Document of
The World Bank

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Report No: 125034-IN

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROGRAM APPRAISAL DOCUMENT

ON A

PROPOSED LOAN
IN THE AMOUNT OF US$220 MILLION

AND A

PROPOSED GUARANTEE
IN AN AMOUNT OF UP TO US$80 MILLION

IN SUPPORT OF COMMERCIAL FINANCIERS

TO

ENERGY EFFICIENCY SERVICES LIMITED

WITH

THE GUARANTEE OF THE REPUBLIC OF INDIA

FOR THE

INDIA ENERGY EFFICIENCY SCALE-UP PROGRAM

April 23, 2018

Energy and Extractives Global Practice
South Asia Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective: March 31, 2018)

Currency Unit = US$
US$1 = INR 65.0746

FISCAL YEAR
April 1- March 31

ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| AC | Air Conditioner |
| ACB | Audit Committee of the Board |
| ADB | Asian Development Bank |
| AFD | *Agence Française de Développement* (French Development Agency) |
| AFS | Annual Financial Statement |
| AgDSM | Agricultural Demand Side Management |
| AMC | Annual Maintenance Contract |
| AMRUT | Atal Mission for Rejuvenation and Urban Transformation |
| BEE | Bureau of Energy Efficiency |
| BEEP | Building Energy Efficiency Program |
| CAG | Comptroller and Auditor General |
| CCMS | Centralized Control and Monitoring System |
| CFL | Compact Fluorescent Lamp |
| CPS | Country Partnership Strategy |
| CVC | Central Vigilance Commission |
| DA | Distribution Agency |
| DFPR | Delegation of Financial Powers and Rules |
| DGM | Deputy General Manager |
| Discom | Distribution Company (Electricity) |
| DLI | Disbursement Linked Indicator |
| DLR | Disbursement Linked Result |
| DSM | Demand Side Management |
| EBITDA | Earnings Before Interest, Taxes, Depreciation and Amortization |
| EE | Energy Efficiency |
| EESL | Energy Efficiency Services Limited |
| EHSS | Environmental, Occupational Health & Safety and Social |
| EIRR | Economic Internal Rate of Return |
| ELCOMA | Electrical Lamp and Component Manufacturers Association (of India) |
| ERP | Enterprise Resource Planning |
| ESCO | Energy Services Company |
| ESSA | Environmental and Social Systems Assessment |
| FIRR | Financial Internal Rate of Return |
| FSA | Fiduciary Systems Assessment |
| FTL | Fluorescent Tube Light |
| GDP | Gross Domestic Product |
| GFR | General Financial Rules |
| GHG | Greenhouse Gas |
| GoI | Government of India |
| GRS | Grievance Redressal System |
| GW | Gigawatt |
| GWh | Gigawatt-hour |
| GWP | Global Warming Potential |
| HCFC | Hydrochlorofluorocarbon |
| HFC | Hydrofluorocarbon |
| HID | High Intensity Discharge |
| HPSV | High Pressure Sodium Vapor |
| IBRD | International Bank for Reconstruction and Development |
| ICL | Incandescent Lamp |
| IMF | International Monetary Fund |
| INR | Indian Rupees |
| IPF | Investment Project Financing |
| ISEER | Indian Seasonal Energy Efficiency Ratio |
| IVA | Independent Verification Agency |
| KfW | *Kreditanstalt für Wiederaufbau* (German government-owned Development Bank) |
| kWh | Kilowatt-hour |
| LED | Light Emitting Diode |
| M&E | Monitoring and Evaluation |
| MDB | Multilateral Development Bank |
| MFD | Maximizing Finance for Development |
| MIS | Management Information System |
| MoP | Ministry of Power |
| MOU | Memorandum of Understanding |
| M&V | Measurement and Verification |
| MW | Megawatt |
| MWh | Megawatt-hour |
| NAPCC | National Action Plan for Climate Change |
| NDC | Nationally Determined Contribution |
| NEEA | Northwest Energy Efficiency Alliance |
| NMEEE | National Mission on Enhanced Energy Efficiency |
| NTPC | National Thermal Power Corporation Limited |
| ODS | Ozone Depleting Substance |
| O&M | Operations and Maintenance |
| OPRC | Operational Procurement Review Committee |
| PAP | Program Action Plan |
| PAT | Perform, Achieve and Trade |
| PDO | Project / Program Development Objective |

| | |
|---|---|
| PFC | Power Finance Corporation |
| PforR | Program for Results |
| PGCIL | Power Grid Corporation of India Limited |
| PMC | Project Management Consultancy |
| PSU | Public Sector Undertaking (state-owned enterprise) |
| PV | Photovoltaic |
| QA | Quality Assurance |
| R&D | Research and Development |
| RA | Results Area |
| REC | Rural Electrification Corporation |
| RO | Regional Office |
| SBD | Standard Bidding Document |
| SCD | Systematic Country Diagnostic |
| SCM | Supply Chain Management |
| SERC | State Electricity Regulatory Commission |
| SLNP | Street Lighting National Program |
| SOP | Standard Operating Protocol |
| TCAF | Transformative Carbon Asset Facility |
| T&D | Transmission and Distribution |
| ToR | Terms of Reference |
| TR | Ton of Refrigeration |
| UJALA | Unnat Jyoti by Affordable LEDs for All |
| ULB | Urban Local Body |
| USAID | United States Agency for International Development |
| WBG | World Bank Group |

| | | |
|---|---|---|
| Regional Vice President (Acting) | : | Ethel Sennhauser |
| Country Director | : | Junaid Kamal Ahmad |
| Senior Global Practice Director | : | Riccardo Puliti |
| Energy Global Practice Manager | : | Demetrios Papathanasiou, |
| GTIFP Practice Manager (Acting) | : | Richard MacGeorge |
| Task Team Leader(s) | : | Ashok Sarkar, Defne Gencer, Simon Stolp<br>Don Purka (Guarantee) |

**INDIA**

**ENERGY EFFICIENCY SCALE-UP PROGRAM**

**Program Appraisal Document**

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*PAD DATA SHEET*

*INDIA*

**ENERGY EFFICIENCY SCALE-UP PROGRAM (P162849/P165488)**

**PROGRAM APPRAISAL DOCUMENT**

*SOUTH ASIA*
*Energy and Extractives*

| **Basic Information** | | | |
|---|---|---|---|
| Date: | April 10, 2018 | Sectors: | Other Energy and Extractives |
| Country Director: | Junaid Kamal Ahmad | Themes: | Environment & Natural Resource Management; Climate Change; Mitigation; Energy; Energy Efficiency |
| Senior Global Practice Director: | Riccardo Puliti | | |
| Energy Global Practice Manager: | Demetrios Papathanasiou | EA Category: | B |
| GTIFP Practice Manager (Acting): | Richard MacGeorge | | |
| Regional Vice President (Acting): | Ethel Sennhauser | | |
| Global Practice Vice President: | Laura Tuck | | |
| Program ID: | P162849 | | |
| Guarantee ID: | P165488 | | |
| Team Leader(s): | Ashok Sarkar, Defne Gencer, Simon Stolp, Don Purka (Guarantee) | | |

| | | | | | |
|---|---|---|---|---|---|
| Program Implementation Period: | | Start Date: | July 1, 2018 | End Date: | Sept 30, 2022 |
| Expected Financing Effectiveness Date: | July 1, 2018 | | | | |
| Expected Financing Closing Date: | Sept 30, 2022 | | | | |
| Expected Guarantee Expiration Date: | May 17, 2033 | | | | |

| **Program Financing Data** | | |
|---|---|---|
| [X] Loan | [ ] Grant | [] Other |
| [ ] Credit | [X] Guarantee | |

| For Loans/Credits/Others (US$ million): | | | |
|---|---|---|---|
| Total Program Cost: | 1, 348 | Total Bank Financing: | 220 (under PforR) and 80 (under IPF Guarantee |
| Total Co-financing: | 1,128 | Financing Gap: | |

| Financing Source | Amount (US$ million) |
|---|---|
| BORROWER/RECIPIENT: Energy Efficiency Services Ltd. | 548 |
| IBRD<br>Loan<br>Guarantee 80 | 220 |
| COFINANCING<br>Commercial Lenders | 200 |
| Other Development Partners | 380 |
| Total | 1,348 |

| | | | |
|---|---|---|---|
| **Borrower**: Energy Efficiency Services Limited (EESL) | | | |
| Responsible Agency: | | | |
| Contact: | Mr. Saurabh Kumar | Title: | Managing Director |
| Telephone: | 0120- 490 8000 | Email: | skumar@eesl.co.in |
| **Guarantor**: | Republic of India | | |
| Responsible Agency: Energy Efficiency Services Limited (EESL) | | | |
| Contact: | Mr. Saurabh Kumar | Title: | Managing Director |
| Telephone: | 0120- 490 8000 | Email: | skumar@eesl.co.in |

**Expected Disbursements (in US$ million)**

| Fiscal Year | 2019 | 2020 | 2021 | 2022 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Annual | 39.76 | 67.29 | 43.33 | 69.07 | | | | | |
| Cumulative | 39.76 | 107.05 | 150.38 | 220.00[1] | | | | | |

**Program Development Objective(s)**

The program and project development objectives are to scale up energy savings in residential and public sectors, strengthen EESL's institutional capacity, and enhance its access to commercial financing.

**Compliance**

**Policy**

| | |
|---|---|
| Does the program depart from the CAS in content or in other significant respects? | Yes [ ] No [ X ] |

[1] Includes US$550,000 Capitalized Front-End Fee.

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| | |
|---|---|
| Does the program require any waivers of Bank policies applicable to Program-for-Results operations? | Yes [ ] No [X ] |
| Have these been approved by Bank management? | Yes [ ] No [ ] |
| Is approval for any policy waiver sought from the Board? | Yes [ ] No [ ] |

**Overall Risk Rating: Moderate**

**Legal Covenants**

| **Name** | **Recurrent** | **Due Date** | **Frequency** |
|---|---|---|---|
| Maintaining National Program Manager for the SLNP Program and the UJALA Program. | | Ongoing | |
| Maintaining Head-quarters and regional offices satisfactory to the Bank. | | Ongoing | |
| Complying with the Program Action Plan | | Ongoing | |
| Excluding any Excluded Activities. | | Ongoing | |
| Engagement of Independent Verification Agency (IVA) | | September 30, 2018 | |
| Verification and transmission of IVA's reports to the Bank | | | Along with every Disbursement Request |
| Joint mid-term review. | | No later than 30 months after effective date | |
| Report prior mid-term review. | | 1 month before Mid-term review | |

Usual and customary covenants and conditions to effectiveness for guarantee operations in support of financings of this nature will be included in the legal agreements. Please refer to Annex 10.

Safeguards Policies Triggered under the Guarantee (if applicable) –

| | Yes | No |
|---|---|---|
| Environment Assessment OP/BP 4.01 | X | |
| Natural Habitats OP/BP 4.04 | | X |
| Forests OP/BP 4.36 | | X |
| Pest Management OP/BP 4.09 | | X |
| Physical Cultural Resources OP/BP 4.11 | X | |
| Indigenous Peoples OP/BP 4.10 | X | |
| Involuntary Resettlement OP/BP 4.12 | | X |
| Safety of Dams OP/BP 4.37 | | X |
| Projects on International Waterways OP/BP 7.50 | | X |
| Projects in Disputed Areas OP/BP 7.60 | | X |

| Team Composition | | | |
|---|---|---|---|
| **Bank Staff** | | | |
| **Name** | **Title** | **Specialization** | **Unit** |
| Ashok Sarkar | Senior Energy Specialist | Team Leader (ADM Responsible) | GEE05 |
| Defne Gencer | Senior Energy Specialist | Team Leader | GEE06 |
| Simon Stolp | Lead Energy Specialist | Team Leader | GEE06 |
| Don Purka | Senior Infrastructure Finance Specialist | Team Leader (Guarantees) | GTIFP |
| Sandhya Srinivasan | Climate Change Specialist | Energy Specialist | GCCMI |
| Martina Bosi | Senior Energy Economist | Results Framework | GEEES |
| Addepalli Sita Ramakrishna | Senior Environment Specialist | Environment | GEN06 |
| Shanker Lal | Lead Procurement Specialist | Procurement | GGO06 |
| Puneet Kapoor | Senior Financial Management Specialist | Financial Management | GGOIS |
| Deepa Balakrishnan | Environmental Safeguards Specialist | Environment | GEN06 |
| Gitanjali Chaturvedi | Senior Social Safeguards Specialist | Social | GSU06 |
| Vincent Launay | Infrastructure Finance Specialist | Finance- Guarantee | GTIFP |
| Bipul Singh | Energy Economist | Economic and Financial Analysis | GEE06 |
| Joeri Frederik de Wit | Energy Economist | Economic and Financial Analysis | GEEES |
| Helene Bertaud | Lead Counsel | Legal - PforR and Overall | LEGES |
| Neil Pravin Ashar | Senior Counsel | Legal – Guarantee | LEGSG |
| Victor Manuel Ordonez Conde | Senior Finance Officer | Disbursement | WFALA |
| Jasneet Singh | Lead Energy Specialist | Technical Advisor | GEE03 |
| Viraj Vithoontien | Lead Environment Specialist | Climate Change Advisor | GEN2B |
| Gailius Draugelis | Lead Energy Specialist | Strategic Advisor | GEE06 |
| Gunjan Gautam | Operations Officer | Operations Support | GEE06 |
| Lu T. Ha | Portfolio Analyst | Support - Guarantee | GTIFP |
| Boonsri Prasertwaree Kim | Program Assistant | Administrative Support | GEE06 |
| Ritika Rodrigues | Program Assistant | Administrative Support | SACIN |
| Shaukat Javed | Program Assistant | Administrative Support | GEE06 |
| Md. Tafazzal Hossain | Program Assistant | Administrative Support | SACBD |
| Janina Andrea Franco Salazar | Senior Energy Specialist | Peer Reviewer | GEE04 |
| Peter Johansen | Senior Energy Specialist | Peer Reviewer | GEE09 |
| Satheesh Kumar Sundararajan | Senior Infrastructure Finance Specialist | Peer Reviewer | GTIFP |

| Non-Bank Staff | | |
|---|---|---|
| **Name** | **Title** | **City** |
| Beatriz Arizu de Jablonski | Consultant, Energy Advisor | Buenos Aires, Argentina |
| Padu S. Padmanabhan | Consultant, Energy Advisor | Bangalore, India |
| Swati Dogra | Consultant, Social Specialist | New Delhi, India |
| Nikit Abhyankar | Peer Reviewer (External) | Berkeley, California |

# I. STRATEGIC CONTEXT

## A. Country Context

1. **India's power sector is going through sustained growth to fuel the economy and meet the needs of its population.** India's annual Gross Domestic Product (GDP) growth rates over the last decade have averaged over 7 percent, accompanied by rising energy demand at 5.3 percent annually. India is now the world's third largest consumer of electricity. However, per capita electricity consumption is only one third of the global average – slightly lower than the average for the African continent. Moreover, in the Indian context, a growth in electricity consumption is related to higher economic growth (GDP), leading the Government of India (GoI) to push for initiatives to increase the supply of electricity.

2. **India's energy policy is based on energy security and self-sufficiency.** Thus, it is historically dependent on indigenous, low-cost coal for power generation. Around 60 percent of India's electricity generation is coal-fired and coal consumption in power generation and industry would continue to grow strongly, unless clean energy initiatives are effective in bringing supply at scale and at lower costs.

3. **India has also shown significant commitment to addressing Climate Change**, particularly in its scale up of renewable energy generation and increased focus on energy efficiency (EE). The Government is implementing visionary plans for 175 GW of renewable power generation by 2022, a significant increase from the current 37GW. This underpins GoI's ambitious goal of providing uninterrupted power for all homes, industrial and commercial establishments, etc., through its *24x7 Power for All program*, targeting universal access to electricity by 2019. The GoI has also invested significantly in energy efficiency to capture part of the 15-30 percent in potential energy savings across the economy, representing about Indian Rupees (INR) 740 billion (US$11.4 billion)[2].

4. **These initiatives also contribute towards India's climate change commitments and Nationally Determined Contribution (NDC)**, which was announced at the Conference of Parties (COP) 21 in Paris. In its NDC, India's commitments include "to reduce its carbon intensity by 33-35 percent by 2030 from 2005 level", which will require a significant focus on energy efficiency (EE).

## B. Sectoral and Institutional Context

5. **India's EE potential remains largely untapped, in part due to limited availability and high cost of financing for EE investments**. Energy efficiency investments are constrained by typical market failures such as high financing costs, limited awareness, and technical and capacity barriers. In recent years, Government policy, and publicly funded initiatives addressed some of the barriers in the industrial and commercial sectors, enabling these sectors to access finance more readily. However, in the residential and public sectors EE investments continue to be limited.

6. **Energy efficiency in the residential and public sectors face additional barriers to those in the industrial and commercial sectors.** Barriers include highly subsidized residential and public-sector electricity tariffs[3] which limit the incentive to invest in EE (whereas in the industrial and commercial sectors, tariffs are closer to cost); lack of awareness; limited technical know-how; low availability and high cost of financing; and high transaction costs for relatively small EE investments. The EE sector has also

[2] National Action Plan for Climate Change, 2008.

[3] Sorrell, Steve, et al. "*Reducing barriers to energy efficiency in public and private organizations*" University of Sussex (2000); Chai, Kah-Hin, Yeo. "*Overcoming energy efficiency barriers through systems approach—a conceptual framework*." Energy Policy 46 (2012); Langlois, Simon et al. "*Political-institutional barriers to energy efficiency*." Energy Strategy Reviews 8 (2015)

seen limited competition amongst a small number of manufacturers, that offer few and relatively expensive energy efficient products. These products are often unaffordable for household consumers.

7. **Demand for lighting, ceiling fans, air conditioners, refrigerators, agricultural pumps, and industrial motors is projected to grow significantly.** [4] Therefore, the Government has shifted its focus to address the barriers for market transformation, required to scale-up deployment of EE appliances and equipment, particularly in the residential sector.

8. **India's nascent energy services industry also faces challenges.** In recent years, numerous Energy Services Companies[5] (ESCOs) entered the market, but were unable to significantly grow their business. Barriers included lack of awareness of EE potential or benefits of ESCO services; the reluctance by financiers and asset owners to invest in energy savings; lack of familiarity with the typical ESCO contractual approaches, and weak balance sheets of some ESCOs. For financial institutions, the perceived risk, and hence the cost of financing offered, was high.

9. **To overcome market failures in the EE sector, the Government took a series of policy, regulatory and institutional steps.** Major Government actions include the Integrated Energy Policy (IEP), Energy Conservation Act of 2001, Electricity Act of 2003, and the National Mission on Enhanced Energy Efficiency (NMEEE), which is one of the eight missions under the National Action Plan for Climate Change (NAPCC) of 2008. These were followed by regulatory mandates including the Perform, Achieve and Trade (PAT) scheme setting mandatory energy saving targets in large energy-intensive industries, support to financing for ESCOs, and introducing appliances EE standards, building EE codes and financing instruments. The Bureau of Energy Efficiency (BEE) was created in 2002 under the Ministry of Power (MoP) to formulate policies and regulations, raise awareness, build capacity, develop EE and conservation programs, and support central and state governments. In 2009, the GoI established Energy Efficiency Services Limited (EESL), a super ESCO owned by public enterprises, to finance and deliver EE solutions, especially in the residential and public sectors, and that is mandated to support and grow the broader ESCO market.

10. **A joint venture of four public sector utilities[6], EESL has been a key implementing agency of the Government's EE vision.** EESL's central role started with its implementation of the "Unnat Jyoti by Affordable LEDs for All" (UJALA) program, which provides energy efficient Light Emitting Diode (LED) lightbulbs. Currently, the Government envisages roll-out of 770 million LED lightbulbs in the residential sector by March 2019, corresponding to estimated load reduction of 20,000 MW and annual energy savings of over 100 million kWh. EESL is also implementing the Street Lighting National Program (SLNP), which will replace 13.4 million conventional street lights with LEDs.

11. **EESL is poised to scale up its support for EE and the ESCO market significantly.** EESL's newer initiatives target previously underserved market segments, such as municipal services and public buildings, contributing to the Government's Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and the Smart City Mission. EESL is also contemplating other new ventures such as an electric vehicles program aligned with the Government's vision for India to move entirely to electric cars by 2030, and its smart meter program that would contribute to the National Smart Grid Mission.

[4] From an estimated 235,757 GWh/year in 2016 to 508,485 GWh/year by 2031. Source: World Bank, *Residential consumption of electricity in India: Strategies for low carbon growth* (2008).

[5] ESCOs are entities that provide a range of energy saving solutions for development, implementation and sometimes financing of EE and conservation projects. Services provided varies by context, client demand and ESCO type.

[6] National Thermal Power Corporation Limited (NTPC), Rural Electrification Corporation Limited (REC), Power Finance Corporation Limited (PFC), and Power Grid Corporation of India Limited (PGCIL)

### C. Relationship to the CPS/SCD and Rationale for Use of Instruments

12. **The proposed Operation would support:** (i) scale-up of ongoing Government programs being implemented by EESL; (ii) achievement of the country's EE and GHG targets anchored in the NMEEE and the NAPCC; and (iii) incremental improvements in the design of ongoing and new EE activities to ensure their viability and sustainability, support development of private ESCOs and other EE market participants, and use public funds with other resources (including climate financing) to leverage commercial funds.

13. **The proposed Operation is consistent with the World Bank's Performance and Learning Review of the Country Partnership Strategy (CPS) for India** (Report No. 99283-IN), discussed by the Executive Directors on October 20, 2015. It is also aligned with the findings of the Systematic Country Diagnostic (SCD) for India. The SCD's draft findings emphasizes that "climate change related risks could be partially mitigated and neutralized through a more resource-efficient growth path."

14. **The proposed Operation is also consistent with the Bank's approach to transforming markets and crowding in the private sector.** As a super ESCO owned by public enterprises, EESL is transforming markets and supporting further private sector participation in two different types of markets:

a. **In the retail market for energy efficient appliances, EESL** is using a bulk-procurement model to drive economies of scale in supply and to encourage demand through competitive pricing. This approach has generated price competition and has expanded private sector supply, bringing down the overall retail cost of EE appliances to levels of general affordability. Once the retail price for these energy efficient appliances is at a sustained level of general affordability there is no further need, nor business case, for EESL intervention and it will exit a transformed market. No other private sector company could undertake a similar large-scale intervention in the energy efficient appliance market;

b. **The remainder of EESL's business falls within the traditional ESCO marke**t, which has effectively stalled in India. As a super-ESCO, EESL creates greater levels of awareness and acceptance by the market, attracts otherwise scarce finance for EE, and has initiated momentum within an otherwise dormant ESCO market. EESL has demonstrated the viability of its unique business model in the Indian market, and under its mandate will replicate this through private sector solutions and participation of ESCOs, and support wider and deeper market transformation by crowding in other private players and investors.

15. **The program is 100 percent eligible for climate co-benefits** based on the criteria in the joint report on multilateral development banks' climate finance (MDB report), under the category energy efficiency. The Program for Results (PforR) is primarily focused on scaling up deployment of energy efficient appliances and equipment in the residential and public sectors, which is consistent with the WBG's Climate Change Action Plan.

16. **The proposed Operation will be supported by a Loan under IBRD's PforR Financing and an IBRD Guarantee[7].**

a. **The PforR instrument** will support the Government's objectives, through EESL's delivery of its EE program. The Bank will add value not only by providing financing in the short-term to meet the Government Program's immediate goals, but would also help improve the sustainability of new initiatives for scale-up.

[7] The proposed IBRD Loan has been processed under Bank Policy/Bank Directive: Program-for-Results Financing. The proposed IBRD Guarantee has been processed under Bank Policy/Bank Directive: Investment Project Financing (IPF).

b. **The IBRD Guarantee, first ever in India, will support EESL in accessing further commercial finance, thereby maximizing finance for development (MFD).** EESL's ambitious program requires increasing amounts of investment and financing each year. Going forward, EESL estimates financing needs from INR 58 billion (US$900 million) to INR 78 billion (US$1.2 billion) per annum over the next several years. Historical financing sources will continue to be tapped, but will likely be insufficient for the significant capital expenditures planned, and the changing risk profile of its emerging business. EESL needs to access a wider set of commercial financiers to meet its investment needs and programs. The Guarantee will support EESL in accessing new commercial financing sources, diversifying its investor base and establishing a track record for regular future access to such commercial markets. In terms of MFD, the Bank's Operation leverages other potential parallel commercial co-financing opportunities that EESL is currently seeking (described in Section II.C).

## II. DESCRIPTION OF THE OPERATION

### A. Government program

17. **The Government program, to be implemented by EESL, would focus on EE market transformation in the residential and public sectors.** The Government of India has requested World Bank financing to support the scale up of existing, already proven programs, and the development of newer nascent programs in other areas. The Program boundary is described in detail in Section C, but includes the following primary components:

18. **Scale up of LED deployment:** EESL has demonstrated success in delivering results in the residential sector through the "Unnat Jyoti by Affordable LEDs for All" (UJALA) program for sale and distribution of energy efficient LED light bulbs, which has already deployed over 295 million 7-watt and 9-watt LED bulbs to households and institutional consumers. This program has resulted in significant falls in retail prices of LED lightbulbs – a clear market transformation. The ultimate target of the UJALA program is for market penetration of LED lightbulbs to continue unaided, by reducing LED prices until strong consumer preference emerges.

19. **Scale up of energy efficiency municipal street lighting:** EESL has a strong delivery record in public street lighting. Under the Street Lighting National Program (SLNP), EESL enters into long-term annuity agreements with cities or municipalities to retrofit existing streetlights with LED lightbulbs and fixtures, and maintain them for up to seven years. The entire investment is made upfront by EESL and recovered from the energy savings of municipalities/cities over the project duration. As of April 2018, EESL has installed over 5.5 million street lights across India, resulting in energy savings of about 4.15 GWh per day.[8] To realize the street lighting program's full EE market potential, EESL aims to leverage the capacity and resources of the private ESCO industry, and enhance access to a wider range of financing sources.

20. **Development of new energy efficiency programs:** Building upon its experience with the UJALA and SLNP, EESL is expanding its programs. EESL is expanding UJALA to efficient ceiling fans and LED tube lights, the most common appliances used in Indian homes and offices, and lower-income households - the primary users of ceiling fans, with annual sales growing at 6-10 percent.[9] EESL is also developing initiatives on energy efficient air conditioners, public buildings, municipal services and agricultural pumps.

[8] EESL SLNP Dashboard. http://slnp.eeslindia.org/

[9] World Bank, Project Appraisal Document, *Proposed India Super Energy-Efficient Equipment Project*, 2013, and Prayas, "*Appliance Ownership in India: Evidence from NSSO Household Expenditure Surveys*", 2012

These new programs are under development and require further technical design, fine-tuning and piloting before they can be financed at scale.

21. **The Program, supported under this Operation, is a subset of EESL's larger program.** EESL's investment program for FY2017 to FY2022 is estimated at INR 427 billion (US$6 billion) which covers EESL's activities under UJALA, SLNP, Municipal Demand Side Managementcultural Demand Side Management (AgDSM), electric vehicles, solar mini-grids, Buildings EE Program (BEEP), and other new EESL's programs. The Program boundary is a time slice within EESL's investment program. The Program boundary is estimated at INR 93 billion (US$1.3 billion) covering EESL's planned investments in UJALA and SLNP; upstream technical work for the development of business models for new market segments; and institutional strengthening over the period from FY2018 to FY2022.

### B. Program and Project Development Objective (PDO) and key results

22. **Program and Project Development Objective.** The development objectives of the Operation are to scale up energy savings in residential and public sectors, strengthen EESL's institutional capacity, and enhance its access to commercial financing. The PDO level outcome indicators are lifetime energy savings and avoided CO2 emissions from selected energy efficient appliances and equipment; and establishment of Sustainable Development Unit in EESL and implementation of updated EHSS[10] Manual across all EESL programs under implementation. For the IBRD guarantee component, the key results on the amount of commercial financing leveraged by the IBRD guarantee will be quantified, measured and reported as a PDO outcome indicator.

### C. Operation Scope

**Program Description and Key Results Areas**

23. The Program consists of the following activities for FY 2018-22, in EESL's overall corporate investments program:

*Results Area 1: Energy Savings and EE Market Transformation in the Residential Sector:*

Scaling-up EE delivery in the residential sector under the UJALA Program, focusing on LED bulbs, tube lights and ceiling fans.

*Results Area 2: Energy Savings and EE Market Transformation in Public Street Lighting:*

Delivering investments in EE public street lighting, under the SLNP Program.

*Results Area 3: Development of Sustainable Business Models in new EE Market Segments:*

Supporting up-stream program development and incorporation of technical, environmental and social sustainability elements into the design of the new initiatives, such as air-conditioning, agriculture demand side management and Buildings EE Program, which require additional preparatory work before sustainable scale-up; but expressly excluding the actual capital investments for such new initiatives.

*Results Area 4: Institutional Strengthening for Sustainable EE Scale-Up:*

Strengthening and developing the institutional capacity of the Borrower, especially with respect to financial, technical, managerial, procurement, environmental and social capacity and practices.

[10] Environmental, Occupational Health, and Safety and Social Manual

**IBRD support for the Operation**

24. **The US$ 300 million in IBRD financing is proposed through a combination of two different IBRD instruments,** which will maximize financing for development, in accordance with EESL's financing plans, and its requirement to access increased levels of commercial financing to meet future program needs. The proposed Operation is a first-of-a-kind hybrid financing, compliant with both PforR and Investment Project Financing (IPF) policies.

*Part A – an IBRD Loan to EESL in support of the Program, for an amount of US$220 million, under IBRD's PforR Financing instrument*

25. **The IBRD Loan under the PforR Financing instrument will support the Program in achieving market transformation, innovation, and sustainability.** The Program covers four Results Areas as described above. The IBRD loan will be made to EESL, under a sovereign guarantee from the Republic of India.

*Part B – an IBRD Guarantee for a maximum amount of US$80 million, under IBRD's Investment Project Financing instrument*

26. **The proposed IBRD Guarantee will be maximizing finance for development (MFD) by mobilizing commercial financing, additional to the PforR loan, to support Results Areas 1 and 2 of the Program.** Currently, EESL does not have access to external capital markets and new financing markets. It is exploring ways to gain access to different capital markets, to diversify its lender base and avoid being over-reliant on the domestic market, or being captive to fluctuating rates. In this context, EESL has sought IBRD's credit enhancement products and is expected to raise financing in offshore commercial markets at more favorable terms than could be otherwise achieved in the local market. Such capital raising is also targeted to set a track-record of EESL's performance and IBRD's support for EESL, which is likely to enable EESL to raise commercial financing for its growing programs in the future. The guarantee amount (US$80 million) is expected to raise an estimated US$200 million in additional program financing.

**Other financing supporting the Operation**

27. **Proposed support from the Transformative Carbon Asset Facility:** In addition to the IBRD loan, and proceeds raised through the IBRD Guarantee, efforts are under way to secure an additional US$50 million in results-based finance from the Transformative Carbon Asset Facility (TCAF), which became operational in March 2017.[11] The proposed Program is being considered for TCAF support to enable EESL to leverage additional climate financing in the future. The amount and timing of TCAF financing will not affect the implementation of the Program.

**Table 1 - Program and Guaranteed Financing**

| Source | Amount (US$ million) | % of Total |
|---|---|---|
| EESL | 548 | 40.7 |
| IBRD Loan | 220 | 16.3 |
| Commercial borrowing raised through IBRD guarantee of US$80 million | 200 | 14.8 |
| Other Development Partners | 380 | 28.2 |
| **Total Program Financing** | 1,348 | 100 |

[11] Additional information on TCAF is accessible on their website: https://tcaf.worldbank.org/

**Role of Development Partners**

28. **The IBRD Loan and Guarantee complement and leverage support to EESL's programs by other development partners**. EESL's broader program is receiving support from Agence Française de Développement (AFD), Asian Development Bank (ADB), Kreditanstalt für Wiederaufbau (KfW), and United States Agency for International Development (USAID). By providing an explicit focus on results, while meeting the program's financing needs, the proposed Program will support the achievement of EESL's programmatic objectives and help accelerate the implementation of the program being supported by the other development partners. Table 2 summarizes EE activities under way or planned by other development partners supporting ESSL's broader EE program. The development partners meet regularly to coordinate and exchange information, discuss progress under respective programs, and future plans.

**Table 2 – Support to EESL by Other Development Partners**

| Agency | Project Scope | Funding (US$ million) and Timing |
|---|---|---|
| KfW | Primarily for SLNP and UJALA. | EUR50 million (2013-2014) |
| AFD | Primarily UJALA and SLNP | EUR50 million (4/2015) |
| ADB | Support for SLNP, UJALA | US$110 million out of US$200 million (7/2016) |
| GEF | Support for establishment of an Energy Efficiency Revolving Fund (EERF) as a sustainable funding mechanism for energy efficiency projects | US$20 million grant from GEF against US$434 million co-financing from other sources including ADB and KfW (11/2017) |

## D. Disbursement Linked Indicators and Verification Protocols

29. **The Disbursement Linked Indicators (DLIs) focus on key Program achievements, and potential improvements identified during assessments carried out by the Bank team.** The four Results Areas (Section II.C) are covered through six DLIs and twelve Program Actions (details in Annex 8). The program DLIs are shown in Table 3. The summary Technical Assessment in Annex 4 further describes the linkages between the activities assessed, and the DLIs identified, as a result of the assessment. The breakdown of DLIs by Results Area is below.

**Table 3: Summary of Disbursement-Linked Indicators**

| Disbursement-Linked Indicator | Definition | Amount |
|---|---|---|
| **Results Area 1: Energy savings and EE market transformation in the residential sector** | | (*40% of total*[12], *US$88 million*) |
| DLI1. Number of LED bulbs and tube lights sold by EESL under the UJALA program. | Number of LED bulbs and tube lights sold by EESL under UJALA program | US$66 million |
| DLI2. Number of EE ceiling fans sold by EESL under the UJALA program. | Number of EE ceiling fans (BEE 5-star rating or above) sold by EESL under UJALA program | US$22 million |
| **Results Area 2: Energy savings and EE market transformation in public street lighting** | | (*35% of total*) |

[12] Total amount refers to US$220 million, and includes capitalized front-end fee of US$550,000.

| Disbursement-Linked Indicator | Definition | Amount |
|---|---|---|
| DLI3. Number of LED street lights installed by EESL under the SLNP program | Number of street lights installed by EESL under SLNP program | US$77 million |
| **Results Area 3: Development of sustainable business models in new EE market segments** | | (*10% of total*, i.e. US$22 million) |
| DLI4. EESL implementation of EE AC sustainability actions (RF) | EESL's Board of Directors (or the relevant official(s) to whom the Board delegates the decision through the adoption of a resolution) adopts a decision to implement following EE AC actions: (i) Included, in the packaging of the air-conditioners sold by the Borrower, consumer guides on safe refrigerant replacement and disposal and buy back options (where available); (ii) Started (without interruption until the date of the withdrawal application) to include, in the Borrower's bidding documents from EE AC manufacturers, request to manufacturers to report AC refrigerant disposal (including Registered E-Waste Dismantler[13]/Recycler's verification or evidence of disposal) in conformity with India's Environmental Protection Act, using the model template provided by the Borrower, to enable monitoring and recording of AC disposal and recycling actions by manufacturers intending to supply AC units to the Borrower; and (iii) Conducted stakeholder consultations (including at least 3 AC manufacturers and 2 waste disposal agents) on safe refrigerant disposal. | US$14 million |
| DLI5. Business model for collaboration with private sector ESCOs in the implementation of EESL's Building EE Program | EESL Board of Directors (or the relevant official(s) to whom the Board delegates the decision through the adoption of a resolution) has approved a business model designed to broaden service offering under the Building EE Program, including through partnership with private sector ESCOs. Such business model: (i) includes a description of the partnership model(s) and the range of targeted energy solutions; (ii) includes a description of the roles, responsibilities and implementation sharing risk between the Borrower and private sector ESCOs; (iii) includes a description of the methods of measurement and verification of EE in buildings; (iv) includes a plan for consultation with the private sector ESCOs; and (v) reflects consultations with stakeholders to inform the design of the business model;<br><br>EESL has published a report on the business model referred above and containing the elements described in (i) to (v) above on its website; and | US$8 million |

[13] i.e., waste disposal agents/service providers, that include also hazardous waste management service providers

| Disbursement-Linked Indicator | Definition | Amount |
|---|---|---|
| | EESL has conducted consultations on the report referred above with at least 10 private sector ESCOs and issued a report on such consultations, including date, location, material presented and/or distributed, list and contact details of the participants, key issues raised by the participants, participants' responses to feedback survey on the consultations. | |
| **Results Area 4 – Institutional strengthening for sustainable EE scale-up** | | (*14.75% of total*) |
| DLI6. Establishment of sustainable development unit, and report on updated EHSS Manual covering all EESL's programs under implementation | EESL Board of Directors (or the relevant official(s) to whom the Board delegates the decision through the adoption of a resolution) has decided to establish a sustainable development unit under the Managing Director, to ensure environmental and social sustainability of all the Borrower's activities, and approved its terms of reference, sufficient budget to implement the terms of reference, staffing plan and program to build staff capacity, as further specified below:<br>(A) Such terms of reference are consistent with Annex VII of the ESSA and include, inter alia: (a) the continuous update of the Borrower's EHSS Manual to ensure full coverage of the Program Under Implementation by the Borrower and all environmental and social risks and mitigation plans for all the Borrower's Program Under Implementation; (b)the development of training on the EHSS Manual and capacity building of the Borrower's staff and contractors; (c) the monitoring of compliance with the EHSS Manual; (d) the restructuring and operation of a systematic and accessible grievance redressal system; and (e) the preparation of biennial (once every two years) management report on the implementation of the EHSS Manual; and<br><br>(B) Such staffing plan includes full time staff in adequate number to carry out the responsibilities of the sustainable development unit, and each with terms of reference, qualifications and experience commensurate with its responsibilities within the unit.<br><br>EESL having established (with a budget sufficient to carry out its responsibilities) its sustainable development unit in accordance with its Board decision referred to in paragraph (i) immediately above and such unit having carried out its activities in accordance with its terms of reference, the Borrower's sustainable development unit has produced its report to the Borrower's management on its first 24 months of activity and on the first period of implementation of the EHSS Manual (including an analysis of its performance, strength and weaknesses) covering all the EESL programs under implementation. | US$32.45 million |

### E. Capacity Building and Institutional Strengthening

30. **During the preparation of this Operation, a set of capacity building and institutional strengthening actions were identified.** Given the significant growth expected in EESL's portfolio over the next five years, EESL will need to continuously improve environmental and social management, corporate governance, risk management, financial planning, quality assurance, and leadership development and succession. In addition to measures under the Program Action Plan (PAP), some of the identified capacity building and institutional strengthening actions are reflected in DLIs 4, 5 and 6, while others were communicated to EESL management as recommendations, for EESL management to implement at their own discretion, or with support from other development partners. Some institutional strengthening on financial planning, risk management and resource mobilization will be achieved through engagement with prospective commercial banks and investors in the structuring, negotiation and eventual closure of the guaranteed transaction.

