What will the UK’s critical infrastructure look like in 2030? In 2050? How resilient will it be? Decisions taken now by policy makers, NGOs, industrialists, and user communities will influence the answers to these questions. How can this decision making be best informed by considerations of infrastructural resilience? The Resilient Futures (R-Futures) project (http://r-futures.ecs.soton.ac.uk/) considers future developments in the UK’s energy and transport infrastructure and the resilience of these systems to natural and malicious threats and hazards, delivering analysis of how the inter-relations amongst our critical infrastructure sectors impact on current and future UK resilience and also practical tools that operationalize the often nebulous concept of resilience for a range of relevant decision makers and stakeholders.

UK organisations as diverse as the Institute for Public Policy Research, the Institution of Civil Engineers, the Council for Science and Technology, and the Cabinet Office are united in their assessment that achieving and sustaining resilience is the key challenge facing the UK’s critical infrastructure. They are also unanimous in their assessment of the main issues. First, there is agreement on the main threats to national infrastructure: 1) climate change; 2) terrorist attacks; 3) systemic failure. Second, the complex, disparate and interconnected nature of the UK’s infrastructure systems is highlighted as a key concern by all. Our critical infrastructure is highly fragmented both in terms of its overall governance and in terms of the number of agencies charged with achieving and maintaining resilience, which range from national government to local services and community groups and local resilience forums. Moreover, the cross-sector interactions amongst different technological and social systems within the national critical infrastructure are not well understood, with key interdependencies potentially overlooked. Bodies with responsibility for oversight and improving joined-up resilience currently lack two critical resources: 1) a full understanding of the resilience implications of our current and future infrastructural organisation; and 2) vehicles for effectively conveying this understanding to relevant stakeholders, for whom the term resilience is currently difficult to understand in anything other than an abstract sense.

To address this, the R-Futures project focuses on future rather than present UK infrastructure. First, this will help to engender a shift in thinking – from a fragmented short-termism that encourages agencies to focus on protecting their own current assets from presently perceived threats to a longer-term inter-dependent perspective recognising that the nature of both disruptive events and the systems that are disrupted is constantly evolving and that our efforts towards achieving resilience now must not compromise future resilience. Second, focussing on a 2030/2050 timeframe lifts discussion out of the politically charged here and now to a context in which there is more room...
for discussion, learning and organisational change.

This paper discusses three critical components of the R-Futures project: 1) The development and analysis of a set of bespoke future scenarios and hazard episodes; 2) The construction of feasible models of the relevant socio-technological systems; 3) Stakeholder-driven development of a demonstrator simulation that operationalizes infrastructure resilience for a wide range of stakeholders and decision makers.