



Low Carbon Infrastructure Investment: Extending Business Models for Sustainability

***Timothy Foxon, Catherine Bale, Jonathan Busch,
Stephen Hall, Katy Roelich and Julia Steinberger
(University of Leeds)***

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Outline

- iBUILD project (Newcastle, Birmingham, Leeds; 2013-2017)
 - Infrastructure business models for local delivery
 - Addressing social and environmental, as well as economic objectives
 - New forms of creation and appropriation of value, and new business models



INFRASTRUCTURE

ageing assets;
changing demand;
climate change; new
technology;
interdependence;
public finance squeeze



Localism Act 2011

LOCALISM

Localism Act 2011;
Green Deal (local low
CO₂ action); Local
Enterprise
Partnerships; City
Deals; Growth &
Infrastructure Bill



INTERNATIONALISM

Global finance; FDI;
cross-border
ownership of assets;
geopolitical
importance of
infrastructure;
international
comparisons

New business models will appear: hurriedly or well designed
ibuild & ICIF will fill the current knowledge vacuum

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ibuild

Social and environmental values

- Investment in infrastructure is a key driver of economic prosperity, but also important for addressing social and environmental challenges
 - Significant investment in “resilient, cost effective and sustainable energy supplies” is needed
- Need to assess alternative business models incorporating social and environmental value streams as well as economic values
 - Creating and capturing value for local communities – job creation, social cohesion, clean environment

Low carbon transition

- Climate Change Act 2008
 - 80% reduction in UK Carbon emissions by 2050
 - 50% reduction by 2025
- Target of 15% renewable energy by 2020
- Scope for local delivery of electricity and heat, linked to improvements in energy efficiency
- Overcome lock-in of technologies, institutions and practices based on centralised systems

Case study – local energy networks

- Infrastructure business models:
 - The system of physical artefacts, agents, inputs, activities and outcomes that aim to create, deliver and capture economic, social and environmental values over the whole infrastructure life cycle
- Case study
 - Case study of the development of local heat delivery networks (co-funded by Chesshire Lehmann Fund) and smart grids for electricity distribution
 - Contribute to security of supply, reducing carbon emissions and creating local economic benefits

District heating



District heating pipes in Jyväskylä.
Author: Antti Leppänen

- Opportunities
 - Transition to low-carbon, affordable heat, supplied through district heat networks
 - Engages new actors and business models
- Barriers
 - Investment
 - Uncertainty of demand
 - Unregulated market, no general contracting mechanisms

Motivations vs Decision Criteria

- Motivations: Economic competitiveness, climate targets, regeneration, fuel poverty.
- **BUT**, decision criteria predominantly techno-economic feasibility.
- Mismatch between national policy and local delivery.
- **Missed opportunity for capturing social value?**

Emergence of new development approaches

- ***Funding-driven***
- ***Commercial***
- ***LA-led strategic – mixed approach***

FUNDING

Mixed funding
from ECO,
HNDU and
private

ACTORS

ESCo

Local Authority

Private sector
investor

SCHEME

High density
housing in fuel
poor areas

Commercial
base loads

Distributed generation and Smart Grids

- Potential for high levels of local distributed generation, e.g. solar PV, onshore wind, and demand management measures
- Needs smart grid to manage two-way power flows and incorporate potential for remote management and time-of-use pricing
- But current market framework does not provide sufficient incentives for co-ordination between distribution network operators (DNOs) and local authorities or community groups

