

Creating strategic couplings in global production networks: regional institutions and lead firm investment in the Humber region, UK

Abstract

This article aims to unpack and analyse the institutional and political dynamics of strategic coupling from a host region perspective, adopting an actor-centred approach that focuses on regional institutions' efforts to attract and embed lead firm investments within global production networks. We are particularly concerned with understanding the strategic agency and shifting coalitions of actors that create couplings and shape their evolution over time. This involves opening up the institutional underpinnings of strategic couplings by focusing more specifically on the key episodes in their creation and the organisation of the temporary coalitions that do the work of creating couplings. This approach is operationalised through a case study of the Siemens offshore wind turbine plant in the Humber region of England. In conclusion, we emphasise the need for regional institutions to develop adaptive coupling creation strategies that co-evolve with the reconfiguration of production networks and the reshaping of national institutional and political environments.

Key words

Strategic coupling; coupling creation; global production networks; regional institutions; offshore wind

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1. Introduction

Over the last two decades the Global Production Networks (GPN) perspective has emerged as an influential approach for understanding the changing organisational dynamics of globalisation and territorial development, alongside the parallel Global Commodity Chain (GCC) and Global Value Chain (GVC) perspectives (Coe and Yeung 2015). One of the key contributions of the GPN approach has been to reconceptualise regional development as a process of strategic coupling between regional assets and the strategic needs of lead firms in global production networks (Coe et al. 2004; Coe and Yeung 2015). Much GPN research on strategic coupling has, however, adopted a firm-led approach, with the recent GPN 2.0 approach reducing regional development to the outcome of firm strategies and value capture trajectories (Coe and Yeung 2015: 22). In response, there is a need for research that reverses the direction of causality to assess how regional initiatives shape the strategic decisions of GPN actors, focusing on the institutional and political processes by which regional and national actors work to attract and embed investment from lead firms and key suppliers (Kleibert 2013; Phelps and Wood 2006), effectively pulling the network into the region.

In this paper, we adopt an actor-centred approach that focuses on regional institutions' efforts to attract investment from lead firms based outside the region in question. As such, we aim to unpack and analyse the process of strategic coupling from a host region perspective, viewing it as "a concerted and planned effort undertaken by local actors to create a linkage" (Kleibert 2013: 257). In developing our approach, we engage with the literature on inward investment and regional development, focusing particularly on the

concept of territorial coalitions (Phelps and Wood 2006) in order to further the GPN understanding of strategic coupling as a 'temporary coalition' between firms and regional institutions (Yeung 2009). Our approach seeks to open up the institutional underpinnings of strategic couplings (Mackinnon 2012) by assessing their creation and the organisation of the temporary coalitions that do the 'work' of creating couplings (Yang 2017). Our concern with coupling creation is inspired by work on path creation in the parallel sub-field of Evolutionary Economic Geography, which examines the formation of new regional growth paths (MacKinnon et al. 2019; Simmie 2012).

The paper's analysis of regional institutions is designed to address the neglect of the state and politics in GPN and GVC research, building on the work of Smith (2015). While the GPN approach incorporates states as key sources of institutional power shaping the operation of global production networks (Henderson et al. 2002), this remains divorced from a more theoretical understanding of the state (Smith 2015). At the same time, although it highlights the politically contested nature of strategic coupling, research on territorial coalitions does not fully incorporate the broader role of state policies and strategies (Rutherford et al. 2018). In response, our analysis is informed by the strategic-relational approach to the state, which emphasises the efforts of particular configurations of social forces to pursue certain accumulation strategies and hegemonic projects through the state (Jessop 1990). This focuses attention on the efforts of regional actors to create particular forms of coupling in the context of wider national and supra-national accumulation strategies designed to promote broader development objectives such as industrialisation, export-oriented growth and macro-regional integration (Smith 2015).

Our analysis of coupling creation is framed by a United Kingdom (UK) state accumulation strategy that aims to maximise the exploitation of its renewable energy resources. As a result, the UK emerged as the world's leading offshore wind market by 2010. This growth trajectory stimulated increased competition between regions to attract the 'holy grail' of a turbine manufacturer (Dawley 2014), culminating in the opening of the Siemens blade manufacturing plant in the Humber region of Northern England in late 2016. The institutional and political processes associated with the attraction of this anchor investment are the focus of our analysis in this paper. While previous GPN studies of resource industries have extended our understanding of network configurations and development outcomes (Bridge 2008; Bridge and Bradshaw 2017), processes of strategic coupling at the regional scale have attracted far less attention.

The remainder of the paper is structured in three main parts. The next section focuses on the concept of strategic coupling, seeking to deepen and extend its conceptual foundations. The subsequent section operationalises our process-sensitive approach to frame the analysis of three key episodes of coupling creation that have shaped the Siemens investment on the Humber. The final section concludes the paper.

2. Strategic coupling and regional development

Emerging as a key element of the GPN framework, the notion of strategic coupling is underpinned by three important characteristics (Coe and Yeung 2015; Yeung 2009). First, coupling processes are conceived as strategic as they require the intentional and active intervention of both regional institutions and GPN actors, often the lead firm (see Figure 1).

capacities to effect change. This reflects how a particular structure “may privilege some actors, some identities, some strategies, some spatial and temporal horizons, some actions over others” (ibid: 1223); and the scope for actors to take account of this differential privileging through reflexive learning and adapt their strategies and tactics accordingly. As a result, some actors and actions matter more than others in shaping strategic coupling (Gregson 2005: 29).

