

SR. No. 10/2015

OP. No. 4/2015

BEFORE THE  
ANDHRA PRADESH ELECTRICITY REGULATORY COMMISSION  
FOR THE STATE OF ANDHRA PRADESH

Filing No. : /2015

OP  
Petition No. 4 /2015

IN THE MATTER OF:

Seeking approval of the Hon'ble Commission for implementation of DSM based Efficient lighting Program (DELP) in Guntur & Anantapur Districts of Southern Power Distribution Company in the state of Andhra Pradesh under Demand Side Management programme

AND

IN THE MATTER OF:

**Southern Power Distribution Company of Andhra Pradesh Limited** - Petitioner

**Affidavit**

I, N.Narasimhulu, Son of Guravaiah aged about 44 Years, residing at Tirupati, the deponent named above do hereby solemnly affirm and state on oath as under:-

- 1) I am the Chief General Manager (Operation)/APSPDCL, competent and duly authorized by APSPDCL to affirm, swear, execute and file this petition.

2) I, the deponent named above do hereby verify that the contents of the affidavit and those of the accompanying petition are true to my personal knowledge and verify that no part of this affidavit is false and nothing material has been concealed.

Encl : Annexure "A" Computation of DELP SOP Price per unit and Annual payouts to EESL

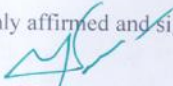
  
DEPONENT  
CHIEF GENERAL MANAGER  
OPERATION  
APSPDCL :: TIRUPATI.

**VERIFICATION.**

The above named Deponent solemnly affirm at Tirupati on this 16<sup>th</sup> day of February, 2015 that the contents of the above Affidavit are true to my knowledge no part of it is false and nothing material has been concealed there from.

  
DEPONENT  
CHIEF GENERAL MANAGER  
OPERATION  
APSPDCL :: TIRUPATI.

Solemnly affirmed and signed before me

  
COMPANY SECRETARY  
APSPDCL :: TIRUPATI.

**BEFORE THE**  
**ANDHRA PRADESH ELECTRICITY REGULATORY COMMISSION**  
**FOR THE STATE OF ANDHRA PRADESH**

FILING NO: /2015

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**IN THE MATTER OF:**

Seeking approval of the Hon'ble Commission for implementation of DSM based Efficient lighting Program (DELP) in Guntur & Anantapur Districts of Southern Power Distribution Company of A.P. Limited. under Demand Side Management programme.

**AND**

**IN THE MATTER OF:**

Southern Power Distribution Company of Andhra Pradesh Limited-

Petitioner

**MOST RESPECTFULLY SHOWETH THE ADDITIONAL SUBMISSION:**

1. The APSPDCL Humbly submits that under the Demand Side Management program, the APSPDCL has proposed to implement the DSM based Efficient Lighting Programme (DELP) in the area of its license through a performance based contractual agreement with an Energy Service Company (ESCO), M/s. Energy Efficiency Services Limited, New Delhi.
2. The APSPDCL submits that M/s. Energy Efficiency Services Limited, New Delhi, have submitted a standards offer programme (SOP) for implementation of DSM based efficient lighting programme (DELP) in household sector in the state of Andhra Pradesh. As per the terms of SOP, the capital investment required for implementation of DELP programme will be made by the ESCO i.e. M/s. Energy Efficiency Services Limited, New Delhi and APSPDCL shall make payment to Energy Efficiency Services Limited to recover the investment made on a periodic basis (monthly) based on the accrued energy efficiency resource benefits. Under this programme M/s.

Energy Efficiency Services Limited shall guarantee the performance of the Project for the entire project period of Five years.

### 3. DELP-SOP Program Detail

Under DELP-SOP program, the APSPDCL along with the technical and financial support of M/s. Energy Efficiency Services Limited has envisaged to undertake the following tasks.

