



ENERGY EFFICIENCY SERVICES LIMITED
A JV of PSUs under the Ministry of Power

India's experience in promoting Innovations for EE Technologies, Finance and Business Models

Deep Dive Workshop

5th June 2018

ACEF 2018

India's commitment to Energy Efficiency & Renewable Energy

- **National Mission (NMEEE)** created by Govt. of India (GoI) in 2008 under the Prime Minister's **National Action Plan for Climate Change**
- **NMEEE** envisaged total avoided capacity addition of **19598 MW** and GHG emissions reduction of **98.5 Million Tonnes** per year
- **Under CoP 21** of 2015, India aims to reduce its **carbon emission intensity** by **33-35%** from what it was in 2005, by 2030
- India aims to produce **40% of the total electricity** from sources other than fossil fuels by 2030
- **EESL** is partnering **GEF** to put together composite funding of **USD 454 Million** including a **USD 200 Million loan from ADB** for its various EE Projects under the **NMEEE Umbrella**

About EESL

- Energy Efficiency Services Limited (EESL) is a joint venture company of four Public Sector Enterprises of Ministry of Power, Govt. of India

SAVE ENERGY SAVE ENVIRONMENT

Project Underway 10 states in India

...P programme has recently
...n started in Chhattisgarh,
...ar, Odhisha, Madhya Pradesh,
...nataka and Jharkhand.

- Established in the year 2009

- A Super ESCO that seeks to unlock energy efficiency market in India, estimated to be at 12 billion US \$ (INR 74,000 Crore), by way of innovative business and implementation models

- NTPC Limited (India's Largest Power Generating Company) Share Capital : 31.71%

- Rural Electrification Corporation Limited (Leading Infrastructure Finance Company) Share Capital : 31.71%

- Power Finance Corporation Limited (Leading Non-Banking Financial Corporation) Share Capital : 31.71%

- Power Grid Corporation of India Limited (India's Largest Power Transmission Company) Share Capital : 4.87%



Project scale
189 Cities by 2019



Number of bulbs
to be replaced
77 crore



Annual Energy Savings
105 billion kWh

Business Model in Emerging World

- **Business Models** in the emerging world need to be **innovative, scalable, embrace technology, learn to survive without public funds, incentivise all stakeholders and deliver outcomes** in a **time bound** manner
- The **Business case** has to be **simple** and **easy to comprehend** by all
- **Transaction cost of joining is low** – easy to aggregate demand
- **Compelling rationality** and transparency – enable fast adoption – **effective communication**
- **Value for money** for all stakeholders is essential
- **Standardization** of technology, services and
- **Turnkey implementation** - to seamlessly integrate all the elements

EESL – Realizing the Vision of New World

- Pay As You Save (**PAYS**) business model
- **No upfront investment- Re-payment *from* savings – performance guaranteed *and* failures warranted**
- **Barriers of high first cost *and* comparative end use overcome**
- **Flexible business model** in terms of performance period and accountability
- **Encouraging** all sections of the **value chain** including **social, economic** and **environment**