Agency is always exercised within specific institutional environments, referring to broader sets of rules and norms (Martin 2000). This recursive relationship means that not only are actions shaped by specific rules, incentives and norms, but that actors can reflexively recombine and change institutions (Jessop 2001; Sotarauta 2017). This contrasts to the overarching social science definition of institutions as prevalent social rules (Hodgson 2006), the notion of regional institutions found in the GPN literature is derived from institutional economic geography and economic sociology (Coe et al. 2004), regarding institutions as organisations that play a key role in the wider (regional) society and that act in a “quasi corporate manner” (Jessop 2001: 1220). This corresponds to the concept of specific institutional arrangements as distinct from wider institutional environments (Martin 2000). While organisations are often equated with the formal dimension of institutions (Rodriguez-Pose 2013), our understanding of regional institutions incorporates informal norms and conventions which are shaped by the broader institutional environment and inherited from the past (Martin 2000; Storper 1997). An example of these inherited norms and conventions is the strong ideological attachment of economic development agencies in peripheral regions of the UK to the attraction of inward investment as a vehicle for regional economic modernisation (Phelps and Wood 2006).

GPN research adopts a multi-scalar definition of regional institutions, also incorporating national and supra-national organisations (Coe and Yeung 2015). While this multi-scalar understanding represents a significant advance over previous 'new regionalist' approaches (see Amin and Thrift 1994; Coe et al. 2004), it conflates the actions of institutions operating at different scales within the single, overarching category of 'regional institutions', potentially obscuring their specific policy mandates, strategic objectives and operating practices. Particularly in its 2.0 incarnation, the GPN approach has offered little analysis of the relational and scalar interactions between sub-national, national and supranational actors and institutions (Lee et al. 2014; Yang 2017). In this sense, successful coupling requires high levels of institutional interaction and the development of a common sense of purpose, supported by shared social norms and values (Amin and Thrift, 1994).

In practice, the understanding of regional institutions as an overarching category incorporating national actors has tended to suppress the agency of national states, with empirical research focusing largely on regional-level strategies for the promotion of strategic coupling (Coe et al. 2004; Coe and Yeung 2015). Yet, national states often act as crucial inter-scalar mediators of coupling processes (Lee et al. 2014), underlining the need for a more theoretical understanding of the state as a critical multi-scalar actor (Rutherford et al. 2018; Smith 2015). Here, we are drawn to the strategic-relational approach developed by Jessop which views state power "as a contingent expression of the changing balance of forces that seek to advance their respective interests inside, through and against the state system" (Jessop 2016, p. 54). Leading social forces exercise state power through hegemonic projects which link the operation of the state to a broader construction of the public

interest. These hegemonic projects are linked to accumulation strategies that define specific economic growth models for the state territory as a whole and specific localities and regions (Jessop, 1990). In a context of increasing globalisation over recent decades, many accumulation strategies have stressed the need for fuller integration into world markets (Smith 2015; Horner 2017). Whilst development states in Asia and North Africa have typically adopted a model of 'exportism' (Jessop and Sum 2006), old industrial regions in the competition states of the UK and United States (US) have focused heavily on the attraction of inward investment as a source of economic modernisation (Phelps 2008; Rutherford et al. 2018).

Much of the agency of regional institutions is directed towards the harnessing of regional assets to match the needs of key firms (Figure 1). The GPN approach defines such assets in rather abstract, overarching terms as technology and know-how, industrial organisation and territorialised politics and social relations (Coe and Yeung 2015: 19). This makes it difficult to specify how regional institutions actually harness and valorise assets to attract and embed GPN actors, requiring a more concrete and grounded understanding. Here, we turn to the work of Maskell and Malmberg (1999) who identify five types of regional assets: natural assets (covering resources); infrastructural and material assets; industrial assets (covering technology and firm competencies); human assets in the shape of labour skills, costs and knowledge; and, institutional endowments of rules, routines and norms. Such assets tend to reflect previous forms of regional economic development, but are not merely a passive reflection of the past. Instead, they are actively "modified or reconstructed by the deliberate and purposeful action of individuals and groups within or outside the area" (ibid,

p. 10), resonating with the GPN interest in how regional actors and institutions match regional assets to the strategic needs of investors.

Temporary Coalitions

Unpacking the institutional and political underpinnings of temporary coalitions remains an underdeveloped area of GPN research. This dimension of coupling creation is best advanced by engaging with the concept of territorial coalitions from the inward investment and urban studies literatures (Cox and Mair 1988; MacKinnon and Phelps 2001; Phelps and Wood 2006). Such coalitions are often led by business interests and sub-national political leaders and state officials, reflecting the differential capacities of regional actors to influence coupling processes. These actors develop accumulation strategies designed to boost growth and property values and hegemonic projects that seek to displace conflict through the construction of a general regional interest based upon job creation (Cox and Mair 1988). Territorial coalitions are increasingly multi-scalar in nature, incorporating not only regionally-bounded institutions and global corporations, but also national agencies and government departments (Lee et al. 2014). The analysis of territorial coalitions can make an important contribution to GPN research by furthering understanding of ‘extra-firm bargaining’ processes (Coe and Yeung 2015) between GPN actors and institutions in sub-national political arenas (Phelps and Wood 2006).

Research on territorial coalitions relates the involvement of key private and public sector actors to their ‘local dependence’ (Cox and Mair, 1988). This concept refers to “the dependence of various actors – capitalist firms, politicians, people – on the reproduction of certain social relations within a particular territory” (ibid, p. 307). Such spaces of

dependence stem from investments in the built environment, limits to labour mobility, local taxation and regulation, localised capital accumulation and processes of electoral and political competition (Jacobs and Lagendijk 2014). The overlapping local dependencies of key actors and interests generates a shared material interest in the expansion of the local economy, giving rise to the formation of growth coalitions seeking to attract inward investment to increase growth rates. Cox (1998) extends this thesis by arguing that local actors and organisations' interests in defending and securing their 'spaces of dependence' lead them to construct 'spaces of engagement' connecting them to key centres of social power at regional, national and supra-national scales.