- (i) It has been envisaged to distribute more energy efficient LED bulbs to 15,41,000 Domestic service connections (households) in the two circles of operation, namely Guntur and Anantapur, of APSPDCL in the state of Andhra Pradesh.
- (ii) It has been proposed to distribute two nos. LED Bulbs to each household, i.e. 30,82,000 LED bulbs to 15,41,000 nos. households in the project area in exchange of good condition GLS lamp for each LED lamps and at subsidized price of Rs.10 per LED lamp.
- (iii) Distribution of LED Bulbs will be in a phased manner and revenue cycle will start on completion of each phase. For this purpose, distribution of a maximum of 5,00,000 LED bulbs will be deemed as completion of one phase of distribution.
- (iv) Total Quantity of LED bulbs will be distributed within a time period of Six months.
- (v) Engage the services of third party agencies such as BEE or any other third party for physical verification. The third party monitoring agency randomly select sample of households for annual verification and certify the working conditions of the LED bulbs in the system.
- (vi) The APSPDCL shall make payment to Energy Efficiency Services Limited to recover the investment made on a periodic basis (monthly) based on the accrued energy efficiency resource benefits calculated based on the working conditions of the LED bulbs as certified by the third party and the DELP-SOP price per unit of energy saved, as determined by the Hon'ble Commission, based on this petition, during the project contract period of Five years.

(vii) M/s. Energy Efficiency Services Limited agrees to replace the faulty LED bulbs at free of cost throughout the project period of Five years irrespective of the type of fault.

(viii) **Safety Aspects & Testing :**

(a) M/s. Energy Efficiency Services Limited has ensured that the LED lights used under this project complies with the photo biological safety standards specified by BIS.

(b) The sample testing procedure may also be carried out in the laboratory of Centre for Green Energy Technology jointly by M/s. Energy Efficiency Services Limited and APSPDCL as part of this programme, before distribution of the LED bulbs to the household consumers, in order to ensure safety compliance.

(c) Before distribution of LED bulbs, samples are to be tested to confirm the technical specifications at NABL accredited laboratories.

**4. Energy Savings**

The APSPDCL submits the workings for the deemed energy savings on account of replacement of a 60 W Incandescent bulb by 7 W LED bulb along with the assumptions as below.

**Factors Considered**

(i) Number of Households : 1541000

(ii) Number of LED bulbs distributed per household : Two

(iii) Number of LED lamps distributed : 30,82,000

(iv) Hours of Usage of bulb per day : 3.5 Hrs

(v) Operating Days Per year : 300 days



S.No.	Particulars	Unit	Value
1	Wattage of ICL	Watt	60
2	Wattage of LED	Watt	7
3	Power saving	Watt	53
4	Hours of Usage	Hrs/day	3.5
5	Operating days per year	Days/year	300
6	Energy saved per LED per Day	Kwhr	0.1855
7	Energy saved per LED per year	Kwhr	55.65
8	Number of LED lamps distributed	Nos	30,82,000
9	Total Energy saved per year (7)x(8)	Million Kwhr	171.51
10	Total losses (10.50%)	10.50%	20.12
11	<b>Deemed Energy supplied through DELP-SOP scheme per Annum</b>	<b>Million Kwhr</b>	<b>191.63</b>

The deemed annual saving of energy under DELP program is around 191.63 Million units.

#### 5. Cost Benefit Analysis

APSPDCL humbly submits that the implementation of DELP Scheme in the two circles of operation, namely Guntur and Anantapur, would result into energy savings of 191.63 Million units per annum resulting into reduction in power procurement cost of INR 561.51 crores over a period of Five years.

The financial payouts / receivable involved in implementation of this scheme, is given in the table below.

S.No.	Description	Amount (INR Crores)
1.	Total investment made by M/s. Energy Efficiency Services Limited	62.87
2.	Total Payout to be made to M/s. Energy Efficiency Services Limited during the project period of Three Years including O&M charges, including taxes presently applicable. *	107.59
3.	Savings to APSPDCL due to savings in power purchases after considering loss of revenue due to reduction of sales in appropriate consumer slabs	561.50
4.	<b>Net Savings to APSPDCL</b>	<b>453.91</b>

Thus, it is submitted that the project is financially viable apart from being benefits the society in achieving Energy security and mitigation of climate changes and protection of environment.

## 6. Other Benefits

The Other accrued benefits upon implementation of this DSM based Efficient Lighting Programme are as given below.

### 6.1 House Hold Sector

- Helps to reduce their energy consumption and its cost.

### 6.2 Distribution Utility

- Aids the department in reducing the demand & Supply gap.
- Minimise load shedding during peak hours.
- To meet demands of other cross subsidising consumers like commercial and industrial establishment.
- Generate additional revenue through sale of deemed energy saving to cross subsidising consumers and thereby helps to bridge the gap between the Average Cost of supply and the cross subsidised tariff rates.

### 6.3 Cross Subsidising Category

- The tariff rates for the cross subsidising categories will progressively reduced due to reduction in cross subsidised costs.

## 6.4 Society

- Energy security.
- Mitigation of climate changes and protection of environment.
- Exploration on usage of energy efficient equipments.

