Welsh Economic Review

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The *Welsh Economic Review* is now published once a year, by the Welsh Economy Research Unit (WERU) at Cardiff Business School. The aim of the *Review* is to provide an authoritative and objective analysis of the Welsh economy in a manner that promotes understanding and informs decision-making. The core section of the *Review* is written by members of WERU, with feature articles contributed by academics or practitioners within or outside Wales. The *Review* is circulated widely within Wales, to both private and public sector organisations, including the education sector and the Welsh Assembly Government.

Notes for Contributors

Authors should send papers for potential publication in the *Welsh Economic Review* to the Editor at the address given below, preferably via e-mail in a Word for Windows format. Papers are welcome on any topic that would be of general interest to the readership, and should be written in a style suitable for non-specialist readers. Papers should be approximately 3,000-4,000 words, and any graphs or figures should be accompanied by the underlying data to allow reproduction.

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Editorial: The Future for Wales - An E-Factor Special

Professor Ken Peattie, Director, BRASS Research Centre, Cardiff University.

The policy and business agendas over the coming decade and beyond will be dominated by the interrelationship between the big three E-Factors: Economy, Energy and Environment. The extraordinary economic growth of the twentieth century was built upon a foundation of cheap energy, but it came at an unprecedented environmental price. The first decade of the twenty first century has been a transitional period during which the potential economic and social repercussions of the era of cheap energy have been highlighted by the likes of Sir Nicholas Stern, Al Gore and the IPCC, amongst others. The idea that has underpinned economic thinking for decades, that cheap energy is unquestionably good because it lowers costs for business and boosts competitiveness, suddenly seems outmoded, even in a time of recession. The new search is for 'clean' energy sources to develop and invest in, as a source of 'green' jobs and growth.

The explicit statutory duty of the Welsh Assembly Government to integrate the pursuit of sustainable development within and across its policy agenda has prompted Wales to seek to lead in sustainability thinking. Amongst other things this has given Wales good reason to think hard about the 3Es. First Minister Rhodri Morgan noted this summer, when he opened the '*Convergence on Zero'* Carbon Transition Conference as part of the Smithsonian Folklife Festival's celebration of Wales in Washington (http://www.convergenceonzero.org/), the carbon intensive economy of the twentieth century was initially founded on the global export of Welsh coal. This makes Wales a peculiarly appropriate candidate to explore possible future pathways towards a more sustainable energy economy.

Like economics, energy management is all about supply and demand and this special issue delivers some facts and figures for current Welsh energy production and consumption. The future picture for energy in Wales and beyond is mostly characterised by controversy. At the '*Convergence on Zero'* conference, Richard Heinberg from the Post Carbon Institute in California, and author of the book '*Peak Everything*', put forward a convincing argument that the practical realities of technology and economics in oil extraction mean that we may well have already reached '*Peak Oil*'. As a concept '*Peak Oil*' remains controversial, and a topic that policy makers usually prefer to avoid discussing. However, following a year of wild fluctuations in oil prices and the faltering of World economic growth, people are increasingly giving serious thought to what a post-oil economy might look like. The implications for Wales are the subject of the '*Wales in the Energy Crunch*' report written by Calvin Jones of the Welsh Economy Research Unit (an executive summary of which accompanies this edition of the *Welsh Economic Review*). It makes a clear case for the need to take action now to create a Welsh economy of the future which is less dependent on fossil fuels, more efficient in its use of energy, and with much reduced carbon emissions. As the paper from Karen Turner and colleagues at the University of Strathclyde explains in its introduction, the Scottish Government have sought to develop a distinctive energy policy with a focus on environmental improvements through tackling both supply and demand. It also focuses on energy efficiency, an issue which Calvin Jones' analysis deliberately does not tackle, and so is usefully complementary to it. Wales is just behind Scotland in leading the UK in power generation from renewable sources, and there will surely be valuable lessons the two nations can learn from one another in developing more sustainable technologies, economic policies and management practices for energy.

