

Energy, Innovation, Equity and Justice

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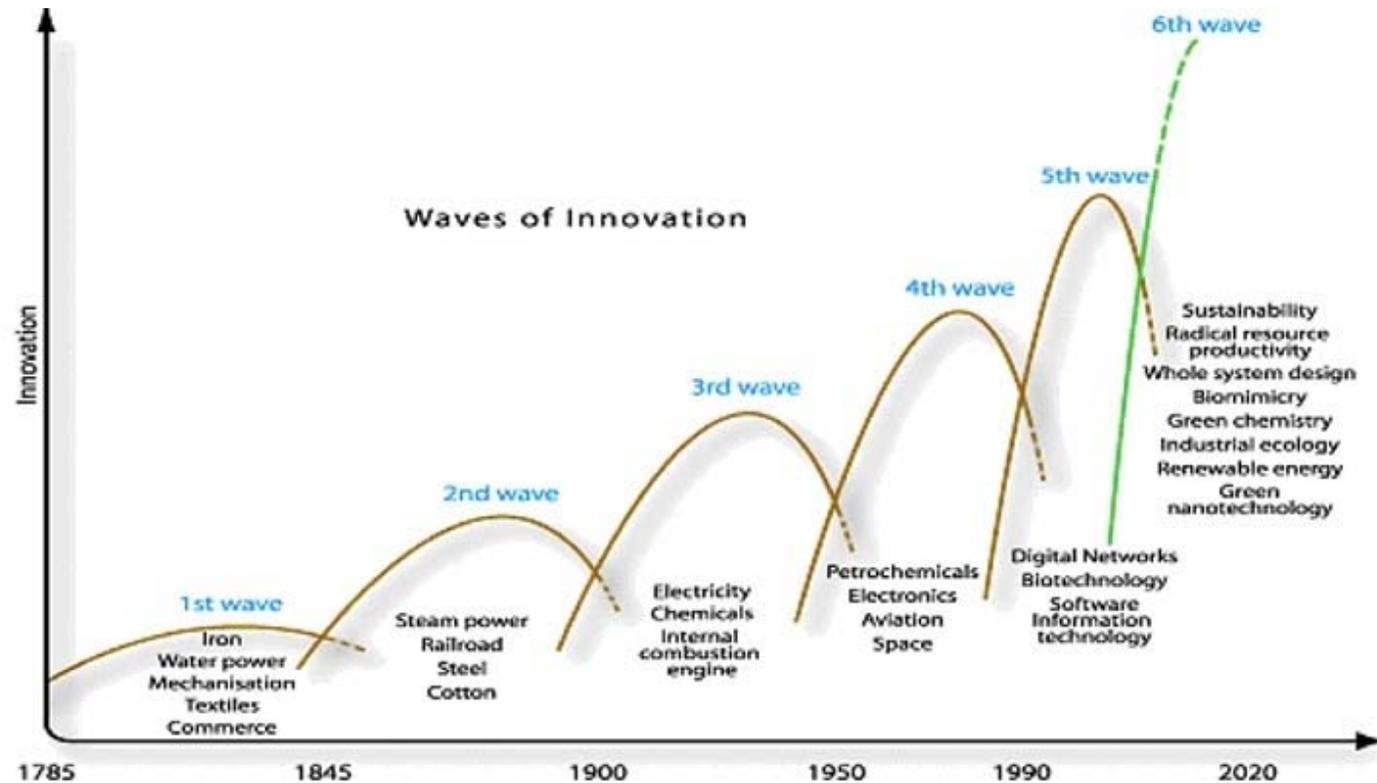
**Energy justice in a changing climate:
defining an agenda conference**

10th November 2011

Overview

- 1. Energy, innovation and society**
- 2. Energy justice?**
- 3. Low carbon transitions & sustainability transitions research**
 - systems innovation (MLP & TM) & innovation systems perspectives critically reviewed**
- 4. UK energy research & policymaking**
- 5. Insights towards an interdisciplinary research agenda**

A long view of innovation..