31. **A key institutional action is the strengthening of the environment and social management function within EESL.** The establishment of a dedicated Sustainable Development Unit managing environmental and social issues would support implementation of the Environmental, Occupational Health & Safety and Social (EHSS) Manual; strengthen citizen engagement; improve the grievance redressal system (GRS); develop and implement a gender strategy; and periodically report to management on implementation of the EHSS. *The establishment of this Sustainable Development Unit is a DLI under RA4. During preparation, to detail out the possible role, tasks and specific environmental and social issues that the Unit could cover, a Terms of Reference (TOR) was provided to EESL (available as Annex VII in ESSA).*

32. **Strengthening mechanisms for collaboration with private sector ESCOs (following an MFD approach), and leveraging private sector delivery, can help EESL achieve Program targets.** EESL is a Super ESCO whose mandate includes developing partnerships with, and support for, private sector ESCOs to broaden the impact of its Program through leveraging private sector solutions and participation. In the Building EE program (BEEP), EESL should explore a broader range of solutions targeting mobilization of the broader ESCO industry, by developing contract agreements with different risk and responsibility sharing options. Moreover, EESL can develop the broader EE sector by training and strengthening institutional performance of private ESCOs. *The development of a business model for partnerships with private ESCOs under BEEP to strengthen private sector participation is a DLI under RA3, and the delivery of capacity building for ESCOs is an action under the PAP.*

33. **Independent monitoring.** At present, EESL's monitors performance through its own Dashboard; and through some surveys by state governments. To fully assess the Program impact, independent surveys of EESL's program performance would allow it to continuously improve the Program design and implementation. *This action is included in the PAP, to be monitored during supervision.*

34. **With its evolving business models and changing risk profile, EESL will need to develop a long-term financial resource mobilization plan to raise larger volumes of financing with longer tenors, to match its evolving annuity based contracts.** EESL's new and growing business lines have different financing needs than historical bulk procurement under UJALA, which has been EESL's core business. Under these new programs, including the SLNP program, EESL makes the full investment upfront and subsequently recovers the investment, operation and maintenance cost, plus financing cost through an annuity contract. EESL will need to raise longer term financing and working capital in amounts significantly larger than in the past. Therefore, a key institutional action is the development of a robust medium and long-term financial resource mobilization plan, and development of in-house management capacity. The EESL team will also need the support of qualified external financial advisors to develop its long-term financing strategy. Some capacity will be built through the process of structuring, negotiating and closing the guarantee transaction under this Operation (which is a typical side benefit of these types of credit enhancement operations). *The development of a long-term financial resource mobilization plan is*

*included in the PAP, to be monitored during supervision. During preparation, the Bank task team advised EESL on the TOR for independent external financial advisors to support EESL in the development of a long-term financial resource mobilization plan.*

## III. PROGRAM IMPLEMENTATION

### A. Institutional and Implementation Arrangements

35. **The Program will be implemented by EESL.** EESL is a public corporation, formed under Government ownership to facilitate the implementation of EE projects in partnership with private ESCOs, state level institutions and other companies. EESL is one of the key agencies tasked with the implementation of NMEEE.

36. **Decisions are taken by the Managing Director (MD) under the overall guidance and support of the Board of Directors.** EESL's Board of Directors comprises the managing director, representatives of its four state-owned shareholders along with MoP and BEE and independent directors. All project investment decisions above a specific monetary threshold set by the Board must be approved by the Board of Directors, while decisions below that threshold are delegated to the MD. Project-related performance targets are set annually after deliberations at the organizational level and subsequent review and approval by the Board of Directors. Generally, there is an appropriate level of involvement of senior staff, including the MD, in all important decision-making processes and project implementation phases.

37. **EESL programs are jointly implemented by EESL's corporate headquarters and regional offices**. Each EESL program has a national program manager in the corporate office responsible for program results, who coordinates closely with local and regional staff. Procurement and finance are presently managed centrally by the corporate office to capture the benefits of economies of scale[14], while program-specific functions are managed regionally. The program manager works closely with regional centers, headed by regional managers for each program. Regional centers are responsible for implementing the programs (through distribution agencies such as in the case of UJALA, asset management consultants and project management consultants). Staff from the corporate office make regular visits to field offices.

### B. Results Monitoring and Evaluation

38. **Monitoring and verification of progress towards achievement of the Program's objectives will largely be based on the monitoring and evaluation systems EESL has already put in place**. Tools include EESL's management information system (MIS) and its public dashboards to monitor developments for each program, such as the UJALA and SLNP. Independent verification agency(ies) will be tasked to gather and verify relevant documentation and data to confirm achievements and performance. The DLIs were defined so that they are under the control of EESL and are measured using existing systems. After the end of each FY, EESL will prepare and submit to the Bank a Program Report covering progress in all activities under the PforR Program during that FY, including progress in implementing the DLIs and the PAP, and in achieving indicators in the results framework described in Annex 2. The Program report will also identify factors that could affect the achievement of program results.

39. **In addition, EESL will commission independent impact evaluations, and monitoring and evaluation of each EESL program**, and make independent evaluation part of regular corporate oversight. Such evaluations will also serve as a useful tool for documenting program impacts on EESL's customers and a diverse range of beneficiaries, including consumption behavior and market impacts. *This is captured as an action in the PAP.*

[14] EESL is considering decentralizing small value procurements to its ROs

### C. Disbursement Arrangements

40. **The IBRD Loan proceeds will be disbursed on achievement of the six DLIs, and disbursed over a period between 2018 and 2023.**[15] The DLIs are structured to ensure a regular flow of financing necessary to deliver the overall Program. Annex 3 provides the agreed list of DLIs and the Disbursement-linked Results (DLRs), the amount allocated and achievement deadlines for all DLRs, and the annual financing allocations across DLIs and DLRs. The prior-result DLRs are under DLI1, 2 and 3 and EESL could submit a withdrawal application in an amount of up to US$55 million for those DLRs which have been achieved before the loan agreement is signed but on or after April 1, 2017. The DLIs 1, 2 and 3 are also scalable, which means that for these three DLIs, the Bank will have the option to authorize a partial disbursement upon partial achievement of a DLR, or to disburse amounts higher than the amount allocated to such results, within overall limits, if achievement outperforms the DLR for a given period, or cancel all or a portion of the allocation upon partial achievement of these DLRs.

41. **Disbursements will be made after confirmation by the Independent Verification Agency (IVA**). The IVA will carry out verification, in accordance with the verification protocol, to confirm that EESL has furnished evidence for the achievement of relevant DLRs. Application for withdrawal will be sent to the World Bank after EESL is notified in writing by the Bank that the Bank has accepted evidence of achievement of the DLRs.

42. **The aggregate amount of the IBRD Loan and the commercial financing raised with the IBRD Guarantee will be equal to or less than the total underlying program expenditures over the Program period,** but expressly excluding any such expenditures financed by the Bank or the Association under any other loan, credit or grant or an expenditure financed by a party beneficiary of a guarantee provided by the Bank or the Association, and any expenditure financed by another multilateral or bilateral development partner. Should there be any unaccounted or un-utilized funds disbursed by the Bank under the Loan at the close of the Program, the same will be refunded to the World Bank. Reconciliation and reporting of expenditures in financial statements and reports will be in Indian Rupees.

## IV. ASSESSMENT SUMMARY

### A. Technical

43. **The Program is strategically relevant and closely aligned with Government of India's EE objectives and priorities**. Energy efficiency is critical to helping India address the multiple challenges facing the power sector, moderate demand growth, and meet its climate change objectives under NAPCC. Despite significant potential, EE continues to face barriers to scale-up, particularly in the residential and public sectors. In this context, the EESL program is highly relevant.

44. **The Program is already delivering results.** The UJALA LED program has been successful in triggering EE market transformation in India and is one of the most globally significant residential LED lighting programs. A crucial outcome has been that UJALA demonstrated the feasibility and viability of large-scale EE appliance deployment programs without requiring Government subsidies. SLNP has helped municipalities and Discoms avoid electricity consumption and reduce utility bills; reduce operating and maintenance costs; and provide improved monitoring, network visibility, and controls. In addition, SLNP helped generate additional economic and social benefits to local communities, created further opportunities for the LED lighting sector and demonstrated approaches to public lighting projects that can be replicated by private ESCOs.

[15] This includes the 4-month disbursement deadline date, after the program end date (Sept 30, 2022)

45. **Areas for further strengthening of the Program were identified.** Several areas for strengthening UJALA and SLNP were identified and relevant recommendations were made in the Program Technical Assessment, which is summarized in Annex 4. The Technical Assessment also identified potential Program design improvements for newer initiatives that EESL is currently developing, such as AC, AgDSM and BEEP, to ensure their viability and sustainability, as they gear up for large scale deployment. *Some actions were captured as DLIs, while others are reflected in PAP.*

46. **As an institution, EESL has already demonstrated that it can effectively implement the Program, and has the makings of a high-functioning commercial organization.** EESL has adopted an organizational structure with clearly defined roles and responsibilities. Decisions making structures are clear and have been observed to be effective in achieving program results. Project-related performance targets are set annually. Project implementation is coordinated between headquarters and field offices, and there are functional units and divisions with clear mandates.

47. **However, there is room for further institutional strengthening at EESL.** The most important areas to further strengthen include environment and social management, corporate governance, risk management, financial planning, resource mobilization and quality assurance. It is important for EESL to incorporate independent surveys and M&E exercises into its overall program management approach, seek consumer feedback, identify program challenges and design corrections.

48. **Program expenditures are realistic and sustainable.** The Program expenditures are assessed to be realistic in terms of prioritization and coverage and are consistent with the current expenditure pattern of EESL. The total program expenditures over the operation period is estimated to be INR 93 billion (about US$1.3 billion) from FY2017 to FY2022, and are included in EESL's corporate plan for 2017-2022. This includes only the cost of physical investments under UJALA and SLNP and employee benefits to EESL staff. The IBRD Loan in support of the Program amounts to US$220 million which is equivalent to around 16 percent of the total program expenditures. The Program expenditures are aligned to EESL's priorities and guided by GoI's agenda. Significant scaling up of existing activities is projected, and the forecast level of expenditure is assessed as sustainable. The program would be implemented entirely by EESL from its own resources, including equity, internal accruals and borrowings (including those from other development partners). EESL has a strong support from its four state-owned shareholders under MoP, whom have ensured that EESL is adequately capitalized, allowing it to maintain the targeted debt-equity ratio of 80:20. Adequate funding availability and financing modalities for the Program are expected to continue to be important.

49. **The Program economic evaluation concludes that public sector support for the Program is justified, and that the Program benefits exceed Program costs.** The Program will generate significant economic benefits. The economic analysis calculated an economic internal rate of return of 144 percent for the Program, readily exceeding the assumed social discount rate of 13%, even when excluding local and global emissions reduction benefits. Economic internal rates for individual sub-programs range from 8 percent for LED street lights to 1,244 percent for LED bulbs. The sensitivity analysis, under which switching values were calculated for appliance costs, operating hours and failure rates, found that the economic viability of the Program is insensitive to these plausible changes. Program investments could contribute to avoidance of an estimated 10 GW of additional electricity generation capacity, which represents around 3 percent of India's total installed generation capacity. The economic and financial analysis is summarized in Annex 4, and details are available in the stand-alone Program Economic and Financial Analysis in the project files.

50. **A thorough corporate financial analysis of EESL was undertaken to assess its financial viability and readiness to engage with commercial financiers.** Risks were identified and discussed on how EESL could sustain growth, improve financial planning, manage foreign exchange fluctuations and raise sufficient financing to keep pace without risking financial sustainability. The analysis is detailed in Annex 11.

51. **During preparation, the Energy and Extractives Global Practice (GP) team collaborated with the Climate Change Group, the Infrastructure, PPP and Guarantees Group and other GPs (including water and urban).** Their collective inputs informed the program design and boundaries, and the opportunities for institutional strengthening. The collaboration with the Infrastructure, PPP and Guarantees Group focused on designing and integrating the IBRD Guarantee into the Operation, while work with the Climate Change Group focused on two key areas among others: TCAF (described in Section II.C) and the integration of low-Ozone Depleting Substances (ODS) and low-Global Warming Potential (GWP) refrigerants along with energy efficient air-conditioners (explained further in Annex 1 and 3). [16]

52. **In addition to overall energy savings and GHG avoidance benefits, EESL initiatives offer significant direct benefits to Indian consumers, especially low-income households**. By reducing the initial incremental cost of higher efficiency appliances, and providing upfront financing, EESL facilitates uptake by consumers who would otherwise not be able to afford these EE options. Additionally, there is growing evidence that public lighting EE programs improve safety through better visibility, reduced crime and traffic accidents, and contribute to economic growth by facilitating increased commercial activity by small-scale and low-income entrepreneurs.

### B. Fiduciary

53. **The conclusion of the Fiduciary Systems Assessment (FSA) is that the Program's fiduciary systems established by EESL provide reasonable assurance that the financing proceeds would be used for intended purposes** with due attention to the principles of economy, efficiency, effectiveness, transparency and accountability. The FSA followed the World Bank's Policy for PforR and the related Directive,[17] identified key fiduciary risks that may affect the Program's development outcomes and recommended systems and capacity strengthening mitigation measures to be implemented by EESL during the life of the Program. Key findings are summarized in Annex 5. The full FSA is disclosed as a separate document.

54. **EESL has established a financial management system that is suitable for carrying out its mandate**. EESL is governed by the Companies Act, 2013, providing a strong framework for corporate financial management including provisions regarding corporate governance, administration, accounting and financial reporting and auditing**.** These provisions inform EESL's FM systems that are to be used for the program. The financial management system includes an accounting system[18] in compliance with the prevailing regulations, which require EESL to maintain accounts that show a true and fair view of its financial status. EESL's accounting system, including the chart of accounts, has the capability to track program expenditure and capture the expenditure on the different lines of business (say UJALA and SLNP) at the general ledger level and provide information on various expenditure lines, Furthermore, the Annual Financial Statements (AFS) of EESL are prepared based on Indian Accounting Standards, which are aligned with the International Financial Reporting Standards and are capable of providing information on the program expenditure. The program AFS will be prepared by EESL and audited by a private audit firm which may include auditor appointed by the Comptroller & Auditor General of India (C&AG).

55. **EESL is strengthening its FM systems in anticipation of its rapidly expanding activities.** Adoption of Enterprise Resource Planning (ERP) system is in an advanced stage which will strengthen

[16] IFC has expressed interest in downstream support to the air-conditioner manufacturing industry and upstream support to the private sector financiers to help scale up EESL's Air-Conditioner program in a sustainable manner in the future by credit financing repayments on a larger scale, (Results Area 3). .

[17] Bank Policy Program for Results and Bank Directive Policy for Results effective July 10, 2016 and Bank Guidance Program for Results Fiduciary Systems Assessment Guidance Note issued June 30, 2017

[18] Accounting is carried out on an off-the-shelf accounting application deployed at the head office and is presently centralized. EESL is in the process of implementing ERP on SAP platform and the Finance module is in Go Live stage.

internal controls. It is important that the transition to ERP and change management does not impact the ability of EESL to appropriately carry out its fiduciary function in the transition and stabilization period. Internal audit mechanism needs to be strengthened in line with the rapidly expanding requirements of EESL and good industry practices. EESL will focus on strengthening the internal audit mechanism during program implementation and this is included in the PAP[19]. Financial management systems, processes, and procedures in EESL will be documented in finance manuals post implementation of ERP. This measure is included in the PAP.

56. **Efficient procurement is core to EESL operations.** Major items to be procured under the program are LED Bulbs, LED tube lights, LED streetlights, fans and fixtures in which EESL has had a proven track record in procurement. The scale-up of EESL's operations may require enhancement of procurement systems. Through various PAPs included under the Program, the current procurement policy, bidding documents and Quality Assurance manuals of EESL will be updated to meet policy, market and technological changes.

57. **The Program is not expected to require large contracts valued at or above Operational Procurement Review Committee (OPRC) thresholds** (US$115 million for works, US$75 million for goods and non-consulting services, and US$30 million for consultant services), which places the Program procurement risk as "moderate". EESL has also implemented a SAP supply chain management (SCM) e-procurement platform and all bids are widely published.

58. **EESL guidelines emphasize transparency and ethics in procurement.** The "Guidelines, Policy and Procedure for Procurement of Goods, Works and Non-Consulting Services for EESL" dated November 19, 2013, emphasizes the need for transparency and ethics in procurement. Open tender is the preferred procurement approach. Corrupt and fraudulent practices are defined in the Guidelines and there are provisions for rejection of bids, cancellation of contract or debarment, if a bidder/supplier was found to be engaged in these practices. Fraud prevention policy and conflict of interest provisions are also part of the Guidelines. As per the Guidelines, suppliers may be debarred due to poor performance apart from indulgence in fraudulent or corrupt activities. EESL's Vigilance Department is under its Chief Finance Officer and there is an opportunity to have a separate Chief Vigilance Officer.

59. **EESL follows the corporate governance provisions in the Companies Act**, though there are some deviations in actual practice. EESL's operations fall under purview of Central Vigilance Commission (CVC), Comptroller and Auditor General (CAG) as well as the Right to Information Act of Government of India. EESL has a documented Code of Conduct (August 2015) applicable to all Board members and senior management personnel, and mandates management to submit a one-time acknowledgement of the Code and annual affirmations of compliance. EESL is developing a defined Corporate Governance framework. EESL has documented policies on Fraud Prevention and Whistle Blowing, covering the eligibility, guiding principles and procedures to be followed in reporting instances of fraud. Employees are required to submit a signed declaration accepting the Fraud Prevention Policy with a commitment to abide in their normal course of business. These documents are publicly available on the EESL website. To strengthen the Board of Directors of EESL, independent directors and a Director Finance have been inducted in the Board.

60. **World Bank anticorruption guidelines.** For the PforR, the Program will be subject to the Bank's Governance and Anti -Corruption Guidelines namely the "Guidelines on Preventing and Combating Fraud and Corruption in Program-for-Results Financing." For the IBRD Guarantee, the "World Bank's Anti-Corruption Guidelines for Guarantee and Carbon Finance Transactions" would apply.

[19] Including enhanced institutional framework, improved scope and coverage of audit through risk-based audit, special audits such as stock audit, developing an internal audit manual/guidelines, and an effective mechanism for compliance and follow- up

### C. Financial Management and Procurement under the IBRD Guarantee

61. The **IBRD Guarantee will partially cover re-payment risks to commercial lenders or investors**, to enable EESL to raise funds for its program. The proceeds of the debt raised with the proposed guarantee will be used for the Result Areas under the Program and reported through periodic Program reports. The Program fiduciary systems of EESL have been assessed to provide reasonable assurance on the use of the proceeds. In case claims are made under the Guarantee, the Bank will disburse the amount of those claims to the Guarantee beneficiaries and the Government will be obligated to repay those amounts to the Bank, as described in Annex 10. **Guarantees under the IPF Policy are excluded from the application of the "Bank Policy: Procurement in IPF and Other Operational Procurement Matters"**. The Fiduciary Systems Assessment undertaken for the purposes of the PforR Financing provides assurance that acceptable procurement arrangements will be applied to the financial resources to be mobilized by the IBRD Guarantee.

### D. Environment and Social

62. **In line with PforR Policy requirements, the Bank team along with EESL prepared the Program Environmental and Social Systems Assessment (ESSA), which includes institutional capacity assessment of EESL and necessary actions linked to the DLIs and PAP**. The Bank's assessment determines areas which need strengthening to ensure that the Operation will be implemented in a manner that meets the requirements of both the Bank's PforR Financing Policy/Directive (applicable to the IBRD Loan) and the Bank's IPF Policy/Directive (applicable to the IBRD Guarantee). With both PforR and IPF policies being applied, the requirements converge for cohesive final outcomes.

63. **EESL is in the process of developing a system to effectively manage environmental and social risks, through EESL's own Environmental, Occupational Health and Safety and Social (EHSS) Manual**. Key environmental and social actions required by EESL include:

a. Update EESL's EHSS Manual to ensure that the necessary safeguards management measures for implementation of Result Areas 1 and 2 (UJALA and SLNP) are addressed adequately;

b. Update provisions of ESSL's EHSS Manual for programs under Results Area 3 during the implementation of the Program;

c. Establish a Sustainable Development Unit to oversee the environmental and social management of EESL programs alongside operating divisions of EESL (Results Area 4); and

d. Deploy resources for training and capacity building within the various divisions of EESL (Results Area 4).

64. Under the Bank's IPF Policy, the Program supported by the IBRD Guarantee (UJALA and SNLP) has been classified as Category B, and the following Bank Policies/Procedures are triggered: Environmental Assessment OP/BP 4.01, Physical Cultural Resources OP/BP 4.11, and Indigenous Peoples OP/BP 4.10. EESL therefore prepared and adopted the following standalone safeguards instruments:

a. Environmental Management Framework (EMF): EESL prepared and adopted an EMF for the UJALA and SLNP programs. The EMF includes the EHSS Manual, updated as per the recommendation of the ESSA. EESL therefore met all environmental safeguard requirements of the Bank's IPF Policies, including OP/BP 4.01 and 4.11 prior to the appraisal of this Operation.

b. Indigenous People's Policy Framework (IPPF): EESL prepared and adopted an IPPF for the UJALA and SLNP programs, given the possibility that the Operation may involve interventions

which affect indigenous peoples in predominantly tribal areas. This IPPF addresses the Bank's requirements under OP/BP 4.10.

65. Given that the EMF and IPPF prepared for the Guarantee component, also include the necessary environmental and social actions of the PforR ESSA, the provisions of EMF and IPPF will be applied uniformly to the Program (PforR and Guarantee), to ensure consistency. The achievement of environmental and social measures/actions required under the PforR ESSA have therefore been advanced in the Program cycle.

***Part A – IBRD Loan under the Bank's Program-for-Results Financing Instrument***

66. **The Program ESSA, carried out by the Bank, concludes that the proposed Program is expected to result in substantial environmental and social benefits**, which can be sustained beyond the Operation's life. Adverse effects are not foreseen if the recommendations of the ESSA are followed, and institutional capacity will be developed to address environment and social issues. The Program is deemed to have "moderate" risk.

67. **Summary of main environmental benefits and risks**. The proposed Program would result in significant benefits including energy savings from installation of EE equipment; avoided energy and capacity; avoided environmental and health costs from avoidance of thermal generation; and improved quality of life for consumers. Risks associated with the UJALA and SLNP programs mainly include material and waste management, including for bulb disposal by consumers; poor product quality; and risks during installation and maintenance including safety issues. Bulb disposal is regulated by India's E-Waste (Management) Rules, 2016, and the ESSA also addresses all aspects of bulb disposal. Risks associated with SLNP additionally include inappropriate planning and placement decisions, which are manageable through adequate institutional systems and monitoring, which will be built into the program. For the newer activities such as the AC program, Building EE Program (BEEP) and Agricultural DSM (AgDSM), critical risks will need to be understood and mitigated as the programs are developed. The ESSA also recommends that the proposed Sustainable Development Unit shall be mandated to incorporate environmental and social management into these new programs.

68. **Summary of social benefits and risks.** The EESL Program spans India and covers geographically remote, politically sensitive and socially marginalized areas and communities. The Program therefore benefits not only mainstream communities, but also those that are often marginalized. Improved street lighting, access to affordable EE products and increased employment opportunities are likely to also provide gender benefits. EESL maintains a GRS and undertakes consultations with all stakeholders. However, EESL will need to develop a gender strategy at both corporate and program level, and design systems to assess gender based impact. Other social risks include: (i) the possibility of exclusion[20] given that there is no specific strategy or targeting for below poverty line families or scheduled caste or scheduled tribe households; (ii) violation of labor rights through contracting and sub-contracting where monitoring systems need to be strengthened; and (iii) risks from implementation in remote, politically and socially sensitive, tribal areas.

69. **Assessment of environmental and social systems and practices.** EESL's environmental and social systems are aligned with national and state level legislation, which addresses most of the potential impacts arising from EESL's Program. EESL's EHSS Manual institutionalizes environmental management, occupational health and safety, and social management systems for UJALA and SLNP. There is scope for further strengthening of the EHSS Manual to cover all of EESL's programs as outlined in the ESSA. EESL's staff capacity needs to be strengthened so that staff are able to manage EESL's various programs

[20] Going ahead, EESL should target low income households and small commercial establishments who are still buying incandescent bulbs (http://www.prayaspune.org/peg/publications/item/354)

in compliance with the EHSS Manual. Strengthening institutional capacity would also enhance EESL's performance in terms of social inclusion, gender indicators, citizens engagement and labor rights.

70. **The ESSA therefore requires several actions under the Program Action Plan** including the establishment of an adequately staffed Sustainable Development Unit, to focus on environmental and social compliance, and capacity development; upgrade of the GRS; strengthening the EHSS Manual to cover all of EESL's operations; and, incorporation of mechanisms to address issues emerging from climate vulnerability and disasters. *These are captured in DLI6 and PAP under RA4.*

71. **Citizens engagement**: EESL has institutional mechanisms to ensure that information is shared effectively and feedback is sought regularly from relevant stakeholders. These include independent complaint registration and feedback mechanisms for each program:

a. The UJALA dashboard provides clearly elaborated 'frequently asked questions', and allows consumers to register their complaints directly;

b. For the SLNP program, immediate grievance redressal is provided through a Centralized Control and Monitoring System (CCMS), which ensures better management of street lighting and improves quality and reliability of public services for citizens. Municipalities also conduct user feedback to assess the benefits of improved street lighting.

72. **The ESSA recommends that EESL further strengthen citizen engagement** by conducting additional consumer surveys, citizen feedback, and stakeholder consultations to fully document the benefits of, and deficiencies within, its program. The Sustainable Development Unit to be established by EESL would strengthen its citizen engagement and GRS by ensuring that feedback and complaints are assessed, and result in program corrections where warranted.

73. **The ESSA identifies several opportunities to improve the gender performance of the Program, and recommends actions to address these**. Provision of electricity to communities and homes can promote gender equality, women's empowerment, and women's and girls' access to education, health care, and employment. Most gender benefits occur because women can carry out their household chores more productively with electricity. Lighting also improves the productivity of many household activities, and has potential benefits for public safety and helps create income generation opportunities for women.

74. **EESL is currently implementing only limited initiatives for gender inclusion, and has an inadequate gender strategy.** This has resulted in (a) limited employment for, and outreach to women in its programs (women's employment/agency gap); (b) limited understanding of gender inclusion within the institution (institutional gender capacity gap); and (c) lack of systems to track and/or assess any gender-specific impacts of EESL's programs. The ESSA addresses these gaps through the following recommendations:

a. Need to create more employment opportunities and greater outreach for women: by recommending (i) strengthening of gender sensitivity through orientation and training, (ii) EESL will improve gender balance by hiring more women at Program sites, with a particular focus on hire of women for senior management and technical positions, and (iii) mobilization of women's self-help groups to promote energy efficiency. In order to measure creation of employment opportunities, EESL will monitor the number of positions it advertises which prefer women candidates, and how many women are directly employed by EESL at each level of its organization (managerial, technical, administrative). In order to measure the success of the outreach activities, EESL will monitor the estimated number of women beneficiaries of LED bulbs sold under the Program.

b. Need to strengthen institutional gender capacity, and lack of tracking systems: the proposed Sustainable Development Unit will be responsible for strengthening the EESL gender policy and systems. The Unit will engage gender experts to develop a gender strategy; oversee gender sensitivity orientation/training for employees; establish gender monitoring systems; and strengthen the existing Committee Against Sexual harassment, which is constituted in accordance with Vishaka Guidelines. The TOR for the Sustainable Development Unit is included as Annex 7 in the ESSA.

75. **Stakeholder Consultations:** The ESSA was prepared by the Bank team in consultation with EESL. In May and June 2017, four site visits were undertaken (Chandigarh, Karnataka, Telangana and Gujarat), and consultations held with EESL, other stakeholders including clients (state and local government officials), vendors and distribution agencies, and consumers. During these consultations, the respondents shared information on their role in the Program, Program impacts, and suggestions to address gaps within the Program. The findings of these consultations were shared with EESL management, and incorporated in the draft ESSA. The details of persons consulted is available as Annex IV in the ESSA.

76. **Disclosure:** Consultations were undertaken on the draft ESSA, and it was disclosed on EESL's website on December 11, 2017, and in the Bank's website. After Appraisal, the revised ESSA was disclosed on the EESL and World Bank websites in the first week of January 2018 (details in Annex 6). The final ESSA will be disclosed in the World Bank and EESL websites, along with the PAD and other project documents.

***Part B – IBRD Guarantee under the Bank's Investment Financing Instrument***

77. The IBRD Guarantee will help EESL raise commercial financing to support the Program in two key results areas: the deployment of LED bulbs, LED tube lights and efficient ceiling fans under the UJALA Program, and LED street lighting under SLNP, covering locations in both urban and rural areas across India. An Environmental Management Framework (EMF) was prepared and adopted by EESL, which has relevant provisions to address the expected environmental impacts of these programs. The EMF provides a comprehensive framework for screening, customized impact assessment procedures for UJALA and SLNP programs, and environmental mitigation measures complying with World Bank requirements. The EMF also incorporates the updated Standard Operating Procedures of the EHSS manual, covering environment, and occupational health and safety provisions for UJALA and SLNP. Consultations were undertaken for the draft EMF, and it was disclosed for public information and comments before being finalized by EESL. The EMF was cleared by the Bank and adopted by EESL management. EESL is in the process of assigning specialized professional staff and consultants to implement the EMF and disseminate the provisions of the EHSS to vendors, consultants and staff.

78. In addition, an IPPF prepared and adopted by EESL includes provisions and measures to be followed in the event that operations are undertaken in areas that impact indigenous peoples. The protocols under the IPPF support full information sharing, consultations and the communication of benefits to indigenous peoples. The IPPF takes into account consultations undertaken during project preparation. The EMF and IPPF was disclosed for public information and comments before finalization by EESL. Details are provided in Annex 6.

79. **EESL has adopted the EMF and commenced with its implementation**. EESL's EHSS Manual has also been updated and included within the EMF. The EHSS Manual's provisions have been integrated into EESL's bid and contractual documentation for UJALA and SLNP, including provisions for waste management, extended producer's responsibility, and safety protocols. EESL has assigned two dedicated officers (a trained environmental specialist and a technical / operations specialist) to oversee implementation of the EMF and EHSS Manual. At the time of appraisal, EESL had hired an Environmental Consultant to provide training in the EHSS, disseminate the provisions of the EHSS to relevant parties, and to assist in establishing a Sustainable Development Unit. The first round of training/dissemination was

provided to EESL's operational divisions, vendors, contractors and other stakeholders, in January to March 2018.

### E. Integrated Risk Assessment

80. **The overall risk of the proposed operation is rated as Moderate**. The proposed operation is well-anchored in a relatively robust policy and regulatory framework, geared towards the development of the EE sector in India led by EESL and the BEE, and is aligned with the targets and plans laid out by the GoI, through the NMEEE, NDC and other long-term commitments.

81. EE market transformation faces a complex set of barriers. As EESL implementation progresses on a larger scale beyond the continuation of its existing and proven initiatives into newer, more sophisticated and complex EE solutions with higher technical risks. The challenge for EESL in the successful UJALA and SLNP programs, covered by Results Area 1 and 2 of the Program, is to ensure sustainable outcomes as these programs are scaled up. However, there is more uncertainty and risk in the new programs being developed by EESL, and supported under Results Area 3. These new programs include more sophisticated and costlier EE technologies, and will involve development of relatively complex implementation mechanisms to address market barriers which are different from those faced under the UJALA and SLNP programs. The Program seeks to mitigate the higher risk of these new programs, through DLIs which aim to strengthen technical capacity, and address sustainability issues.

82. As EESL grows its annuity based business across multiple market segments, it will need to develop more robust long-term contracts with mechanisms (and penalties) to mitigate payment risks and non-performance by counterparties. This may include the development of a more comprehensive risk management framework with strengthened screening of new contractual and financial commitments. Further improvements in risk management will become necessary as EESL seeks to raise long-term commercial financing from lenders and investors on a regular basis.

83. The assessment of risks with respect to program technical design, fiduciary, environmental and social aspects, and institutional capacity for implementation in a sustainable manner is described further in Annex 4 (Summary Technical Assessment). Risk ratings are provided in the SORT matrix, available in Annex 7.

### F. Program Action Plan

84. **The Program Action Plan covers institutional strengthening, fiduciary enhancement and sustainability of EE market transformation.** Actions included in the PAP address risks identified in FSA, enhance sustainability of EE programs of EESL, and measures to strengthen EHSS manual and training, track women employment, and develop long-term financial resource mobilization plan. Details of the PAP are provided in Annex 8.

### G. Grievance Redress

85. **Communities and individuals who believe that they are adversely affected as a result of a Bank supported operation, as defined by the applicable policy and procedures, may submit complaints to the existing program grievance redress mechanism or World Bank's Grievance Redress Service.** The World Bank's Grievance Redress Service ensures that complaints received are promptly reviewed in order to address pertinent concerns. Affected communities and individuals may submit their complaint to the Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of World Bank non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service, please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org

## Annex 1: Detailed Program Description

1. This Annex describes the main EESL initiatives included in the Program boundary as described in PAD Section II. Annex 4 contains an assessment of key implementation challenges and sustainability considerations for each initiative.

2. The proposed PforR operation would support the Government Program in achieving EE market transformation, innovation, and sustainability, through the following four Results Areas.

### I. Results Area 1: Energy Savings and EE Market Transformation in the Residential Sector

3. **Products offered.** The UJALA program currently involves the sale of three energy efficient appliances and equipment to residential consumers, namely LEDs lightbulbs, LED tube lights, and efficient ceiling fans. To date, the primary focus of UJALA has been on LED lightbulbs, but will shift towards LED tube lights and super efficient ceiling fans, with LED bulbs representing smaller share of future program spending.

4. **Services provided and functions performed by EESL under UJALA.**

- ***Awareness programs.*** EESL engages with potential consumers to disseminate information on the benefits of energy efficiency (EE) appliances. Awareness programs may be in the form of government launch events, fliers, advertisements, street plays, etc.
- ***Bulk procurement.*** EESL procures competitively large quantities of EE appliances to drive down the price. EESL's tendering process awards contracts to multiple suppliers, where feasible, by offering all qualifying firms the chance to match the lowest bid price. The bidders that accept the lowest price are awarded a share of the tendered quantity based on their production capacity and price ranking (from lowest to highest bid price) at the lowest bid price. Repeated tenders of bulk procurement lead to the creation of greater manufacturing capacity, fostering competition, developing local manufacturing capacity, and protects EESL from the risk of a single supplier not meeting the order on time.
- ***Quality assurance (QA).*** EESL seeks to ensure quality through clear technical specifications, a three-step testing process, and requiring manufacturers to provide a three-year replacement warranty (for LED bulbs and LED tube lights) and 2.5-year replacement warranty for fans. Technical specifications are developed in line with the Bureau of Energy Efficiency (BEE) standards and a stakeholder consultation process. EESL's quality standards create a quality benchmark for the market. EESL has recently developed QA Manuals for LED domestic lighting and LED street lighting.
- ***Distribution.*** EESL contracts distribution agencies to distribute energy efficient appliances at a lower cost relative to the retail market by passing on the benefits of bulk procurement price to consumers. The distribution agency responsibilities include transporting appliances to the point of sale, collecting payments, and maintaining records of sales data.
- ***Offering payment options that help overcome first cost barriers.*** Consumers can pay upfront the full price of the appliance; or on-bill payment, where the price of the appliance is recovered through equal monthly instalments (EMI) charged in electricity bills under the deemed savings approach.[21]

[21] Under the deemed savings approach, energy savings are calculated by demonstrating the percentage difference in energy consumption by an energy inefficient appliance and the energy efficient alternative, and validating this calculation through pilots to measure energy savings. For example, the deemed savings calculation for LED bulbs assumes that a 9W LED bulbs replace

- ***Data.*** Real-time number of appliances sold and the location is available in EESL online dashboard.[22]

5. **Implementation Arrangements.** EESL initiates the program in each State by entering a Memorandum of Understanding with the State Government, and a legally enforceable Memorandum of Agreement with the electricity distribution companies (Discoms) with the endorsement of the State Government and approval of the State Electricity Regulatory Commissions (SERCs) where needed. EESL then starts program roll-out in consultation and coordination with Discoms, which provide space for distribution kiosks, participate in awareness building activities, and provide a database of potential consumers. EESL disseminates information or provides clarifications to consumers regarding its programs through the state information department. Discoms are responsible for collecting EMI payments through electricity bills and depositing the payment to EESL's account. All quality standards and warranties offered to consumers are secured through identical requirements in contracts between EESL and the product manufacturers.

