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

Project Number: 52196-001
November 2019

# Proposed Loan, Administration of Loan, and Administration of Technical Assistance Grant
# Energy Efficiency Services Limited
# Scaling Up Demand-Side Energy Efficiency Sector Project
# (Guaranteed by India)



Asian Development Bank

## CURRENCY EQUIVALENTS
(as of 1 October 2019)

| Currency unit | = | Indian rupee/s (₹) |
|---|---|---|
| ₹1.00 | = | $0.01415 |
| $1.00 | = | ₹70.6485 |

## ABBREVIATIONS

| | | |
|---|---|---|
| ADB | – | Asian Development Bank |
| CTF | – | Clean Technology Fund |
| EARF | – | environmental assessment and review framework |
| EESL | – | Energy Efficiency Services Limited |
| ESCO | – | energy service company |
| FIRR | – | financial internal rate of return |
| O&M | – | operation and maintenance |
| PAM | – | project administration manual |
| TA | – | technical assistance |
| $tCO_2$ | – | ton of carbon dioxide |

## NOTES

(i) The fiscal year (FY) of the Government of India and its agencies ends on 31 March. "FY" before a calendar year denotes the year in which the fiscal year ends, e.g., FY2020 ends on 31 March 2020.

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

| | |
|---|---|
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| **Peer reviewer** | Yongping Zhai, Chief of Energy Sector Group, SDCC |

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# PROJECT AT A GLANCE

**1. Basic Data** — **Project Number:** 52196-001

| | | | |
|---|---|---|---|
| **Project Name** | Scaling Up Demand-Side Energy Efficiency Sector Project | **Department/Division** | SARD/SAEN |
| **Country** | India | **Executing Agency** | Energy Efficiency Services Limited |
| **Borrower** | Energy Efficiency Services Limited | | |
| **Country Economic Indicators** | https://www.adb.org/Documents/LinkedDocs/?id=52196-001-CEI | | |
| **Portfolio at a Glance** | https://www.adb.org/Documents/LinkedDocs/?id=52196-001-PortAtaGlance | | |

**2. Sector**

| | Subsector(s) | ADB Financing ($ million) |
|---|---|---|
| ✓ **Energy** | Energy efficiency and conservation | 250.00 |
| | **Total** | **250.00** |

**3. Operational Priorities**

- ✓ Addressing remaining poverty and reducing inequalities
- ✓ Accelerating progress in gender equality
- ✓ Tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability
- ✓ Strengthening governance and institutional capacity

**Climate Change Information**

| | |
|---|---|
| $CO_2$ reduction (tons per annum) | 245,000 |
| Climate Change impact on the Project | Low |

**ADB Financing**

| | |
|---|---|
| Mitigation ($ million) | 108.30 |

**Cofinancing**

| | |
|---|---|
| Mitigation ($ million) | 46.00 |

**Sustainable Development Goals**

SDG 5.b
SDG 7.a
SDG 13.a

**Gender Equity and Mainstreaming**

Effective gender mainstreaming (EGM) ✓

**Poverty Targeting**

General Intervention on Poverty ✓

**4. Risk Categorization:** Complex

**5. Safeguard Categorization** **Environment:** C **Involuntary Resettlement:** C **Indigenous Peoples:** C

**6. Financing**

| Modality and Sources | Amount ($ million) |
|---|---|
| **ADB** | **250.00** |
| Sovereign Project (Regular Loan): Ordinary capital resources | 250.00 |
| **Cofinancing** | **46.00** |
| Clean Technology Fund - Project loan (Full ADB Administration) | 46.00 |
| **Counterpart** | **296.00** |
| Government | 296.00 |
| **Total** | **592.00** |
| Note: An attached technical assistance will be financed on a grant basis by the Clean Technology Fund in the amount of $1,900,000. | |

**Currency of ADB Financing:** US Dollar

Source: Asian Development Bank

# I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to Energy Efficiency Services Limited (EESL), to be guaranteed by India, for the Scaling Up Demand-Side Energy Efficiency Sector Project. The report also describes the proposed (i) administration of a loan, and (ii) administration of technical assistance (TA), both to be provided by the Clean Technology Fund (CTF), for the Scaling Up Demand-Side Energy Efficiency Sector Project, and if the Board approves the proposed loan, I, acting under the authority delegated to me by the Board, approve the administration of the loan and the administration of the TA.[1]

2. The project will be the second Asian Development Bank (ADB) loan to EESL to support the expansion of investments in energy efficiency. The project will follow tested and improved new business models to exploit vast investment opportunities in energy efficiency. Key areas of intervention will include (i) deployment of distributed solar photovoltaic systems in rural agricultural areas, smart meters, and electric vehicles (e-vehicles) with charging stations; and (ii) end-user energy-efficiency awareness and capacity development.

# II. THE PROJECT

## A. Rationale

3. India witnessed strong economic expansion between FY2003 and FY2016, when the economy grew by an average of about 7.2%. Annual carbon dioxide emissions from fuel combustion have grown even faster, from 0.89 billion tons in 2000 to 1.87 billion tons in 2013 to 2.02 billion tons in 2016.[2] The energy mix in India is still largely based on fossil fuels and is dominated by coal even though the country is striving to achieve cumulative 175 gigawatts of renewables by 2022 from about 80 gigawatts as of August 2019. India's energy-efficiency potential remains largely untapped, with potential annual energy savings of more than 220,000 gigawatt-hours—equivalent to about 17% of the country's total power generated in FY2019.[3]

4. **Sector development plan.** The Government of India (the government) has recognized the need to achieve more sustainable economic growth while reducing carbon emissions. The Energy Conservation Act (2001) formalized the government's strategy to reduce demand for energy without jeopardizing growth by increasing energy efficiency. The 2010 National Mission for Enhanced Energy Efficiency was one of eight national missions by the government under the National Action Plan on Climate Change, launched in 2008. National missions are designed to introduce innovative business models to strengthen the market for energy efficiency products and services. In April 2015, the government launched the National Electric Mobility Mission Plan 2020 to support increased usage of e-vehicles. The India National Smart Grid Mission (Phase 2, 2017–2020) elucidates key objectives and guidelines for reducing system losses, deploying advanced metering infrastructure, promoting energy storage solutions, and increasing e-vehicle usage. Advance metering infrastructure includes smart meters and communications devices that allow end-users to track electricity consumption and allow distribution companies to plan and improve billing and collection efficiency.

