TECHNICAL ASSISTANCE
RAJASTHAN RENEWABLE ENERGY CAPACITY DEVELOPMENT AND IMPLEMENTATION SUPPORT

A. Introduction

1. The State of Rajasthan is committed and poised to becoming a leader in the generation, promotion and sale of renewable energy in India. It has targeted 8,000 MW of total renewable energy capacity before 2018. The state has attractive levels of solar and wind radiation intensity, low average rainfall, and abundant desert wasteland. The Government has put in place a Solar Policy in 2011 and a Wind Policy in 2012. The State Policy is aligned to national renewable energy priorities and the need for development of the renewable energy resource in Rajasthan to meet state and national requirements for renewable energy.

2. Under the Rajasthan Renewable Energy Transmission Investment Program (RRETIP), a multi-tranche financing facility (MFF) being considered by the Asian Development Bank, power evacuation infrastructure will be built by the Rajasthan Rajya Vidyut Prasaran Nigam Ltd. (RRVPNL) at the state level to connect renewable energy projects – both wind and solar power - to the state and national grid. The Rajasthan Renewable Energy Corporation (RREC) and subsidiary special purpose vehicle (SPV) companies have a planning and facilitating role for the development of the renewable energy capacity across Rajasthan including the development of renewable energy parks starting with the solar park in Bhadla. The solar park in Bhadla is expected to support economic growth and investment into the region of Western Rajasthan and help position the state as a hub for clean energy, industry, research & development (R&D), employment and socio-economic development. This model will subsequently be replicated to other locations. RRVPNL as the transmission utility in Rajasthan is also faced with increasing challenges of integrating wind and solar energy with the grid because of their intermittent generation and impact on the transmission system operation. This challenge needs to be addressed to meet the proposed target of about 8,000 MW of total renewable energy capacity by 2018.

B. Methodology and Key Activities

3. The Rajasthan Renewable Energy Capacity Development and Implementation Support technical assistance is linked to the multi-tranche financing facility (MFF) and will target specific capacity development needs of the executing agencies and implementation support. It also provides implementation support to RREC linked to the solar park and community intervention activities.

4. The TA will consist of consultants working along with the project management unit (PMU) that has been set up for the MFF for the following key activities

a. Studies for state smart grid roadmap;
b. Solar park master-plan development;
c. Institutional support for RRVPNL and RREC including financial management support; and
d. Renewable energy policy for community interventions and pilot solar water pumping projects

5. The target area for interventions for the pilot would be the districts in Western Rajasthan (including Jodhpur, Jaisalmer, Bikaner, Nagaur, Barmer) and in particular in proximity to the proposed solar park at Bhadla, the first solar park initiative in Rajasthan.

C. Implementation Arrangements

6. The TA is expected to be implemented over 28 months from December 2013 to March 2016. The executing agency (EA) will be the Energy Department, Government of Rajasthan and the Rajasthan Rajya Vidyut Prasaran Nigam Limited. The Project Management Unit (PMU) set up by the Government of Rajasthan comprising officers from RRVPNL and RREC, in charge of implementing the RRETIP, will be the counterpart and recipient of assistance under this TA. The EAs will provide adequate office accommodation and administrative support to the consultants for carrying out the tasks of the TA.

7. Terms of Reference (TOR) are provided in Section D. ADB will recruit the consultants in accordance with its Guidelines on the Use of Consultants (2013, as amended from time to time). The Government of Rajasthan, through RREC and RRVPL, will provide office accommodation and support facilities and counterpart staff. Disbursements will be made in accordance with ADB's Technical Assistance Disbursement Handbook (May 2010, as amended).

8. ADB will recruit a consulting firm or a consortium of firms in accordance with its *Guidelines on the Use of Consultants* (2013, as amended from time to time) using quality and cost based selection on a 90:10 basis. Advanced recruitment of consultants will be carried out in the months prior to loan effectiveness to ensure that there is no major delay in the recruitment of consultants and commencement of TA implementation. RREC will set up a community development fund with contributions from solar park developers that would be used to carry out community support activities including livelihood support. The TA will support design, conditions and criteria for selection of projects to be supported under the community fund.

D. Cost and Financing

9. The total cost of the TA is $2,000,000 equivalent. ADB will provide technical assistance not exceeding the equivalent of $2,000,000 to be financed on a grant basis by the ADB Clean Technology Fund. The Government of Rajasthan will contribute in kind by providing office accommodation, support facilities, counterpart staff in the Project Management Unit, maps, reports, and logistical support. Detailed cost estimates and financing plan are in Table 1.

Table 1 COST ESTIMATES AND FINANCING
(US$'000)

Item	Total Cost
A. ADB Clean Technology Fund [a]	
1. Consultants	
a. Remuneration and Per Diem	
i. International Consultants	1,012.0
ii. National Consultants	258.0
b. International and Local Travel [b]	214.0
c. Reports and Communications	10.0
2. Workshops and Training [c]	55.0
3. Surveys [d]	200.0
4. Pilot Projects [e]	50.0
5. Miscellaneous Administration [f]	90.5
6. Contingencies	110.5
Subtotal (A)	**2,000.0**
Total	**2,000.0**

[a] Administered by the Asian Development Bank.
[b] Includes airfare, land travel and/or vehicle hire.
[c] Includes 4 workshops on smart grids and solar park development.
[d] Includes cost for preparation of future tranches, solar park phase 2 and load flow studies
[e] Includes cost for electrification and water pilots under the community program. Equipment purchased under this head will be handed over to the community, RREC and RRVPNL at the time of TA completion.
[f] Grant supervision and implementation
Source: Asian Development Bank estimates.

