Executive Summary of the Project:

Project Title: Solar Powered DC Systems for Domestic Electrification & Rural Application	**Project Sanction Letter:** [(4463)/{Innov-5/2014(Pt)}]/P, Bhubaneswar Date: 13th April 2015
Starting Date of Project: 12th Aug 2015	**Approved Date of Completion:** 11th February 2017 30th November 2017 (with Extension)
Principal Investigator: Dr. Nirod Chandra Sahoo School of Electrical Sciences, IIT Bhubaneswar **Co-Principal Investigator:** Dr. Sankarsan Mohapatro School of Electrical Sciences, IIT Bhubaneswar	**Collaborator:** Odisha Renewable Energy Development Agency (OREDA), Bhubaneswar

Objectives of the Project:

Objectives	Status
Design and evaluation of an integrated PV based home electrification system without and with battery energy (2hrs), to meet the energy demands during day time for different loads such as fan, TV, and light for three house-load models: M-I (< 500W) , M-II (< 750 W) and M-III (< 1000 W)	Completed
Design and evaluation of an integrated PV based home electrification system using battery energy (1 day), to meet the energy demands during day and night time for different loads such as fan, TV, computer, mixer, and light	Completed
Design and evaluation of MPPT controller and battery charging controller	Completed
Evaluation and analysis of the energy saving as well as losses of PV based DC system in comparison to traditional PV powered AC system	Completed
Design of an optimum system considering all the system constraints such as technical feasibility and economic aspects for three house models M-I, M-II, and M-III	Completed

Technical/Scientific Achievements from the Project:

1. M Tech Thesis in Power System Engineering: 'Solar powered dc system for domestic electrification and rural application' by Ajit Kumar Sahu, 2016.
2. N. C. Sahoo, S. Mohapatro, A. K. Sahu and B. S. Mohapatro, "Loss and cost evaluation of typical DC distribution for residential house," IEEE International Conference on Power and Energy (PECon), pp. 668-673. (2016) https://doi.org/10.1109/PECON.2016.7951644.
3. N. C. Sahoo, S. Mohapatro, "Feasibility of Solar PV-Powered DC System for Residential Electrification—A Comparative Study," Proceedings of Symposium on Power Electronic and Renewable Energy Systems Control (PERESC 2020), vol. 616, pp. 171-183, Springer, Singapore. (2021) https://doi.org/10.1007/978-981-16-1978-6_15.