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[1] CTF is the fund of about $5.4 billion under the Climate Investment Funds established by approval of the International Bank for Reconstruction and Development executive directors on 1 July 2008 and governed under the CTF Governance Framework.

[2] International Energy Agency. Statistics. http://www.iea.org/statistics/ (accessed 15 November 2018).

[3] World Bank. 2016. *Utility Scale DSM Opportunities and Business Models in India*. World Bank Energy Sector Management Assistance Program. Washington, DC.

5. In 2015, the government pledged, through its nationally determined contribution to the United Nations Framework Convention on Climate Change, to reduce the energy intensity of its economy by 33%–35% from 2005 levels by 2030.[4] To meet its 2015 pledge, the government must address several barriers. These barriers are (i) on the regulatory side, most distribution utilities continue to subsidize retail electricity prices, and energy-efficiency programs remain voluntary; (ii) at the institutional level, capacity to scale up energy-efficient technologies remains limited; (iii) on the financial side, the economic benefits of investments, even when quantifiable, cannot be readily monetized and delivered as upfront financing; and (iv) on the consumer awareness side, understanding of energy-saving technologies and associated benefits remains limited, which in turn limits market penetration.

6. **Borrower.** EESL, established as a public sector energy service company (ESCO)[5] in 2009, is a joint venture of four public sector undertakings of the Ministry of Power (MoP): NTPC Limited, Powergrid Corporation of India Limited, Power Finance Corporation, and Rural Electrification Corporation.[6] As an implementing arm of the Bureau of Energy Efficiency under MoP, EESL pursues large-scale energy efficiency focused investments with a comprehensive service package of project design, implementation, monitoring, and investment. ADB approved a loan to EESL in 2016 for the Demand Side Energy Efficiency Sector Project, which focuses on efficient lighting and appliances, and is being implemented in a satisfactory manner.[7] EESL has also successfully implemented several similar projects supported by the German development cooperation through KfW, Agence Française de Développement, and the World Bank.

7. **The approach of Energy Efficiency Services Limited.** The company's overall approach is evolving to create a cycle of more innovation, more transparency, and more transformation. It adopts low-emission solutions that deliver benefits across all levels: individuals, institutions, utilities, and the government. EESL implements rigorous energy audits and technology needs assessments, followed up by pilot projects to assess performance and calculate energy savings. EESL invests in and implements projects and retains operational responsibility through service level agreements throughout the project life. Typically, EESL is paid back by the beneficiary over time from the resulting energy savings, thereby addressing the upfront cost barriers that hinder some energy-efficiency projects. Repayment terms are based in part on a deemed savings approach.[8] Furthermore, EESL regularly invests and partners with other technology developers and private sector ESCOs to pilot-test and promote new energy-efficient technologies and business models. ADB is administering a grant from the Global Environment Facility to support expansion of EESL's ESCO business to new energy-efficient technologies.[9]

8. **Rationale for sector lending.** The sector loan modality allows for implementation of subprojects with high readiness and inclusion of newer subprojects as they are developed,

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[4] Government of India, Ministry of Environment, Forest and Climate Change. 2015. *India's Intended Nationally Determined Contribution to the United Nations Framework Convention on Climate Change.* New Delhi.

[5] An ESCO company makes an investment and recovers costs from its clients based on agreed energy-saving parameters. Private sector ESCOs have exhibited limited growth because of the reasons outlined in para 5.

[6] NTPC Limited, formerly known as National Thermal Power Corporation Limited, is an Indian Public Sector Undertaking and engaged in the business of electricity generation and allied activities.

[7] ADB. 2016. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Energy Efficiency Services Limited for the Demand Side Energy Efficiency Sector Project in India*. Manila.

[8] A deemed savings approach involves upfront estimation of energy savings that will be achieved from the project, which is agreed by both parties and serves as the basis for annuity payments made during the project life.

[9] ADB is supporting EESL in setting up a revolving fund to pilot-test new technologies and business models through Additional Financing - Demand-Side Energy Efficiency Sector Project of $13 million approved in September 2018. EESL is developing a new Global Environment Facility project to promote e-mobility in India with ADB and the UN Environment Programme as partners.

irrespective of their physical location. A sector roadmap of the Government of India is available (para. 4), and adequate implementation capacity in EESL and states exists (para. 7). Therefore, the sector loan modality is considered appropriate. The loan will also complement support from other development partners such as the World Bank, KfW, and others.

9. **Alignment with ADB priorities.** The project is consistent with ADB's country partnership strategy for India, 2018–2022, which aims to boost economic competitiveness to create more and better jobs; provide inclusive access to infrastructure networks and services; address climate change through renewable energy development, energy efficiency, and development of low-carbon and nonmotorized transit; and increase climate resilience.[10] The project will also contribute to meeting ensuring access to affordable, reliable, sustainable and modern energy for all (Sustainable Development Goal 7). The project is aligned with the following operational priorities of ADB's Strategy 2030:[11]

(i) addressing remaining poverty and reducing inequalities (by prioritizing investments that provide more reliable electricity services to agricultural consumers);
(ii) tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability (through large-scale investments in distributed clean energy, smart grid, and electric transport services);
(iii) making cities more livable (through investments in electrified transport services);
(iv) accelerating progress in gender equality (by providing training and awareness for women in the project areas); and
(v) promoting rural development and food security (by providing more reliable electricity services to agricultural consumers).

