Report and Recommendation of the President to the Board of Directors

Project Number: 48209
September 2014

Proposed Loans
Special Purpose Vehicles owned by ACME Solar Energy Private Limited
ACME-EDF Solar Power Project
(India)

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 7 August 2014)

Currency unit	–	Indian rupee(s) (Re/Rs)
Re1.00	=	$0.016
$1.00	=	Rs61.24

ABBREVIATIONS

ACME	–	ACME group
ACSL	–	ACME Cleantech Solution Limited
ADB	–	Asian Development Bank
ASEPL	–	ACME Solar Energy Private Limited
EDF	–	Électricité de France
EDF EN	–	EDF Energies Nouvelles
EPC	–	engineering, procurement, and construction
ESMS	–	environmental and social management system
FDI	–	foreign direct investment
JNNSM	–	Jawaharlal Nehru National Solar Mission
kWh	–	kilowatt-hour
MW	–	megawatt
O&M	–	operation and maintenance
RVPNL	–	Rajasthan Vidyut Prasaran Nigam Limited
SECI	–	Solar Energy Corporation of India
SPV	–	special purpose vehicle
VGF	–	viability gap funding

NOTES

(i) The fiscal year (FY) of the special purpose vehicles owned by ACME Solar Energy Private Limited ends on 31 March. “FY” before a calendar year denotes the year in which the fiscal year ends, e.g., FY2015 ends on 31 March 2015.

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

Vice-President	L. Venkatachalam, Private Sector and Cofinancing Operations
Director General	T. Freeland, Private Sector Operations Department (PSOD)
Director	D. Purka, Infrastructure Finance Division 1, PSOD
Team leaders	I. Chauche, Investment Specialist, PSOD
	M. Lemoine, Senior Investment Specialist, PSOD
Team members	P. Bailet, Senior Counsel, Office of the General Counsel
	E. David, Associate Investment Officer, PSOD
	J. Gomez, Safeguards Officer (Environment), PSOD
	S. Noda, Senior Safeguards Specialist, PSOD
	M. Principe, Senior Social Development Officer, PSOD
	V. Ramasubramanian, Safeguards Specialist, PSOD

CONTENTS

PROJECT AT A GLANCE

1. Project Name: ACME-EDF Solar Power Project **2. Project Number:** 48209

3. Country: India **4. Department/Division:** Private Sector Operations Department
Infrastructure Finance Divisions 1

5. Sector Classification:

Sector	Primary	Subsector
Energy	√	Renewable energy generation - solar

6.Strategic Agendas and Drivers of Change:

Themes	Primary	Subthemes
Inclusive economic growth	√	Economic opportunities, including jobs, created and expanded
Environmentally sustainable growth		Eco-efficiency
Private sector development and private sector operations		Promotion of private sector investment

6a. Climate Change Impact:

Adaptation	
Mitigation	√
Not applicable	

6b. Gender Mainstreaming:

Gender equity theme	
Effective gender mainstreaming	
Some gender elements	
No gender elements	√

7. Poverty Targeting:

Project directly targets poverty	No
Geographic targeting	n/a
Household targeting	n/a
MDG-targeting (TI-M)	n/a

MDG = Millennium Development Goal, n/a = not applicable, TI-M = promoting the non-income MDGs.

8. Location Impact:

Rural	Low
Urban	Low
National	High
Regional	

9. Nonsovereign Operation Risk Rating: NSO8 (loans)

10. Safeguard Categorization:

Environment	B
Involuntary resettlement	B
Indigenous peoples	C

11. ADB Financing:

Sovereign/Nonsovereign	Modality	Source	**Amount** ($ million)
Nonsovereign	Loan	OCR	up to 100
Total			**up to 100**

OCR = ordinary capital resources.

