

**STANDARDS OFFER PROGRAMME (SOP)**  
**DSM BASED EFFICIENT LIGHTING PROGRAMME (DELP)**  
**IN HOUSEHOLD SECTOR**  
**IN**  
**PUDUCHERRY**



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**Energy Efficiency Services Ltd., Government of India**

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## OBJECTIVE

1. To provide households upto 4 LEDs/CFLs as replacement of incandescent bulbs. This would reduce power consumption of households and their electricity bill, estimated at Rs.800-1000 per household per year.
2. To reduce power procurement cost for Puducherry Electricity Department (PED) due to peak demand reduction.
3. To enhance awareness about use of energy efficient products amongst households and have a cascading effect for other products.
4. To make energy efficiency as a resource that could be procured by PED through long term contracts. It could reduce the power procurement cost by the same amount as it spends for procuring energy efficiency to make a tariff natural preposition.
5. To provide a viable payment security mechanism to incentives large scale investments in energy efficiency.

## DELP – SOP MECHANICS

DELP will capture key best practices of BLY and would leverage Demand Side Management (DSM) regulatory framework that many SERCs have created to set up a robust payment security mechanism. EESL, on its own or in collaboration with partners, will undertake project implementation and would take the investment risk. It would provide the LEDs at costs similar to that of ILBs and recover the balance cost over the project cycle. The key elements of the programme, to be implemented by EESL, will be as follows –

1. EESL will, in consultation with DISCOM, select an area for implementation of DELP.
2. EESL, DISCOM and SERC , under the overall guidance of BEE, will agree on necessary DSM regulations that will inter-alia include –
  - (a) A DSM based mechanism to service investments. This would be based on agreed energy savings based on BLY methodology.
  - (b) A mechanism for monitoring and verification,
  - (c) A dispute resolution mechanism
  - (d) Logistic arrangements for distribution of LEDs as replacement of ILBs

3. EESL will undertake awareness and outreach of the scheme to household. It will provide upto 4 LED per household at Rs.25/ lamp as replacement for working ILBs
4. EESL and DISCOM will undertake distribution of LEDs/CFLs to every household and maintain a list of such distribution.
5. For monitoring purposes, BEE will select a random sample of household for bi-annual verification.
6. DISCOM will provide EESL payment on a periodic basis based on the methodology agreed. Appropriate ESCROW/payment security mechanism to be in-built to reduce the revenue risk to EESL.
7. There will be some robust mechanism to ensure that the LEDs/CFLs distributed should not enter into market for re-sale by adopting suitable stamping on LEDs and other procedures.
8. At the same time it will be ensured that the ILBs collected should not be on the way to market for re-sale, its proper crushing process will be ensured.

## DELP – SOP FINANCING

1. JERC can allow PED to provide Rs.2.5/Unit for every unit of energy saved. PED could pass this on to EESL, which will provide LEDs/CFLs to households at a nominal rate. The EE payout by PED will help EESL to recover investments. There is a net saving to PED even after EESL payment.
2. JERC could reduce power procurement cost in ARR by the total EE payout therefore making the proposal tariff natural.

## DELP – SOP : MONITORING & VERIFICATION

1. It will be following the demand savings approach where the savings per bulb will be reckoned by taking the difference in wattage of lamps. If 60W incandescent is replaced by 8W LED, the savings per lamp will be 52W.
2. The number of hours of usage will be 3.5 per day and for 300 days / year.
3. The distribution will ensure that incandescent lamps are given back in lieu of LED/CFL.
4. A Project Sample Group (PSG) will be determined through random sampling. Physical monitoring of lamps that are functional will be done. BEE/REAP would undertake this activity.
5. Based on the proportion of lamps not working, the payment to EESL will be adjusted.

## DELP-SOP: NEXT STEP

1. In-principle agreement of JERC and Government of Puducherry on the approach.
2. Conduct of a sample survey to determine pattern of usage in household sector.
3. Preparation of DELP-SOP petition in consultation with PED.
4. Submission of DELP-SOP petition for consideration and approval of JERC.
5. Roll out after approval of JERC.

## **BENEFITS OF SOP**

### **Benefits to consumers**

1. Rs. 102.34 Crores for entire period of life of the project at a discount rate of 10% for 2,50,000 domestic consumers.

### **Benefits to Puducherry Electricity Department**

1. Net present SOP benefits of Rs. 23.94 Crores over the project life at discount rate of 12%
2. Reduction in T&D Losses.
3. Savings in CAPEX on T&D Network.
4. Reduction in Peak Demand.
5. Improvement in Average Revenue Realization as % of Average Cost of Supply.

