

Innovating for transformative change towards sustainability

Paula Kivimaa

Senior Research Fellow, SPRU

Senior Researcher, SYKE



US

University of Sussex

SPRU – Science Policy Research Unit

Innovations for sustainable economy – future needs

- **From technological to social, institutional and service innovation**
 - Social: increased need for new practices, e.g. joint procurement of solar panels or energy services
 - Institutions: overarching changes in formal regulatory structures and policies, e.g. transformative innovation policy
 - Services: orientation towards reduced ownership of high-carbon technologies, e.g. mobility as a service (MaaS)



Source: www.ymparisto.fi

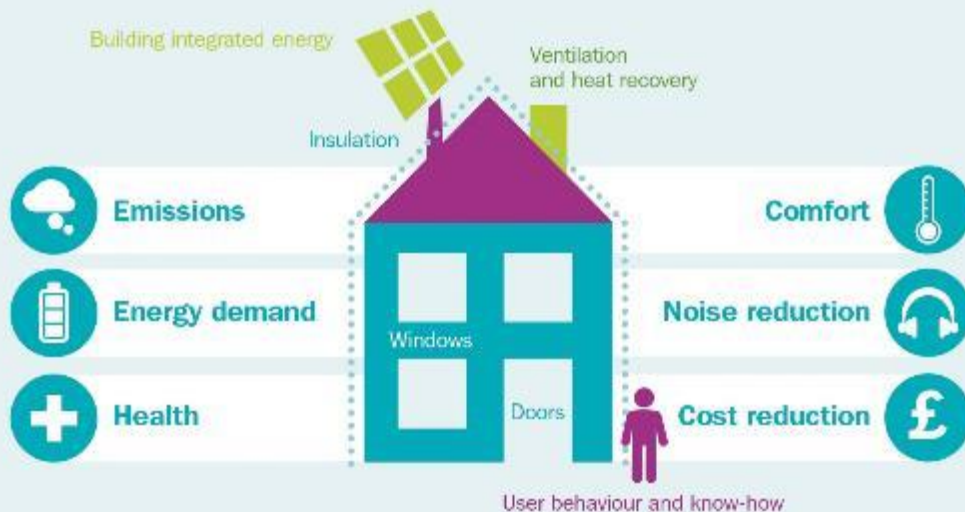


Source: peakcar.org

Innovations for sustainable economy – future needs

- **From modular to architectural and system innovation**
 - Architectural: novel combinations of existing solutions, e.g. for low energy housing
 - System: novel combinations of multiple innovations, e.g. transforming mobility systems

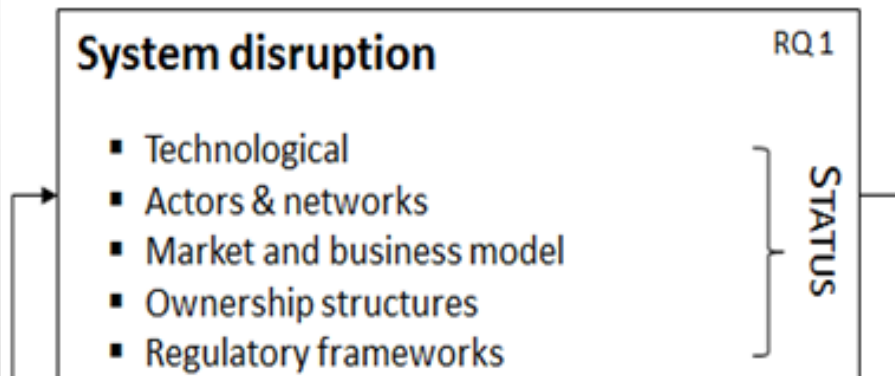
Whole house approach to energy efficiency



Innovations for sustainable economy – future needs

- **Disruptive innovation**

- Disruption of unsustainable sociotechnical systems, e.g. energy intensive building, mobility and industry to speed up change (Kivimaa & Kern 2016)
- Extending from disruptive innovation in the firm level (Christensen 1997) to market disruption (Dijk et al. 2016) and institutional disruption (Johstone et al. 2017)



Source: Johstone et al. 2017

Emerging governance trends as part of sustainable innovation

- **Experimental governance culture**
 - E.g. Sabel & Zeitlin 2012, Broto and Bulkeley 2013, Karvonen & van Heur 2014
- **Policy, social and technological experimentation**
 - E.g. transport governance and basic income experiment in Finland
 - What are the explicit and hidden agendas? Where does this lead to?
- **Alternatives/complements to state-led governance**
 - Community initiatives, living labs, public-private partnerships (e.g. Evans & Karvonen 2014, Seyfang et al. 2014)
 - Intermediary actors at the interface of public and private
- **Policy mixes in the context of transformational/transition policy**
 - E.g. 'transformational innovation policy' (Schot & Steinmuller 2016)
 - Innovation supporting and regime destabilising policies (Kivimaa & Kern 2016)

Upscaling or embedding?

- Embedding, as a process, is difficult.
 - Requires active work & engagement by participants, and time for systemic, institutional, and actor-based dynamics to play out.
- Embedding contains four macro processes:
 - Scaling up
 - Replication
 - Circulation
 - Institutionalisation