6. **Targets.** India's national program target is to deploy 770 million LED lightbulbs,[23] totaling sales and deployment of LED bulbs through UJALA and those sold in the retail market. EESL targets distributing 420 million LED bulbs over the Program period. In addition, EESL targets selling 10 million LED tube lights annually. The annual target for efficient ceiling fans is 2 million.

7. **Results.** The UJALA LED program is currently the world's largest residential LED lighting program implemented and has transformed the LED lighting market in India without requiring financial incentives or subsidies to consumers. As of April 2018, over 295 million LED lightbulbs and 6.3 million tube lights were distributed. Per EESL records, the failure rate as of August 2016 was less than 1 percent. As of April 2018, EESL had distributed over 1.8 million efficient ceiling fans across India. LED lightbulbs are sold at INR 70 for upfront purchases, LED tube lights at INR 220, and fans at INR 1100.

## II. Results Area 2: Energy Savings and EE Market Transformation in Public Street Lighting

8. **Products.** EESL replaces existing street lights (high pressure sodium vapor lamps, high intensity discharge, halogen lights, fluorescent tube lights, CFLs, and ICLs) with LED street lights.

9. **Services provided and functions by EESL under SLNP:**

- ***Outreach and engagement with urban local bodies (ULBs).*** EESL engages with ULBs, which do not have the finances to carry out large-scale EE, to build understanding of the benefits of energy efficient street lights in terms of energy and cost savings, as well as improved lighting services to the public.
- ***Inventory survey.*** EESL carries out initial studies and an inventory survey of existing street lighting stock to prepare a detailed project report (DPR).[24] A detailed energy audit for data validation of the DPR and verification is conducted jointly with municipalities.
- ***Bulk procurement.*** Similar to UJALA, EESL carries out bulk procurement of LED street lights, along with replacement and maintenance services from vendors. The bundling of services ensures greater accountability, and bulk procurement drives down costs.

equal shares of replacement of 100W incandescent lamps (ICL), and 18W Compact Fluorescent Light (CFL) lightbulb. The BEE 5 star rated 50W ceiling fans replace 75-80 W fans.

[22] EESL "UJALA Dashboard". http://ujala.gov.in/

[23] This target is based on an estimation of existing incandescent lightbulbs in India, derived from their 2013 sales total. The target is not based on actual lighting points and hence less LED bulbs might be required to replace the actual lighting points fitted with IC bulbs given that more than one IC bulb may be bought for the same lighting point in a given year.

[24] In earlier phase of SLNP, EESL also carried out pilots with actual LED street lights

- ***Installation and maintenance.*** Under their contract, the awarded vendors must replace identified conventional streetlights with LED streetlights, and carry out minor repairs (such as installing missing arms) where necessary. In the agreement that EESL signs with ULBs, EESL is required to maintain a minimum uptime of retrofit luminaries of 95 percent, excluding the period of load shedding. EESL also guarantees repair or replacement of faulty lights within 48 hours for a seven-year period.
- ***Centralized Control and Monitoring System (CCMS).*** In addition to LED street lights, EESL installs a CCMS at lighting switch points that enables remote and real-time operations and monitoring, automatic switching, timing configuration and fault detection.
- **Data collection and reporting.** CCMS uses mobile technology (to send operational data to EESL servers. Real-time data on number of LED street lights deployed is online on the SLNP dashboard.[25]
- ***Payment mechanism.*** EESL undertakes the entire upfront investment, and is paid under the deemed savings approach from the ULBs in monthly instalments over the project duration (ESCO model). The annuity charged to the ULB recovers EESL actual installation, maintenance, and financing costs.

10. **Implementation arrangements.** EESL typically initiates SLNP implementation in a state through agreements with state governments, which in turn work with EESL in the selection of municipalities to be supported by SLNP. EESL engages with the selected municipalities to assess interest and feasibility of program implementation under a Memorandum of Understanding (MoU).

11. **Targets.** The overall program target is to replace 13.4 million street lights across India. Initial program focused in cities, working with municipal corporations, but is now expanding to rural areas with "gram panchayats" (village council).

12. **Results.** As of April 2018, EESL had deployed over 5.5 million LED streetlights across India, avoiding an estimated 375 MW of generation capacity.

## III. Results Area 3: Development of Sustainable Business Models in New EE Market Segments

13. Building on the success of UJALA and SLNP, EESL is expanding its programs to new market segments that offer significant opportunities for EE, including super-efficient air conditioners, energy efficiency in public buildings, and efficient agricultural water pumps. Under Results Area, support would be provided to EESL in developing the design of these new initiatives, including incorporating sustainability elements into the design and implementation arrangements. Support will be provided to technical and analytical work, and no physical investments are included in the Program boundary.

### A) Super-efficient Air Conditioning

14. **Product offering.** EESL plans to offer 1.5 ton of refrigeration (TR) capacity super-efficient room Air Conditioners (ACs) rated at 5.2 Indian Seasonal Energy Efficiency Ratio (ISEER).

15. **Services provided and functions performed by EESL.**

- ***Development of technical specifications.*** The maximum efficiency currently made available by manufacturers is ISEER 4.8. The technical features would gradually evolve to incorporate more advanced options, such as low GWP refrigerants, or Demand Response ready ACs, through a process of stakeholder consultation and better understanding of market demand.

[25] Energy Efficiency Services Limited. "Street Lighting National Program Dashboard". http://eeslindia.org/slnp/

- ***Bulk procurement.*** EESL carries out bulk procurement of air conditioners, along with maintenance services under an annual maintenance contract (AMC)..
- ***Installation and maintenance.*** Vendors will provide installation and maintenance services.
- ***Payment.*** EESL will bear the upfront cost of the ACs and provide comprehensive warranty for three years.[26] EESL proposes to use a shared savings model, which involves EESL recovering project costs based on deemed energy savings, over five years.

16. **Implementation Arrangements.** EESL expects to implement in phases, starting with institutional customers, establishing track record and branching out to other groups of customers over time.

17. **Results.** EESL's first tender called for 100,000 1.5 TR split inverter ACs, of minimum 5.2 ISEER. Of the three bidders, the lowest (L1) offered INR 35,000 per AC, plus additional costs for installation, maintenance services, warranty, among others. The L2 bid was INR 41,000. The L3 bidder offered a lower GWP refrigerant, at INR 59,000. EESL then called a reverse auction, and L1 and L3 bidders were awarded 60,000 and 40,000 units, respectively. The inclusion of a low refrigerant option is a significant development.

18. **Sustainability Elements.** The program presents an opportunity for Hydrofluorocarbon (HFC) phase-down. The incorporation of low GWP refrigerants could accelerate India's transition away from high-GWP refrigerants, enabling a much larger scale of avoidance of direct and indirect emissions from ACs.

**B) <u>Buildings Energy Efficiency Program</u>**

19. **Product and service offering.** As part of its Building Energy Efficiency Program (BEEP), EESL plans to replace existing appliances and equipment with the efficient options it offers, such as LED lights and tube lights, BEE 5 star rated ACs and ceiling fans. EESL will target buildings owned by the central and state governments, public sector undertakings, and other government agencies.

20. **Services provided and functions performed by EESL**

- **Walk-through energy audit:** EESL carries out walk-through energy audits to collect data and verify the infrastructure and equipment. The audit informs the specifications of retrofit equipment; a baseline with technical and financial analysis; and proposal preparation and submission to the building owner. This provides a basis for a negotiated agreement on the main technical and commercial provisions.
- **Bulk procurement:** EESL procures the necessary equipment for carrying out retrofits.
- **Installation:** EESL installs and commissions and provides a product warranty.
- **Payment:** EESL offers two models. (1) Under the Project Management Consultancy (PMC) model, EESL provides services (audits, technology recommendation, procurement, installation, product warranty) and the investment is made by the client, with EESL's role similar to a standard "guaranteed savings" ESCO approach.[27] EESL charges a PMC fee of about 10-15 percent of total project cost. (2) Under the ESCO model, the upfront investment is made by EESL, and is recovered through monetized share of deemed energy savings. Payment security mechanisms (bank guarantee, state government guarantee, escrow arrangements) are finalized prior to

[26]Technical specifications are available at the EESL website: https://www.eeslindia.org/writereaddata/636337722441801149Procurement%20Data%20of%20EESL%20(1st%20May%202017%20to%2031st%20May%202017).PDF

[27] However, unlike in ESCO approach, in this case, there are no energy savings performance contract signed between EESL and the public building.

implementation. EESL estimates projects would have a simple payback of one and a half to three years, require three to six months to implement and an amortization period of 3-5 years.

- **Data:** Information on the number of building retrofits by EESL is shown on an online dashboard.

21. **Targets:** It is estimated that a pan-India program involving 10,000 buildings would result in annual energy savings of over 1 billion kWh.

22. **Results:** EESL has retrofitted energy efficient appliances in 28 buildings at a total cost of INR 125 million, resulting in annual energy and cost savings of 11 million kWh and INR 90 million, and a 39 percent reduction from baseline energy consumption. A program involving EE retrofits in A (large) and C (small) categories of railway stations in the country is under consideration.

23. **Sustainability Elements:** Sustainability could be improved through more partnerships with private sector under a contract agreement to expand service offered and offer ESCO services to a wider range of consumers.

### C) Agricultural Demand Side Management Program (AgDSM)

24. **Appliance:** EESL provides BEE 5-star rated agricultural pump sets free of cost to farmers, with a smart control panel (operated through a mobile phone) allowing the farmer to switch the pump on or off remotely, and receive text messages on energy and water consumption. The pump set is offered in exchange for the farmers' existing pump set, and is sized to provide at least as much water flow as the old pump set.

25. **Services provided/ functions performed by EESL.**

- ***Awareness programs.*** EESL disseminates to farmers, information on the benefits of EE efficiency appliances, through government launch events, fliers, advertisements, street plays, etc.
- ***Preparation of Detailed Project Reports.*** A detailed project report is prepared with empaneled energy auditing agencies which lays out the agreement on repayment terms, annuity/instalment to be paid each year, area to be covered by the program, number of pumps, and penalty mechanisms for nonpayment.
- ***Bulk procurement.*** EESL procures in bulk the pumps and smart control panels. It empanels local workers and agencies to carry out installation, thereby generating local employment opportunities.
- ***Repair and Maintenance.*** Vendors are required to provide free repair and maintenance for a period of five years, which is expected to result in significant savings for farmers in terms of repair costs.
- ***Deployment approaches.***
    - **Original AgDSM program.** EESL procures BEE 5-star rated pumps in bulk, delivered to farmers free of charge in exchange of old pump sets. EESL conducts awareness campaigns, carries out farmer outreach and education to secure participation, and closely coordinates with Discoms and local authorities, including local groundwater bodies, in the period leading up to deployment. EESL empanels local firms and workers to provide installation and repair services to farmers to remove existing pump sets and install new pump sets. Pump sets are activated through a call from the registered mobile number to avoid resale of pump sets. EESL also offers incentives such as free repair and maintenance for the pump sets for five years.[28]

[28] EESL indicates that existing pump sets go out of order about twice a year due to irregular water supply. Repair is expensive since the pumps need to be removed from a depth of about 100-150 feet, repaired and reinstalled, and can cost about INR 4,000-5,000 for each repair.

- **Solar PV mini-grid plus pumping program.** This modified version of the AgDSM program, installs a 5hp BEE 5-star rated EE irrigation pump set along with a 15kW (oversized, at about three times the capacity required to operate the pump set) solar array on a farmer's land, connected to the distribution network to inject the excess energy to the grid. The system includes agricultural pump, variable frequency drive, smart control panel for remote operation, meter, inverter (to be replaced every 10 years), solar array and balance of system equipment. This is expected to create incentives to reduce consumption of electricity, provide an alternate source of reliable power for the pump set, and incentivize energy saving.

- **Solar PV generation systems for agricultural loads.** EESL is refining details for a program to install solar photovoltaic (PV) mini-grids of 0.5 - 1 MW capacity to serve agricultural load in an area on land owned by the Discom, to assist Discoms make productive use of unused land, reduce T&D losses by locating the system close to load served, and lower costs.

- ***Payments.*** The cost of each pump is about INR 38,000. Under the PMC model, EESL recovers the entire investment from the Discom after completing installation. Under the ESCO model, EESL recovers project costs through monthly payments by the Discom over a period of 7-10 years, based on subsidy savings resulting from reduced agricultural energy consumption. Under the ESCO model, the agreement for repayment through subsidies may be directly with the State government or with the Discom depending on the State government's preference.

26. **Implementation arrangements.** Implementation typically begins with discussions with the state government, agreeing to support the program. Thereafter, EESL approaches Discoms to enter into a MoU.

27. **Targets.** In the agreement with the Government of Andhra Pradesh, EESL plans to replace around 200,000 pump sets at a cost of over US$100 million. The repayment by the state government will be made over a 10-year period while EESL will provide five years of free repair and maintenance.

28. **Sustainability Elements.** To strengthen sustainability aspects, it is required to understand the impact on groundwater resources. → *Independent evaluation and report is included in the PAP.*

**IV. Results Area 4: Institutional Strengthening for Sustainable EE Scale-up**

29. **Activities for achieving results.** The activities under Results Area 4 were informed by the Technical Assessment and Environmental and Social Systems Assessments (ESSA) undertaken during program preparation, identifying actions for strengthening EESL's institutional capacity during the implementation of the Program. Details can be found in the stand-alone technical assessment, and the ESSA.

- ***Strengthening EESL environment and social function.*** Informed by the ESSA and the assessment of program institutional soundness, EESL will establish a Sustainable Development Unit in charge of environmental and social sustainability (i) set up based on agreed TOR (acceptable to World Bank); (ii) resourced with budget and dedicated full-time qualified staff; (iii) have direct reporting to EESL's Managing Director; and (iv) ensure a GRS that is available and accessible. Moreover, EESL will adopt updated EHSS Manual covering all EESL programs under implementation, to mainstream environmental and social considerations into EESL's operations. → *These actions were agreed as DLI6 and in the PAP under the PforR.*
- ***Strengthening institutional capabilities on finance.*** EESL internal financial planning capacity is constrained, and it needs to build in house capacity supplemented with external advisors to support development of its long-term financing strategy. EESL is seeking to enhance its internal skills and

capacity on commercial financing and international capital raising. EESL has inducted a new Director Finance to manage all aspects of EESL's finances).[29]

- ***Strengthening institutional practices on procurement and quality assurance.*** There is a need to update "EESL Procurement Guidelines", which cover only UJALA and SLNP, to (i) cover all methods and market approaches for the size and complexity of EESL procurement in future EE initiatives, and (ii) take into consideration orders related to procurement issued by the Government of India and by the CVC. The standard bidding documents (SDBs) will then need to be revised to reflect the updated Guidelines. Additionally, there is no standard template for MoUs between EESL and counterparts (state governments, ULBs, other PSUs), which leads to some MoUs with unrealistic provisions that can compromise the procurement process, as well as impact EESL's finances. EESL to update procurement guidelines and standard bidding documents, and develop MOU. This is included in the PAP.
- ***Strengthening institutional capabilities on quality assurance.*** EESL has recently developed manuals and standard protocols for quality assurance (QA) for domestic and street lighting programs, which are yet to be disseminated. QA manuals are yet to be developed for other programs. EESL will train its staff and suppliers on QA manuals for domestic and street lighting programs, and develop and disseminate QA manuals and protocols for EE fan program. This activity is included in the PAP.
- ***Independent monitoring.*** EESL will put in place plans for systematic and periodic independent evaluation of its program to supplement existing mechanisms, identify challenges and collect feedback, as inputs to improving the programs.
- ***Institutionalizing focus on continuing training and capacity building.*** EESL's long term growth is critically dependent on the development of its human resources and staff training. In this context, the establishment of a training center would serve as a venue for training EESL staff, other ESCOs and EESL customers, as well as development of new products and business lines, and eventually support testing and certification services.

**Program Result Chain**

30. The linkage between the Program activities or actions, and expected outcomes reflected in the PDO for the PforR is described in the Program results chain shown in the following figures

[29] In the interim, the World Bank provided the Terms of Reference for a team of financial advisors to guide and assist EESL on revising their long-term capital mobilization plan (inclusive of both debt and equity, including a prospective IPO). Advisors have recently been engaged by EESL.

**Figure 1.1. Program Results Chain: Results Area 1 and 2:**


| | | | |
|---|---|---|---|
| | - Setting baseline of the number of women EESL employs (including direct staff, short term contracted staff, and apprentices) at each level (managerial, technical, administrative), and system to track number of women employed. (**RF**) (PAP) | - *Number of positions advertised with preference for women candidates*<br>- Indicators of how many women EESL directly employs at each level (managerial, technical, administrative) | - Increase in number of women employed<br>- Increased EESL management awareness of number and functions of women in its workforce |
| **RESULTS AREA 1- Energy savings and EE market transformation in the residential sector.** | - Procurement of EE appliances (LEDs, tube lights and fans)<br>- Information and awareness raising campaigns for residential EE programs, targeting both urban & rural<br>- Targeted outreach to women- more women at kiosks, involving women's groups for mobilization<br>- Monitoring, tracking and compilation of information and data on key strategy indicators | - ***(DLI 1) Number of LED bulbs and tube lights sold by EESL under UJALA program (RF)***<br>- ***(DLI2) Number of energy efficient ceiling fans sold by EESL under UJALA program (RF)***<br>- Adoption of EESL strategy for EE market transformation of residential LED market and reporting indicators **(PAP) (RF)** | - Energy savings from LED bulbs, tube lights and energy efficient ceiling fans distributed via UJALA program (RF)<br>- Avoided GHG emissions associated with LED bulbs, tube lights and energy efficient ceiling fans (RF)<br>- Estimated number of beneficiaries (of which women) of LED lighting |
| **RESULTS AREA 2- Energy savings and EE market transformation in street lighting** | - Procurement of LED street lights and fixtures<br>- Installation of LED street lights and fixtures<br>- Feedback from citizens (focus on women) on benefits | - ***(DLI 3) Number of LED street lights installed by EESL under SLNP program*** | - Energy savings from LED street lights installed through SNLP Program (RF)<br>- Avoided GHG emissions from LED street lights (RF)<br>- Municipalities/towns//panchayat with LED street lights (RF)<br>- Greater accessibility of public spaces |

**Figure 1.2. Program Results Chain: Results Area 3**


| | | | |
|---|---|---|---|
| **RESULTS AREA 3 – Development of sustainable business models in new EE market segments** | **For efficient ACs**:<br>- Stakeholder consultations on safe refrigerant disposal<br>- Development of consumer guide on safe refrigerant replacement and disposal and of buy-back option (where available), and inclusion in AC package.<br>- Use of reporting template for manufacturers on AC refrigerant disposal including Registered E-Waste Dismantler/Recycler's verification/evidence of disposal.<br>- Inclusion in EESL's bidding documents for energy efficient ACs request to manufacturers to report (through the reporting template) on their AC refrigerant disposal and recycling, including Registered E-Waste Dismantler[30]/Recycler's verification (or evidence) of disposal, in conformity with India's Environmental Protection Act to enable monitoring and recording of AC disposal and recycling actions by manufacturers participating in EESL bids.<br>**For EE Buildings**<br>- Development of business model for collaboration with private sector ESCOs in the implementation of EESL<br>- Consultations with 10 private ESCOs and stakeholders on sustainable model for EE in buildings<br>**AgDSM**<br>- Publication of report including independent evaluation of AgDSM models and reporting on EESL sustainability actions and indicators **(PAP)** | - **(DLI4) Implementation of EE AC sustainability actions. (RF)**<br>- **(DLI5) Business model for collaboration with private sector ESCOs in the implementation of EESL's Building EE program (RF)**<br>- Increased awareness of EESL of energy-water nexus issues and economic and sustainability implications of different AgDSM models | - EESL efficient AC program integrates sustainability actions supporting environmentally-sound and safe disposal of refrigerants<br>- EESL plans and strategy for its EE buildings program integrate collaboration with private sector ESCOs<br>- EESL AgDSM plans and strategy integrate sustainability considerations associated with energy-water nexus, including ground water conservation |

[30] i.e., waste disposal agents /service providers, that include also hazardous waste management service providers

**Figure 1.3. Program Results Chain: Results Area 4**


| | | | |
|---|---|---|---|
| **RESULTS AREA 4 – Institutional Strengthening for sustainable EE scale-up** | - Development of standardized procurement documents: "Guidelines", SBDs and MOU format (RF) **(PAP)**<br>- Dissemination of quality assurance (QA) manuals for street and domestic lighting, and development of QA manuals and standard protocols for efficient ceiling fan (**PAP**)<br>- EESL reconstitutes its Audit Committee of the Board (ACB) by including the two independent directors (**PAP**)<br>- EESL to prepare finance manual(s) covering all financial management functions (**PAP**)<br>- EESL to strengthen internal audit function (**PAP**)<br>- EESL develops plan for systematic and periodic independent evaluation of each EESL program **(PAP)**<br>- **(DLI6) Establishment of Sustainable Development unit (RF)**;<br>- Development of training program, including a training center, for energy efficiency capacity building and training for EESL staff, EE private sector, and EESL customers **(PAP).** | - Adoption by EESL management, and dissemination, of standardized procurement documents: "Guidelines", SBDs and MOU format(**RF**) (**PAP**)<br>- Dissemination and training of staff and vendors on QA Manuals/Protocols<br>-<br>- EESL Board (or the relevant official(s) to whom the Board delegates the decision through the adoption of a resolution) approves Finance Manual(s) covering all financial management functions, in line with current systems, issues an internal notification of their use.<br>- Strengthened internal audit function is implemented.<br>- Periodic independent evaluation of EESL programs (**PAP**) (**RF**)<br>- **Update of EHSS Manual (PAP)**<br>-<br>- **(DLI6) Implementation of updated EHSS manual covering all EESL programs under implementation**<br>- EESL management approves training program and reports on delivery of first training session, targeting private sector ESCOs and other EE service providers (**PAP**) | - EESL procurement activities integrate good international practice and Quality Assurance measures.<br>- EESL's corporate governance and financial management strengthened<br>- Improved design and implementation of EESL EE programs<br>- Strengthened EESL capacity to handle environmental and social impacts and risks associated with its activities<br>- Mainstreaming of environmental and social considerations into EESL's various operations<br>- Improved Grievance Redressal System<br>- EESL staff and India's EE private sector capacity strengthened |

N.B. Legend: Disbursed linked indicator (DLI); Program Action Plan (PAP); Results Framework (RF)

## Annex 2: Results Framework Matrix

| Results Areas Supported by PforR | PDO/Outcome Indicators (Key indicators to measure the achievement of each aspect of the PDO statement) | Intermediate Results Indicators (critical processes, outputs or intermediate outcomes indicators needed to achieve each aspect of the PDO) | Indicator | DLI # | Unit of Meas. | Baseline (Year) | End Target (Year) |
|---|---|---|---|---|---|---|---|
| | **PDO Indicator 1**[31] **-** Projected lifetime energy savings from LED bulbs, LED tube lights, energy efficient ceiling fans and LED street lights sold via EESL programs | | **1** | | GWh | 197,900 **(2017)** | 403,400 **(2022)** |
| | **PDO Indicator 2 –** Avoided CO2 emissions associated with projected lifetime energy savings from LED bulbs, LED tube lights, energy efficient ceiling fans and LED street lights sold via EESL programs (see footnote for assumptions) | | **2** | | MtCO2 | 160.7 **(2017)** | 326.8 **(2022)** |
| | **PDO Indicator 3** – Amount of commercial financing leveraged by the IBRD guarantee | | **3** | | **US$** | **0 (2017)** | **$200,000,000 (2022)** |
| | | **IR Indicator 1.0 –** Direct employment (number of jobs) created (of which women) [32] | **1.0** | | number | **366 (of which 16% women); (2017)** | **500 (of which 25% women) (2022)** |
| **Results Area 1 -** Energy savings and EE market transformation in the residential sector | | **IR Indicator 1.1** – Number of LED bulbs and tube lights sold via EESL program | **1.1** | **DLI1** | **Number** | 216,000,000 **(2017)** | 437,000,000 **(2022)** |
| | | **IR Indicator 1.2 –** Estimated number of beneficiaries (of which women) of LED bulbs sold via EESL program[33] | **1.2** | | Number | 336 million (163 million) (2017) | 656 million (318 million) (2022) |
| | | **IR Indicator 1.3 -** Number of energy efficient ceiling fans sold via EESL program | **1.3** | **DLI2** | **number** | 587,795 **(2017)** | 6,408,000 **2022** |

[31] Key assumptions for calculations: of PDO 1 and 2: (i) LED bulbs: energy savings per equipment per year: 130 kWh/yr per equipment (as per EESL dashboard); estimated lifetime: 7 years; (ii) LED tube lights: energy savings per equipment per year: 36 kWh/yr per equipment (as per EESL dashboard); estimated lifetime: 10 years; (iii) EE fans: energy savings per equipment per year: 93 kWh/yr per equipment (as per EESL dashboard); estimated lifetime: 10 years; and (iv) LED street lights: energy savings per equipment per year: 141 kWh/yr per equipment (as per EESL dashboard); estimated lifetime: 8 years. Grid emissions factor: 0.00081 tCO2/kWh

[32] Target for the indicator is based on additional hires above the 2017 baseline. Achievement of the indicator assumes sufficient applications from eligible female candidates are received for advertised positions.

[33] The following assumptions are used to estimate the indicator: (i) an average of 3 LED bulbs per household are sold via the EESL UJALA program; (ii) the average household size data (4.7 people per household) is taken from the India's 2011 populations census; (iii) the average male-female ratio of households (940 females per 1000 males) is also taken from India's 2011 population census.

| Results Areas Supported by PforR | PDO/Outcome Indicators (Key indicators to measure the achievement of each aspect of the PDO statement) | Intermediate Results Indicators (critical processes, outputs or intermediate outcomes indicators needed to achieve each aspect of the PDO) | Indicator | DLI # | Unit of Meas. | Baseline (Year) | End Target (Year) |
|---|---|---|---|---|---|---|---|
| | | **IR Indicator 1.4** – Approval of EESL strategy for sustainable LED market transformation in residential lighting, including set of indicators EESL will monitor and track. | **1.4** | | Y/N | **(2017) No strategy** | **(2022) Yes** |
| **Results Area 2** – Energy savings and EE market transformation in public street lighting | | **IR Indicator 2.1-** Number of LED street lights installed under SLNP | **2.1** | **DLI3** | number | 1,967,000 **(2017)** | 9,167,000 **(2022)** |
| | | **IR Indicator 2.2 -** Number of municipalities/towns/villages/gram panchayats[34] with LED street lights installed through SLNP | **2.2** | | number | **500 (2017)** | **1250 (2022)** |
| **Results Area 3 –** Development of sustainable business models in new EE market segments | | **IR Indicator 3.1** – EESL implementation of the three EE AC sustainability actions approved.[35] | **3.1** | **DLI4** | Y/N | **(2017) N** | **(2021) Y** |
| | | **IR Indicator 3.2**– EESL approval of business model for collaboration with private sector ESCOs in the implementation of EESL's Building EE activities | **3.2** | **DLI5** | Y/N | **(2017) N** | **(2020) Y** |
| **Results Area 4 –** Institutional Strengthening for sustainable EE scale-up | **PDO Indicator 4** – Establishment of Sustainable Development Unit, and report on implementation of updated EHSS Manual covering all EESL programs under implementation. (See note (1)) | | **4** | **DLI6** | Y/N | **(2017) N** | **(2020) Y** |
| | | **IR Indicator 4.1 –** Periodic independent evaluations of EESL programs | **4.1** | | Y/N | **(2017) N** | **(2022) Y** |
| | | **IR Indicator 4.2** Approval of capacity building and training program for EE private sector to facilitate support and participation in EE market segments | **4.2** | | Y/N | **(2017) N** | **(2020) Y** |
| | | **IR Indicator 4.3** – Adoption by EESL management of standardized procurement documents: "Guidelines", SBDs and MOU formats. | **4.3** | | Y/N | **(2017) N** | **(2019) Y** |

[34] The gram panchayats in India are the local self-governments in the villages of the country.
[35] As described in Table 3 of PAD main document with the full description of DLI4.

## 2.1 Indicator Description

| Indicator Name (#) | Description | Frequency | Data Source | Methodology for Data Collection | Responsibility for Data Collection | DLIs | |
|---|---|---|---|---|---|---|---|
| | | | | | | Responsibility for Data Verification | Scalability of Disbursement (Yes/No) |
| **PDO Indicator 1** | Projected lifetime energy savings from LED bulbs, LED tube lights, energy efficient ceiling fans and LED street lights sold via EESL programs | Annual | EESL Dashboard | Compilation of equipment sold from dashboard [**see assumptions for calculation of indicator*] | EESL | | |
| **PDO Indicator 2** | Avoided CO2 emissions associated with projected lifetime energy savings from LED bulbs, LED tube lights, energy efficient ceiling fans and LED street lights sold via EESL programs | Annual | EESL Dashboard | Compilation of equipment sold from dashboard (**see footnote with assumptions for calculation* of indicator*)* | EESL | | |
| **PDO Indicator 3** | Amount of commercial financing leveraged by the IBRD guarantee | Once | EESL annual report; commercial lead arrangers | Compilation of information from loan agreements signed or bonds issued | EESL | | |
| **IR Indicator 1.0** | Direct employment (number of jobs) created (of which women) | Annual | EESL | EESL employment records | EESL | | |
| **IR Indicator 1.1** | Number of LED bulbs and tube lights sold via EESL program | Annual | EESL dashboard and its reporting system; EESL sales receipts | Compilation from EESL dashboard and verification of EESL's reporting system for EESL dashboard, including random sampling to test reporting system's integrity to confirm quantities in dashboard | EESL | Independent verification agency | **Yes** |
| **IR Indicator 1.2** | Estimated number of beneficiaries (of which women) of LED bulbs sold via EESL program | Annual | | Estimate, taking into account number of bulbs sold (assuming per household 3 LED bulbs sold via EESL UJALA program) and household data from India Population Census | EESL | | |
| **IR Indicator 1.3** | Number of energy efficient ceiling fans sold through EESL program | Annual | EESL dashboard and its reporting system; EESL sales receipts | Compilation from EESL dashboard and verification of EESL's reporting system for EESL dashboard, including random sampling to test reporting system's integrity to | EESL | Independent verification agency | **Yes** |

| Indicator Name (#) | Description | Frequency | Data Source | Methodology for Data Collection | Responsibility for Data Collection | DLIs | |
|---|---|---|---|---|---|---|---|
| | | | | | | Responsibility for Data Verification | Scalability of Disbursement (Yes/No) |
| | | | | confirm quantities in dashboard | | | |
| **IR Indicator 1.4** | Approval of EESL strategy for sustainable LED market transformation in residential lighting, including set of indicators EESL will monitor and track. | In year 2 and end of Program | EESL Board Meeting Notes (or signed document issued by the relevant official(s) to whom the decision has been delegated by the Board of Directors through the adoption of a resolution); ELCOMA[36] and third party market data | EESL Board meeting minutes, as certified by the Company Secretary (or signed document issued by the relevant official(s) to whom the decision has been delegated by the Board of Directors through the adoption of a resolution); approved strategy; report on key strategy indicators | EESL | | |
| **IR Indicator 2.1** | Number of LED street lights installed under SLNP | Annual | EESL Dashboard and EESL reporting system; sales receipts | Compilation from EESL dashboard and verification of EESL's reporting system for EESL dashboard, including random sampling to test reporting system's integrity to confirm quantities in dashboard | EESL | Independent verification agency | **Yes** |
| **IR Indicator 2.2** | Number of municipalities/towns/villages/gram panchayats with LED street lights installed under SLNP | Annual | EESL contracts with Urban / Rural Local Bodies or State Governments/other Departments as the case may be; Weekly MoP report to Cabinet | EESL compiles information from weekly MoP report to Cabinet | EESL | | |
| **IR Indicator 3.1** | EESL implementation of three EE AC sustainability actions approved | Annual | EESL Board meeting minutes, as certified by the Company Secretary (or signed document issued by the relevant official(s) to whom the decision has been delegated by the Board through the adoption of | EESL submits relevant documentation to IVA; IVA checks EESL website. | EESL | Independent verification agency | Not Applicable |

[36] Electrical Lamp and Component Manufacturers Association of India

| Indicator Name (#) | Description | Frequency | Data Source | Methodology for Data Collection | Responsibility for Data Collection | DLIs | |
|---|---|---|---|---|---|---|---|
| | | | | | | Responsibility for Data Verification | Scalability of Disbursement (Yes/No) |
| | | | a resolution); EESL website; EESL documents; EESL consultations report; random sampling of EESL ACs. | | | | |
| **IR Indicator 3.2** | EESL approval of business model for collaboration with private sector ESCOs in the implementation of EESL Building EE activities | Once | EESL Board meeting minutes, as certified by the Company Secretary (or signed document issued by the relevant official(s) to whom the decision has been delegated by the Board of Directors through the adoption of a resolution); Final report on business model | EESL submits relevant documents to IVA | EESL | Independent verification agency | Not Applicable |

| Indicator Name (#) | Description | Frequency | Data Source | Methodology for Data Collection | Responsibility for Data Collection | DLIs | |
|---|---|---|---|---|---|---|---|
| | | | | | | Responsibility for Data Verification | Scalability of Disbursement (Yes/No) |
| **PDO Indicator 4** | Establishment of Sustainable Development Unit, and report on implementation of updated EHSS Manual covering all EESL programs under implementation. (See note (1)) | Annual | EESL Board meeting minutes, as certified by the Company Secretary (or signed document issued by the relevant official(s) to whom the decision has been delegated by the Board of Directors through the adoption of a resolution); organizational chart; staffing and scope of work as per ToRs (as per Annex VII of ESSA, and acceptable to World Bank) Report submitted to EESL management on activities of Sustainable Development Unit and implementation of EHSS Manual | EESL submits relevant documentation to IVA | EESL | Independent verification agency | Not Applicable |
| **IR Indicator 4.1** | Periodic independent evaluations of EESL programs | Annual | Plan adopted by EESL Management; at least 2 final independent evaluation reports | EESL submits relevant documents to World Bank | EESL | | |
| **IR Indicator 4.2** | Approval of capacity building and training program for EE private sector to facilitate support and participation in EE market segments | Annual | EESL management approval; report of first training; | EESL submits documents to World Bank | EESL | | |
| **IR Indicator 4.3** | Adoption by EESL management of standardized procurement documents: "Procurement Guidelines", SBDs, and MOU formats. | Once | Report to EESL Management recording adoption of standardized procurement documents (Guidelines, SBDs and MoU format) | EESL submits document to World Bank | EESL | | |

***Note (1):**

For the purpose of DLI6 and PDO Indicator 4, an EESL program is deemed "under implementation" when the following conditions are met:

EESL will determine whether a project is classified as "under implementation" by March 31 of each year based on the following criteria:

i. EESL has completed at least three rounds of procurement and deployment, as per the technical specifications set forth in the relevant procurement documents; or EESL has made investments of at least INR 2 billion in projects of that program, and has received management approval to continue program deployment in the subsequent year, whichever is earlier; and
ii. EESL's investment projections for the subsequent financial year for the project in question is higher than the investment made during the financial year that is ending

The EHSS Manual will be updated to include within 12 months of a project being deemed "under implementation.