### **Benefits to Society:**

1. Savings in electricity will accommodate the increase electricity demand thereby lead to less consumption of fossil fuels and minimizing the Green House Effects.

### **Benefits to State Govt./ Commission:**

1. Enhanced awareness amongst consumers towards energy conservation and efficiency.
2. Promoting national programmes and priorities.

## FREQUENTLY ASKED QUESTIONS ON DELP-SOP

**Ques. 1            What is DELP-SOP mechanism?**

**Ans.**            The Standard Offer is a mechanism for acquiring demand-side resources (energy efficiency and load management) under which a utility (or a government agency) purchases energy savings and/or demand reductions using a predetermined rate.

Any energy user (utility customer) or energy service company (ESCO) that can deliver energy and/or demand savings is paid the fixed amounts per kWh or kW (the Standard Offer amounts) upon completion of the EE/DSM project and verification and certification of the achieved savings by an authorized measurement and verification (M&V) organization. The amount will be paid periodically based on a long term contract signed between the ESCO and Utility.

A Standard Offer Program (SOP) treats energy saving projects in a manner analogous to customer generation of electricity, and considers the energy or demand reductions as resources that the utility will pay for, in lieu of the avoided peak power procurement.

SOP is comparable to the feed-in tariffs (FITs) utilized to promote increased implementation of renewable energy resources. The amounts to be paid for the energy savings and/or demand reductions under a SOP are generally based on the value of these reductions to the utility system.

**Ques. 2            The Life Expectancy for CFL and LED is 3 and 10 Years respectively. Once the Contract Period as determined under PPA is over then the customer has to procure the CFL / LED at the market price.**

**Ans.**            It has been observed over a period of time that price of these products are reducing with a passage of time. For example, CFL was available at a price of INR 200/- during 2009 and in 2013, price of CFL has been considerably down to INR 80/-. Once the consumers get familiar with these products and the demand for these products also get increased/ stabilized then the difference between subsidized price and the market price will also be narrowed. However for the contract period we will ensure free replacement warranty so that performance warranty can be put on manufacturer.

**Ques. 3** Under DELP-SOP offer, it is proposed to distribute 4 CFL/ LED per household. In case the household has more than 4 light points or the renovation/ expansion of the house is undertaken, then household has to pay market price for procuring additional CFL/LED.

Ans. At the beginning, 4 CFL/ LED per Household may be distributed during the initial period say 1 Year and after reviewing the performance of the scheme it may be considered to distribute additional CFL/ LED so that such instances can be taken care of. It may be noted that the programme is for replacement only. Also, as was the case in Bachat Lamp Yojana, consumers will be encouraged to replace lamps which have high usage. This will be a part of the awareness programme that will be carried out before and during implementation.

**Ques.4** What will be the source of expenditure on Survey, Warehousing and Distribution and who will incur these expenditures?

Ans. The entire cost of survey and distribution will be borne by EESL as part of project development cost which will be capitalized. As regards warehousing costs, it will be the responsibility of the LED/ CFL manufacturer who gets selected based on a competitive bidding.

**Ques. 5** Lighting Points in the households consumes only a fraction of the total energy consumption of the Households. What is the way forward for targeting other Equipments such Air Conditioners, Refrigerator, Water Heaters, Fans, etc with the efficient ones?

Ans. This is the first SOP model being proposed. Once this is successfully implemented, other equipments will also be brought under the ambit to target refrigerators, ACs, etc. As of now, this scheme is being targeted to create awareness in respect to CFL/ LED.

**Ques. 6** Households getting subsidized electricity may not be interested in a pay out of Rs 15 /- or 25/- per CFL / LED since the programme will not have any monetary savings for such consumers.

Ans. These households will also benefit from reduced energy bills due to lower consumption. In fact, being economically weaker they would be very attracted to the scheme. Further, we can also consider free distribution of CFL/ LED to Economically Weaker Section or People falling under BPL and accordingly the DELP-SOP price will change.

**Ques. 7 Whether CFL and LED have the same lumen intensity as an incandescent bulb?**

Ans. Incandescent bulb will be replaced with CFL/ LED as per BIS norms so as to get the same lumen intensity.

**Ques. 8 The PPA agreement under DELP-SOP will envisage payment of energy savings to EESL and the same will form a part of expenditure in ARR while fixing Tariff Rates, hence it will have the effect of increase in tariff rates.**

Ans. The DELP-SOP will not have any effect on the Tariff Rates and is, hence, tariff neutral. The energy saved will be used to reduce the costliest Power Purchase of the DISCOM thereby also reducing T&D losses. Hence both components in the ARR will neutralize the effect on Tariff rates. Detailed working is enclosed as Annexure-A.

