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# Policy activism and regional path creation: the promotion of offshore wind in North East England and Scotland

## Abstract

This paper argues for a broad evolutionary political economy understanding of local and regional path creation. We adopt a multi-actor and multi-scalar perspective, focusing on the roles of the state and regional policy interventions in mediating the creation of growth paths. The framework interprets attempts in North East England and Scotland to support path creation in the offshore wind sector through evolutionary inspired contextual policies. We demonstrate that the realisation of these policies remains crucially conditioned by the dynamic and complex interplay between the national political economy of energy market regulation, industrial policy and inter-regional asymmetries in the governance of economic development.

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## **Introduction**

The question of how new growth paths emerge or, indeed, fail to emerge in particular locations has been identified as one of the most “intriguing and challenging issues” in economic geography (Neffke, Henning and Boschma 2011. 241). In many respects, this issue of path creation represents the local growth dimension of economic evolution, compared to path dependence which is largely associated with studies of lock-in and decline (e.g. Grabher 1993). Emerging work in ‘evolutionary economic geography’ has begun to situate the notion of path creation within more open and dynamic understandings of local industrial evolution (Martin and Sunley 2006; Martin 2010). Building upon this conceptual advance, more theoretically-informed and empirically-grounded research is required to establish greater clarity and specification of the causal factors, mechanisms, agents and conditions involved in shaping the geographic variability of new paths (Dawley 2013; Simmie 2012).

Our approach in this paper is designed to make three distinct but inter-related contributions to the literature on path creation and local growth evolutions. First, without denying the important role of firms and entrepreneurs in path creation (Simmie 2012), we aim to redress the relative neglect of the multiple roles of the state and policy in mediating the development of paths. As Cooke (2010, 10) acknowledges, even in some of the most successful cases of path creation in advanced regions, the mechanisms involved are “are not purely market branching processes but are significantly intermediated by regional agencies.” Nonetheless, relative to the weight of conceptual discussion, “the policy agenda in evolutionary economic

geography has remained largely implicit” (Asheim et al 2013 p. 2). Second, we seek to overcome the tendency of existing evolutionary work to view path creation as a primarily regional or territorialised process and underplay the role of extra-regional actors, linkages and networks (Mackinnon 2012). While notions of place dependence rightly direct attention to local conditions of path creation (Martin and Sunley 2008), we recognize that path creation is also enabled or constrained by national state strategies and wider political economic relations (Morgan 2021). Third, our evolutionary political economy approach demonstrates how regional path creation, as well as local economic evolution more broadly, involves adaptation to an “ever-shifting market, competitive and regulatory environment” (Martin 2010: 22). In particular, the paper adds to the growing work in economic geography and sustainability transitions research which provides a local and regional dimension to the predominantly national focus of energy debates (Bridge et al 2013; Hansen and Coenen 2013; Smith; 2007).

We develop these arguments in the policy environment of the UK where the recent economic crisis and recession has focused attention on the need for the sectoral and spatial rebalancing of the economy, seeking a revival of manufacturing and a reduced dependence on the growth engine of the South East of England (Gardiner *et al* 2013). In this context, renewable energy has been identified as a key growth sector with offshore wind projected to generate 250,000 jobs by 2050, offering the potential to create “new industries and employment around the country” (UK Minister of State for Energy cited in Crown Estate 2012 p.1). Given a variety of geographically specific factors that limit the locational freedoms of the offshore wind industry (for example, proximity to wind farms, port-related facilities, offshore fabrication and engineering skills – see BVG Associates (2013)), geographically peripheral regions may be able to generate competitive advantages by reconstituting assets from previous and

declining paths of industrial and maritime-related growth (Fornahl et al 2012). At the same time, however, the sector highlights how local and regional mechanisms of path creation are crucially mediated by the broader UK market and regulatory environment. Indeed, this wider environment is particularly important in the case of offshore wind given that the sector is not yet price competitive with established fossil fuel technologies and therefore dependent on state support, making regional path creation particularly challenging because of the need for alignment with supportive national and supra-national policy frameworks. In particular, the national regulatory context has changed significantly in the aftermath of the economic crisis as state support for the renewable energy market has been reframed in the context of austerity.