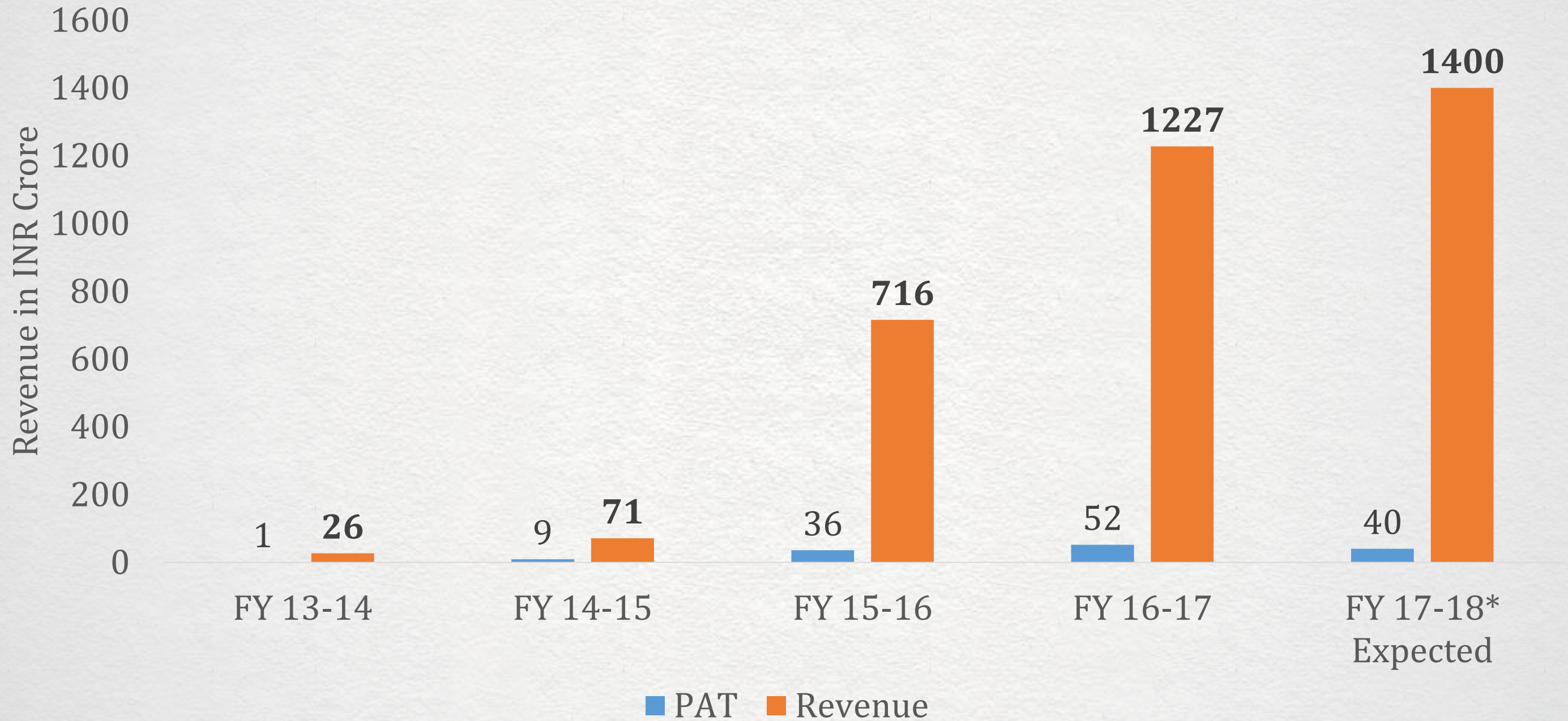
EESL's Business Model

- Take the upfront **risk of investment and performance** for end consumers/users
- EESL funding of investment through Debt:Equity of 80:20 – Debt interest rate at actuals subject to maximum of 9.5%. Equity return at 14% (post tax)
- **Assure** end users of Pay As You Save (**PAYS**)
- **Innovative** risk allocation of **procurement, installation, service and maintenance**
- **Aggregate demand** by including **incentives** for all stakeholders
- Putting out **large procurements to leverage economies to scale**
- Passing on the benefits to end users for more demand aggregation– **virtuous cycle**