In practice, the local dependence of key firms in global production networks may be relatively limited compared to that of local political institutions (Phelps and Wood 2006). Furthermore, as suggested by the GPN concept of temporary coalitions, the overlap between the dependencies of different actors may be partial and relatively fleeting, generating cooperation around particular investment projects at certain times, but not giving rise to a more enduring inward investment regimes (ibid). The process of strategic coupling is highly dynamic (Kleibert 2013) and can give way to future decoupling and disinvestment as economic conditions change and the material interests of regional, global and national actors diverge (MacKinnon 2012).

Spatial Relations

The third defining feature of strategic coupling relates to its spatiality, bringing together the 'horizontal' dimension of firm networks and the 'vertical' dimension of different scales of governance (Dicken et al. 2001). These networks and scales are not fixed and stable, but are

relationally constituted through their mutual interactions (Jacobs and Lagendijk 2014). As such, GPN research stresses that many of the critical strategic decisions that shape coupling processes within regions are made by extra-regional actors such as lead firms, national governments and supra-national authorities (Coe and Yeung 2015).

It is important to recognise, however, that intra-firm networks are not purely 'horizontal' in orientation, but incorporate an element of vertical structuring through the relations between corporate headquarters and local branches, depending on the particular organisational form adopted (Dicken 2015). Hierarchically-structured arrangements can confine plants to lower value-added tasks within the wider production network, while flatter structures are associated with higher-value roles and more entrepreneurial forms of affiliate management (Fuller and Phelps 2018). The organisation of the production network in this sense will influence the qualitative characteristics of the coupling process in terms of the scope for value to be captured and retained within the regional economy (Coe and Yeung 2015). At the same time, multi-scalar governance structures may not operate in an entirely 'vertical' fashion, leaving scope for national and sub-national state institutions to work closely together (Allen and Cochrane 2007; MacKinnon 2011).

From a coupling creation perspective, this conception of spatial relations incorporates a crucial temporal element, meaning that the actions of regional institutions must be related to the evolution of the broader production network. Coupling creation can often be a concerted and protracted process (Kleibert 2013), particularly in emerging market contexts characterised by high levels of uncertainty. This will require high levels of persistence and flexibility on the part of regional institutions as they strive to pull the target firm into the

region. This may be magnified by the parallel reconfiguration of the production network as the strategic needs of the lead firm change, potentially closing down certain investment prospects while opening up others.

Rather than offering a snapshot of coupling creation, we adopt a process-sensitive approach that reflects the temporality of agency in shaping the formation of new regional growth paths based upon key anchor investments (MacKinnon et al. 2019; Steen 2016). This is organised around the identification of three casual episodes in what was a protracted process of coupling creation, reflecting the uncertainties of investment in an emerging industry shaped by multi-scalar institutional and political environments. The first involved the harnessing and matching of regional assets to the requirements of Siemens. This was followed by the brokering and negotiating of the coupling, involving extensive lobbying and discussion before a final agreement was reached. The third moment of valorising and materialising the coupling refers to the opening of the plant as the coupling process is realised. Our analysis focuses largely on the first two episodes when much of the underlying institutional and political work of coupling creation was undertaken.

The ensuing analysis of the Siemens investment in the Humber region is based upon a predominantly qualitative research design. This involved over 40 semi-structured interviews with firm and industry personnel, policy practitioners including sub-national, national and supra-national government bodies, and representatives of trade bodies, alongside forms of nonparticipant observation (e.g. policy events; trade fairs etc.) (Karlsen 2018). The research was supported by the interrogation of an extensive range of policy documents, industry reports and press articles.

3. Coupling Creation: Offshore Wind Production Networks and the Humber region

The Humber region has struggled to adapt to its decline as a world-leading fishing and maritime centre since the early 1970s (Gibbs et al. 2001). Characterised as a peripheral region of the UK, the Humber appeared to have few of the historical industrial assets that encouraged regional institutions in North East England and Scotland to forge new growth paths in offshore wind (Dawley et al. 2015). In recent years, however, the Humber's response to the rapid growth of the UK's offshore wind market saw it become the country's leading region for investment, based upon the natural asset of its geographical proximity to many of the UK's offshore wind farms off the east coast of England. Operating on the context of the UK's national accumulation strategy for renewable energy, regional institutions have sought to capitalise on this locational advantage through the attraction of investment to the Humber as the UK's 'energy estuary' (Bondholders undated).

The offshore wind industry is structured by a two-pronged production network, comprised of a manufacturing network and a deployment and services network (Lema et al. 2011; MacKinnon et al. 2018). The former, our main focus here, is concerned with the assembly of the wind turbine, involving as many as 8,000 components, coordinated by the wind turbine manufacturer. In the European market, Siemens is the lead turbine supplier with 63.5 per cent of installed capacity in 2015 (European Wind Energy Association 2016). Its offshore wind operations have largely been based in Denmark, following its acquisition of the Danish firm Bonus in 2004, including research and development activities, a blade plant and

harbour facilities. Siemens has also expanded into the Asian and US wind markets in recent years, before merging with the Spanish turbine manufacturer, Gamesa, in 2017.

