Preface

This research is an outcome of four years of research, discussions and readings in user experience of smart home energy technologies and related subjects. My energy technology user experience research emerged from BCDC Energy research consortium work starting from 2016, which led to a research project “Iisisti Energinen” in the small town of Ii. There, I had the chance to conduct empirical research in households which used smart home energy management systems. Later, empirical research was extended to households in the Southern Finland. Furthermore, an online survey concerning energy communities was conducted for more than 1300 contacts, followed by telephone interviews on values related to energy communities. The results of the last two studies have not yet been published or included in the five papers included in this thesis. This thesis takes a view on the present situation of user experience of the smart home energy technologies. The future articles will be based on the research presented here and combine gained knowledge with the results of two energy community studies to draw design implications for future smart home energy technologies.

The articles included in this thesis are based on interviews, observations and data collection in 28 Finnish households. The first article “User values of smart home energy management system: sensory ethnography in VSD empirical investigation” (2019) presents the key user values of smart home energy management system (SHEMS) users. The second article “Warmth is more than temperature: it is a feeling” (2020) describes the sensory user experience related to SHEMS and energy use, but also to home environment. The third article “Impacts of home energy management systems on electricity consumption” (2021) shows how energy consumption volume and profiles changed due to use of SHEMS. The fourth article “Drivers and Barriers to the Adoption of Smart Home Energy Management Systems – Users’ Perspective” (2021) presents identified key drivers and main barriers to adoption of SHEMS among three user groups. The fifth article “Gender inclusiveness in adoption and use of home energy technologies” (2022) takes a critical view on the lack of gender inclusiveness in adoption and use of SHEMS and other smart home technologies.

I believe technology is not value-free but needs a social basis. Technology is affected by society and values, and on the other hand technology influences the society and values. Conductive values and structures sustain certain technologies, and technological changes precipitate social, structural and value changes. Energy transition accelerates development and diffusion of energy management technologies and services, and these will be adopted increasingly in homes. Energy is a vital part of everyday life and thus energy transition touches us all. New energy technologies and digital services may influence our practices and values, and reciprocally our values and practices direct us to use (or not to use) digital solutions in certain ways, resulting different impacts on environment, society and individuals. The aim of my work is to understand what values are related to smart home energy management systems and energy communities, and how these values should be taken into consideration in the design of technologies, services and structural changes.

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