12. Cofinancing:

Financier	Category	**Amount** ($ million)
International Finance Corporation	Loan	33
Local commercial banks	Official loans	up to 66
Total		**up to 99**

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on proposed loans in the aggregate amount of up to $100 million (or Indian rupee equivalent) to special purpose vehicles owned and controlled by ACME Solar Energy Private Limited for the ACME-EDF Solar Power Project in India.[1]

II. THE PROJECT

A. Project Identification and Description

1. Project Identification

2. The ACME group is a pioneer in solar power development in India. In 2009, it commissioned the first pilot solar thermal power project based on tower technology in India with a capacity of 2.5 megawatts (MW). Since then it has developed 65 MW of solar photovoltaic projects. In October 2013 EDF Energies Nouvelles (EDF EN) and EREN, two leading renewable energy developers from France, took a combined equity stake of 50% in ACME Solar Energy Private Limited (ASEPL), the solar subsidiary of ACME. With these new investors and a solid pipeline, ASEPL is expected to significantly contribute to the goal of the Jawaharlal Nehru National Solar Mission (JNNSM), which aims to achieve an installed capacity of 22,000 MW of solar power in India by 2022.[2] In February 2014, ASEPL won 100 MW of solar photovoltaic power projects under the JNNSM phase 2 tender.

3. It will be ADB's first direct support to solar photovoltaic projects developed under the JNNSM. ADB's assistance is required to support decreasing solar tariffs through long-tenor fixed-rate loans. ADB's assistance will also support the entry of foreign renewable energy developers (EDF EN and EREN) into the Indian solar sector, catalyzing much-needed foreign direct investment (FDI) and expertise into this key sector.

2. Project Design

4. The project involves the financing and implementation of 200 MW of solar photovoltaic projects by ASEPL during 2014–2017. ADB will provide debt financing to the 100 MW already awarded under JNNSM phase 2, as well as to 100 MW of projects to be identified after approval by the ADB Board of Directors.

5. The 100 MW of capacity awarded under the JNNSM phase 2 encompasses five individual projects of 20 MW each that will be developed by five different special purpose vehicles (SPVs): ACME Gurgaon Power Private Limited (Gurgaon Power), ACME Mumbai Power Private Limited (Mumbai Power), ACME Rajdhani Power Private Limited (Rajdhani Power), Medha Energy Private Limited (Medha Energy), and Ranji Solar Energy Private Limited (Ranji Energy). The five projects are all located near the village of Badi Sid in Jodhpur district of Rajasthan, 160 kilometers northwest of the city of Jodhpur. The annual global horizontal

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

[2] Ministry of New and Renewable Energy. 2010. *Jawaharlal Nehru National Solar Mission Towards Building Solar India.* New Delhi; and Sector Overview (accessible from the list of linked documents in Appendix 2).

irradiance[3] at the project site is estimated to be 1,996 kilowatt-hours (kWh) per square meter on average, one of the highest in the country.[4]

6. The five projects will be developed and implemented in accordance with the JNNSM phase 2 tender procurement requirements.[5] First, Ranji Energy, awarded under the domestic component requirement, will procure mono crystalline solar panels domestically. Second, Gurgaon Power, Mumbai Power, Rajdhani Power, and Medha Energy, awarded under the open category, will procure panels without any geographical restriction. The panel suppliers are selected by ASEPL in compliance with ADB's procurement policies. Commissioning of the five projects is expected by 28 April 2015.

7. The additional 100 MW of projects to be financed by ADB will be selected by ADB and structured on standard terms and conditions similar to the first five projects. The selection of such additional projects will be based on the following criteria and standard ADB private sector operations and due diligence procedures: (i) solar photovoltaic projects in India with long-term offtake, (ii) financial viability, (iii) risk-adjusted pricing of the ADB loans, and (iv) compliance with all ADB policies. Subject to the approval of the proposed loans by the Board, the borrowers, amount and structure of the financing for the additional projects will be reviewed and approved by ADB's Investment Committee.[6] To ensure full utilization of the proposed loans within a reasonable time after Board approval, the additional 100 MW of projects will need to be financed by December 2016. Due diligence has been conducted on the first five borrowers, the sponsors, as well as their respective shareholders, directors, and key management. The project team will update due diligence during project implementation, and undertake due diligence on all additional borrowers.

