India's electrified households still consume less than one-third of the world's average for electricity. A better understanding of this can help to develop effective energy-efficiency policies and tackle challenges of climate change and environmental pollution. An interdisciplinary approach is proposed that can be adopted for research on residential electricity consumption in India.

India's average monthly household electricity consumption is still approximately 90 kWh. Rapid electrification, increasing incomes and technology development indicate that Indian households will buy more appliances in future. Meeting this increased demand by building additional power plants could lead to serious social as well as local environmental issues.

A better understanding of India's residential electricity consumption can help design and implement better energy efficiency and conservation policies and programs. Knowledge of the factors that affect people's decisions to buy and use appliances can inform these interventions and significantly increase their effectiveness. India's residential electricity consumption has received limited attention despite its importance in planning and policy-making. Load forecasting and management based on knowledge of consumption patterns will play a key role in integration of the added RE capacity, which is variable and intermittent. An interdisciplinary approach involving engineering, economics, anthropology, architecture and others is required.

India is the second most populous country in the world with a yearly population growth of1.5% and one third of the population. There is also a high urbanization trend in this country. About 20% of the world's population that has no access to electricity used to belong to India. India's per capita electricity usage was one of the lowest in the world. This figure has improved to one third of the world's average per capita. About 800 million households in India use health damaging energy sources for their cooking, heating and agriculture.

The thesis focuses on the long-term forecasting of hourly electricity demand. Historical data are first analyzed through a clustering analysis to identify trends and patterns, based on a k-means clustering algorithm. Generalized additive model, a relatively new model in the energy forecasting field, gives promising results.

Policy makers need to plan their future investments to ensure access to electricity while reducing emissions. Financing too many power plants would result in a waste of public funds, but financing too few could lead to a blackout. France's non-interconnected territories account for 17% of the national greenhouse gas emissions for electricity generation. The study focuses on one specific French non interconnected territory, Reunion, which is located in the Indian Ocean. As electricity production is less controllable, a precise knowledge of the electricity demand is required to size correctly the different means of production and avoid failure.

The project aims to design a forecasting algorithm to predict future electricity consumption in Indian territories. The model is designed for a forecast horizon between 5 and 15 years. The scope of the study is limited to study the patterns of electricity demand and peak demand.