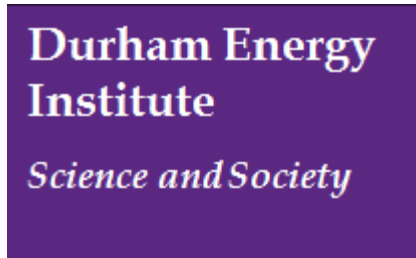


# From customers to prosumers in an equitable low carbon transition



Sandra Bell and Janice Astbury

# Energy Systems Integration – Research Challenges

iiESL, 6 August 2015

# Contemporary dilemmas facing the electricity utilities

- Greater efficiency to **reduce carbon emissions** in face of climate change
- Need to more effectively **match supply and demand** through renewable generation and accompanying intermittency
- Pressures to **increase efficiency despite ageing assets**. In UK these need to be nurtured as wholesale replacement too expensive
- Above bullets linked to development of **smart grids** that move the electricity distribution system into the **digital age**
- Development of smart grids is linked to the increased **electrification of private transport** and to the **spread of micro-generation** particularly solar powered.

# Presentation Outline

- Focus on domestic customers – but important not to lose sight of SMEs
- Reconfiguring demand side management
- Considerations of vulnerability, equity and justice in energy transitions

# Demand Side Management: brief history of an idea

- Demand side management (DSM) initially mainly applied to industrial and commercial customers
- Design philosophy of distribution networks for domestic customers regarded demand “not as something to be differentiated, promoted or controlled, but as a non-negotiable need that had to be met” (van Vliet, Shove, & Chappells, 2012, p. 31). Customers are passive.
- Can this model provide overall reduction, altered load shapes and two way power flows?

# Recent efforts towards demand side management

- Top down command and control load management practices
- Replicates the characteristics of the system that produced it

