

Technology for low carbon development: from technology transfer to socio- technical transformation

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Hex River
Durban Exhibition Centre

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- Forms of innovation
- Going beyond hardware
- Innovation system-building
- Key conclusions

- Innovation often assumed to be radical
- Many innovations are incremental
- Innovation can be in products, processes or services
- Innovations can be organisational or institutional

Going beyond hardware

- Technology is usually understood narrowly as hardware
- More useful to consider technology as hardware and “software”
 - Software refers to (tacit) knowledge and skills, usually enhanced through experience (capabilities)
 - Connects us to cultural and social aspects
 - Connects us to supportive/complementary technologies
- Technologies can be shaped by existing cultural and social contexts
- Technologies can also shape those contexts

- We can see technologies as embedded in systems
 - innovation systems
 - socio-technical systems
- System developments over time create pathways
- We have choices about the directions of such pathways
- Some pathways could be transformational

Innovation system building

Some evidence from developing countries



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- Theoretical base
 - Insights from innovation studies in developing countries
 - Further theory development from socio-technical studies
- Empirical evidence
 - China & India studies on low-carbon technology transfer (various technologies)
 - Solar Home System (SHS) market evolution in Kenya & Tanzania

Innovation system building

Some evidence from China



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Windpower

- National policy & CDM
- Firm-level activity
 - Licensing, joint ventures, collaborative R&D, acquisitions & OEM
- Innovation system building
 - Linking universities with firms and international systems

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Innovation system building

Some evidence from Kenya & Tanzania

Service markets for SHSs

- Evolved through multiple efforts of both private and public actors
 - Partnerships, complementarities, sometimes “accidental”
- Public sector (usually donor-support) bore risks to try new ideas
 - Product & service innovations
- Successful ideas taken up by private sector
 - In effect: roll-out, scaling-up
 - Some incremental innovation

Key conclusions

- System-building more likely to lead to ***development*** pathways
- Needs long-term commitment to building local capabilities
 - Among all actors – users, producers, policy makers, etc.
 - At all levels – education, including postgraduate, and training
 - Embedded in local context but linked to external systems
 - Self-directed with pro-poor as well as low-carbon focus
- Economic benefits possible too
 - Low-carbon can be high-value

China & India studies

<http://www.sussex.ac.uk/sussexenergygroup/research>

Kenya & Tanzania solar home system market evolution

<http://sro.sussex.ac.uk/6963/>

STEPS Energy Pathways Working Paper

http://www.steps-centre.org/PDFs/Energy_PathwaysWP.pdf

**The CTCN should work with stakeholders to
build local innovation systems that are pro-poor
as well as low-carbon**