3.1 Harnessing and matching regional assets

3.1.1 Constructing a National Offshore Wind Market

The creation of the Siemens coupling on the Humber can only be understood as part of a long-term, state-orchestrated accumulation strategy, reflecting the role of national states as proprietors of natural resources (Bridge 2008). Following a series of pilot projects in the 1990s, the then Labour Government identified offshore wind as one of the UK's most scalable opportunities to respond to European Union targets for reducing climate change in the early 2000s. Its strategy was predicated upon the UK's comparative advantage in natural assets - extensive shallow seabed and favourable wind conditions – along with the potential to convert existing, and often underused, port facilities (national government official, authors' interview 2016). Two state-conditioned practices were implemented to create and support the development of a domestic market. First, a subsidy system was introduced to nurture nascent renewable energy technologies that were not price competitive with conventional fossil fuel technologies (Essletzbichler 2012). Second, the UK's Crown Estate - as sovereign proprietor of the seabed - used successive rounds of competitive tendering to award suitable marine sites to developers. By 2010, the UK had overtaken Denmark as the world's largest offshore wind market.

The UK's burgeoning market has largely been supplied by established production networks based in the industry's heartlands of Denmark and Germany (Mackinnon et al. 2018a).

Given the high barriers of entry into a capital intensive and technologically complex industry, lead firms sought to control costs by servicing the UK's Round 1 and 2 projects from existing production and port facilities in continental Europe. In particular, almost the entire manufacturing side of UK projects was being supplied by turbines, blades and towers produced and assembled in Germany, Denmark and the Netherlands (Redpoint Energy 2012; Macalister 2013).

The UK's Round 3's "industrial scale deployment" (Green Alliance 2014, 6) of offshore wind farm tendering in 2009, however, prompted the world's leading turbine producers - Siemens, Vestas, GE - to review and identify sites for new UK based subsidiary operations by 2010. This added to a raft of Memorandums of Understandings (MoUs) signed by Areva, Gamesa and Samsung in Scotland and by Clipper Wind in North East England (Dawley 2014; Pollock 2018). For Siemens, the global leader in turbine production, the UK now represented "the single biggest opportunity anywhere in Europe...a tremendous market that didn't exist before Round 3" (senior manager, Siemens UK, authors' interviews, 2017).

Siemens commissioned locational consultants to survey ports on the North Sea coasts of the UK and continental Europe to build a new turbine plant to complement its existing facility in Aalborg, Denmark. The UK emerged as the preferred destination for this investment on the basis of its projected market growth relative to the suitability of sites (e.g. cost and availability of infrastructure; supply-base, skills) (project manager, Siemens, author's interview 2015). Accompanied by a high-level of political fanfare by the UK Government, Siemens signed a MoU with Prime Minister Gordon Brown in 2010 to locate a £80 million turbine manufacturing plant in the UK.

3.1.2 Regional Institutional Dynamics and Site Selection

To understand how these broader industry and institutional dynamics fostered strategic coupling, we unpack the key forms of agency within regional institutions (Steen 2016). The governance of economic development in the Humber sub-region was managed by the regional development agency Yorkshire Forward from 1998, focused upon the larger urban economies of Leeds and Sheffield. In contrast to the strategic support for renewable energy pioneered by development agencies in Scotland and North East England (Dawley et al. 2015), Yorkshire Forward's economic strategies did not prioritise offshore wind. Consequently, the initial attempts of regional institutions to identify and harness the Humber's asset base emerged from the limited resources of the two, often rival, local authorities based around the main port settlements of Hull and Grimsby (see Dawley et al. 2015).

Reflecting the centralised character of the UK's competition state (Martin et al. 2016), the site selection activities of the turbine manufacturers were subject to inter-scalar mediation by national government. Yorkshire Forward was subsequently enlisted to showcase the Humber's regional assets. At the same time, Siemens refined its UK search from a reported 60 sites to two Humber sites for its final investment decision in late 2010. Although the search had included regions possessing related technological and industrial competences in oil, gas and maritime engineering, Siemens identified the location of the Humber and its available port infrastructures as the critical regional assets that best matched its strategic needs at this point in time.

On the Humber, however, institutional support for identifying and harnessing regional assets diverged across two rival port sites, as processes of intra-regional competition impeded the formation of an overarching regional coalition (Cox and Mair 1988). On the South Bank, Able UK, a family owned marine engineering and port operator, acquired a large greenfield site near Immingham in 2008 and aimed to develop a 320-hectare Able Marine Energy Park (AMEP) equipped with a 1,400 metre riverside quay. Able's vision for "the big space in the right place" (Able 2013) was to provide a customised site suitable for investments across the turbine and foundation supply chain (Peck 1996), providing 60 per cent more capacity than the world-leading integrated offshore wind complex of Bremerhaven in Germany.

In parallel, Hull City Council (HCC), on the North Bank of the Humber, began to actively promote the city's Alexandra Dock as a rival, albeit smaller, brownfield site. Alexandra Dock is owned by Associated British Ports (ABP), a privately-owned port operator formed following the privatisation of certain UK ports in 1981 (Baird and Valentine 2006). A Harbour Revision Order (HRO) to construct a large riverside quay and container facility at Alexandra Dock was approved in 2005, but the impact of the 2008 financial crisis meant that ABP lost the client for the planned container facility. By 2010, HCC had identified the locational tournament for a turbine manufacturer as a new opportunity to harness this infrastructural asset and its planning provision to create jobs in an economically disadvantaged city.

Whilst the scale and scope of the AMEP site was initially favoured by Siemens, the "deliverability" of the smaller brownfield Alexandra Dock became a critical infrastructural advantage for Hull (senior official, HCC, authors' Interview 2017). For an industry

increasingly driven by cost-reduction, the £450 million of capital investment and lengthy statutory planning required to convert a site where “cows were still grazing” attached a heightened level of risk to AMEP (senior manager, Siemens UK, authors’ interview 2017). By contrast, the ability to amend the existing HRO for the conversion of Alexandra Dock, requiring an application by ABP to HCC and the subsequent approval of national government, was pivotal to the coupling creation process, providing Siemens with reduced risk and lead-time to investment. HCC’s local planning powers also played an important supporting role in progressing the complex and evolving Siemens project on the constrained Alexandra Dock site.

