Harnessing Energy from Highways

In-person presentation / Written paper

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The highway network is subjected to different forces every day: solar radiation, wind, the movement of water and kinetic energy generated by vehicles. Technology already exists to harness energy from each of these forces, yet it has either remained at the prototype stage or not been fully developed due to the poor energy and financial returns and the inconsistent levels of energy produced. This paper proposes that each technology is incorporated into a Hybrid Renewable Energy System (HRES) that gathers energy from multiple sources depending on the prevailing weather in the country it is being delivered to enable consistent energy supply. For example in northern Europe this may be based on the management of water, wind and kinetic energy, whereas solar, wind and kinetic energy may be the energy sources in the Middle East.

The paper explores how governments can move this technology from the prototype phase to delivery. The most cost effective means of achieving this would be through
the funding of a number of different trials to identify what works. Consortia comprising of highway authorities, multi-disciplinary consultancies, universities and energy companies could then apply to enter the competition. The government along with the consortia members would then be able to retain a percentage of any patents created, allowing the technology to be sold elsewhere and recouping the funding outlay for each party involved.

The key elements of the technology are that they will have to be low-tech, cheap to build, maintain and replace and therefore easy to roll out when replacing the existing highway infrastructure as part of the maintenance schedule. The benefits of this approach are reduced emissions from power stations and additional funding to maintain and enhance existing highway networks for the benefit of all users.

• Author(s) Biography (200 words each):

David has worked in the transportation and planning sector for the past 13 years working in the consultancy, local authority and academic sectors. David completed his PhD at the University of the West of England (UWE) in 2015 and for his research he designed a sociological model to understand how the transport planning system locks us into unsustainable patterns of travel behaviour. David is currently works as a research associate at UWE in the Centre of Sustainable Planning and Environments. He is currently working on the ESRC funded PARCOUR project which is designed to identify who ensures the public interest in met in the delivery of brownfield urban regeneration projects. He is working with teams in the UK, Brazil and the Netherlands as part of a comparative approach.

The idea within this paper is something David has been thinking about for many years and in April 2017 he was awarded a Lightbulb Prize for Originality in the Wolfson Economics Prize for his concept of harnessing energy. This paper is an opportunity to bring the paper to a wider audience and identify both research and delivery funding opportunities moving forward.