## 7. Project Financial at a Glance

### 7.a. Tentative Project Cost:

SI No.	Particulars	Unit	Value
1	Cost of a LED Bulb	INR per Bulb	204
2	Distribution, Storage, Transportation, Insurance of LEDs & Crushing of ICLs	INR per Bulb	10
3	Less : Consumer Contribution (Upfront)	INR per Bulb	10
4	Net cost per LED	INR per Bulb	204
5	Rebate to Consumer through ARR	INR per Bulb	204

SI No.	Particulars	Unit	Quantity
1.	Number of LED Bulbs offered under this Scheme	Nos.	30,82,000
2.	<b>Total Cost of the LED Bulbs</b>	<b>INR</b>	<b>62,87,28,000</b>
3.	Public Awareness Cost	INR	Please See Note
4.	<b>Capital cost of the Project</b>	<b>INR</b>	<b>62,87,28,000</b>

**Note:** APSPDCL agrees to reimburse EESL the Public Awareness Cost incurred on this project on actual submission of bills / invoice by EESL. The ceiling of the expenditure for Guntur & Anantapur is kept at INR 6 Crores.

### 7.b. DEBT EQUITY Ratio

The debt equity ratio considered for this project is 80:20.

SI No.	Particulars	Unit	Value
1	Debt portion (80% of Capital Cost)	INR	50,29,82,400
2	Interest for Debt servicing	%	12.50% p.a.
3	Equity portion (20% of Capital cost)	INR	12,57,45,600
4	Return on Equity / Equity IRR	%	15.50% p.a. (approx.)



**7.c. Annual Maintenance charges**

SI No.	Particulars	Unit	Value
1	Annual Maintenance Charges (Manpower, Third party Services, Warranty)	%	2.5% p.a.
2	Annual Maintenance Charges (Manpower, Third party Services, Warranty)	INR	1,57,18,200

Note: \*This cost is based on expected distribution of 30,82,000 LED bulbs. In case actual distribution goes up, cost will increase accordingly.

**7.d. Tentative DELP-SOP price**

The tentative DELP-SOP price per unit of energy saved and the annual payout to be made to EESL by the APSPDCL under this project is worked out based on the above mentioned parameters envisaging distribution of 30,82,000 LED bulbs and are as detailed in the table below. In case of actual distribution varies, annual payout will vary accordingly. A detailed working sheet is enclosed along with this petition for consideration of the Hon'ble Commission.

YEAR	I	II	III	IV	V
DELP price per unit (INR)	2.5868	2.3966	2.2064	2.0163	1.8261
Deemed Energy supplied through DELP-SOP scheme per Annum (Units)	19,16,34,972	19,16,34,972	19,16,34,972	19,16,34,972	19,16,34,972
Annual payout to EESL, excluding All Taxes (INR)*	240793252	206913439	188433541	169953643	151473745

**7.e. Energy Saving Agreement**

Honorable Commission have issued its approval vide Lr.No.APERC/E-211/APSPDCL/2014-15/DD-Dist/2014 dt.30.09.2014. for this DSM based Energy Efficient Lighting Program (DELP) which was submitted by APSPDCL for the purpose of implementation of DELP Scheme in the two circles of operation with the financial support of M/s. EESL, an ESCO company, an agreement called Energy Saving Agreement needs to be signed between the two parties viz., APSPDCL and EESL. Accordingly, an agreement was concluded with M/s.EESL. A copy of the same is herewith enclosed.

**8. PRAYER**


Thus, the APSPDCL humbly prays before the commission to consider this petition and pass necessary orders on the following.

1. Allow APSPDCL to implement the DSM based efficient lighting program as part of DSM measures, with the financial support of M/s. Energy Efficiency Services Limited, New Delhi.
2. Approve the capital investment made in this project.
3. Approve the DELP-SOP prices per unit of energy saved, proposed for recovery of the investment made by M/s. Energy Efficiency Services Limited and allow the APSPDCL to make monthly payout to M/s. Energy Efficiency Services Limited in accordance with DELP-SOP price.
4. Approve the normative parameters as considered by APSPDCL or as deem fit by the Hon'ble Commission for the purpose of working of the DELP-SOP price.
5. Allow the APSPDCL to recover the annual payout to be made to M/s. Energy Efficiency Services Limited through the ARR for the respective year.
6. Approve the Energy Saving Agreement, and
7. Pass necessary orders as deem fit by the Hon'ble Commission.

