

## FIELD TESTING OF HYBRID ULTRA CAPACITORS (HUC) POWERED SOLAR LIGHTING KITS AND SOLAR STREET LIGHTS FOR GRID DEPRIVED RURAL AREAS, LIGHTING IN VARYING CLIMATIC ZONES OF INDIA

Principal Investigator	:	Executive Secretary
Co - Investigator	:	S N Jayaram, Sr. Project Engineer
Budget	:	Rs.76.44 lakhs (DST, Gol - Rs.37.74 lakhs; Industry - Rs.25.50 lakhs; KSCST - Rs.13.20 lakhs)

### Introduction:

The Department of Science and Technology, Government of India sanctioned the project titled "Field testing of Hybrid Ultra Capacitor (HUC) Powered Solar PV Lighting Kits and Street Lights for Grid Deprived Rural area for Lighting in Varying Climatic Zones of India" to KSCST, vide sanction order No.DST/SSTP/Karnataka/484(G), dated 18.05.2017 for field testing the performance of the HUC Technology. This project is an initiative of IISc, DST, Gol, KSCST and the Industrial Partner M/s MESHA Energy Solutions Private Limited, Bengaluru.

KSCST procured 1016 units of 5W capacity and 10 units of 10W capacity lighting kits from M/s MESHA Energy Solutions and installed these lighting kits in different states across India for field testing the performance of the HUC technology under varying climatic zones.

### Progress:

KSCST along with M/s. Mesha Energy Solutions installed total 628 HUC Solar PV lighting kits in Karnataka, Nagaland, Odisha, Assam, Himachal Pradesh and Arunachal Pradesh. HUC lights installed during the year 2018 & 2019 mentioned bellow,

- 298 HUC lights installed at Karnataka
- 70 HUC lights installed at Nagaland
- 90 HUC lights installed at Odisha
- 80 HUC lights installed at Assam
- 75 HUC lights installed at Himachal Pradesh
- 75 HUC lights installed at Arunachal Pradesh
- 40 HUC lights installed at Uttarakhand
- 50 HUC lights installed at Meghalaya
- 50 HUC lights installed at Sikkim
- 50 HUC lights installed at Andaman & Nicobar Islands
- 70 HUC lights installed at Rajasthan

In addition to that, installed 36 HUC lighting kits in 13 State S&T Councils i.e. Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Telangana, Kerala, Manipur, Tamilnadu, Tripura, Odisha, Goa and Puducherry for technology demonstration.



Installation photos in Karnataka, Sikkim and Andaman & Nicobar Island

Presented before the 6<sup>th</sup> meeting of DST T2 Screening Committee on State S&T Programmes (T2SC – SSTP) held on 13-14 May 2019 at Bhopal.

The data analysis shows that these HUC lighting kits are being used in most places and performance is excellent. Final report of the project submitted to DST–Gol.

**Outcome of the field testing of HUC lighting kits project:**

Hybrid Ultra Capacitors (HUC) used in this project is to demonstrate the readiness of the technology via dissemination in a home lighting system. With the data acquired and feedback sought from the end users, the performance of the system was pretty much consistent across different climatic conditions. Further, industry has done research to show that the HUC technology could be optimized for enhanced performance with a better cost benefits for the end users. As a result of this, the industry has come up with a patented process of making traditional lead acid batteries into high performance lead acid batteries with benefits such as:

- Quick charging/ better charge acceptance
- Longer cyclic life for the product
- Better performance across different load conditions

In future, this new energy storage device can be used for microgrid applications, Inverter/UPS systems, Electric vehicles etc. This technology is already being commercialized by the industry.