## Annex 3: Disbursement Linked Indicators, Disbursement Arrangements and Verification Protocols

### Disbursement-Linked Indicator Matrix

**Table 3.1 Disbursement Linked Indicators**

***Notes**: DLIs 1, 2, and 3 are scalable and cumulative, i.e. the yearly allocated amounts for DLIs 1, 2, and 3 in the table below are indicative, and in case of partial-achievement or over-achievement, the Bank may authorize to disburse a smaller or larger yearly amount for these DLRs based on the value per LED bulbs and tube lights for DLI1, the value per energy efficient ceiling fan for DLI2, and the value per LED street light for DLI3 sold via EESL program (as per the values provided in the last column of Disbursement table in this Annex), up to the total amount allocated for each DLI respectively, and/or may cancel all or a portion of the allocation to these DLRs.*

| | ***Total Financing Allocated to DLI*** | ***As % of Total Financing Amount*** | ***DLI Baseline (3/31/2017)*** | ***Timeline for DLI achievement*** | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | ***Year or Period 1 (ending on 3/31/2019)*** | ***Year or Period 2 (ending on 3/31/2020)*** | ***Year or Period 3 (ending on 3/31/2021)*** | ***Period 4 (ending on 9/30/2021)*** | ***Period 5 (ending on 3/31/2022)*** |
| **DLI 1 -** Number of LED bulbs and tube lights sold by EESL under the UJALA program *(DLI quantities are based on 60% of EESL annual targets, as communicated 11/30/2017, totaling 219 million LED bulbs and tube lights.)* | | | 216 million | 57 million in addition to baseline | 63 million in addition to target from previous Period | 63 million in addition to target from previous Period | 33 million in addition to target from previous Period | 3 million in addition to target from previous Period |
| Allocated amount: (*US$0.30 per LED bulb or tube light, for up to 219 million LED bulbs and tube lights*). | **US$66 million** | 30% | | US$17.11 million | US$19.00 million | US$19.09 million | US$9.9 million | US$0.9 million |
| **DLI 2 -** Number of energy efficient ceiling fans sold by EESL under the UJALA program *(DLI quantities based on 60% of EESL target, as communicated 11/30/2017, totaling 5.82 million EE fans)* | | | 0.59 million | 0.9 million in addition to baseline | 1.2 million in addition to target from previous Period | 1.32 million in addition to target from previous Period | 1.2 million in addition to target from previous Period | 1.2 million in addition to target from previous Period |
| Allocated amount: *[US$3.78 per fan, for up to 5.82million EE fans* | **US$22 million** | 10% | | US$3.4 million | US$4.54 million | US$4.99 million | US$4.54 million | US$4.53 million |

| | *Total Financing Allocated to DLI* | *As % of Total Financing Amount* | *DLI Baseline (3/31/2017)* | *Timeline for DLI achievement* | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | *Year or Period 1 (ending on 3/31/2019)* | *Year or Period 2 (ending on 3/31/2020)* | *Year or Period 3 (ending on 3/31/2021)* | *Period 4 (ending on 9/30/2021)* | *Period 5 (ending on 3/31/2022)* |
| | | | | | | | | |
| **DLI 3 -** Number of LED street lights installed by EESL under the SLNP program *(DLI quantities based on 60% of EESL target, as communicated 11/30/2017, total of 7.2 million street lights)* | | | 2 million | 1.8 million in addition to baseline | 1.8 million in addition to target from previous Period | 1.8 million in addition to target from previous Period | 1.5 million in addition to target from previous Period | 0.3 million in addition to target from previous Period |
| Allocated amount: *(US$10.69 per street light,* for up to 7.2 million street lights). | **US$77 million** | 35% | | US$19.25 million | US$19.25 million | US$19.25 million | US$16.04 million | US$3.21 million |
| **DLI 4 -** EESL implementation of EE AC sustainability actions (For d*isbursement action must be completed not later than Period 4, by September 30, 2021*) | | | No decision | | | | Decision adopted and implementation of the 3 EE AC sustainability actions (see footnote[37]) | |
| Allocated amount: | **US$14 million** | 6.4% | | | | | US$14 million | |
| **DLI5** Business model for collaboration with private sector ESCOs in the implementation of EESL's Building EE Program (For d*isbursement action must be completed not later than Period 2, by March 31, 2020*) | | | No approved business model | | Approval of business model (see footnote[38]) | | | |
| Allocated amount: | **US$8 million** | 3.6% | | | US$8 million | | | |

[37] As established in main document of the PAD, Table 3.
[38] As established in main document of the PAD, Table 3.

| | *Total Financing Allocated to DLI* | *As % of Total Financing Amount* | *DLI Baseline (3/31/2017)* | *Timeline for DLI achievement* | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | *Year or Period 1 (ending on 3/31/2019)* | *Year or Period 2 (ending on 3/31/2020)* | *Year or Period 3 (ending on 3/31/2021)* | *Period 4 (ending on 9/30/2021)* | *Period 5 (ending on 3/31/2022)* |
| **DLI 6** – Establishment of Sustainable Development unit [*disbursement triggered no later than period 2, by March 31, 2020*], and report on updated EHSS Manual covering all EESL's programs under implementation *[disbursement triggered no later than Period 5, by March 31, 2022*] | | | No sustainable development unit; EHSS manual not updated | | Approval of new unit (ToRs, capacity building and staffing plan) (see footnote [39]) | | | Report delivered to management on activities of Sustainable Development unit and implementation of updated EHSS Manual (see footnote 37) |
| Allocated amount | **US$32.45 million** | 14.75% | | | US$16.5 million | | | US$15.95 million |
| Capitalized Front End Fee | **US$0.55 million**[40] | Not Applicable | | | | | | |
| **TOTAL AMOUNTS** | **US$220 million** | **100%** | | **US$39.76 million** | **US$67.29 million** | **US$43.33 million** | **US$44.48 million** | **US$24.59 million** |

### 3.2 DLI Verification Protocol Table:

| *#* | *DLI* | *Definition/ Description of achievement* | *Scalability of Disbursements (Yes/No)* | *Protocol to evaluate achievement of the DLI and data/result verification* | | |
|---|---|---|---|---|---|---|
| | | | | *Data source/agency* | *Verification Entity* | *Procedure* |
| 1 | Number of LED bulbs and LED tube lights sold by EESL under the UJALA program | Number of LED bulbs and LED tube lights sold by EESL under UJALA program. | Yes | EESL Dashboard (http://www.ujala.gov.in) ; EESL reporting system and sales receipts | Independent verification agency | IVA to confirm quantities in EESL dashboard through verification of EESL's reporting system for EESL dashboard, including random sampling to test reporting system's integrity. IVA to send World Bank a confirmation of quantities of LED bulbs and LED tube lights sold via EESL program and compliance with maximum frequency of disbursement |

[39] As established in main document of the PAD, Table 3.
[40] This amount is not connected to any DLI.

| # | DLI | Definition/ Description of achievement | Scalability of Disbursements (Yes/No) | Protocol to evaluate achievement of the DLI and data/result verification | | |
|---|---|---|---|---|---|---|
| | | | | Data source/agency | Verification Entity | Procedure |
| | | | | | | request (as per table 3.1 Disbursement Linked Indicators above). |
| 2 | Number of energy efficient ceiling fans sold by EESL under the UJALA program | Number of energy efficient ceiling fans (BEE 5-star or above) sold by EESL under UJALA program | Yes | EESL Dashboard http://www.ujala.gov.in); EESL reporting system and sales receipts | Independent verification agency | IVA to confirm quantities in EESL dashboard through verification of EESL's reporting system for EESL dashboard, including random sampling to test reporting system's integrity. IVA to send World Bank a confirmation of quantities of energy efficient fans sold via EESL program and compliance with maximum frequency of disbursement request (as per table 3.1 Disbursement Linked Indicators above). |
| 3 | Number of LED street lights installed by EESL under the SLNP program | Number of EESL street lights installed under SLNP | Yes | Dashboard http://slnp.eeslindia.org/; reporting system, and contracts with ULBs (and State rural departments) and contractors installing street lights | Independent verification agency | IVA to confirm quantities in EESL dashboard through verification of EESL's reporting system for EESL dashboard, including random sampling to test reporting system's integrity. IVA to send World Bank a confirmation of quantities of LED street lights installed under SLNP and compliance with maximum frequency of disbursement request (as per table 3.1 Disbursement Linked Indicators above) was achieved. |
| 4 | Implementation of EE AC sustainability actions | EESL's Board of Directors (or the relevant official(s) to whom the Board delegates the decision through the adoption of a resolution) adopts a decision to implement following EE AC actions: (i) Included, in the packaging of the air-conditioners sold by the Borrower, consumer guides on safe refrigerant replacement and disposal and buy back options (where available); (ii) Started (without interruption until the date of the withdrawal application) to include, in the Borrower's bidding documents from EE AC | No | EESL Board meeting minutes, as certified by the Company Secretary (or signed document issued by the relevant official(s) to whom the decision has been delegated by the Board of Directors through the adoption of a resolution); final consumer guide; random sample of EESL | Independent verification agency | EESL submits to IVA EESL Board meeting minutes, as certified by the Company Secretary (or signed document issued by the relevant official(s) to whom the decision has been delegated by the Board of Directors through the adoption of a resolution) confirming approval of decision on AC sustainable actions; and the following documentation: (i) consumer guide including steps to take to ensure safe replacement, storage and |

| # | DLI | Definition/ Description of achievement | Scalability of Disbursements (Yes/No) | Protocol to evaluate achievement of the DLI and data/result verification | | |
|---|---|---|---|---|---|---|
| | | | | Data source/agency | Verification Entity | Procedure |
| | | manufacturers, request to manufacturers to report AC refrigerant disposal (including Registered E-Waste Dismantler /Recycler's verification or evidence of disposal) in conformity with India's Environmental Protection Act, using the model template provided by the Borrower, to enable monitoring and recording of AC disposal and recycling actions by manufacturers intending to supply AC units to the Borrower; and (iii) Conducted stakeholder consultations (including at least 3 AC manufacturers and 2 waste disposal agents) on safe refrigerant disposal. | | ACs (to confirm inclusion of consumer guide); final reporting template; and EESL AC bidding document including reference to use of template; report from consultations on safe refrigerant disposal | | disposal of refrigerants, along with information on buy-back options (where available) and evidence of inclusion of guide in AC packaging from random sample of EESL ACs; (ii) reporting template for manufacturers on AC refrigerant disposal, along with evidence of its reference in EESL's AC bidding documents; and (iii) Report on stakeholder consultations, including, inter alia, date and location, agenda; material presented and/or distributed; list and contact details of participants; and participant responses to feedback survey on usefulness of stakeholder consultation.<br>IVA to confirm (1) evidence of Board or Management decision; (2) completion and dissemination of consumer guide in packaging (through random sampling); (3) final template and its reference in EESL's AC bidding documents;<br>and (4) EESL's stakeholder consultation on safe refrigerant disposal through report which includes elements outlined above in (iii). IVA to confirm posting of (i); (ii); and (iii) on EESL website. |
| 5 | Business model for collaboration with private sector ESCOs in the implementation of EESL's Building EE Program | EESL Board of Directors (or the relevant official(s) to whom the Board delegates the decision through the adoption of a resolution) has approved a business model designed to broaden service offering under the Building EE Program, including through partnership with private sector ESCOs. Such business model: (i) includes a description of the partnership model(s) and the range of targeted energy solutions; (ii) includes a description of the roles, responsibilities and implementation sharing risk between the | No | EESL Board meeting minutes, as certified by the Company Secretary (or signed document issued by the relevant official(s) to whom the decision has been delegated by the Board of Directors through the adoption of a resolution); report outlining business model for collaboration | Independent verification agency | EESL submits to IVA (i) EESL Board meeting minutes, as certified by the Company Secretary (or signed document issued by the relevant official(s) to whom the decision has been delegated by the Board of Directors through the adoption of a resolution) confirming approval of business model; (ii) copy of report on business model; and (iii) report on consultation with private sector ESCOs and stakeholders (including date and |

| # | DLI | Definition/ Description of achievement | Scalability of Disbursements (Yes/No) | Protocol to evaluate achievement of the DLI and data/result verification | | |
|---|---|---|---|---|---|---|
| | | | | Data source/agency | Verification Entity | Procedure |
| | | Borrower and private sector ESCOs; (iii) includes a description of the methods of measurement and verification of EE in buildings; (iv) includes a plan for consultation with the private sector ESCOs; and (v) reflects consultations with stakeholders to inform the design of the business model;<br><br>EESL has published a report on the business model referred above and containing the elements described in (i) to (v) above on its website; and<br><br>EESL has conducted consultations on the report referred above with at least 10 private sector ESCOs and issued a report on such consultations, including date, location, material presented and/or distributed, list and contact details of the participants, key issues raised by the participants, participants' responses to feedback survey on the consultations. | | with private sector ESCOs in implementation of EESL Building EE activities; EESL website | | location; material presented and/or distributed; list and contact details of participants; key issues raised by participants; and participant responses to feedback survey on stakeholder consultation). IVA to confirm (i) development of report on business model which includes required elements and is published on EESL website; and (ii) completion of report consultations with private sector ESCOs and stakeholders which includes elements specified in this table. |
| 6 | Establishment of Sustainable Development Unit, and report on updated EHSS Manual covering all EESL programs under implementation | EESL Board of Directors (or the relevant official(s) to whom the Board delegates the decision through the adoption of a resolution) has decided to establish a sustainable development unit under the Managing Director, to ensure environmental and social sustainability of all the Borrower's activities, and approved its terms of reference, sufficient budget to implement the terms of reference, staffing plan and program to build staff capacity, as further specified below: (A) Such terms of reference are consistent with Annex VII of the ESSA and include, inter alia: (a) the continuous update of the Borrower's EHSS Manual to ensure full coverage of the Program Under Implementation by the Borrower and all environmental and social risks and mitigation | No | (1) EESL Board meeting minutes, as certified by the Company Secretary (or signed document issued by the relevant official(s) to whom the decision has been delegated by the Board of Directors through the adoption of a resolution) providing evidence of approval of unit, along with staffing plan; mandate; budget and approved ToRs; (2) Updated EHSS Manual covering all EESL programs under | Independent verification agency | EESL to submit EESL Board meeting minutes, as certified by the Company Secretary (or signed document issued by the relevant official(s) to whom the decision has been delegated by the Board of Directors through the adoption of a resolution) confirming establishment of unit, along with agreed ToRs, staffing plan and budget allocation to IVA. IVA to confirm that unit has been established, with TORs covering scope of work as outlined in ESSA Annex 7 and acceptable to World Bank) and staffing plan approved; and budget confirmed, reporting to Managing Director. |

| # | DLI | Definition/ Description of achievement | Scalability of Disbursements (Yes/No) | Protocol to evaluate achievement of the DLI and data/result verification | | |
|---|---|---|---|---|---|---|
| | | | | Data source/agency | Verification Entity | Procedure |
| | | plans for all the Borrower's Program Under Implementation; (b)the development of training on the EHSS Manual and capacity building of the Borrower's staff and contractors; (c) the monitoring of compliance with the EHSS Manual; (d) the restructuring and operation of a systematic and accessible grievance redressal system; and (e) the preparation of biennial (once every two years) management report on the implementation of the EHSS Manual; and<br><br>(B) Such staffing plan includes full time staff in adequate number to carry out the responsibilities of the sustainable development unit, and each with terms of reference, qualifications and experience commensurate with its responsibilities within the unit.<br><br>EESL having established (with a budget sufficient to carry out its responsibilities) its sustainable development unit in accordance with its Board decision referred to in paragraph (i) immediately above and such unit having carried out its activities in accordance with its terms of reference, the Borrower's sustainable development unit has produced its report to the Borrower's management on its first 24 months of activity and on the first period of implementation of the EHSS Manual (including an analysis of its performance, strength and weaknesses) covering all the EESL programs under implementation. | | implementation[41]; and (3) Report to EESL management on activities of Sustainable Development Unit and implementation of updated EHSS Manual for all programs of EESL. | | EESL to submit to IVA report on implementation of updated EHSS Manual, covering all EESL programs under implementation. IVA to confirm report submitted to EESL management and covers, inter alia, implementation performance, strengths, weaknesses (as per Annex VII of ESSA) for all EESL programs under implementation. |

[41] For the purpose of determining compliance with this DLI, see in Annex 2 Note 1 (at the bottom of Indicator Description table) for conditions determining whether EESL program is deemed under implementation".

## Bank Disbursement Table

| *#* | *DLI* | *Bank financing allocated to the DLI* | *Deadline for DLI Achievement* | *Minimum DLI value to be achieved to trigger disbursements of Bank Financing* | *Maximum DLI value(s) expected to be achieved for Bank disbursements purposes* | *Determination of Financing Amount to be disbursed against achieved and verified DLI value(s)* |
|---|---|---|---|---|---|---|
| 1 | Number of LED bulbs and LED tube lights sold by EESL under the UJALA program | **$66 million** | **March 31, 2022** | **as per Annex 3** | | **$0.30 per LED bulb and LED tube light** |
| 2 | Number of energy efficient ceiling fans sold by EESL under the UJALA program | **$22 million** | **March 31, 2022** | **as per Annex 3** | | **$3.78 per energy efficient ceiling fan** |
| 3 | Number of LED street lights installed by EESL under the SLNP program | **$77 million** | **March 31, 2022** | **as per Annex 3** | | **$10.69 per LED street light** |
| 4 | EESL implementation of EE AC sustainability actions | **$14 million** | **September 30, 2021** | | | **Pass/fail** |
| 5 | Business model for collaboration with private sector ESCOs in the implementation of EESL's Building EE Program | **$ 8 million** | **March 31, 2020** | | | **Pass/fail** |
| 6 | Establishment of sustainable development unit and report on updated EHSS Manual covering all EESL's programs under implementation | **$32.45 million** | **March 31, 2020 Establishment of Sustainable Development unit; and March 31, 2022 report on implementation of EHSS Manual** | | | **Pass/fail** |

## Annex 4: Summary Technical Assessment

1. This Annex summarizes the assessment of the program technical and institutional soundness, drawing on the Program Technical Assessment. The summary focuses on technical soundness, implementation challenges, viability, and sustainability of EESL's initiatives, described in detail in Annex 1; and on institutional soundness in terms of program implementation arrangements, EESL institutional practices, capacity and resources. Details are available in the stand-alone full Program Technical Assessment.

### A. Technical Soundness

2. For Results Areas 1-3, this section summarizes short term challenges and risks related to program implementation and achievement of targets, and sustainability of program impacts in the medium to long term. For UJALA and SLNP, it also discusses impact and outcomes to date.

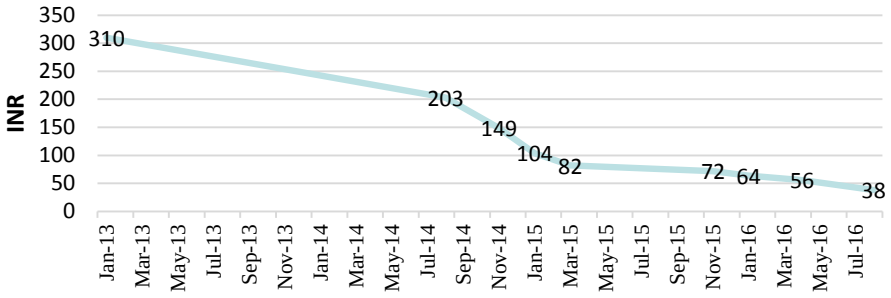
#### 1. Results Area 1: Energy saving and market transformation in the residential sector

##### a) LED lightbulbs and tube lights

***Assessment of program impact and effectiveness.***

3. **Quality improvement.** Use of transparent and stringent technical specifications, combined with a quality assurance process and better warranty terms than those on the retail market, have helped EESL ensure good quality products under UJALA, contributing to its technical and commercial viability. This has also encouraged manufacturers to improve the quality of products offer outside UJALA, including development of LED lightbulbs that can better tolerate local power system conditions across in India.

**Figure 4.1: Evolution of EESL procurement cost for 9W LED bulbs**




Source: EESL

4. **Cost reduction.** As shown in Figure 4.1, since 2014, bulk procurement costs of LED bulbs under UJALA reduced by 80 percent. The procurement price as of September 2017 was INR 38.58. The final prices at which EESL offers LED lightbulbs declined from INR340 in 2014 to INR65 in June 2017. Bulk procurement costs of LED tube lights came down marginally from INR 140 in August 2016 to INR138 in June 2017, while market prices are in the range of INR 700-800 per tube light.

5. **Increased affordability of efficient lighting products and benefits for the poor**. UJALA has triggered reduction in market retail prices of LED bulbs (from about INR550 in 2014 to INR150-200 in 2017), increasing affordability for poor households, as lighting is one of their two major end-uses of

electricity.[42] Reducing the initial incremental cost of efficient appliances compared to cheaper and less efficient options facilitates uptake by the poor. Reducing energy consumption by poor households can help them to remain in consumption blocks with lower tariffs and releasing disposable income.

6. **Greater market penetration of efficient products.** The increased affordability and quality of LED lighting have translated to higher sales. A large number of consumers who have been able to try out LED lightbulbs at lower cost than prevailing retail prices, contributing to overall consumer acceptance.

7. **Promotion of competition, local manufacturing capacity and opportunities for private sector.** EESL's approach of large-scale procurement through tenders and contracting multiple suppliers can be credited with helping build local manufacturing capacity and promoting competition between multiple suppliers, while preventing a single entity from becoming a dominant actor.[43] Manufacturing output reportedly grew from about 100,000 – 200,000 LED bulbs in 2014 to 30 – 40 million in 2017, and created an estimated 25,000 jobs in one year.[44] Diversity of suppliers also increased, and there are more than 15 domestic manufacturers of LED bulbs in the Indian market. In 2016, for the first time since EESL's establishment, the private sector supplied more than half the LED bulbs sold in India.

8. **Opportunities for the rest of the lighting value chain.** The number of lighting testing facilities have grown over the past five years largely due to the UJALA program.[45] On distribution, starting from a single agency at the beginning of UJALA, there are now over 35 distribution agencies in India.

9. **Avoided energy consumption and generation capacity.** At over 295 million LED bulbs and 6.3 million LED tube lights as of April 2018, EESL estimates avoided peak demand of 7.8 GW and GHG emission offsets of over 31 million $tCO_2e$.

10. **Demonstration of viability of large-scale EE appliance deployment without Government subsidies.** The delivery and sale of large quantity of LED lightbulbs was achieved through a market based approach, allowing EESL to fully recover the cost of procuring, distributing, marketing, and selling these products.

***Assessment of Program sustainability and risks.***

*Short term challenges– program implementation and achievement of targets*

11. **Procurement planning and inventory management.** EESL faces challenges in stock reconciliation since its operations are based on demand estimates. Depending on the market response observed, EESL reduces procurement volumes, and maintains a running sock for replacements. The cost of floating inventory needs to be fully reflected in EESL's financial model. An additional challenge for tube lights is the greater ease of breakage during transportation. EESL is training distributors and subcontractors on handling, and considering bids for tube lights made of different materials – such as polycarbonate –, if costs are reasonable.

12. **Managing risk of resale and avoiding leakages.** To manage the risk of resale, EESL adds EESL logo to product packaging, with warnings about resale; has set up a hotline for reporting violations, which

[42] Prayas, "Appliance Ownership in India: Evidence from NSSO Household Expenditure Surveys", 2012
[43] See subsection on results to date for a discussion of local manufacturing capacity.
[44] ELCOMA (2015). Indian Lighting Industry. http://www.elcomaindia.com/wp-content/uploads/FINAL_2015_Lighting_Industry_India.pdf
[45] Starting with three National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited labs for LED bulb testing in 2012 (ELCOMA, 2013), the number has gone up to 15 in 2017 per data on NABL website.

is advertised on its website; and has been working on developing QR codes or tamper-proof holograms that would be stamped on the LED lightbulbs which can also facilitate handling of warranty claims.

13. **Enhancing awareness of warranty services and accessibility of post-delivery replacement.** A recent survey of UJALA by an independent third party[46] indicated low awareness of the warranty option among earlier UJALA customers in some areas. Moreover, in some locations, exchanging a defective LED lightbulb once EESL completes the deployment phase (and the temporary local distribution kiosks are removed) can be quite significant, sometimes costing more than the lightbulb itself. The inability to easily secure a replacement during the warranty period creates a risk of reversal of program impact. Considering possible usage errors by consumers (i.e. using lightbulbs intended for indoors in outside), EESL can consider strengthening awareness and providing simple visual messaging in product packaging.

14. **Quality assurance, failure analysis and testing.** The recent survey by the independent third party mentioned above found increasing failure rates of the LED lightbulbs that were distributed in early days of UJALA and have been in operation for longer than three years, likely of lower quality, hence limiting the relevance of findings for the future of UJALA. Nonetheless, considering the scale of UJALA targets, there is merit to paying attention to such findings, to assess if the underlying data and resulting concerns are valid Measures to better understand the extent and nature of any failures include working with major manufacturers that perform their own failure testing, and testing labs that can offer failure analysis testing.

15. **Ensuring LEDs can be a valid alternative to incandescent lights (ICLs).** Industry data from ELCOMA indicates that sales of CFLs have fallen by a third since peaking in 2013, while ICL sales have marginally grown. ICLs continue to be significantly cheaper (approximately INR 25-30 per bulb). Hence, EESL may enhance awareness and outreach efforts on advantages of LEDs over ICLs, focusing on LED lightbulbs' technical, environmental and comfort benefits, in addition to bill savings.

*Medium to long term challenges – program impacts and sustainability*

16. **Prospects for continued cost reduction.** EESL's effort to drive down the prices of LED products has put pressure on manufacturers, but there are uncertainties about EESL's ability to trigger further price reduction in subsequent tenders. There are already indications that EESL may be nearing the cost reduction limit, since the April 2017 tender saw a minor uptick in the price offer, although it is too early to tell if it is a trend.

17. **Maintaining focus on quality improvement.** To enable sustained quality improvement in LED products, with spillover benefits on the rest of the market, EESL can gradually increase required technical specifications, or offer higher scores for manufacturers that offer innovative features. There will be cost tradeoffs, which may well be worthwhile in terms of efficiency benefits and sustainability of outcomes.

18. **Risk of overcapacity in manufacturing.** Some manufacturers have argued that the capacity created is greater than what they consider "normal' market demand. The validity of this concern remains difficult to verify in the absence of in-depth market demand assessments. If there is indeed excess capacity, some Indian manufacturers may cease operations; merge and consolidate; or develop export capabilities.

19. **Ensuring continuation and sustainability of market transformation.** As EESL gets closer to the Government targets and the demands from the States, it intends to exit the lighting segment to focus on other EE appliances, equipment and end-uses, leaving the market to be served by private suppliers. EESL's investment projections foresee that this exit can happen in as early as three years, when EESL is likely to

[46] Chunekar, A.; Mulay, S.; Kelkar, M. (2017). "Understanding the impacts of India's LED bulb programme, UJALA". Prayas. http://www.prayaspune.org/peg/publications/item/354

have achieved its public sector ESCO mandate of removing barriers to EE and transforming the LED lighting market. In this context, it is critical to recognize EESL's role as marketing, quality assurance, customer service, awareness building, encouraging development of local manufacturing capacity for efficient appliances, and promotion of competition, and develop and implement a strategy that covers how and by whom the functions currently performed by EESL will be handled. An abrupt withdrawal by EESL, without adequate transition planning may result in a sudden reversal of its accomplishments in the LED lighting segment. A gradual tapering down of program volumes accompanied by a shift in focus towards low income households may be a more appropriate and sustainable market transition.[47]

20. **Adopting realistic targets and workable mechanisms for UJALA beyond LEDs.** As EESL moves to newer, more sophisticated and higher priced appliances, the business model will need to be adapted, especially on payment options offered to consumers. The EMI option may be deemed riskier for the higher cost appliances, as it would imply higher upfront financing requirements for EESL, to be recovered over a longer period of time; and would add higher monthly payments. On the other hand, a workable consumer financing mechanism will be critical to ensure continued uptake of appliances by households.

### b) Ceiling fans

21. This section covers challenges, sustainability and risks, in the short and medium term.

22. **Ensuring proper installation and adequate servicing.** Improper installation or use of inappropriate associated components can affect the performance of the ceiling fan; it can malfunction, or not perform to its design capabilities if the existing regulator is of poor quality. EESL is exploring the option of offering on-site repair or replacement of fans through a helpline number, providing material on proper installation in the packaging, partnering with local service providers to offer installation services, and increased awareness efforts.

23. **Gradually increasing program volumes.** The slower deployment of ceiling fans can be explained by the relatively more complex installation, and possibly higher price. Implementation has recently picked up, nonetheless, the program targets may need to be revised in view of implementation record.

24. **Recognizing limits of cost reduction potential.** Cost reduction through bulk procurement of ceiling fans has been more modest, compared to LED lighting, attributed by EESL to the relatively smaller number of suppliers and smaller volume of tenders for ceiling fans (1 million units per tender in the last two rounds), compared to LEDs (with up to 50 million units per round).

25. **Evaluation of financial risk and implications for program targets.** If there are significant mismatches between actual and forecasted demand for ceiling fans, EESL would be procuring and taking higher inventory risk requiring working capital, to be estimated and financed.

26. **Developing alternatives for consumers to pay in installments.** In the two states where EESL did offer option for the cost of ceiling fans to be paid through equal monthly installments on Discom bills, 80 percent of consumers opted for on-bill payment. While EESL is not keen to offer this in the future, reasonable monthly installments, be it via Discom bills or through consumer financing through a third party, is likely to help lower the upfront cost barrier for consumers and achievement of program targets, while also reducing the risk to EESL's own balance sheet. It would be advisable for EESL to assess other options for EMI.

[47] This may also have the benefit of increasing the replacement and phase out of ICL bulbs.

**Related DLIs under proposed PforR.** There are two DLIs proposed under this results area, and the delivery of UJALA program: focusing on number of LED bulbs and tube lights and ceiling fans.

## 2. Results Area 2: Energy Savings and EE Market Transformation in Street Lighting

***Assessment of Program outcomes and impacts of SLNP.***

27. **Savings on electricity consumption and utility bills.** The primary impact is increased efficiency for a level of service; since LED lights provide at least as much light output with lower wattage and longer life.

28. **Reduced operating and maintenance costs.** The longer life span and improved technical performance of LEDs, combined with enhanced fault detection capabilities from EESL's Centralized Control and Monitoring System (CCMS) help reduce repair, replacement and maintenance costs.

29. **Improved monitoring, network visibility, and controls.** In addition to helping EESL meet technical performance commitments, CCMS provides greater data and control over systems, which further helps improve operational performance in addition to ULBs viewing the energy consumption and savings in real time. The remote switching and dimming, enable operational decisions that can save additional energy, compared to a simple replacement of conventional lighting with LEDs.

30. **Economic and social benefits from improved illumination.** Improved availability of lighting and increased brightness improves public safety and security, and extends hours for economic activity.[48]

31. **Opportunities for the broader LED lighting sector.** SLNP has contributed to the development of local manufacturing capacity, and created opportunities for service providers, distributors, subcontractors.

32. **Replicable approaches for public lighting projects by private ESCOs** Successful projects have helped increase awareness among municipalities, financiers and decision makers about efficiency in public street lighting and created implementation track record. EESL's business model demonstrated deemed savings approach and standard contracts based on annuity payments to overcome issues around baseline data availability, M&V, and risk allocation, which hampered past ESCO projects. If replicated, it can result in more street lighting projects by public and private actors, and help raise financing going forward.

***Assessment of Program challenges, risks and sustainability.***

*Short term challenges– program implementation and achievement of targets*

33. **Strengthening operational monitoring.** At present, the CCMS detects failure when a group of lights do not function, but does not provide data on each individual street light. EESL could explore the feasibility of including advanced capabilities in specifications for future systems, provided the costs are reasonable.

34. **Managing commercial and repayment risk.** EESL receives no explicit guarantee from the states for repayments by the ULBs. To mitigate payment risk, the payment security mechanisms requires the establishment of escrow accounts for monthly payments to EESL, with a balance of six months of annuity payments (reviewed annually within one month of completion). In the event of payment delays, EESL may reach out directly to State governments, to remedy and resolve the issues in an amicable way. Most of the

[48] The social benefits are discussed in extensive detail in the Program Environmental and Social Systems Assessment (ESSA).

current efforts are informal, based on public sector relationships and not rigorous contractual mitigants. It is recommended that additional contractual remedies are built in to ensure performance by the ULB and/or the state government and termination provisions if necessary. While there have been no defaults to date, receivables from municipalities have been growing and contracts will need to be carefully managed going forward. To address this, EESL can explore options including bank guarantees, agreement with the State government to improve project bankability, and consider off-balance sheet financing for municipal projects, targeting ULBs supported by adequately resourced Government missions such as Smart Cities.

35. **Better estimating and managing working capital requirements.** Payments to vendors are made regularly, while payments from municipalities to EESL have been delayed, including due to the time taken by ULB to issue completion certificate. Under the agreement with ULBs, EESL commits to rectify or repair faulty lights within 48 hours, which would require EESL to maintain inventory. The impact on working capital needs and cost of financing to be mobilized must be reflected in financial projections and arrangements for fully recovering costs should be built into relevant annuity contracts.

36. **Improved communications and outreach around projects.** EESL can consider incorporating proactive engagement with resident welfare associations and general public around, to manage expectations about LED lighting, pre-empt misunderstandings and emphasize program benefits.

37. **Managing baseline data availability, quality and accuracy issues at program level.** While EESL is able to address the baseline data availability and accuracy at the project level through inventory surveys, detailed project reports, and deemed savings approach, these issues represent a challenge for setting targets for the program at the national level. There are no reliable estimates of the total number of streetlights across India.

*Medium to long term challenges – program impacts and sustainability*

38. **Strengthening SLNP contracts.** EESL may wish to undertake a systematic review of existing contracts to ensure completeness of descriptions, clarity of parties' responsibilities in the event of non-performance of their obligations, conditions precedent to initiate countdown toward deadlines for EESL delivery targets, and appropriate allocation of rights on avoided greenhouse gas emissions resulting from the implementation of the project.

39. **Broadening service offering.** As EESL enters different urban areas, ULBs may express preference for tasks or designs that are not part of EESL's standard offering, such as varying light coloring and fixture design. Similarly, as EESL expands the program to smaller towns and rural areas where public infrastructure development is often inadequate, they would require more upfront support, and an integrated service offering. There are also cases where EESL is mobilized for post-disaster reconstruction, where more extensive support is needed.[49] There could be value for EESL to have a systematic approach to broadening its service offering.

40. **Partnering with private ESCOs for greater impact.** Consistent with the MFD approach, partnering with other ESCOs can allow EESL to focus on its core strengths of bulk procurement, program management and ensuring quality, while the private partner can be in charge of other areas, including civil works, or building new street lighting infrastructure where necessary. EESL has already developed a partnership policy, and has begun to work with private ESCOs under different risk sharing arrangements in select cases, but to date, progress has been limited. Considering the ambition of EESL's targets, it is

[49] For example, in Andhra Pradesh, where cyclone Hudhud caused massive damage in 2014, the scope of services required from EESL extended well beyond replacement of street lights with LED lights. A good summary of this experience is available in the 2016 ESMAP report "Proven Delivery Models for LED Public Lighting: Super-ESCO Delivery Model in Vizag, India," ESMAP Knowledge Series 026/16.

advisable to dedicate time and resources to furthering private ESCO partnerships, starting with active outreach. This would also be consistent with EESL's Super ESCO mandate, to support to development of India's ESCO industry.

**Related DLI under proposed PforR.** The DLI proposed for this Results Area captures the number of LED streetlights installed under SLNP.

### 3. Result Area 3: Development of Sustainable Business Models for New Segments

#### a) Air Conditioning Program

***Assessment of Program Sustainability.***

41. **Demand aggregation.** The AC program entails a more significant financial risk taken by EESL due to the high unit cost of the AC. EESL's ability to build credible demand will be critical. Institutional demand aggregation can help address this, along with better integrating ACs into its range of offerings in BEEP.

42. **Managing safe disposal of refrigerants in old ACs.** Older ACs in India contain refrigerants with either Ozone Depleting Substances (ODS)[50], or non-ODS but high GWP refrigerants, including HFC refrigerants. At present, EESL's program does not include buyback or disposal of old ACs, which is the property of the consumer. EESL does not require buyback or refrigerant disposal as part of the tender, as this could risk raising the cost of the super-efficient ACs to a level that could affect program uptake by institutional buyers. EESL may consider strengthening awareness and outreach campaigns as part of program deployment to educate consumers on safe disposal of old ACs.

43. **Managing tradeoffs in EE and HFC integration: efficiency, GWP, cost and safety.** If large scale deployment of super-efficient ACs under EESL's program is successful, and if ACs with low GWP refrigerants are incorporated, a major shift in the AC market in India is possible. This would be a globally significant achievement, that could set an example for the rest of the world. It is recommended that EESL emphasize on stronger safety features in the technical specifications, especially for handling and maintenance of new ACs. At the very least, it is recommended that the tender incorporates requirements for installation and periodic maintenance visits by well-trained and authorized technicians. Maintenance within the warranty period should be by authorized technicians of the manufacturers. After the warranty expires, there can also be a requirement that customers sign maintenance contracts with qualified service providers or original manufacturers, and the final disposal should be done by qualified personnel.

**Related DLI under proposed PforR.** To incorporate key sustainability aspect of the AC program a DLI under Results Area 3 is proposed, on EESL monitoring and reporting on AC disposal and recycling actions by manufacturers participating in EESL bids, organization of stakeholder consultation workshops on safe refrigerant disposal and development of consumer guidance material.

#### b) Building Energy Efficiency Program

44. **Program sustainability.** Given the large market potential and the 10,000 buildings that EESL has targeted for retrofits, the ability to meet the needs of targeted buildings and rapidly scale up implementation will be challenging. There are opportunities for strengthening the program design.

[50] Including Chloroflurocarbons (CFCs) and HCFC refrigerants (such as R-22, which was widely used in India) in older ACs, before ODS phase-out was introduced.

45. **Strengthening EESL in-house skills and practices related to buildings.** EESL ability to rapidly deploy adequate number of technically qualified staff and its ability to replicate standard approaches, while customizing them to the specific needs of buildings served, will be critical for rapid scale-up. EESL can benefit from standard manuals for the operation and maintenance of building equipment and safety, and training programs for EESL staff, contractors and facilities management groups in public buildings, Public Works Departments, and others, to enable the sustainability of projects.

46. **Opportunities for broader service offering.** EESL limits its service offering to the replacement of selected equipment and does not undertake any significant works beyond equipment replacement. However typically, ESCOs in the buildings sector use comprehensive energy audit-driven, "whole building" solutions that takes a "systems" approach as opposed to an "equipment" approach and entails measurement and verification. As BEEP develops, it is advisable for EESL to explore the feasibility of offering broader range of solutions targeting higher levels of savings.