In a vacuum of regional strategic planning, commercial and sub-regional rivalries were played out through a protracted planning conflict between ABP and Able UK. To complete the AMEP site, Able required a Government-backed compulsory acquisition of a small amount of land unused owned by ABP. Indicative of “an aggressive market whereby port operators aren’t very nice to each other” (former port director, authors’ interview 2015), ABP used a series of planning objections to trigger a Parliamentary select committee and High Court review process that increased the risks associated with the rival AMEP project.

3.1.3 Forming a sub-regional political coalition

The ability of the sub-regional institutions representing the North Bank to work together as a coalition played a crucial role in shaping Siemens’ final investment decision. Despite entering the investment competition some 6 to 8 months after AMEP, HCC quickly began to draw together resources and powers to gain relative institutional advantage in the bidding process. Central government and Yorkshire Forward had identified AMEP as the preferred

site for investment on the basis that it offered “a massive opportunity for co-location and clustering.....it had the potential to be a game changer for the Humber and the North” (former UK government official, authors’ interview 2015). Perceiving themselves to have been “discounted” in this broader institutional process, HCC responded by being “quite aggressive about it” and began to directly lobby lead firms and the national state actors involved in site selection processes (Senior official, HCC, Authors’ Interview 2017).

The timing of Hull’s entrepreneurial approach coincided with a change of national government in 2010, leading to the disbanding of Yorkshire Forward – a champion of the rival AMEP project – as part of the abolition of England’s regional development agency (RDA) network (see Pike et al. 2016). An embryonic sub-regional Humber Local Enterprise Partnership (LEP) was formed in 2011 without the statutory authority or resources of the former RDA. This nationally-driven rescaling process allowed HCC to develop a more proactive approach. Hull was now more directly able to “engage in the beauty parade when all the OEMs were coming over from Vestas, to Mitsubishi, Gamesa, GE and, of course, Siemens” (former port director, authors’ interview 2015). Focusing its efforts on Siemens as the market leader, HCC led a ‘Greenport Hull’ branded campaign, bringing together a coalition of local authorities, ABP, the university, and local skills providers to promote the city’s infrastructural, human and industrial assets. This territorial coalition, supported by the planning and convening powers of HCC, was underpinned by a strong shared agenda of attracting Siemens to an economically and socially disadvantaged city (Amin and Thrift 1994).

These efforts were supplemented by the tactical use of political agency, drawing on the national influence of one of the city's Members of Parliament (MPs), Alan Johnson, a former Labour cabinet minister, alongside the LEP Chair, Lord Haskins, who "knows everybody" in central government, to lobby ministers and senior civil servants to support Hull's case (former port director, authors' interview, 2015). These political actors acted as crucial inter-scale mediators by building spaces of engagement with national authorities to obtain "supra-local regulatory and financial backing" for Hull's campaign to attract Siemens (Jacobs and Lagendijk 2014, p .53). This provided Hull with an important source of political leverage that reinforced the infrastructural and institutional advantage associated with the deliverability of the Alexandra Dock site.

Port-related assets in both AMEP and Alexandra Dock are owned by commercial enterprises. The position of these private port operators can be seen as analogous to that of rentier interests within US urban growth coalitions, reflecting their commercial interest in attracting investment to maximise rents (Cox and Mair 1988). In this sense, ABP's geographically fixed material and infrastructural assets can be seen to generate a reasonably high degree of local dependence, although this is mediated by its geographically extensive range of operations and ownership by foreign institutional investors. The bargaining dynamics between local policy institutions and the port operator reflected a "vast gulf in the expectations" of Siemens who were accustomed to dealing with the largely state-owned ports in continental Europe rather than a commercial operator like ABP (former port director, authors' interview 2015). This was particularly pronounced around the ability of many continental ports to offer nominal leases and absorb 'below the line' capital expenditures that were factored

into commercial charges by UK port operators (senior project manager, Siemens, author's interview 2015).

In the case of Alexandra Dock, HCC was able to utilise a long-standing collaborative relationship with ABP that stretched back to the original HRO process in the mid-2000s. As part of HCC's bid to Siemens, ABP committed to the vast bulk of infrastructural investment including £150 million in dock infilling and the development of a 600 metre riverside berth. By contrast, state-aid rules confined HCC's to a much smaller £5 million contribution for non-commercial facing infrastructure projects. HCC's agency and direct influence was further constrained by ABP's commercial requirement that any deal with Siemens would need to appease ABP's institutional shareholders, including the Singapore Investment Corporation and Canadian Pension Plan Investment Board. The relationship between ABP and Siemens was pivotal to the formation of the temporary coalition that supported the Siemens investment, with HCC also playing a vital co-ordinating and supporting role, particularly in terms of managing the planning process and engaging with the broader local community (former port director, authors' interviews, 2015).

These harnessing and matching processes led to Siemens announcing a MoU with ABP to invest £160 million in a wind turbine and blade manufacturing facility at Alexandra Dock in January 2011. As the UK's first turbine production facility, Siemens' announcement was heralded as a "new era" for Hull, making it a "world leader in offshore wind" by the Prime Minister David Cameron (cited in Hull Daily Mail 2011). In reality, however, Siemens MoU represented a more measured statement of intent, meaning:

'if we come, this is the place we will come to' ...there was a lot of detail to work out.

