

Accelerating the Adoption of Technologies for Meeting the Climate Change Challenges: The Case of Photovoltaic Solar Technology

Abstract

The proposed research aims to identify policies for accelerating the adoption of photovoltaic solar technology (PVST). Through analysis of PVST, we will be able to develop a base model which we can adapt for other energy related technologies. Although the overall system of interrelationships is very complex, the linkage between energy use and climate change is almost universally accepted. A variety of models are available or under development for analyzing the short-term and long-term impacts of alternative energy policies on emission of carbon dioxide and other gases that contribute to the atmospheric greenhouse effect and climate change. The subject is so important, however, that additional research is warranted to study the development and adoption of clean energy technologies. When they are studied in isolation, the knowledge gained can certainly lead to better decisions and policies. However, models that simultaneously address technological advancement as well as the adoption have the potential to yield much more profound and important insights. This is because each of the various subsystems in this highly interconnected system is likely to operate with very different time scales and time horizons. Thus, a properly formulated and reasonably comprehensive dynamic model is needed to sort out the net effects of the interrelationships amongst these disparate subsystems. As a first step towards that we will focus on photovoltaic solar technology and develop a prototype model.

Research Objectives

The proposed research will study the technology development and market adoption processes in order to address the following questions:

1. *What are the key metrics for development and adoption of PVST?* A literature review will identify the keywords to be used in patent and bibliometric analyses as well as metrics measuring the technological performance and adoption rates.
2. *What are the potential future development and adoption trajectories of PVST?* Using metrics identified in 1, we will develop performance/development and adoption trajectories using growth curves.