

Chapter 12

Solar Micro Grids: Impact and Future in Rural Uttar Pradesh – Case Study on MGP

Rahul Singh
IMT Ghaziabad, India

Amanpreet Kaur
IMT Ghaziabad, India

Anirban Sharma
IMT Ghaziabad, India

Mansi Gupta
IMT Ghaziabad, India

Kannan TS
IMT Ghaziabad, India

ABSTRACT

Like most of the developing countries, India also has a large number of off-the-grid villages. In spite of government's efforts at rural electrification, many villages cannot hope for grid power in the near future because the cost of setting up the distribution infrastructure. But when these villages come on grid, they place an additional demand on the distribution network and most states are already facing several hours of power cuts because conventional electricity is scarce. Thus these villages remain un-electrified for the simple reason that electricity is not available. This case study deals with the innovative business model of the company "Mera Gao Power" which sets up "Solar Micro Grids" in villages. It further analyses the impact of Solar Power on the socio-economic parameters of the villages where the project has been implemented. Further it discusses the various challenges faced by MGP in sustaining and expanding this business model.

"When you have your first idea, know that it will not work but do it anyway. Because in the middle of it you will get to know what will." (R. Singh, A. Sharma, A. Kaur, M. Gupta, & K. TS, personal interview)

Nikhil Jaisinghani, Co-Founder Mera GAO Power

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INTRODUCTION

Energy is one of the important factors for social, economic, educational development for any country. It is very important for the sustainable growth and improvement of the lives of people living in a particular area. In a country like India with the majority of the population living in villages there are still thousands that are not connected to the main power grid. And even if they are connected, they lack an uninterrupted power supply. A rough estimate states that more than half of the 1.2 billion plus population of the country does not have access to electricity. At present there are 6, 40,867 villages and out of them 1, 07,452 are in Uttar Pradesh. Ministry of Power data puts the percentage of villages in Uttar Pradesh with electricity at less than 42% in 2006 and household electrification percentage figure even lower. Off-grid demand of power still continues to be unmet and communities use low quality sources of energy such as kerosene, wood, diesel, disposable batteries etc. When compared to the traditional power sources micro-grid provides efficient, reliable services to the end users and also helps in overcoming the various hurdles caused due to power shortage. Micro-grids are small-scale modern versions of centralized electricity system and are mostly developed to achieve local goals and help in production, distribution and regulation of flow of electricity to consumers locally. Globally the capacity of Micro-grid power is supposed to grow at a CAGR of 17% and will attain a total capacity of 22GW by 2022. (Census India, 2011)

SOLAR POWER IN INDIA

Due to the huge energy crisis in the country there is an increasing need to tap the energy from renewable forms of energy like wind and solar. In India sun shines for almost 300 days per year and receives on an average over 4500 trillion kWh of pure solar energy which is far greater than the annual energy requirement of the country. Thus the geographical location is ideal for tapping the solar power. The problem, however, is the high installation cost of solar energy systems as compared to the installation of conventional fossil fuel energy system. So, the future of solar power is basically dependent on the reduction in cost to a certain extent because in countries like India low cost is one of the main factors when it comes to production of energy. Grid parity, which is the point when traditional and solar energy are equivalent in cost, will have to be reached for sustainable use of this power source. (Markets and Markets, 2013)

But in recent years it can be seen that solar power is slowly finding its way in the country. India has installed 1.8 Gigawatt solar plants in past three years and the government is working on approving projects for 2.3GW more over the period of next six months. States are pitching in large multinationals like SunEdison, Welspun Energy and Azure to install more solar capacity in the coming years. Central Government of India launched Jawahar Lal Nehru National Solar Mission in 2010, targeting a production of 20,000 MW of solar power by 2022. The first phase i.e. installation of 890 MW of solar energy capacity has been completed till date and this has made solar power much cheaper than what it was two years back. The same energy which was available at Rs. 15 per unit is now available at Rs. 7 per unit.

Gujarat was amongst the first state to come out with a solar policy and has solar energy capacity of 800 MW, closely followed by Tamil Nadu. Other states like Karnataka, Punjab and Andhra Pradesh have also developed respectable solar energy capacity in the last few years. Government of India has also recently launched the ambitious project of setting up the world's largest solar power plant in India which will generate 4000 MW (three times the present total solar energy) of energy from sunlight near

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