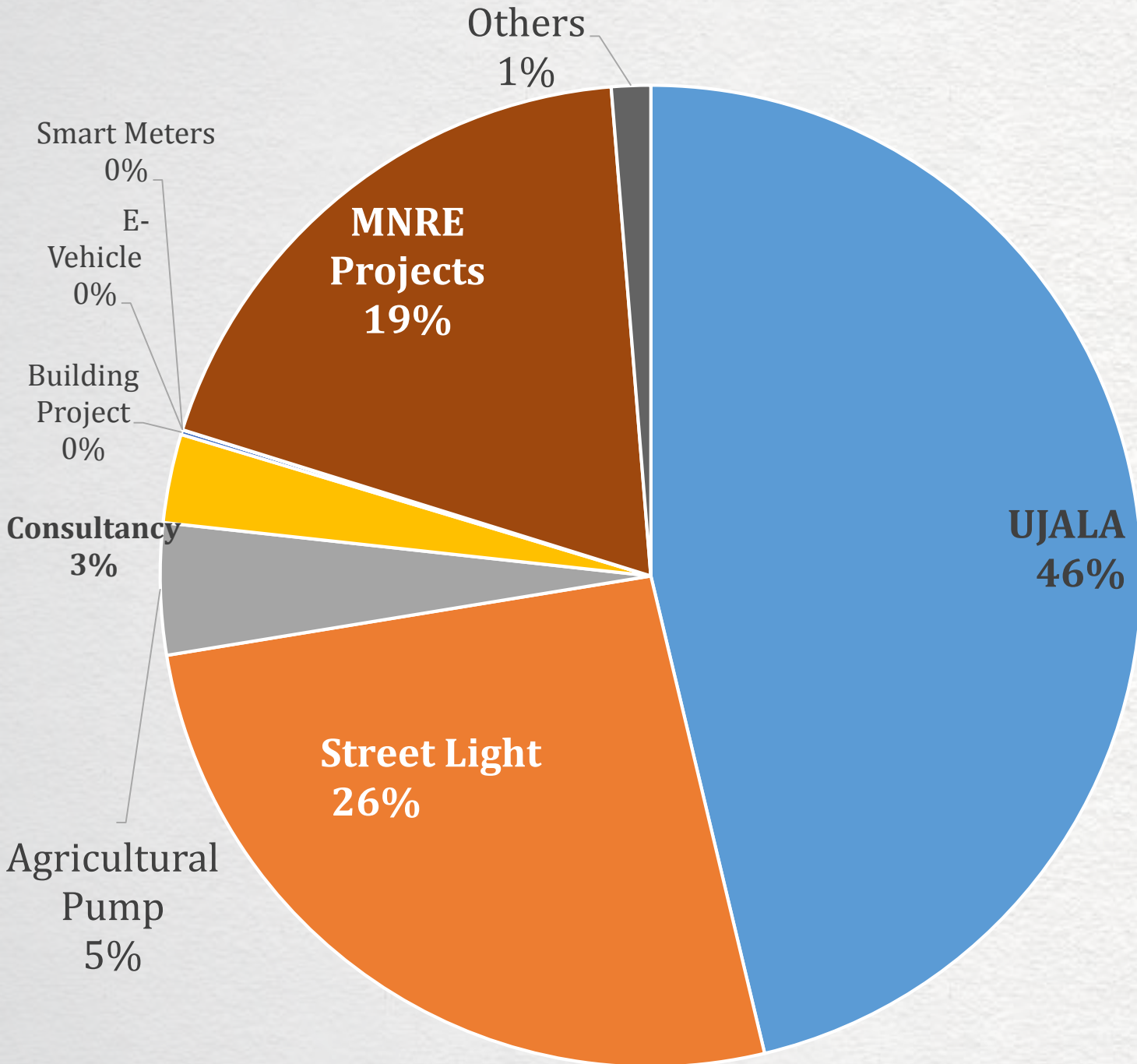
The Three Pillar that defines us



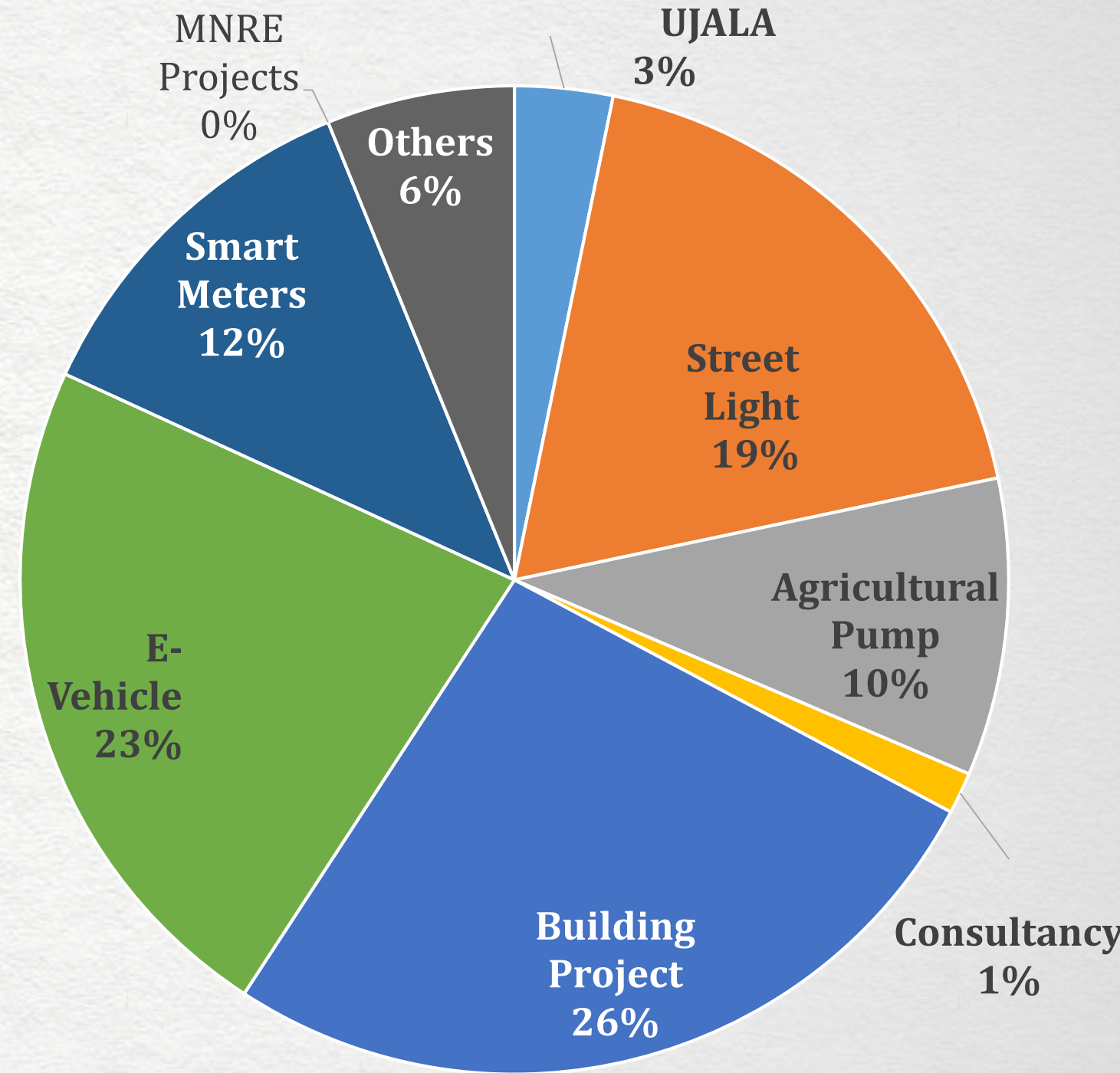
EESL – Revenue and PAT



Revenue Contribution Program wise

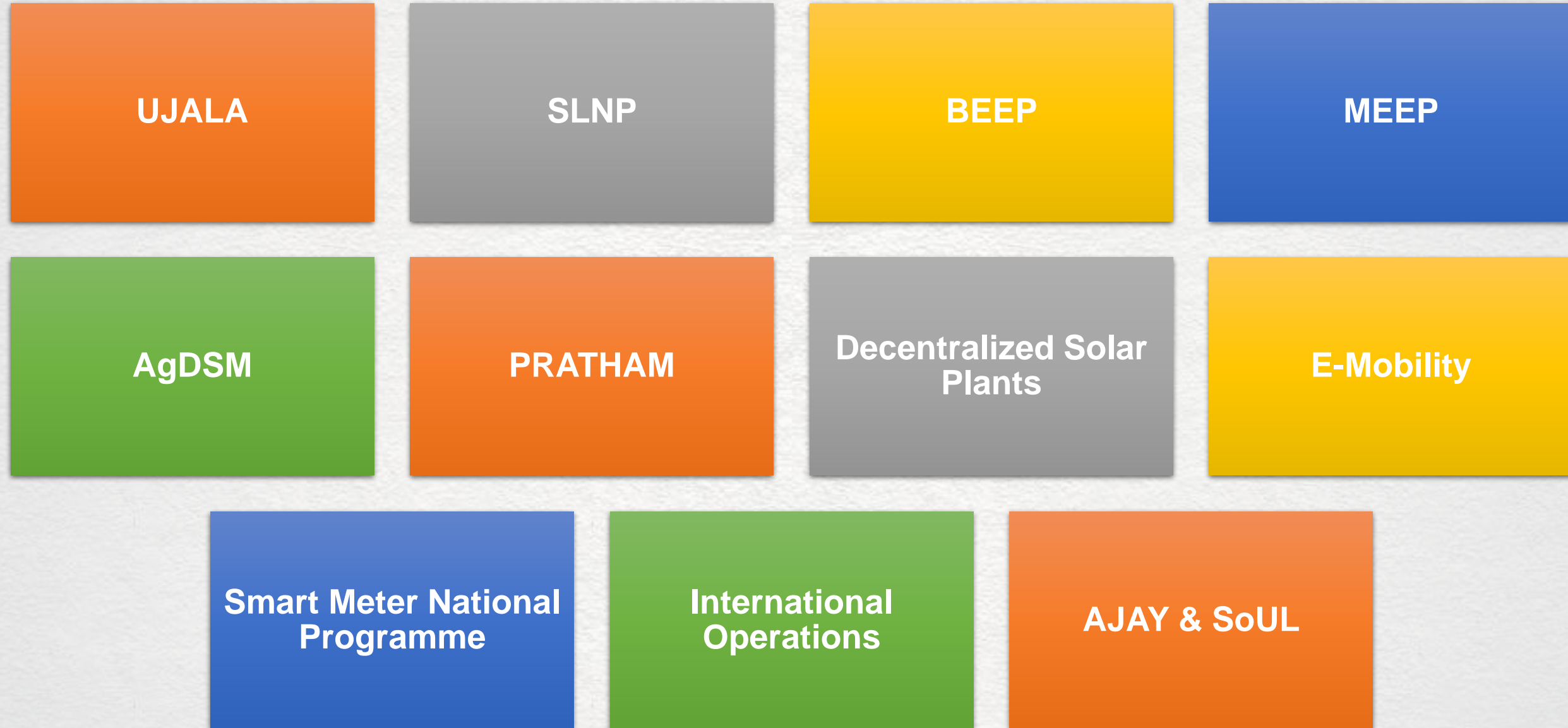


Provisional Revenue Breakup in FY 2017-18



Projected Revenue Breakup in FY 2021-22

EESL Initiatives



National LED Lighting Programme



PM launches: Scheme for LED bulb distribution under Domestic Efficient Lighting Programme in Delhi