**Ques. 9 How this scheme is going to help to the consumers, the DISCOMS, the State Commission/ State Government and the Society?**

Ans. The benefits to various stakeholders have been explained as under:

➤ Benefits to Consumers

- a. Reduction in Electricity bills.
- b. Reduction in Load Shedding due increase in electricity supply.
- c. Availability of CFL/ LED at the price of ICL.

➤ Benefits to DISCOMS

- a. Reduction in Transmission and Distribution Losses.
- b. Savings in capital expenditure on Transmission and Distribution Network that will, in turn, help DISCOM to undertake System Augmentation and Strengthening that will further decrease the T&D Losses.
- c. Reduction in Peak Demand.

- d. Trading of excess power to other deficit states/ UT.
- e. Sale of energy saved to other High-end consumers.
- f. Improvement in Average Revenue Realization as % of Average Cost of Supply.
- Benefits to State Commission/ State Government
  - a. Enhanced awareness amongst consumers towards energy conservation and efficiency.
  - b. Promoting National programmes and priorities.
- Benefits to Society
  - a. Savings in electricity will accommodate the increased demand in electricity thereby leading to less consumption of fossil fuels and minimizing the Green House Effect.

**Ques. 10      The success of the scheme depends on the participation of people at large. What will be done to motivate the people and spread the awareness of the Programme?**

Ans.      This can be done through General Awareness Programmes through local Radio channels in regional language and other media channels. Further Workshops may also be conducted to make the people recognize the importance of Energy Conservation and Energy Efficiency.

**ANNEXURE-A**

**Assumptions**

1. Puducherry is a power surplus state
2. Sales for next seven years have been forecasted on the basis of approved CAGR.
3. Growth rate of Domestic Consumer excludes One Hut One Bulb.
4. Energy Purchase has been forecasted on the basis of projected Energy Sales after considering T&D Loss @12.50% and external loss @4% (as per approved ARR 2013-14)
5. Average Power procurement Cost for FY 2013-14 has been determined by considering total procurement of 2909 MUs at total cost of Rs. 925 Crores.
6. Average power procurement cost (i.e. market cost) for next 5 years has been projected after considering 2% increase in the cost.
7. Two scenario have been presumed:-
  1. **Existing Scenario (i.e. without SOP)**- Total Energy Requirement has been procured from the open market at the market rate.
  2. **SOP scenario (i.e. Energy Efficiency)** - Out of total Energy Requirement, available EE may have been procured at the cost of Rs. 2.5 per unit and balance energy has been purchased from open market at the market rate.
8. NPV has been determined at 12% i.e. Return on capital @ 12% (ARR for 13-14, 10.88%)
9. Benefits to the consumer have been derived as under:
  1. Consumption of 4 ICBs per house hold (i.e. 60W/L) for 3.5 hours for 300 days
  2. Average cost of supply has been taken as Rs. 3.85 per unit.
  3. Total Domestic Consumers are 299,772. It includes 35466 One Hut One Bulb (2011-12). Scheme has targeted 2.50 lacs Domestic Consumers.
  4. Total Revenue from domestic consumers is Rs. 564.33 Crs (13-14). Considering 10% from lighting.

1. Compounded Annual Growth Rate (approved) as per ARR 2013-14

Consumer Category	Growth rate FY 13-14 (APPROVED)
Domestic	8.77%
Commercial	5.22%
Street Lighting	8.45%
LT Industrial	7.91%
HT-1	0.00%
HT-2	12%
HT-3	2.58%

2. Seven years Projections of Energy sale and Energy Purchase of the State.

<b>Forecast for Sales (MUs)</b>								
Consumers	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-2021
Domestic	564.33	613.8	667.7	726.2	789.9	859.2	934.5	1016.5
Commercial	179.94	189.3	199.2	209.6	220.6	232.1	244.2	256.9
Agri	56.00	56.0	56.0	56.0	56.0	56.0	56.0	56.0
PL	26.74	29.0	31.5	34.1	37.0	40.1	43.5	47.2
LT	213.02	229.9	248.1	267.7	288.9	311.7	336.4	363.0
TS	20.00	20.0	20.0	20.0	20.0	20.0	20.0	20.0
HT-1	978.65	978.6	978.6	978.6	978.6	978.6	978.6	978.6
HT-2	50.21	56.2	63.0	70.5	79.0	88.5	99.1	111.0
HT-3	345.97	354.9	364.1	373.4	383.1	393.0	403.1	413.5
<b>Total</b>	<b>2434.85</b>	<b>2527.80</b>	<b>2628.01</b>	<b>2736.19</b>	<b>2852.97</b>	<b>2979.10</b>	<b>3115.36</b>	<b>3262.64</b>
<b>Additional Demand for sale</b>		<b>92.95</b>	<b>100.21</b>	<b>108.18</b>	<b>116.78</b>	<b>126.12</b>	<b>136.26</b>	<b>147.28</b>