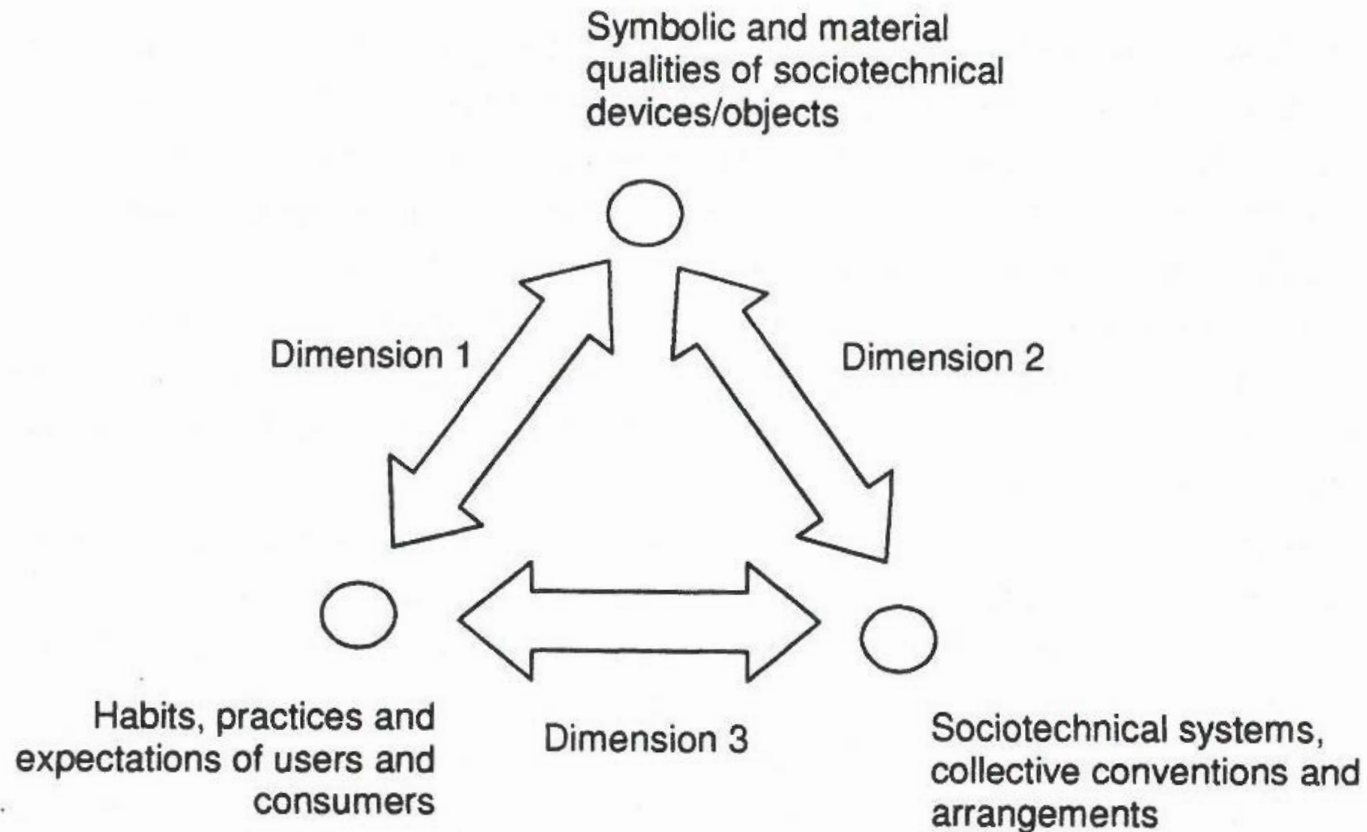


# Demand Side Management versus Demand Side Participation: a 'soft energy path'

Facet	DSM Practices	DSP Practices
<b>Perspective of Operation</b>	To Manage	To involve
<b>Implicit model of public's understanding</b>	High Individualised	Socially aware active participants (citizens)
<b>Implicit characterisation of people</b>	Deficient, limited and with little interest beyond minimising inconvenience	Discriminating, grounded in own or trusted others' experiences
<b>Mode of Communication</b>	Information Provision	Knowledge transfer
<b>Direction of Communication</b>	One-way	Two-way
<b>Content of Communication</b>	Factual'	Social meanings' of technology
<b>Purpose of Communication</b>	Inform choice and individual decisions making	Build trust and respect, to enable co-provision of services
<b>Locus of Control</b>	Producer-led	User-led
<b>Direction of influence</b>	Top down: expert to lay	Reciprocal
<b>Motivation</b>	Self-interest	Both self-interest and self-transcendent
<b>Attribution of responsibility</b>	Specific stakeholder e.g. Utility company	shared between stakeholders e.g. Utility and users
<b>Normative influence</b>	Predominately individual (personal)	Predominately social
<b>Type of 'energy path'</b>	Hard	Soft

*Potential facets of social construction of demand-side management and demand-side participation perspectives (Devine-Wright & Devine-Wright, 2005, p. 176)*

# Co-evolution of technical systems



**Figure 3.1.** Three dimensions of co-evolution



# Smart Grids

## Potential for decentralised networks

### Pecan Street Project, Austin, Texas

- Third industrial revolution? (Rifkin, 2011)
- Allows for social experimentation (McLean, 2013)





# Prosumers

“Some electricity industry stakeholders...have characterised prosumers as a threat to grid reliability and to established utility sector business models because of revenue erosion and the prospect of stranded assets. Other stakeholders have argued that these challenges must be addressed and overcome because prosumers represent a beneficial, necessary and inevitable evolution of the electricity industry.”  
(Rickerson et al., 2014, p. 6)

# Power *from* the People

- Policies and Regulation

*“how do national differences in prosumer policies reflect the pattern of power structures and norms and differences in regulatory traditions and requirements in the electricity sectors in specific countries’ national system and the degree to which they might fit policies at supranational or federal levels – in this case those of the EU?”*

- Citizen-consumers

# **Considerations of vulnerability, equity and justice in energy transitions**

- Integrating equity and justice into energy policy, governance and implementation is a necessary part of achieving a sustainable and socially progressive transition to a low carbon future.
- Access to affordable, safe and reliable energy varies over space and time, and between and within social groups, leaving some people energy vulnerable.