Programme has 2 components

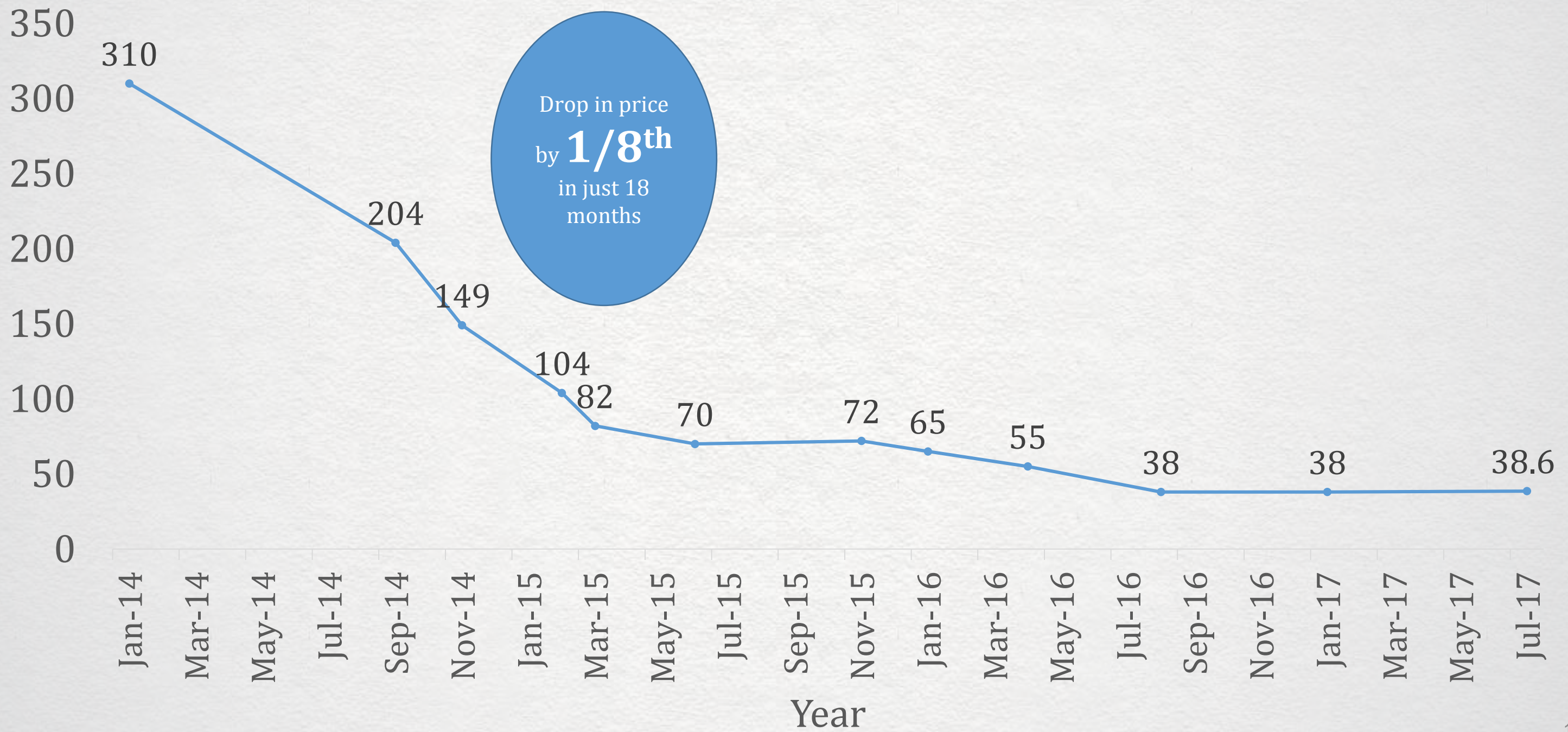
- **UNNAT JYOTI BY AFFORDABLE LEDs FOR ALL (UJALA)** - Conversion of conventional domestic lights with LED bulbs
- **STREET LIGHTING NATIONAL PROGRAMME (SLNP)** - Conversion of conventional street lights with LED street lights