47. **Partnering with private sector ESCOs.** There is an opportunity for EESL to partner with other ESCOs to leverage and offer a broader range of private sector solutions for optimal energy savings in buildings, beyond equipment replacement., which can also help EESL fulfil its Super ESCO mandate by catalyzing the private ESCO market. EESL and its partners could bundle their complementary services and provide fully financed shared energy savings performance contracts at little or no upfront cost to the building owners, be they public or private.

**Related DLI under proposed PforR.** The development and management approval of a business model for collaboration with other ESCOs in this area was proposed as a DLI under Results Area 3.

### c) Agricultural Demand Side Management Program

***Program Sustainability.***

48. **Monitoring and managing groundwater impacts of more efficient pumps.** More efficient pumps replacing older pumps can extract water more efficiently for a given level of electricity use.[51] If a significant number of farmers start over-extracting water, this could further exacerbate groundwater concerns, especially in water stressed areas of India. This is partly addressed by EESL efforts to offer the new pump set sizing in a way that provides equivalent water flow as the existing pump set. But where this option is not accepted by the farmer, the risk of water overuse by farmers still remains. In the longer term, farmers may have incentive to increase water use through expansion of the irrigated area, or by switching to water-intensive cash crops, or use the water for purposes other than agriculture. To ensure environmental sustainability of the solutions developed and avoid any unintended damage from the AgDSM program in the long-term, options to encourage water use efficiency may be considered.

49. **Monitoring and verification challenges.** There may be challenges in areas where monitoring of electricity consumption by farmers is a politically sensitive subject. At present, there is no data for actual usage of power by each farmer and, therefore, the creation of a baseline is based on aggregate data.

50. **Power quality issues.** Continued low power quality could lead to damage of pump sets, raising repair costs for EESL and affecting program credibility.

[51] International experience includes cases where the introduction of water supply side efficiency measures, without corresponding measures on the demand side have resulted in increased water use by farmers. For instance, in rural China, there have been cases where water supply efficiency measures that led to improved availability of water (through better pumping or improved irrigation systems) did not result in a reduction in water use, but rather, farmers tended to respond to increased availability of water by using more of it, sometimes switching to higher water intensity crops and expanding the crop planting (hence irrigated) area.

51. **Different risk profiles of the newer models for serving agricultural sector.** The newer programs incorporating solar PV, diverges from EESL's typical approaches and entails risks yet to be adequately addressed, such as significant upfront financing requirements, long payback period times, etc. The recovery of payments through agricultural subsidies saved can be a financial risk due to delays in payments from Discoms and/or state governments, and require additional working capital or long-term finance. EESL may consider financing these schemes off balance sheet, to segregate from core business risks.

**Actions under proposed PforR.** The preparation of an independent evaluation of the AgDSM program that systematically assesses the different models and records key indicators, including groundwater data measured prior to, during and at the end of specific EESL interventions in specific project areas, is proposed in the PAP.

## B. Institutional Soundness

### 1. Institutional Practices and Capabilities Assessment Summary

52. The assessment of institutional structures, systems and capabilities concluded that EESL has sufficiently robust institutional structures and processes to implement the proposed Program effectively and efficiently. Given the significant growth expected in EESL's program over the next five years and new business models, and its plans to ramp up its international businesses, EESL will need to carefully plan and develop its future institutional capabilities. Important areas of focus include of environment and social management, corporate governance, risk management, financial planning, resource mobilization and quality assurance.

#### a) Assessment of EESL Institutional Mandate, Objectives and Activities

53. EESL works closely with MoP and other relevant central, state and local public sector agencies. Overall, there is strong Government commitment, ownership and support for EESL initiatives. Along with its track record, EESL as a public sector entity is credited with the high level of trust and confidence that it appears to enjoy while working with other public sector stakeholders and local authorities as these actors are reportedly more comfortable and perceive lower risks of working with EESL than with private institutions implementing an EE project in these sectors.

#### b) EESL's institutional practices and capabilities

54. For the most part, EESL based its institutional policies and processes on those of the four promoter PSUs, particularly NTPC. EESL has taken steps to start putting in place more robust and well-defined structures and policies, accompanied by a rapid growth in the number of core EESL staff.

55. ***Organizational set-up and decision making.*** EESL has adopted an organizational structure which clearly defines the roles and responsibilities of the teams. Generally, there is a fair amount of involvement of senior staff including the MD in all important decision-making processes and project implementation phases.

56. **Staffing.** EESL makes use of a mix of regular and fixed term employees and outsourced contracts to implement its programs. EESL can quickly leverage its available staffing with external contractual support to respond to specific needs arising during implementation. EESL's use of institutional policies and processes that are based on those of the four PSUs allows it to offer competitive salary and benefits to its employees and attract qualified staff. EESL has put in place a dynamic institutional culture that is based on motivated staff and high performing management. The focus of the institution's human resource policy is on maintaining this culture and attracting people with the required skill set and orientation.

57. ***Relationships with partners.*** EESL benefits from its association with its promoter PSUs. EESL is now well resourced in key operational areas. As it continues to expand its operations, it is critical that EESL focuses on continuing to match its growing technical capabilities with corresponding commercial and managerial capabilities. One area to focus on is continuing training and development of mid-level leaders that will build experience in operational areas and move them tto leadership positions over time.

## C. Assessment of Program Expenditure Framework

### 1. Program Boundary

58. The Program would be anchored in EESL's Investment Plan that projects investments of INR 427 billion ($ 6 billion) over FY2017 to FY2022. Bank financing will contribute to a narrower Program boundary of INR 93 billion (US$ 1.3 billion) representing a time slice covering the period from FY2018 to FY2022 which will comprise of EESL's planned investments in UJALA and SLNP and technical activities relating to development of business models for new market segment, enhanced access to financing and institutional strengthening. The Program boundary will not include investment costs on ACs and pump sets, since the support provided for these lines are technical and upstream in nature.

### 2. Budget Structure and Classification

59. The Program would be implemented entirely by EESL from its own resources, including equity, internal accruals and borrowings. No resources will flow from the budget of GoI and hence a traditional budget line in the government budget is not applicable to the Program. GoI has extended sovereign guarantee on the loans to EESL under development assistance.

60. As a corporate entity under the 2013 Companies Act, EESL has established a financial management system, including an accounting system[52] in compliance with the prevailing regulations. EESL has a chart of accounts that can provide information on the various expenditure lines, disaggregated for each project/location (profit centers and cost centers) and this is facilitated through a computerized accounting application and expected to be replicated in the new ERP under implementation.[53]

61. Since the Program includes UJALA and SLNP investments for a defined period the configuration of the chart of accounts will provide the required information on program expenditure. Furthermore, EESL Annual Financial Statements (AFS) are prepared based on Indian Accounting Standards (IndAS), which are aligned with the International Financial Reporting Standards. The AFS is also capable of providing information on the expenditure incurred by EESL on various lines of business.

### 3. Program's financial sustainability and funding predictability

62. ***Program Expenditure Framework.*** The total Program expenditure over the operation period and its indicative year-wise structure is summarized in Table 4.1. These are aligned to EESL's priorities guided by GoI's agenda. The Program expenditure is based on assumptions that have been discussed with EESL and the Bank considers realistic in terms of prioritization and coverage.

[52] Accounting is carried out on an off-the-shelf accounting application and is presently centralized. EESL is in the process of implementing ERP on SAP platform and the Finance module is in *Go Live* stage.
[53] The ERP is on SAP platform and partially under Go Live stage. Full transition is expected by March 2018.

**Table 4.1: Program Expenditure Framework Composition**

| Program Expenditure | Est. Cost (INR million) | Est. Cost (US$ million) | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 |
|---|---|---|---|---|---|---|---|
| LED Bulbs | **18,071** | **263** | 72 | 78 | 76 | 37 | - |
| LED Tube lights | **4,790** | **68** | 14 | 14 | 15 | 13 | 12 |
| EE Ceiling Fans | **8,558** | **122** | 20 | 26 | 28 | 24 | 24 |
| Public Street lighting | **60,000** | **867** | 225 | 220 | 214 | 174 | 34 |
| Salaries including Employee Benefits | **1,960** | **28** | 3 | 4 | 5 | 8 | 8 |
| ***Grand Total*** | **93,379** | **1,348** | 334 | 342 | 338 | 256 | 78 |
| ***Percentage of Total*** | | | 25% | 25% | 25% | 19% | 6% |

63. Costs under UJALA (Result Area 1) include distribution and media expenses, and SLNP (Result Area 2) include the cost of installation. Salaries are attributable to the UJALA and SLNP and implementing the activities under Result Areas 3 to 5, represent just 2 percent of the total Program Expenditure Framework.

64. Actual program expenditure during the last two completed years is summarized in Table 4.2. Scaling up of existing activities is projected for FY 2017/18 which will take the program expenditure to the level of more than US$ 300 million. EESL is on a high trajectory of growth and this level is assessed as sustainable.

**Table 4.2: Actual Program Expenditure during last two years (in INR million)**

| Item | 2016-17 | 2015-16 |
|---|---|---|
| Purchase cost of items under UJALA (LED bulbs, tube lights, fans) | 8000.2 | 7847.1 |
| Distribution Expenses | 818.8 | 478.3 |
| Media Expenses | 379.5 | 515.4 |
| Purchase cost of Street Light including overheads and direct costs including work in progress | 5926.6 | 3735.1 |
| Salaries and Employee Benefits | 209.1 | 127.8 |
| **Total** | **15334.2** | **12703.7** |
| **Total in US$** | **236.7** | **198.5** |

*Source: Audited Annual Financial Statements*

65. ***Program Financing Plan.*** The Program expenditures would be financed through a combination of equity contribution from EESL's promoters and internal accruals; domestic borrowing from Banks (short term and working capital loans) and bonds; loans from development partners (including proposed World Bank financing); commercial borrowing; and other foreign loans and bonds. IBRD contribution is through the PforR instrument and comprises 16 percent of the of total Program expenditure. Additionally, the Bank will extend a guarantee equivalent to US$80 million that is expected to leverage commercial lending up to US$ 200 million. Promoters of EESL, which is as a joint venture of four of India's central power utilities (referred to as EESL's "promoters"[54]) have provided equity support, and ensure EESL is adequately capitalized and maintains a debt-equity ratio of 80:20. The authorized share capital has been increased from INR 5,000 million to INR 15,000 million indicating additional equity potential.

66. EESL is a profitable entity and projections indicate that it will remain profitable (further details are provided in Annex 11 - Financial Analysis of EESL). The major risk is credit risk, arising from exposure

[54] These are all government owned listed power utilities and enjoy credit rating of AAA/A1+

to financially-stressed Discoms and ULBs, but EESL has instituted as risk-mitigation payment security mechanisms including statutory recognition to its schemes, escrow account and upfront recovery from households. There is a risk of timely realization of its receivables – EESL's debtors to revenue ratio days sales (outstanding) has increased from 162 days to 254 days from FY 2015/16 to 2016/17 which would require a higher working capital. EESL recognizes trade default as receivables outstanding more than 90 days beyond the credit period (usually 30 days) and such receivables were more than 25 percent of total as of March 31, 2017, (as compared to 4 percent as of March 2016).[55] EESL contends that risk of default is insignificant and it has not experienced any significant impairment losses in the past years.

67. EESL has successfully accessed the capital markets and fund availability is not expected to pose significant challenges. EESL has recently made a bond issue of INR 4.5 billion that was over-subscribed by two. Adequate funding availability and financing modalities to the Program will continue to be important.

68. Given the high priority accorded to the EE program by the GoI and the strong financial position of EESL, it is expected that EESL will continue to be able to contribute and mobilize sufficient funds to meet the Program expenditure. The funds availability during the initial year of the Program seems sufficient to initiate the operation and EESL has already raised enough funds for the year.

69. ***Adherence of Program expenditure to Government priority.*** The Program has been following the targets set by the government, in most cases meeting and even exceeding targets.

### 4. Efficiency of Program expenditures

70. The program expenditures have been efficient to date, combining competitive bulk procurement with quality increase, reaching a larger number of beneficiaries, while reducing the cost of serving them and achieving program targets. UJALA and SLNP have evolved into well-defined business models with the requisite implementation structures and systems in place, along with demonstrated success.

## D. Program Results Framework and Monitoring and Evaluation

### 1. Assessment of Monitoring and Evaluation Capacity

71. EESL's internal reporting, monitoring and evaluation structure follows good practice. EESL has a management information systems (MIS). Each EESL business line has its own business unit, which determines how its targets will be achieved, submits their plans and reports on revenues and physical quantities on a quarterly basis, with plans for monthly reporting soon. Developments in the EE market (e.g. prices and sales of EE equipment and appliances) are also monitored for the quarterly/monthly evaluation of performance and inform management and operational decisions. Review and monitoring occurs both at the level of management for each state ("regional"), as well as at the overall central corporate level. The Managing Director holds review meetings on a quarterly basis with heads of each business line and EESL regional managers. This system enables EESL management to monitor and evaluate progress practically on a continuous basis and provide a timely notification of any deviations from plans. EESL's market assessment is shared with MoP and NITI Aayog to track progress towards the Government's NMEEE.

72. EESL has developed public dashboards, publicly accessible via the Internet, displaying data for key business lines, especially UJALA and SLNP. There has been an independent monitoring and evaluation study in 2015 commissioned by EESL assessing the performance of the street lighting and the LED program. Periodic independent impact assessments, or independent monitoring and evaluation of each

[55] A policy of recognizing bad and doubtful debts is yet to be developed and adopted by EESL. This is part of the agreed action plan between ADB and EESL

EESL programs would be a useful tool for documenting program impacts on EESL customers and a diverse range of beneficiaries, including consumption behavior and market impacts. Such a function could be managed through EESL's Quality team, in collaboration with each business line manager.

## E. Program Economic and Financial Evaluation

73. This section summarizes the Economic and Financial analysis ("the Analysis") for the proposed Program. The full details can be found in the stand-alone Program Economic and Financial Assessment.

### 1. Assessment of Rationale for Public Financing

74. India's power system needs to almost quadruple its generation capacity by 2040[56]. The Intended Nationally Determined Contribution (INDC) target commits India to reduce carbon dioxide emissions per unit of GDP by 33-35 percent by 2030 from 2005. EE improvements are amongst the most cost-effective methods of meeting these challenges[57], however private financing alone has not been able to unlock the market for EE.

75. Public support for EE investments in the residential and public sectors in India is justified on (i) the "efficiency gap"- an underinvestment in cost effective energy savings - that results from market failures such as incomplete and asymmetric information and high transaction costs; (ii) economies of scale - an entity supported by the public sector, through better access to information as well as potentially lower transaction costs, may be in a better position to secure sufficient demand to achieve such cost reductions than a private sector entity; (iii) non-cost reflective electricity prices - external costs such as the damages arising from climate change as well as local environmental and health impact are typically not factored in and tariff structures are often rife with cross-subsidization, leading to a suboptimal allocation of resources and eventually welfare loss. EE measures can reduce the magnitude of these distortions.

### 2. Economic and Financial Analysis

76. The Program's development impact, in terms of expected benefits and costs, was assessed by comparing the discounted benefits and costs with the Program, to a counterfactual state in absence of the Program[58]. The Analysis focused on quantifying the development impact for appliances in Results Areas 1 and 2[59].

77. The Program is considered economically viable if the Economic Internal Rate of Return (EIRR) exceeds the social discount rate. In accordance with World Bank guidance, a social discount rate twice the expected real per capita growth rate is used. In India, real per capita growth rates are forecast at 6.5 percent (IMF WEO, 2017)[60], yielding a social discount rate of 13 percent. The Program is considered financially viable when the internal rates of return exceed the opportunity cost of capital, which is typically set at 10 percent.

78. ***Costs and Benefits.*** Costs considered are capital investment, distribution, installation, operations and maintenance and taxes incurred by retailers (EESL and counterfactual equipment retailers) and

[56] Energy Efficiency Outlook for India 2015, IEA
[57] World Energy Outlook 2015, IEA, and Energy Efficiency Outlook for India 2015, IEA
[58] The counterfactual for the Program is formulated as a situation in which the less efficient appliance currently prevailing in the market continues to be used to provide the same level of service as that of the appliance distributed by the Program
[59] A qualitative assessment of EESL's air conditioner and agricultural pump program is included in the stand-alone Program Economic and Financial Assessment.
[60] World Economic Outlook, 2017. International Monetary Fund.

consumers (typically households and municipalities) in the Program and counterfactual states of the world. Quantified benefits include: (i) avoided fuel costs, based on the energy supply requirements of reduced generation; (ii) avoided global externalities, environmental benefits that arise from a reduction in global pollutants following reduced grid electricity consumption and reduced use of diesel generators (consistent with World Bank guidance on the social value of carbon, carbon emission reductions are valued in the base case at US$32 in 2017 and increasing to US$80 in real terms by 2050[61]; and (iii) avoided local externalities - proxied by avoided damages of fossil fuel generation on human health (Cropper et al, 2012)[62]

79. Due to a situation of excess generation capacity across all regions in India in 2017[63], the benefits of avoided generation capacity were not quantified. Other non-quantified benefits could include: (i) improved energy security due to increased electricity availability, affordability, and accessibility; (ii) improved utility financial viability in situations where electricity tariffs are set below cost recovery; (iii) improved health and well-being from increased safety, comfort and productivity etc.; (iv) macroeconomic and employment benefits from local manufacturing of EE appliance; and (v) market transformation benefits from a reduction of prices of energy efficient appliances leading to their more rapid market penetration, and hence greater market share of efficient appliances, increasingly served by the private sector, with resulting additional revenue.

80. One important set of assumptions, which can have great impact on the economic costs and benefits are behavioral assumptions: how consumers behave upon purchasing, using and disposing of the appliance. The approach on assumptions with uncertainty, is to err on the conservative side with regard to the expected benefits versus the costs of the Program.

### 3. Results of economic analysis

81. The Analysis finds high economic internal rates of return for UJALA appliances, ranging from 69 percent for LED street lights to 1244 percent for LED bulbs, exceeding an assumed social discount rate of 13 percent, even when excluding local and global emissions reduction benefits. The economic internal rate of return of the streetlight program is lower, at 8.8 percent excluding externalities and 25 percent including externalities. The Program internal rate of return is at least 144 percent. Accounting for avoided health damages from local emissions increases the EIRR by 44 percent and accounting for avoided damages from $CO_2$ emissions boosts it by another 49 percent. Table 4.3 summarizes the discounted net benefits. LED bulbs account for 96 percent of the total discounted net benefits of INR 329 billion excluding externalities, while Consumers are the largest net recipients of these benefits. Over the course of 20 years, the Program reduces energy demand by an estimated 313 TWh.

**Table 4.3: Summary of economic analysis**

| | Units | Bulb | Tube | Fan | Street light | Total |
|---|---|---|---|---|---|---|
| Social discount rate | % | 13 | 13 | 13 | 13 | 13 |
| **Economic rate of return** | | | | | | |
| EIRR excluding externalities | % | 1244 | 205 | 69 | 8.8 | 144 |
| EIRR including local externalities | % | 1798 | 300 | 103 | 16 | 207 |
| EIRR including local and global externalities | % | 2742 | 455 | 155 | 25 | 309 |
| **Costs** | | - | - | - | - | - |
| Capital costs | | - | - | - | - | - |
| New appliance | INRm | 13,658 | 3,370 | 5,931 | 44,396 | 67,355 |

[61] "Social Value of Carbon in project appraisal, Guidance note to the World Bank Group staff", July 14, 2017
[62] Cropper, M., S. Gamkhar, K. Malik, A Limonov, and I Partridge, The Health Effects of Coal Electricity Generation in India, Resources for the Future, June 2012.
[63] CEA (2017), "Load generation balance report, 2017-2018", Central Electricity Authority of India.

| | Units | Bulb | Tube | Fan | Street light | Total |
|---|---|---|---|---|---|---|
| Old appliance | INRm | (30,920) | (2,527) | (3,543) | (16,839) | (53,830) |
| Total costs | INRm | (17,263) | 842 | 2,388 | 27,557 | 13,525 |
| **Benefits** | | | | | | |
| Supplying electricity | | - | - | - | - | |
| Avoided self-generation | INRm | 25,116 | 1,059 | 938 | 1,724 | 28,837 |
| Avoided grid generation | INRm | 272,947 | 11,453 | 10,138 | 18,666 | 313,203 |
| Total benefits | | 298,063 | 12,512 | 11,076 | 20,389 | 342,040 |
| **Net economic flows** | INRm | | | | | |
| Excluding externalities | INRm | 315,325 | 11,670 | 8,688 | (7,168) | 328,515 |
| Including local externalities | INRm | 498,141 | 20,693 | 16,423 | 6,052 | 541,309 |
| Including local and global externalities | INRm | 750,286 | 31,757 | 26,144 | 23,575 | 831,762 |
| **Electricity demand** | | | | | | |
| Capacity | MW | (102,000) | (8,480) | (3,395) | (4,608) | (118,483) |
| Consumption | GWh | (264,929) | (15,264) | (12,629) | (20,183) | (313,005) |

82. High rates of return for LED bulbs arise because (i) LEDs are assumed to last on average 5 times longer than the counterfactual bulb (incandescent and CFL), (ii) LED bulbs consume 23 percent of the power of a counterfactual bulb and (iii) the cost at which EESL is able to supply LEDs is lower than the retail price of CFLs. Lower rates of return for SLNP result primarily because the capital cost of an LED streetlight with fixture significantly exceeds the cost of a counterfactual streetlight lumière (without fixture).

83. **Sensitivity analysis.** Switching values were calculated for total costs of the appliance, operating hours/day and failure rates, excluding avoided externalities[64]. The economic viability of UJALA appliances are very insensitive to plausible changes in these variables. Cost of procurement would have to increase beyond existing retail market prices for the project to become non-viable. The switching values for operating hours per day are very low and those for failure rates do not drop below 59 percent (Table 4.4).[65] The cost of streetlights would have to drop by 18 percent to make it viable without avoided externalities.

**Table 4.4: Switching values for economic viability**

| Parameter | Appliance | Light bulbs | Tube lights | Ceiling fans | Street lights |
|---|---|---|---|---|---|
| Cost, total | Baseline | 53 | 181 | 882 | 5,000 |
| | Switching value | 1,272 | 813 | 2,206 | 4,100 |
| Operating hours/day (fixing lifespan) | Baseline | 7.1 | 6 | 15.5 | 12 |
| | Switching value | - | 0.4 | 3.3 | 16.8 |
| Failure rate | Baseline | 0% | 0% | 0% | 0% |
| | Switching value | 95% | 78% | 59% | - |

84. The Analysis also calculated economic internal rates of return under the conservative assumption that the energy efficient appliances last just as long as counterfactual appliances, with the lifespan of bulbs and tube lights limited to the warranty period of three years. This yielded only slightly lower rates of return

[64] A switching value defines the value of a variable at which the outcome which is dependent on that variable meets a certain threshold. In this case, the outcome threshold is a EIRR that is equal to the social discount rate of 13%.
[65] The switching values for failure rates assume the EESL appliance, upon failure, is not replaced by another energy efficient appliance.

(due to the high social discount rate) for UJALA appliances and a rate of return of 1.8 percent excluding avoided externalities and 20 percent including avoided externalities for streetlights.

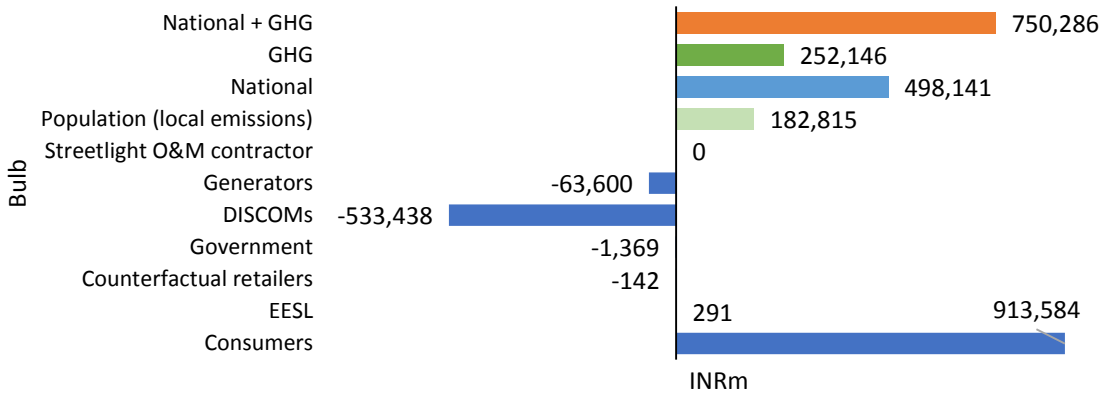
### 4. Results of financial analysis

85. A Financial Internal rate of Return (FIRR) was calculated based on the net stream of costs and benefits including taxes but excluding externalities for both EESL and its customers. For consumers buying EESL LED bulbs, LED tube lights and energy efficient ceiling fans, the Analysis shows positive returns in each year such that a FIRR cannot be calculated. For municipalities buying streetlights, the FIRR similarly cannot be calculated unless it is assumed, as it is in the financial model, that a midyear adjustment to the annuities distributes a portion of the costs of the streetlights to the year prior to that in which streetlights are installed. With latter assumption, the FIRR is 41 percent. For EESL, the financial rates of return of the UJALA product lines are dictated by mark-ups on the costs of procurement and distribution, and range from 11.6 percent for LED tube lights, 14.8 percent for 5-star fans, to 15.5 percent for LED bulbs. The FIRR of streetlights is fixed by the requirement to cover a 10 percent cost of debt and a 24 percent pre-tax cost of equity. An annuity model covers these costs with collections over a period of seven years. The model assumes O&M costs of 3 percent as well a tax of 15 percent. With the mid-year adjustment, the FIRR is 15.2 percent in real terms.

### 5. Distributional analysis

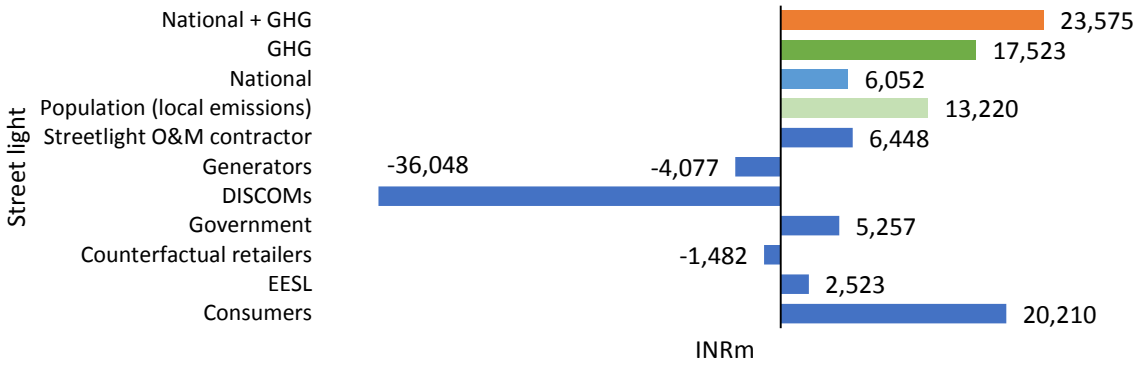
86. A distributional analysis identified the impact of the Program by stakeholder. The pattern of distributional impacts is roughly the same for each UJALA appliance, and illustrated for the case of LED bulbs in Figure 4.2. Consumers gain the most from energy expenditure reductions, primarily at the cost of Discoms and generators[66]. EESL gains while retailers of counterfactual appliances lose out. The government gains from more tax revenues on the higher costs of efficient tube lights and fans, but collects less revenues from the lower lifetime costs of LED bulbs versus their counterfactual. Avoided local emissions account for a substantial share of national net benefits. Avoided GHG emissions further increase net benefits at a global level by at least 50 percent. The distribution of benefits for LED streetlights follows a similar pattern, albeit with proportionately lower consumer benefits and higher avoided emissions benefits (Figure 4.3).

**Figure 4.2: Distributional impact of LED bulbs**




[66] The losses of Discoms here should be interpreted with caution: due to insufficient data, the analysis does not model DISCOM costs other than electricity purchases. Furthermore, it is not uncommon that a distribution company is operating below full-cost recovery, such that the utility could actually stand to gain from a reduction of energy demand brought about by the Program.

**Figure 4.3: Distributional impact of LED streetlights**



## Annex 5: Summary Fiduciary Systems Assessment

### A. Section 1: Conclusions

#### 1. Reasonable assurance

1. The conclusion of the Fiduciary System Assessment (FSA) is that the Program fiduciary systems capacity and performance are considered adequate to provide reasonable assurance that the Program funds will be used for the intended purposes with due attention to the principles of economy, efficiency, effectiveness, transparency, and accountability.

#### 2. Risk assessment

2. The following key risks have been identified in the Program fiduciary systems. EESL has agreed to implement an action plan comprising mitigation measures to address these risks, to be monitored during implementation through the Program Action Plan (PAP).

- **Risk of weak oversight over internal controls due to lack of a robust Internal Audit mechanism: The** Internal Audit function in EESL needs to be strengthened to meet the rapidly expanding requirements of EESL and good industry practices. EESL has agreed to strengthen its internal audit function through enhanced terms of reference covering institutional framework, increased scope and coverage including risk-based audit, developing internal audit manual/guidelines, specialized audit such as stock audit, and an effective mechanism for compliance and follow-up. This has been included as an action in the PAP.
- **Risk of lack of uniformity in practices due to absence of Finance Manuals:** Financial management (FM) systems, processes, and procedures in EESL are not documented in finance manuals. Significant changes are expected following the implementation of an ERP system. There is an opportunity for EESL to prepare finance manuals in line with extant systems, including those established under the ERP. Preparation of Finance Manuals is an action in the PAP.
- **Risk of compromising Efficiency in Procurement Process:** "Guidelines, Policy and Procedure for Procurement of Goods, Works and Non-Consulting Services for EESL" were prepared in 2013 and since then various orders have been issued by Government of India, CVC, etc. EESL has been taking into account these orders, which are scattered in various files, during the procurement process. To make the process more efficient, the Guidelines need to be updated to incorporate various orders as well as additional methods/ market approaches commensurate with the size and complexity of procurement to be handled by EESL in future. Standard Bidding Documents (SBD) are also required to be updated in line with the updated Guidelines. These measures are included in the PAP.
- **Risk of Non-Realization of Revenues from Clients:** Currently EESL does not have standard template for signing Memorandum of Understanding (MoU) with its government clients (states, state-owned enterprises and urban local bodies, etc.) and most of the times, the clients suggest their terms and conditions, which may not always be equitable, creating potential performance and financial risks for EESL. To address this risk, EESL will develop a standard MoU template. This is an action in the PAP.
- **Risk of Poor Quality of Procured Items**: To mitigate the risk of compromising quality, EESL enters in to agreements for supply including services of LED products. EESL will further train its staff and suppliers on recently developed manuals and protocols for Quality Assurance (QA) for domestic and street lighting programs, and develop and disseminate QA manuals and protocols for efficient ceiling fan programs. This activity is included in the PAP.
- **Risk of default by Distributors**: Distribution agencies hold large stocks that act as an unsecured advance. The value of bank guarantee provided by distribution agencies is linked to the value of their contract and is a fraction of value of stocks held by them. This creates the risk of payment default or misappropriation of inventories by these agencies. It is expected that as the business lines mature,

inventory ratio will increase and the level of inventories will reduce. In such scenario, the value of the bank guarantee will be able to cover higher level of inventories.

- **There is a risk that the implementation of PAP may be delayed:** EESL has agreed to implement a Financial Management Action Plan with ADB as part of the India: Demand Energy Efficiency Sector Project. Agreed activities are in various stages of implementation, but some are delayed beyond the agreed date. There is a risk that the PAP under the Program may also get delayed. To mitigate this risk, the Bank will closely follow up and work with EESL to implement the agreed PAP.
- **There is a risk that transition to ERP may not be smooth:** EESL is in an advanced stage of implementing an ERP application that covers all the functional areas of the organization. Full transition is expected by March 2018[67]. There is a risk that the transition may not be smooth due to software or hardware issues and migration and change management procedures may not be managed adequately that may impact the ability of EESL to appropriately carry out its fiduciary functions in the interim period.

### 3. Procurement exclusions

3. No procurement above the thresholds set by Operational Procurement Review Committee (OPRC)[68] are anticipated under the Program.

## B. Section 2: Scope

### 1. Brief description of the scope of the FSA

4. The FSA covers the fiduciary systems currently established by EESL and to be used for the Program. The assessment was conducted at the head office and two zonal/regional offices[69] of EESL, which are representative of the Program systems established by EESL. This assessment reviewed the adequacy of the Program systems in EESL as an entity in general, and the systems, processes and procedures underlying two key activities, in particular –UJALA and SLNP[70]. The FSA is based on Program Expenditure Framework identified in the Technical Assessment for US$1.3 billion and Bank financing will be US$220 million over the period 2018/2023[71] supplemented by Bank Guarantee of up to US$80 million to leverage commercial financing.

## C. Section 3: Review of Public Financial Management Cycle

5. *Regulatory Framework:* EESL is governed by the Companies Act, 2013, which contains provisions on corporate governance, administration, accounting and financial reporting and auditing. EESL has established its corporate financial management and procurement systems, processes and procedures which are proposed to be used for the Program. No material weaknesses of its fiduciary systems have been reported by the statutory auditors of EESL (other than qualifications on accounting treatment of certain items). The auditors have also endorsed maintenance and effective operation of internal financial controls over financial reporting. EESL is a Board managed company comprising of directors nominated by the GoI and the join venture (JV) partners. The Board has a functioning Audit Committee of the Board (ACB) and a Project Sub-Committee.

[67] Implementation of a comprehensive ERP system is a part of the Financial Management Action Plan agreed by EESL with ADB to be completed by December 2017. EESL is implementing ERP under SAP platform with partial funding from the World Bank under the TA component of the Partial Risk Sharing Facility for Energy Efficiency (PRSF) Project.
[68] US$75 million per contract for goods based on moderate risk rating
[69] The FSA covered the Western and Southern Zonal Offices and Regional Offices Maharashtra and Telangana
[70] The FSA also referred to the Financial Management Assessment of EESL conducted by the Asian Development Bank in September 2016 under the "Demand Side Energy Efficiency Sector Project" (RRP 48224).
[71] This includes the 4-month disbursement deadline date, after the program end date (Sept 30, 2022)

6. *Transition to ERP: EESL* has recently implemented an ERP application based on SAP platform. It is also expected to further strengthen internal controls in a fast-growing organization.

## 1. Planning and Budgeting

### *a) Adequacy of budgets*

7. EESL has recently established a Corporate Planning unit with the function of preparing corporate plans, monitoring plan implementation and performance. This unit also reports to the MoP and the NITI Aayog on the corporate plan and achievements. An annual planning meeting is held to assess the achievements and decide targets for the next year. The Program is part of the 5-year business plan of EESL covering FY 2017 to 2022 and approved by its Board.

8. A detailed revenue and capital budget is prepared annually and is used for periodic variance analysis. The budget is normally approved by the Board in July each year. There is an opportunity to obtain approval before the start of the financial year and to strengthen the system of comparison of budget vs. actuals. The Board also approves the project related annual performance targets and these are agreed with the parent MoP through a MoU. EESL has successfully achieved sales turnover agreed in the MoU during the last two years. Projects are approved at the level of the Board or by a Project sub-Committee[72] of the Board or the Managing Director, based on delegation of powers. Based on the investment plan, the Board approves an annual borrowing program with associated terms and conditions. Approval of the shareholders is also obtained.

### *b) Procurement planning*

9. Procurement processes in EESL are governed by *"Guidelines, Policy and Procedure for Procurement of Goods, Works and Non-Consulting Services for EESL*" dated November 19, 2013 (referred to as EESL Procurement Guidelines), which also define the procurement planning process. As part of the preparation for a project, EESL prepares an indicative preliminary procurement plan for the entire scope of the project, based on the Detailed Project Report / Investment Grade Energy Audit Report related to projects or other similar documents available. Such procurement plans, however, are not publicly available.

### *c) Procurement profile of the Program*

10. Program Expenditure includes procurement of LED bulbs, LED tube lights and EE fans under UJALA and street lights under SLNP. While the items being procured are not very complex or of high value per unit, the number of items required is very large and thus procurement is a very important function in the business model of EESL. The projected procurement plan of EESL for the Program is summarized in Table 5.1 below. Some of 2018 procurement of LED bulbs has already taken place, and will be included in targets for FY18.