They had to decide what they wanted to do.....they were very unclear (senior official, HCC, Authors' Interview 2015).

The MoU effectively granted Siemens exclusive rights to the site while it made its decision about what to do with it (project manager, Siemens, authors' interview 2015), and it would take the coalition of actors a further three years to finally secure the investment.

3.2 Brokering and negotiating the coupling

3.2.1 Changing National Context and Industry Response

After the election of the Conservative-Liberal Democratic Coalition Government in 2010, the national institutional environment for offshore wind development became less supportive (Senior Government Official, authors' Interview 2015). With the shift to austerity in the wake of the 2008 financial crisis and ensuing recession (Schäfer and Streeck 2013), the Coalition Government embarked on a process of Electricity Market Reform (EMR) that sought to reduce the costs of investment in low-carbon technologies. This replaced the Renewable Obligations (RO) regime, which had been weighted favourably for offshore wind technologies since 2009, with an auction-based Contracts for Difference (CfD) system involving competition between projects. In addition, the Government established a Levy Control Framework to cap the budget for low-carbon electricity until 2020. This meant that the national accumulation strategy of exploiting the UK's renewable energy resources was overlain by a new emphasis on cost reduction and consumer affordability.

At the same time, the UK Government published an Offshore Wind Industrial Strategy (OWIS) in response to the lack of industrial development relative to the UK's world leading market status (HM Government 2013). With over 80% of the value of some existing installations having been sourced from outside the UK, OWIS set an aspirational target of projects generating 50% of value from domestic content (Dawley et al. 2015). This was linked to the requirement to submit a Supply Chain Plan as part of the new CfD process. OWIS was also aligned with EMR by the identification of cost reduction as the industry's key strategic imperative. Its introduction represented an effort to extend the UK accumulation strategy for offshore wind from market growth to industrial development, offering potential opportunities for peripheral regions with related natural, infrastructural and industrial assets (ibid).

The shifting institutional landscape for UK offshore wind was widely seen by the industry as source of increased uncertainty and risk, exacerbated by the lengthy implementation of EMR. Developers responded by cutting plans for new investment. In the manufacturing network, projected market growth was reduced to levels sufficient enough to sustain only one UK-based facility (national government official, authors' Interview 2016). The raft of MoUs signed between turbine lead firms and regional development agencies, especially in Scotland, lay dormant or expired (Pollock 2018).

The contraction of the future market meant that the Siemens' investment was now likely to represent the UK's only turbine project. Consequently, despite Able hosting visits by world's leading turbine manufacturers in 2009-10, and even shaking hands on a deal with one, the altered market conditions left the AMEP project undeveloped (ibid). The new CfD subsidy

model was deemed only to encourage project-based supply agreements, rather than the long-term certainty of a framework agreement with a lead firm, or tier one supplier(s), required to justify the £450 million transformation of the AMEP site (Senior Siemens UK Manager, Authors' Interview 2017).

3.2.2 Siemens' Changing Strategic Needs

The focus, both within the region and nationally, now fell solely on Siemens and the Alexandra Dock project. After signing the MoU in January 2011, a joint planning application was submitted to HCC in December to build a turbine assembly plant. As the broader landscape of UK energy policy began to shift, however, it became clear that Siemens was beginning to review its European production strategy and the potential role of Hull (senior official, HCC, authors' interview 2015). Siemens became increasingly vocal with their concerns about the UK Government's commitment to renewable energy, including an open letter to the national media in 2012. More specifically, Siemens concerns over the protracted EMR process raised the prospect that "if we wait until 2016 to get the certainty that would help us make a decision, particularly around the Hull investment, we would probably miss the boat" (Senior Siemens manager quoted in Torrance 2013).

With annual market growth in Germany beginning to exceed the UK, adding to the longer-term visibility of demand across Denmark, Netherlands and Belgium, Siemens began to alter its strategy for the location of new turbine manufacturing facilities (Wind Europe representative, authors' Interview 2016). On the basis of the UK's previous market projections, Siemens had anticipated that its turbine investment on the Humber would be followed by a number of first tier suppliers. With a reduced market growth in the UK,

Siemens now perceived that the co-location of strategic partners would “take too long”, requiring too much stock to be stored to sustain a UK turbine plant (Senior Siemens UK Manager, Authors’ Interview 2015). It began to favour locating a turbine production facility closer to an existing and responsive supply chain, in either Germany or Denmark. Siemens also became concerned about the ability of the Humber’s labour market, and the UK more broadly, to service the advanced engineering skills required for turbine production (Senior Manager, HCC, Authors’ Interview 2017). Within this evolving corporate strategy, the future of the Hull project was subject to a rolling review process stretching over three years and triggering “four successive board meetings and decisions, where we could have gone at any point” (Projects Manager, Siemens, authors’ Interview 2015).

3.2.3 Political Lobbying and Extra-Firm Bargaining

At this stage of the coupling process, important shifts of agency and scalar politics took place (MacKinnon 2011). In particular, the institutional processes of brokering and negotiating the coupling was ‘upscaled’ to the national level. At the sub-national level, HCC found that “Siemens went into review mode....they locked us out for six months and went into radio silence” (Local Authority Director, Authors’ Interview 2016). For long periods, its role became confined to local planning activities with investor relations channelled through government departments and the civil service. As Siemens increasingly exercised the power asymmetries in the investment process, the “big state choreography was more important than local politics” (Siemens project director, authors’ interview 2016), especially as they are one of the few companies who the “Prime Minister will, and had to, pick up the phone to” (senior Siemens UK manager, authors’ interview 2017).