## B. Project Description

10. The project is aligned with the following impact: emissions intensity of economy reduced.[12] The project will have the following outcome: end-use energy efficiency in the project areas increased.[13]

11. **Output 1: Energy-efficient technologies in utility service areas in eligible states (including Andhra Pradesh, Assam, Bihar, Delhi, Gujarat, Jharkhand, Maharashtra, Manipur, Meghalaya, Odisha, Rajasthan, Sikkim, Telangana, Tamil Nadu, Tripura, and Uttar Pradesh) promoted and deployed.[14]** EESL has successfully created a "new normal" for more efficient lighting, pumping, and buildings. EESL is now expanding its market scope to include "upstream" efficiency opportunities that have not been targeted by traditional ESCO investments, including smart meters, distributed solar photovoltaic systems, and e-vehicles. Installation of distributed solar photovoltaic systems will reduce network losses, improve power quality in the low-voltage electricity distribution network, and reduce the need for new centralized electricity generation plants. Deployment of e-vehicles and charging stations will increase overall energy

[10] ADB. 2017. *Country Partnership Strategy: India, 2018–2022—Accelerating Inclusive Economic Transformation.* Manila.
[11] ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific*. Manila.
[12] Government of India, Ministry of Environment, Forest and Climate Change. 2015. *India's Intended Nationally Determined Contribution: Working Towards Climate Justice.* New Delhi.
[13] The design and monitoring framework is in Appendix 1.
[14] Eligible states are those agreed by EESL and ADB based on ongoing programs or strong demand. Eligibility criteria and selection process are mentioned in the Project Administration Manual (accessible from the list of linked documents in Appendix 2).

efficiency in transport services while reducing consumption of petroleum fuels and improving energy security.

12. **Output 2: End-user energy-efficiency awareness and capacity increased.** The aim of this output is to create awareness of the benefits of using energy-efficient technologies, and persuade people to adopt; and other key stakeholders such as distribution companies to promote energy-efficient measures. EESL's business is concentrated on the retail end of the energy supply chain, and as such is dependent on consumer acceptance of efficiency interventions. Awareness campaigns under this output will engage local organizations in knowledge-sharing and training activities, with a focus on women electricity consumers. Capacity building for electricity distribution companies, electricity regulatory agencies, and other government agencies is another component of this output.

13. **Core subprojects.** EESL and ADB have conducted due diligence of sample core subprojects in distributed solar, smart metering, and e-vehicle deployment in Maharashtra and Andhra Pradesh.[15] EESL will ensure that all subprojects contribute to the sector development plan (para. 4). EESL and ADB will appraise, select, and approve subprojects following criteria and procedures outlined in the project administration manual (PAM), to the satisfaction of ADB.[16] The eligibility criteria for sub-projects include:

(i) have a detailed project report completed in a format and to a level of detail that are acceptable to ADB;
(ii) have all counterparty arrangements agreed, including implementation schedules and repayment terms;
(iii) be scheduled for completion no later than March 2025;
(iv) yield a financial internal rate of return exceeding its weighted average cost of capital, with an economic internal rate of return of at least 9%;
(v) meet category C of ADB's Safeguard Policy Statement (2009) for environment, indigenous people, and involuntary resettlement; and
(vi) use no funds from other bilateral and multilateral sources, unless complementary arrangements are clearly agreed beforehand, to avoid duplication and double counting.

14. Effective gender mainstreaming approaches will be undertaken for each output to maximize gains where appropriate. The project will build on the experience gained since 2016, expanding the scope of EESL's operations to include activities which have not been addressed by the traditional ESCO business, specifically distributed solar photovoltaic systems, e-vehicles, and smart metering.

## C. Value Added by ADB

15. The project will incorporate lessons learned from ADB's ongoing Demand Side Energy Efficiency Sector Project. The loan will help scale up promotion of demand-side energy efficiency technologies and replicate the successes of and lessons learned from the ongoing ADB project. These include (i) providing sufficient timeline and manpower for EESL to reach agreement and implement subprojects in the eligible states; and (ii) provision for large contract package with multiple smaller lots to address manufacturing constraints while maintaining economy of scale for cost reduction and quality assurance. The project will also complement other ADB energy sector investment operations, even though most of those are on the supply side—in electricity generation, transmission, and distribution. This will be one of the few ADB projects that specifically

[15] Subprojects from other states where ADB operates may also be included, subject to further due diligence and acceptance by ADB following its eligibility requirements.
[16] Project Administration Manual (accessible from the list of linked documents in Appendix 2).

focuses on demand-side energy efficiency and business models; this model can be scaled up in India and other ADB developing member countries. EESL continues to investigate opportunities to expand its services and create new market opportunities for its new technologies. One way it does this is through large-scale deployment of new business models such as leasing e-vehicles to remove up-front cost barriers to vehicle users. Investments in distributed solar use proven technologies combined with a relatively new business model for clean energy services. The smart metering component will represent one of the most comprehensive efforts to implement smart metering among ADB developing member countries. The attached TA will support continued investigation of new opportunities that can be rapidly scaled up and replicated across the region.

## D. Summary Cost Estimates and Financing Plan

16. The project is estimated to cost $592 million (Table 1). Detailed cost estimates by expenditure category and by financier are in the PAM (footnote 14).

