

WERU Conference

The Welsh Economy Research Unit held its 13th annual conference in May 2005 entitled *Wales' Comparative Advantage: building on success*. Following the conference, speakers were invited to provide a summary of their presentations for this *Review*. Those received are published below. The 2005 conference achieved a high standard of lively debate, and WERU would like to thank both speakers and delegates for their participation.

Comparative Advantage? Wales in the 21st Century (part 2)

Calvin Jones, Welsh Economy Research Unit, Cardiff Business School.

The Policy Problem

Wales currently lags dead last in the list of Britain's regions when it comes to wealth creation, with a figure for gross value added per head at under 80% of the UK average. Whilst unemployment rates are remarkably low, 'hidden' unemployment (including early retirees, those disabled and sick) is far higher than the average. Moreover, there are significant problems with the distribution of incomes; many upper-Valleys and rural communities have very low incomes, leading to problems with the local level of economic demand, and hence service provision and quality of life.

The Welsh Assembly has correctly identified the issues as a mixture of participation (not enough people in work) and productivity (those in work creating, on average, lower value added than elsewhere in the UK). These are, of course, only symptoms. The *causes* of Wales' lack of economic dynamism have accumulated over decades, indeed centuries, as Wales' original agrarian economy was supplanted by one based upon mineral extraction and steel, then post-war manufacturing branch plants, the Japanese and Korean FDI influxes of the 1980s and 1990s, and latterly, successes in attracting the service economy contact and call-centres. These industries had several things in common; they were largely the result of non-Welsh capital investment, and largely run from outside Wales; they hence required lower levels of managerial skills and occupations from the Welsh population. Thus, a vicious circle has developed where Wales has succeeded in attracting mobile investment that relies upon flexible and relatively cheap labour, and demand for high-level skills has remained weak.

The problems described above are the product of generations of economic structural change. It is then reasonable to suggest that they will not be solved in a short number of years, but only in decades, or perhaps generations (even Michael Porter suggests his competitive clusters will only become fully fledged over many years). This raises a fundamental problem for economic policymaking: it is currently formulated largely under a paradigm of 'no change' in basic productive and economic

structures (leaving aside non-central attempts to develop environmental goods & renewables). But the question should not be '*what must we do to succeed in today's world*' but rather '*what will it take to succeed in the world decades hence?*'. Indeed, taking such a long term view enables us to ask a more fundamental and constructive question: '*what would we like Wales to look like in the future, and can we make it happen?*'

A Future Economic Context

Economists and others know that predicting the future is a impossible task. However, we know enough about the long-term pressures on our society to make some broad judgements on likely scenarios; perhaps suggesting a 'best case' and a 'worst case'. It is clear that whilst socio-economic pressures (for example increased competition from Asian economies and the ageing of Western populations) will have some impact on local outcomes, environmental stresses may have far more impact on our basic quality of life; dominant among these are perhaps global warming and vastly increased energy costs. How we (in the widest sense and in Wales) can respond to these pressures will determine our level of 'success' – although success in an oil-depleted world may be a very different concept to our current understanding.

The Best of Times, the Worst of Times...

Whilst the reality of future climate change and scarce energy resource is clear (to most), the adequacy of our responses to them is not. It may be, for example that a move away from fossil fuels can be adequately managed; future oil discoveries (as postulated by those such Bjorn Lomborg) and increased nuclear capacity might combine with coal-to-oil and other technologies (such as extraction from Russian and Canadian tar sands) to give us breathing space, whilst we develop interim and future energy technologies that are truly renewable. Similarly it may be that inter-regional pressures can be managed so that climate change in the South, and energy demand from the East do not lead to a series of resource wars and an untenable security situation for the West. Meanwhile, large-scale carbon sequestration and other technological advances minimise the

day-to-day impacts of pollution and climate change for the UK.

A more pessimistic view would suggest that environmental and energy pressures may act too quickly, and externalities be too poorly accounted for in the capitalist system for us to develop an adequate response. In this case, we might face hugely increased energy costs, and the attendant collapse of existing productive and distributive networks, placing globalised capitalism in the dustbin of history along with Marxism and Feudalism. Under this scenario resource wars would be rife, personal security in serious doubt and living standards in freefall decline as the lack of fossil fuels would deny us not only our personal mobility but also most of our energy and heating, and the very Nikes on our feet.

