRVPNL Annual Reports RREC Annual Reports	**Assumptions** Up to 5700 MW of solar and wind generation is set up in Rajasthan in a timely manner under NSM, GoR policy by 2017. Last mile transmission, inter-state transmission and other infrastructure as required by the developer to be completed. Key aspects of the agreed roadmap to integrate renewable energy are met. **Risks** Expected growth in generation capacity does not match the increase in transmission capacity.

[1] To be supported through ADB. 2011. Technical Assistance for S*mart Grid Development in South Asia.* Manila

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks[a]
Outputs **Physical Investment** 1. Bulk power transmission system in Rajasthan expanded.	Construction of 3 400/220/132 kV Grid Substation (GSS) at Bhadla, Ramgarh, Jaisalmer associated automation and control infrastructure, and 9 220/132 kV GSS at Bap, Kanasar, Chhatrail, Pokaran, Kolayat, Ramdev Nagar, Badisid, Aau and Bajju by 2018 by RRVPNL Augmentation of 4 400 kV GSS at Akal, Jodhpur, Barmer, Bikaner and upgradation of PS 2,3,4 to 132 kV GSS by 2018 by RRVPNL Construction of approx. 1440 km. of 400kV, 355 km. of 220 kV, 57 km. of 132 kV by 2018 by RRVPNL	RRVPNL Annual Report RRVPNL Annual Report RRVPNL Annual Report	**Assumptions** Counterpart funds for timely project implementation are made available from GoI, GoR and RRVPNL. Approval of contract awards by the relevant authorities is timely. Land acquisition, environmental and social clearances as well as approvals for construction of transmission lines are timely. **Risks** Increase in the prices of raw materials exceeds contingency and inflation forecasts.
Non- Physical Investment 2. Institutional capacity for renewable energy parks and transmission system developed.	Timely preparation, procurement, supervision, implementation, monitoring and reporting of the Program including GIS based asset accounting, renewable energy integration studies starting 2013 Community development policy for renewable energy park by 2014 (including gender indicators and targets) Technical studies for Bhadla solar park Phase 2 starting 2013.	RRVPNL Annual Report RREC Annual Report RREC Annual Report	**Assumptions** RREC will coordinate with government departments to support timely project implementation Technical assessment of the solution undertaken prior to any pilot

	Skills training interventions to 20 women led self-help groups and community based organizations including training in animal husbandry and livelihoods starting 2013 with RREC	RREC Annual Report	
	400 women and girls trained in health, nutrition and hygiene by 2015 with RREC	RREC Annual Report	
	Pilot community models for renewable energy based water supply to benefit at least 200 families by 2015 with RREC	RREC Annual Report	
	Training for at-least 15 CSR champions within RREC, RSPL, RRVPNL and other stakeholders in GOR (including 50% women) by 2013	RREC Annual Report	

Activities with Milestones	Inputs
Project 1 – Creation/augmentation of pooling substation and associated infrastructure, identified transmission lines 1.1 Procurement of major equipment: Issuance of bidding documents by Q2 2013 and contract awards by Q3 2013 1.2 Construction of substation started by Q4 2013 1.3 Commission of substation by Q4 2015 **Project 2 – Creation/augmentation of existing substations and development of identified transmission lines** 2.1 Procurement of major equipment: Issuance of bidding documents by Q1 2014 and contract awards by Q3 2014 2.2 Construction started by Q4 2014 2.3 Commission by Q1 2017 **Project 3 – Construction of remaining transmission lines** 3.1 Procurement of major equipment: Issuance of bidding documents by Q1 2015 and contract awards by Q3 2015 3.2 Construction started by Q4 2015 3.3 Commission by Q4 2017	**Loan** **ADB OCR: $ 300 million** **ADB CTF: $ 198 million** **Government: $ 300 million** **Technical Assistance (ADB CTF) $ 2.0 million**

ADB = Asian Development Bank, CTF = Clean Technology Fund, DC = double circuit, EA = Executing Agency, GoR = Government of Rajasthan, GoI = Government of India, GSS = grid substation, kV = kilo Volt, MW = megawatt, RERC = Rajasthan Electricity Regulatory Commission, RREC = Rajasthan Renewable Energy Corporation, RRVPNL = Rajasthan Vidyut Prasaran Nigam Limited
Source: Discussions during March 2013 mission with RRVPNL and Government of Rajasthan

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=XXXXX-XX-3

1. Framework Financing Agreement
2. Periodic Financing Request for Project 1
3. Sector Assessment (Summary): Rajasthan Power Sector
4. Facility Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Financial Analysis
8. Economic Analysis
9. Country Economic Indicators
10. Summary Poverty Reduction and Social Strategy
11. Gender Action Plan
12. Environmental Assessment and Review Framework
13. Initial Environmental Examination: Tranche 1
14. Resettlement Framework
15. Resettlement Plan: Tranche 1
16. Indigenous Peoples Planning Framework
17. Risk Assessment and Risk Management Plan