**Table 5.1: Tentative Procurement Plan of EESL for the Program**

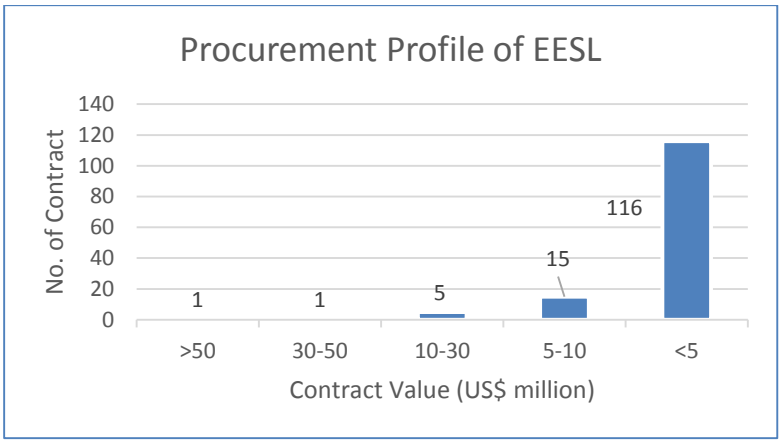
| Item | Quantity (No.) | Unit Rate (US$) | Estimated Cost (US$ million) | Bidding Process Starts | Contract awarded |
|---|---|---|---|---|---|
| LED Bulbs (package 1) | 60,000,000 | 0.95 | 56.81 | Feb-18 | May-18 |
| LED Bulbs (package 2) | 50,000,000 | 0.95 | 47.34 | Aug-18 | Nov-18 |
| LED Bulbs (package 3) | 50,000,000 | 0.99 | 49.71 | Feb-19 | May-19 |
| LED Bulbs (package 4) | 50,000,000 | 0.99 | 49.71 | Aug-19 | Nov-19 |
| LED Bulbs (package 5) | 40,000,000 | 1.04 | 41.75 | Feb-20 | May-20 |

[72] Comprising of the Managing Director and two other Directors.

| Item | Quantity (No.) | Unit Rate (US$) | Estimated Cost (US$ million) | Bidding Process Starts | Contract awarded |
|---|---|---|---|---|---|
| LED Tube lights (package 1) | 10,000,000 | 2.99 | 29.92 | Apr-18 | Jul-18 |
| LED Tube lights (package 2) | 10,000,000 | 3.14 | 31.42 | Apr-19 | Jul-19 |
| EE Fans (package 1) | 1,000,000 | 14.12 | 14.12 | Feb-18 | May-18 |
| EE Fans (package 2) | 1,000,000 | 14.12 | 14.12 | Oct-18 | Jan-19 |
| EE Fans (package 3) | 1,200,000 | 14.83 | 17.79 | Apr-19 | Jul-19 |
| EE Fans (package 4) | 1,200,000 | 14.83 | 17.79 | Oct-19 | Jan-20 |
| EE Fans (package 5) | 1,000,000 | 15.57 | 15.57 | Apr-20 | Jul-20 |
| EE Fans (package 6) | 1,000,000 | 15.57 | 15.57 | Oct-20 | Jan-21 |
| EE Fans (package 7) | 1,000,000 | 16.35 | 16.35 | Apr-21 | Jul-21 |
| EE Fans (package 8) | 1,000,000 | 16.35 | 16.35 | Oct-21 | Jan-22 |
| **TOTAL** | | | **434.32** | | |

11. Based on the analysis during the last year, that maximum value of the contract issued by EESL for UJALA and street lighting programs is about US$50 million (which was awarded to a multinational), while the value of remaining contracts is much lower (around US$30 million or below).

**Figure 5.1: Procurement Profile of EESL**




## 2. Budget Execution

### *a) Treasury management and funds flow*

12. Funds management is entrusted to separate Additional General Managers (AGMs) for international and national borrowings. Management of availability of funds is entrusted with another AGM, Banking Section. Bank accounts are opened under authority delegated to the Managing Director and each account is operated under dual signatories. Funds collected by distribution agencies are deposited in "virtual accounts" for each scheme/state/party to identify the receipts from each source.

13. All major payments are made from the corporate office usually through electronic mode by the Banking Section. The Banking Section prepares a Daily Fund Position copied to the Chief General Manager (CGM) Finance, who reviews the funds requirements and decides on the course of action, including utilization of undrawn line of credits from the banks.

14. Actual expenditures are compared to those budgeted on a quarterly/half-yearly basis and reported to top management and the Board. Re-appropriations can be done at level of the Board or the Project Sub-Committee of the Board or the Managing Director, based on delegation of powers.

15. *The funds flow arrangement for Program implementation:* The Bank will execute the Loan Agreement with EESL. Bank funds will be released upon achievement and verification of the DLIs in accordance with the agreed verification protocol. Prior results post a date specified in the legal agreement will also be financed under the project. Funds will flow directly to EESL in a specified bank account.

***b) Accounting and financial reporting***

**Accounting**

16. EESL follows double entry accrual basis of accounting under the India Accounting Standards or IndAS developed by the Institute of Chartered Accountants of India, for both accounting and financial reporting purposes.

17. Accounting in EESL is presently established through an off-the-shelf accounting application and EESL is transitioning to ERP. A chart of accounts is in use that allows each expenditure to be linked to the natural head of account and to a project (further details are provided in the Program Technical Assessment). Transactions are captured under the appropriate head at the time of voucher generation. Posting of transactions is done by each section based on the assigned job responsibilities.

18. EESL provides a statement of significant accounting policies in its publicly available audited annual financial statements (AFS). The auditors have reported compliance with generally accepted accounting standards, except in respect of treatment of advertisement expenses. Cost of LED bulbs and tube lights and of efficient ceiling fans distributed is expensed in the year of distribution. The cost of street lights (including apportioned expenses) installed and put to use is capitalized and amortized. Salaries are expensed in the year incurred.

**Financial Reporting**

19. EESL publishes half-yearly financial statements as of September each year and these are subject to limited review by auditors. For year-end closing, a formal circular for closing of accounts is issued. EESL is meeting its reporting obligations by finalizing the annual financial statements within the statutory time within six months from the close of the financial year.

20. EESL submits a weekly report on progress of UJALA and SLNP to the Union Cabinet covering data on distribution of LED bulbs and replacement of street lights and number of states, towns and institutions covered. Although accounting is fully computerized, EESL's financial reporting system is presently not fully integrated with the accounting system and there are manual processes, and spread sheets are used frequently.

***c) Procurement processes and procedures***

21. At the federal level, India currently does not have a public procurement law. Public procurement by Government of India (GoI) and entities owned by it are guided by General Financial Rules, 2017 ((GFR 2017), particularly in chapters 5-8 dealing with procurement and contract management. Accordingly, EESL follows the basic principles of GFR 2017 in its own detailed procurement procedures. The broad regulatory framework contained in the (i) Indian Contract Act (1872), (ii) Sale of Goods Act (1930), (iii) Arbitration and Conciliation Act, 1996, (iv) Right to Information Act (2005), and (v) the Competition Act (2002) apply to the procurement contracts of the government. Additionally, the Delegation of Financial Powers and

Rules, Government Orders (GO) and the guidelines issued by the CVC and Manual on Policies and Procedures for Goods, Works and Consultancy contains broad and generic guidelines applicable to all procurements of the government.

22. **EESL's Procurement Guidelines describe procurement procedures**. These Guidelines provide for prequalification for high value or complex packages, and post qualification in remaining cases; and allow both single responsibility/turnkey contracts as well as separate contracts for supply, installation etc. Single stage (with single envelope) bidding process is used for very small packages (up to INR 0.5 million). For packages estimated to cost more than INR 0.5 million, single stage two envelope process can be used. Two stage bidding is used for complex packages, particularly where it is difficult to freeze specifications or quantity. Open tender is used for packages more than INR 1.5 million in value. Apart from advertising for individual tenders, EESL has also set-up panels of suppliers through open advertisement to supply items as and when needed. Limited tender is used for small value purchases while single tender is used in case of proprietary items, repeat order or urgency. EESL also uses Rate Contracts for standard off-the shelf items and simple non-consulting services. As per the EESL Procurement Guidelines, all the suppliers are eligible to participate in bidding processes and EESL will not deny participation of any firm for reasons unrelated to its capacity to perform the contract provided there is no conflict of interest. Qualification requirements in NCB bid documents require the Bidders to have manufacturing facilities in India, though there is no such stipulation for ICB procurement. EESL currently uses an e-procurement system, which has been assessed by ADB as per MDB checklist and found acceptable.

23. EESL will be required to apply Public Procurement (Preference to Make in India) Order[73] issued by the Government of India on June 15, 2017, stating clear preference in the procurement processes for items manufactured in India. The main provisions of this order are:

- For procurement up to INR 5 million (about US$77,000) in value, only local bidders/suppliers will be allowed to participate (unless there is insufficient local capacity), where local bidder/supplier is defined based on minimum local content in goods offered rather than on the nationality of the company / agency that bids;
- For items above INR 5 million (about US$77,000) in value, there will be a requirement of minimum 50 percent local contents in items to be procured (unless the purchasing entity decides to increase or decrease it). However, foreign bidders (those that do not meet local content requirement) are not barred from participation in bidding process (see the next bullet);
- For items above INR 5 million (about US$77,000) in value, if there are local as well as foreign bidders participating in a bidding process, local bidders will be given purchase preference of 20 percent (unless the purchasing entity decides to increase or decrease it);
- For items above INR 5 million and if item is divisible and L1 bid is not from a local bidder, 50 percent of quantity is awarded to L1 (non-local) bidder, while remaining 50 percent is awarded to next (L2) local bidder if it matches L1 price. If procurement is for an item that is not-divisible and L1 bid is not from a local bidder, the contract will be awarded to next (L2) local bidder if it matches L1 price. If L2 local bidder does not match the L1 price, opportunity is provided to L3 local bidder and so on.
- This order is not applicable for very small value purchases (lesser than INR 0.5 million).

24. The Bank Team analyzed the likely impact of this policy on economy and efficiency of procurement processes for the Program. It may be noted that (a) the policy provides flexibility to the purchasing entity to decide percentage local content as well as purchase preference; and (b) economical and efficient procurement is core to EESL's business and it is not expected to apply local content requirement in the "Make in India" policy in a way that affects its business. The Bank team also reviewed the list of current bidders and suppliers of EESL for LED program (42 for street lighting and 40 for UJALA). EESL

[73] http://dipp.nic.in/sites/default/files/publicProcurement_MakeinIndia_15June2017.pdf

confirmed that all of these bidders and suppliers will meet domestic value addition requirements of the "Make in India" policy. The Bank team interviewed two of these suppliers (a multinational and an Indian company), selected as sample. These companies talked on behalf of the entire supplier base of EESL and confirmed that this new policy is not going to impact EESL suppliers as they already have manufacturing base in India. Decision for setting-up manufacturing facilities in India were influenced by factors like size of market for LED products in India, availability of cheap labor, etc. rather than the :Make in India" policy (as majority of their products are procured by private sector, not public sector in India). These manufacturers continue to import some raw material/components for manufacturing final product but they still meet the requirement of local value addition. For high efficiency ceiling fans, EESL expects similar trend to continue.

25. Based on this analysis, it was concluded that application of "Make in India" policy in this PforR operation does not dilute economy or efficiency and is not likely to adversely impact the results under current operation and may be accepted, provided: (a) EESL continues to adjust local content and purchase preference percentages to optimize economy and efficiency of procurement; and (b) the bid documents clearly mention the applicability of these provisions to ensure transparency. The Bank team will closely monitor implementation of "Make in India" policy in future procurement under the Program.

***d) Contract administration***

26. EESL Procurement Guidelines describe the procedures to be applied for post-contract phase including release of initial advance, manufacturing quality plan, factory acceptance tests and pre-dispatch inspections, project monitoring, variation orders, application of liquidated damages and contract closing. These Guidelines also have a section on performance management of contractors/suppliers and apply to the contracts for procurement of items under Program.

27. The requirements are initiated by the indenting department based on technical and financial approval. The procurement is handled by an AGM at the corporate office who also issues the Letter of Award after approval of Finance Section. Contract Agreement must be signed within 28 days of issue of Letter of Award. Administration of contracts is handled by the concerned indenting department and execution of contracts is supported by the Regional Offices. For each project, a team is designated under a Project Manager. Performance guarantees for a project is directly verified from the issuing bank by Finance Section of EESL. With implementation of SAP, Letter of Award will be issued and execution monitored through the application. Ongoing contracts are presently being migrated to SAP.

28. EESL's Zonal and Regional offices oversee/supervise the implementation of the projects and recommend payment of expenditures on services, material supply invoices of the vendors, Project Management Consultant (for SLNP), Distribution Agencies (for UJALA), Installation Agency (for SLNP), media awareness agency etc. Invoices raised by the above are reviewed for contractual compliance by the engineers, Manager / Deputy Manager (Finance) and recommended for payments by the Zonal/Regional Manager. Bills are forwarded to the corporate office that does the final review, approvals are obtained per extant delegation and job responsibilities and payments are released electronically through RTGS/NEFT[74]. Stocks of bulbs, fans and tube lights supplied by the vendor under the UJALA scheme are stored in the warehouse(s) of the DAs and the supplies are confirmed on receipt jointly by the Distribution Agency (DA) staff and the Regional Office (RO) engineer. Supplier bill is stamped and signed by the DA staff and the RO engineer on verification of supplies received at the warehouse/s. Balance of stocks at the DA warehouse/s is also periodically verified by the RO engineers though periodic confirmations are not documented.

[74] Real Time Gross Settlement/ National Electronics Funds Transfer

## 3. Internal Controls

### *a) Internal controls*

29. Staff duties and payment processes are defined in practice, though most of the procedures are not well-documented. EESL maintains a system of internal control including monitoring procedures which ensures accurate and timely financial reporting of various transactions, efficiency of operations and compliance with statutory laws, regulations and Company policies. Delegation of powers approved by the Board is well-documented. All claims on achievement of a particular stage are verified by the site in-charge and Engineer at the concerned RO and a verification report is issued and reviewed at various levels, and payments made through electronic modes by the Banking Section. Bank reconciliations are conducted quarterly both at the head office and the RO and there is a practice of review of the bank reconciliation by a higher-level officer and by the Internal Auditors. Internal controls are expected to be strengthened through the on-going implementation of the ERP application; full transition is expected by end March 2018. Payroll (salaries and employee benefits) processing has already been shifted to SAP-ERP as from April 1, 2017, and the automated attendance system is integrated with ERP. Payroll data is entered and processed by the HR Department, is verified by the Finance Department, and data file is transferred online to the bank and paid directly to the employees' bank accounts. The statutory auditors have reported that internal controls over financial reporting were operating effectively as of March 31, 2017, based on the internal control over financial reporting criteria established by the company considering essential components of internal control.

### *b) Internal Audit*

30. There is an internal audit system to ensure an adequate internal control system that is working. The function is presently under an Additional General Manager reporting to the CGM (Finance). Internal Audit is conducted through a firm of Chartered Accountants selected on a nomination basis and appointed by the Board. The periodicity of audit is half-yearly. Audit is completed up to March 2017 and the report placed before the ACB. The audit team comprises 2-3 Chartered Accountants supported by audit staff. The report is addressed to the Managing Director and is placed before the Board.

31. The coverage of the audit includes audit of reconciliation, banking, loans, ledger scrutiny, branch accounts, creditors etc. but the review appears routine and the set of recommendations are repeated from one report to the other i. e. the audit is done in a traditional transaction based compliance approach. Management response and follow up of previous audit findings should be part of subsequent audit reports. Internal audit function can be made more effective through strengthened terms of reference in response to EESL's rapidly expanding business and in line with good industry practices. These strengthening activities could include an enhanced institutional framework, improved scope and coverage of audit through risk-based audit, special audits such as stock audit, developing internal audit manual/guidelines, and an effective mechanism for compliance and follow-up.

## 4. Program Governance and Anti-Corruption arrangements

***Governance***

32. EESL follows the corporate governance provisions in the Companies Act, though there are some deviations in actual practice. EESL is a Board-managed entity and the sanctioned and actual composition of the Board is shown below Table 5.2. The JV Partners have the right to nominate the Chairperson of the Board and nominee directors on a rotation basis.

**Table 5.2: Composition of the Board of Directors of EESL (March 2018)**

| Designation | Composition as mandated by the Articles of Association | Actual Composition | Remarks |
|---|---|---|---|
| Chairman | 1 | 1 | from PFC |
| Managing Director (Executive) | 1 | 1 | -- |
| Functional Directors | 2 | 1 | Director Finance-- |
| Nominee of the Promoter – companies (part-time) | 3 | 2 | NTPC and REC |
| Nominee of the Ministry of Power (part-time) | 1 | 1 | Joint Secretary |
| Nominee of the Bureau of Energy Efficiency(part-time) | 1 | 1 | -- |
| Independent Directors (part-time) | 2 | 2 | -- |
| **Total strength** | **11** | **9** | |

33. The Board of EESL has been further strengthened by inducting Director (Finance) and two independent directors. The Audit Committee of the Board (ACB) presently comprises of the part-time directors nominated by the promoters and the MoP. The Act requires two independent directors on the ACB. As the Board now has independent directors, the composition of the ACB needs to be re-constituted.

34. **Risk management.** EESL has yet to establish a formal Risk Management Framework. The FM Action Plan agreed by EESL with ADB provides for establishment of certain risk mitigation measures such as a foreign exchange risk management framework, commercial audit of agreements with ULBs, insurance and payment mitigation mechanisms. As EESL is expected to grow significantly, it would be prudent to have a full-scale enterprise risk management framework.

***Anti-Corruption arrangements***

35. The GoI has taken several steps to prevent corruption, including the Right to Information Act, 2005 and ratification of UN Convention Against Corruption by the central government. At the national level, a CVC is the apex government body to address governmental corruption. It is an autonomous body, free of control from any executive authority and plays a key role in advising various authorities in central Government organizations in planning, executing, reviewing and reforming their vigilance work.

36. In addition to the regulatory framework, the oversight mechanism in terms of audit by the Comptroller & Auditor General of India (C&AG), a constitutionally appointed supreme audit institution, or its appointed auditor, enhances transparency and objectivity in the government processes. The Parliamentary Public Accounts Committee has overarching oversight powers on the accounts of the governments and regulation to the procurement processes to ensure purchases are made following a uniform and systematic procedure in accordance with the relevant rules and regulations of the Government. These provisions and arrangements are applicable to and followed by EESL.

37. EESL has a documented Code of Conduct (August 2015) applicable to all Board members and senior management personnel and mandates management to submit a one-time acknowledgement of the Code and annual affirmations of compliance. EESL has documented policies on Fraud Prevention and Whistle Blower. The employees are required to submit a signed declaration accepting the Fraud Prevention policy with a commitment to abide by its provisions in their normal course of business. These documents are publicly available on the EESL website. EESL has also implemented SCM e-procurement platform and all bids are widely published. EESL Procurement Guidelines emphasize the need for transparency and ethics in procurement. Open tender is the preferred procurement approach. Corrupt and fraudulent practices are defined in the Procurement Guidelines and there are provisions for rejection of bids, cancellation of contract or debarment, if a bidder/supplier was found to be engaged in these practices. Fraud prevention

policy and conflict of interest provisions are also part of the Procurement Guidelines. As per these Guidelines, suppliers may be debarred due to poor performance apart from indulgence in fraudulent or corrupt activities. EESL's Vigilance Department is under its Chief Finance Officer and there is an opportunity to have a separate Chief Vigilance Officer. EESL follows the Right to Information Act, 2005.

38. Number of vigilance/fraud & corruption complaint cases reported and their disposal during the last three years is summarized in the following table.

| Financial Year | Vigilance complaints received from within EESL | Vigilance complaints received from external parties | Total Vigilance complaints received | Complaints resolved | Complaints open and under examination |
|---|---|---|---|---|---|
| 2015-16 | 1 | 0 | 1 | 1 | 0 |
| 2016-17 | 0 | 2 | 1 | 1 | 1 |
| 2017-18 | 1 | 1 | 2 | 0 | 2 |

*Source: EESL*

39. The Program will be subject to the Bank's Governance and Anti -Corruption Guidelines namely the "Guidelines on Preventing and Combating Fraud and Corruption in Program-for-Results Financing".

### 5. Auditing

***Program audit***

40. The independent statutory auditor of EESL is appointed by the C&AG. The C&AG also conducts supplementary audits. Audits are annual, are concluded within six months of the end of the fiscal year and done in accordance with the extant Indian auditing standards. Audits for EESL are current and completed up to FY 2016/17. The audited AFS, as part of the Annual Report of EESL, is put in public domain after the annual general meeting is concluded.

41. **Arrangements for independent audit of the Program and related risks including procurement**: Audit of Program AFS are proposed to be conducted by an independent private audit firm, which could be the auditors appointed by the C&AG. The audit would be in accordance with terms of reference to be agreed with the Bank and include audit of procurement and contract management processes.

### 6. Procurement and Financial Management capacity

42. The Finance function is under a CGM Finance and is divided into four functional groups each headed by an AGM Finance. Each of the four ROs has a State Finance Officer supported by Manager Finance and Assistant Manager. In view of the growing volume and complexity of EESL's business, a Director (Finance) has been appointed to the Board to provide strategic direction.

43. The procurement function is under a General Manager (as additional charge) reporting to the Managing Director. In view of the importance of procurement function for EESL as well as likely volume and complexity of procurement in the future, EESL may consider upgrading this position. There are 17 staff handling procurement function, which appear to be adequate currently. Further procurement staff may be required for future business.

## D. Section 4: Program Systems and Capacity Improvements

44. Based on the assessment and identification of risks, mitigation actions have been agreed with EESL to be implemented over the Program period. Together, these measures are expected to enhance institutional effectiveness particularly in financial management and procurement. The measures including strengthening the FM framework by strengthening internal audit and preparation of finance manuals; strengthening the

procurement framework by updating the Procurement Guidelines, developing standard SBDs and templates for MoU with clients; strengthening the QA mechanism; and enhancing corporate governance by inducting independent directors on the ACB. These are included in the PAP (see Annex 8).

## E. Section 5: Implementation Support

45. Based on the Program risk profile, the Bank team will undertake at least bi-annual implementation support and need-based short technical missions with the objective of reviewing the progress of achievement of the fiduciary related activities in the Program Action Plan and to support EESL in any fiduciary related issues. Internal and external audit reports including observations on procurement aspects will be reviewed by the Bank and mitigation actions agreed with EESL.

## Annex 6: Summary Environmental and Social Systems Assessment

### ESSA Scope and Methodology

1. The proposed Program is focused on scaling up deployment of energy efficient appliances and equipment in the residential and public sectors, and institutional strengthening of EESL. The interventions planned are expected to result in environmental and social benefits. Adverse effects that are sensitive, diverse and unprecedented on the environment and people are not foreseen. However, the Program will need to be managed well to result in sustainable social and environmental benefits. As required by the Bank Policy on Program-for-Results Financing (July 2015), an Environmental and Social Systems Assessment (ESSA) was conducted during Program preparation to assess the adequacy of the environmental and social systems of EESL and identify specific strengthening measures.

2. In preparing the ESSA, detailed discussions were held with the Corporate team of EESL to understand the activities under various programs and the intended benefits and perceived risks, along with the review of secondary data including reports and studies on EESL's operations. Site visits were conducted to several locations where UJALA, SLNP and the AgDSM programs are under various stages of implementation and operation. Discussions were also held with EESL's regional and site offices (in varied topographic / climatic areas), supporting agencies and beneficiaries, to better understand EESL's program management and program environmental risks. Such discussions helped the team understand the environmental and social risks, and how to mitigate them. The environmental benefit and risk analysis defined the possible opportunities for institutional improvement.

### Summary of Environmental Systems Assessment

***Key Findings: Environment***

3. Program benefits include (i) energy savings from installation of EE equipment; (ii) avoided energy and capacity benefits; (iii) avoided environmental and health costs from reduction of thermal generation and pollution; and (iv) economic value of improved quality of life for consumers.

4. Environmental risks for the different programs of EESL are of varied nature. UJALA and SLNP are supported under Results Area 1 and 2 of the proposed PforR. Risks associated with the UJALA program mainly include (i) material and waste management specifically with respect to packaging, storage and disposal of bulbs and appliances by consumers, (ii) poor product quality, and (iii) risks during installation and maintenance including safety issues. In case of SLNP, in addition to the above, risks due to inappropriate planning of activities and placement decisions for installation of street lights are also pertinent. However, these risks are manageable through appropriate institutional systems and monitoring.

5. For UJALA, the lighting suppliers have responsibility for the management of broken / replaced bulbs under the Extended Producer Responsibility (EPR) in E-Waste (Management) Rules, 2016. UJALA is not a free replacement scheme, therefore consumers have responsibility for disposal of the bulbs under the provisions in EPR.[75] In addition, the ESSA and EMF have incorporated all aspects of bulb disposal, including Standard Operating Protocols (SOPs) for occupational health and safety, consumers' awareness, and activities of the Sustainable Development Unit in EESL. Under SLNP, waste is managed by Local

[75] Here, it is pertinent to note that purchase and use of incandescent lamps and CFLs, which have shorter life as compared to LEDs and are environmentally more harmful than LEDs, are drastically reduced when the deployment of LEDs are scaled up through UJALA.

Bodies as the street lighting is their duty entrusted by the Twelfth Schedule: Article 243 of Indian Constitution. Under E-Waste rules, 2016; Responsibilities of consumer or bulk consumer: Consumers or bulk consumers of electrical and electronic equipment shall ensure that e-waste generated by them is channelized through collection center or dealer of authorized producer or dismantler or recycler or through the designated take back service provider of the producer to authorized dismantler or recycler (Refer Page 8 of E-Waste Rules 2016).

6. In case of EESL's programs under development, such as buildings, air conditioning, and agricultural water pumping, possible risks include managing the hazardous wastes, electrical/electronic parts, heavy equipment and refrigerants. In addition, critical aspects such as impacts on the water table, cropping patterns and sensitive areas need to be understood prior to upscaling these activities. Therefore, for these programs, the proposed PforR operation will only focus on strengthening their design from a technical, environmental and social perspective, while no physical investments will be supported under the PforR. Results Area 3 of the PforR will support technical and analytical work, and no physical investments will be included in the Program boundary.

7. The existing environmental policies and procedures at the National, State and Local body level are found adequate to guide the current operations of EESL.

8. The potential risks that can emerge in case of improper planning, execution and management of programs are: (i) inappropriate management of wastes polluting the environment and posing risks to health and safety, (ii) effects of inappropriate lighting quantities and placement decisions on flora fauna and cultural heritage, and (iii) occupational and public safety risks for workers and the communities. EESL programs therefore must conform with applicable legislation, and national environmental regulations.

9. EESL has prepared an Environmental, Occupational Health & Safety and Social (EHSS) Manual covering mainly UJALA and SLNP. EESL has recently designated an EHSS officer to align their programs with the provisions of the EHSS Manual. Scope remains to improve the existing EHSS Manual including its Standard Operating Protocols (SOPs) and Documentation Formats (DFs) and ensuring full coverage of all programs and activities undertaken by EESL.

10. This assessment found that a unit should be established to ensure environmentally sustainable program operations. This unit shall be adequately staffed by full-time, dedicated personnel with the right skills. Preparation of program planning guidelines, updating of the EHSS Manual, training programs for the staff on environment related aspects and monitoring should be undertaken by this unit.

11. Recommendations of the environmental systems assessment are presented in ***Table 6.1*** below.

**Table 6.1: Environmental Assessment: Risks and Opportunities**

| Risks | Opportunities |
|---|---|
| **Institutional Mechanism** | |
| ▪ **Environmental risks which may arise due to limited considerations on environmental aspects during the project lifecycle**<br>▪ **Operational and reputational risks and overheads due to limited awareness among staff, clients, vendors and beneficiaries regarding environmental risks associated with certain products, operational processes and management** | ▪ Establishment of an adequately staffed environment and social unit or Sustainable Development Unit in EESL<br>▪ Information, Education, Communication (IEC) and awareness generation activities among the staff, clients, vendors and beneficiaries regarding environmental risks and its management |

| Risks | Opportunities |
|---|---|
| ▪ **Inadequate institutional capacity to factor in and manage environmental risks including worker and community safety during the program life cycle** | ▪ Dissemination of information regarding the products, specific procedures to manage the wastes<br>▪ Arrangements for inventorying the materials and wastes and ensuring proper storage, handling, transport, treatment and disposal of wastes<br>▪ Incorporation of clauses regarding key provisions of EESL Manual including worker safety in all levels of contracts and arrange systematic monitoring |
| **Program Planning** | |
| ▪ **Risks due to the absence of a professional roadmap for each program essential to anticipate and avoid environmental issues**<br>▪ **Possible reputational risks and overheads due to no attention on placement decisions and waste management**<br>▪ **Disaster vulnerability due to the absence of a contingency plan or emergency preparedness and mechanisms to address climate change vulnerabilities and disasters**<br>▪ **Health and safety risks due to inadequate amenities and facilities for the workers and communities**<br>▪ **Safety risks to communities and workers due to inadequate attention on work-close- out procedures and safety considerations** | ▪ Preparation of a systematic of a professional roadmap for each program, incorporating environmental and climate change considerations<br>▪ Systematic planning and provision of worker amenities and community amenities if applicable, arranging suitable waste management mechanism with emphasis on recycle, recover, reuse of possible material and effective treatment and disposal of rejects<br>▪ Preparation of suitable and effective Work Closeout Plan clearly spelling out the responsibilities for handholding safety and environmental considerations for each program even after EESL's exit from its management. |
| **EHSS Manual and Directions for Sustainable operations** | |
| ▪ **Risks to health and safety due to the gaps in the EHSS Manual to guide the operations of EESL and the need for its systematic updation**<br>▪ **Reputational and environmental risks due to limited monitoring of the activities and regulatory compliance of the vendors, sub-contractors and other partners** | ▪ Continuous updation of EESL's EHSS Manual; train program staff and contractor on the EHSS Manual; and report to management on a periodic basis.<br>▪ Incorporation of procedures and protocols to assess, monitor and manage environmental aspects of EESL activities including performance of vendors, sub-contractors and other partners and their compliance with respect to program requirements and legislation |

**Summary of Social Systems Assessment**

***Key Findings: Social***

12. Overall the expected social impact from the Program is positive, and benefits are high. The benefits include improved access to and affordability of energy efficient and cost saving technology; and access to improved public services like street lighting, which improves safety, security and creates opportunities for municipalities to become efficient and responsive in terms of service delivery. The scale and pace of the program has created many employment opportunities for technical as well as non-technical personnel.

13. Some weaknesses were identified on EESL social practices during the implementation of their programs, such as lack of deliberate identification and targeting of vulnerable areas and people and ensuring their inclusion as beneficiaries in the LED and street lighting programs. Secondly, lack of a gender strategy is an issue. EESL also requires appropriate systems for reporting, documenting and monitoring provision of services and goods to vulnerable groups, and improvement in gender indicators.

14. Overall, the social risks of the program are low and can be addressed if the right safeguard and monitoring mechanisms are developed. The ESSA identifies social risk related to contracting and sub-contracting arrangements where, unless proper monitoring systems are developed, there may be a possibility of labor rights violation. Secondly, there are risks of social exclusion if the program does not develop affirmative actions to reach out to the Below Poverty line families or women headed households or marginalized areas. Thirdly, there are risks related to operating in physically remote, politically volatile and predominantly tribal areas as these areas are sensitive, have issues related to mobility and access, and therefore require additional safeguards and preparation.

15. In terms of institutional capacities, so far EESL does not yet have dedicated personnel or a unit to handle social management aspects of its programs. In order to strengthen social management, there is a need to develop a comprehensive social policy, social risk assessment for its ongoing and upcoming programs, expand the purview of the existing manual on EHSS and finally, hire and develop experts on social development so that issues such as outreach to vulnerable areas and people, protection of labor rights especially in cases of sub-contracting, improvement in gender indicators, and more responsive systems for citizen engagement for transparency and accountability can be improved.

**Key Program Actions – Environmental and Social**

16. The ESSA recommends the following actions for inclusion in the program:
   *(i)* Establishment of a Sustainable Development (Environment and Social) Unit addressing:
      a. comprehensive program planning and implementation management;
      b. climate vulnerability and disasters;
      c. issues on social management
   *(ii)* Strengthening and Operationalizing the EHSS Manual

***Establishment of a full-fledged Sustainable Development (Environment and Social) Unit***

*Comprehensive program planning and implementation management*

17. A Sustainable Development Unit should be established with the mandate and resources for comprehensive environmental and social management, with suitable numbers of appropriately qualified staff to plan, design, manage and monitor EESL's programs. The unit shall work with the national, regional and site-level project teams and report to the Managing Director.

18. Comprehensive program planning based on rapid Environmental and Social screening is essential and should be implemented by this unit.

19. The unit shall oversee the activities of vendors and ensure provision of worker amenities and community amenities if applicable, arrangements to prepare and maintain inventory of all materials and wastes, suitable waste management mechanism with emphasis on recycle, recover, reuse of possible material and effective treatment and disposal of rejects. The unit shall propose minimum worker rights and working conditions in the kiosks for UJALA or for installation and maintenance in SLNP including for subcontractors.

20. The unit shall be entrusted with the responsibility to train, and build capacity and awareness among the staff, contractors, and communities regarding environmentally safe practices and social management.

*Climate vulnerability and disasters*

21. Program design should factor the risks of planning infrastructure in vulnerable areas (coastal areas, mountains, regions prone to earthquakes, flood and droughts). EESL should develop guidance on products and implementation processes, an effective contingency plan, emergency response and preparedness plan.

22. It is recommended that EESL develop a Terms of Reference for the proposed unit that take into account the need to manage climate vulnerability and risk of disaster.

*Issues on social management*

23. EESL should design strategies for vulnerable communities and measure its social impact effectively. This can help strengthening its targeting, marketing and outreach.

24. To improve gender indicators, there is a need for more data and information to measure impact on women, through EESL's programs or through direct and indirect economic and employment opportunities.

25. EESL must ensure that labor rights are duly followed.

26. In case of land acquisition, transfer or use (temporary or permanent), EESL will need to develop instruments to assess impacts and ensure that the affected people are informed, consulted, protected and compensated

27. EESL needs to improve accountability and transparency: through a charter of services; designation of responsibilities and strengthening of GRS.

***Strengthening and Operationalizing the EHSS Manual***

28. The EHSS Manual should be updated for all programs of EESL under implementation, to ensure full coverage of environmental impacts and mitigation measures. Dissemination and implementation of the EHSS Manual should be a priority. A plan and schedule to train the program staff and contractor/vendors and associated agencies on the EHSS Manual should also be prepared as a priority.

29. Protocols to report compliance of various operations with the provisions of the EHSS Manual and incorporation of EHSS Manual (updated) clauses / conditions in all contracts should be developed.

30. The following ***Table 6.2*** compiles the proposed measures associated with the Program Action Plan and DLIs in the proposed Program.

**Table 6.2: Proposed Measures / Action Plan**

| Sl No | Action | Timeline | Responsibility | Completion Measurement |
|---|---|---|---|---|
| **1** | Strengthening and Operationalizing the Full-fledged EHSS Manual | Up to March 31, 2019 | EESL | EHSS Manual updated to (i) cover all existing gaps including procedures for environmental and social screening; (ii) strengthened with provisions, SOPs and DFs to guide and manage all on-going programs of EESL; (iii) |

| Sl No | Action | Timeline | Responsibility | Completion Measurement |
|---|---|---|---|---|
| | | | | procedures / mechanisms to update it in the future; (iv) program to completely train and disseminate among the staff, vendors and support agencies; and (iv) procedures for compliance monitoring. |
| **2** | Incorporate a separate Sustainable Development Unit to provide overall program planning support in environmental and social aspects, Training, Capacity building and IEC to consumers and all stakeholders | Up to March 31, 2020 | EESL | Separate Sustainable Development Unit for environment and social considerations incorporated with (i) adequate number of suitable qualified staff, (ii) well-defined scope of works, and (iii) reporting protocols.<br><br>The Unit shall prepare (i) Program Plans; (ii) monitoring plan; (iii) training and capacity building plan; (iv) guidance material for staff, vendors and support agencies to select products and activities, plan and operate considering climate resilience; (v) prepare Contingency Plan, Emergency Preparedness and Response Plan, with guidance on how to adapt and use for each program. |

**Risk Management**

31. Review and analysis of existing programs reveals that risk factors in ongoing programs such as UJALA and SLNP, with strong implementation track record, are limited.

32. Most of the risks and gaps identified by the ESSA can be mitigated by appropriate program strategies and are hence manageable. Proposed responsibilities towards management of environmental risks are presented in ***Table 6.3*** below.

**Table 6.3: Proposed Responsibilities for Managing Environmental Risks**

| Environmental Risks | Responsibilities for Managing Environmental Risks |
|---|---|
| **Wastes (Solid, Hazardous wastes ad probable E-Wastes)** | ▪ EESL, through the proposed Sustainable Development Unit<br>o to develop appropriate guidance to help contractors and consumers (including local bodies) during project planning, implementation and 'end-of-life' management (including management protocol for wastes suggested by the prevalent legislation), arrange training, awareness and capacity building;<br>o to ensure that the program activities are aligned with the Standard Operating Procedures in the updated EHSS Manual regarding waste collection, storage, treatment and disposal and roles of stakeholders;<br>o to ensure that supervision and monitoring of the above during planning, implementation and operations are as per schedule. |
| **Quality Related** | ▪ EESL, through the proposed Sustainable Development Unit<br>o to coordinate with the proposed Quality Assurance Unit to develop program plans, (including product quality related considerations, specifically environmental) as per prevalent legislation including suggesting product quality innovations to vendors, certifications, training, awareness and capacity building;<br>o to ensure that testing, supervision and monitoring of the above during planning, implementation and operations are as per schedule. |
| **Installation, Operation and Maintenance** | ▪ EESL, through the proposed Sustainable Development Unit<br>o to develop program plans, (including environmental considerations during installation, operation and maintenance as per prevalent legislation) training, awareness and capacity building;<br>o to ensure that the program activities related to installation, operation and maintenance are aligned with the Standard Operating Procedures in the updated EHSS Manual. (Develop appropriate design options that address disaster and resource constrained areas, ensure kiosks and structures appropriate for area and ensure facilities.)<br>o to ensure that supervision and monitoring during implementation, operations and maintenance stages are as per schedule. |
| **Placement Decisions** | ▪ EESL, through the proposed Sustainable Development Unit<br>o to develop program plans, (including placement decisions as guided by prevalent legislation) training, awareness and capacity building;<br>o to ensure that program activities involving placement decisions are aligned with the Standard Operating Procedures in updated EHSS Manual;<br>o to ensure that supervision and monitoring of the aspects related to placement decisions are as per schedule. |

## Conclusion

33. The ESSA concludes that for better environmental and social risk management of the ongoing and proposed operations of EESL, it is imperative that the institutional capacity of EESL is improved. This includes the creation of a separate department on Sustainable Development unit within EESL to plan, implement and oversee the actions for managing the environmental and social risks, update of the EHSS Manual, capacity building of the staff, vendors, contractors, associated agencies, and regular monitoring and supervision.