3. The Borrower and Sponsors

8. All borrowers will be different SPVs controlled and owned by ASEPL. ASEPL was established by ACME to develop solar energy projects across India. ASEPL has 25 MW of operational solar photovoltaic projects in Madhya Pradesh, and 25 MW of projects under construction in Odisha. ASEPL is owned 50% by ACME (32% by ACME Cleantech Solution Limited [ACSL] and 18% by MKU Holdings Private Limited), 26% by EDF EN, and 24% by EREN. EDF EN and EREN have together committed to invest $100 million in ASEPL.

9. ACME is specialized in energy saving solutions for telecommunication companies and in the development of renewable energy projects. The company was founded in 2003 by Manoj Kumar Upadhyay, a research engineer in the telecommunications and power sectors. Headquartered in Gurgaon, India, ACME has over 20 offices in India and a presence in more than 10 countries.

10. EDF EN is fully owned by EDF, the second-largest utility in the world. EDF acquired EDF EN from Pâris Mouratoglou and other investors in 2011. EDF EN has more than 20 years of experience in solar power. With 7,190 MW of capacity in operation[7] and 2,320 MW of capacity

[3] Measure of intensity and availability of sunlight in a given location, which can be converted to electricity either through photovoltaic solar panels or concentrating solar thermal power technology.
[4] The global horizontal radiance estimation is based on the METEONORM 6.0 weather database developed by the private company Meteotest.
[5] Ministry of New and Renewable Energy. 2012. *Jawaharlal Nehru National Solar Mission. Phase II – Policy Document.* New Delhi (December).
[6] The borrowers for the additional projects will be different SPVs controlled and owned by ASEPL (para. 8).
[7] This consists of wind 6,255 MW, solar 719 MW, and others 216 MW.

under construction worldwide as of June 2014, EDF EN is a leading player in the renewable energy sector. EDF EN operates in 17 countries, mainly in Europe and North America, and more recently in Africa and the Middle East. EDF EN's turnover for the fiscal year ending 31 December 2013 was $1.7 billion.

11. EREN, founded in 2012 by Pâris Mouratoglou and David Corchia, is a company dedicated to renewable energies and natural resource savings. EREN has a diversified portfolio of circa 300 MW of renewable energy projects (wind, solar, and hydro power) in operation and construction in France, Greece, Italy, Israel and India and is an active investor in several companies with innovative technology solutions that allow for more efficient use of natural resources.

12. ASEPL's board of directors consists of four individuals: (i) Manoj Kumar Upadhyay, the founder of ACME; (ii) R. M. Samy from ASEPL, with over 30 years' experience in administration, corporate affairs, finance, and accounting; (iii) Antoine Garret, vice-president of EDF EN in charge of business development in Asia; and (iv) Pierre Dagallier, board member of the EREN group. The board of directors of ASEPL is supported by a well-qualified management team with a strong solar and/or business background.

B. Development Impact, Outcome, and Outputs

1. Impact

13. The project's impact will be the diversification of India's energy mix through the addition of renewable energy capacity, helping the country progress towards its clean energy targets.[8] To achieve sustainable long-term economic growth, India is promoting alternative sources of energy, such as solar, for power generation. Solar is a secure, reliable, and sustainable source of electricity that diversifies the country's energy mix, strengthening energy security and reducing reliance on fossil fuels.

14. The project also contributes to the acceleration and expansion of private sector investment, including FDI, in clean energy infrastructure in India. ASEPL and its shareholders see ADB's potential assistance as a key success factor to expanding the company's solar portfolio. In particular, it is expected that ADB's assistance will help demonstrate the viability of the JNNSM phase 2 offtake structure, which in turn will help attract further investments in the Indian solar sector from both within and outside India.

2. Outcome

15. The project's outcome is increased solar power capacity installed and operated by the private sector. The project will generate 380,000 megawatt-hours of clean energy per annum and contribute to avoiding 280,000 tons of carbon dioxide emissions annually from 2018 onwards.