The paper compares path creation processes in North East England and Scotland.<sup>1</sup> Both are peripheral industrial regions which have identified offshore wind and renewable energy as a key future growth sector (Scottish Government 2010; Simmonds and Stroyan 2008). In both cases, previous industrial growth paths have bestowed a legacy of assets in marine-related engineering and offshore oil and gas. While both regions operate within the same political economy of UK energy regulation, there are significant differences in regional institutional capacities between them, particularly following the abolition of England's Regional Development Agencies in 2011. Our analysis examines the implications of the pronounced asymmetry between Scotland's powerful devolved government and the reduced capacities of local and regional institutions in the North East of England for strategies to create regional growth paths in offshore wind. As well as drawing upon previous interviews conducted in 2010-11 (Dawley 2013), this paper is informed by a fresh round of interviews with thirteen respondents drawn from economic development agencies, policy-makers, firms and industry bodies conducted between December 2013 and February 2014. This is combined with the

interrogation of an extensive range of policy documents, reports and newspaper articles. The remainder of the paper is structured in five main sections. Next, we draw out some themes from the evolutionary literature on path creation. This is followed by an account of the UK institutional and political landscape for offshore wind. We then assess the development of the offshore wind sector in the regions of North East England and Scotland in turn. Finally, a brief concluding section summarises our findings and considers their wider implications.

### **Reframing Regional Path Creation: A Multi-Actor and Multi-Scalar Approach**

In recent years, as part of the broader focus on path dependence in economic geography, attention has increasingly focused on the roles played by history and place, suggesting that “the pre-existing industrial structure of a region or locality does have an influence on whether a particular new industry develops there” (Martin 2010, 6). Moreover, as part of Martin and Sunley’s (2006, 407) increasingly open and dynamic notion of “path as process,” path creation became understood as part of the “ongoing, never ending interplay of path dependence, path creation and path destruction.” Martin (2010) provides a useful schematic model of the ‘path as process’ approach, identifying different phases of evolution (Figure 1). The first of these is a preformation phase dominated by pre-existing economic and technological conditions and the resources, competences, skills and experiences inherited from previous local patterns of economic development. This is succeeded by a *path creation* phase where there is experimentation but also competition between different economic agents which leads to the emergence of a new path. Path creation subsequently gives way to a *path development* phase based upon local increasing returns and externalities. Established pathways are subject to subsequent divergence, towards either negative ‘lock-in’ or successful adaptation and renewal. In this sense, path creation becomes understood largely as

a latent element of path dependence, conditioned by an array of local industrial-technological legacies and place-dependent factors. Our interest here is in the transition from preformation to path creation and the role of different mechanism, actors and conditions in enabling or constraining such a transition.

<<<<<<Figure 1 about here >>>>>

Path creation requires the generation of sufficient economic momentum and direction so as to secure the expanded reproduction of the particular technology, sector or industry that underpins the putative path. It is commonplace to conceive of this in terms of particular mechanisms of change, although this is often framed in terms of path dependence, regional ‘de-locking’ and path branching rather than path creation *per se* ( Dawley 2013). In an important point of departure for path creation thinking, Martin and Sunley’s (2006) identify five ‘candidate’ mechanisms of regional de-locking: indigenous path creation, based upon the exploitation of new technological paradigms; heterogeneity among agents, technologies, institutions and social networks which fosters variety and innovation; transplantation through the importation and diffusion of new technologies, firms or industries; upgrading of a region’s industrial base, and, diversification into related industrial sectors. In parallel, other EEG research has developed the concepts of related variety and path branching (Boschma and Frenken 2011). When a region’s sectors are neither overly specialized nor diverse, but are instead related in terms of technological fields and knowledge bases, they possess related variety (Boschma 2009). This is argued to foster interactive learning and knowledge spillovers that stimulate the generation of novelty and branching into new growth paths. Four sub-mechanisms of such branching have been identified: the diversification of firms (e.g., new products, mergers, and acquisitions); entrepreneurship (e.g. spin-offs and start-ups);

labor mobility (between firms and sectors); and social networking (e.g. professional associations). As indicated above, we see path branching or diversification as a key mechanism of path creation involving the redeployment of existing competencies towards new markets and technologies, although if this occurs in a more limited fashion in terms of scale, distance from established paths and new knowledge generation it can result in path extension (Isaksen 2014).