# The Interdisciplinary Cluster on Energy Systems, Equity and Vulnerability (InCluESEV)

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## Welcome to InCluESEV



The final InCluESEV conference, *Energy justice in a changing climate: defining an agenda*, took place on November 10th and 11th.

The Interdisciplinary Cluster on Energy Systems, Equity and Vulnerability (InCluESEV) is an interdisciplinary research cluster led by King's College London, the Universities of Lancaster and Durham. It brings together academics and practitioners working on issues of equity, vulnerability and low carbon energy systems.

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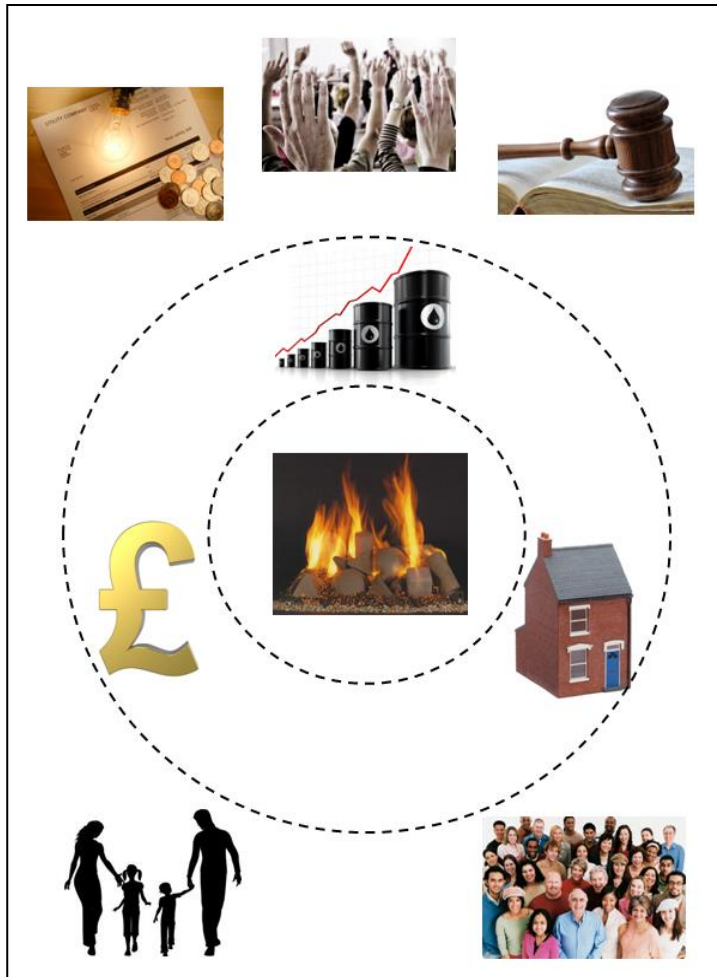
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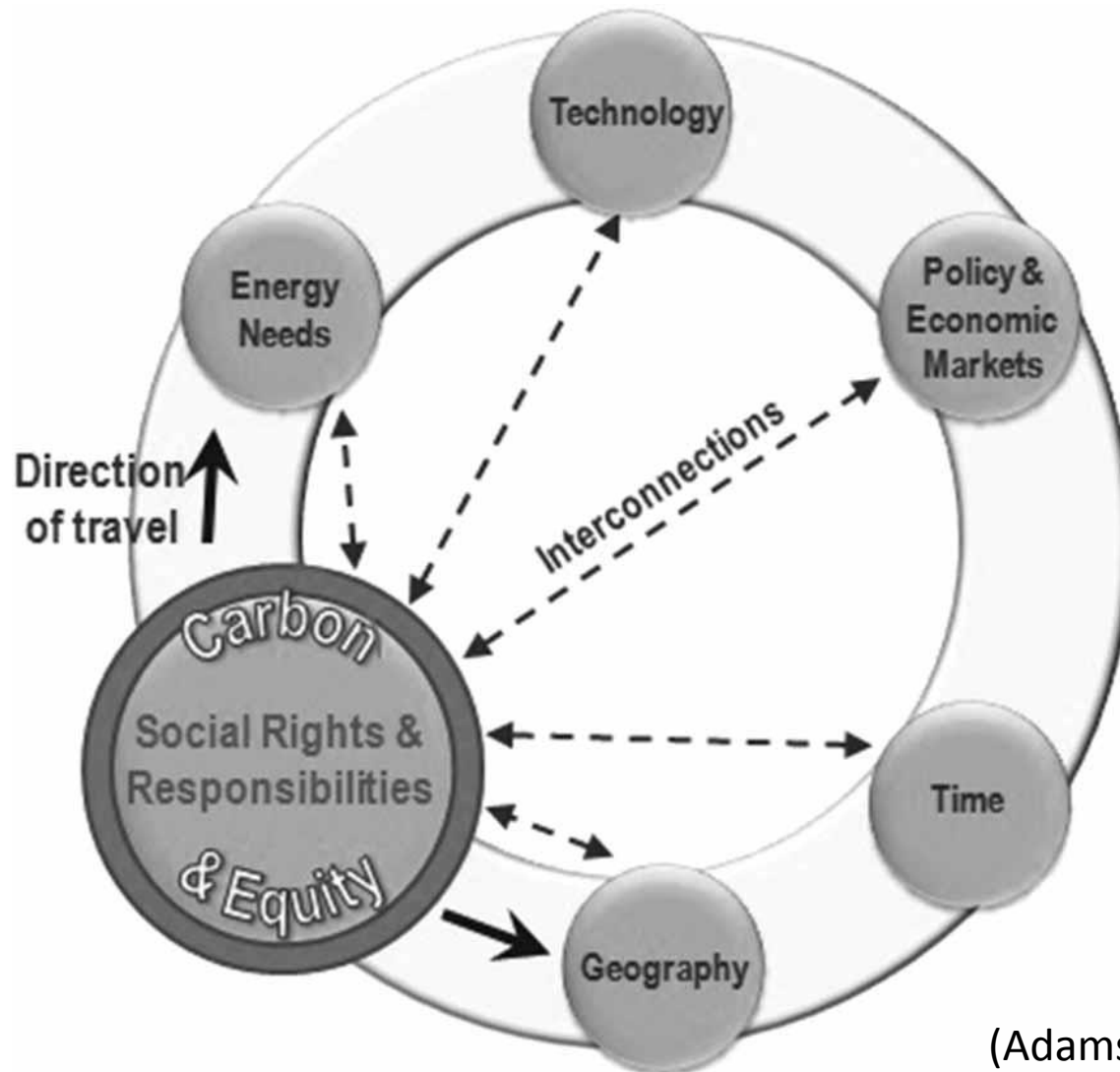
# InCluESEV Tool for assessing the multiple dimensions of energy vulnerability



- Used in assessing procedural, distributional and recognition injustices to which individual are exposed for particular energy services
- A tool for analysis and for engagement