UJALA

- Hon'ble Prime Minister, on **5th January 2015** launched the National UJALA programme which aims to provide LED bulbs to domestic consumers with a target to replace **77 Crore incandescent bulbs** with LED bulbs by March 2019
- As on 25th May 18, EESL has distributed over **300 Million** LEDs bulbs since the launch of the program resulting in annual estimated energy savings of over **39 billion kWh per year** with avoided peak demand of over **7,815 MW**
- UJALA program is largest non-subsidy based LED lighting programme in the world
- The information about the programme is disseminated through a website **www.ujala.gov.in** which monitors the real time progress of the UJALA scheme
- Under UJALA, EESL has distributed over **6.4 Million LED tube lights** resulting in estimated energy savings of over **281 million kWh per year** with avoided peak demand of **129 MW**
- Under UJALA, EESL has distributed over **1.9 Million energy efficient fans** resulting in estimated energy savings of over **270 million kWh per year** with avoided peak demand of **48 MW**

Demand Aggregation – Economics of Scale

Price Per Bulb(in Rs.)



Street Light National Programme (SLNP)

- Hon'ble Prime Minister, on **5th January 2015** launched the SLNP with a target to replace **13.4 Million** conventional Street Lights in Municipal Bodies with smart and energy efficient LED street lights by March 2019.
- As on 25th May 18, EESL has installed over **5.9 Million LED street lights** resulting in estimated energy savings of **1.59 billion kWh per year** with avoided peak demand of **397 MW**
- EESL has enrolled **941 ULBs** and work is completed in **506 Urban Local Bodies**
- EESL replaces the conventional street lights with LEDs at its own costs (without any need for municipalities to invest) and the consequent reduction in energy and maintenance cost of the municipality is used to repay EESL over a period.
- The contracts that EESL enters into with municipalities are typically of **7 years duration** where it not only guarantees a minimum energy saving (of-typically 50%) but also provides free replacements and maintenance of lights at no additional cost to the municipality.

EESL – ADB Partnership to deliver next phase of SLNP

- EESL and ADB agreed in May 2017 for funding of EESL's next phase of investments in the SLNP where **USD 110 Million** funding is being provided by ADB for implementation of the **world's largest 2 Million LED Street lights project** across cities in India.
- The project has already crossed its first milestone of **500,000 LED street lights** installation
- EESL aims to partner ADB further in other projects under SLNP, UJALA, Tri-generation, Smart Meters etc.
- Under GEF-6, EESL is already partnering ADB for carrying out PoC projects in new business verticals

Building Energy Efficiency Programme

- GoI mandate to implement this programme in all central Government buildings
- Agreement signed for implementation of Energy efficiency measures in over 5000 buildings belonging to Central / State Governments as well as private sectors
- As on 25th May 18, EESL has completed **3723 buildings**, which has led to cost savings of about **USD 13 Million** with reduction of over 69,000 tonnes CO₂ and avoided peak demand of over **19.2 MW**
- EESL has target of 5,000 buildings in FY 2018 – 19 on implementation of Energy efficiency measures
- EESL has launched “National Building Dashboard” **<http://www.eeslbeep.com>**, which provides information of real time/deemed energy savings after EESL intervention of energy efficiency measures in all buildings on pan India basis

