

The political economy of energy demand and the UK steel economy

This research project considers a number of interrelated questions about the ‘UK steel economy’ energy demand and consumption, and how and why the UK is decarbonising by deindustrialising.

Despite its declining national economic contribution, the UK steel industry still uses the most electricity and emits the most carbon of all of the country’s energy intensive industries. A highly capital and energy-intensive industry, the carbon footprint of steel is larger than any other industrial sector (Cullen et al 2012)ⁱ. Globally, steel-making accounts for nine per cent of the world’s CO₂ emissions and 25 per cent of global industrial CO₂ emissions due to energy and processes (Skelton and Allwood 2013)ⁱⁱ.

Events over the last 10 months, including the mothballing, closure and downsizing of various UK steel plants, and most significantly the announcement of the sale of Tata steel’s UK operations in March 2016, have illustrated how the UK steel economy cannot be understood without analysing its international and historical context. Economic geography and history, and the impact of contemporary policy making and economics should also be considered.

The three main areas of research are:

- i) The economic and industrial history of the UK’s steel economy. Recent national and international factors attributed to its decline will also be examined.
- ii) How a political economy of energy demand should be conceptualised, including the costs of concepts of embodied carbon emissions, land and labour.
- iii) What a low-carbon industrial strategy for the UK could look like, including the potential for material efficiency, and the key challenges to be overcome for that to happen.

1. The UK steel economy

In the UK, steel has gone from being an industry of strategic national importance and pride as a foundation economy in a manufacturing industry, to one that is foreign-owned and from which government has largely withdrawn its historic support (Hudson and Swanton 2011ⁱⁱⁱ, Sadler 1990^{iv}).

Until about 40 years ago, steel was critical to the UK national economy, especially within Yorkshire, the north-east of England and in parts of Wales¹, a significant generator of employment, and at the core of many local communities and their cultural heritage (Business Innovation and Skills Committee 2015)^v. Yet in 2013, UK steel production constituted 16 million tonnes, forming just under one per cent of the global total, compared to the 779 million tonnes produced by China (World Steel Association 2014)^{vi}.

Tata Steel announced in March 2016 that it would sell off its UK business, affecting about 15,000 workers. While cuts to the UK’s steel operations are of national and particularly local significance, not least because of the impacts to employment and livelihoods (Rickhuss 2016)^{vii}, the impact in terms of international production will barely be felt.

Using the ‘UK steel economy’ as a case study (Allwood 2013:5)^{viii}, this research aims to develop a historical understanding of the dynamics of ‘decarbonisation by deindustrialisation’ in the UK, and to

understand its social, economic, political and environmental impacts. With this in mind, this research aims to understand “the powerful worldwide forces within which [the UK steel industry] is located” (Fine and Harris 1985:259)^{ix} and explore how the decline of the UK’s steel industry illustrates changing geographies of production, (Hudson 2005)^x and dramatic changes within the UK’s industrial landscape and economic system over the last 50 years. The research further analyses current causal factors attributed to the latest crisis.

2. Political economy of energy demand

From a theoretical perspective the research builds on comprehensive existing studies that have examined the inadequacy of orthodox economics approaches with regards to how energy demand is treated (Sorrell 2014^{xi}, 2009^{xii}). This includes the failure of many policy interventions to account for the complexity of economic systems, which “can lead to unintended and unanticipated consequences...that may undermine the main aims” (Sorrell 2014:75).

In considering some of that complexity, this research draws from the literature on political and economic geography (Bridge 2010)^{xiii} and heterodox economics in order to pose “systemic questions about the relationship between energy, geography and society” (Huber 2015:12)^{xiv}. It will also consider how energy demand is located within broader systems of production and consumption (Fine et al 2014)^{xv}.

The nature of the UK steel economy relates to questions of ‘embodied carbon,’ which refers to how carbon emissions are embodied within commodities and products manufactured abroad (Scott and Barrett 2015^{xvi}). This in turn is part of a bigger issue of the inequalities of global consumption patterns (Chancel & Piketty 2015^{xvii}) given that the territorial measurement of carbon emissions does not account for emissions embodied in imports (Paterson & Strippel 2010)^{xviii}. The research therefore draws from existing arguments that “emissions should be measured on a consumption not production basis” (Helm 2008:224) and that such measurements be integrated into national, and international climate policy.