<http://ses.jrc.ec.europa.eu/smart-grid-interactive-tool>



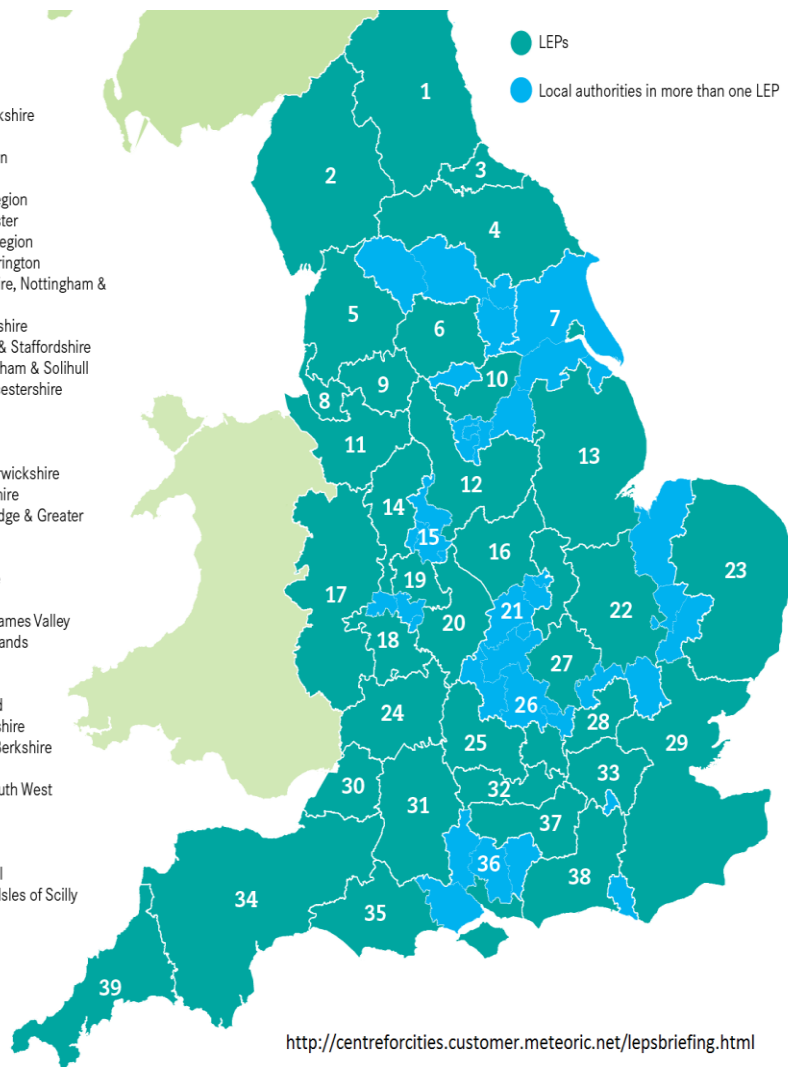
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15. Greater Birmingham & Solihull
16. Leicester & Leicestershire
17. The Marches
18. Worcestershire
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32. Thames Valley Berkshire
33. Pan London
34. Heart of the South West
35. Dorset
36. Solent
37. Enterprise M3
38. Coast to Capital
39. Cornwall & the Isles of Scilly

