



5th International Conference on Advances in Energy Research, ICAER 2015, 15-17 December 2015, Mumbai, India

## Localization of Solar Energy through Local Assembly, Sale and Usage of 1 Million Solar Study Lamps

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### Abstract

The concept of 'Solarization' has been doing rounds for past decade. Use of Solar Energy is advocated by many; however, the sustainability of the solar energy has never been discussed. 'Localization of Solar Energy through Local Assembly, Sale and Usage of 1 Million Solar Study Lamps', an initiative by IIT Bombay in partnership with NCEF tries to address the challenges of sustainability through the twin pillars of 'Localization and Saturation'. Moreover, under this project the focus is given on making the rural economy self-sufficient in solar products along with accomplishing the aim of Right to Light to each child. In this paper, we discuss the energy requirements of rural India, followed by technical design of the SoUL lamp that has been distributed, along with a brief idea of the objectives and the framework which has been incorporated while distributing SoUL.

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Peer-review under responsibility of the organizing committee of ICAER 2015

*Keywords:* Solar Photovoltaic, Economic, Solar Lamp, Energy, Localisation

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## 1. Introduction

There is a general consensus about the fact that energy access is one of the key factors that can lead a country to the path of economic development, and more so by achieving the sustainable development. In other word, energy development is the path to economic development. Given that the energy needs all over the world are fulfilled from the limited means of the fossil fuels, which won't last forever, hence it is in the best interests of the countries to not only discover but also propagate the idea and therefore, the benefits of adopting renewable energies. Around the world, there is no dearth of literature either favoring renewable technologies or opposing them. Most of the literature appraising renewable technologies argues that it is environmentally viable and saves the limited stock of fossil fuels that is remaining all over the world. However, the opponents of renewable

energy have argued against these claims, most often, questioning whether such technologies can be produced in a cost effective manner. Various NGO's and funding aids tend to omit the remote and underserved village communities, who need the energy the most. In the Indian context, the picture even more dismal. As per Census of 2011, only 55% of the rural households use electricity as the main source of lighting, while 46% of the rural households are dependent on kerosene. Such conditions make it difficult for the rural children to study in the dark hours, which further hamper the scope of economic development. As per Census 2011, 43% of households in the country use Kerosene for lighting purpose; out of which 40.9% in Madhya Pradesh, 39.3% in Rajasthan, 23.9% in Maharashtra and 62.8% in Odisha. India is a very poor in terms of fossil fuel resources; so we import 85% of Oil and 25% of coal. Hence, alternate source of energy is the need of hour.

Therefore, in response to such unfavorable conditions to the young rural population of India and the opponents of renewable energy, IIT Bombay in partnership with National Clean Energy fund (NCEF) initiated the project 'Localization of Solar Energy through Local Assembly, Sale and Usage of 1 Million Solar Study Lamps'. IIT Bombay is partnering with remote rural organizations in four states viz; Maharashtra, Madhya Pradesh, Odisha and Rajasthan to provide solar study lamps for school children to enhance their daily night studies, exams preparation, home work and other educational programs. The primary motive of this project is 'Right to light to each child'.

Under this project, a solar study lamp has been given to the students between the classes of V to XII in the rural schools of the selected blocks of aforementioned four states. In the following sections, we will discuss the technical design of the lamp and a brief review of the project wherein we explore as to how the technical design of the lamp has been beneficial in creating the livelihood for rural people.

## 2. Right to light

Every child in India has been guaranteed a 'Right to Education'. Yet, the conditions in which a child studies are not paid enough attention. This scenario is more prominent in rural India. As already established, that there is still a large chunk of population in rural India which is dependent on kerosene for lighting, it is imperative that use of alternative energies should be promoted. Also, kerosene fumes that blow out of a kerosene lantern, while studying at night is harmful to health and can cause damage to the lungs and eyes. Such conditions prompt an intervention which enables a child to not only has 'Right to Education' but also 'Right to clean light'. By 'Right to clean light', one means that a source of light that causes no harm and is renewable. More so, it should be affordable by all. Million SoUL Project along with NCEF endeavors to provide every child the 'Right to clean light' in all four states in which the project is operational. The project in a way wants to ensure that no child's growth and education should get hampered because he/she can't afford a clean and reliable energy source for lighting purposes.

## 3. Design

The SoUL has primarily been designed keeping in mind to help a child to study at night. However, this doesn't imply that usage of lamp is only restricted to studying. It should also be useful for other lighting purposes. Additionally, since the lamp is to be assembled at the local level, its design is such that allows easy assembly of the

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