Hargroves, K. and Smith, M. (2005) *The Natural Advantage of Nations: Business Opportunities, Innovation and Governance in the 21st Century*, The Natural Edge Project, Earthscan, London

Energy (In)Justice

1. **Energy (environmental, economic & social) justice...**
2. **Past, present & future generations (?)**
3. **Human and non-human actors (?)**

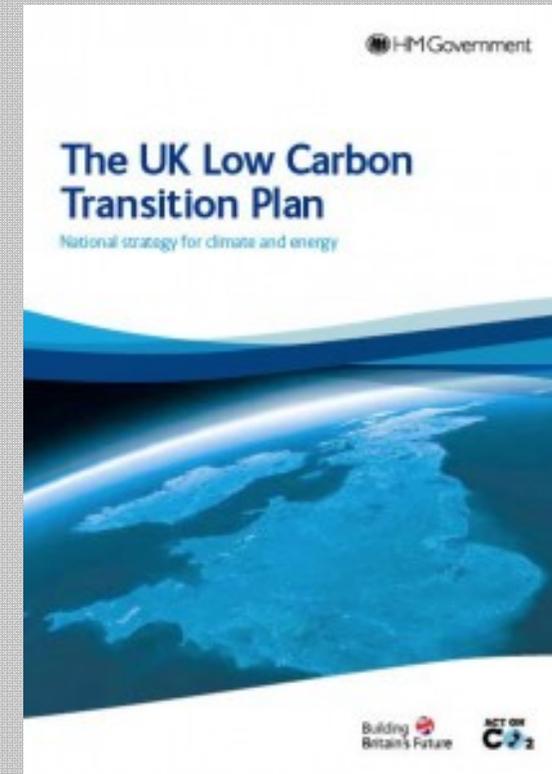
Energy (In)justice

1. **Distribution** - social, spatial and temporal - of costs and benefits
2. **Procedure** - how are unequal distributions created & maintained (power, choice, influence...)
3. **Recognition** - who (and what) is given respect

**Evidence of inequality x argument for 'fair' treatment
= justice claim**

Transitions to sustainability

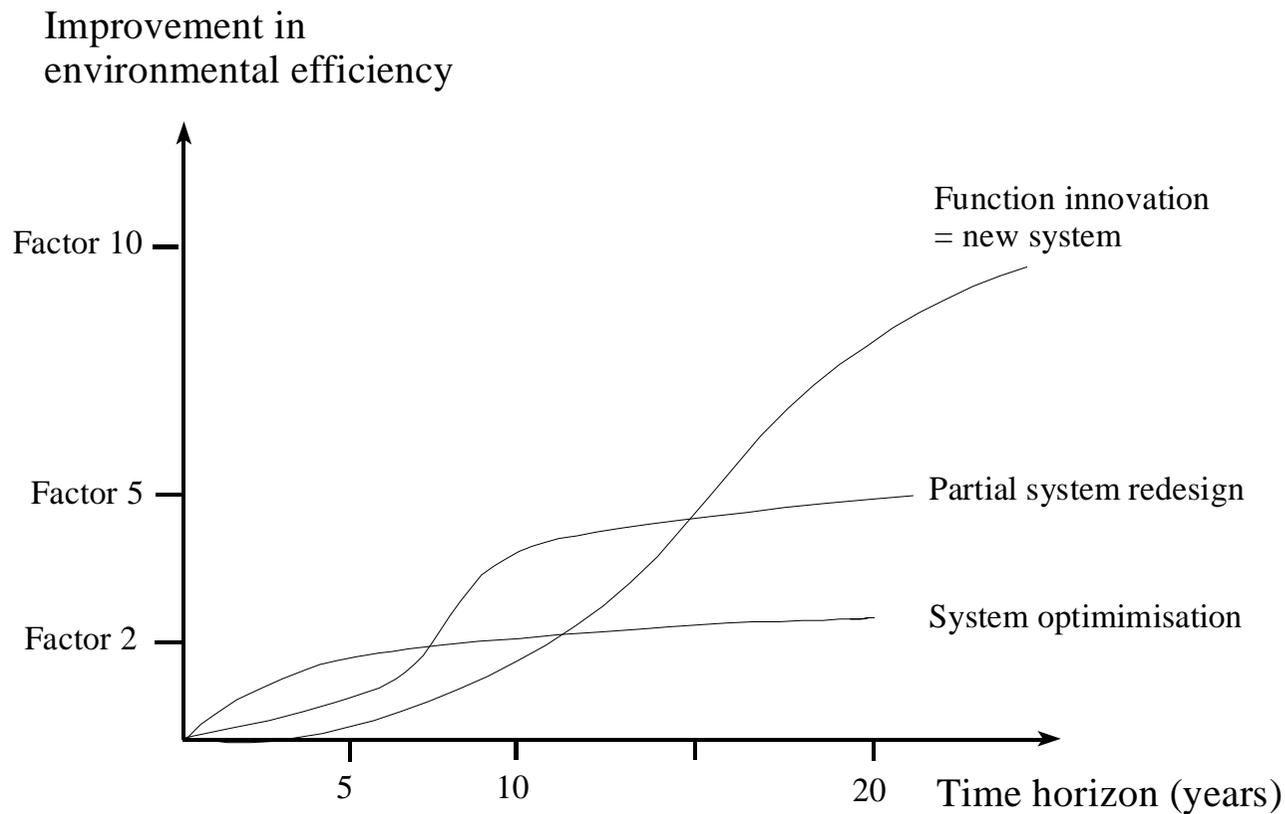
- *'...for those concerned with sustainability, the idea of transition – of substantial change and movement from one state to another – has powerful normative attractions'*. (Shove and Walker, 2007)