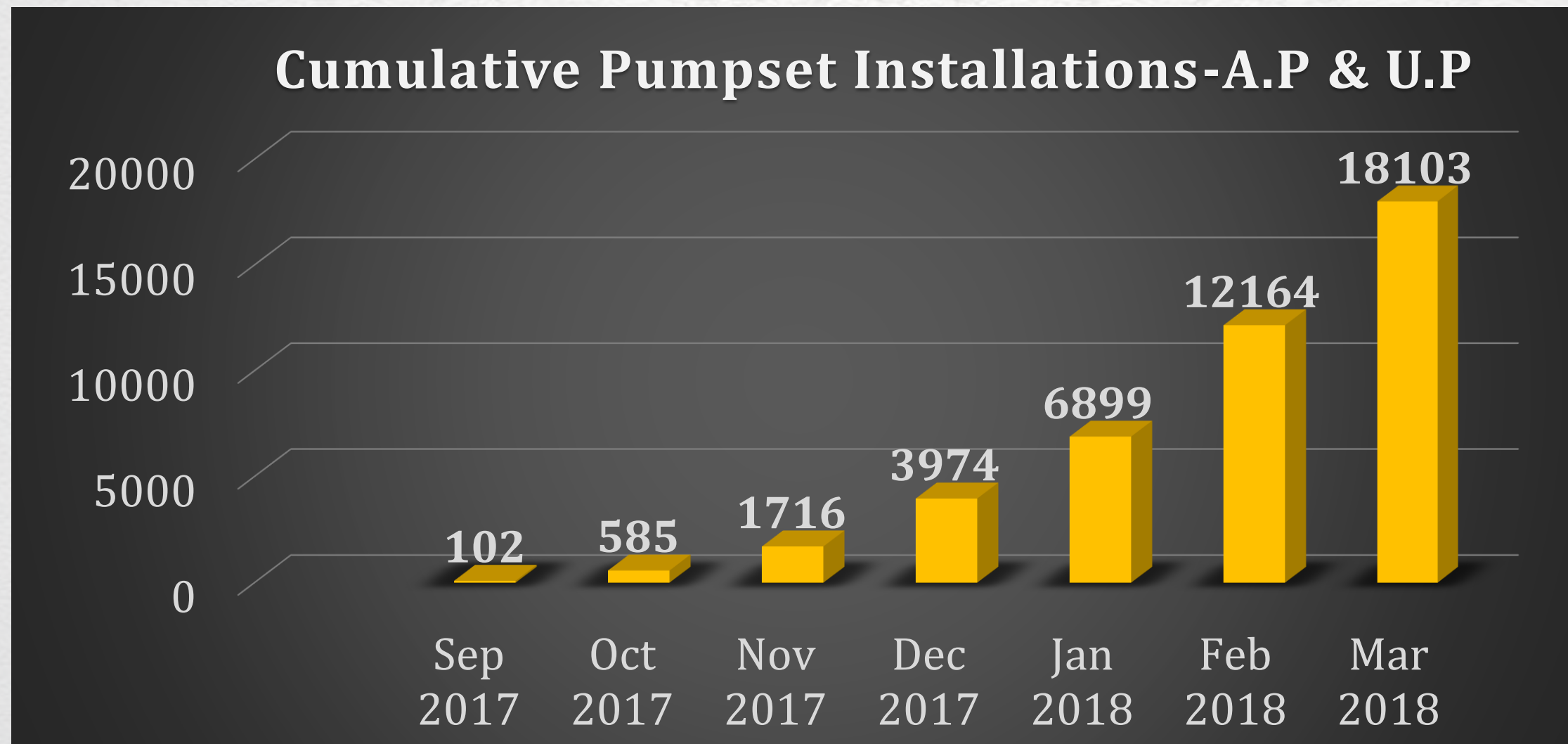
Municipal Energy Efficiency Programme

The Ministry of Urban Development signed MoU with Energy Efficiency Services Limited on 28th September 2016 to improve energy use efficiency in bulk water supply, public lighting, transportation and domestic consumption in cities and towns across the country.

Item	Actual (2016-17)	Target (2017-18)	Achievement in FY 18
No of AMRUT Cities enrolled	211	289	170 (other Cities are implementing the project on their own)
No of City Audits has started	53	447	177 (Inventories of other enrolled Cities are still awaited from ULB's)
No of Cities where IGEA Reports are submitted to ULB	NA	500	156

Agriculture Demand Side Management (AgDSM)

- EESL is implementing AgDSM Program using upscaling methodology for replacing farmer's inefficient pump sets with new BEE 5 Star rated Pump sets in the State of Andhra Pradesh, India.



Total Pump Sets Installed (FY 2017-18)
18,103 Nos

Energy Saved in Million Units (MU)
47 MUs

PRATHAM (National Motor Programme)

- EESL aims to replace 1,20,000 energy inefficient motors with energy efficient IE3 motors from 1.1 kW to 22 kW range
- Varanasi, Surat, Bhiwandi, Ichlakarnji, Erode clusters identified to replace in-efficient electric motors with IE-3 motors on Pay- as -you- save (PAYs) model
- Potential of about 1.3 million Power Looms – Estimated Energy Saving of 565 MU of electricity per year (32.60 million USD) – Investment of about 59.98 million USD– Simple Payback Period of 22 months
- EESL has set the target of 0.325 million IE3 motors to be replaced by 2020 in Textile Power Looms under SAATHI program – Investment to the tune of 15.38 million USD
- Targeting 1 million IE3 motors to be replaced by 2020 – Investment to the tune of 246 million USD – Going beyond 22 kW in subsequent bidding

Decentralized Solar Plants

- Decentralized solar plants of 0.5 MW to 2 MW capacity on surplus land of rural substations – to feed agriculture consumers directly
- PPA approved with MSEDCL at INR 3 per unit for 25 years for 200 MW under phase-1.
- Work has commenced in approx. 200 rural substations and expected to be completed by Oct 2018
- Reduces the line losses of DISCOMs, reduces subsidy burden
- EESL has signed a MoU with New Delhi Municipal Council (NDMC) for implementation of Solar PV based projects in buildings including embassies, schools, hospitals etc.
- Tariff offered by EESL is more than 50 % cheaper than the prevailing commercial tariff in the NDMC area.