**Table 1: Summary Cost Estimates**
($ million)

| Item | | Amount[a] |
|---|---|---|
| **A.** | **Base Cost**[b] | |
| | 1. Output 1: Energy-efficient technology deployment | 532.4 |
| | 2. Output 2: End-user energy-efficiency awareness and capacity development | 5.0 |
| | **Subtotal (A)** | **537.4** |
| **B.** | **Contingencies**[c] | **39.1** |
| **C.** | **Financial charges during implementation**[d] | **15.5** |
| | **Total (A+B+C)** | **592.0** |

[a] Includes taxes and duties of $54.8 million to be financed by Energy Efficiency Services Limited.
[b] In third quarter 2019 prices as of 30 July 2019.
[c] Physical contingencies computed at 2.0% of all equipment costs. Price contingencies computed at an average of 5.0% on local currency costs and 1.5% on foreign currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.
[d] Includes interest, commitment charges, and guarantee commission. Interest during construction (assumed to be 1 year as each of the subprojects are expected to be completed within 1 year) for Asian Development Bank (ADB) loan(s) has been computed at the 5-year fixed swap rate plus a spread of 0.5%. Commitment charges for an ADB loan is 0.15% per year to be charged on the undisbursed loan amount. Interest on domestic borrowing is computed at 8% per annum. A service charge (interest) of 0.25% per annum is levied on the disbursed Clean Technology Fund (CTF) loan and an administrative fee of 0.18% per year is also levied on the undisbursed CTF loan. Guarantee commission to the Government of India on ADB and CTF loans has been computed at 1.2% per annum on outstanding ADB loan.
Source: Asian Development Bank estimates based on discussions with Energy Efficiency Services Limited.

17. EESL has requested a sovereign guaranteed loan of $250 million from ADB's ordinary capital resources to help finance the project.[17] The loan will have a 20–year term, including a grace period of 5 years; 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 guarantee agreements. Based on this and the loan repayment schedule agreed with EESL, the average loan maturity is 12.75 years.

18. CTF will provide loan cofinancing equivalent to $46 million, to be administered by ADB. The CTF loan comes with a 40–year term, including a grace period of 10 years, an annual interest rate of 0.25%, a management fee of 0.18% per year, and such other terms and conditions set forth in the draft loan agreements. EESL will bear the foreign exchange risk under this loan. The

[17] ADB received a formal request of investment support of $500 million from the Department of Economic Affairs, Ministry of Finance on 24 May 2018 for this project being processed in a phased manner.

remaining financing will be mobilized by EESL, including debt from other lenders and equity contributions.

19. The summary financing plan is in Table 2. ADB will finance the expenditures in relation to: (i) smart meters; (ii) distributed solar photovoltaic systems; and (iii) e-vehicles and charging infrastructure. CTF will provide loan cofinancing equivalent for distributed solar photovoltaic systems, to be administered by ADB. EESL will finance taxes, equipment installation charges, contingencies, financing charges during implementation, and the cost of awareness campaigns.

**Table 2: Summary Financing Plan**

| Source | Amount ($ million) | Share of Total (%) |
|---|---|---|
| Asian Development Bank | | |
| Ordinary capital resources (regular loan) | 250.0 | 42.2 |
| Clean Technology Fund[a] | 46.0 | 7.8 |
| Energy Efficiency Services Limited | 296.0 | 50.0 |
| **Total** | **592.0** | **100.0** |

[a] Loan to be administered by the Asian Development Bank; loan amount includes administrative fees and other charges as may be deducted pursuant to the cofinancing agreement.
Source: Asian Development Bank estimates based on discussions with Energy Efficiency Services Limited.

20. Climate mitigation is estimated to cost $154.3 million. ADB will finance 70% ($108.3 million) and CTF will finance 30% ($46 million) of mitigation costs. These costs were estimated using ADB's guidance note on counting climate finance. Details are in the PAM.

## E. Implementation Arrangements

21. EESL will be the borrower for the project and will also serve as the executing and implementing agency for all subprojects under the ADB and CTF loans. ADB assistance will be used to support several energy-efficiency subprojects, some of which EESL has already identified and others that EESL will develop during project preparation and implementation. As requested by EESL, advance contracting and retroactive financing will be considered, subject to a ceiling of 20% and a time limit of not more than 12 months prior to the date of signing of loan agreement. Procurement will follow the ADB Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time). A project director within EESL will oversee implementation of subprojects under the ADB loan, including CTF-financed subprojects. The project director will coordinate across regional offices and distribution companies and ensure compliance with ADB requirements.

22. The implementation arrangements are summarized in Table 3 and described in detail in the PAM.

**Table 3: Implementation Arrangements**

| Aspects | Arrangements |
|---|---|
| Implementation period | December 2019–March 2025 |
| Estimated completion date | 31 March 2025 |
| Estimated loan closing date | 30 September 2025 |
| Management | |
| (i) Oversight body | EESL board |
| (ii) Executing agency | EESL |
| (iii) Key implementing agencies | EESL |
| (iv) Implementation unit | EESL's central and regional offices, about 100 staff to oversee |

| Aspects | Arrangements | | |
|---|---|---|---|
| Procurement | Open competitive bidding (internationally advertised) | Multiple contracts | $296 million |
| Consulting services | Not applicable | | |
| Retroactive financing and/or advance contracting | All eligible contract packages and eligible expenditures agreed between ADB and the borrower have been approved for retroactive financing and advance contracting. | | |
| Disbursement | The loan and CTF cofinancing proceeds will be disbursed following ADB's *Loan Disbursement Handbook* (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB. For the CTF-cofinanced packages, CTF financing will be front-loaded. | | |

ADB = Asian Development Bank, CTF = Clean Technology Fund, EESL = Energy Efficiency Services Limited.
Sources: Asian Development Bank and Energy Efficiency Services Limited estimates.