But what do we mean by a 'transition'?

- Calls for a *transition* implies the need for **large scale socio-technical systems change** rather than simple product or process innovations or behavioural changes
- The *transition* to low carbon will not 'simply' require a transformation of our energy system
- But also finding radically more (eco-)efficient ways to fulfil societal functions and human needs (e.g. mobility, food, housing, heating, lighting, etc).
- Requires integrative and holistic view of **production & consumption of energy good & services**

The need for systems change



System optimisation versus system innovation (Weterings et al, 1997)

Systems change and transitions: some key concepts

- We know from history and innovation studies (Geels) that systems changes or transitions do occur and something about the innovation processes involved.
 - Systems changes are complex (co-evolutionary, multi-dimensional, multi-actor, multi-level; radical; long-term; non-linear process)
 - Existing systems resist radical change (lock-in, path dependencies, sunk investments, vested interests, etc...)
 - Radical R&D innovations face a 'valley of death' on journey to the market
 - Historically most transitions have been emergent processes
- Purposively shaping transitions seen as requiring new policy, institutional & governance structures

The Multi-Level Perspective

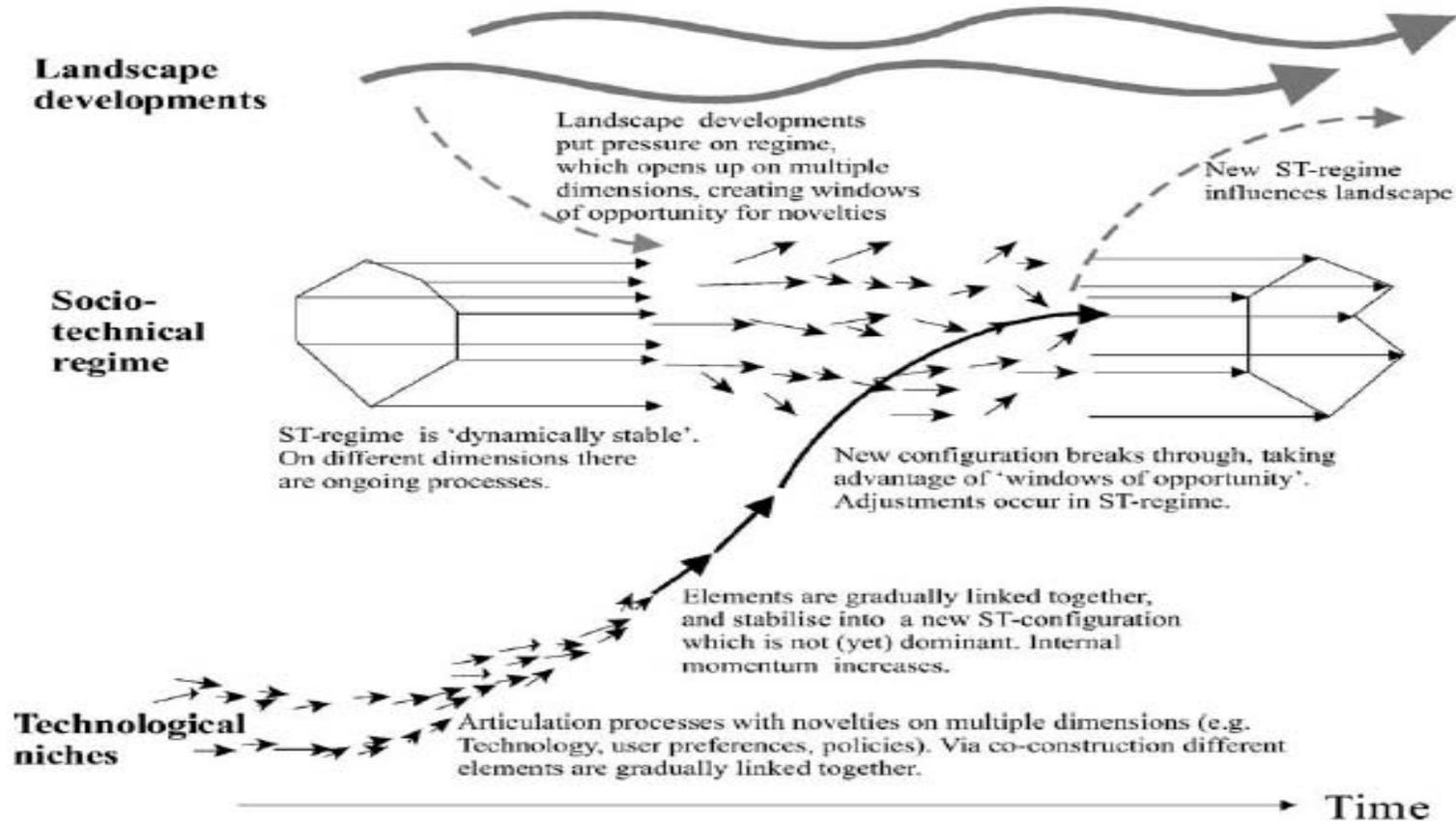
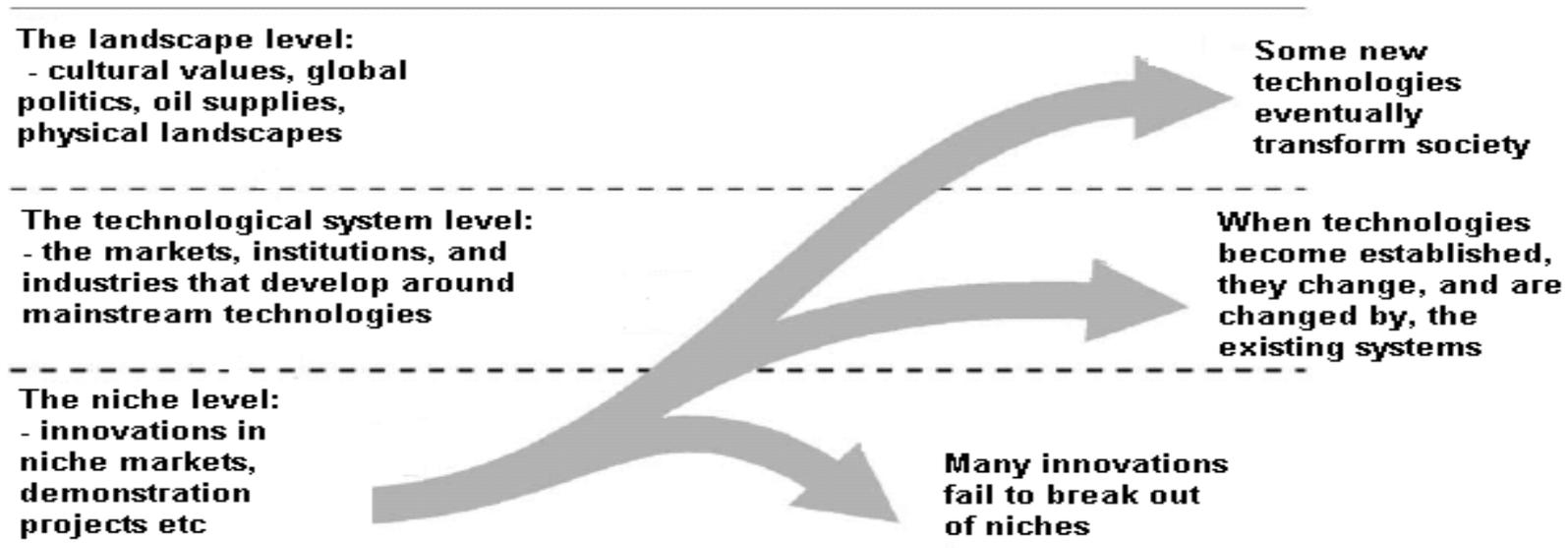


Fig. 9. A dynamic multi-level perspective on system innovations (Geels, 2002b, p. 110).