  
CHIEF GENERAL MANAGER  
OPERATION  
APSPDCL :: TIRUPATI

**Financial Calculation for DELP Program at APSDCL-****Guntur and Anantapur**

Cost per LED Bulb	204						
Cost per LED Bulb	204						
Distribution, Storage, Transportation, Insurance of LEDs & Crushing of ICLs	10						
Less : Consumer Contribution	10						
Net cost per LED Bulb	204						
Rebate to Consumer through ARR	204						
Total number of LED Bulb proposed for Distribution	3,082,000						
Total Project Cost	628,728,000						
EESL's Project Cost	628,728,000						
Project life	5						
Financial Years		1	2	3	4	5	Total
EESL Equity Financing ( 20% of Capital Cost)	125,745,600						
EESL Debt Financing ( 80% of Capital Cost)	502,982,400						
EESL Debt at the beginning of the Financial year		502,982,400	402,385,920	301,789,440	201,192,960	100,596,480	
EESL Debt at the End of the Financial year		402,385,920	301,789,440	201,192,960	100,596,480		
EESL Debt Principal payout annually		100,596,480	100,596,480	100,596,480	100,596,480	100,596,480	502,982,400
EESL Interest Rate/ Interest amount	12.50%	67,588,260	44,534,900	31,960,340	19,385,780	6,811,220	170,280,500
Annual maintenance charges	2.50%	15,718,200	15,718,200	15,718,200	15,718,200	15,718,200	78,591,000
EESL Recovery of equity investment		56,890,312	46,063,859	40,158,521	34,253,183	28,347,845	205,713,718
<b>Total repayment to be made by DISCOM to EESL (Excluding Service Tax)</b>		240,793,252	206,913,439	188,433,541	169,953,643	151,473,745	957,567,618
Service Tax Liability	12.36%	29,762,046	25,574,501	23,290,386	21,006,270	18,722,155	118,355,358
<b>Total repayment to be made by DISCOM to EESL (Including Service Tax)</b>		270,555,298	232,487,940	211,723,926	190,959,913	170,195,900	1,075,922,976
<b>DELP SOP Price per Unit</b>		1.4118	1.2132	1.1048	0.9965	0.8881	
Debt (Pre-Tax)	80.00%	12.50%					
Equity (Pre-Tax) i.e. 15.50% plus Tax rate	20.00%	23.48%					
<b>Cost of Capital</b>	100.00%	14.70%					
Equity (Post-Tax)		15.50%					
Income Tax Rate		30.00%					
Surcharge		10.00%					
Education Cess		3.00%					
<b>Tax Rate</b>		33.99%					
EESL Equity Investment							
Opening Balance	125,745,600	125,745,600	100,596,480	75,447,360	50,298,240	25,149,120	
Recovery of Equity	5.00	25,149,120	25,149,120	25,149,120	25,149,120	25,149,120	125,745,600
Closing Balance		100,596,480	75,447,360	50,298,240	25,149,120		
Return on Equity @ 15.50% plus Income taxes thereon @ 33.99%	23.48%	31,741,192	20,914,739	15,009,401	9,104,063	3,198,725	79,968,118
EESL Recovery of Equity	(125,745,600)	56,890,312	46,063,859	40,158,521	34,253,183	28,347,845	205,713,718
<b>Trade-Off between Payout to EESL and Savings in Power Procurement Cost during the project period</b>		1	2	3	4	5	Total
Energy Savings per Annum under the Scheme on account of Demand Reduction (Mus) -Guntur		114.53	114.53	114.53	114.53	114.53	572.67
Energy Savings per Annum under the Scheme on account of Demand Reduction (Mus) -Anantapur		77.10	77.10	77.10	77.10	77.10	385.51
<b>Power Procurement Cost per Unit (INR)</b>	2.00%	5.6304	5.7430	5.8579	5.9750	6.0945	
Benefit- Savings in Power Procurement Cost per Annum (INR Crores)- Guntur		64.49	65.78	67.09	68.43	69.80	335.59
Benefit- Savings in Power Procurement Cost per Annum (INR Crores)- Anantapur		43.41	44.28	45.17	46.07	46.99	225.91
Payout- Payment to EESL through ARR (INR Crores)		27.06	23.25	21.17	19.10	17.02	107.59
<b>Net Impact on ARR</b>		80.84	86.81	91.08	95.41	99.77	453.91

  
**CHIEF GENERAL MANAGER**  
**OPERATION**  
**APSPDCL :: TIRUPATI,**  
 11