[8] The government has established targets of adding 30 gigawatts of renewable power (including solar, wind, biomass, and small hydro) by 2017 under the Twelfth Five-Year Plan.

3. Output

16. The project output is the development and commissioning of 100 MW of solar photovoltaic power projects under JNNSM phase 2 by December 2015 and an additional 100 MW of solar photovoltaic power projects by December 2017.

C. Alignment with ADB Strategy and Operations

1. Consistency with Strategy 2020 and Country Strategy

17. The project is consistent with ADB's Midterm Review of Strategy 2020.[9] The midterm review calls for investing $2 billion annually in clean energy (including renewable energy). The midterm review highlights the key role of the private sector in climate change mitigation and confirms that ADB should continue to prioritize private sector operations in clean and renewable energy. The project is aligned with ADB's India country partnership strategy, 2013–2017, which calls for "investments in renewable energy development, particularly solar."[10]

2. Consistency with Sector Strategy and Relevant ADB Operations

18. The project is fully aligned with ADB's Energy Policy.[11] The policy states that support for renewable energy projects will be prioritized and broadened. In 2013, ADB increased its target of clean energy investments to $2 billion a year from the previous target of $1 billion a year. As part of the policy implementation, ADB is emphasizing private sector participation as a tool to increase energy sector efficiency by introducing increased competition and increased investable resources. The proposed investment also contributes to ADB's Asia Solar Energy Initiative and complements sovereign interventions in the sector (for example, the sovereign project that is supporting renewable power evacuation from Rajasthan to other states).[12]

D. Project Cost and Financing Plan

19. The total funding requirement for the 200 MW pipeline is estimated at $265 million.

20. Confidential information deleted.

---

[9] ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila.

[10] ADB. 2013. *Country Partnership Strategy: India, 2013–2017.* Manila.

[11] ADB. 2009. *Energy Policy.* Manila.

[12] ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Administration of Loans and Technical Assistance Grant to India for Rajasthan Renewable Energy Transmission Investment Program.* Manila.

E. Implementation Arrangements

21. Table 4 summarizes the implementation arrangements.[13]

Table 4: Summary of Implementation Arrangements

Aspects	Arrangements
Implementation period	The construction period for the first five projects (100 MW) is from October 2014 to April 2015. The life of the PPA with SECI is 25 years from COD. The remaining 100 MW of projects will be developed between 2015 and 2017.
Construction arrangements Engineering, procurement, and construction	All projects will enter into lump-sum turnkey contracts (EPC contracts) for the procurement and supply of foreign and domestic equipment and erection, construction, and services for the project. The EPC contracts will include standard provisions for liquidated damages on schedule and performance.
Equipment supplier	For the first five projects, ACSL will source panels from well-reputed suppliers and from different technologies (thin film, multi-crystalline). All selected technologies are suited to warm and dry environments such as Rajasthan. All modules will benefit from performance warranties for 25 years. The remaining 100 MW of projects will use suppliers of similar quality, to ADB's satisfaction.
Civil works	Confidential information deleted
Transmission line and connection to the grid	The electricity generated from the five first projects will be evacuated from the project site to the nearest substation under the responsibility of Rajasthan Vidyut Prasaran Nigam Limited through a 132-kilovolt double-circuit transmission line to be built under the EPC contracts of the five projects. The substation is under construction and is expected to be operational by December 2014.
Operations arrangements Revenue structure	Each borrower of the first five projects has entered into a PPA with SECI, which is wholly owned by the Government of India, to sell 100% of the output of the project for a period of 25 years at a fixed tariff of Rs5.45 per kWh ($0.089 per kWh). SECI will on-sell the electricity to a pool of distribution utilities (10–20 state electricity boards or distribution utilities) under a power sale agreement at a price of Rs5.50 per kWh ($0.09 per kWh) and for a period of 25 years. The PPA provides for the payment of a subsidy—the viability gap funding—over the first 5 years of operation. The viability gap financing is payable in six tranches: 50% is paid upon successful commissioning and 50% is released over the next 5 years in five equal installments of 10% if the borrower maintains a certain level of electricity generation. For the remaining 100 MW of projects, output will be sold to government-owned entities such as state utilities or central government entities such as SECI or private sector offtakers with a credit standing, to ADB's satisfaction.
Operation and maintenance	ASEPL will be responsible for operation and maintenance of all projects for 25 years from COD.
Performance monitoring	Key performance indicators will be reported by the borrowers of the ACME-EDF Solar Power Project and monitored by ADB. In addition, during the construction phase, ADB will appoint an independent lenders' technical advisor to monitor progress, attend performance testing, and certify COD.