Around one third of all the carbon emissions linked to the Welsh economy comes directly from electricity generation. This is currently dominated by gas, nuclear and coal based generation. Reducing supply-side carbon emissions will require significant future investment, either in renewable sources or new nuclear capacity. Both are controversial in relation to their environmental impact and embedded emissions related to their construction. The proposal for the Severn Barrage has put Wales in the forefront of the UK debate about energy policy, and also the wider debate about whether such large centralised schemes are a legacy of 'old' economic thinking, and whether the future belongs to smaller-scale and more localised solutions.

More localised energy solutions that encompass both supply and demand are reflected in the paper from Jan Cliff, founder of Sundance Renewables, a Welsh biofuel business whose story also featured at the '*Convergence on Zero'* conference. Biofuels are an interesting example of an energy technology which has developed a poor reputation through unforeseen interactions between the 3Es. The subsidised American dash for corn-based ethanol biofuel misfired technically, environmentally, politically and economically. Research showed that corn kernels were a less efficient source of ethanol than other biomass crops, and that (depending on production methods and how the residues were used) corn ethanol production could even consume more energy than it generated. The inflationary impact it had on food prices led to food riots in countries like Mexico, and generated bad biofuel headlines globally. By contrast Sundance's production of '*good*' biodiesel from waste cooking oil shows what can be accomplished in providing more sustainable energy through localised initiatives and applying a community social enterprise business model. What is remarkable is that an enterprise which provides ticks against so many items on the sustainable business policy agenda should have such a struggle against '*counterproductive government policies and perverse incentives*'. It reflects an all too common pattern of well-intentioned government policies unintentionally stifling the development of new and more sustainable businesses and technologies because we fail to join up our thinking between the 3Es.

The Welsh government and the Scottish share a common disadvantage in developing a sustainable energy future, in that some of the key potential policy levers are not in their hands because the management of energy markets (through climate levies, emissions trading systems and energy performance certificates) and building regulations are still determined in Westminster. There is however potential for the Assembly Government to tackle issues of energy demand. The two areas of the Welsh economy that constitute the largest (and fastest growing) contributors to energy demand-based carbon emissions are transport and homes. Both are vital to our quality of life and to the Welsh economy, and reducing their use of energy and carbon emissions will be difficult without significant investment. In the case of homes there is the potential to reduce

Welsh CO_2 emissions by an estimated three quarters of a million tonnes annually if the Household Energy Efficiency Scheme was extended to achieve energy efficiency improvements in all Welsh homes. This would be relatively expensive, partially because Wales has a higher than UK average proportion of relatively large, old and '*hard-to-treat*' homes. The precise E-Factor impact of extending the scheme is also difficult to forecast because it depends a great deal on householder behaviour. As the paper from Karen Turner and colleagues implies, the environmental gains of being more efficient and economical with energy depend on what other activities the savings lead to. If the money saved by households through domestic energy saving is used to fund more long-haul holidays, then this '*rebound effect*' reduces the effectiveness of a well-intentioned initiative. Tackling our environmental impacts, like economics, depends upon a holistic understanding of such everyday behaviours and '*the way we live now*'.

The Welsh Economy Research Unit and the BRASS Research Centre at Cardiff University share an interest in the interaction between the 3E factors in Wales (and they also share several researchers). Biofuels for transport, climate change and energy futures, everyday household energy behaviours and the role of social enterprises like Sundance Renewables in delivering more sustainable and resilient local economies are amongst the key areas for BRASS Research. What the research of WERU and BRASS highlights most clearly, is the complexity of developing and delivering more sustainable policies and practical solutions. There is never a single X-Factor for success in sustainable development, but there is an over-riding need to develop innovative, progressive and integrated policies for the 3 crucial E-Factors.

WERU Activities

Information about WERU publications, projects and activities can be found at www.weru.org.uk. Alternatively please contact Annette Roberts (robertsa1@cf.ac.uk) or Jane Bryan (bryanj@cardiff.ac.uk).

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