In response, Hull City and ABP continued to utilise the networks of locally embedded national politicians to lobby both national government and Siemens. In addition to the extensive lobbying of Alan Johnson and Lord Haskins, Lord Mandelson, a former Labour Business Secretary and European Trade Commissioner who was made the honorary High Steward of Kingston upon Hull in 2013, acted as a key inter-scalar mediator for local institutions. Mandelson “knew the Chief Executive of Siemens and could meet for dinner...press our case...and bring us some feedback” (former port director, authors’ interview 2015). These lobbying activities were bolstered by the UK Government starting to implement its long-awaited CfD process, particularly through the awarding of contracts to five offshore wind projects in early 2014. This allowed Siemens to “alleviate some of our risks in terms of knowing the nature of the market, at least until 2021” (project manager, Siemens, authors’ interview 2015), underlining the crucial role of national states in supporting coupling formation at the regional scale (Lee et al. 2014). At the same time, the development of a collaborative relationship between key HCC officials and senior civil servants in the then Departments of Energy and Climate Change and Business, Innovation and Skills helped to resolve emerging problems and advance the project (senior manager, HCC, authors’ interview 2015). This indicates that cooperative ‘horizontal’ ties can form between local and national government officials operating within ostensibly ‘vertical’ institutional and political structures, particularly around specific projects (Allen and Cochrane 2007; MacKinnon 2011).

Despite the changed context of UK energy policy, it became apparent that the “government dragging their heels equated to only about 50% of the delay between the MoU and the

eventual agreement” (former port director, authors’ interview 2015). The remainder related to an intensive 18 months of bargaining and commercial negotiation between Siemens and ABP, before the former finally signed a lease for Alexandra Dock. For ABP, a long-term land lease for Alexandra Dock offered a lower rate of return than they could generate through conventional cargo tonnage crossing the quay. This required protracted negotiations between ABP and Siemens to “make the numbers balance”, involving a further commercial settlement to supplement the land rental deal (former port director, authors’ interview 2015).

This extensive bargaining reflects the distinct local dependencies of the two organisations at the core of the territorial coalition with ABP reliant on the generation of value from its geographically fixed material assets, while Siemens maintained greater locational mobility and flexibility. Ultimately, however, there was sufficient overlap between the spaces of dependence of the two parties to support strategic coupling, reflecting a critical intersection between ABP’s priority of generating revenue from a harbour facility for which they had no other use, and Siemens objective of enhancing its dominance of the UK offshore wind turbine market through the establishment of a manufacturing plant. These negotiations exemplify the process of ‘extra-firm bargaining’ with regional institutions in the terminology of the GPN 2.0 approach (Coe and Yeung 2015), although strictly speaking they involved ‘inter-firm bargaining’ given ABP’s status as a private port operator.

Siemens confirmed their intention to proceed with the £310 million investment in March 2014, £160 million of which was from Siemens and other £150 million from ABP, creating 1000 direct jobs in Hull. The project was now, however, reconfigured to focus solely on

blade manufacture. During the matching and brokering episode, Siemens' review of European production led to the more technologically advanced nacelle production, the core of the turbine, being switched from Hull to a new purpose built 200 million Euro facility at Cuxhaven in Germany. Unlike the Humber, Cuxhaven's North Sea port site is owned by the state of Lower Saxony and managed by a publically owned port operator. More broadly, in contrast to the UK, a series of revisions to the German Renewable Energy Supply Act from 2014 onwards created a higher level of long-term market visibility and certainty for offshore wind in Germany, reflecting a strengthening of the German state's accumulation strategy for promoting renewable energy in the context of a transition away from fossil fuels and nuclear power (MacKinnon et al. 2018a; 4cOffshore 2016). The growth of the German market reduced Siemens relative dependence on the UK market and changed the role of the Hull investment within its European production network.

As a consequence of the Cuxhaven investment, Siemens no longer required a nacelle factory on Humberside and therefore were able to scale down the footprint of the project initially envisaged under the MoU. Although still representing one of its largest ever manufacturing investments outside Germany, Siemens now focused solely on the Alexandra Dock site for blade production and removed over £30 million of additional costs that would have required to develop a nacelle facility on the second interconnected ABP site.

3.3 Valorising and materialising the coupling

In December 2016, the Hull plant produced a 75 foot 'golden blade' as part of a high profile opening ceremony to mark the start of Hull's year as UK City of Culture. Hull now represented Siemens most advanced blade facility, surpassing existing capacity in Denmark, and producing the next generation of 7 Megawatt turbines. With its proximity to multiple offshore wind farms, together with transportability constraints of the vast blades, the Hull site would also act as a final staging point for Siemens' turbine production network. Using the industry's huge 'jack-up' vessels, already loaded up with turbine components (e.g. nacelles, towers) from Germany and Denmark, Hull would be used as an installation point before moving all components to sea for construction. In this sense, Siemens' strategic review and decision to shift the more advanced nacelle assembly to Cuxhaven points to the relatively subordinate position of the Hull plant within Siemens overall offshore wind production network in terms of technological sophistication and value creation.

National industrial policy exerted some influence on the Hull investment through Siemens perception that continued market leadership was best served by increasing its level of local content to key clients such as Orsted (formerly Dong), reflecting the increased emphasis on supply chain plans within the CfD process (project manager, Siemens UK, author's interview 2015). Siemens interpretation was that this would increase its clients' chances of winning contracts, thereby enhancing its own market position. This concern with local content became increasingly focused on its own blade factory, with Siemens' reconfiguration of the investment project reflecting concerns about the weakness of the wider UK's supply chain. As such, the largest source of local economic development remains the relatively labour-intensive craft-based production process involved in blade manufacture (senior manager, Siemens UK, authors' interview 2017). Compared to the far more technologically

sophisticated nacelles which incorporate large and complex components that cannot be transported easily, blades offer fewer opportunities for local sourcing.

