

Title

“Emergence of Technological Innovation System Determinants during Sustainability Innovation”. An exploratory study on organizational and institutional co-evolution

Author

Anna Darmani, Industrial Engineering and Management, Royal Institute of Technology, Lindstedtsvägen 30 100 44 Stockholm, Sweden.
E-mail: anna.darmani@indek.kth.se

Abstract

Climate change as an environmental and international issue has become one of the biggest concerns of current societies. Accordingly, since 1990, as one possible solution, development of renewable energy has followed a double-digit growth rate. The benefits of this growth, however, are slow and their innovation process is highly uncertain. The uncertainty associated with this technological transformation is what that motivated researchers, holding different backgrounds, to explore innovation processes of renewable energy as an important topic of research and address the system dynamics behind them.

At the present time, ambitious governments attempt to increase share of renewable energy within their countries. However, political determinants are not the only influential factors on a decision of an energy company concerning development of renewable technologies. Firms and what they perceive as an opportunity, is dependent on a set of factors. Therefore, technological developments in energy companies, is the result of co-evolution between several system's elements in which actors capabilities are bounded. The main assumption associated with this systematic view is that innovation is built via a flow of technology and knowledge among a group of people and organizations rather than one single player. When it comes to

renewable energy, this systematic perspective includes all elements related to organizations, institutions and artifacts, active in an Innovation System (IS).

Regardless of conducted researches in this field, studying the interaction between different system elements and co-evolution exist between them, specially as a key explanatory variable of success or failure, have been largely lagged behind. So far, enriched researches have been conducted to understand how political framework affects the energy companies' decision-making and how they push renewable energy forward. Though, the role of organizations, specifically energy companies, in this dynamic process is still unexplored.

This study aims to take a step in this path of research. It intends to explore co-evolution of organizational determinants aligned with institutional factors and study impact of compatibility and incompatibility of them (if any) on IS formation and outcome. While organizational and institutional dimensions in IS cover a wide range of elements, this study mainly focus on mutual role of energy firms as a primary player of the organizations and policies as the most dominant factor of institutions. In addition, I investigate to what extend energy companies are dependent on policies concerning energy and how they can gain competitive advantages based on their own stand-alone organizational capabilities. This will be studied how energy companies can become an active player in aligns with the boundaries of a specific institutional framework.

Keywords

Technological Innovation System, co-evolution, institutional framework, organizational capabilities, renewable energy.