Predicting Acceptance and Adoption of Renewable Energy Community solutions: The Prosumer Psychology

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Abstract : This research, in the frame of social acceptance of renewable energies and community-based production and consumption models, aims at (1) supporting a data-driven approachable to dealing with climate change and (2) identifying & quantifying the psycho-sociological dimensions and factors that could support the transition from a technology-driven approach to a consumer-driven approach throughout the emerging "prosumer business models." In addition to the existing Social Acceptance dimensions, this research tries to identify a purely individual psychological fourth dimension to understand processes and factors underling individual acceptance and adoption of renewable energy business models, realizing a Prosumer Acceptance Index. Questionnaire data collection has been performed throughout an online survey platform, combining standardized and ad-hoc questions adapted for the research purposes. To identify the main factors (individual/social) influencing the relation with renewable energy technology (RET) adoption, a Factorial Analysis has been conducted to identify the latent variables that are related to each other, revealing 5 latent psychological factors: Factor 1. Concern about environmental issues: global environmental issues awareness, strong beliefs and pro-environmental attitudes rising concern on environmental issues. Factor 2. Interest in energy sharing: attentiveness to solutions for local community's collective consumption, to reduce individual environmental impact, sustainably improve the local community, and sell extra energy to the general electricity grid. Factor 3. Concern on climate change: environmental issues consequences on climate change awareness, especially on a global scale level, developing pro-environmental attitudes on global climate change course and sensitivity about behaviours aimed at mitigating such human impact. Factor 4. Social influence: social support seeking from peers. With RET, advice from significant others is looked for internalizing common perceived social norms of the national/geographical region. Factor 5. Impact on bill cost: inclination to adopt a RET when economic incentives from the behaviour perception affect the decision-making process could result in less expensive or unvaried bills. Linear regression has been conducted to identify and quantify the factors that could better predict behavioural intention to become a prosumer. An overall scale measuring "acceptance of a renewable energy solution" was used as the dependent variable, allowing us to quantify the five factors that contribute to measuring: awareness of environmental issues and climate change; environmental attitudes; social influence; and environmental risk perception. Three variables can significantly measure and predict the scores of the "Acceptance in becoming a prosumer" ad hoc scale. Variable 1. Attitude: the agreement to specific environmental issues and global climate change issues of concerns and evaluations towards a behavioural intention. Variable 2. Economic incentive: the perceived behavioural control and its related environmental risk perception, in terms of perceived short-term benefits and long-term costs, both part of the decision-making process as expected outcomes of the behaviour itself. Variable 3. Age: despite fewer economic possibilities, younger adults seem to be more sensitive to environmental dimensions and issues as opposed to older adults. This research can facilitate policymakers and relevant stakeholders to better understand which relevant psycho-sociological factors are intervening in these processes and what and how specifically target when proposing change towards sustainable energy production and consumption.

Keywords : behavioural intention, environmental risk perception, prosumer, renewable energy technology, social acceptance