

A multi-level exploration of the urgent transition to Net Zero Infrastructure

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Detailed project background and description:

Examining the infrastructure changes that will support the transition to Net Zero calls for consideration of innovation in systems and wider socio-technical transitions (Grin et al., 2010). The finite time available for Net Zero 2050 requires a mix of newly designed (e.g. carbon capture), in progress (e.g. Hinkley Point C) and upgraded infrastructure (e.g. electric vehicles). Proven (e.g. renewables) and disruptive technologies (e.g. hydrogen grids) (Brown and Sovacool, 2011) need to be developed, tested and rapidly deployed at scale. Disruptive innovation may result in the emergence of new firms unconstrained by commitments to the high-carbon legacy assets and established practices of incumbents. Equally, novel collaborative (e.g. multi-party alliances, public-private collaborations) and contracting approaches as well as supporting ecosystems of organisations may be required to accelerate the Net Zero transition. But government clients and businesses engaging with Net Zero 2050 are also “short on time”. They have to make urgent decisions and adjustments to achieve future decarbonisation targets, while building on existing experiences and capabilities, to prepare for an uncertain future.

Such a grand challenge warrants research that addresses different levels of analysis and timeframes, so this PhD project will combine systems, organisational and behavioural insights with a range of temporal perspectives (e.g. differing degrees of urgency). The first phase of this project will focus on identifying, characterising and defining the infrastructure delivery system required by the complex and uncertain transition to Net Zero. This will likely include understanding system scale and scope (e.g. from large, one-off ‘system of systems’ programmes to multiple, smaller-scale ‘system’ projects); speed of deployment; interactions between supply and demand/user adoption; and the innovation landscape. The second phase will examine how governance may help organisations navigate between conflicting environmental policies and maximise value creation between organisations in the wider ecosystem. This is a critical area for research as we are moving beyond traditional delivery models, and there is surprisingly little research on decision-making during the pluralistic, complex and extended timeframes of infrastructure delivery, when projects often fail and urgent decisions have to be made.

Depending on the specific candidate and conceptual/empirical focus, there is considerable scope for a range of methods to be applied in this project. For example, but not limited to:

1. Longitudinal and embedded process research (e.g. Langley et al., 2013) informed by engaged scholarship (Van de Ven, 2007), to explore connections between interpretations of the past, present and future to shape strategic and innovative practices and processes;
2. Experimental work: ‘live’ and laboratory approaches (supported by the School of Management’s lab space) will be central to addressing behavioural concerns; and
3. While projects are ‘data-making factories’, the availability of this ‘Big Data’ has not yet transformed the way we study projects. This project could engage with Big Data (Bansal et al., 2020), topic modelling, qualitative comparative analysis (QCA) and contract (template) analysis.

References

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- Grin, J.; Rotmans, J. and Schot, J. (2010). *Transitions to sustainable development: new directions in the study of long term transformative change*. Routledge.
- Langley, A.; Smallman C.; Tsoukas H. and Van de Ven A.H. (2013). Process studies of change in organization and management: Unveiling temporality, activity, and flow. *Academy of Management Journal*, 56(1), 1–13.
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