- LEPs
- Local authorities in more than one LEP



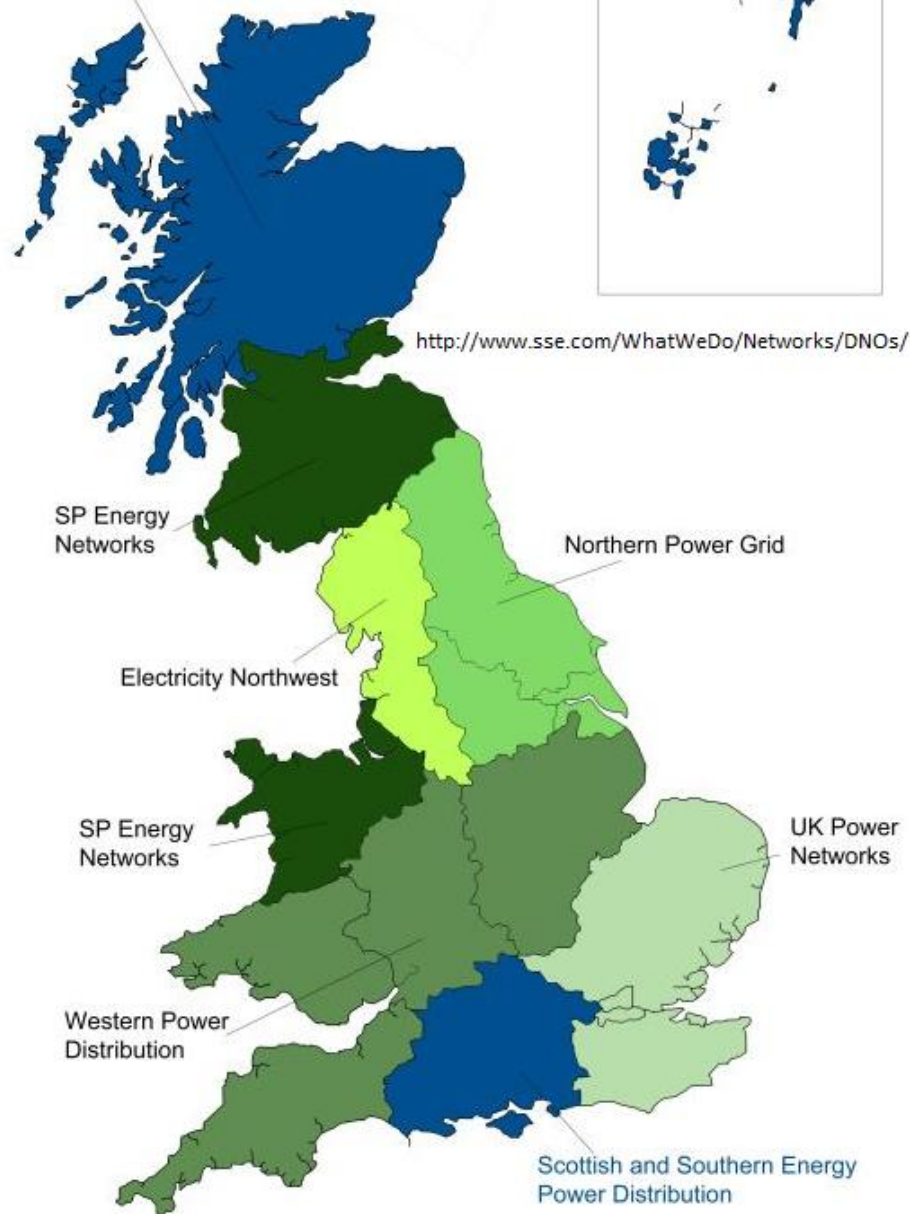
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Scottish and Southern Energy Power Distribution



<http://www.sse.com/WhatWeDo/Networks/DNOs/>

A Power Grid of Their Own: German Village Becomes Model for Renewable Energy

By Renuka Rayasam

The tiny village of Feldheim, some 60 kilometers southwest of Berlin, was catapulted by chance to the forefront of the renewable energy movement. Now visitors from around the world are flocking to this otherwise unremarkable rural community to see if they can replicate its success.

Thousands of German Cities and Villages Looking to Buy Back Their Power Grids



What do Boulder, Colorado and Hamburg, Germany have in common?

Matthias B. Krause
October 11, 2013



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The Local

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A Vattenfall power station in Hamburg. Photo: DPA