## III. ATTACHED TECHNICAL ASSISTANCE

23. The TA will support EESL in implementing the project. Areas of support will include expanding policy dialogue with the government, implementing the gender action plan for the project, mobilizing private sector participation in energy-efficiency services, identifying new business opportunities, transferring knowledge about successful energy-efficiency investments, and pilot-testing new technologies and business models. Additionally, the TA will support (i) project management consultants (primarily for monitoring and reporting); (ii) technology and business model analyses; (iii) identification and development of remaining subprojects; (iv) mapping of candidate sites for e-vehicle charging systems; (v) selective pilot-testing of promising technologies that can be rapidly deployed at scale; (vi) key elements of the gender action plan; and (vii) workshops and seminars.[18]

24. The TA is estimated to cost $2.1 million, of which $2.0 million will be financed on a grant basis by the CTF and administered by ADB. EESL will provide counterpart support in the form of counterpart staff, office accommodation, and other in-kind contributions.

## IV. DUE DILIGENCE

### A. Technical

25. The project will adopt advanced proven energy-efficient technologies including grid-connected solar photovoltaic, e-vehicles and charging systems, and smart metering to reduce electricity network losses and reduce greenhouse gas emissions. The distributed solar component will generate electricity at distribution substations in rural areas; this will help distribution companies reduce technical losses and achieve performance targets. Smart metering improves billing and collection efficiency and facilitates introduction of more efficient and interactive pricing and demand response options allowing customers and utilities to reduce their costs. E-vehicles reduce overall energy consumption and reduce street-level emissions, providing direct public health benefits. It is expected that the project's energy savings will total 266 gigawatt-hours annually, while greenhouse gas emissions will be reduced by 245,000 tons of carbon dioxide ($tCO_2$) annually.[19] EESL has confirmed that equipment and systems will be (i) suitable for local conditions; taking into account issues such as mandated reliability and the quality of the electricity supply; (ii) backed by warranties and maintenance contracts from suppliers, system

[18] Attached Technical Assistance Report (accessible from the list of linked documents in Appendix 2).
[19] The estimated emissions reductions are from the distributed solar photovoltaic component only to be conservative and 19% capacity factor and 0.92 $tCO_2$ per megawatt-hour emission factor are used.

integrators, and service providers; and (iii) serviceable locally. The technical specifications for energy-efficient technologies will comply with national and international standards. Laboratory testing of samples of procured equipment will be undertaken to include both safety and equipment life parameters.

## B. Economic and Financial Viability

26. The project is economically and financially viable.[20] Distributed solar subprojects under output 1 will provide clean daytime electricity supply at the point of demand for rural consumers, reducing upstream network losses and displacing coal-fired power generation. They will also provide secondary economic benefits via improved power quality, particularly voltage levels. EESL wants to spark India's e-vehicle aspirations by aggregating public sector demand for e-vehicles, thereby guaranteeing substantial volumes to allow prospective manufacturers to invest in domestic e-vehicle manufacturing facilities. In turn, this will demonstrate that, despite India's heavy reliance on coal-fired generation, e-vehicles can still generate net environmental and economic benefits. Smart metering provides a direct means through which electricity distributors can address pervasive billing and collection inefficiencies (collectively termed "commercial losses"). Although most of these avoided losses will be converted into sales with no net economic benefit, a significant reduction in wasteful end use of energy (an economic resource cost saving) is still expected. The economic internal rates of return for the subprojects are 9.5% for e-vehicles, 15.7% for distributed solar photovoltaic, and 16.6% for smart meters. Questions remain over the expected life of the e-vehicle batteries. EESL is largely insulated from this risk by way of manufacturers' performance warranties, but shorter-than-expected battery life still represents a risk to the subproject's economic performance.

27. ADB conducted a financial analysis of one sample subproject for each of the subproject areas of intervention (distributed solar photovoltaic systems, e-vehicles, and smart meters) being financed by ADB under output 1. The financial internal rate of return (FIRR), calculated on a real post-tax basis (and assuming no reflow of loan proceeds) is 2.70% for the smart meter subproject and 3.23% for the e-vehicle subproject—in both cases higher than the weighted average cost of capital of 2.20%. In the case of the distributed solar subproject, which is also cofinanced by the CTF loan, the real post-tax FIRR is 1.1% per annum, against a weighted average cost of capital of 0.5%. The analysis indicates that the project would generate an even higher FIRR if subsequent reflows from the investments are considered. Although the ADB loan is for a 20–year tenor, cost recovery of assets financed under the project (except distributed solar photovoltaic which will earn revenue over 25 years) would range from 6 years to 8 years. Consequently, the tenor of the ADB loan is substantially longer than the tenor of the cash reflows that EESL will receive through a transfer of assets. EESL will use such cash flows for similar subprojects until the ADB loan is repaid, which may widen the impact of the project.

28. EESL's financial performance during 2017–2019 has shown aggressive growth, with revenue increasing from ₹12.3 billion in FY2017 to ₹19.4 billion in FY2019, and post-tax profit increasing to ₹951 million in FY2019 from ₹519 million in FY2017. EESL's investment plan is ambitious and will be a challenge from the perspectives of access to investment capital and institutional capacity.

[20] Financial Analysis and Economic Analysis (accessible from the list of linked documents in Appendix 2).

## C. Sustainability

29. All subprojects will be revenue-generating and financially sustainable. Rigorous subproject selection criteria will ensure that only financially and economically viable projects are selected. The ESCO business model adopted by EESL implies that the annuity is set to recover the full cost of debt, plus a return on equity including income tax. Other costs, like taxes, duties, and operation and maintenance (O&M) charges would be billed and recovered periodically at actuals.[21] Payment is secured by way of escrow accounts, state government guarantee, and/or letters of credit. EESL is also continuing its focus on collections. The subprojects are also inherently sustainable with respect to environmental and social safeguards criteria (category C) and EESL's implementation capacity.