**Consultations and Disclosure of ESSA**

34. The ESSA is a document that is subject to public disclosure and consultation.

35. The entire document has been written in consultation with EESL. During May and June 2017, site visits and meetings with various teams were organized to conduct an environment and social assessment. Other stakeholders including state and local government officials, vendors, distribution agencies, and consumers were also consulted. During these consultations, the respondents shared how they are involved in the program, their role, the impact and the suggestions to address risks and gaps in environmental and social management. During the June 2017 Pre-Appraisal Mission, the preliminary findings – benefits, risks, gaps and recommendations (environmental and social) were shared with EESL management. A draft ESSA was shared with EESL in November 2017 and based on the consultations and feedback received, the report was revised for draft disclosure. The details of persons consulted is available as Annex IV of the ESSA.

86. The draft ESSA (full report in English) and Executive Summary translated in Hindi was disclosed on the EESL website on 9th December 2017.[76] The document was available online for one month and the information was circulated to all stakeholders for comments. The World Bank website also disclosed the same documents with a link to the EESL website (after receiving No Objection Certificate (NOC) for its disclosure). There were no comments received. During the Appraisal in December 2017-Jaunuary 2018, discussions were held with EESL to revise the ESSA. The revised ESSA was disclosed on the EESL and World Bank websites in the first week of January 2018. All the other environmental and social safeguard documents (namely, EMF and IPPF) have been disclosed on the EESL website as well as the Bank's Website.[77] The final ESSA will be disclosed in the World Bank and EESL websites, along with the PAD and other project documents.

[76] Draft ESSA was disclosed on the EESL website on 9 December 2017 (accessible at https://www.eeslindia.org/EN/MediaCorner/NewsDetails?q=UJGS6/BzQ8Y7P2Ev/gW2/g== ) and on World Ban website on 12 December (accessible at http://documents.worldbank.org/curated/en/507231513089218502/Environmental-and-social-systems-assessment).

[77] The draft EMF was disclosed on 12 December 2017 by EESL (accessible at https://www.eeslindia.org/EN/MediaCorner/NewsDetails?q=UJGS6/BzQ8b8vuSOJFtUYg==) and World Bank website (accessible at http://documents.worldbank.org/curated/en/693621513105913097/Environmental-management-framework). The draft IPPF was disclosed by EESL on 29 December 2017 (accessible at https://www.eeslindia.org/EN/MediaCorner/NewsDetails?q=anGZB0608IW40Zh47BFmTA==), and on World Bank website (accessible at http://documents.worldbank.org/curated/en/472121516124566054/Indigenous-people-s-policy-framework) on 16 January 2018. Final EMF was disclosed on the EESL website on 1 January 2018 (accessible at https://www.eeslindia.org/DMS/8baec555_EMF_FINAL.pdf); and disclosed on World Bank website on 8 January 2018 (accessible at http://documents.worldbank.org/curated/en/693621513105913097/Environmental-management-framework).

## Annex 7: Systematic Operations Risk Rating (SORT)

**Stage: Appraisal**

| **Systematic Operations Risk-Rating Tool (SORT)** | |
|---|---|
| **Risk Category** | **Rating (H, S, M, L)** |
| 1. Political and Governance | Low |
| 2. Macroeconomic | Moderate |
| 3. Sector Strategies and Policies | Low |
| 4. Technical Design of Project or Program | High |
| 5. Institutional Capacity for Implementation and Sustainability | Moderate |
| 6. Fiduciary | Moderate |
| 7. Environment and Social | Moderate |
| 8. Stakeholders | Moderate |
| 9. Other | High (DLIs, Commercial financing, Guarantee, Contracts, TCAF co/parallel financing) |
| **OVERALL** | **Moderate** |

1. The proposed operation is well-anchored in a relatively robust policy and regulatory framework geared towards the development of the EE sector in India, and is aligned with the targets and ambitious plans laid out by the GoI, through the NMEEE, NDCs and other long-term commitments. As a key institution in the EE sector, EESL has already demonstrated its ability to deliver results through financing and implementing large-scale EE initiatives and has played an important role in EE market transformation in India. Sector Strategy and Policy risk is rated as Low.

2. Macroeconomic policies and institutions are generally adequate. Monetary, exchange rate and fiscal policies are generally consistent with macroeconomic stability and growth objectives. Residual macroeconomic risks stem from fiscal balances and public debt that are higher than peers, though risks are mitigated by robust economic growth and the minimal share of debt held by foreigners or in foreign currency. The intergovernmental fiscal system supports fiscal sustainability but has some loopholes, in the specific case of this operation the commitment of the state to internalize losses from DISCOMS, and the commitment of the central government to avoid costly future bailouts. The government has taken measures to address these risks but additional reforms are needed. The macroeconomic environment has limited effect on individual operations.

3. Technical design risk is rated as "High". The Program combines financing for scaling up of proven initiatives, involving partnerships with proven track record, for which implementation risk is relatively low, with more complex initiatives. While the challenge for the successful UJALA and SLNP programs is to continue delivery and ensure sustainability of results as implementation progresses on a larger scale for LED bulbs, LED tube lights, fans, and LED public street lights, EESL having had extensive experience through which it has gained valuable lessons, will continue to apply those to overcome the operational, commercial, contractual, repayment, credit, financial and other potential risks to be faced during the future expansion of UJALA and SLNP, which are covered by Results Area 1 and 2 of the Program. There is relatively more uncertainty and associated risks around the newer initiatives which EESL is just beginning to get into and which the Program will support under Results Area 3, that is, superefficient ACs, and Building Energy Efficiency, agricultural DSM Programs. These include more sophisticated and costlier EE technologies, and will involve development of relatively complex implementation structures and business delivery mechanisms to address market and other barriers which are different from that faced under UJALA

and SLNP programs. As EESL grows its annuity based business across multiple market segments, it will need to develop more robust long-term contracts with mechanisms (and penalties) to mitigate payment risks and non-performance by counterparties. This could include the development of a more comprehensive risk management framework for each new contract as part of the screening process. The potentially higher risks pertaining to Results Area 3 can be partially mitigated by the Program Design and DLIs which themselves aim to strengthen the technical design and address the operational and institutional sustainability issues related to the inclusion of the newer initiatives in EESL portfolio. Further improvements in risk management will become necessary as EESL seeks to raise long-term commercial financing from lenders and investors on a regular basis. This will include certain requirements from the Reserve Bank of India with respect to hedging certain elements of foreign exchange exposure. In relation to these "Other" sources, the risk is rated as "Substantial" as there are uncertainties related to their readiness, eligibility, modalities, process requirements, and timing.

4. Efforts to involve more private EE businesses, including ESCOs, in the market transformation, which is one of the focus areas of the Program Results Area 4, will depend on market conditions and effective stakeholder engagement. The proposed Program will include support targeted to strengthen the design of the newer initiatives and sustainability of implementation approaches.

5. EESL's Business Plan 2015-2020, which reflects its evolving nature of its business and the requirements, is undergoing a rapid transformation. EESL will be faced with changing technical, managerial, institutional, and financial resource mobilization needs and risk profiles as it moves forward. With significant growth expected in EESL's portfolio over the next five years, and new business models involving EE measures of increasing complexity and sophistication, EESL will need to carefully plan, improve its internal risk management frameworks, develop stronger contractual mechanisms to mitigate payment and non-performance risks of counterparties, and develop its future institutional capabilities. Most important areas of focus include of environment and social management, fiduciary frameworks, financial planning, resource mobilization (including the introduction of a formal hedging policy to manage foreign exchange risks) and quality assurance. In addition to finding the right skill mix for meeting the demand to deliver all of its functions in the market, EESL may have to strengthen the skills of its staff through training and by continuing to out-sourcing certain activities. The assessment of risks with respect to program technical design fiduciary, environmental and social aspects, and institutional capacity for implementation in a sustainable manner as described further in Annex 4 (Summary Technical Assessment). Financial risks are more thoroughly described in Annex 11.

6. Institutional Capacity for Implementation and Sustainability. As the key financing and implementing entity, EESL has demonstrated its ability to deliver large-scale EE initiatives, and has played a central role in EE market transformation in India during the last few years. In order to achieve the objective of becoming a full-service public sector Super ESCO in India, EESL is focused on refining existing approaches, developing its new initiatives, and strengthening its capacity. EESL is interested in not only scaling up their ongoing successful appliance initiatives like UJALA, but also drawing from international good practice to expand to other areas like superefficient ACs and AgDSM, and leverage financing and private sector participation, including through private ESCOs. This risk is currently rated as Moderate. Furthermore, the rating of risk can go up if EESL loses focus and gets involved in many different areas at once, stretching its resources thin and financially over-leverages. It is crucial for technical capacity, and human resources keep up with the planned scale-up, and environmental and social capacity is strengthened. This will be continuously monitored during preparation.

# Annex 8: Program Action Plan

| Action Description | DLI* | Due Date | Responsible Party | Completion Measurement** |
|---|---|---|---|---|
| 1. EESL will:<br>• Update EESL Guidelines, Policy and Procedure for Procurement of Goods, Works and Non-Consulting Services ("Guidelines") to add additional market methods/ approaches commensurate with size and complexity of procurement to be handled by EESL in the future;<br>• Update Standard Bidding Documents (SBDs), in line with the "Guidelines"; and<br>• Develop standard template for Memorandum of Understanding (MoU) with EESL's government clients (states, SOEs, ULBs, etc)<br>• Adopt and disseminate such Guidelines, SBDs and MoUs, and train staff, vendors and clients on such documents.<br>• | ☐ | March 31, 2019 | EESL | Adoption by EESL management of standardized procurement documents: "Guidelines", SBDs and MOU format, as well as dissemination and training of staff and clients, including vendors |
| 2. EESL will<br>• Disseminate its Quality Assurance Manuals and dispense training on quality assurance in street and domestic lighting to staff and vendors; and<br>• Develop and adopt a manual (including standard protocols) for quality assurance of the EESL's efficient ceiling fans program, disseminate it and dispense training on such manual to staff and vendors. | ☐ | Sept. 30, 2018<br><br>March 31, 2019 | EESL | Dissemination and training of staff and vendors on street lighting and domestic lighting QA manuals.<br><br>Adoption and dissemination of QA manuals/protocols for efficient ceiling fans program. |
| 3. EESL Audit Committee of the Board (ACB) shall include two independent directors as its members | ☐ | Sept 30, 2018 | EESL | The ACB is reconstituted including the two independent directors as its members. |
| 4. EESL will prepare, adopt and implement finance manual(s) covering all financial management functions in line with current systems and issue an internal notification of their application as of April 1, 2019 | ☐ | March 31, 2019 | EESL | EESL Board approves finance manual(s) covering all financial management functions, in line with current systems, and issues an internal notification of their use as from April 1, 2019. |
| 5. EESL shall ensure that its audit committee approves terms of reference acceptable to the Bank to strengthen EESL's internal audit function; and such internal audit function is performed in accordance with approved terms of reference throughout implementation of the Program. | | Sept. 30, 2018 | EESL | EESL's Audit Committee has approved the strengthened terms of reference for internal audit.<br>The strengthened internal audit function is implemented immediately and maintained thereafter. |
| 6. EESL shall develop and adopt its strategy on EE market transformation of residential lighting. Such strategy shall: (A) include reporting on activities (and their results) associated with the EESL's roles/functions related to, *inter alia*, (a) bulk procurement; (b) quality assurance (e.g., equipment quality | ☐ | March 31, 2019 | EESL | EESL Board approves strategy on residential lighting market transformation.<br>The strategy includes reporting on<br>- activities (and their results) associated with EESL roles/functions related to, inter |

| Action Description | DLI* | Due Date | Responsible Party | Completion Measurement** |
|---|---|---|---|---|
| assurance and warranty); (c) environmental sustainability; and (d) marketing and outreach (including programs targeting low income/poor households and women consumers/users); and<br><br>(B) specify the indicators the EESL will track, including: (i) number of LED bulbs sold: by the Borrower and other sellers; (ii) the EESL's bulb cost; (iii) prices of the bulbs sold by the EESL and by other sellers; (iv) the EESL's bulbs market share and other sellers' market share; (v) number of manufacturers selling LED bulbs in India's residential LED lighting market; (vi) number of direct employment created by the EESL (of which women); (vii) estimated number of beneficiaries (of which women and girls).<br><br>(C) EESL shall report to the Bank on key strategy indicators. | | March 31, 2022 | | alia, (a) bulk procurement; (b) quality assurance (e.g., equipment quality assurance and warranty); (c) environmental sustainability; and (d) marketing and outreach (including programs targeting low income/poor households and to women consumers/users).<br>The strategy also specifies indicators EESL will track, including (i) number of LED bulbs sold: by EESL and non-EESL; (ii) EESL bulb cost; (iii) bulb prices: EESL bulbs sold and non EESL bulbs sold; (iv) market share: EESL bulbs and non-EESL bulbs; (v) number of manufacturers selling LED bulbs in India's residential LED lighting market; (vi) number of direct employment created by EESL (of which women); (vii) estimated number of beneficiaries (of which women and girls).<br>At end of Program, EESL reports to World Bank on key strategy indicators. |
| 7. EESL shall produce and make publicly available (including by posting it on its website) a report (i) containing an independent review and evaluation of the agricultural demand side management models examined/tested by the EESL; and (ii) reporting on the EESL's sustainability actions and indicators including:<br>(a) Sampling and data recording of ground water levels prior to the installation of agricultural pump sets; (b) EESL's compilation of available real-time monitoring data from smart panels for all EE agricultural pump sets installed; (c) EESL's collection of reported data on ground water level data collection (by State ground-water Board) and evaluation of the suitability of EE agricultural pump equipment in that particular region, along with information on: (i) water extraction from the fields for non-agricultural uses and mechanism(s) to control/limit water consumed for non-agriculture uses; and (ii) changing crop patterns, if any; (d) EESL's sampling of ground water measurement in each region where agricultural demand side management activities are implemented or proposed; (e) EESL-organized farmer education workshops (on both energy and water efficiency); and (f) EESL's education material on EE agricultural pump systems (including guidance on irrigation efficiency and pump usage). | ☐ | March 31, 2020 | EESL | EESL completes the report (containing both (i) independent review and evaluation of AgDSM models; and (ii) reporting on EESL sustainability actions and indicators and makes it publicly available, inter alia, by posting it on its website. |

| Action Description | DLI* | Due Date | Responsible Party | Completion Measurement** |
|---|---|---|---|---|
| 8. EESL develop and implement a plan for systematic and periodic independent evaluation of each of EESL's Program Under Implementation, including program impact assessment, challenge identification and consumer perspectives collection, to inform such program design; and (having carried out the first two such independent evaluation reports) share with the Bank the first two reports. | ☐ | March 31, 2020 | EESL | Adoption by EESL Management of plan for systematic and periodic independent evaluation of EESL programs under implementation. First two (2) independent evaluation reports completed and shared with the World Bank. |
| 9. Develop and adopt a training program, and install a training center, for EE capacity building and training of the EESL's staff, EE private sector targeting private sector ESCOs and other EE service providers, and the EESL's customers, to: (i) ensure continued development of the EESL's human resources necessary for the EESL's long-term growth; and (ii) facilitate and support private sector participation in India's EE market segments; and report on the delivery of the first training session including: (i) the date and location of such training; (ii) training agenda; (iii) training material; (iv) list and contact details of participants; and (v) participant responses to feedback survey on training session. | ☐ | March 31, 2020 | EESL | EESL management approves training program and reports on delivery of first training session, targeting private sector ESCOs and other EE service providers. The training report includes, at minimum, (i) date and location; (ii) training agenda; (iii) training material; (iv) list and contact details of participants; and (v) participant responses to feedback survey on training session. |
| 10. EESL will (i) develop a baseline of the number of women it employs (including direct staff, short term contracted staff, and apprentices) at each level (managerial, technical, administrative); and (ii) track, on an ongoing basis, how many women it directly employs at each level (managerial, technical, administrative). | ☐ | March 31, 2020 | EESL | EESL to develop a baseline of the number of women it employs (including direct staff, short term contracted staff, and apprentices) at each level (managerial, technical, administrative) and track number of women employed for duration of project. |
| 11. EESL will strengthen and operationalize the complete EHSS Manual to: (i) cover all existing gaps; (ii) strengthen it with provisions, Standard Operating Protocols and Documentation Formats to guide and manage all Programs Under Implementation no later than twelve (12) months after its qualification as Program Under Implementation; (iii) provide procedures / mechanisms to update it in the future; (iv) include a program to completely disseminate in among, and train, the staff, vendors and support agencies; and (iv) describe procedures for compliance monitoring. | ☐ | March 31, 2019 | EESL | EHSS Manual updated to (i) cover all existing gaps; (ii) strengthened with provisions, SOPs and DFs to guide and manage all on-going programs of EESL, (iii) procedures / mechanisms to update it in the future; (iv) program to completely train and disseminate among the staff, vendors and support agencies; and (iv) procedures for compliance monitoring |
| 12. EESL, with financial advisors' support, shall develop, and its management shall approve, a long-term financial resource mobilization plan. | ☐ | March 31, 2019 | EESL | EESL to appoint financial advisors to analyze and advise management on corporate financing, and undertake review of financing models for EESL programs. Strategic plan for mobilization of sources of financing to be developed and approved by EESL Management. |

***Note (1):**

For the purpose of action 8 of PAP, an EESL program is deemed "under implementation" when the following conditions are met:

EESL will determine whether a project is classified as "under implementation" by March 31 of each year based on the following criteria:

i. EESL has completed at least three rounds of procurement and deployment, as per the technical specifications set forth in the relevant procurement documents; or EESL has made investments of at least INR 2 billion in projects of that program, and has received management approval to continue program deployment in the subsequent year, whichever is earlier; and

**ii.** EESL's investment projections for the subsequent financial year for the project in question is higher than the investment made during the financial year that is ending.

The periodic independent evaluation will include within 12 months of a project being deemed under implementation.

## Annex 9: Implementation Support Plan

1. The implementation arrangements have been developed in line with the Bank's operational guidelines. Overall coordination and implementation of the program is EESL's responsibility, with targeted and continuous implementation support from the World Bank team. Program monitoring is designed to provide confidence to the Bank that the targeted outputs will be achieved within the expected timeframe at the expected level of quality.

2. The Bank's implementation support will focus on:
   (i) Review of progress in Program implementation to achieve Program results, DLIs and PAP actions;
   (ii) Support for identifying and addressing risks to the achievement of the Program Development Objective as well as implementation issues;
   (iii) Support for institutional capacity building; and
   (iv) Monitoring compliance with legal agreements and the adequacy of institutional systems.

3. The Bank's implementation support will consist of:
   a) **Monitoring** –The Bank team has supported EESL in developing TOR for hiring an independent verification agency to confirm achievement against agreed DLIs for disbursement to take place, as well as results framework indicators. In addition, the Bank team will also hold bi-annual implementation support missions to assess progress in implementing the program action plan and achieving DLIs, and review relevant documents.
   b) **Technical support** – The Bank implementation support missions will include technical specialists to provide guidance on project implementation to achieve DLIs and actions agreed under PAP. The Bank will also provide technical advice on development of TORs, development of guidance documents and training manuals, etc.
   c) **Fiduciary** – The Bank team will undertake at least bi-annual implementation support and need-based short technical missions to review the implementation of agreed financial management and procurement arrangements, progress of achievement of the fiduciary related activities in the PAP, and to support EESL in any fiduciary related issues. Internal and external audit reports will be reviewed by the Bank and mitigation actions agreed with EESL.
   d) **Environment and social** – The Bank team will periodically monitor environmental and social systems and measures taken to implement the agreed actions.
      - The Bank task team will explore opportunities to improve environmental management capacity by sharing relevant information, reviewing ToRs for improving institutional capacity, and supporting the development of guidance manuals during implementation.
      - The Bank task team will undertake periodic field visits to assess the effectiveness of environmental or social impact mitigation measures in the PAP. A site visit strategy will be developed so that sampling during Program implementation includes sites with relatively significant impacts or relatively complex implementation issues.
   e) **Raising financing under the guarantee** – Negotiation and execution of the guarantee and underlying financing is carried out after Board approval. The Bank team and legal counsel will support EESL in determining the final guarantee structure, negotiating the documentation, conducting roadshows, and helping close the commercial transaction under the guarantee.
   f) **Coordination and Stakeholder engagement** – The Bank has regularly held discussions with other development finance institutions supporting EESL. The Bank will continue to coordinate with these institutions to minimize duplication of effort and ensure smooth program implementation.

**Main Focus of Implementation Support**

| *Time* | *Focus* | *Skills Needed* | *Resource Estimate* | *Partner Role* |
|---|---|---|---|---|
| First twelve months | Refinement of third party DLI monitoring and verification arrangements<br>Monitoring of:<br>• Program design<br>• Program results framework<br>• Progress in implementing PAP<br>Negotiating and finalizing the Guaranteed financing (including legal documentation) | • Project management<br>• Guarantee specialist<br>• Legal including guarantee lawyer<br>• Financial management<br>• Procurement and contracts<br>• Safeguards<br>• Technical specialist in energy efficiency<br>• Disbursement management | 6 staff weeks for project management<br><br>6 staff weeks for guarantee specialist<br><br>4 staff weeks each for other specialists | |
| 12-48 months | Monitoring of:<br>• Commercial financing and risk of claims under the guarantee<br>• Program design<br>• Program results framework<br>• Progress in implementing PAP | Same as above | 12 staff weeks for project management<br><br>8 staff weeks each for guarantee and other specialists | |

**Task Team Skills Mix Requirements for Implementation Support**

| *Skills Needed* | *Number of Staff Weeks (Average over 48 months)* | *Number of Trips* | *Comments* |
|---|---|---|---|
| Project Management | 4-5 weeks per year | 2 per year | |
| Guarantee specialist | 3-4 weeks per year | 2 per year | |
| Legal counsel | 3 weeks per year | 2 per year | |
| Financial management | 3 weeks per year | N/A | *Delhi-based* |
| Procurement | 3 weeks per year | N/A | *Delhi-based* |
| Safeguards | 3 weeks per year | N/A | *Delhi-based* |
| Technical specialist | 3 weeks per year | 2 per year | |
| Disbursement management | 3 weeks per year | 2 per year | |

## Annex 10: Draft Guarantee Term Sheet

*This term sheet contains a summary of indicative terms and conditions of a proposed guarantee ("Guarantee") by the International Bank for Reconstruction and Development ("IBRD") for discussion purposes only and does not constitute an offer to provide a Guarantee. The provision of a Guarantee is subject, inter alia, to satisfactory appraisal by IBRD of the Scaling up for Energy Efficiency in India Program and related project ("Program"), compliance with all applicable policies of the World Bank, including those related to environmental and social safeguards, review and acceptance of the ownership, management, financing structure, and Program/transaction documentation by IBRD, and the approval of the management and Executive Directors of IBRD in their sole discretion.*

### V. Term Sheet for Loans

| **IBRD-Guaranteed Loan (the Financing)** | |
|---|---|
| **IBRD-Guaranteed Loan Agreement:** | Agreement among the Borrower, the Agent [on behalf of] [and the] Lenders and IBRD as Guarantor setting out terms and conditions of the Financing, mechanism for payment on the Financing [and containing the Guarantee]. {The Guarantee could be contained in the IBRD Guaranteed Loan Agreement or separately in an IBRD Guarantee Agreement between IBRD and the Agent on behalf of the Lenders.} |
| **Borrower:** | Energy Efficiency Services Limited (EESL), incorporated under the Companies Act of India (1956) on 10 December 2009. |
| **Guaranteed Lender/Beneficiaries:** | [International commercial bank lenders, or the Agent on their behalf, each to be identified] |
| **Currency:** | US$ [or Euro or Yen] |
| **Principal Amount:** | Up to [200] million equivalent |
| **Term:** | Up to [10] years |
| **Repayment of the Financing:** | [Annual][Semi-annual] [Quarterly] |
| **Loan Interest Rate:** | [Spread above LIBOR acceptable to IBRD] |
| **Use of Proceeds:** | Capital expenditures by EESL in line with (a) the IBRD Program[78] and (b) as defined as eligible under the external commercial borrowing guidelines, or as otherwise decided by Reserve Bank of India |
| **Drawdown:** | [Up to [xx] drawdowns annually until the end of the Availability Period] |
| **IBRD Guarantee Agreement** | |
| **Guarantor:** | International Bank for Reconstruction and Development (IBRD) |
| **Parties:** | IBRD and the Guaranteed Lender (if several Guaranteed Lenders, a Facility Agent or Trustee acting on behalf of the Guaranteed Lenders). |
| **Guarantee Face Value:** | Up to [80] million |
| **Guarantee Support:** | IBRD would guarantee the payment, following occurrence of a Guaranteed Event, of [principal and interest amounts] [selected, pre-agreed debt service payments] due on scheduled payment dates up to the Maximum Guaranteed Amount. |
| **Guaranteed Events:** | Failure by the Borrower to [make certain payments of [principal] [and interest] on][repay at scheduled maturity the principal amount of] the IBRD-guaranteed Loan. |
| **Guarantee Period:** | [Define guarantee period] |
| **Max Guaranteed Amount:** | A partial amount of financing, not to exceed the Guarantee Face Value. |

[78] IBRD operation (which is inclusive of a parallel PforR loan operation and an IPF guarantee) will be defined as set of planned energy efficiency expenditures and investments such as different forms of LED lights, appliances and municipal and rural street lighting. This will be documented in the Project Agreement with the Borrower.

| | |
|---|---|
| **Amendments and waivers:** | IBRD will be entitled to be kept fully informed about any proposed waiver, consent or amendment to the terms of the transaction. Certain amendments, consents or waivers to the provisions of the finance documentation and IBRD Guarantee, insofar as they relate to the IBRD Guarantee, requires the prior written consent of IBRD, including, but not limited to, any material amendment or modification to a finance document or any amendment or waiver that materially and adversely affects the rights and obligations of IBRD. |
| **Suspension:** | IBRD may, during the availability period for drawdown of the guaranteed financing, inform the Agent that no further drawdown of the guaranteed financing, from the date of notification by IBRD up until such notice is revoked by IBRD, will be covered by the IBRD Guarantee upon the occurrence of the following types of scenarios, inter alia: (i) an event of default occurs under the guaranteed financing; (ii) the borrower has breached a material obligation [under the Project Agreement] and such breach continues after any applicable cure period; or (iii) the Agent or a beneficiary of the IBRD Guarantee engaged in certain sanctionable practices (fraud, corruption, coercion, collusion, obstruction) relating to the guaranteed financing. If the event giving rise to a suspension has been waived by IBRD, or remedied to IBRD's satisfaction, then IBRD may revoke its suspension notice and let the Agent know which amounts are reinstated for coverage under the IBRD Guarantee]. |
| **Exclusion:** | IBRD is not liable for losses directly resulting from noncompliance with, or the invalidity, illegality or unenforceability of any transaction document under laws in effect on, or events occurring before, the date of the [Fiscal Agency Agreement] [IBRD-Guaranteed Loan Agreement]. IBRD may deny payment to a beneficiary of the IBRD Guarantee in the following types of scenarios, inter alia: (i) a sanctionable practice (fraud, corruption, coercion, collusion, obstruction) has been found to have been committed by the Agent or a beneficiary of the IBRD Guarantee; (ii) the Agent or a beneficiary of the IBRD Guarantee, inter alia, amends the guaranteed financing documents, or transfers, or assigns the financing to a non-commercial lender without IBRD's prior written consent; (iii) the Agent or a beneficiary under the IBRD Guarantee engages in Repackaging Arrangements in respect of the IBRD Guarantee. |
| **Termination:** | The Guarantee may be terminated, inter alia, if (i) an installment of the Guarantee Fee or Standby Fee is not paid when due; (ii) an amendment, consent, waiver, modification or other change is made or given relating to certain provisions of the finance documentation, IBRD's rights or obligations, or the Guarantee without IBRD's prior written consent, including but not limited to any material amendment or modification to a finance document or any amendment, consent or waiver that materially and adversely affects the rights and obligations of IBRD; (iii) following full payment of all guaranteed amounts or (iv) after the final date for payment under the Guarantee. |
| **No Discharge:** | Neither the obligations of IBRD under the IBRD Guarantee nor the rights, powers and remedies conferred upon the Agent with respect to IBRD by the IBRD Guarantee or by applicable law or regulation shall be discharged, impaired or otherwise affected by: (i) any insolvency, moratorium or reorganization of debts of or relating to the borrower; (ii) any of the obligations of the borrower under the financing agreements being or becoming illegal, invalid, unenforceable, void, voidable or ineffective in any respect; (iii) any time or other indulgence being granted to the borrower in respect of its obligations under the financing agreements; or (iv) any other act, event or omission (other than the failure of the Agent to make a timely and duly completed demand under the IBRD Guarantee) which might otherwise operate to discharge, impair or otherwise affect any of the obligations of IBRD under the IBRD Guarantee or any of the rights, powers or remedies conferred on the Agent by the IBRD Guarantee or by applicable law or regulation. |

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|---|---|
| **Reduction of Demand:** | If, after the Agent has made a demand on IBRD for payment under the IBRD Guarantee, but before IBRD has made payment of the amount so demanded, the Agent receives payment in respect of such amount from the Borrower (or the Agent recovers otherwise than from IBRD) any sum which is applied to the satisfaction of the whole or any part of such amount, the Agent shall promptly notify IBRD of such fact and IBRD's liability under the IBRD Guarantee in respect of such demand shall be reduced by an amount equal to the portion so paid by the Borrower (or so recovered by the Agent) and so applied. |
| **Non-Accelerability of Guarantee:** | The Guarantee cannot be accelerated and become payable prior to the scheduled debt service payment dates under any circumstances, including if the underlying IBRD-Guaranteed Loan is accelerated as a result of a Guaranteed Event. In such instances, the IBRD Guarantee will cover payment of debt service up to the Maximum Guaranteed Amount in accordance with the original payment schedule. |
| **Conditions Precedent to Effectiveness of the IBRD Guarantee:** | Usual and customary conditions for financing of this type including but not limited to the following:<br>a) Provision of relevant legal opinions satisfactory to IBRD (including a legal opinion from counsel to EESL on the Project Agreement);<br>b) Payment [in full] of the Guarantee Fee, [the Front-End Fee] and the relevant installment(s) of the Standby Fee, and payment/reimbursement by India/the Borrower of IBRD's external legal expenses, auditor's fees and roadshow attendance expenses, if any;<br>c) Conclusion of an Sovereign Guarantee Agreement between IBRD and India, a Project Agreement between IBRD and the Borrower, and any other applicable documentation, all acceptable to IBRD;<br>d) Confirmation or obtaining of any necessary market consents; and<br>e) Satisfaction of any other conditions precedent under the financing documents. |
| **Subrogation:** | If and to the extent IBRD makes any payment under the Guarantee, IBRD will be subrogated immediately to the extent of such unreimbursed payment to the lenders' rights.[79] |
| **Right to Purchase:** | If IBRD guarantees payment of interest, then upon payment default by the Borrower, IBRD will have the right to purchase all rights, title and interests of the Beneficiaries in the Financing. |
| **Repackaging Arrangements:** | The Guaranteed Lenders will severally undertake for the benefit of IBRD that, provided the IBRD Guarantee remains in effect, they will not enter into or permit any of their affiliates to enter into any arrangement pursuant to which any security or other similar obligation is created or issued, the economic effect of which is the separation of rights of payment from IBRD under the IBRD Guarantee and of rights of payments from the Borrower under the financing, which is referred to as "Repackaging Arrangements". |
| **Front-end Fee:** | 25 basis points (bps) of the Guarantee Face Value payable by the Borrower. |
| **Standby Fee:** | 25 bps per annum, charged periodically and applied to that portion of the guaranteed amount that IBRD has contractually committed and for which IBRD does not yet have financial exposure under the guarantee. The IBRD standby fee is normally charged semi-annually and accrues sixty (60) days after the date of signing of the agreement providing for IBRD's guarantee. Standby Fee also applies if IBRD limits coverage of the Guarantee pursuant to any limitation event. Payment of the Standby Fee is the obligation of the Borrower and must be paid in advance on regular payment dates. |

[79] Subject to RBI approval, if required.

| | |
|---|---|
| **Guarantee Fee (recurring):** | [50] bps per annum[80]. The IBRD guarantee fee is charged on that portion of the guaranteed amount that IBRD has contractually committed and for which IBRD has financial exposure under the guarantee. (i.e. the present value of the Maximum Guaranteed Amount). Payment of this fee is the obligation of [Replace by Paying Party] and must be paid [in advance semi-annually] [in a one-time lump sum]. [Where the Guarantee Fee is payable in installments] The Guarantee will terminate in the event of nonpayment of any installment of the relevant Guarantee Fee. |
| **External Legal Costs:** | Reimbursement of IBRD external legal counsel expenses and roadshow attendance costs, if any, by the Borrower. |
| **Governing law:** | English law or New York law. |
| **Indemnity Agreement**[81] | |
| **Parties:** | IBRD and India (the "Member Country") |
| **Indemnity:** | The Member Country will reimburse and indemnify IBRD on demand, or as IBRD may otherwise direct, for all payments under the Guarantee and all losses, damages, costs, and expenses incurred by IBRD relating to or arising from the Guarantee. |
| **Covenants:** | Usual and customary covenants included in agreements between member countries and IBRD, as well as undertakings to pay the fees and expenses of IBRD's external counsel and other advisors, and IBRD's roadshow attendance expenses, in connection with the Financing, if any (if the Borrower is not bearing such costs). [Specific additional covenants, if any, to be defined.] |
| **Remedies:** | If the Member Country breaches any of its obligations under the Indemnity Agreement, IBRD may suspend or cancel, in whole or in part, the rights of the Member Country to make withdrawals under any other loan or credit agreement with IBRD, or any IBRD loan to a third party guaranteed by the Member Country, and may declare the outstanding principal and interest of any such loan or credit to be due and payable immediately. A breach by the Member Country under the Indemnity Agreement will not, however, discharge any guarantee obligations of IBRD under the Guarantee. |
| **Governing Law:** | The Indemnity Agreement will follow the usual legal regime and include dispute settlement provisions customary for agreements between member countries and IBRD. |
| **Project Agreement** | |
| **Parties:** | IBRD and the Borrower |
| **Program** | A Program by IBRD which specifies a set of eligible energy efficiency activities undertaken by the Borrower as eligible for funding under the IBRD-Guaranteed Loan. |
| **Representations and Warranties:** | The Borrower will represent, among other standard and Program-specific provisions, as of the effective date, that:<br>(a) it is in compliance with applicable environmental laws and the applicable World Bank guidelines, environmental and social safeguard requirements and other applicable requirements; and<br>(b) neither it (nor its direct and indirect shareholders and any other relevant Program participants, as determined by IBRD), nor any of its affiliates has engaged in any Sanctionable Practices ("Sanctionable Practices" include corrupt, fraudulent, collusive, coercive, or obstructive practices, as defined in IBRD's Anti-Corruption Guidelines.) in connection with the Program. |

[80] The guarantee fee level is determined by the average life of the guarantee: 50 bps up to 8 years, 60 bps from 8 to 10 years, 70 bps from 10 to 12 years, 80 bps from 12 to 15 years, 90 bps from 15 to 18 years and 100bps from 18 to 20 years.
[81] IBRD requirements may also be incorporated into the sovereign guarantee agreement.

| | |
|---|---|
| **Covenants:** | The Borrower will covenant, among other things, that it will:<br>(a) comply with applicable laws, including environmental laws, and the applicable World Bank environmental and social safeguards requirements;<br>(b) provide annual audited financial statements and other reports;<br>(c) provide certain notices and other information to IBRD;<br>(d) provide access to the Program;<br>(e) not engage in (or authorize or permit any affiliate or any other Person acting on its behalf to engage in) any Sanctionable Practices in connection with the Project;<br>(f) comply with World Bank requirements relating to Sanctionable Practices regarding individuals or firms included in the World Bank Group list of firms debarred from World Bank Group-financed contracts;<br>(g) obtain IBRD's consent prior to agreeing to any change to any material Program related transaction document to which it is a party which would materially affect the rights or obligations of IBRD under the Guarantee Agreement; and<br>(h) use the proceeds of the disbursements under the IBRD-Guaranteed Loan exclusively for the Program and in accordance with the terms and conditions of the IBRD-Guaranteed Loan Agreement.<br><br>[Specific additional covenants, if any, to be defined.] |

