Sustainable Innovation 2015
20th International Conference
'State of the Art' Sustainable Innovation & Design
9th – 10th November 2015
University for the Creative Arts
Epsom, Surrey, UK
www.cfsd.org.uk

The Centre for Sustainable Design®

Exploring the Role of Intermediaries in Smart Grid Developments.

Matthew Cook, Per-Anders Langendahl, Stephen Potter, Helen Roby, Trevor Collins and Dan Taylor
Open University and Smart Grid Consultancy, UK

Smart grid pilot projects have been initiated in a number of locations across the UK, e.g. London, Manchester, and Milton Keynes. Funded from the UK energy regulator's (Ofgem) Low Carbon Network Fund (LCNF), these projects focus on the development and application of various innovations to augment distribution network management. Innovations considered in these projects include various technologies such as smart meters and electrical energy storage devices, as well as novel institutional arrangements which form the basis of commercial demand side response (DSR) initiatives.

DSR initiatives aim to reduce electricity demand at peak times or alleviate fault recovery. Significant electricity users (industrial and commercial) who are able to generate their own electricity and switch off non-essential equipment at peak times are recruited to DSR initiatives for these purposes. Contractual arrangements are then established to formalise arrangements between such parties and the Distribution Network Operator (DNO). However, while these institutional innovations are important components of smart grids, little is known about the processes through which they are developed. In this contribution, we therefore draw on a range of sources including the LCNF projects to begin to address this gap in knowledge. Using the Accessibility Mobility Receptivity (AMR) conceptual framework (Trott, 2005), we explore the practices of intermediaries known as aggregators who play a key role in the development of DSR initiatives and associated institutional innovations.

The AMR framework has been used in a normative way to promote efficacious intermediary practices as part of technology transfer (*cf.* Cook et al., 2006) as well as in analytical mode to explore intermediary practices associated with service and institutional innovations (Cook et al., 2012). This framework draws attention to intermediary practices which aim to promote: 1) accessibility – the availability of innovations and information about them; 2) mobility – the establishment of intermediary channels through which innovation can move between sources of innovation and contexts of application; and 3) receptivity - the ability and willingness of the receiving organisation to accept, absorb and utilize an innovation. Initial findings suggest that aggregators form a mobility channel (between DNOs and participating firms) for DSR innovations. However, far from a linear unidirectional process, an interactive process was observed through which receptivity to DSR innovations is constructed by intermediaries. On one hand, aggregators help participating firms explore their internal environments and articulate ways to reduce electricity demand. On the other, DNOs redevelop DSR innovations in response to such articulations. Thus in conclusion, far from lying out there waiting to be discovered, receptivity to DSR innovations is constructed through aggregator practices, which are fundamentally interactive. This suggests that user centered models of innovation, which render successful innovation the outcome of a tight fit between innovations and user needs identified *a priori*, may be of limited value in the development of DSR initiatives. Rather, work to develop DSR initiatives should focus on creating contexts in which intermediary interactions, through which receptivity to associated institutional innovations is constructed, can flourish.