E. OUTLINE OF TERMS OF REFERENCE FOR CONSULTING SERVICES

10. The TA will require the services of 16 consultants (10 international and 6 national), for a total of 87 person-months. The primary responsibility of the consultants is to advise and assist the EAs on the following areas namely (i) studies for state smart grid roadmap; (ii) solar park master-plan development; (iii) Institutional support for RRVPNL and RREC; and (iv) renewable energy policy for community interventions and pilot solar water pumping projects. The outline terms of reference for the consultants will include, but not necessarily be limited to, the following tasks.

i. Solar Park Master Planner (International, 4 person months over 8 months)

A Master Planner would review RREC's implementation plan for Bhadla Solar Park Phase 1 and preliminary reports and studies completed for Bhadla Solar Park Phase 2 to finalize the master plan for the Bhadla solar park including the studies required for government clearances. The Planner will provide inputs on required aspects of design and implementation for the solar park site including a phased planning for clustered solar PV and CSP projects on the available land area along with other required infrastructure, renewable energy resource measurement, green zones, planning for civil structures, related economic development activity in the vicinity of the solar park, etc. He will also provide guidelines to RREC on the planning of future parks. The Planner will have

extensive knowledge of civil engineering and have experience of preparing similar plans for other renewable energy parks and infrastructure projects.

ii. Electrical Engineer (National, 4 person months over 8 months)

An Electrical Engineer would review the Bhadla Solar Park Phase 1 and 2 plans and the proposed connection plans for individual renewable energy projects with the sub-pooling and pooling facilities being developed with support from RRVPNL. The Engineer will also support coordination between RRVPNL and RREC for renewable energy deployment in the Bhadla area. The Engineer will also periodically review the development plan for solar and wind power projects in the state based on information from RREC and the transmission network information from RRVPNL. The Engineer will have extensive experience of conducting similar studies for connectivity and evacuation of solar and wind projects elsewhere.

iii. Solar Park Commercial Expert (International, 3 person months over 8 months)

The Commercial Expert will be responsible for benchmarking the policies for renewable energy park development with those for similar parks or infrastructure zones coming up in Asia and Africa and the business models for different types of power generation projects that could be hosted in the Park. The Expert will also review and update the business plans for the Bhadla Solar Park to reflect the revised cost estimates, development plan timelines and requirements from stakeholders for Phase 1 and Phase 2 of the Solar Park and support the Solar Park master planner in proposing models to spur economic activity in and around the solar park area. The Expert will have extensive experience of conducting similar studies for special economic zones / infrastructure parks in India and elsewhere.

iv. Transmission Smart Grid Expert (International, 6 person months over 15 months)

The Smart Grid Expert will support RRVPNL on the phased implementation of the smart grid roadmap for Rajasthan to integrate renewable energy at transmission voltage level. He/she will also be responsible for supporting RRVPNL to contract and conduct the required technical studies for the roadmap including dynamic system studies, review the suitability of different models for implementing the roadmap for the state and identify the design and cost estimates for equipment that can be tested out in the high concentration renewable energy zone in Western Rajasthan. He will also support RRVPNL for planning state level smart grid interventions vis-à-vis proposed and ongoing regional and national level interventions. The Smart Grid Expert will also support RRVPNL in identifying software to be procured and to train RRVPNL staff to build capacity to undertake studies. The Expert will also interface with regulatory agencies and private sector to discuss and identify requirements from other stakeholders. The Smart Grid Expert should have wide international experience of similar studies for other utilities.

v. Load Management Center Expert (International, 2 person months over 6 months)

The Load Management Center Expert would review the hardware requirements for the SLDC including the existing SCADA systems, IT and communication requirements and software for integrated renewable energy management for the implementation of the smart grid roadmap. The Expert will have extensive experience of conducting similar support for other utilities.

vi. Environmental Expert (International, 5 person months over 24 months)

The Environment Expert would support RREC and RRVPNL to develop environmental safeguard guidelines for renewable energy projects and environment management plans for transmission lines. The expert would also help support RRVPNL develop capacity to monitor and report environment impacts. The Expert will have extensive experience of conducting similar support for other utilities and for ADB.

vii. Social Development Expert (International, 5 person months over 24 months)

The Social Development Expert would support RREC and RRVPNL to develop social safeguard guidelines for renewable energy projects and resettlement and indigenous people plans for transmission lines. The expert would also help support RRVPNL develop capacity to monitor and report social development impacts. The Expert will have extensive experience of conducting similar support for other utilities and for ADB.

viii. RE Policy Expert (International, 2 person months over 6 months)