In this paper, we argue that analysis needs to move beyond firm-centric understandings of path creation mechanisms and develop a broader perspective on the roles and types of social and institutional agency operating in territorially varied contexts (Dawley 2013). Martin's (2010) alternative model of local industrial evolution (see Figure 1) begins to address this challenge by matching the successful creation and renewal of growth paths with the existence of an enabling institutional environment. Conversely, a constraining institutional environment would lead to the lock-in or stasis of local industries or technologies. A central challenge for path creation research is to unpack the necessarily stylized notions of enabling and constraining environments and to better understand the causal processes at play. While existing work views these enabling or constraining environments as local and regional in nature, we also emphasise the role of national and supra-national actors and influences. In the case of renewable energy, for example, opportunities for regional path creation are dependent on the introduction of favorable policy regimes and financial instruments by government and supra-national institutions (Essletzbichler 2012).

This is bound up with the broader role of the state in influencing path creation. First, through what can be termed horizontal policies (*inter alia* markets, infrastructure, R&D, legal and regulatory frameworks etc.) states actively construct and restructure national institutional

environments and market opportunities (Chang et al 2013). Taking the example of renewable energy, states have supported the development of renewable energy technologies by offering a range of subsidies and supports to enable such emerging technologies to compete with established fossil fuel sources (Essletzbichler 2012). This opens up opportunities for regional path creation if existing regional assets can be harnessed and exploited in line with these emerging market opportunities. At the same time, however, such state conditioned market opportunities remain subject to altered political strategies and pressures, which may either reinforce or constrain regional path creation. For example, Germany's recent radical drive away from fossil fuels and nuclear power – the so called *Energiewende* – to renewable energy has prompted a political re-think in response to the impact of Europe's highest energy costs on its industrial competitiveness (Chazan 2013). Second, states operate vertical policies which are selective and sector-based (Chang *et al* 2013). In the aftermath of the crisis, Bailey *et al* (2013) suggest that industrial policy is 'back in vogue' as states attempt to structure and design economic recovery. In the UK, for example, the Conservative-Liberal Coalition Government have recently instituted a form of industrial strategy which aims to help rebalance the economy by targeting manufacturing activities with high-growth potential in future markets (BIS 2012) . Third, states also foster path creation through the spatial coordination and support of other economic actors and initiatives at sub-national scales, involving a range of local and regional development initiatives (Morgan 2012).

Turning to the regional scale, recent EEG thinking has adopted a "contextual view" of policy intervention, whereby " the degree and nature of policy intervention should be different in regions because their histories differ...[and] be based on the institutional history of a region and which type of intervention fits better a region's situation" (Boschma 2009, 19). More specifically, the Constructing Regional Advantage (CRA) approach developed by a group of prominent EEG researchers emphasises the importance of relatedness, whereby policy

intervention can assist regional branching by supporting new sectors that have their roots in the regional knowledge base and technological field (Boschma 2013). The policy prescription is one of taking the history of each region as a starting point “when broadening the region’s sector base by stimulating new fields of applications that give birth to new sectors” (Asheim et al. 2011, 899). Although the precise implications for operational policies remain vague, these perspectives suggest that successful policy outcomes may be achieved by stimulating the mechanisms of transferring knowledge (e.g. entrepreneurship, networks, and diversification) between related sectors and activities, described as stimulating transversality by Cooke (2010).

The notion of basing policy on existing regional assets is hard to disagree with at a general level, but it would nevertheless appear to favour prosperous regions with a plethora of diverse assets and sectors. In contrast, it poses acute dilemmas for lagging regions which often lack such endogenous assets and frequently face structural and institutional failures in the innovation system (Isaksen 2014). Furthermore, much of the prescription around contextual policy interventions is devoid of any discussion of the ability and autonomy of local and regional policy actors to undertake these forms of intervention. This raises crucial questions of sub-regional institutional capacity in terms of resources, expertise, leadership, institutional cultures and relationships (MacKinnon et al. 2009).

