

The Rise of the Electric Vehicle

Stephen Hall

The report is available at: <https://research.ncl.ac.uk/ibuild/outputs/>



With a focus on electric vehicles, a recent report explores new business models that can work across the auto industry, transport infrastructure and energy systems.

Through exploring and exploiting these links there are opportunities to improve air quality, tackle climate change, and grow new business models. Business model innovation is needed because new technologies and engineering innovations are currently far ahead of the energy system's ability to accommodate them.

The question is, when it will make sense for most of us to ditch diesel and petrol, and go electric? Given the pace of innovation in the sector, the use of electric vehicles might be sooner than you think. The report highlights the following reasons:

1. Electric fuel costs could go down

It is already much cheaper per mile to drive electric than diesel or petrol – it costs about 12p per mile for liquid fuel versus 2p-4p per mile for electric. Most people will also do the majority of their charging at night, when the price of electricity is much lower. With smart electricity meters in our homes, our energy providers will be able to charge us more accurately for when we use electricity as well as how much we use.

2. Electric cars can be clean and green

Low-price electricity is often the greenest electricity. As we build more wind

and solar power into our electricity systems, the cost of electricity on the wholesale market falls. Some electric cars can already be switched on and off charge remotely – and there is no reason they cannot be programmed to charge when electricity is cheapest or greenest.

3. Mobility for the price of a coffee

For 97% of the time, we are not behind the wheel of our cars. This has led to a host of non-ownership models where people take short-term rental of cars, buying “mobility as a service”. This research shows that innovative ideas around mobility as a service could be linked with the energy system to offer low-carbon vehicle access to everyone – whether they want to actually own a car or not.

4. No driveway, no problem.

Until now, having a driveway or garage was the only realistic option for everyday charging. Public charge provision has been patchy – drivers are often forced to use slow chargers in inconvenient locations to top up. Now rapid charger points are available in motorway service stations, and they are set to appear in cities, too – so not having a driveway won't stop you buying an electric vehicle if you live anywhere close to one of these “filling stations of the future”.

5. Buy one for the price of a used Ford

Expect to see a growing market for used electric cars and extended warranties on batteries and charging kit. Overall, this research showed us that new partnerships between car makers, energy utilities and cities will offer many more options for us to take our first ride in a purely electric car.

Typology of construction components for reuse Workshop

4th April 2017, London.

An important missing link in enabling sustainability in the construction sector is the potential for construction components to be reused. A typology system for assessing the reusability potential of construction components has been developed, containing a number of classifications based on the:

- properties and characteristics of the component, connection details, etc.;
- nature of the original use, exposure conditions, and the match thereto for the proposed new structural form, loading, exposure;
- nature of the recovery process, including details of the methods used to extract the component and the associated likelihood of damage or contamination caused.

The purpose of this workshop is to assess the validity of these classifications, and of the typology system overall, to provide valuable information and insights into the potential for construction component reuse.

Contact Eleni Iacovidou (E.Iacovidou@leeds.ac.uk) if you would like to attend.

Formation of Outcome-Oriented Performance Indicators for Infrastructure

Claire Walsh and Chris Bouch

A research collaboration between iBUILD and ICIF (<http://www.icif.ac.uk/>) on behalf of the at the time Infrastructure UK, now Infrastructure and Projects Authority, looked at deriving a process for the formation of outcome-orientated performance indicators for infrastructure.

The work which is published in two papers, cited below, reviews approaches to the use of performance indicators, and proposes a five step process to develop outcome-orientated performance indicators for the strategic evaluation of infrastructure performance. This process is tested on the water, rail and energy sectors.

Recommendations arising from the research are as follows:

- The desired outcomes society expects infrastructure to facilitate must be identified and regularly reviewed in order to define the purpose(s) of the nation's infrastructure;

Valuing Infrastructure Conference

26-27 April, 2017

Met Hotel, Leeds

The conference aims to develop the interdisciplinary 'systems of systems' approach to sustainable and resilient infrastructure, arising originally from the engineering disciplines, now applied universally and exemplified by HM Treasury's Valuing Infrastructure Spend.