Particulars	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-2021
<b>Energy Purchase (MUs)</b>	<b>2909.95</b>	<b>3021.12</b>	<b>3140.88</b>	<b>3270.17</b>	<b>3409.75</b>	<b>3560.49</b>	<b>3723.35</b>	<b>3899.37</b>
External Loss (4%)	127.34	132.20	137.44	143.10	149.21	155.81	162.93	170.64
<b>Energy Requirement (MUs)</b>	<b>2782.61</b>	<b>2888.913</b>	<b>3003.436</b>	<b>3127.072</b>	<b>3260.5405</b>	<b>3404.6825</b>	<b>3560.4134</b>	<b>3728.73</b>
T& D Loss	347.83	361.11	375.43	390.88	407.57	425.59	445.05	466.09
<b>Energy sale (MUs)</b>	<b>2434.78</b>	<b>2527.80</b>	<b>2628.01</b>	<b>2736.19</b>	<b>2852.97</b>	<b>2979.10</b>	<b>3115.36</b>	<b>3262.64</b>
<b>Additional Purchase (MUS)</b>		<b>111.17</b>	<b>119.76</b>	<b>129.29</b>	<b>139.58</b>	<b>150.74</b>	<b>162.86</b>	<b>176.02</b>
<b>Per unit Power Procurement Cost</b>	<b>3.18</b>	<b>3.24</b>	<b>3.31</b>	<b>3.37</b>	<b>3.44</b>	<b>3.51</b>	<b>3.58</b>	<b>3.65</b>

3. Energy Efficiency Proposed

Measure	No. of consumers	Project Period	Units saved (MUs/Yr)	Unit before distributions (MUs/Yr)	SOP Purchase price	Total Annual Payout to EESL	SOP Saving
8 W LED	2.5 Lakh (4 bulbs each)	7 Years	54.60	65.39	Rs.2.5/Unit	Rs.16.35 Crores	Rs.4.68 Crores
14 W CFL	2.5 Lakh (4 bulbs each)	2 Years	48.30	57.84	Rs.2.5/Unit	Rs.14.46 Crores	Rs.4.28 Crores

4. SOP Savings

EE Scenario	Particulars	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-2021
	Cost of Power Procurement through open market	925.36	958.34	1017.12	1081.07	1150.72	1226.64	1309.47	1399.93
	Cost of Power Procurement through EE	0.00	16.35	16.35	16.35	16.35	16.35	16.35	16.35
	<b>Total Purchase Cost</b>	<b>925.36</b>	<b>974.69</b>	<b>1033.47</b>	<b>1097.42</b>	<b>1167.07</b>	<b>1242.99</b>	<b>1325.82</b>	<b>1416.28</b>

Existing Scenario (without EE)

<b>Cost for Purchase without EE@ open market</b>	<b>925.36</b>	<b>979.54</b>	<b>1038.74</b>	<b>1103.13</b>	<b>1173.22</b>	<b>1249.59</b>	<b>1332.88</b>	<b>1423.81</b>
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Benefit of DELP SOP i.e. Reduction in Power Purchase Cost	0.00	4.86	5.28	5.71	6.15	6.60	7.06	7.53
Total Benefits for contracted period	43.19							
<b>NPV @12%</b>	<b>24.33</b>							

5. Benefits to Consumers

(Amount in Rs.)

Particular	2013-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21
Capital Cost Benefit - LED @ cost of ICB	0.00	375	375	375	375	375	375	375
<b>Total capital Cost benefits @ DELP SOP scheme</b>	<b>0.00</b>	<b>9.375</b>						
Annual Bill with 4 ICBs per consumer	970.2	970.2	970.2	970.2	970.2	970.2	970.2	970.2
Annual Bill with 4 LEDs per consumer	0.00	129.36	129.36	129.36	129.36	129.36	129.36	129.36
Recurring Expenses Reduced by -Reduced Electricity Bills per consumer	970.2	840.84	840.84	840.84	840.84	840.84	840.84	840.84
<b>Total Expenses Reduction @ DELP SOP scheme (Rs. In Crs)</b>	<b>0</b>	<b>21.021</b>						
<b>NPV @ 10% (Rs. In Crs)</b>		<b>102.34</b>						