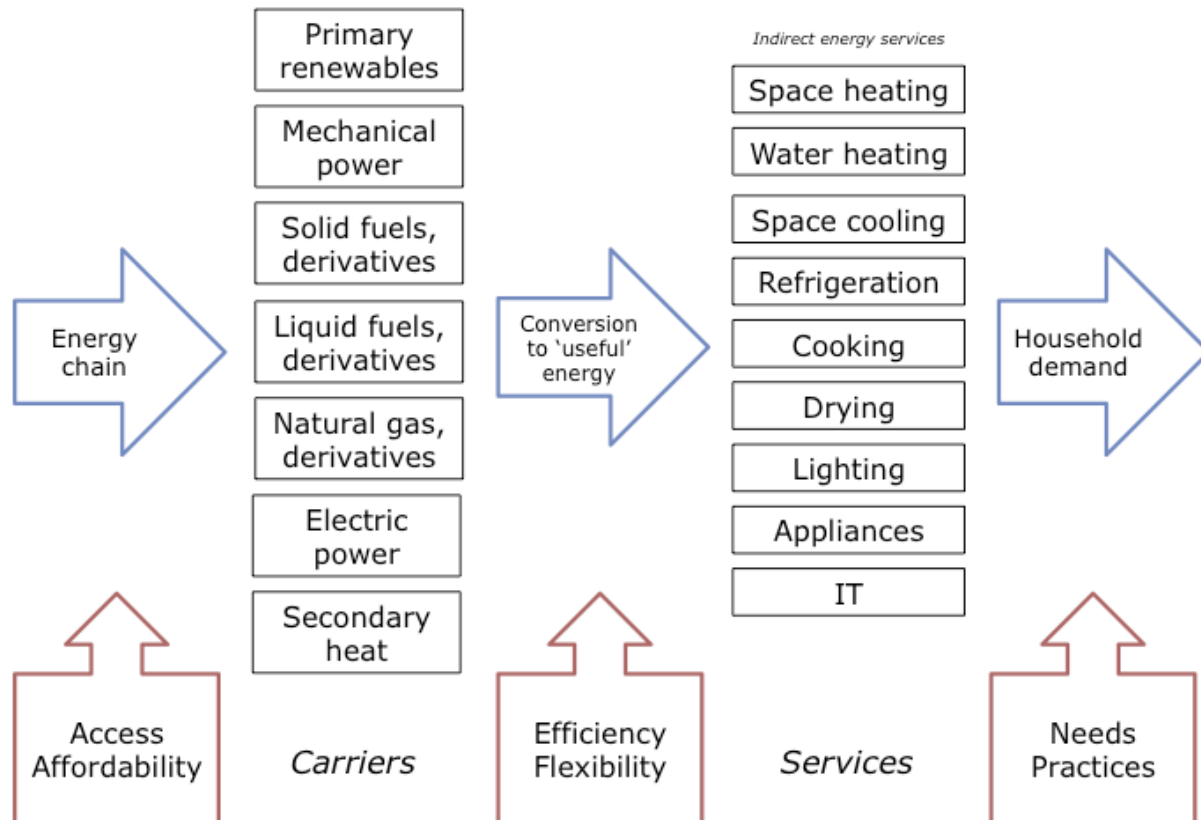
(Fuller and Bulkeley, 2013)

# InCluESeV Energy Equity Assessment Tool (EEAT)



(Adams and Bell, 2014, p.6)

# Dimensions influencing the delivery of energy services to the home, and the rise of domestic energy deprivation



(Bouzarovski, Petrova & Tirado, 2014, p. 10)



# Demand side participation for the energy vulnerable

- Energy vulnerable people are usually coping with a range of interrelated stresses e.g. fuel debt
- They are reluctant to engage with energy markets through lack of confidence and mistrust
- Prepayment cards (which tend to increase energy costs) are preferred because they provide a sense of control. Can smart meters provide a similar sense of control? (Darby, 2012, p.105)

# Prosumers to citizen-practioners

Energy inequity, injustice and vulnerability are not matters only of prices and income, but of structural differences that are produced and reinforced over time and through space. As such, we need to widen the scope of ethical consideration from only energy consumption choices as they relate to individuals, to public engagement as “citizen-practitioners” in choices over the development of energy networks, generation capacity and wider energy policy.

(Hall, Hards, & Bulkeley, 2013, p. 415)

# What does this mean for your work?

- How would you conceive a move from Demand Side Management to Demand Side Participation in the area in which you are involved?
- How might you apply an energy vulnerability/equity/justice lens?