Wales in the Future

By imagining such futures, however bleak, we may improve our prospects of developing policy tools better suited to their management. Indeed there are several related themes which are common to best- and worst-cases that might illustrate possible policy action 'ahead of time'.

The Scarcity of Energy – Under both scenarios, energy, particularly mobile energy, becomes vastly more expensive than is currently the case. It is likely that current debates in Wales regarding the siting of windfarms will become utterly irrelevant as every watt of renewable and non-renewable power is exploited. Here, Wales may once again have a comparative advantage, with plenty of wind, water for nuclear cooling and significant reserves of coal for use both directly and following conversion to liquid fuel. Meanwhile, we may be well placed to exploit interim hydrogen technologies if the Hydrogen Valley initiative bears fruit (<http://www.h2wales.org.uk>).

Lack of Personal Mobility – In a generation, the idea of using 1.5 tonnes of metal to carry 80Kg of human may be viewed as an absurdity. In two or three generations, even shared public transport may be rare. This scenario raises a number of opportunities as well as threats; first, can we be part of providing short term answers (such as

the NARO commuter car that Prodrive may produce in Wales; <http://www.naro.co.uk>? Secondly, can we increase not only the availability of next-generation ICT across Wales, but also incentivise the early use of such capacity for economic and work purposes, thus minimising transport needs? Thirdly, how can we develop local trading systems (not least for food) that can fortify us against substantial transport-related increases in the cost of produce and products delivered from locations far away? Lastly, if work is to be undertaken from home, and we can work from anywhere, how can we make Wales the sort of place that attracts and retains the best and most productive individuals?

The Importance of Community – The reliance by individuals on the state and on the wider world for security, economic commodities, for a cultural and social life has arisen in recent decades largely as a result of easily and cheaply available transport and ICT infrastructure. The restriction of the first of these may place the emphasis back on the geographically-close community as the place to live, work and play. Hence, it may be important to ensure that economic ‘competitiveness’ in a globalised economy is not pursued to the detriment of existing socio-geographic structures that may now seem obsolescent, but may be of use in future, when suburban and isolated living becomes impractical.

Policy Responses?

Sustainable development features large in the subject and tone of Welsh Assembly Government policy. There is much that is already being done to encourage future technologies, including support for the projects detailed above. Meanwhile, the Wales Spatial Plan explicitly notes the importance of sustaining communities. These pronouncements, plans and individual actions are all laudable and welcome. However, they do not obscure the patchy progress in many areas ‘on the ground’, for example in the production of renewable energy, in local/organic farming (as noted elsewhere in this Review) or even in the recycling of waste. Meanwhile, Welsh commuters are no more likely to commute via public transport (or by bike or foot) than any other region. We are in fact a no more ‘future-proof’ or sustainable society than any other part of the UK. It might be argued that Welsh Assembly powers are limited in many areas where progress could be mandated. In particular, local authorities are responsible, day-to-day, for many areas including town planning and (potentially) congestion charging where regulation could be implemented or costs explicitly imposed to alter

behaviour. Meanwhile, the Assembly lacks the legislative power to implement radical policy actions. There seems, however, little in the way of a strong message emanating from the Assembly, for example, in terms of enthusiasm for road tolling (on the M4 relief road), persuading Welsh towns to implement congestion charging or deterring single-use new housing developments. Meanwhile, there is no unifying strategy behind a planning policy which grants a wind farm development on appeal, but does not see any need to undertake a holistic region-level environmental assessment of an extremely significant liquefied gas terminal at Milford Haven.

Conclusion

It is evident that if Wales is to ‘succeed’ in future, we will do so under very different conditions than if we were to succeed today. The level of that success will depend on a number of factors; not least the nature of global economic conditions. If the economic focus shifts strongly Eastward and we cannot retain high value activities, all of Europe may face a long economic twilight. What also will be critical is how far we can anticipate the shape of the future, and relate that expectation to the on-the-ground strategic policy actions of today, and how far we, *as a population as a whole*, are willing to bear any costs of seeking ‘first mover’ advantage – be that through congestion or road pricing, large scale wind or nuclear power, or abandoning the push to succeed in a global-competitive, clustered and ‘knowledge-driven’ world. A serious change in socio-economic policy in this way would incur very significant costs, and income distribution rather than generation might take a more central role (something we are currently able to do, bankrolled as we are by the Barnett Formula). Yet it is worth considering that no region in the UK, Europe or probably the world is seriously planning for a post-oil world. What if we were the first?