30. EESL is exploring various avenues to improve its current financial standing including increasing its equity base, to diversify funding sources to meet its growing financing requirements. Depending on the progress, and in due course, ADB may consider further assistance to EESL from its nonsovereign operations.

## D. Governance

31. The assessed pre-mitigation financial management risk is *moderate* mainly because of EESL's established financial management systems, its experience with ADB procurement procedures, and its satisfactory progress on the ongoing Demand-Side Energy Efficiency Sector Project.

32. **Financial management assessment.** EESL has robust budgeting and accounting systems in place, a finance department staffed by accounting professionals, an integrated enterprise resource planning system, and experience implementing ADB-funded projects. The assessed pre-mitigation financial management risk arising out of higher volumes of receivables from its customers in the urban and energy sectors and implementation risk due to EESL's strategy to diversify its business segments. EESL's customers are mainly government agencies that face liquidity issues and, consequently, are not prompt with their payments. EESL and state governments are aware of the situation and are taking measures to address the issue. EESL has agreed to significantly reduce its receivables balances to manageable levels within the next 3 years. In addition, the external auditors have issued qualified audit opinions on EESL financial statements for improvements in financial reporting.

33. ADB has been engaging continuously with EESL to evaluate and improve EESL's internal governance, receivables monitoring, and financial reporting. ADB has assessed EESL's financial management action plan and determined that EESL has complied with financial management requirements by formulating and/or implementing (i) a foreign exchange risk management framework, (ii) a framework for protection of project assets, and (iii) a framework for monitoring payment security. EESL has also agreed to an ADB requirement to appoint a chief risk officer to formulate a risk policy, taking into consideration the business plan of EESL. Under the attached TA, a financial management expert will assist EESL in improving financial management.

34. **Project procurement risk assessment.** EESL has a well-developed procurement system and a procurement policy that complies with the government's General Financial Rules, 2017. Its procurement department is staffed by experienced professionals who have extensive

[21] EESL recovers O&M charges, including insurance, on a pass-through basis based on incurred costs, capped at 2%–4% of project cost. Any differential between this and actual O&M costs would accrue to EESL.

experience delivering projects of similar size and complexity using open competitive bidding procedures. As per government guidelines, EESL has adopted an e-procurement system that is compliant with the Information Technology Act, 2000 and has been reviewed and is being used in ADB projects. Existing information management systems are easily accessed and can provide data to support contract negotiations, dispute resolutions, and required audits. EESL is implementing ADB-funded project and is familiar with ADB procurement requirements and processes. ADB will also continue to provide assistance in developing standard bidding documents to facilitate the smooth implementation of procurement plans and conduct prior review for procurement packages. The ADB Procurement Policy and Procurement Regulations for ADB Borrowers will be used for procurement packages that use ADB loan proceeds. Lowered procurement transaction cost through the use of the borrower's e-procurement system has also been considered to achieve value for money under strategic planning process. For procurement of goods and services for components of the project that use counterpart funds, EESL will follow its existing policies and rules.

35. ADB conducted integrity due diligence and identified no significant integrity risks.[22] ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and EESL. The specific policy requirements and supplementary measures are described in the PAM.

## E. Poverty, Social, and Gender

36. The project will contribute to sustainable economic development, poverty reduction, and social well-being through reduced electricity consumption, reduced energy consumption in transportation services, improved consumer awareness of electricity consumption patterns, and improved access to energy-efficient appliances for consumers. Project beneficiaries will be spread across the regions covered by the project and will include agricultural, residential, and institutional consumers, and electricity distribution companies in selected states in India. People will benefit from (i) economic investment and growth, (ii) improvements in basic infrastructure, and (iii) continued community support. A stakeholder communication plan will include end-user awareness programs in subproject areas that emphasize women's participation, gender-sensitive training, and the adoption and use of energy-efficient technologies.

37. **Gender.** The project is categorized as *effective gender mainstreaming*. The project includes affirmative gender actions that will maximize benefits to women. EESL and ADB conducted extensive consultations with stakeholders in preparing a gender action plan with well-defined activities, indicators, targets, and time frames. The gender action plan provides activities integrated within the project design, including (i) training women as commercial drivers, (ii) training rural women in energy-efficient technologies to expand their existing businesses or start new businesses, (iii) end-user energy-efficiency awareness programs with at least 40% women participation, (iv) report preparation by EESL on good practices in gender mainstreaming in energy-efficiency investments in EESL, and (v) orientation for EESL project staff on gender issues and gender mainstreaming practices in the energy sector. EESL will collect, monitor, and report on sex-disaggregated project data. Toward project completion, EESL will conduct a study (with at least 50% women respondents) to assess the benefits of using energy-efficient technologies and appliances in the households. The attached TA will finance a gender action plan for the project.[23] A gender specialist will be engaged under the attached TA to guide implementation of the project's gender action plan.

[22] ADB. 2003. *Enhancing the Asian Development Bank's Role in Combating Money Laundering and the Financing of Terrorism*. Manila.

[23] Gender Action Plan (accessible from the list of linked documents in Appendix 2).