ADB = Asian Development Bank; ASEPL = Acme Solar Energy Limited; COD = commercial operations date; EPC = engineering, procurement, and construction; kWh = kilowatt-hour; MW = megawatt; PPA = power purchase agreement; SECI: Solar Energy Corporation of India.
Source: ACME Solar Energy Private Limited.

[13] Details of Implementation Arrangements (accessible from the list of linked documents in Appendix 2).

F. Projected Financial and Economic Performance

22. Confidential information deleted.

III. THE PROPOSED ADB ASSISTANCE

A. The Assistance

23. ADB will provide up to $100 million (or Indian rupee equivalent) in limited-recourse loans to multiple SPVs owned by ASEPL to finance 200 MW of solar photovoltaic power projects during 2014–2016.

B. Value Added by ADB Assistance

24. The proposed transaction merits ADB's assistance for the following reasons:

(i) **Solar power policy support**. ADB will support the first round of projects financed under JNNSM phase 2. While the objective of JNNSM phase 1 was to pilot different solar power technologies in India, the objective of phase 2 is to dramatically scale up capacity addition in the sector. ADB's assistance will help demonstrate the viability and bankability of the new offtake structure (i.e., pooling of multiple offtakers through the Solar Energy Corporation of India [SECI]), which will ensure the success of the subsequent rounds of phase 2.

(ii) **Single Board approval, multiple projects**. The requested Board approval will enable ADB to support multiple projects that likely would have been too small for separate financing by ADB. Further, ADB's commitment for a total of $100 million in long-term project finance loans through a single Board approval will enable ASEPL to implement additional solar photovoltaic projects in a manner that delivers competitively priced solar tariffs to Indian distribution utilities.

(iii) **Foreign direct investment support**. ADB's assistance will support the entrance of leading foreign renewable energy players (EDF EN and EREN) into the Indian market. ADB's assistance will facilitate $100 million in FDI, which EDF EN and EREN have committed to invest as equity in ASEPL. In addition to much-needed capital, FDI will bring new technical knowledge and expertise to the country.

C. Risks[14]

25. **Offtaker risk.** The first five projects have entered into a power purchase agreement with SECI at a tariff of Rs5.45 per kWh. SECI will on-sell the power to a pool of distribution utilities and bulk purchasers (10–20 offtakers) at a price of Rs5.50 per kWh. These projects are exposed to a nonpayment risk from SECI and indirectly from SECI's offtakers. However, (i) the competitive tariff of Rs5.45 and the renewable purchase obligation partly mitigates the risk of state utilities' default in the short and long term; (ii) the first five projects benefit from a diversification effect of the final electricity purchasers; and (iii) SECI is a Government of India enterprise and, as such, benefits from the implicit support from the central government.

26. Confidential information deleted**.**

27. Confidential information deleted.

[14] This section relates to the first five projects awarded under JNNSM phase 2.

28. **Technology risk.** All modules selected for the first five projects are proven technologies which have been in commercial operation globally for more than 10 years. EDF EN led the selection and certification of technology and equipment providers, providing an additional level of comfort. Unique local conditions in Rajasthan, such as high ambient air temperatures and high levels of dust and soiling, could impair module performance. The forecast of energy yields has conservatively factored in the loss in performance caused by high temperatures, soiling, and other factors. Adequate performance guarantees and liquidated damages will be obtained from manufacturers and engineering, procurement, and construction (EPC) contractor.

