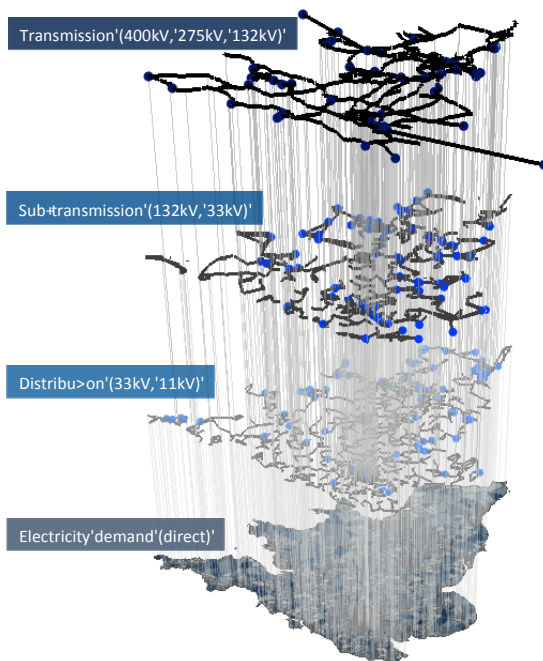


Assessing the impacts of increasing levels of decentralized energy in the United Kingdom

Scott Thacker

The UK Infrastructure Transitions Research Consortium (ITRC) has developed a new generation of infrastructure systems simulation models and tools to inform the analysis, planning and design of National Infrastructure (NI). Working with partners in government and industry, our research examines energy, transport, water, waste and digital communications systems at a national scale.

Tools and models developed within the programme, including a multi-scale interdependent energy model (right), have been used to inform policy and practice across academia, industry and government. Notable collaborations include: the co-development of a tool with National Grid to evaluate the impact of increasing levels of distributed generation on their asset base; the identification of geographic concentrations of infrastructure criticality in the UK with Infrastructure UK (HM Treasury); calculation of the potential disruptions to customers from multiple sectors that could result from the failure of major electricity assets located in flood prone areas in the Thames catchment – work undertaken with the committee on climate change, adaptation sub-committee.



Analysis from the ITRC has revealed that re-orientation towards a decentralised arrangement of infrastructure (both in terms of technology and governance) could result in NI performance increases. The energy sector analysis, for example, revealed that the decentralisation transition strategy resulted in the greatest diversification of energy supply options. Decentralisation also has the potential to capitalise upon interdependencies (e.g. via local waste to energy conversion or combined heat and power plants). However, the evaluation of the cross-sectorial performance of decentralised options indicated that there are significant front-loaded capital investment requirements to enable the transition.

The next phase of analysis will further extend our capabilities to address emerging research challenges and opportunities. This includes high-resolution modelling of community-scale decentralised energy provisions; providing analysis and insights for multiple stakeholders interested in infrastructure performance at a range of scales.

Further details of current and future work can be found through our website: <http://www.itrc.org.uk>. Enquires into potential research collaborations and applied 'case-study' analysis should be primarily directed to the ITRC programme manager: Miriam Mendes miriam.mendes@ouce.ox.ac.uk

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