



**AARUPADAI VEEDU
INSTITUTE OF TECHNOLOGY**
OMR, PAIYANOOR, CHENNAI - 603104



**VINAYAKA MISSION'S
RESEARCH FOUNDATION**
(Deemed to be University under section 3 of the UGC Act 1956)



Accredited by NAAC



Approved by AICTE



IIT Delhi



मानव संसाधन विकास मंत्रालय
MINISTRY OF
HUMAN RESOURCE DEVELOPMENT



उन्नत भारत अभियान
UNNAT BHARAT ABHIYAN


उन्नत भारत अभियान 2.0 UNNAT BHARAT ABHIYAAN 2.0

PROJECT REPORT

ON

DC MICROGRID BASED SOLAR PV GENERATION TO SUPPLY POWER TO STREET LAMP AND COMMON UTILITIES IN A VILLAGE

1	Name of the institute& code	AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY C-10224
2	Title of the project	DC micro grid based solar PV generation to supply power to street lamp and common utilities in a village
3	Name of Subject expert group	Dr. G. EZHILARASAN, Professor Dr.L.Chitra, HoD & Associate Professor Mr.V.Rattan Kumar, Assistant Professor Department of Electrical and Electronics Engineering, AVIT
4	Name of villages where project development activities was carried out	Irular Colony (Tribal), Arunkundram Village, Tiruporur Taluk, Kanchipuram District Tamil Nadu – Pin 603 109.
5	Duration/ Budget of the project	6 Months, Rs. 50,000/-
6	Brief Introduction	The survey done under UBA scheme has prioritized few problems in the adopted villages. One among them is Irular community (Tribes) living in darkness without street lamp. Hence the department of EEE proposed to design DC micro grid based solar PV generation in a centralized location for easy maintenance and management. The team has selected tribal area at Arunkundram village that consist of 15 families

		living in two streets. The team have also planned to install 4 street lamp, two to each street.
7	Current status/Achievement of the project	This project has been successfully completed. The team were happy to see the glow among the people and especially children running in happiness. The team would also like to thank UBA that they could be a part in making the tribes dream a reality.
8	Project Outcomes	<ul style="list-style-type: none"> • Implementation of renewable energy for power generation • Solar Photovoltaic based Centralised Power Generation setup • Improved efficiency in the dc output by using efficient dc-dc converter. • Usage of dc microgrid principle to power the electrical load • Powering of 4 street lamps using the solar Photo Voltaic power for two streets of approximately 100 meter length
9	Description of Project in 150 words	The principle aim of this work is to provide street lighting in the Tribal area at Arunkundram v village using centralised solar photovoltaic based power production. To achieve the above, a location is selected in the village common area, to setup solar panels which produces electrical energy during the day time to be stored in batteries for usage during night hours for street lighting. The innovativeness of this work is that instead of converting the dc power stored in the battery to ac power using converter, the dc power is used directly using newly designed efficient dc-dc converter and the principle of DC microgrid. Thus this system is safe due to low voltage levels, efficient due to improvised converter and easy to maintain and troubleshoot in case of any problems after installation.
10	Photos of the UBA activities (maximum of 6 photograph of high resolution)	 <p>A photograph showing a dirt road in a village. On the left, there are lush green trees and some dry brush. On the right, there is a small white building with a red roof. The ground is uneven and dusty.</p> <p>A) Village street before the installation of street lamps</p>



B) Installation of LED street lamp on metallic post




C) Constructed Power Room with Solar Panel on Roof Top



D) DC-DC Converter assembly, with batteries and LED Lamps during testing in the laboratory of EEE department at AVIT.



E) View of the illuminated street during the night time

		 <p>F) HOD/EEE, AVIT, With Faculty members and Villagers at the project site.</p>
11	Description of each photos in maximum of 50 word	<p>A – Village street before the installation of street lamps</p> <p>B – Installation of LED street lamp on metallic post</p> <p>C – Constructed Power Room with Solar Panel on Roof Top (centralised Power Production)</p> <p>D- DC-DC Converter assembly, with batteries and LED Lamps during testing in the laboratory of EEE department at AVIT.</p> <p>E – View of the illuminated street during the night time</p> <p>F- HOD/EEE, AVIT, With Faculty members and Villagers at the project site.</p>
12	Impact of the Project in the adopted village	<ul style="list-style-type: none"> ➤ Use of renewable energy by tribes (Advance technology) ➤ Holistic improvement in the quality of life ➤ Improvement in the performance of school going children ➤ Beneficent for women to do house hold activities at night
13	4 key words	DC Microgrid, DC-DC converter, Solar PV generation, Village LED Street lighting
14	Link of video	
Optional		
15	Other relevant information (100 words) optional	<p>The impact of this project on the learning of the teachers and students is that the students can visit and understand the concept of power production from solar photovoltaic system at smaller scale using this village as a model. They can have a look at the converters used for the energy conversion and also the concept of micro grid which is gaining popularity against ac grid (currently used). The students can</p>

		<p>learn the basic infrastructure requirements of a village with respect to power production and consumption In short they can know about various aspects of rural electrification.. This work will also give an exposure to study newer power electronic converters that can convert solar power efficiently over the conventional / commercially available converters. This work will ensure that this rural village becomes an example of localised electricity production for the use of common utilities like street lamps. Upon extension, this concept can be implemented at a bigger scale using microgrid principle for renewable power generation to feed even domestic households</p>
--	--	--