

Wasserstoff - H₂



www.cleanenergypartnership.de



Regional Energy Transitions: Pathways to Hydrogen Infrastructure in South Wales

Nick Hacking

The potential for new forms of energy to transform post-industrial landscapes is very real. Research in innovation studies suggests that the emergence of a “cheap, almost universally available input, characterized by rapidly falling costs, that potentially can be used in many sectors of the economy ... may have very pervasive effects”¹

When modelling energy transitions at the regional level, significant barriers to change are evident. These include price, path dependency, the cost of new infrastructure, and the chicken-and-egg nature of infrastructural deployment. Despite such barriers, transnational original equipment manufacturers (OEMs) in the automotive sector and transnational energy producers have long-term corporate strategies for renewable energy transitions. Since the 1990s, this has also included hydrogen and fuel cells (H&FCs).²

Germany leads Europe in making an energy transition towards the greater use of H&FCs and in exploring how this can be linked to regeneration. Aware of the long-term strategic direction taken by its leading automotive OEMs, the federal government signed a Memorandum of Understanding (MOU) in 2009. This is helping roll out more H&FC products and infrastructure. The MOU is linked to a federal ‘H₂ Mobility’ programme, a coordinated cross-sectoral approach to bringing out mass-produced hydrogen-, and hydrogen-electric-powered vehicles by 2015. It is a bold vision that has helped align actors and de-risk funding via public-private partnerships. For example, Germany is committed to 500 hydrogen filling stations by 2015, rising to 1,000 by 2017.

The country’s federalist structure is key. Not only does regional activity in H&FCs benefit from historically close industry-academia links, but there are national *and* regional funding programmes. In North Rhine-Westphalia (NRW), there is a true H&FC cluster centred on the Ruhr. With around 350 related companies, infrastructure funds come via the national Konjunkturpaket II economic stimulus package. This solves the chicken-and-egg problem by kick-starting the construction of hydrogen filling stations. There is a ‘hydrogen highway’ planned in the Ruhr. Regionally, regeneration policies in NRW are pushing the area away from its historic reliance on coal production and further into renewables. Fiscal measures include startup support and attracting foreign investment in R&D and manufacture.

This potential energy transition is not all rosy. There are still problems for all German regions trading in H&FCs given a declining engineering skills base, the squeezing of funding by some foreign-owned companies, and the fact that federal funds for hydrogen and fuel cells will stop in 2016. Nevertheless, the evidence so far suggests that H₂ Mobility and Konjunkturpaket II are helping Germany to meet Europe’s low carbon targets for 2050 and simultaneously boost its domestic economy.

Could a similar vision be replicated for South Wales’ post-industrial landscape? The region is a strong potential base for hydrogen and fuel cell (H&FC) activity. There is significant research undertaken at the University of Glamorgan, plus a number of regional H&FC demonstration projects in the past with both linked to a number of nationally-based entrepreneurs who are in the marketplace. In terms of governance,

the newly devolved Welsh Assembly Government (WAG) began overtly pursuing policies based upon sustainable development in 1999. The automotive component sector in South Wales, made up of 200 or so national and regional OEMs, was already a priority. Livelihoods and communities are very much dependent upon renewed growth and thanks to very active advisory work by the University of Glamorgan, the idea of moving towards a regional hydrogen economy has remained on the table throughout the 2000s as a technological option. However, a planned national regeneration policy instrument known as a Low Carbon Economic Areas (LCEA) hasn’t yet taken off yet, and a new national transport study known as ‘UK H₂ Mobility’ is not expected to report on private H&FC interest before the end of 2012.

Thus, without a top-down, politically-sanctioned vision, as in Germany, prospects for an economic transition based on H&FCs do not look as strong. The UK also has shorter-term trading horizons on its capital markets, persistent under-resourcing and under-valuation of education and training, and less effective institutional links between academia, industry, development agencies and local planning authorities (LPAs). Also, while the car industry is strong, it lacks home-grown R&D. This appears to be why Whitehall historically has failed to strategically support H&FCs. Instead, national policy makers have largely focussed on the shorter-term roll out of electric vehicles. While energy can help transform post-industrial landscapes, currently in Wales, a more long-term vision combining a lead from central government and delivery via devolved regional government is required.

1 Fagerberg, J. (2003), Schumpeter and the revival of evolutionary economics: an appraisal of the literature, *Journal of Evolutionary Economics*, 13(2), 139.

2 Fuel cells are electrochemical devices that produce clean energy from chemical reactions. Energy can be stored in hydrogen, just one chemical that can be used with fuel cells.