Hamburg buys its energy grid back for €400 million

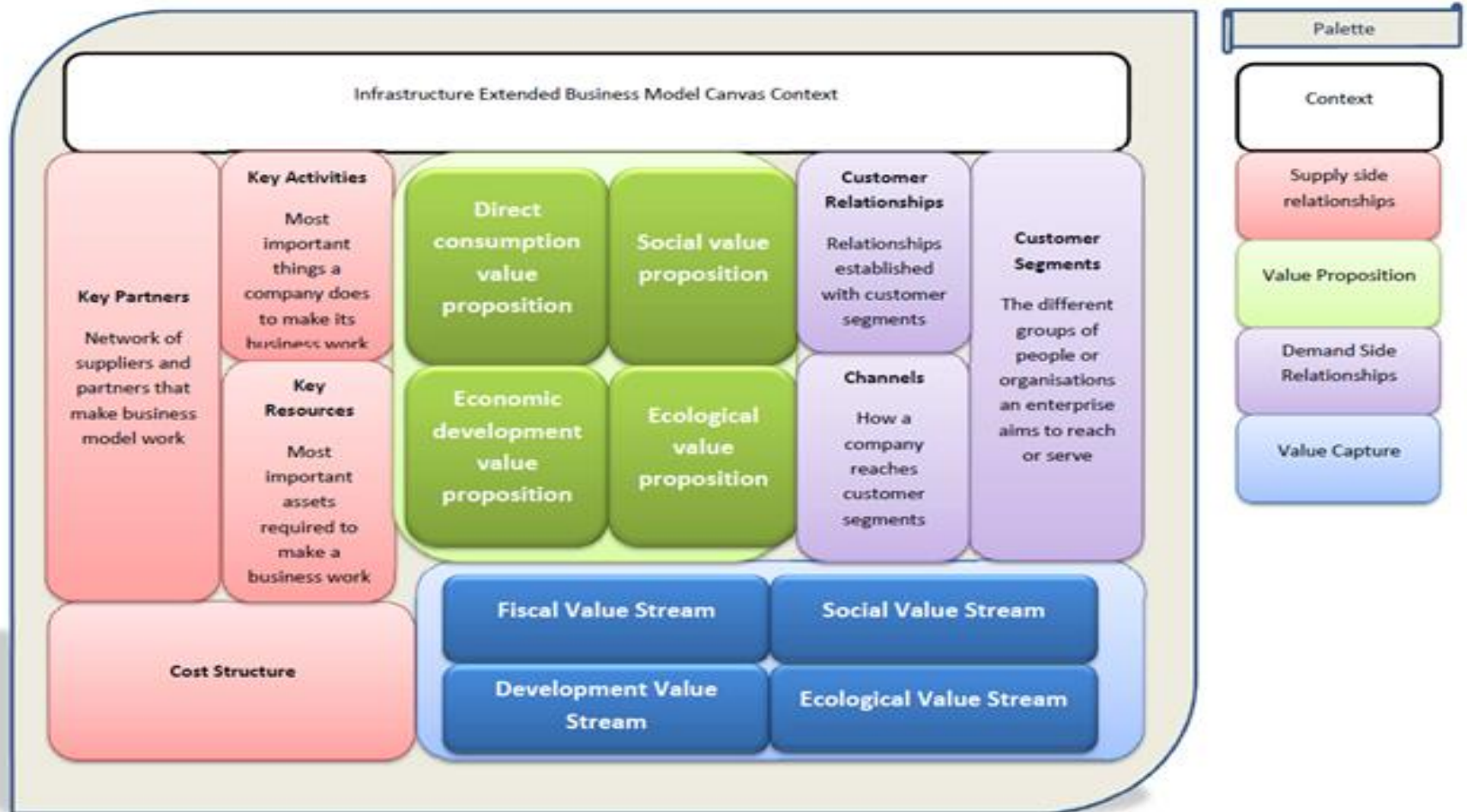
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Challenges

- Incorporating social value in decision-making stage and business model development
 - Needs systems perspective
- Aligning national policy to bring forward strategic infrastructure investment
 - Integrating infrastructure and low carbon objectives
- Policies, incentives, actors to enable strategic LA-led business models
 - More power to core cities and local authorities

Extended business model canvas



Ongoing research

- Case study analysis through interviews and focus groups
- Developing agent-based models of interactions between actors
- Working with local authority and LEP partners
 - Leeds, Newcastle
- Further information:
 - <http://sure-infrastructure.leeds.ac.uk/ibuild/>