Panel Title: Urban energy transitions: emergent intermediaries and the need to connect energy flows

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Panel Schedule

Introduction by the organizers	10	Debizet, Yalcin-Riollet, Tabourdeau
Paper 1	20	Mette Kragh-Furbo and Gordon Walker, DEMAND Centre and Lancaster Environment Centre, Lancaster University g.p.walker@lancaster.ac.uk **Switching things on and off: the intermediary roles of 'aggregators' in the making and enactment of grid balancing demand response in the UK** One of the many ways in which energy systems are being reworked is in terms of shifting relationships between electricity demand and supply. From demand being taken largely as given, there is now a spreading enactment of new forms and methods of 'balancing', in which demand becomes temporally responsive to both patterns of peak creation and to fluctuations in supply from renewable energy sources. Whilst there are various ways in which demand responsiveness can be pursued and practised, currently operational schemes in the UK and elsewhere entail enrolling mundane electricity using (and producing) technologies into monetised and contractual relations with the national grid operator. Intermediary actors, known as **'aggregators', have become crucial to making and enabling these new sets of relations between the dynamics of demand and supply**. Aggregators sit in-between demand response schemes run by the national grid operator, and the wide diversity of industrial, commercial and public sector organisations that have the potential to be responsive to the needs of the electricity system. Based on a set of **interviews with aggregators in**

the UK, analysis of marketing materials and observation at industry events, in this paper we analyse and conceptualise the intermediary roles that aggregators are performing. These **roles extend beyond enabling flows of knowledg**e to include the **active (re)assetization of spatially dispersed energy using and producing devices**; the **material scaling up** of response capacity; the **infrastructural establishment and ongoing enactment of flows of information, evidence and money**; and the **anticipatory shaping of expectations** as to how risks, benefits and costs of scheme participation are distributed. We reflect on the characteristics of the relational, networked geography of demand response that aggregators are co-producing, and the possibilities and tensions at work within its further evolution.

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Collective self-supply and self-consumption in urban situations

The paper reviews the different ways, advantages and drawbacks of developing 'energy communities' centred on self-supply and self-consumption devices within urban situations. For the sake of simplicity, only electricity will be considered. The electrical distribution network is structured in a tree-like manner, and each final branch, behind a low-voltage cab called "feeder", typically serves 100 to 200 meters. There is a great interest in trying to balance production and consumption at the level of the feeders, in particular to avoid having to reinforce the network but also because it is a physical place that brings together neighbours. At first view, this situation should foster the constitution of communities centered on feeders, which would exchange electricity directly (an thus establish microgrids). Today, the direct exchange of electricity between neighbours is allowed in some European countries and forbidden in others. However, **allowed models are based on a restricted way of measuring electricitiy and on a limited number of governance forms.**

In order to discuss the various possible actualisations of these energy communities, I consider them as **sociotechnical assemblages** with various interlinked dimensions: metering, governance, means of production, uses (households and other types of activities, electrical

vehicles, heat pumps, …) and exchanged signals. These assemblages are analysed according to the following criteria: **resilience (including high or low tech), user involvement, technological versus social innovation, energy autonomy**. I show how external links between communities are related to internal links within communities. I discuss also **the value to be attributed to the link to the distribution network and other forms of solidarity at a larger scale.**
The paper will be fed with preliminary results from a research in progress in which I explore the 'flexibility' of users in area in which many PV panels are installed (10% of households). We can observe two things: **collective self-consumption is already high (more than 90%); users are interested to join not for financial reasons but to develop a collective project with their neighbours and to participate to the energy transition**. Other reflexions will come from a nascent fieldwork constituted by multiple **'living labs' in Brussels** about energy and people.

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Intermediaries as niche for local energy transitions: case studies in three urban areas
Abstract for the Panel: Urban energy transitions: emergent intermediaries and the need to connect energy flows
At the Sustainable Urban Energy Systems Conference, TU Delft Science Centre, 8-9 November 2018
The urban socio-technical energy system presents an important domain for the shift towards sustainability of cities. A key for sustainable energy transitions at the local level are changes to the social organization of infrastructure systems, especially at cutting edges between producers and consumers, policy and producers but also different infrastructure systems like energy and waste or energy provision and habitation. One way for achieving this effect is intermediary institutions. This concept has been discussed in literature since several decades, e.g. as change agents or brokers. Still, the focus in innovation research is often on utilities and regulators as well as on consumers, neglecting the actors in-betweeni. Even though they have always existed, a growing significance of

these actors “operating across the traditional spheres of provision, use and regulation as well as between technologies, nature and the city” (Moss 2011: 21ii) is stated in literature. Van Lente et al. iii,iv postulate the need for “systemic intermediaries”. These are defined as “functioning at system or network level” v connecting, translating and facilitating flows of knowledgevi. This concept takes into account the more complex settings and changing relations between the stakeholders as well as the notion of governance as a more fluid and relational approach to political actionvii.

The presentation will build on three case studies on energy transitions in Berlin, Frankfurt/Main and Ruhr Metropolis. They were realized in the framework of a PhD thesis project. In all three cases, intermediaries play an important role as socio-technical niche for energy system innovations. The form of the intermediary is strongly linked to the local context, socio-technical system and its history. The presentation will go into these differences and the roles of the intermediaries. A concrete focus will be on the example of the development of the virtual power plant by the intermediary institution ABGnova in Frankfurt/Main. This intermediary links the housing sector (ABG) and the local energy provider (Mainova) as shareholders as well as the city of Frankfurt, research institutions, end users and other actors.

The presentation will thus provide empirical insights but it will also reflect how to link the concept to approaches theorizing local transition processes.

i Moss, Timothy, Guy, Simon, Marvin, Simon, Medd, Will (2011), ‘Intermediaries and the Reconfiguration of Urban Infrastructures: An Introduction’, in Guy, Simon, Marvin, Simon, Medd, Will, Moss, Timothy (Eds.), *Shaping Urban Infrastructures. Intermediaries and the Governance of Socio-technical Networks,* London and Washington DC

ii Moss et al. (2011) See note i

iii Van Lente, Harro, Hekkert, Marko, Smits, Ruud (2011), ‘Systemic Intermediaries and Transition Processes’, in Guy, Simon, Marvin, Simon, Medd, Will, Moss, Timothy (Eds.), *Shaping Urban Infrastructures. Intermediaries and the Governance of Socio-technical Networks,* London and Washington DC.

iv Van Lente, Harro, Hekkert, Marko, Smits, Ruud,

van Waeveren, Bas (2003), 'Roles of systemic intermediaries in transition processes', *International Journal of Innovation Management* 7/3: 247-289

v Van Lente et al. (2003), see note iv: p. 275.

vi Van Lente et al. (2011), See note iii

vii Mayntz, Renate (2005), 'Governance-Theorie als fortentwickelte Steuerungstheorie?', in Schuppert, Gunnar Folke (Ed.), *Governance-Forschung. Vergewisserung über Stand und Entwicklungen,* Baden-Baden, 11-20.

Collective Discussion	15	All
Conclusion	5	Debizet, Yalcin-Riollet, Tabourdeau
Total	90	