Magstim: Building Value in West Wales

Mr John Starzewski, Managing Director, The Magstim Company

Introduction

The Magstim Company is engaged in the research, development and marketing of medical devices used to investigate neural function. Our products are used around the world by researchers and clinicians involved in Neurology, Neurophysiology, Psychiatry and Neurosurgery. Magstim machines are used to stimulate both brain tissue and other, peripheral neural tissue with the goal of understanding important aspects of function.



Transcranial Magnetic Stimulation

In the context of brain stimulation there is strong evidence to suggest that repetitive Transcranial Magnetic Stimulation (rTMS) can provide a useful and therapeutic effect in the treatment of psychiatric conditions such as mood disorders, up to and including drug resistant depression. In the case of severe depression the induction of seizures is sometimes required, the technique being called Magnetic Seizure Therapy (MST). Single pulse TMS is also a useful diagnostic tool for neurologists in determining nerve function changes characteristic of neurodegenerative diseases such as Multiple Sclerosis or Motor Neurone Disease. The company also manufactures a range of neurosurgical products which are used widely in Europe together with related disposable probes.

Neurosurgical probe

Medical devices present a substantial opportunity for companies with access to the appropriate technologies and the skilled staff needed to continually develop products to meet the rapidly changing requirements of the medical community worldwide. Published



estimates of the sector indicate that the worldwide sales of medical devices in 2003 is in the region of \$184 billion, with 42% of that arising in the USA (*PJB Publications Ltd*, August 2004).

It is our intention to strengthen our development efforts in Wales in support of our leading products to continually improve functionality, reduce costs and hence maintain the competitive position of them in world markets.

History

Magstim was established 1989 at Whitland Abbey, Carmarthenshire. At that time the company had a turnover of £400,000 and employed 14 people making magnetic stimulators. By 1992 Magstim introduced a second line of products used by neurosurgeons for intra-operative nerve monitoring (Neurosign) and shortly thereafter, in partnership with a Canadian company, acquired the rights to sell a device to enable the accurate location of brain stimulation sites (Brainsight).

Subsequent development of our products and markets has enabled us to grow turnover to £3.2 million and employ a workforce of 48 at our facility at Whitland.

The Future for Magstim

Magstim is recognised as one of the leading suppliers of magnetic nerve stimulators in most European countries. We intend that our reputation will be greatly enhanced in the USA and Japan over the next three years as new products currently in registration are approved and the clinical utility of magnetic stimulation becomes better understood and more widely applied. Magstim is leading the world in the development of TMS techniques through our collaboration with leading institutions in the USA.

Our expectation is that we shall achieve global sales of £20 million (\$35 million) by 2010 using the currently forecast portfolio. Any significant new developments will cause us to exceed that performance.

We are maintaining a substantial clinical development and engineering support effort to gain regulatory approval for Magnetic Seizure Therapy. This will continue until a reliable therapeutic effect is proven beyond doubt and we can obtain registration in the USA. If successful, approval for MST should occur in 2007.

Economic and social considerations

The challenges of working in West Wales centre around four main factors: funding support, the availability of qualified and experienced staff,

managing communications and having effective distribution network.

Many small businesses like Magstim benefit from the availability of support from the Welsh Development Agency (WDA) and Wales Trade International (WTI) to help improve business processes, evolve competitive strategies and facilitate contact with overseas partners through the trade missions.

Welsh Assembly investment policies have been a key factor in maintaining our ability to employ the staff we require and develop their skills. That, in combination with local colleges (Carmarthen College) has meant that a number of our younger employees are able to take advantage of vocational training whilst retaining a job. In addition, since we are in an EU Objective One area, grants are available to support our ability to expand and represent an important source of supplementary funding.

The role of the WDA and WTI should not be underestimated. They have proven to be of decisive help to Magstim by facilitating contact with centres of excellence and assisting with business improvements via the work of approved expert consultants. The continuation of these support services after the forthcoming merger of WDA/WTI is of great importance to many small to medium enterprises (SME) in the region.