Our approach in this paper is genuinely multi-scalar as well as multi-actor, incorporating national, supra-national and industry-wide rules and norms in addition to local and regional arrangements.<sup>2</sup> Using the case of the offshore wind industry, we are specifically concerned with the complex ways through which the mechanisms of local and regional path creation are mediated through the multi-scalar roles of the state and the dynamic ways in which

horizontal policies interface with selective, or sector-based, vertical policies and the governance of economic development (Smith 2007). In particular, our approach allows us to better understand the capacity of territorial economic development agencies to stimulate evolutionary inspired policy interventions within enabling and constraining environments that are multi-scalar and subject to wider conditions and forces.

### **The Policy Framework for Offshore Wind in the UK**

Our analysis begins by unpacking elements of the broader institutional environment shaping the development of offshore wind in the North East and Scotland. First, we focus upon the ‘horizontal’ dimension of recent UK energy policy, in particular the changes in the enabling and constraining environment of the energy market before and after the economic crisis. Second, we examine how, as part of the post-crisis agenda on rebalancing growth, offshore wind has been selected as a strategic sector within the UK government’s new industrial policy. This provides a basis for the subsequent two sections which examine the implications of this changing regulatory context for regional path creation initiatives in North East England and Scotland.

#### *Energy policy and market regulation*

Since the early 2000s, climate change has become an increasingly important driver of energy policy, reflecting that the UK is subject to an European Union (EU) emissions target of a 20 per cent reduction in 1990 levels of greenhouse gases by 2020, alongside a target for meeting 15 per cent of energy demand from renewable sources by 2020, equating to about 30 per cent of electricity demand. Renewables have expanded rapidly in the UK in recent years from 4.3 per cent of UK electricity in 2005 to 14.8 per cent in 2013 (DECC 2014a). The principal

mechanism for support for renewable energy generation since 2002 has been the Renewables Obligation (RO)<sup>3</sup> which places a mandatory requirement on suppliers to source an increasing proportion of electricity from renewable sources (Redpoint Energy 2012: 17). This financial support entails the construction of markets by the state (O'Neill 1997). More recently, rising energy prices have focused attention on consumer affordability, exerting increased political pressure on renewables subsidies.<sup>4</sup>

After its election in 2010, the Coalition Government announced a process of Electricity Market Reform (EMR) involving a move away from the RO from 2017 to a Contracts for Difference (CfD) system (DECC 2013). CfD operates on the basis of a pre-agreed 'strike price' with generators receiving the difference between this and the wholesale price of electricity. The offshore wind strike price is £155 per MWh for 2014/5, reducing to 140 per MWh by 2017/18 (around three times the current wholesale price), whereas for onshore wind the equivalent prices are £95 and £90 per MWh, reflecting the relative immaturity of the former technology. In some respects, CfD represents a liberalisation of the support mechanism for renewable energy, replacing the RO as a direct subsidy with a selective and competitive allocation mechanism. Although decisions continue to be made directly by government through DECC rather than being overseen by the industry regulator, Ofgem. The EMR process has been widely seen as a source of uncertainty by the industry (authors' interviews). At the same time, ambitions for the deployment of technologies like offshore wind are being constrained by the spending limits set by the Treasury-agreed Levy Control Framework (LCF). This allocates a capped annual budget for low carbon electricity, rising to £7.6 billion by 2020/21 (National Audit Office 2013). In this sense, the government's austerity strategy is part of a changed regulatory environment for offshore wind in recent years, potentially constraining the prospects for local economic growth in the sector. In view of the high costs of offshore wind deployment, cost reduction has been prioritised by the

government as the overriding goal of the sector (DECC 2011). Growing local political opposition to onshore wind, has prompted the government to further reduce subsidies to this sub-sector (Pickard et al 2013), reinforcing the privileged position of offshore wind which accounted for five of the eight renewable projects awarded investment contracts in April 2014 as part of the transition to CfD (DECC 2014c).

