

Summary

Adoption of technologies is multi-dimensional in nature, showing that multiple dimensions shape the diffusion of innovation. This study seeks to analyze the factors related to the consumer (namely behavioural, social, and cultural dimensions) and the market in which the uptake and development of technologies takes place. The geographical focus of this dissertation is Lebanon, which was selected as an illustrative case of a developing country context. This selection was based on the idea that diffusion of technologies is influenced by the context in which it is situated. As such, the research focuses on the adoption on two solar energy technologies; i.e, solar thermal and PV systems.

This dissertation is divided into four empirical studies that aim to answer the research questions developed to fulfill the objective of this research. The studies were conducted to understand how concepts from multiple disciplines help policy makers and market strategists to overcome ongoing challenges for the adoption of solar energy technologies. The results are based on a combination of both qualitative and quantitative methods, including 30 in-depth interviews with different groups of stakeholders; namely national government institutes, NGOs, banks, contractors, consultants, the public sector and end users, and a survey among 200 households in the Metn neighbourhood in Lebanon.

The first study sought to explore the importance of the socio-cultural dimensions in the diffusion of solar energy systems. This premise seems to be enriching innovation studies that often ignore the significance of the socio-cultural dimensions and relevant consumer needs. This is because technology adoption is a result of technical, economic, behavioural, social, and cultural factors that directly influence consumers' decision-making regarding technology uptake. Building on the stakeholders' views, interests, and influence, the findings supported the argument that certain market related factors along with the socio-cultural dimension influenced consumers' decisions.

In the second study on consumer adoption of solar thermal technologies, an empirical analysis was conducted in innovation diffusion and environmental psychological concepts to enrich the understanding of 'green' consumer behaviour and green innovation adoption decision-making. The results indicated that relative advantage, observability, consumer novelty seeking, and independent judgement making were significant in all tested models. Thus, supporting the argument that combining theoretical notions from innovation and behavioural studies improves our understanding of consumer adoption decision making.

The third study analyzed the niche internal processes of Strategic Niche Management that shape the development of solar energy niches in Lebanon. This framework was applied to investigate the market formation of solar energy technologies from a societal context. The study compared between solar thermal and solar PV niche development and found that the expectations of one niche affected the other, and contributed to efficient use of knowledge from previous projects. The Strategic Niche Management

framework still needs to address and/or embed important contextual aspects in developing countries. Overall, it was noted that international donors played an active role in the niche development through shaping programs in the country. This was clear in their support in formulating expectations and visions and in contributing to niche networking.

Related to the third study, was the fourth study on the role business models play in bringing sustainable innovation to the market and promoting dissemination, and thus their implications on the diffusion of innovations. Due to the similarities between internal processes of Strategic Niche Management and business models on experimentation, networking, and learning levels, the findings supported the notion that business models play a significant role in facilitating various internal niche process activities and in market development. Examples of the role of three business models applied in the Lebanese context were analyzed. Overall, it was noted that higher adoption rates in the Lebanese solar energy market will be achieved, when certain policy instruments for the end users are utilized, while taking into consideration the actual needs of the latter and the societal conditions in which they live.

Taking into consideration the focus of this research and the findings of its empirical studies, it is deemed important that by linking the diffusion views from consumer and market perspectives, knowledge of a larger diffusion process would be developed. As such, this doctoral thesis offers a multi-disciplinary analysis of the complex phenomenon of the diffusion of eco-innovations. Finally, the outcomes of this doctoral study provide insights to the academic literature in both innovation and transition studies, and behavioural research.