## F. Safeguards

38. In compliance with ADB's Safeguard Policy Statement (2009), the project's safeguard categories are as follows.[24]

39. **Environment (category C).** As required by ADB's Safeguard Policy Statement (2009) for a sector loan, an environmental assessment and review framework (EARF) has been prepared by EESL to guide subproject selection, screening and categorization, environmental assessment, and institutional arrangements. The EARF specifies that only category C subprojects, according to ADB's Safeguard Policy Statement (2009), will be considered for funding. All subprojects will have energy-efficient management and technology systems in place that minimize energy losses and reduce carbon dioxide emissions. These interventions will generate some waste, which will be collected, stored, transported, and disposed of following the requirements and regulations of the Ministry of Environment, Forest and Climate Change. EESL and its contractors will adhere to ADB's Safeguard Policy Statement (2009) and national environmental, health, and safety regulations in managing any waste that the project may generate. EESL will keep a record of any waste disposed, including relevant permits and/or waste destruction certificates, following the requirements of the Ministry of Environment, Forest and Climate Change and the central and state pollution control boards. EESL will require its contractors to establish a grievance redress mechanism consistent with ADB's Safeguard Policy Statement (2009), and to follow the environment, health, and safety requirements of the government as the guarantor, the relevant state, and ADB. EESL will assign staff to the project management unit to (i) manage potential environmental issues and compliance with the EARF, and (ii) monitor the compliance of contractors and implementing partners with environmental requirements.

40. **Involuntary resettlement (category C).** The project activities are not expected to cause physical or economic displacement, nor will they require private land acquisition and/or government land transfer. Solar photovoltaic systems will be installed on the existing premises of substations belonging to distribution companies and will connect to the existing distribution infrastructure. E-vehicle charging stations will be located in available public spaces; with EESL entering into memorandums of understanding with municipal and/or other public agencies to use such spaces. Replacing old meters with new smart meters will require resettlement. The project will have no negative impacts on titled or non-titled holders or their livelihoods. A resettlement framework has been prepared by EESL that details involuntary resettlement screening procedures and contains checklists for subproject selection and implementation and to ensure that all future sites for solar infrastructure are within existing substation areas and free of encumbrances. It also contains due diligence reports of sample subprojects to ensure that the project will not cause negative involuntary resettlement impacts. EESL and ADB conducted stakeholder consultations and documented them in due diligence reports, in accordance with ADB's Safeguard Policy Statement (2009). The loan agreement will include assurances related to social safeguards, core labor standards for contractors (including equal pay for equal types of work), and HIV and sexually transmitted disease prevention.

41. **Indigenous peoples (category C).** The project activities will not negatively impact indigenous peoples or their livelihoods. The project outcome—to increase end-use energy efficiency—will produce positive socioeconomic impacts in the project area. The resettlement framework (para. 41) includes indigenous people's checklists, and due diligence reports for the sample subprojects to ensure that the project will not negatively impact indigenous peoples. EESL

[24] ADB. 2009. *Safeguard Policy Statement*. Manila.

and ADB held consultations with stakeholders following ADB's Safeguard Policy Statement (2009) and documented these consultations in the due diligence reports.

## G. Summary of Risk Assessment and Risk Management Plan

42. Significant risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.[25]

**Table 4: Summary of Risks and Mitigating Measures**

| Risks | Mitigation Measures |
|---|---|
| **Counterparty risks.** Most of EESL's project payments come from urban local bodies and distribution companies, which are known to have uncertain cash flows, leading to delayed payments to EESL. EESL's trade receivables have increased substantially during FY2017 to FY2019. | EESL will continue its focus on collections, bringing down its average trade receivables to 250 days of billable revenue for the year by March 2020 and to 150 days by March 2022. EESL will appoint a chief risk officer by March 2020 and formulate an integrated risk management policy by December 2020. |
| **Financial reporting.** External auditors have issued qualified audit opinions on EESL's financial statements and flagged the following issues: significant increase in receivables balances, inadequate provisioning for doubtful trade receivables, some cases of inconsistent accounting policies, and potential accounting adjustments at conclusion of ongoing reconciliations of receivable and/or payable balances, assets, and inventories resulting in restatement of financial accounts. | ADB has been continuously engaged and will provide a financial management expert to further support EESL. EESL has agreed to several mitigation measures, including achieving significant reduction in its trade receivables balances, implementation of a revised policy on bad and/or doubtful debt, and development of a management information system manual. |

ADB = Asian Development Bank, EESL = Energy Efficiency Services Limited.
Source: Asian Development Bank.

# V. ASSURANCES

43. The government and EESL have assured ADB that implementation of the project shall conform with all applicable ADB requirements, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, financial management, and disbursement as described in detail in the PAM and loan documents.

44. The government and EESL have agreed with ADB on certain covenants for the project, which are set forth in the draft loan agreements and guarantee agreement.

# VI. RECOMMENDATION

45. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of $250,000,000 to Energy Efficiency Services Limited, to be guaranteed by India, for the Scaling Up Demand-Side Energy Efficiency Sector Project, from ADB's ordinary capital resources, in regular terms, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 20 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and guarantee agreements presented to the Board.