### *Industrial Policy for Offshore Wind*

The UK is the worlds' largest offshore wind market with 22 operational wind farms providing 3.7 GW of electricity (The Crown Estate 2014). Given its industrial scale and technological complexity, offshore wind offers substantial opportunities for supply chain development, requiring a wide range of goods and services from turbines to cables, electrical infrastructure, project management and insurance (HM Government 2013). With the publication of the UK Offshore Wind Industrial Strategy (OWIS) in 2013, the sector became the eleventh since 2011 to be selected for targeted industrial policy as part of the Coalition Government's efforts to rebalance the economy by supporting a manufacturing revival (BIS 2012).

The 2012 OWIS seeks to respond to the needs of industry in four principal areas. First, planning consent for future wind farms will aim for 50% of value to be derived from domestic content. This is a response to estimates that over 80% of the value of existing UK installations have been sourced from outside the UK, mostly by Siemens and Vestas in Germany and Denmark (CBI 2013; McCusker 2013). Given existing low levels of UK content and a history of 'light touch' regulation of projects, however, the extent to which this aspiration be achieved in the short to medium term remains open to debate (BVG Associates

2013; authors' interviews 2013-2013). Second, the UK is entirely dependent upon FDI investment to provide capacity in the manufacture of wind turbines (Former MD Clipper Wind UK, authors' interviews 2010). In response, a new Offshore Wind Investment Organisation, established by UK Trade and Industry (UKTI), will provide a sector based focus for FDI promotion. Third, to stimulate domestic development in the broader supply chain and balance-of-plant (in effect everything out with the turbine itself), which accounts for over 75% of the value of a wind farm, £20 million has been allocated to the creation of GROW: Offshore Wind to provide grants, assistance and advice for firms. Fourth, inspired by the German Fraunhofer model of Technology and Innovation Centres (TICs) (Hauser 2009), £46 million of support has been allocated to the Offshore Renewable Energy (ORE) Catapult Centre to lead on R&D, testing and cost reduction strategies.

Despite low levels of local content in installed projects, several UK regions view offshore wind as a major economic growth opportunity, particularly those with existing expertise in marine and offshore engineering and services such as Scotland, North East England and Humberside. The Coalition's abolition of the nine English Regional Development Agencies in 2010 has, however, reduced the capacity of localities and regions to develop industrial policy (Dawley 2013). At the same time, the implications of the OWIS for local and regional development remain implicit rather than explicit. Whilst the strategy designates six coastal localities as being Centres for Offshore Renewable Engineering (CORE), this geographical status appears to offer little more than a retrospective attempt to package and coordinate the standard repertoire of cost-based support measures such as tax breaks and enterprise zone status (Former Director of Tyne and Wear City-Region, Authors' Interview 2014). In this sense, it falls short of industry's appeal to establish 'proactive' development of regional hubs

of expertise, such as the WAB wind industry network in North West Germany (Redpoint Energy 2012: 74).

In the remainder of the paper, we examine path creation initiatives in North East England and Scotland and assess the regional implications of these changes in the national institutional environment.

### **North East England**

During the 1980s, despite little market incentive and government support, the activities of a small number of hobbyist-styled firms and organizations developed a fledgling profile for the North East in the renewable sector (Dawley 2013). This was accelerated in 1990 when a North East based company - Border Wind - secured funding from a newly available national fund for renewable pilot projects (Non-Fossil Fuels Obligation Levy) to develop a semi-offshore wind farm along the Blyth harbour “when few people were thinking about offshore wind, either in the UK or globally” (Director of Energy and Innovation, Authors’ Interview ONE 2010). By 2000, Border Wind completed a further milestone project for the North East when it created the United Kingdom’s first truly offshore wind farm. Whilst ultimately enabled by national-level policy frameworks, niche markets and funding streams (Simmie 2012), these local entrepreneurial activities provided the seedbed for subsequent periods of more targeted local and regional policy intervention (Asheim et al. 2011).

