

**FIELD TESTING OF HYBRID ULTRA CAPACITOR (HUC) BASED  
SOLAR PV – LED LIGHTING KIT DEVELOPED BY SSCU, IISc.**

Principal Investigator: Executive Secretary, KSCST  
Budget: Rs.1,00,000/- (KSCST funded)  
Duration: One year (From April 2015)

Prof. A K Shukla, SSCU, Indian Institute of Institute has developed and demonstrated a Hybrid Ultra-capacitor (HUC) lighted solar/ mechanical/ grid chargeable lanterns with mobile charger. This project was financially supported from Department of Science and Technology, Government of India.

KSCST is interacting with the project team and have seen the performance of the lanterns. Prof. A K Shukla has given 10 lighting kits to KSCST for demonstration/ field testing and data collection.

KSCST has identified two residential schools in tribal dominated remote areas where the grid power is frequently fails namely Swamy Vivekananda Youth Movement High School, Saraguru, H D Kote Taluk, Mysore District and Pragathi High School, Bharathanahalli, Kundargi, Yallapur taluk, Uttara Kannada District.

KSCST has provided the lighting kits to the above residential schools for field testing and collecting the data. The Council has identified a caretaker for monitoring the performance of the lighting kits and field data collection.

To get a statistically significant result it is proposed to procure 20 more such lanterns and deploy in 4-5 institutions in rural pockets of Karnataka.

Based on the performance of the lighting kits, KSCST is planning to procure more lighting kits and deploy in the residential schools / hostels in remote areas where the grid power frequently fails.

## FIELD TESTING OF HYBRID ULTRA CAPACITOR (HUC) BASED SOLAR PV - LED LIGHTING KIT DEVELOPED BY SSCU, IISC., BANGALORE

Principal Investigator: Executive Secretary  
Co-investigator: Mr. S N Jayaram  
Budget: Rs.1, 00,000/- (KSCST funded project)  
Date of start: April 2015

### Background:

Prof. A K Shukla, SSCU, Indian Institute of Institute has developed and demonstrated a Hybrid Ultra-capacitor (HUC) lighted solar/mechanical/grid chargeable lanterns with mobile charger. This project is being carried out with the financial support from the Department of Science and Technology, Government of India. Prof. A K Shukla has agreed to provide these lighting kits to KSCST for demonstration/ field testing and data collection.

### Progress

KSCST & MESHA (Manufacture) have installed these lanterns lighting in various residential schools & institutions maintained by Trusts / NGO. The details are as follows.

Sl No	Name of the District	State	No of Lights
1	Bengaluru	Karnataka	10
2	Mysore	Karnataka	10
3	Chamarajanagara	Karnataka	04
4	Chickmagalur	Karnataka	37
5	Uttara Kannada	Karnataka	04
6	Chitradurga	Karnataka	05
7	Badra, Worli, Prabalmachi, Valap	Maharashtra	10
8	Brestwana, Doda	Jammu & Kashmir	20
		<b>Total</b>	<b>100</b>

The Council had identified caretakers for monitoring the performance of the lighting kits and field data collection. The lighting kits are working satisfactorily and the users are happy about the performance of these lighting kits.

Based on the response from the field, Prof. A. K. Shukla SSCU, IISc has agreed to provide additional lighting kits to KSCST for field testing of HUC Technology in different climatic zones. As suggested by the Dept. of Science and Technology, Government of India, KSCST is providing additional 50 lighting kits to North Eastern States i.e. Nagaland, Meghalaya, Manipur, Mizoram and Arunachal Pradesh (10 lights for each States).

**FIELD TESTING OF HYBRID ULTRA CAPACITOR (HUC)  
POWERED SOLAR PV - LED LIGHTING KIT  
DEVELOPED BY SSCU, IISc., BANGALORE**

Principal Investigator : Executive Secretary, KSCST  
Co-Principal Investigator : Mr. S N Jayaram, KSCST

**Background:**

Prof. A K Shukla, Solid State Structural Chemistry Unit (SSCU), Indian Institute of Science and MESHA Energy Solutions Pvt. Ltd Bangalore have developed and demonstrated a Hybrid Ultra-Capacitor (HUC) Technology for energy storage applications. This project was given financial support from Department of Science and Technology, Government of India. KSCST has taken the responsibility of field testing the technology in different climatic conditions.

**Progress**

The MESHA Energy Solutions Pvt. Ltd. has designed & developed the HUC powered Solar PV home lighting kits, Lanterns with mobile charger, Street lights and micro-grid applications. KSCST has deployed 150 number of 100F capacity HUC powered Solar PV lanterns in North Eastern States, Jammu & Kashmir, Maharashtra, and Karnataka. The details are as follows.

Place of deployment	Region	No of Lighting kits
Bangalore	Karnataka	18
Mysuru		14
Sirsi		6
Sringeri		30
Chitradurga		10
Assam	North East India	10
Arunachal Pradesh		10
Manipur		10
Nagaland		10
Meghalaya	10	
Breswana	Jammu & Kashmir	22
Total		150



The performance of the HUC lantern is found to be good and could be replicated in several remote places where grid supply is not available or not sufficient.

Further, the MESHA Energy Solutions Pvt. Ltd. has developed the 500F capacity HUC powered Solar PV home lighting kits and Solar PV street lights to meet the lighting load of un-electrified villages and hamlets. KSCST has installed one lighting kit at the Regional Office, Rural Electrification Corporation Limited (Government of India Enterprise) Bangalore and is collecting the data for monitoring the performance of this HUC Powered home lighting kit, with a view to introducing this technology for remote and un-electrified village electrification under Deendayal Upadhyaya Grama Jyothi Yojana National Programme.



#### Technical Specification of HUC Powered Solar Home Kit.:

Input	<ul style="list-style-type: none"> <li>• 40 Wp Solar PV Panel</li> </ul>
Storage	<ul style="list-style-type: none"> <li>• 2 x 12V 500F Hybrid Ultra Capacitor,</li> <li>• 1 x 11.1V 15600 mah Lithium-ion Battery,</li> <li>• 1 x Smart Controller – Controls both HUC &amp; Battery</li> </ul>
Total storage	<ul style="list-style-type: none"> <li>• 154 whr</li> </ul>
Output	<ul style="list-style-type: none"> <li>• 4 No. of 6 Watt LED lights</li> </ul>
<b>Total run-time</b>	<ul style="list-style-type: none"> <li>• If one light is used 20 hrs, Two Lights 12 hrs, Three lights 8 hrs, Four lights 5 hrs</li> </ul>