3. Low-carbon industrial strategy

We will also examine contemporary industrial strategy in the UK, or the lack of one, and ask what a low-carbon industrial strategy could look like.

In particular, the research will focus on future possibilities for a circular economy (Green Alliance 2015) and material efficiency (Allwood et al 2013). While there is already a compelling case from an engineering perspective (Ibid) for greater material efficiency, significant political and economic barriers must be overcome for this to be realised. This research will therefore examine some of these barriers, including:

- the role of policy and regulation, politics and finance in shaping current trends and facilitating and/or obstructing future developments
- the dispersed and fragmented nature of global supply chains in manufacturing and
- the role of trade, investment, finance and labour.

ⁱ Cullen, J.M., Allwood, J. M., Bamabach, M.D. (2012) ‘Mapping the global flow of steel: from steelmaking to end-use goods’, *Environmental Science & Technology*, 46, 13048-13055

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- ⁱⁱ Skelton, A., & Allwood, J. (2013) 'The incentives for supply chain collaboration to improve material efficiency in the use of steel: An analysis using input output techniques', *Ecological Economics*, 89, 33-42
- ⁱⁱⁱ Hudson, R. and Swanton, D. (2012) 'Global shifts in contemporary times: the changing trajectories of steel towns in China, Germany and the United Kingdom', *European Urban and Regional Studies* 19:1, 6-19
- ^{iv} Sadler, D. (1990) 'Privatising British steel: the politics of production and place', *Area* 22(1): 47-55
- ^v Business, Innovation and Skills (BIS) Committee (2015) 'The UK steel industry: Government response to the crisis, first report of session 2015–16', House of Commons, 21 December [available at: <http://www.publications.parliament.uk/pa/cm201516/cmselect/cmbis/546/546.pdf>]
- ^{vi} World Steel Association (2014) 'World steel in figures 2014'
<https://www.worldsteel.org/dms/internetDocumentList/bookshop/World-Steel-in-Figures-2014/document/World%20Steel%20in%20Figures%202014%20Final.pdf>
- ^{vii} Rickhuss (2016) 'Tata steel crisis needs real action - not confusion and mixed messages', *Touchstone Blog*, 31 March [available at: <http://touchstoneblog.org.uk/2016/03/tata-steel-crisis-needs-real-action-not-confusion-mixed-messages/>]
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- ^{ix} Fine, B. & Harris L. (1985) *The peculiarities of the British economy*, Lawrence & Wishart, London
- ^x Hudson, R. (2005) 'Rethinking change in old industrial regions: reflecting on the experiences of North East England', *Environment and Planning A* 37(4): 581-596
- ^{xi} Sorrell, S. (2014) 'Energy substitution, technical change and rebound effects', *Energies*, 7 (5) 2850-2873
- ^{xii} Sorrell, S. (2009) 'Jevons' paradox revisited: the evidence for backfire from improved energy efficiency', *Energy Policy*, 37 (4) 1456-1569
- ^{xiii} Bridge, G. (2010) 'Heading 'downstream': towards a cultural political economy of energy consumption', Seminar 3 in the ESRC-funded 'Geographies of energy transition' series, Manchester 15 October, 2010 [available at: https://www2.le.ac.uk/departments/geography/documents/research/seminar-series-geographies-energy-transition/seminar-3/seminar_3_bridge.pdf]
- ^{xiv} Huber, M. (2015) 'Theorizing energy geographies', *Geography Compass* 9(6): 327-338
- ^{xv} Bayliss, K., Fine, B., & Robertson M. (2014) 'From financialisation to consumption: the systems of provision approach applied to housing and water', FESSUD working paper series, No 2
- ^{xvi} Scott, K. & Barrett, J. (2015) 'An integration of net imported emissions into climate change targets', *Environmental Science & Policy* 52: 150-157.
- ^{xvii} Chancel, L. & Piketty, T. 'Carbon and inequality from Kyoto to Paris: trends in the global inequality of carbon emissions (1998-2013) & prospects for an equitable adaptation fund', Paris School of Economics, November 2015 [available at: <http://piketty.pse.ens.fr/files/ChancelPiketty2015.pdf>]
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