SME activities in areas of high technology derive particular benefit from WDA/WTI, since for technology companies to compete effectively on the world stage requires state of the art technical knowledge and very competent staff. There is no doubt that such resources exist in the region and the agencies serve to bring together the opportunities and the resources to satisfy them.

Finding staff with advanced qualifications or significant experience in medical electronics has proven a challenge to Magstim. In the long term it will be vitally important to ensure a good supply of trained and talented people emerging from the local universities and willing to make a career in West Wales. The education system in Wales could contribute greatly to the prospects of the region by increasing the emphasis on science and mathematics at primary level to help increase the flow of well prepared students into the university system.

In the short term the region has to look at making itself more attractive as a place to reside by improving infrastructure, especially transport, and

investing more in primary wealth generation sectors such as engineering rather than, for example, tourism.

In addition, housing is relatively expensive in an area where there is little real justification for high prices because of poor infrastructure, making relocation of key workers to the region a problem.

The future of high technology business in West Wales is bright so long as the relevant bodies in the region continue to address the factors that have hampered international competitiveness in the past. We work in a global market that is increasingly unforgiving.

Renewable Energy – the Welsh Opportunity

Dr Doug Parr, Chief Scientist, Greenpeace

It is widely recognized that the greatest environmental threat from industrialized society is that of climate change. Climate change is expected to lead to a rise in temperature across the globe, and of sea levels. Significant change is anticipated in precipitation patterns and the frequency of extreme events like hurricanes and flooding, damage to biodiversity and a host of other impacts, the majority of which would be damaging. It is even possible that temperature rises resulting from current atmospheric levels of greenhouse gases and fairly optimistic projections of greenhouse gas emissions will lead to the irreversible melting of the Greenland ice sheet – and hence to sea level rises of 6 or 7 metres.

It has proved a difficult problem to tackle because the major greenhouse gas, carbon dioxide, is a product of virtually all aspects of economic activity in industrial societies because it comes from fossil fuels which provide the vast majority of our energy. There is a strong need to reduce emissions and this can be done by much more efficient use of energy. However, there will always be a need for energy so we must develop clean energy sources. This has been recognized by the UK's Renewables Obligation which requires that electricity suppliers have certificates to demonstrate they are supplying 10% of their electricity from renewable sources by 2010, 15% by 2015 and an indicative target of 20% by 2020.

Whilst a variety of renewable sources of electricity are in development, the most likely to provide a substantial amount of the 10% and 15% targets is wind power. Solar power remains expensive, wave and tidal power whilst promising (and see below) are not yet technically well demonstrated, and biomass energy

suffers from a need to develop a market supply chain to give both farmers and potential generators confidence – biomass crops can take 3 or 4 years to grow. While other forms of renewable energy exist e.g. hydro, landfill gas, it is clear that wind will need to be a major player in the increase of renewable electricity supply.

Given that wind is a global energy resource the UK is not alone in seeking to expand wind energy generation. Thus the stage is set for a massive new industry. Who will be the main beneficiaries of this shift in electricity generation?

Wind can be divided into onshore wind and offshore wind. Onshore wind is where most installed capacity exists for the excellent reason that it is easier and cheaper to do. Offshore wind requires considerable additional skills and resources as well as the development and refinement of some of the skills for onshore wind engineering.

We can examine who has achieved dominance (and why) in the onshore wind market by looking at installation and wind resource in Europe. Installed capacity in the main EU countries is shown in table 1.

It is no surprise to find that those countries having the greatest amount of installed wind power onshore are also the most industrialised. A tremendous expansion of wind energy is being undertaken in China at present (along with virtually every other form of electricity generation) and whilst the first movers on wind energy – Denmark – have been dominant in supplying the equipment such as turbines thus far, both Spain and Germany are becoming more significant. The home market appears to be an essential element for the creation of a viable industry.

Obviously, an important element is the availability of a good wind resource.

Countries with a strong resource – Denmark and Spain are indeed leaders. The surprises are the extent of Germany’s exploitation of a much weaker resource, and that France has not exploited its resource potential. The UK has the best resource, however thus far it remains under-utilised.