(Source: Eames & McDowall, 2010. Adapted from Geels, 2002)

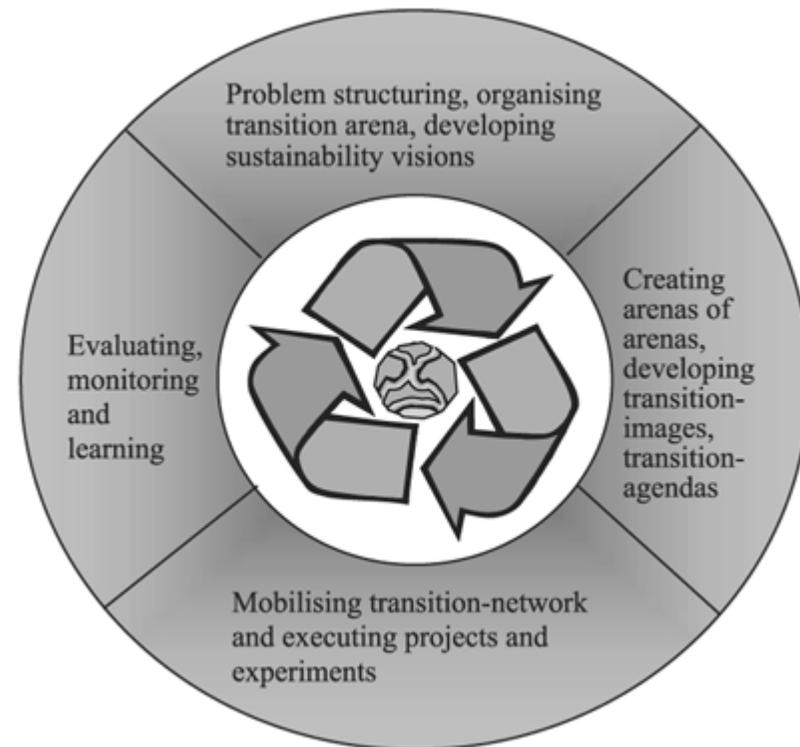
- **MLP provides a rich heuristic structure for analysis of past/prospective transitions, but need for greater attention to:**
 - **Agency and power**
 - **Spatial perspectives (inc' capacity & comparative advantage)**
 - **Social distribution (inc' vulnerability & resilience)**

Transition Management

- TM places process of stakeholder engagement, foresight, scenario building, experimentation, evaluation and social learning centre stage
- ***‘The vision, in combination with the images, the transition paths and experiments, forms the joint transition agenda...This is where coalitions come together around specific options or expectations’***

(Kemp & Loorbach, 2006)

The Transition Management Cycle



(Kemp, 2007)

Low Carbon as a 'Guiding Vision'

- Power of 'low carbon' as a '**guiding vision**' lies in its **interpretive flexibility**
- However, **grounding and translation** must occur when guiding vision touches down in particular **places and communities**
- Moreover clearly there are **multiple** prospective low carbon **pathways and futures** embodying **deeply contested** and **irredeemably political choices**

(Stirling, 2007; Berkhout et al, 2004; Eames & McDowall, 2010; Shove & Walker, 2007; Eames *et al*, 2006; Berkhout 2006)

TM and Energy Justice

- **Raises questions of procedural, epistemic and distributive justice**

Important to recognise these questions also apply to more established foresight and technology appraisal processes and conventional tools for innovations policy and support

- How is problem framed & who's vision (knowledge, values, interests, etc)
- Access to information, participation & agency in the process
- How are the social distribution of costs and benefits of different technological options evaluated?

