



Energy Efficient Street Lighting Project in Agartala City, the capital city of State of Tripura

Introduction:

- Agartala Municipal Corporation executed an agreement with the Energy Efficiency Services Limited (EESL)-a Joint Venture Company of PSUs of Ministry of Power, Government of India) on Public- Public Partnership(PPP) mode on 9th December 2014 to convert 32216 HPSV(High Pressure Sodium Vapour Lamp)- -4000 number and CFL(Compact Fluorescent lamp) 28216 number- street lights under Agartala City into LED(light Emitting Diode) Lights in order to bring efficiency and economy and better illumination in the sector of Street Lighting in Agartala City.
- The scope of this project involves all the responsibility with EESL for installation, operation and maintenance of LED street lights supplied by EESL during project period of 10 years.
- Entire capital cost has been borne by the EESL as per the agreement.
- EESL will operate and maintain the street lighting for 10 years from the savings of annual electric bill as on today.

Situation before the initiative began:-

- Relatively high electric bill and operation and maintenance bill to operate the earlier street lighting system which ranged from Rs. 5.50 crore to 6.00 core per year.
- Agartala Municipal Corporation took decision to reduce electricity consumption bill by implementing the L.E.D. street light project in Agartala Municipal Corporation areas which would beautify Agartala City also.
- If LED based lights are promoted, the agreed demand will not only spur domestic manufacturing but will also drive down costs, making projects more attractive. Use of LED technology is being implemented across advanced countries & some cities in India. It has the potential to provide most efficient energy outcome as it allows highest efficiency gains from retrofits as well as additional energy savings due to optimized operational performance.

Economics –(Savings in terms of energy as well as amount):-

Total amount bill per annum of Agartala Municipal Corporation for street lighting(including electric bill and operation and maintenance) in Agartala City

was approximate Rs. 6.00 crore . After the LED Project is implemented successfully, electric expenditure will be reduced at 50% of the previous bill i.e it will be around Rs. 3.00 core. Operation and maintenance will be done by the PPP operator namely EESL, thus the expenditure for O&M expenditure will also be nil.

Calculation for Electricity Consumption for 4000 HSPV Lamps in Agartala City :-

- a.) A 250Watt + 20Watt (Ballast) = 270Watt HPSV lamp is changed by 120 Watt LED lights including drivers wattage.
- b.) So, there saving of 270Watt – 120 Watt = 150 Watt.
- c.) At present TSECL unit cost @ Rs.6.06 / unit.
- d.) So, saving amount is 150 Watt X 11hrs.=1.65 Unit/
- e.) 1.65 Unit X Rs.6.06 = Rs.9.99 per Lamp per day.
- f.) Considering 4000 Nos HPSV fittings.
- g.) Total amount save per month = 4000 Nos X Rs. 9.99 X 30 Days = Rs.11,98,800.00(Per month)

Calculation for electricity consumption for 28216 CFL lamps in Agartala City:

- a.) A 20Watt CFL is replaced by 10 Watt LED lights including driver’s wattage.
- b.) So, there saving of 20Watt – 10 Watt = 10 Watt.
- c.) At present TSECL unit cost @ Rs.6.06 / unit.
- d.) So, saving amount is 10 Watt X 11hrs.=0.11 Unit/
- e.) 0.11 Unit X Rs.6.06 = Rs.0.67 per Lamp per day.
- f.) Considering 28,216 Nos 20 Watt CFL fittings.
- g.) Total amount save per month = 28,216 Nos X Rs. 0.67 X 30 Days = Rs.5,67,142.00(Per month)

Total Energy saving per day = 875 KW

Total energy saved per month:- (Rs.10,98,800.00+Rs.5,67,142.00) = Rs,16,65,942.00 (Per Month)

Total Amount saved per year:-

- | | |
|--|---------------------------|
| a) From Consumption Bill = Rs,16,65,942.00 X 12 Months = Rs.1,99,91,304.00 | |
| b) Material Cost | = Rs.74,00,000.00 |
| c) Operation & Maintenance cost | <u>= Rs.28,00,000.00</u> |
| Total | Rs. 3,01,91,304.00 |

What were the Best Practices for implementation of the project:

- Before starting the project, intense discussion was done at various levels and ultimately field survey was done. Data was collected from the site and finally an action plan was prepared. Decision was taken up in the highest executive body of

Agartala Municipal Corporation i.e. Mayor In Council of to take up pilot project on VIP road in Agartala first. In this pilot project, on demonstration basis 474 numbers of HPSV conventional lights were replaced from the Governor House to Agartala AIR Port (V.I.P. Road). After the initial success, decision was taken by Mayor in Council Agartala Municipal Corporation to implement this project in entire Agartala City to convert all the 32000 street lamps in Agartala City into LED Lamps. As Agartala City is the capital of Tripura state, consent of the State Government was also obtained by Agartala Municipal Corporation.

- Hon'ble Mayor with members of Mayor-in-council had taken the initiative and the Municipal Commissioner of Agartala Municipal Corporation assumed the leadership.
- Special emphasis is being given by Agartala Municipal Corporation to keep in order the LED fixtures.

Problems encountered:

- During implementation of the project Agartala Municipal Corporation faced lot of natural problem like as heavy rainfall, cyclonic winds, hot & humid temperature etc. However Agartala Municipal Corporation has overcome all the said problems in coordination with the EESL.

Results achieved

- 50 % reduction in the power consumption bill.
- 50 % energy saving as compared to the earlier year.
- No expenditure for operation and maintenance to Agartala Municipal corporation as it will be borne by PPP partner EESL
- Better illumination as well as beautification of city achieved.
- General People of Agartala City are happy and pleased with this initiative.

Lessons learnt:-

- To save energy and to inculcate economy and efficiency in the system.

Some Photographs of Energy Efficient Street Lighting Project in Agartala City



Airport Road near Army cantonment after LED installation



Secretariat Road Agartala after LED Light Installation



Before



After

Airport Road before and after installation of LED lights



Road near entrance of heritage park, Agartala



National Highway - 44 at Resham Bagan Agartala after LED Installation



VIP Road Agartala in the night Hours