The conference will be indispensable for all people and groups interested in the value of infrastructure and its wider impact on social provisioning. Policy makers, civil servants, engineers, economists, environmental and social scientists are warmly invited to attend, notably from such diverse backgrounds as:

- **local authorities, national government and regulators** seeking efficiency, effectiveness, and new ways of delivering services, in the face of austerity
- **private infrastructure providers, developers, investors and financiers** assessing the long-term value of infrastructure investment, as well as new forms of value realisation
- **civil society organisations** seeking high quality, inclusive infrastructure provision
- **academics** undertaking high-impact interdisciplinary infrastructure research.

We call for abstract submissions from individuals and interdisciplinary teams who employ or address a 'systems of systems' approach to infrastructure provision, and/or address the long-term (or 'whole-life') economic, social and environmental value of infrastructure. We also call for abstract submissions on the wider impact of infrastructure value and infrastructure financing on social provisioning.

Submit abstracts (of approx. 300 words) by email to:

valuinginfrastructure@leeds.ac.uk.

There will be a subsequent opportunity to submit papers to special issues of international journals including *Regional Studies and Infrastructure Asset Management*.

Register to attend: <http://store.leeds.ac.uk/conferences-and-events/environment/earth-and-environment/valuing-infrastructure-conference-april-2017>



Deal or No Deal? Australia bets on UK-style City Deals

Peter O'Brien

The Australian government is introducing UK-style City Deals in an attempt to break down the barriers between federal, state and local government, and forge new partnerships for economic growth. Three City Deals have been launched to date: Townsville (Queensland); Launceston (Tasmania); and Western Sydney (New South Wales). Each is predicated on planning new forms of investment in urban development and/or infrastructure.



Against a background of rising public debt, City Deals represent an attempt by the federal government to introduce a new approach to investing in urban infrastructure, although Australia's debt to GDP ratio (19%) remains a fraction of the UK's, which is nearly 83%. Clues as to what we can expect from Australian City Deals were evident in the press release launching the initiative, which the federal government said will "draw on the Commonwealth's coordination capacity and the strength of its balance sheet at a time of historically low interest rates, to get the best infrastructure projects off the ground". The fiscal position of the federal government can be used in various ways, either through direct borrowing or de-risking private investment. The logic of the City Deal approach suggests that, in return for 'drawing upon' federal capacity, states and local government will be asked to agree mechanisms that ensure local areas prioritise infrastructure projects that deliver growth. But despite the rhetoric surrounding innovative funding and financing, such concepts have proved difficult to implement in the UK. Instead, emasculated local authorities, facing continued budgetary pressures, have sought long-term (up to 30 years) grant funding from national government. For its part, the UK government has also found grants easier to manage than complex earn-back arrangements of the kind devised initially in the Greater Manchester City Deal.

City Deals in Australia are being negotiated between three tiers of government. The experience of the City Deals in Scotland (e.g. Glasgow, Aberdeen, Dundee and Inverness) and Wales (Cardiff and Swansea) – involving UK government, devolved administrations and local authorities are more akin to a federal-type situation – and could be instructive for policy-makers in Australia. Like the UK, national government in Australia is proposing to incentivise actions and accountabilities at the sub-national level. The UK government has dangled the carrot of long-term grant funding to 'encourage' local authorities to establish statutory governance partnerships across city-region geographies. City Deals in Australia may be part of a similar, albeit clandestine, push for local government reform, reflecting arguments that direct funding of local government by federal government creates efficiencies, and that new investment in local infrastructure requires effective cross-border local government collaboration.

Contd.

- A long-term vision or strategic plan for the nation's infrastructure should reflect these outcomes and be developed within the context of enabling them;
- Indicators should be explicitly derived from these outcomes in order to signal the performance towards their achievement, even if they require the contribution and cooperation of multiple infrastructure systems;
- The indicators need to be applicable at a range of scales to ensure activity is being delivered in the right locations.

Publications

Cahart N; Bouch C; Walsh CL; Dolan T. 2016. Applying a new concept for strategic performance indicators. *Infrastructure Asset Management* 3(4), 143–153.

<http://dx.doi.org/10.1680/jinam.16.00016>

Dolan T; Walsh CL; Cahart N; Bouch C. 2016. A conceptual approach to strategic performance indicators. *Infrastructure Asset Management* 3(4), 132–142.