The RE Policy Expert would support RREC and RRVPNL and other state agencies to review the implementation of the Solar and Wind Policy in Rajasthan. The Expert will review the implementation procedures for RE projects and the institutional requirements at these agencies to support an accelerated roll out of projects in Rajasthan. The Expert will have extensive experience in reviewing RE policies internationally and providing advice to stakeholders.

ix. Community Policy Expert (National, 5 person months over 6 months)

The Community Policy Expert will support RREC in reviewing the community development requirements and existing policies for areas in proximity to renewable energy projects. He/she will support RREC in developing such a framework including targets for empowerment of such communities including through access to infrastructure including electricity and drinking water, livelihood and access to markets including a gender based focus. The Expert will review the design of terms and conditions, criteria for disbursing funds and financing of community development fund projects. The Expert will support RREC on implementation of the policy including identifying target groups, livelihood opportunities, community based consultations and behavioral change communication strategy in coordination with national consultants. The Expert will have demonstrated experience in designing policy for small communities, knowledge of project development processes at an international level with governments.

x. Livelihood Expert (National, 12 person months over 24 months)

The Livelihoods Expert (LS) will work with RREC and be responsible to identify and develop livelihood activities and opportunities identified through a needs based and participatory approach. The LS will also focus on empowering women and particularly well-functioning and operating village level self-help groups (SHG) or functional groups (FGs), providing a potential model for future scaling up. The LS will explore skills training, financing, and entrepreneurial opportunities at the household and SHG/FG level. The Expert will have background in business development, marketing and/or skills training with demonstrated experience in small and micro scale ventures and will be responsible for linking the communities with market opportunities.

xi. Mini-grid Renewable Energy Expert (International, 6 person months over 12 month period)

The Minigrid Renewable Technology Expert will have a background in renewable energy, preferably solar and wind technologies, and demonstrated experience in designing and implementing small scale off-grid and mini-grid development projects. The Expert will be tasked with reviewing the experience of off-grid/ mini-grid electrification and infrastructure provision in remote areas. The Expert will be responsible for reviewing feasibility reports and supervising the installation of the solar/RE based off-grid technologies to improve the availability of electricity and water in the local communities and providing alternatives for home/community based lighting in the identified pilot areas in Western Rajasthan. The Expert will also review the commercial mechanism for communities to pay user fees for such services and to scale these up with RREC support. The Expert should have working knowledge of working in remote desert environments and the ability to design, procure and supervise implementation. These arrangements could be scaled up under subsequent programs supported by ADB in 2013.

xii. Financial Function Effectiveness Expert (International, 6 person months over 12 months)

A Finance Function Effectiveness expert will review and benchmark RRVPNL's existing financial and accounting system with those of state and central utilities in India and similarly placed transmission utilities elsewhere. The expert would develop an action plan to support process review of the financial management function in RRVPNL with periodic monitoring for management including key performance indicators for various levels of decision making. The expert will assist RRVPNL to update accounting manuals for internal audit, accounting, budget and costing. The expert would also review and propose improvements to the fixed asset register, inventory accounting, accounting systems for capital work in progress and control for RRVPNL as well as undertake physical verification to address regulatory requirements and audit observations. The Expert will also provide training on updated manuals on internal audit, accounting, budget and costing. The Expert should have a recognized accounting qualification such as chartered accountancy, and will have at least 10 years relevant experience in conducting similar effectiveness audits for transmission utilities. Prior experience in working in India or another country in the South Asia region would be desirable.

xiii. ERP Expert (National, 5 person months over 12 months)

An ERP Expert would support RRVPNL in identifying the organizational requirements for an ERP arising from the FFE and related reviews. He would support in developing specifications and provide technical inputs for bid advisory support for ERP related procurement to RRVPNL. The Expert will have extensive experience of conducting similar ERP specification and bid advisory support for transmission utilities.

xiv. Asset Mapping Expert (National, 5 person months over 12 months)

An asset mapping Expert would review RRVPNL's existing asset database and assist RRVPNL in identifying an optimal solutions to enable automation and adoption of technologies such as digital mapping of assets on a GIS map, installation of identification devices for tracking asset movements and other such interventions to meet auditing requirements. Such a solution could be considered for financing in subsequent tranches of the MFF. The Expert will have extensive knowledge of asset mapping and related technologies and would support RRVPNL in preparing the design specifications.

xv. Institutional and Capacity Development Expert (International, 5 person months over 12 months)

An Institutional and Capacity Development Expert would support RREC and RRVPNL to identify the institutional requirements and organizational changes required to support the scaling up of RE generation and transmission projects in Rajasthan. The Expert will work with other consultants to identify specific training needs and skill development and support in implementing these. The Expert will have extensive experience of conducting similar programs for electricity utilities.

xvi. PMU Coordinator (National, 12 person months over 24 months)

A PMU Coordinator would provide support to the PMU including RREC and RRVPNL to support day to day coordination on solar parks, implementation support for the investment program including future tranches, reporting, communication and other TA activities including the conduct of studies. The Coordinator should have experience on project management, infrastructure development and renewable energy projects.