



ECONOMIC AND SOCIAL RESEARCH COUNCIL KEY FINDINGS REPORT

The Key Findings Report should be completed and submitted using the **grant reference** as the email subject to, reportsofficer@esrc.ac.uk on or before the due date.

Please complete each box as fully as possible, adhering to the word counts, please do not include images within the text. Appendices are not accepted.

Principal Investigators are expected to consult with co-investigators on the content of this report.

Grant Reference:	ES/H022864/1
Investigator/s:	Adrian Smith and Florian Kern (Research Assistant) (SPRU, University of Sussex) Rob Raven and Bram Verhees (Research Assistant) (Technical University Eindhoven)
Project Title:	Bilateral Netherlands: The politics of low carbon innovation: towards a theory of niche protection

1. Summary of Project Findings (circa 500 words)

Please summarise your main findings from the project. You are also invited to briefly indicate any plans for further research in this, or a related area.

For ESRC Seminar Series and projects under the Research Development Initiative please detail the outcomes of the activities carried out and provide information on the level of demand for participation.

Research into sustainability transitions emphasises the idea of ‘protective niche spaces’ as crucial to the cultivation of more sustainable technological alternatives compared to incumbent ‘socio-technical regimes’. This is because emerging, inchoate technologies rarely perform as competitively or as conveniently as incumbent technologies, with the latter benefitting from many years incremental improvement, infrastructure provision, and institutionalisation. Protective niche spaces shield path-breaking technologies against premature market rejection in order to learn about their performance and desirability. However, the research literature has failed to really address what is meant by protection: what it is, where it comes from, how it is shaped and operates, and what the consequences are for the development of sustainability alternatives and their possibilities for seeding wider transformations to regimes. Our project developed a theory through review and

synthesis of relevant literatures and empirical research into six case studies across two different countries (UK and the Netherlands). The case studies were three different low carbon technologies in each country: solar PV, offshore wind, and carbon capture and storage. The experience of each in each country was quite different. Comparison helped us nuance and finesse the theory developed in the project.

Our theory contrasts an outsider-ontological framework with an insider-ontological framework. Essentially, the outsider position adopts an evolutionary approach to the development of technology systems, and niche protection is conceived as a set of measures and locations where the development of sustainable technologies were shielded, nurtured and empowered in relation to incumbent technologies.

The insider-ontological framework focuses particularly on empowerment, which was a dimension of protection absent in the literature. We suggest niche technologies are able to exert greater influence either by fitting-and-conforming to prevailing regime-technological institutions, or by stretching-and-transforming those institutions into forms better adapted to the new technology. Both processes require substantial political work. This insider conceptualisation draws on more actor-network oriented ideas in technology studies, but also social constructivist ideas about the meanings and performance of technologies for different constituencies. Often this work is done through representations of niche technological performance and promise in broader narratives, and managing the boundary between the detailed material developments of the technology, and its projected significance to debates in the wider social world.

Theory built through our empirically-grounded, insider-ontology enables analysis that explains the complex, often messy, socio-political work necessary for creating and maintaining protective niche conditions conducive for sustainable development, as identified in our outsider-ontological approach. As such, we have found a way to bring together in quite nuanced ways the kind of critical appreciation of political on-the-ground realities helpful for reflective technology advocates, with a more systematic, evolutionary appreciation of the development of technologies over time of relevance to policy decision-makers.

2. Exploitation Routes(circa 250 words)

Please describe the process and activities through which you plan to ensure that your findings obtain the maximum potential impact. This can include both scientific impact and economic and societal impact.

Scientific impact has been sought through the usual channels of publication, seminars, conferences (see Research Outcomes System for data), doctoral training, and teaching on both undergraduate and postgraduate courses. The work has been well received and is already becoming widely cited and used in other projects, especially in Europe. It is used in domains as diverse as innovation studies, science and technology studies, urban studies, energy studies, transportation studies, geography, environmental governance and health. We also convened a dedicated international, inter-disciplinary workshop of researchers in Eindhoven to explore further our ideas about the politics of providing and expanding spaces for low carbon

innovation. We are now editing a special issue journal (Environmental Innovation & Societal Transitions) on the basis of the workshop.

Policy impact has been sought through European training programmes under the EU 'Climate-KIC' (Knowledge and Innovation Community), in particular in the 'Pioneers into Practice' program. This is a Europe-wide program through which decision leaders and practitioners engage in an intra- and inter-regional exchange programmes. Dutch investigators of the current Bilateral project have been closely involved in designing and teaching a mentoring program on transitions, including 4 annual training workshops. Theories and examples of shielding, nurturing and empowering niche sustainable innovations are now used in these workshops, exposing up to 180 practitioners to these ideas annually.

We have also made sure that our theory and cases are included in a post-academic training program on transition management, in which one of the Dutch investigators has been a lecturer for almost ten years, teaching ideas about niches and experiments in socio-technical transitions to 20-40 Dutch practitioners annually.

Project results have also been presented to non-academic audiences by the UK investigators at various stakeholder occasions such as bilateral meetings and policy and industry events in both the UK and at European level. We were also authors for the section on energy transitions for IASA Global Energy Assessment.

3. Potential use in a non-academic context (circa 250 words)

Please outline any anticipated or potential economic or societal impacts that you believe your project might have in future on the 'user' community.

We believe our empirically-informed theory could have tremendous impact on the formulation of more effective policies and business strategies for addressing sustainable development and climate change. We provide a more politically-realistic and innovation-informed approach to developing more sustainable technologies and the wider 'socio-technical' configurations that make those technologies work. In the context of the Pioneers-into-Practice program, for examples, ideas about shielding, nurturing and empowerment have been translated into practical assignments as part of a toolkit for doing transitions in practice.

Our theory is of relevance not just to the energy domain, but to any economic sector confronting increasing demands to transform radically in order to become lower carbon and more sustainable. So we expect these ideas to become of growing interest as pressure builds over time.

An ambition of the new SPRU-based Centre for Innovation and Energy Demand is to try and get socio-technical transitions ideas into policy debates and discussions. This follow-on funding gives us an opportunity to get these new theories about protective space into those debates. We will also promote our theory through the Sustainable Transitions Research Network in which we are involved internationally.

4. URL

If your project has its own website/web page, please enter the URL here.

<http://lowcarbonpolitics.wordpress.com/>

5. Sector Coding

Please select the sector(s) from the list that best indicates where the findings of your grant will potentially be of most relevance to *(delete those not applicable)*:

Energy and Environment principally – due to the empirical focus. But our theory is of relevance to any economic sector confronting increasing demands to transform radically in order to become lower carbon and more sustainable. So we expect these ideas to become of growing interest as pressure builds over time.