Takehiko Nakao
President

6 November 2019

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

## DESIGN AND MONITORING FRAMEWORK

| **Impact the Project is Aligned with**<br>Emissions intensity of economy reduced (India's Intended Nationally Determined Contribution: Working Towards Climate Justice)[a] | | | |
|---|---|---|---|
| **Results Chain** | **Performance Indicators with Targets and Baselines** | **Data Sources and Reporting Mechanisms** | **Risks** |
| **Outcome**<br>End-use energy efficiency in the project areas increased | **By 2026:**<br>a. Annual energy savings of 266 gigawatt-hours achieved (2018 baseline: 0)<br><br>b. Additional aggregate greenhouse gas emissions avoided by 245,000 $tCO_2eq$ per year (2018 baseline: 0) | a. Distribution utility and project reports<br><br>b. Project reports | Rebound effect is substantial whereby consumers offset energy savings from efficiency measures with increased usage or other behaviors. |
| **Outputs**<br>1. Energy-efficient technologies in utility service areas in eligible states (including Andhra Pradesh, Assam, Bihar, Delhi, Gujarat, Jharkhand, Maharashtra, Manipur, Meghalaya, Odisha, Rajasthan, Sikkim, Telangana, Tamil Nadu, Tripura, and Uttar Pradesh) promoted and deployed[b] | **By 2025:**<br>1a. 5 million smart meters and other intelligent energy management elements installed in eligible states (2018 baseline: 0)<br><br>1b. 160 megawatts distributed solar photovoltaic installed in eligible states (2018 baseline: 0)<br><br>1c. 10,000 e-vehicles and charging stations commissioned in eligible states (2018 baseline: 0)<br><br>1d. 200 women demonstrated skills as commercial drivers with women from poor and socially backward groups[c] prioritized (2018 baseline: 0) | 1a.–1c. Monitoring and verification reports on an annual basis<br><br>1d. Pre- and post-training assessment | EESL's growth plans involving entering new business segments and enlarging its geographic presence could strain the company's financial and human resources, resulting in delayed release and deployment of EESL's counterpart contribution. |
| 2. End-user energy-efficiency awareness and capacity increased[d] | 2a. At least 500 end-users participated in energy-efficiency awareness workshops or other events, with at least 40% women participants (2018 baseline: 0)<br><br>2b. At least 100 staff of electricity distribution companies, regulatory agencies and other government agencies reported knowledge on energy efficient technologies and business models (2018 baseline: 0) | 2a. Monitoring and verification reports<br><br>2b. Pre and post training assessment | |

**Key Activities with Milestones**

**1. Energy-efficient technologies in utility service areas in eligible states (including Andhra Pradesh, Assam, Bihar, Delhi, Gujarat, Jharkhand, Maharashtra, Manipur, Meghalaya, Odisha, Rajasthan, Sikkim, Telangana, Tamil Nadu, Tripura, and Uttar Pradesh) promoted and deployed**

1a. Smart meters and other intelligent energy management elements (smart grid) installed in eligible states
1a.1 EESL signs MOUs with distribution companies (Q2 2020).
1a.2 EESL develops and validates DPRs and conducts pilot tests to demonstrate technology and savings (Q4 2020).
1a.3 EESL enters into contractual agreements with distribution companies and ensures a secure payment mechanism (Q4 2020).
1a.4 EESL procures equipment and implements the subprojects (Q4 2024).
1a.5 EESL undertakes capacity building, monitoring, and verification activities (Q4 2024).

1b. Distributed solar photovoltaic installed in eligible states
1b.1 EESL signs MOUs with distribution companies (Q4 2020).
1b.2 EESL develops and validates DPRs and conducts pilot tests to demonstrate technology and savings (Q4 2020).
1b.3 EESL enters into contractual agreements with distribution companies and ensures a secure payment mechanism (Q4 2020).
1b.4 EESL procures equipment and implements the subprojects (Q4 2022).
1b.5 EESL undertakes capacity building, monitoring, and verification activities (Q1 2025).

1c. E-vehicles and charging stations deployed in eligible states
1c.1 EESL signs MOUs with government agencies (Q2 2020).
1c.2 EESL develops and validates DPRs and conducts pilot tests to demonstrate technology and savings (Q4 2020).
1c.3 EESL enters into contractual agreements with government agencies and ensures a secure payment mechanism (Q4 2023).
1c.4 EESL procures equipment and implements the subprojects (Q4 2024).
1c.5 EESL undertakes monitoring and verification activities (Q1 2025).

1d. Training of women as commercial drivers
1d.1 EESL signs MOU with training institute (Q4 2020)
1d.2 EESL finalizes the training program and selection of women participants (Q2 2021)
1d.3 Conduct of the training program and evaluation (Q4 2023)

**2. End-user energy-efficiency awareness and capacity increased**
2.1 Develop end-user energy-efficiency awareness program (Q2 2020).
2.2 Implement awareness programs (Q4 2024).

**Project Management Activities**
Project monitoring and evaluation; capacity building of EESL staff on Asian Development Bank policies and procedures; gender mainstreaming (ongoing).

**Inputs**

| | |
|---|---|
| Asian Development Bank: | $250 million (loan) |
| Clean Technology Fund: | $46 million (loan) |
| Energy Efficiency Services Limited: | $296 million |

**Assumptions for Partner Financing**
None

DPR = detailed project report, EESL = Energy Efficiency Services Limited, MOU = memorandum of understanding, Q = quarter, RFI = results framework indicator, $tCO_2eq$ = ton of carbon dioxide equivalent.

[a] Government of India, Ministry of Environment, Forest and Climate Change. 2015. *India's Intended Nationally Determined Contribution: Working Towards Climate Justice.* New Delhi.

[b] Eligibility criteria and selection process are mentioned in the Project Administration Manual (accessible from the list of linked documents in Appendix 2)

[c] Below poverty line households, scheduled caste, scheduled tribe, and other backward classes.

[d] To be financed by the attached TA and EESL counterpart contribution

**Contribution to ADB Results Framework:** To be determined

Source: Asian Development Bank.

## LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=52196-001-3

1. Loan Agreement: Ordinary Operations
2. Loan Agreement: Clean Technology Fund
3. Guarantee Agreement
4. Sector Assessment (Summary): Energy
5. Project Administration Manual
6. Financial Analysis
7. Economic Analysis
8. Summary Poverty Reduction and Social Strategy
9. Risk Assessment and Risk Management Plan
10. Attached Technical Assistance Report
11. Gender Action Plan
12. Environmental Assessment and Review Framework
13. Resettlement Framework

**Supplementary Documents**

14. Clean Technology Fund Application
15. Financial Management Assessment
16. Technical Due Diligence
17. Note on Greenhouse Gas Reduction Estimation