Both sets of actors associated with the rival Hull and AMEP bids for Siemens continued their efforts to create associated manufacturing-based couplings. CS Wind, a South Korean-based tower manufacturer, appeared close to investing on the Humber in 2015 following extensive bargaining with local institutions (Board member, Humber LEP, Authors' Interview 2015).

Yet in a stark illustration of the industry's cost-reduction pressures, it chose instead to invest £27 million in converting a former onshore wind tower plant on the West Coast of Scotland.

The disadvantages of increased shipping were seemingly negated by the reduced costs of site conversion and benefits of 'deliverability' at an established facility which had already received £10 million of infrastructure support through the devolved Scottish Government.

Given the challenges faced in attracting further manufacturing investment to the Humber, HCC reoriented its efforts on delivering £25 million of national government Regional Growth Funding (RGF) to support the Green Port Growth Programme. R&D linkages with local universities have been confined to Logistics and Health and Safety given the limited levels of local capacity and industrial relatedness (Green Port Hull representative, authors' interview 2015; BVG Associates 2017). Another strand of institutional support has focused on indirect forms of skills and training support for employers affected by the labour market pull of Siemens recruitment process.

4. Conclusions

In conclusion, we identify three principal theoretical contributions of our analysis to understandings of strategic coupling, mapping on to its key foundations. First, relative to firm-led accounts (Coe and Yeung 2015; Fuller and Phelps 2018), this article has opened up the 'black box' of regional institutions as an analytical category in GPN research, examining the critical processes of interaction between regional and national institutions and GPN actors. In our case, the abolition of RDAs gave the sub-regional agencies representing Hull the institutional and political space to engage directly with the lead firm. The deliverability of the Alexandra Dock site provided a crucial source of infrastructural advantage in the context of intra-regional competition, supported by the planning and convening powers of the local authority. This was reinforced by the political advantage generated by locally embedded national politicians who acted as key inter-scalar mediators in a bottom up fashion, contrasting with the top-down manner in which such mediation has been understood in the literature (Lee et al. 2014). Reflecting our focus on a resource-based sector, the national state exerted a critical influence on firm strategy, underpinned by the commitment of successive governments to market creation. As our analysis demonstrates, the creation of couplings requires high levels of institutional alignment and scalar interaction between national and regional actors. Regional and national accumulation strategies are closely inter-twined, particularly in centralised competition states such as the UK where the efforts of regional institutions to foster strategic coupling are strongly conditioned by national growth models.

Second, regional agency is most effectively exercised through temporary territorial coalitions (Phelps and Wood 2006). The success of Hull in securing the Siemens investment reflected the operation of a cohesive coalition of interests. While HCC played a crucial role,

the 'extra-firm bargaining' between Siemens and APB lay at the heart of the coalition formation process. This required a crucial element of intersection between their respective 'spaces of dependence'. While ABP sought to generate returns from its fixed infrastructural asset, Siemens' objective of extending its dominant market position underpinned its interest in establishing a turbine plant in the UK. As such, members of the territorial coalition shared a vital material interest in securing the investment to enhance the flow of value through the local economy, generating revenues and jobs (Cox and Mair 1988). While coupling creation is underpinned by the construction of such a shared interest between regional institutions and GPN actors, this is often a difficult and protracted process subject to failure in the context of inter-regional competition for investment (Phelps and Wood 2006). Regional strategies for coupling creation can still emerge in the absence of territorial coalitions, but will be dominated by a narrow set of actors and may lack local political legitimacy as a result (Kelly 2013). Even if such coalitions are formed, they tend to be structured by power asymmetries, often being orchestrated by business interests and state actors, sometimes to the exclusion of labour and other interests (Rutherford et al. 2018). Moreover, temporary territorial coalitions remain fragile and subject to political fracturing over time if the shared interests they incorporate can no longer be sustained in the face of changing political agendas and corporate strategies (Kleibert 2013).

Third, the spatial relations between global production networks and territorialised spaces of governance should be understood in a temporal manner. As we have demonstrated, both the 'vertical' structures of government and 'horizontal' firm networks that regional institutions operate within are liable to change. This means that their actions need to co-evolve with the reconfiguration of production networks and the reshaping of national

institutional and political environments. Changing corporate strategies may alter the nature of the investment itself, requiring regional institutions to be adaptable and flexible. Like subsequent recoupling processes, coupling creation is often orchestrated through processes of intra-firm and inter-regional competition, and the locus of such competition may change in line with the evolution of the production network. As such, the qualitative character and developmental outcomes of the couplings created by regional institutions and GPN actors will reflect the positionality of different types of region within changing international divisions of labour (Hudson 2016).

Finally, we outline some brief implications for future research on strategic coupling. The first concerns the need for continued research on regional initiatives in GPN research, covering both successful and unsuccessful instances of coupling creation to provide a nuanced understanding of the agency of regional institutions within production networks and the conditions that shape the outcomes of such agency (Kleibert 2013). Second, our approach focuses attention on power relations within territorial coalitions, requiring further work to move beyond simple notions of corporate capture (Phelps 2008) to a fuller characterisation of such relations, linking to the notions of 'ruptures' and 'frictions' within regions and between regions and global production networks (see Coe and Hess 2011). Third, there is scope to extend the temporal approach developed in this paper beyond coupling creation to assess subsequent episodes of the strategic coupling process, notably recoupling and decoupling (MacKinnon 2012). Last, research on coupling creation should move beyond single case studies to undertake more comparative analyses of regional initiatives, incorporating both intra-national and cross-national studies (Rutherford et al. 2018).

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