



Rural electrification in India and feasibility of Photovoltaic Solar Home Systems

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ABSTRACT

Rural electrification is an integral component of poverty alleviation and rural growth of a nation. In India, electricity has not played effective role in the socio-economic growth of village. Gross Domestic Product (GDP) is increasing with 8% where as contribution of agriculture sector is 1.9%. Government of India has ambitious target of providing electricity to all villages by 2008 and all rural households by 2012. Steps are already initiated with Rural Electric Corporation, Rural Electricity Supply Technology mission, State Electricity Boards, Reforms in Power sector. An attempt has been made in this paper to assess the features of rural electrification in India and the feasibility of Photovoltaic Solar Home Systems (PV SHS).

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1. Introduction

India has one of the fastest growing economies in the world and ranked 6th place in the worldwide consumer of energy. Being the seventh largest country in the world, 6000 villages inhabit 72.2% of its human resource (census 2001). About, 40% of the total energy is in rural areas. Domestic sector constitutes major energy demand and its consumption accounts for 60% of energy used. The main energy sources are coal and oil, whilst hydro, wind, nuclear and biomass provide additional sources. Although hydropower has good potential, it has yet been utilized to its full potential. India holds 7% of the worlds coal reserves, whereas for oil 0.5%. Following are some of the salient aspects having direct and indirect bearings on energy supply, to rural –

- Both the traditional energy and commercial energy are in short supply and the demand supply gap is in increase.
- Pressure on traditional energy resources such as wood is continuously increasing due to growing population.
- Heavy dependence on commercial fuels such as coal and oil as a short term measure for meeting increasing demand is alarming in view of depleting fossil fuels and pollution.
- Energy supply to far-off rural areas is associated with high transportation and transmission losses of about 22.4%.

Thus emphasis should be laid on the auditing of the energy in such a way that ensures affordable, environment friendly and clean energy.

2. Impact of rural electrification

Importance of electricity as a crucial infrastructure input for economic development of the country has been well established. Recent studies of rural electrification indicate the following broad consensus concerning the impact of electrification in the rural areas [1].

A. Quantifiable benefits: cost saving and increased productivity

1. Industrial and commercial uses of electricity

- (a) motive power – replacing liquid fuel
- (b) lighting – replacing liquid fuel or gas
- (c) processing food – replacing liquid fuel, gas, biomass, animal waste
- (d) transport – replacing liquid fuel

2. Household uses of electricity

- (a) lighting – replacing liquid fuel, gas, biomass
- (b) cooking – replacing biomass, animal waste, wood, liquid fuel, coal, gas
- (c) drinking water – replacing liquid fuel for pumping
- (d) home appliances (fan, TV, radio) – replacing batteries, biomass, coal

3. Agricultural uses of electricity

- (a) water pumping – replacing liquid fuel, coal, muscle power
- (b) heating and drying – replacing biomass, coal, liquid

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