E-Mobility

- Successful tender completed for procurement of 10,000 e-cars
- MoU for 10,000 e-cars and 4,000 chargers signed with AP State Govt in Feb 2018
- The **National E-Mobility Program** was launched on 7th March 2018 by Hon'ble Minister of Power, New and Renewable Energy
- More than 100 AC and 25 DC chargers already installed in key locations including MoP, MNRE, NTPC, NDMC, SDMC, NISE among others. Charger installation in other location within Delhi
- As on date, demand of e- vehicles from Central Governments and States is around 19,000 cars
- Planning and execution of program in key states including Andhra Pradesh, Gujarat, Maharashtra, Rajasthan, Madhya Pradesh, Telangana, Uttarakhand etc.

Smart Meter National Programme

- Procurement of **5 Million smart meters** and System Integrator completed
- Single phase smart meter at **INR 70 per meter per month** for 8 years
- Work has commenced in States of UP and Haryana since February, 2018
- Jharkhand, Gujarat, Bihar shown interest in the model
- Prepaid meters for UP – Procurement of 1 Crore meters under progress
- Tender for procurement of additional 50 Lakh smart meters and system integrator initiated on 5th March 18.
- Signed MoU for **1.7 Million Smart Meters** with both power distribution companies i.e. APEPDCL and APSPDCL in the Andhra Pradesh state on 24th Feb 2018
- EESL has signed **MoU with NDMC** on 13th April 2018 for implementation of Advanced Metering Infrastructure (AMI) and SCADA system for **80,000 customers**
- EESL has installed 100 smart meters as proof of concept at Varanasi and online demonstration made to Hon'ble MOSP, GoI.

International Operations - UK

- Investment of £55 million in acquisition of Combined Heat & Power (CHP) asset – Edina Power, leading CHP integrator in UK and Ireland
 - Revenue: £100m; 200+ Staff; 8 offices; 500+ installations
 - £208m of potential in CHP based ESCO market in UK
 - 11.5GW of potential in Tri-generation in India
- Acquisition worth £5.6 million of 7 Building Energy Efficiency Contracts. Revenues: £700 k per annum
- Investment of £1.5 million in a 58MW Battery Storage plant for Toronto Hydro – largest in North America
 - 12GW of potential in UK and 70GW in India by 2022

International Operations – Other Countries

- **SE Asia (Vietnam / Thailand)**
 - Feasibility study completed for EVN's National Program on DELP with UNEP assistance (\$46,000). Report Accepted by EVN
 - Study on EE in Thai Auto Parts Industry is under progress with GGGI assistance (125,000 \$)
 - Projects under discussion: DELP for 1.6 million bulbs in Vietnam with partial support from UNEP
- **SE Asia (Myanmar)**
 - Pilot projects on LED lighting (Domestic & Street) under financial assistance of MEA (\$1.2 million) including for parliament building submitted to Embassy of India, Yangon

International Operations – Other Countries

- **Saudi Arabia**

- EESL has signed MoU with National Energy Service Company of Saudi Arabia for providing Consultancy services.
- EESL is sharing technical knowledge and experience with NESCO (Tarshid) for rolling out LED Street Light projects in Saudi Arabia. First project of 35000 lights launched in Riyadh.

- **SE Asia (Malaysia)**

- EESL has signed an agreement with Green Growth Asia for supply of 3 Million LED bulbs in the state of Melaka in Malaysia (\$ 3.9m).
- Green Growth Asia is under the chairmanship of the Hon'ble Chief Minister of Melaka, Malaysia & is related to a sub regional group (IMT-GT, Indonesia, Malaysia, Thailand – Growth triangle) of ADB.
- EESL has commercially supplied 1200 No's, 20W LED Tube lights & 600 No's of 9W LED bulbs to the Indian High Commission in Malaysia in Dec 2017.

AJAY and Solar Study Lamp - Status

Atal Jyoti Yojana (AJAY):

- Installation of Solar Street Lighting Systems in the States where household Grid Power coverage is less than 50% as per 2011 census.
- Lighting up the roads, streets, bus stops, market places and intersections in remote areas/ villages that do not have adequate Street Lights.
- Over 1 Lakh Solar LED Street Lights commissioned in 5 States i.e. UP, Bihar, Jharkhand, Odisha and Assam

Solar Urja Study Lamp (SoUL) Programme :

- Over 11 lakh Solar Study Lamps distributed in 4 States i.e. UP, Bihar, Jharkhand, Assam
- It has covered 110 Blocks through 56 Assembly-cum-Distribution Centres
- Phase – II Procurement for 24 lakhs is under evaluation – LoA given in Jan 2018
- Total 70 lakhs SSLs to be distributed by December 2018



Thank You

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