29. Confidential information deleted.

30. Confidential information deleted.

31. **Construction delay risk**. Under the SECI power purchase agreement, commissioning for the first five projects is due by 28 April 2015. A delay of more than 3 months in the commissioning date of the first five projects will affect the tariff, resulting in reduced cash flows for the project. Risk of delay beyond 3 months is viewed as limited because (i) the EPC contractor and the sponsors have extensive experience, and (ii) the EPC contract will provide for liquidated damages for any delay in completion.

32. **Operation and maintenance risk**. Operation and maintenance (O&M) risk for a solar photovoltaic plant is primarily limited to ensuring adequate cleaning and replacing inverters after 10 years. ASEPL is considered to have the necessary experience, being the O&M contractor for its 40 MW operational portfolio since 2012. O&M risk is not considered significant.

33. Confidential information deleted.

IV. POLICY COMPLIANCE

A. Safeguards and Social Dimensions

34. The project is processed as corporate finance from a safeguards and social dimensions perspective, with ADB funds expected to be allocated for implementing specific solar projects. In compliance with ADB's Safeguard Policy Statement (2009), the project is classified category B for environment and involuntary resettlement and category C for indigenous peoples. The potential environmental and social impacts of the projects will be identified and effective measures to avoid, minimize, mitigate, and compensate for the adverse impacts will be incorporated in the safeguard reports and plans. In addition to compliance with the safeguard requirements for individual projects, ASEPL has established and commits to maintain an environmental and social management system (ESMS) to screen, assess, and address environmental and social impacts and risks. The institutional capacity and commitment of ASEPL to manage the project's social and environmental impacts are deemed adequate.

35. The first five projects, developed under JNNSM phase 2 in Jodhpur district, Rajasthan will be constructed on government land, classified as barren and non-agriculture land. ASEPL will avoid any impacts on local population by excluding from the project site parcels of land used by locals for grazing or agricultural purposes. Unavoidable impacts, if any, on non-titleholders occupying the government lands will be addressed in line with ADB requirements. An audit of the land procurement process to confirm compliance with ADB's Safeguard Policy Statement (2009) requirements on involuntary resettlement and that no impacts on indigenous peoples

occurred will be carried out. Information disclosure and consultations will be carried out in accordance with ADB requirements.[15]

36. A corporate audit was conducted on the ASEPL's ESMS. Key findings of the audit show that the ESMS is substantively compliant with ADB's Safeguard Policy Statement requirements, while gaps exist with respect to the actual implementation of ESMS provisions, for which corrective actions have been agreed upon by ASEPL. ASEPL commits to have in place an ESMS that is compliant with the Safeguard Policy Statement, which is satisfactory to ADB, prior to the first disbursement. ASEPL's project selection criteria will include that only projects with land allotted by government or purchased in the private land market will be eligible for inclusion. ASEPL will submit monitoring reports on the implementation of its ESMS and the projects. In addition, an initial environmental examination and a resettlement plan or a due diligence report documenting the negotiated settlement for land acquisition will be prepared for each of the projects to be funded by the ADB loan (para. 7).

37. **Other social dimensions.** ASEPL is committed to prioritizing local residents for jobs created during construction and operation. ASEPL's human resource policies promote equal opportunities for women and ensure that the rights of women are protected. The project is classified as having no gender elements. ADB will ensure that the investment documentation includes appropriate provisions requiring the borrowers to comply with national labor laws and, in addition, to take specific measures (including in relation to contractors) in relation to the internationally recognized core labor standard for the ADB-financed portion of the project, in compliance with ADB's Social Protection Strategy.[16]

B. Anticorruption Policy

38. ASEPL was advised of ADB's policy of implementing best international practice relating to combating corruption, money laundering, and the financing of terrorism. ADB will ensure that the financing documentation includes appropriate provisions prohibiting corruption, money laundering, and the financing of terrorism, and remedies for ADB in the event of noncompliance.