However the UK is beginning to lead the world in the offshore sector; not simply in terms of installed capacity but in ambition. At time of opening (end 2003) Wales hosted the largest offshore wind farm in the world at North Hoyle, Rhyl. The UK has an extremely good offshore wind resource around its shores, and an ambitious sea-bed licencing programme run by Crown Estates. Three areas have been chosen as strategic areas for development. Two are on the East Coast in the Thames Estuary and the Wash, but the third is on the West Coast in Liverpool Bay. Given the sorts of skills and facilities required for the installation and operation of offshore wind farms, Wales would appear be a region ideally suited to capitalize both on the immediate opportunity, and the potential for export in the longer term.

Wales also has a strong manufacturing tradition and workforce skills in heavy engineering, which are increasingly under-utilised as the sector has declined in importance. Hence, it is favourably placed to expand rapidly into the kinds of manufacturing and engineering required. Examples would be steel fabrication and electrical engineering. South Wales has good port facilities (if that seems a long way from Liverpool Bay remember that even for the East Coast locations, the North East is considered to be in a good position to service the strategic areas despite its distance from the Wash).

The current situation in Wales mimics that in the North East of England. A study undertaken for Greenpeace by the consultancy *Energy for Sustainable Development* on that region indicated

that it had a number of advantages supporting expansion of renewable energy manufacturing and servicing. This study was commissioned to demonstrate that with appropriate regional support a new manufacturing and engineering platform could be established. Potential jobs identified were in turbine manufacture, civil engineering, electrical engineering and transformers manufacture, cabling, grid connection, erection and commissioning, planning, legal and financial services. Approximately half of the manufacturing and engineering jobs – the total being over 60,000 full time equivalents for 30% of UK electricity supplied by wind – would need to be located close to the point of turbine production. Ideally turbines would be manufactured close to the point of installation. As turbine manufacture grows world-wide, new manufacturing capacity will need to be created.

Even at a level close to current UK Government aims – 20% of electricity by 2020, and roughly half of this from offshore wind – the UK market would be around £33 billion and in 2020 there could be around 20,000 jobs in manufacture and installation, with a further 4,400 in operation and maintenance. The outstanding question is which region gets the big slices of this lucrative cake.

Further, a developed offshore wind industry would position any region well for the next stage of innovation – wave and tidal power – as so many of the skills and capacities are similar. Again Wales is very well located given the wave resource striking the southern half of the UK – closer than Northern Scotland to the main areas of electricity use, and otherwise better than anywhere else in Europe. Projections of device development show commercial wave machines being produced and deployed by around 2014. The UK currently leads the world in wave and tidal power and if properly nurtured the UK will become a world leader in the export of the technologies.

However, the above is a ‘sketch’ of what appear to be the substantial opportunities from the perspective of a London-based environmentalist. What is needed is a coherent plan from those with local knowledge and understanding. The Welsh Assembly, Welsh Development Agency and relevant local authorities need to come together to stimulate interest, assess the strengths and weaknesses of the Welsh position, and generate interest from wind developers. Businesses in the relevant sectors will need to move quickly to first show support, and demonstrate a capacity to deliver.

Table 1. Installed capacity of Wind power in 2003 in selected EU countries.

	Installed Wind capacity/MW
Germany	14,609
Spain	6,202
Denmark	3,110
Netherlands	912
Italy	904
UK	649
Others (EU-25)	2,156

Source: European Wind Energy Association

In conclusion global warming is a threat which is likely to become more politically charged, not less. But existing policies to contain UK emissions will already open up major new business opportunities in the energy sector. Wales has the skills and latent resources, if properly supported, to capture a major employment and wealth generating opportunity.

Seeing the Wood for the Trees: Clustering for Competitiveness in the Welsh Timber Sector

Dr David Pickernall, University of Glamorgan

The research underpinning this conference paper was funded under a Welsh Assembly Government pilot scheme. The research results from all of the projects funded under the

scheme are currently being reviewed by the Welsh Assembly Government prior to publication. It is therefore not possible to publish a summary of this conference paper.

The conference paper by Nicolas Lampkin of the University of Wales, Aberystwyth, entitled **Organic Farming in Wales: Economic and Policy Opportunities and Constraints**, appears in the feature article section of this Review.