<http://dx.doi.org/10.1680/jinam.16.00015>



Robert Sweeney

Robert Sweeney is a final year PhD student in economics at University of Leeds. He researches issues surrounding financialisation, and banking and institutional investors in the context of Europe. Previously, he completed an MSc in Economics at University of Leeds, an MA in Globalisation at Dublin City University, and a BA in Physics and Chemistry at Trinity College Dublin.



Richard Whittle

Dr Richard Whittle is a Principal Research Fellow (Economics) in the Centre for Applied Behavioural Economics and a Fellow in the Institute for Place Management. He completed his PhD at the University of Keele in 2016 and researches in economic crisis and contemporary explanations for the business cycle. He has received funding from the ESRC, the British Academy, the Money Advice Service and the CIPD. Richard currently directs the postgraduate economic and fiscal policy programme for Her Majesty's Revenue and Customs, which delivers pluralist economic teaching and research to senior policy advisors within HM Government.

Recent Publications

Cahart N; Bouch C; Walsh CL; Dolan T. 2016. Applying a new concept for strategic performance indicators. *Infrastructure Asset Management* 3(4), 143–153.

<http://dx.doi.org/10.1680/jinam.16.00016>

Dawson RJ. 2016. Communities must be at the heart of an open infrastructure planning process. In *Institute for Social Renewal, Newcastle University, The Devolution Revolution: Empowering local communities to drive change*, Newcastle University.

<http://www.ncl.ac.uk/media/wwwnclacuk/socialrenewal/files/NUISR%20Devolution%20Revolution%20final.pdf>

Dolan T; Walsh CL; Cahart N; Bouch C. 2016. A conceptual approach to strategic performance indicators. *Infrastructure Asset Management* 3(4), 132–142.

<http://dx.doi.org/10.1680/jinam.16.00015>

Hall S; Shepherd S; Wadud Z. 2017. Business model innovation for electric vehicle futures.

http://homepages.see.leeds.ac.uk/~earshal/Files/11167_SEE_electrical_vehicles_report_WEB.pdf

Kafouros M; Aliyev M. 2016. Institutions and foreign subsidiary growth in transition economies: the role of intangible assets and capabilities. *Journal of Management Studies*, 53, 4, 580-607.

<http://dx.doi.org/10.1111/joms.12169>

Lee SE; Quinn AD and Rogers CDF. 2016. Advancing City Sustainability via its Systems of Flows: The Urban Metabolism of Birmingham and its Hinterland. *Sustainability*, 8, 3, 220.

<http://dx.doi.org/10.3390/su8030220>

O'Brien P; Pike A; Tomaney J. 2016. Beyond the northern pitchbook, in Raco M (ed) *Britain for Sale: perspectives on the costs and benefits of foreign ownership*, The Smith Institute: London.

<http://www.smith-institute.org.uk/book/britain-sale-perspectives-costs-benefits-foreign-ownership/>

Pike A; Kempton L; Marlow D; O'Brien P and Tomaney J. 2016. *Decentralisation: Issues, Principles and Practice*, Newcastle University.

<https://research.ncl.ac.uk/ibuild/outputs/reports/Pike%20et%20al.%202016%20Decentralisation%20-%20Issues%20Principles%20and%20Practice%20-%20Final%20Draft-1.pdf>

Pike A. 2016. Elected mayors and combined authorities must focus on inclusive growth. In *Institute for Social Renewal, Newcastle University, The Devolution Revolution: Empowering local communities to drive change*, Newcastle University.

<http://www.ncl.ac.uk/media/wwwnclacuk/socialrenewal/files/NUISR%20Devolution%20Revolution%20final.pdf>

Walsh CL; Blenkinsop S; Fowler HJ; Burton A; Dawson RJ; Glenis V; Manning LJ; Jahanshahi G; Kilsby CG. 2016. Adaptation of water resource systems to an uncertain future. *Hydrology and Earth System Sciences*, 20, 1869-1884.

<http://dx.doi.org/10.5194/hess-20-1869-2016>

Wang S; Wang S. 2016. Integrating spatial and biomass planning for the United States. *Energy*, 114, 113-120.

<http://www.sciencedirect.com/science/article/pii/S0360544216310660>

About iBUILD

iBUILD is developing new business models to improve the delivery of infrastructure systems and the services they provide.

For further information about the iBUILD programme visit our website: www.ibuild.ac.uk