Low carbon technology transfer to developing countries: “Situated needs across multiple spaces”

Dr David Ockwell

Email: D.G.Ockwell@sussex.ac.uk
Web profile: http://www.sussex.ac.uk/profiles/197916
Further reading on energy & climate research:


• David G. Ockwell, Lorraine Whitmarsh and Saffron O'Neill (2009) "Reorienting climate change communication for effective mitigation - forcing people to be green or fostering grass-roots engagement?" Science Communication 30: 305-327


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CLIMATE CHANGE
Global Warming
Greenhouse Emissions
Low carbon technology transfer to developing countries

1. Ways SEG (Sussex Energy Group) and other contemporary research *has* engaged with geographic concerns

2. What’s missing from research in this area
SEG research on low carbon technology transfer

- **Empirical work:**
  - UK-India and UK-China collaborative studies on low carbon technology transfer (DECC funded)
  - Emerged from G8 Gleneagles - fed into UNFCCC negotiations
  - Doctoral research (Kenya, Tanzania, Ghana)

- **Policy advice & reviews:**
  - National govt. (UK, China, India, Chile, Peru, Colombia)
  - Different govt. departments (e.g. energy vs. environment vs. international development)
  - Inter-govt. organisations (UNFCCC, OECD, Commonwealth Secretariat)
Horizontal technology transfer
Horizontal technology transfer

- Changing direction of flows e.g. north-south, south-south, south-north (Tom Brewer)
SEG research on low carbon technology transfer

• Responded to unique characteristics of low carbon technology transfer:
  - Urgency
  - Public good (not always provided by the market)
  - Different stages of technology development...
## Horizontal vs. vertical technology transfer

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Stage of technology development</th>
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<tbody>
<tr>
<td>Pre-commercial</td>
<td>Supported commercial</td>
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<tr>
<td>Low-carbon power generation technologies</td>
<td>Coal gasification including IGCC</td>
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<tr>
<td>Network / infrastructure technologies</td>
<td></td>
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<tr>
<td>Low carbon end use technologies</td>
<td>LED lighting</td>
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</table>
SEG research on low carbon technology transfer

• Informed by insights from innovation studies literature:
  - Emphasises knowledge component of technology
  - Role of “innovation capacities” in sustaining low carbon development pathways
Outstanding geographic research concerns

- Direction of flows e.g. north-south, south-south, south-north
- Extent of flows
- Qualitative nature of flows (especially hardware vs. knowledge)
- Maturity of technology flows
- Mapping distribution of innovation capacities
- Understanding patterns of, and identifying opportunities for, capacity development
A needs-based approach

- Multiple framings of “technology needs”
- Questions as to whose interests these framings serve
- Distributional implications
- Institutional refinement & power relations
- Alternative (reflexive) approaches to negotiating development pathways & promoting consideration of marginalised needs
Context specificity: Situated needs, multiple spaces

- Context-specific needs situated across different spaces
- Very real implications for efficacy of policy & potential for low carbon energy technology uptake as part of sustained low carbon development pathways
Context specificity: Situated needs, multiple spaces

• Cultural space...
  • Uptake of externally manufactured fuel-efficient cookstoves
  • Gender related aspects of energy related practices

• Ecological space....
  • Wind vs. solar vs. geothermal vs. CCS

• Socio-economic space...
  • Household vs. industrial needs
  • Rural poor vs. urban industry
  • BRICs vs. LDCs vs. SIDS
  • Existing technological capabilities

• Technological space...
  • Hardware / software balance e.g. CCS vs. distributed solar

• Temporal...
  • Current vs. future generations
  • Poor now, emerging later
Reframing policy & governance

• Dominant international policy framings insensitive to context-specificities
Engaging with emerging policy priorities...

1. Macro level policy discourses
2. Hardware financing vs. capacity building
3. Technology Needs Assessments under UNFCC
4. Climate Technology Centres Network
5. Collaborative RDD&D
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Historically different motivations for being party to the UNFCCC

Developed countries

- Solution to environmental problem
- Mitigating future economic costs

Developing countries

- Access to new technology for economic growth and poverty alleviation
Conflicting political views on role of technology

Developed countries
- Rapid DIFFUSION of low carbon technology

Developing countries
- Building capacities for economic DEVELOPMENT
CDM registered projects and accumulated investment value, as at end of February 2010

Brazil, 1.2, 2%
ROW, 8.2, 17%
India, 6.7, 14%
China, 32.2, 67%

Source: Bryne et al. based on figures from UNEP Risø (2010)
Number of registered CDM projects as of the end of February 2010, disaggregated by project type (2062 total registered projects)

| Source | Bryne et al. based on figures from UNEP Risø (2010) |

- **Hydro**: 562 projects
- **Methane avoidance**: 318 projects
- **Wind**: 297 projects
- **Biomass energy**: 277 projects
- **Landfill gas**: 154 projects
- **EE own generation**: 132 projects
- **N2O**: 60 projects
- **EE industry**: 56 projects
- **Fossil fuel switch**: 45 projects
- **Coal bed/mine methane**: 26 projects
- **HFCs**: 21 projects
- **EE supply side**: 19 projects
- **Solar**: 19 projects
- **Cement**: 19 projects
- **Forests**: 13 projects
- **Fugitive**: 12 projects
- **Geothermal**: 8 projects
- **EE households**: 7 projects
- **PFCs and SF6**: 6 projects
- **EE service**: 5 projects
- **Transport**: 2 projects
- **Energy distribution**: 2 projects
- **Tidal**: 1 project
- **CO2 capture**: 1 project

- Over 75% registered CDM projects use just five types of technology
- Only one *new* renewable energy technology - wind - although mature relative to other new renewables
Hardware financing vs. capacity building

1. Need to finance the uptake of (often foreign produced) hardware
   - CDM at industry level
   - Externally manufactured cookstoves at household level
Hardware financing vs. capacity building

2. Need to develop indigenous capacity in developing countries

Innovation capacity among developing country firms e.g. tacit knowledge development via international personnel exchanges

Capacity of households to participate in the development & implementation of new technologies e.g. capabilities to build more efficient cook stoves from locally available materials that fit the social practices of their families and facilitate knowledge transfer to others in their communities
A geographic research agenda…

• Understand & critically assess dominant policy framings & distributional implications
• Emphasise the relevance of a needs-based approach
• Unpack context-specificities & articulate situated technology needs
• Translate into policy via reflexive governance structures that respond to multiple spatial considerations