## *4.* Term sheet for Bond:

| **IBRD-Guaranteed Note (the Financing)** | |
|---|---|
| **Issuer:** | Energy Efficiency Services Limited (EESL), incorporated under the Companies Act of India (1956) on 10 December 2009. |
| **Beneficiaries of the IBRD Guarantee:** | [The holders of the notes issued by EESL (the Notes, and such holders, the Noteholders)] |
| **Currency:** | US$, Euro, Yen (or INR) |
| **Principal Amount:** | Up to [200] million or INR equivalent |
| **Term:** | Up to [10] years |
| **Repayment of the Financing:** | [Annual][Semi-annual][Quarterly] |
| **Coupon:** | [Coupon acceptable to IBRD and EESL] |
| **Use of Proceeds:** | Capital expenditures by EESL in line with (a) the IBRD Program[82] and (b) as defined as eligible under the external commercial borrowing guidelines, or as otherwise decided by Reserve Bank of India |
| **Drawdown:** | One drawdown at the time of issuance of the Notes |
| **IBRD Guarantee** | |
| **Guarantor:** | International Bank for Reconstruction and Development (IBRD) |
| **Guarantee Face Value:** | US$/Euro/Yen 80 million or INR equivalent. For the avoidance of doubt, IBRD does not cover penalty interest, default interest or charges of similar nature. |
| **Guarantee Support:** | IBRD would guarantee the payment, following occurrence of a Guaranteed Event, of certain principal [and interest] amounts due on scheduled payment dates up to the Maximum Guaranteed Amount, all being subject to claims made by the Fiscal Agent on behalf of the Noteholders. |
| **Guaranteed Events:** | Failure by the Issuer to [make certain payments of [principal] [and interest] on][repay at scheduled maturity the principal amount of] the Notes. |

[82] IBRD Program (which is inclusive of a parallel loan operation and this guarantee) will be defined as set of planned energy efficiency investments such as LED lighting, street lighting, and agricultural demand side management. This will be documented in the Project Agreement with the Issuer.

| | |
|---|---|
| **Guarantee Period:** | [To be defined no greater than the tenor of the Notes plus demand period] |
| **Maximum Guaranteed Amount:** | A partial amount of financing, not to exceed the Guarantee Face Value. |
| **Non-Accelerability of Guarantee:** | The Guarantee cannot be accelerated and become payable prior to the scheduled debt service payment dates under any circumstances, including if the underlying Notes are accelerated as a result of a Guaranteed Event. In such instances, the IBRD Guarantee will cover payment of debt service up to the Maximum Guaranteed Amount in accordance with the original payment schedule. |
| **Conditions Precedent to Effectiveness of the IBRD Guarantee:** | Usual and customary conditions for financing of this type including but not limited to the following:<br>a) Provision of relevant legal opinions satisfactory to IBRD (including a legal opinion from counsel to EESL on the Project Agreement);<br>b) Payment in full of the Guarantee Fee, the Front-End Fee, the relevant installment (if any) of the Standby Fee, and IBRD's External Costs[83];<br>c) Conclusion of an Indemnity Agreement between IBRD and India, the Fiscal Agency Agreement among the Fiscal Agent, India and IBRD (expected to include the Guarantee), a Purchase Agreement among the Lead Managers and India, a Warranty Agreement among the Lead Managers and IBRD, and any other applicable documentation, including preparation of an Offering Memorandum whose presentation of the Guarantee is acceptable to IBRD;<br>d) Confirmation or obtaining of any necessary market and currency consents[84]; and<br>e) Satisfaction of any other conditions precedent under the financing documents. |
| **Subrogation:** | If and to the extent IBRD makes any payment under the Guarantee, IBRD will be subrogated immediately to the extent of such unreimbursed payment to the Beneficiaries' rights. |
| **Right to Purchase:** | If IBRD guarantees payment of interest, then upon payment default by the Issuer, IBRD will have the right to purchase at par all rights, title and interests of the Beneficiaries in the Financing. |
| **Front-end Fee:** | 25 bps of the Guarantee Face Value payable by the Issuer. |
| **Restriction on Repackaging Arrangements:** | The Lead Managers will, in connection with the initial offer and resale of the Notes, severally undertake for the benefit of IBRD that they (or their affiliates) will not enter into any arrangement pursuant to which any security or similar obligation is created or issued, the economic effect of which is the separation of rights of payments from IBRD and of rights of payment from the Issuer under the Notes (a "**Repackaging Arrangement**"); and severally undertake to IBRD to:<br>(a) inform prospective purchasers of such undertaking by delivery of the Offering Document; and<br>(b) not sell any Notes to any purchaser with respect to which the applicable Lead Manager has such knowledge that as of that date, the purchaser intends to enter into a Repackaging Arrangement, provided such Lead Manager is not obliged to make any enquiries to ascertain such purchaser's intention. |

[83] In securities guarantees and certain other guarantee operations, the World Bank requires the services of external counsel and other advisors, whose costs and expenses must be paid by the other project participants. These External Costs could be paid by India or EESL, but would need to be paid in full before effectiveness of the Guarantee.
[84] In addition, this is a condition precedent to signing the Guarantee.

| | |
|---|---|
| **No Additional Amounts:** | The Guarantee is limited to certain outstanding scheduled payments of principal or principal and interest (as to be determined) and would not cover any additional amounts payable by the Issuer with respect to such amounts. |
| **Standby Fee:** | 25 bps per annum, charged periodically and applied to that portion of the guaranteed amount that IBRD has contractually committed and for which IBRD does not yet have financial exposure under the guarantee. The IBRD standby fee is normally charged semi-annually and accrues sixty (60) days after the date of signing of the agreement providing for IBRD's guarantee. Payment of the Standby Fee is the obligation of the Issuer and must be paid in advance on regular payment dates. |
| **Guarantee Fee (recurring):** | [X][85] basis points per annum. The IBRD guarantee fee is charged on that portion of the guaranteed amount that IBRD has contractually committed and for which IBRD has financial exposure under the guarantee. (i.e. the present value of the Maximum Guaranteed Amount). Payment of this fee is the obligation of the Issuer and must be paid in a one-time lump sum. |
| **External Costs:** | IBRD's external legal counsel, external auditors, and roadshow attendance costs and expenses must be paid by the Issuer. |
| **Termination events:** | The Guarantee may be terminated, *inter alia*, (i) if an installment of the Guarantee Fee or Standby Fee (to the extent the Standby Fee is applicable) is not paid when due; (ii) if an amendment, waiver, modification or other change is made or given relating to certain provisions of the finance documentation, IBRD's rights or obligations, or the Guarantee without IBRD's prior written consent, including but not limited to any material amendment or modification to a finance document or any amendment or waiver that materially and adversely affects the rights and obligations of IBRD; (iii) following full payment of all guaranteed amounts or (iv) after the final date for payment under the Guarantee. |
| **Exclusions:** | IBRD is not liable for losses due to the application of laws in force as of the date of the Fiscal Agency Agreement, or actions or inactions of the Issuer or any other event or circumstance occurring prior to the date of the Fiscal Agency Agreement or where the failure of the Issuer to make a payment on the Notes is due to the application of laws in force as of the date of the Fiscal Agency Agreement or due to the invalidity, illegality or unenforceability of any transaction document[86] under applicable laws in effect as of the date of the Fiscal Agency Agreement. |
| **Governing law:** | English law or New York Law. |
| **Indemnity Agreement[87]** | |
| **Parties:** | IBRD and India (the "Member Country") |
| **Indemnity:** | The Member Country will reimburse and indemnify IBRD on demand, or as IBRD may otherwise direct, for all payments under the Guarantee and all losses, damages, costs, and expenses incurred by IBRD relating to or arising from the Guarantee. |

[85] The guarantee fee level is determined by the average life of the guarantee: 50bps up to 8 years, 60bps from 8 to 10 years, 70bps from 10 to 12 years, 80bps from 12 to 15 years, 90bps from 15 to 18 years and 100bps from 18 to 20 years.
[86] Expected to include the documents relating to the Financing and the Guarantee, [as well as the Downstream Agreements] and the Project Agreement.
[87] IBRD requirements may also be incorporated into the sovereign guarantee agreement.

| | |
|---|---|
| **Covenants:** | Usual and customary covenants included in agreements between member countries and IBRD, as well as undertakings to pay IBRD's External Costs (if the Issuer is not bearing such costs). [Specific additional covenants, if any, to be defined.] |
| **Remedies:** | If the Member Country breaches any of its obligations under the Indemnity Agreement, IBRD may suspend or cancel, in whole or in part, the rights of the Member Country to make withdrawals under any other loan or credit agreement with IBRD, or any IBRD loan to a third party guaranteed by the Member Country, and may declare the outstanding principal and interest of any such loan or credit to be due and payable immediately. A breach by the Member Country under the Indemnity Agreement will not, however, discharge any guarantee obligations of IBRD under the Guarantee. |
| **Governing Law:** | The Indemnity Agreement will follow the usual legal regime and include dispute settlement provisions customary for agreements between member countries and IBRD. |
| **Project Agreement** | |
| **Parties:** | IBRD and the Issuer |
| **Program** | A Program for Results operation by IBRD which specifies a set of eligible energy efficiency activities as eligible for funding by a parallel sovereign loan. |
| **Representations and Warranties:** | The Issuer will represent, among other standard and project-specific provisions, as of the effective date, that:<br>(a) it is in compliance with applicable environmental laws and the applicable World Bank guidelines, environmental and social safeguard requirements, and other applicable requirements; and<br>(b) neither it (nor its direct and indirect shareholders and any other relevant project participants, as determined by IBRD), nor any of its affiliates has engaged in any Sanctionable Practices[88] in connection with the Program. |
| **Covenants:** | The Issuer will covenant, among other things, that it will:<br>(a) apply the proceeds of the Notes for the purposes of the appropriate Program component;<br>(b) comply with applicable laws, including (as appropriate) environmental laws, and the applicable World Bank environmental and social safeguards requirements;<br>(c) provide annual audited financial statements and other reports, and certain notices and other information to IBRD;<br>(d) provide access to the Program (as applicable);<br>(e) not engage in (or authorize or permit any affiliate or any other Person acting on its behalf to engage in) any Sanctionable Practices in connection with the Project;<br>(f) comply with World Bank requirements relating to Sanctionable Practices regarding individuals or firms included in the World Bank Group list of firms debarred from World Bank Group-financed contracts;<br>(g) obtain IBRD's consent prior to agreeing to any change to any material Project related transaction document to which it is a party which would materially affect the rights or obligations of IBRD under the Guarantee; and<br>(h) pay IBRD's External Costs (if such costs are not to be paid by India). |

[88] "Sanctionable Practices" include corrupt, fraudulent, collusive, coercive, or obstructive practices, as defined in IBRD's Anti-Corruption Guidelines.

| Additional Terms and Documentation | |
|---|---|
| **Fiscal Agent:** | To be identified (the Fiscal Agent). |
| **Lead Managers:** | Commercial and/or investment banks to be identified (the Lead Managers). |
| **Distribution:** | [To be determined] |
| **Listing:** | [To be determined] |
| **Form and Settlement:** | [To be determined] |
| **Selling Restrictions:** | [To be determined] |
| **Roadshows** | Representatives of IBRD, including its legal counsel, would attend all roadshows or investor presentations relating to the Financing. |
| **IBRD-Guaranteed Fiscal Agency Agreement** | |
| **Guaranteed Fiscal Agency Agreement:** | Agreement among the Issuer, Fiscal Agent and IBRD as Guarantor setting out terms and conditions of the Financing, mechanism for payment on the Financing, and containing the terms and conditions of the notes and the Guarantee. |
| **Agency mechanics:** | [The Fiscal Agent may make a demand on IBRD for payment under the Guarantee if, [ ] Business Days prior to the scheduled payment date of a guaranteed payment on the Financing, the Issuer has not transferred amounts sufficient to make such payment to the appropriate account of the Fiscal Agent. After receiving a duly completed Demand Notice, IBRD will make payment to the Fiscal Agent on behalf of the noteholders on or before the relevant due date for making the scheduled payment on the Notes.] |
| **Choice of law:** | [New York or England] |
| **Warranty Agreement** | |
| **Warranty Agreement** | IBRD would enter into a Warranty Agreement with the Lead Managers in order to make and receive certain representations and warranties about the information each set of parties provides to the other in that type of transaction, as well as to receive certain representations, warranties, and undertakings from the Lead Managers, including but not limited to a representation and warranty that the Lead Managers have not engaged in any Sanctionable Practice in connection with the Financing, and an undertaking by the Lead Managers not to engage in any Repackaging Arrangements and to inform purchasers of the Notes of IBRD's Restrictions on Repackaging Arrangements. |
| **Offering Document** | |
| **Offering Document** | Document describing the offering of the Notes and providing market-standard information for investors regarding the Notes, India, IBRD and the Guarantee. |
| **Purchase Agreement** | |
| **Purchase Agreement** | The Issuer would enter into a Purchase Agreement with the Lead Managers relating to the offer, initial purchase and distribution of the Notes. |
| **[Deed of Covenant]** | |
| **[Deed of Covenant]** | Depending on the legal regime and nature of the issuance, the Issuer would enter into a Deed of Covenant, pursuant to which it would constitute the Notes and grant the Noteholders certain rights. |
| **[Deed of Guarantee]** | |
| **[Deed of Guarantee]** | Depending on the legal regime and nature of the issuance, IBRD may enter into a Deed of Guarantee setting out the terms of the Guarantee for the benefit of the Noteholders. |

## Annex 11: Financial Analysis of EESL

1. ***The ramp up of the UJALA program has resulted in exponential growth for EESL.*** EESL's revenues grew from INR 711 million (US$10.9 million) in 2014-15 up to INR 12.3 billion (US$188 million) in 2016-17, a 1,630 percent increase in three years. EESL procures energy efficient appliances in bulk and sells them to consumers at a margin. EESL has been able to maintain a net margin of 4 percent in the past two fiscal years, proving that its business model is profitable.

2. ***Working capital has increased to high levels as a consequence of its growing operations***. As EESL expanded its operations, working capital grew with its revenues. In the past three fiscal years, the level of receivables has consistently been high, ranging from 244 to 293 days of revenues (and 26 percent of receivables as of end FY2016-17 is more than 90 days past due). While EESL eventually collects what it is owed, it must finance its operations in the meantime, and given a marginal cost of rupee financing of 9 – 10 percent per year (cost of EESL's credit lines), this payment delay is costly for EESL at a corporate level. While the Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) of EESL grew from INR 800 million to INR 1,987 million from 2015-16 to 2016-17, or a INR 1,187 million increase, its working capital increased over the same period by INR 1,287 million, more than erasing any increase in operating margin.

3. ***Capital expenditures have increased four-fold in the past three years.*** EESL finances projects where it makes the capital investment and then generating a return on the investment (through long-term annuity contracts) through a combination of debt and equity, capitalize them on its balance sheet and then depreciates them over a period consistent with the signed annuity contracts. As the volume of these contracts has increased in the past three years, so has the amount spent on capital expenditures, from INR 1,582 million in 2014-15 to INR 6,033 million in 2016-17, a 281 percent increase. Since the Cash Flow from Operations was barely positive in 2014-15 and 2016-17 and negative in 2015-16, these capital expenditures have to be financed by new debt and new equity.

4. ***EESL has historically financed its growth with equity from promoters, domestic bonds and loans from DFIs.*** To date, EESL relies on different sources of financing, including:

(i) equity capital by its four promoters (INR 4.62 billion or US$71 million),

(ii) INR 5 billion (US$76.9 million) proceeds from the three domestic secured bonds it issued in September 2016 at 8.07 percent,[89] and an additional INR 4.5 billion (US$69.2 million) proceeds from an unsecured domestic bond issued in July 2017 at 7.8 percent

(iii) loans from multilateral and bilateral donors (two loans totaling EUR 250 million from KfW[90]; a EUR 50 million from AfD; a US$200 million loan from ADB)[91]and

(iv) one-year lines of credit from commercial banks to finance its working capital.

[89] Business Standard (2016, September). "EESL issues domestic bonds worth Rs 500 crore". http://www.business-standard.com/article/companies/eesl-issues-domestic-bonds-worth-rs-500-crore-116092000933_1.html

[90] Live Mint (2017, March). EESL signs €200 million loan deal with Germany's KfW Development Bank" http://www.livemint.com/Industry/HGvmfGBkeiKYnC8x49wcJK/EESL-signs-200-million-loan-deal-with-Germanys-KfW-Develop.html

[91] Asian Development Bank (2017, March). "ADB, India sign $200 million loan to finance energy-efficient streets, homes". https://www.adb.org/news/adb-india-sign-200-million-loan-finance-energy-efficient-lights-streets-homes

## Table 11.1: EESL Income Statement – Actuals and Forecast[92]

| *INR Million*<br>***Income Statement*** | **Audited**<br>**3/31/2015** | **Audited**<br>**3/31/2016** | **Audited**<br>**3/31/2017** | **Forecast**<br>**3/31/2018** | **Forecast**<br>**3/31/2019** | **Forecast**<br>**3/31/2020** | **Forecast**<br>**3/31/2021** | **Forecast**<br>**3/31/2022** |
|---|---|---|---|---|---|---|---|---|
| **Total Revenues** | **711** | **8,031** | **12,272** | **16,514** | **37,102** | **62,768** | **83,858** | **104,542** |
| *YoY growth* | | *+1029%* | *+53%* | *+35%* | *+125%* | *+69%* | *+34%* | *+25%* |
| COGS | (388) | (6,667) | (9,269) | (7,968) | (11,148) | (9,437) | (5,326) | (2,668) |
| Maintenance costs | - | (16) | - | (930) | (3,753) | (8,222) | (12,637) | (17,121) |
| Employee benefits | (71) | (128) | (209) | (315) | (525) | (770) | (1,050) | (1,260) |
| Other expenses | (48) | (420) | (807) | (1,572) | (3,896) | (4,900) | (3,341) | (3,461) |
| **EBITDA** | **204** | **800** | **1,987** | **5,729** | **17,779** | **39,439** | **61,504** | **80,031** |
| *Margin* | *29%* | *10%* | *16%* | *35%* | *48%* | *63%* | *73%* | *77%* |
| Depreciation & Amortization | (60) | (176) | (554) | (3,388) | (10,335) | (21,513) | (31,750) | (40,250) |
| **EBIT** | **144** | **625** | **1,432** | **2,341** | **7,444** | **17,926** | **29,755** | **39,781** |
| *Margin* | *20%* | *8%* | *12%* | *14%* | *20%* | *29%* | *35%* | *38%* |
| Interest expense | (5) | (139) | (616) | (754) | (1,407) | (4,940) | (9,404) | (11,763) |
| **Profit Before Tax** | **140** | **486** | **817** | **1,587** | **6,038** | **12,986** | **20,351** | **28,017** |
| *Margin* | *20%* | *6%* | *7%* | *10%* | *16%* | *21%* | *24%* | *27%* |
| Corporate tax | (45) | (131) | (298) | (549) | (2,090) | (4,495) | (7,044) | (9,697) |
| **Net Income** | **95** | **355** | **519** | **1,038** | **3,948** | **8,492** | **13,308** | **18,321** |
| *Margin* | *13%* | *4%* | *4%* | *6%* | *11%* | *14%* | *16%* | *18%* |

## Table 11.2: EESL Cash Flow Statement – Actuals and Forecast

| *INR Million*<br>***Cash Flow Statement*** | **Audited**<br>**3/31/2015** | **Audited**<br>**3/31/2016** | **Audited**<br>**3/31/2017** | **Forecast**<br>**3/31/2018** | **Forecast**<br>**3/31/2019** | **Forecast**<br>**3/31/2020** | **Forecast**<br>**3/31/2021** | **Forecast**<br>**3/31/2022** |
|---|---|---|---|---|---|---|---|---|
| EBITDA | 204 | 800 | 1,987 | 5,729 | 17,779 | 39,439 | 61,504 | 80,031 |
| Change in Working Capital | 632 | (4,184) | (1,287) | 2,690 | 4,241 | (2,338) | (10,927) | (3,299) |
| Corporate tax | (45) | (131) | (298) | (549) | (2,090) | (4,495) | (7,044) | (9,697) |
| **Cash Flow From Operations** | **791** | **(3,515)** | **402** | **7,869** | **19,931** | **32,606** | **43,534** | **67,034** |
| Capital Expenditures | (1,582) | (2,946) | (6,033) | (26,351) | (81,955) | (108,666) | (72,242) | (77,184) |
| **Cash Flow From Investing Activities** | **(1,582)** | **(2,946)** | **(6,033)** | **(26,351)** | **(81,955)** | **(108,666)** | **(72,242)** | **(77,184)** |
| New Borrowings | 878 | 4,985 | 5,900 | 14,803 | 50,356 | 66,311 | 35,781 | 27,767 |
| Debt repayment | - | - | - | - | (440) | (457) | (3,534) | (7,968) |
| Interest payment | (5) | (139) | (616) | (754) | (1,407) | (4,940) | (9,404) | (11,763) |
| Equity injections | 900 | 2,751 | 988 | 5,200 | 12,589 | 16,578 | 8,945 | 6,942 |
| Change in other long term liabilities | 29 | 298 | 220 | - | - | - | - | - |
| Dividend | - | (33) | (129) | (188) | (376) | (1,432) | (3,080) | (4,827) |
| **Cash Flow From Financing Activities** | **1,802** | **7,862** | **6,363** | **19,061** | **60,722** | **76,060** | **28,708** | **10,149** |
| **Change in Cash** | **1,012** | **1,401** | **731** | **579** | **(1,302)** | **-** | **-** | **-** |

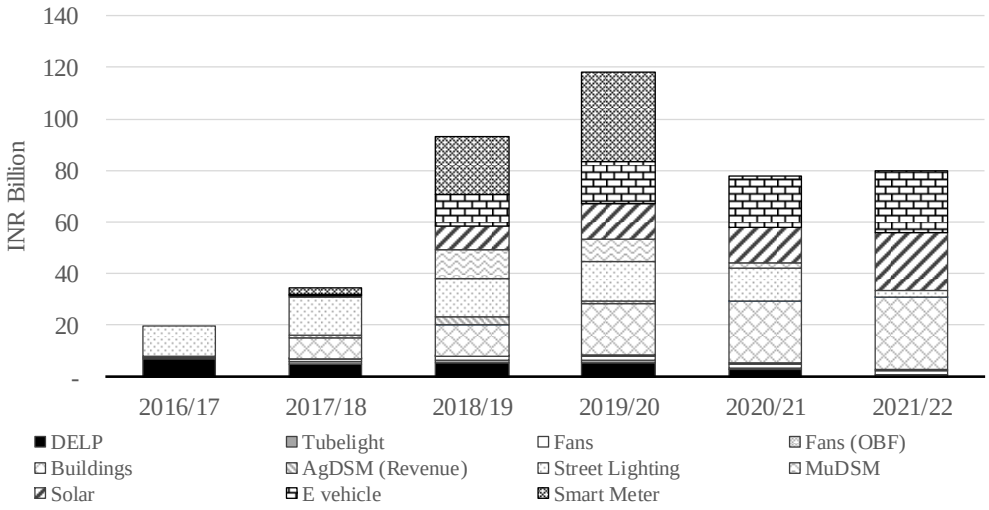
[92] YoY: Year over Year; COGS: Cost of Goods Sold; EBIT: Earnings Before Interest and Taxes.

**Table 11.3: EESL Balance Sheet – Actuals and Forecast**

| *INR Million* | Audited | Audited | Audited | Forecast | Forecast | Forecast | Forecast | Forecast |
|---|---|---|---|---|---|---|---|---|
| ***Balance Sheet*** | **3/31/2015** | **3/31/2016** | **3/31/2017** | **3/31/2018** | **3/31/2019** | **3/31/2020** | **3/31/2021** | **3/31/2022** |
| Fixed assets | 1,522 | 4,292 | 9,771 | 32,734 | 104,354 | 191,508 | 232,000 | 268,934 |
| Receivables | 538 | 5,379 | 9,837 | 6,512 | 12,966 | 19,770 | 24,439 | 28,518 |
| Inventory | - | 1,889 | 1,546 | 4,154 | 9,974 | 12,568 | 7,098 | 6,863 |
| Other current assets | 7 | 546 | 1,387 | 1,387 | 1,387 | 1,387 | 1,387 | 1,387 |
| Cash | 1,091 | 2,492 | 3,223 | 3,802 | 2,500 | 2,500 | 2,500 | 2,500 |
| **Total Assets** | **3,159** | **14,599** | **25,766** | **48,590** | **131,182** | **227,732** | **267,425** | **308,202** |
| Paid-in capital | 900 | 3,630 | 4,620 | 9,820 | 22,409 | 38,987 | 47,932 | 54,874 |
| Change in FX | - | - | - | (131) | (516) | (1,147) | (2,162) | (3,202) |
| Reserves and Surplus | 203 | 546 | 933 | 1,783 | 5,355 | 12,414 | 22,641 | 36,134 |
| **Total shareholders' equity** | **1,103** | **4,176** | **5,553** | **11,472** | **27,248** | **50,254** | **68,412** | **87,806** |
| Long-term borrowings | 878 | 3,012 | 8,262 | 23,196 | 73,496 | 139,982 | 173,243 | 194,083 |
| Other long-term liabilitiles | 29 | 327 | 547 | 547 | 547 | 547 | 547 | 547 |
| Short-term borrowings | - | 2,850 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 |
| Other financial liabilities | - | 596 | 1,721 | - | - | - | - | - |
| Payables & other current liabilities | 1,148 | 3,637 | 6,181 | 9,874 | 26,390 | 33,449 | 21,722 | 22,266 |
| **Total shareholders' equity & liabilities** | **3,159** | **14,599** | **25,766** | **48,590** | **131,182** | **227,732** | **267,425** | **308,202** |

5. ***Increasingly larger volumes of financing required by growing and more capital intensive operations.*** EESL's project costs are expected to increase from INR 20 billion in FY 2016/17 up to INR 120 billion in FY 2019/20, or 500 percent increase during this three-year period. Figure 11.1 below illustrates the expected growth.

**Figure 11.1: Annual Cost Forecast by Business Areas[93]**

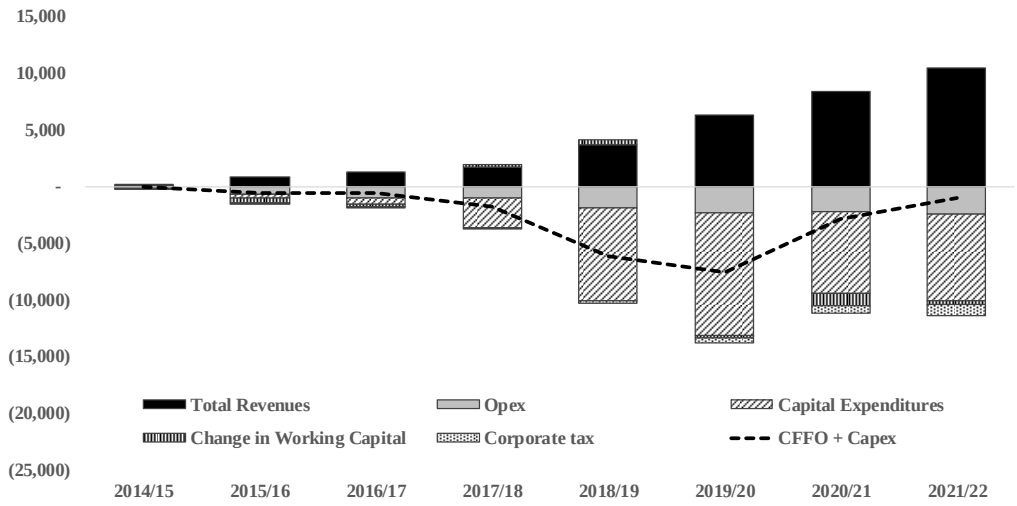



6. ***Increase in revenue will not be sufficient to cover the increase in project costs.*** The new business lines are expected to be profitable but are also expected to dramatically increase the volumes of financing that EESL will need in the early years of deployment as there is a mismatch between the time of capital

[93] DELP: Domestic Efficient Lighting Program; MuDSM: Municipal Demand Side Management; E vehicle: Electric vehicle

investment and revenue generation (through annuities over several years). Revenues generated by EESL's activities are expected to increase from INR 12 billion in FY 2016/17 up to INR 104 billion in FY 2021/22, a 750 percent increase over the five-year period. This is a rather ambitious assumption (and to a large extent fuels projected net profit growth). This large expected increase in revenue is however not expected to cover the rise in projects costs (both operating costs and capital expenditures) over the same period, resulting in negative cash flows before financing. As EESL is anticipating to invest significantly in electric vehicles and smart meters for state electricity distribution companies in the next three years, the financing requirements are expected to peak in 2019/20 at around US$1.2 billion before decreasing, as revenues from annuity contracts from these business lines start generating positive cash flows.

**Figure 11.2: EESL Revenues and Costs Forecast Before Financing[94]**

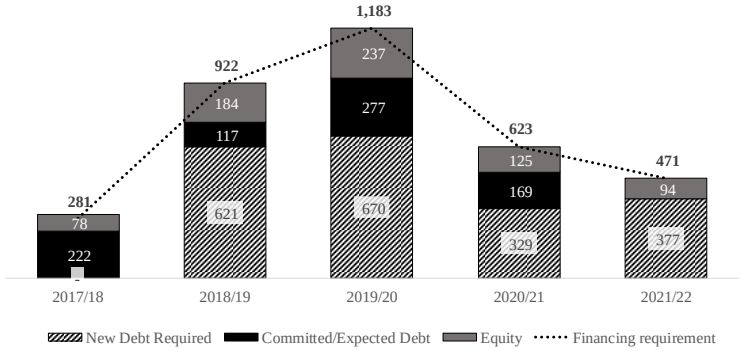



7. ***EESL is expected to require significant volumes of financing for the growth of its operations, both expansion into new business areas and international operations***.[95] Estimated financing needs, based on current projections, average US$800 million per annum over the next five years depending on which of the nascent plans for new businesses materialize and achieve scale-up. Figure 11.3 provides a snapshot of projected net financing requirements for EESL, based on current plans. The financial projections assume that the promoters will keep providing 20 percent of the financing requirements to maintain a maximum 80:20 debt-to-equity ratio. The loans that are currently being discussed or negotiated with IBRD and other DFIs have also been included as "Committed/Expected Debt". The rest of the financing will most likely have to be raised by EESL either in the domestic bond market or in the international commercial loan and bond market.

[94] CFFO: Cash Flow From Operations; Capex: Capital expenditure; Opex: Operational expenditure

[95] EESL recently announced the procurement of Smart Meters for a total of US$210 million and of 10,000 Electric Vehicles for US$170 million.

**Figure 11.3: Net financing requirements (in US$ million)**




***Risk Analysis***

8. ***Newer business models with changing contractual approach, risk profiles and financing needs.*** Historically, the upfront financing needs of the UJALA program could be met with relatively short-term working capital financing from local commercial banks, or through growth of its payables (i.e., unfunded cash management). On the other hand, the new business areas will shift towards longer term annuity contracts where EESL makes the full investment upfront and recovers the cost of investments, operation, maintenance, and financing[96] over annuity contracts with five to seven years' duration. According to EESL's investment projections, the SLNP program and other annuity-based models, such as BEEP, solar, and AgDSM programs, are expected to scale up significantly in the coming years.

9. ***Financial viability and sustainability for individual business lines and EESL as an institution.*** This section highlights several factors that are important for ensuring the financial viability and sustainability of EESL's current and future businesses, and potential areas for improving program design, financial planning, resource mobilization and institutional strengthening. The factors highlighted range from those that are more immediate and relevant for current businesses, to those relevant for the longer term. Financial performance ratios are expected to be under pressure for the foreseeable future. The Net Debt to EBITDA ratio is expected to be 4.3x at the end of FY 2017/18 and remain in the same range for the next three years as EESL will have to borrow large amounts to finance its growth. EESL will have to closely monitor its financial performance as any deterioration of these ratios may hamper EESL's ability to borrow commercially at reasonable terms in the future.

10. ***Critical assessment of working capital needs and associated financing requirements.*** The comprehensive financial analysis undertaken as part of Program preparation reveals that in several annuity-based contracts, EESL is paid with a delay (on average, 293 days of receivables at the end of FY2016/17). This implies additional working capital needs to address the delayed payments. Moreover, the financial analysis indicates that, under the newer annuity-based businesses EESL is not expected to generate positive cash flows in the early years of implementation. While this is reasonable and consistent with the experience of any rapidly growing business, EESL must plan to raise large amounts of financing to cover the negative cash flows in the early years of scale up. The marginal cost of financing for EESL can be derived from its short-term local currency credit lines, which currently stand at 9.1 – 12.5 percent. However, when pricing a new annuity scheme across the various business lines, EESL does not appear to fully factor in the cost of additional working capital cost in its calculation of the tariffs/prices charged to the customers. EESL's

[96] In the currently used financial model, the cost of financing built into the annuity includes the average cost of debt (set at 10%) as well as a fixed return on equity (set at 15% after tax, in line with regulated power PSUs).

approach is to cover these estimated working capital requirements through corporate cash flow or general working lines. While practical, this approach underestimates the full cost, reduces the return on equity and puts some pressure on its balance sheet. EESL can therefore consider taking into account the cost of its working capital in the calculation of the annuity schemes going forward.

11. ***Strengthening of EESL institutional capabilities on finance*.** EESL currently does not have the in-house capacity and expertise to manage the multiple bond issuances and the IPO under consideration. Internal financial planning capacity remains constrained, as EESL has several key vacancies including the director-finance. It is important for EESL to build in house capacity supplemented with qualified external advisors. EESL has selected a new Director (Finance) responsible to manage all aspects of EESL's finances and long-term capital raising plan. The Director (Finance) will have a role on EESL's board of directors and guide the senior management team.[97]

12. ***Recognizing different risk profiles of newer business lines that are not core EE activities*.** At present, EESL does not have any experience with solar generation, which is one of the approaches that will be piloted under AgDSM. While not complex, EESL could benefit from a partnership with solar energy companies to facilitate risk sharing (e.g., on construction, commissioning interface with Discom and project implementation) and knowledge transfer over the first projects/years. With the need for relatively longer-term financing, it may also make sense to develop these business lines off balance sheet where assets could be ring-fenced and pledged to lenders in a long-term project finance structure (as opposed to corporate finance). A Special-Purpose Vehicle (SPV) structure could facilitate more effective financing, including clearly determining the return on equity, and allow for different partnerships through shareholding for each SPV. This will provide more flexibility and retain "core" energy efficiency operations on EESL's balance sheet.

13. ***Importance of a new risk management framework that recognize increasing financial risks.*** Going forward, it will be important for EESL to ensure that the maturity of the financing raised matches the investment horizon and repayment profiles of the annuity contracts. This will be particularly challenging for the solar schemes under AgDSM. If these solar schemes are designed as 25-year power purchase agreement (PPA) or annuity schemes, there will be a significant departure from EESL's current annuity based ESCO contracts, with durations of between seven to ten years. New programs such as the upfront financing and leasing smart meters and electric vehicles also involve different types of risks than EESL has encountered. These longer-term annuities introduce a substantially greater financial risk, which would be subject to similar risks faced by solar power developers, as EESL would be effectively selling electricity to Discoms, and being exposed to Discom generally weak balance sheets and repayment risks. Many solar developers insist on various forms of primary and secondary payment security, which are codified in their PPAs. As EESL will be taking similar levels of risks, it is strongly recommended that EESL considers suitable risk mitigation measures.

14. **Need to develop a long-term resource mobilization plan.** Going forward, existing sources of finance will continue to be tapped[98] but will likely be insufficient to maintain EESL's growth and momentum in view of ambitious targets and estimated financing needs to support new business areas within India and potentially its international operations. Given the significant capital expenditures planned, and changing risk profile of emerging business lines, EESL will need to diversify its sources of financing (both debt and equity) as loans from bilateral agencies, multilateral development banks, the domestic debt market, and modest amounts of equity infusions are unlikely to be able to meet all of EESL's large financing needs.

[97] In the interim, EESL has sought World Bank assistance to develop Terms of Reference for a team of financial advisors who can guide and assist them on revising their long-term capital mobilization plan (inclusive of both debt and equity, including a prospective IPO).

[98] In addition to the proposed IBRD loan, ADB and KfW are currently considering additional loans of US$200 million and EUR 200 million, respectively, to help EESL meet its financing requirements for the next few years. EESL also plans to carry out an Initial Public Offering (IPO) and access international capital markets to raise the financing it needs to support its operation.

Increasing foreign currency borrowing will also increase EESL's exposure to foreign currency risks (which need to be at least partially hedged). Gaining access to different capital markets will allow EESL to diversify its lender base and will avoid saturating the domestic market (or being captured to fluctuating rates).

15. **Careful planning on approaches for accessing offshore capital markets.** EESL currently does not have access to external capital markets. EESL does not have an international credit rating, is currently not yet deemed a "mature" entity by potential financiers, and is unlikely to be considered investment grade at this point in time. Recognizing the need to diversify sources of financing, EESL is interested in exploring ways of accessing offshore capital market, to supplement the domestic capital markets, which would still continue to be the bulk of financing. Options for offshore financing that can provide EESL access to different types of investors and instruments, include foreign currency "green" bonds; syndicated commercial loans, various sources of debt and equity and structured finance solutions (e.g., IBRD carbon-linked bond, asset-backed security type green bonds). In this context, EESL may benefit from credit enhancement to access the overseas bond and loan markets. The provision of an IBRD credit enhancement can help EESL secure a credit rating that would allow EESL to access offshore commercial markets and new investors. As offshore financing is being pursued, an important step will be to develop a foreign exchange hedging policy (currently under development).