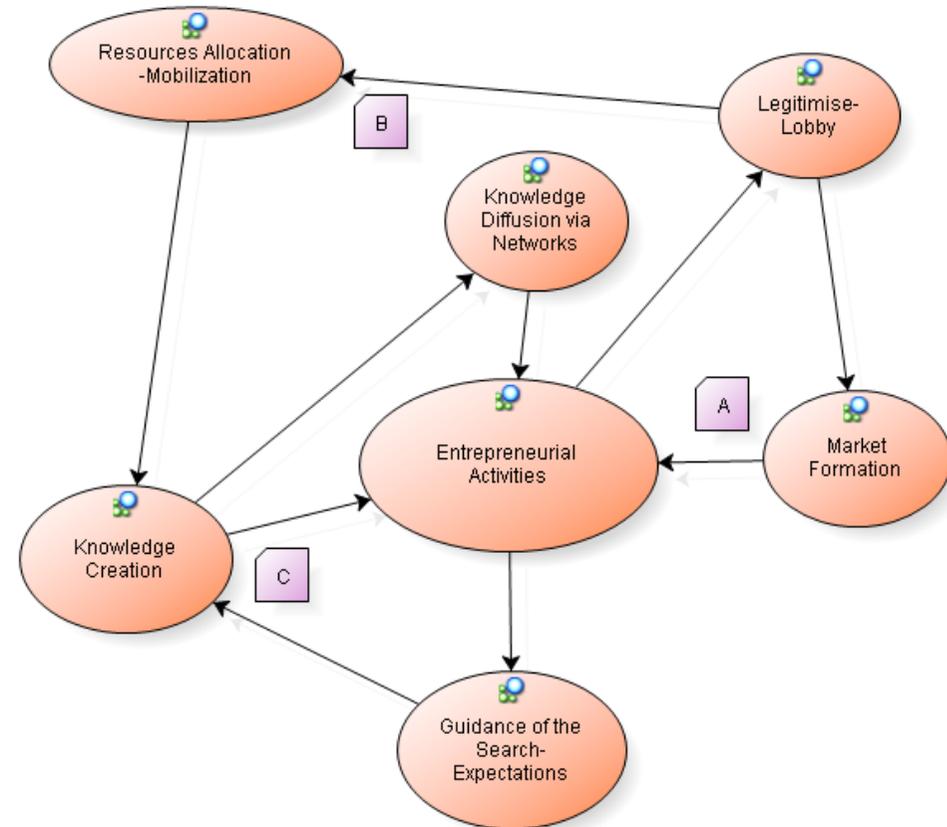
Innovation Systems Approaches...

	Focus	Scale	Comments
National Systems of Innovation (NSI)	National economic competitiveness	National	Underpinned emergence of innovation policy and notion of ‘Knowledge Economy’
Sectoral Systems of Innovation (SSI)	Differing patterns of innovation across sectors	(?)	
Regional Innovation Systems (RIS)	Regional economic competitiveness	Regional (clusters)	Focus on under performing Regions
Technological Innovation Systems (TIS)	Specific technological field or artefact	National/Global (?)	Widely applied to analysis of sustainable technologies but lacks geographical and spatial dimension
Functions of Innovation Systems	Structure & dynamics of innovation system	National/Global (?)	

Functions of a (Sustainable?) Innovation System

- **Guidance of search activities** (visions, targets, etc)
- **Knowledge creation** (R&D, pilot & demonstration projects)
- **Networks for knowledge diffusion**
- **Mobilisation of resources** (human, financial, etc)
- **Facilitate formation of new markets** (regulatory, fiscal, supply chain, etc)
- **Creation of legitimacy** (advocacy coalitions)
- **Entrepreneurial activities**

• **Precautionary appraisal** (of environmental, social & economic sustainability)



'Motors of change' in a TSIS – A, B & C feedback loops (+/-) (Hekkert et al, 2007)

UK Energy Research/Polycymaking

- To date socio-technical transitions research has had rather limited impact on UK Energy policy
- Engineering/economic energy systems models predominate
- Top down linear models of innovation and separation of technological & behavioural change remarkably persistent
- Limited progress in ‘opening up’ processes of foresight & technological choice
- However, UK also has a remarkable history of institutional and policy innovation...

Insights towards an interdisciplinary research agenda

- **The conceptual frameworks and policy oriented tools of sustainability transitions research need to incorporate more explicit consideration of (distributive, procedural & epistemic) justice**
- ...But then so do many more established fields of energy research

Key challenges

- **Need to develop a more explicit ‘geography’ of energy & low carbon transitions**
- **Ground transitions research in particular communities & places in order to better understand distributive impacts and issues of vulnerability & resilience**
- **Pay attention to losers as well as winners in transitions**
- **‘Opening up’ of TM processes – framing, participation & agency**
- **Top down – bottom up dialogue**
- **Foster precautionary appraisal as an explicit function of sustainable/low carbon innovation systems**