C. Investment Limitations

39. The proposed loan is within the medium-term, country, industry, group, and single project exposure limits for nonsovereign investments.

D. Assurances

40. Consistent with the Agreement Establishing the Asian Development Bank, the Government of India will be requested to confirm that it has no objection to the proposed assistance to ASEPL and its subsidiaries. ADB will enter into suitable finance documentation, in form and substance satisfactory to ADB, following approval of the proposed assistance by the Board of Directors.

---

[15] Summary Poverty Reduction and Social Strategy; and Findings of the Corporate Safeguards Audit: Environmental and Social Management System Arrangement (accessible from the list of linked documents in Appendix 2).

[16] ADB. 2003. *Social Protection.* Manila (adopted in 2001).

V. RECOMMENDATION

41. I am satisfied that the proposed loans would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loans of up to $100,000,000 (or Indian rupee equivalent) to special purpose vehicles owned and controlled by ACME Solar Energy Private Limited for the ACME-EDF Solar Power Project in India from ADB's ordinary capital resources, with such terms and conditions as are substantially in accordance with those set forth in this report, and as may be reported to the Board.

Takehiko Nakao
President

24 September 2014

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and/or Indicators with Baselines	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
Impacts Continued development of renewable energy in India Greater private sector participation in the Indian renewable energy sector	Share of renewable energy (including hydropower) in total installed capacity maintained at 31% until 2022 (end of 13th 5-Year Plan) Private sector share of total installed capacity of renewable energy (including hydropower) increases from 33% in 2011 to 50% in 2022 (end of 13th plan)[a]	ADB estimates based on capacity addition for the 12th and 13th plans, cited in Central Electricity Authority's 2012 National Electricity Plan	**Assumptions** Continued macroeconomic and political stability at the central and state levels Regulatory incentives for renewable energy projects remain
Outcome Increased solar power supply by the private sector	380,000 megawatt-hours generated annually from 2018 onwards 280,000 tons of CO_2 avoided annually from 2018 onwards[b] FTE employment of 70 people for operation and maintenance services from 2018 onwards Contribution of government revenue of $3 million from 2018 onwards	Development effectiveness monitoring reports Company reports from human resources department Audited financial statements	**Assumptions** Power purchase agreements honored Continuity of qualified company management **Risks** Interconnection risk Operational risks causing disruption in power production
Output Development and commissioning of a portfolio of solar power projects in India	100 MW of JNNSM solar photovoltaic capacity commissioned by Dec 2015 100 MW of additional solar photovoltaic capacity commissioned by Dec 2017 Locally purchased goods and services amount to $100 million during 2014–2017 FTE employment of 150 people during construction in 2014–2017	Company progress reports Development effectiveness monitoring reports Audited financial statements Company reports from human resources department	**Assumption** Business plans are executed in a timely fashion and within budget **Risks** Construction delay risk
Activities with Milestones 1.1 Financial close of 100 MW of JNNSM projects achieved by December 2014 1.2 COD of the 100 MW of JNNSM projects achieved by December 2015 1.3 Financial close of remaining 100 MW of projects achieved by December 2016 1.4 COD of remaining 100 MW of projects achieved by December 2017			**Inputs** Equity: $66 million Project debt: (i) ADB: $100 million; (ii) other lenders: $99 million

ADB = Asian Development Bank, CO_2 = carbon dioxide, COD = commercial operations date, FTE = full time equivalent, JNNSM = Jawaharlal Nehru National Solar Mission, MW = megawatt.

[a] Target assumes 10% of hydro power capacity addition by the private sector and 90% of other renewable energy capacity addition by the private sector in the 12th and 13th 5-year plan periods.

[b] 380 gigawatt-hours x 739.73 (ADB's conversion factor) = ~280,000 tons of CO_2 avoided.

Source: Asian Development Bank.