Following its formation in 1999, the North East’s regional development agency, ONE, developed a new regional economic strategy which appears to connect to many of the core principles of an evolutionary inspired ‘contextual approach’ (Boschma 2013). Rather than ‘starting from scratch’ (Boschma 2009) in the development of new economic activities,

ONE's approach involved commissioning consultants to review the region's existing research and technological capabilities in relation to emerging markets . Drawing on the 'demonstration effect' of the earlier period of pioneering offshore wind activity in the North East, together with an assessment of the relatedness of the region's academic strengths and offshore fabrication and engineering capabilities, offshore wind was chosen of one of five strategic sectors targeted for support within the North East's 'Strategy for Success'. This was the largest innovation and industrial development program implemented in any of the English regions at £200 million over six years.

At the outset, ONE's attempts to create an offshore wind growth path focused on the establishment of the New and Renewable Energy Centre (NaREC), a company limited by guarantee, as the focus for a new sector-based Centre for Excellence which would eventually become the world's largest onshore physical test asset base for offshore wind. Alongside ONE's core funding, NaREC was particularly successful in drawing down central government support – more than £30 million in 2009-10 alone. Significantly, for a region with a historically weak performance in R&D capacity, NaREC was then identified by the UK government as an, albeit rare, U.K. success story and blueprint for future industrial policy around technical innovation centres (Hauser 2009).

For the North East's policy community, the optimism and vision building around the path creation potential for offshore wind was increasingly bound up within the then Labour Government's commitment to producing 30% of electricity from renewables by 2020 as part of the 2008 Climate Change Act (Redpoint Energy 2012). The Crown Estate subsequently released its third and largest round of offshore sites for development, with 75% of their potential value being in the UK North Sea, very accessible to the North East of England

(authors' interview). Based on the potential of this state-conditioned market, ONE perceived that the North East could create a leading growth path in "a seller's market....it's not a guaranteed market but the risks are technological risks rather than the customers not being there" ( Former Head of Innovation and Strategy, ONE, Authors' Interview 2010).

Consequently, in parallel to the R&D approach, ONE developed an industrial strategy for offshore wind, focusing on two key mechanisms of path creation: transplantation and diversification (Martin and Sunley 2006). Drawing on the North East's experience and institutional capacity of attracting FDI, together with the promotion of NaREC as a regional asset, in 2007 ONE successfully attracted transplantation investment from U.S. firm Clipper Wind in R&D functions and then latterly the "holy grail" of the UK's first offshore wind manufacturing plant (The former director of business development of NaREC, authors' interviews 2010). To promote diversification, ONE specifically recruited 'novel agents' (Morgan 2012) from backgrounds in the region's existing oil, gas and energy industries to raise market awareness and support the transfer of knowledge between related sectors. By 2010, together with transplantation investments, North East-based firms had delivered more than £300 million of offshore wind contracts, making the North East the leading region in the United Kingdom (Former Manager of Energy and Environment, ONE, Authors' Interview 2010).

However, following a decade of regional "contextual" policy support (Asheim et al. 2011) aligned with an enabling institutional environment, the North East's incipient growth path became exposed to two national state-driven changes from 2010. First, the uncertainty surrounding EMR and the workings of CfD meant that much of the momentum generated in the period of economic growth in the 2000s became dissipated:

In 2009 it looked like we had certainty with the Government aiming for 18GW of new offshore wind by 2020. Back then we thought the market would have really taken off by now, but regrettably programmes have slipped...investor confidence has lapsed due to Government indecision over the level of support for offshore wind. It's hard to make anything happen until the investment situation becomes clear" (MD, EnergiCoast cited in McCusker 2013: 1)

Consequently, for the North East's policy community the changed regulatory and market environment for renewables in the wake of the economic crisis has proven to be "frustrating...as we have been working with land owners to get manufacturers and supply chain businesses in offshore wind to take up the opportunities... but they are facing a very different and uncertain energy policy environment" (Director of NorthEast LEP, Authors' Interview 2014).

Second, ONE was abolished as part of the Government's radical restructuring of the governance of economic development in England. Subsequently, two sub-regional Local Enterprise Partnerships were formed, Tees Valley LEP and North East LEP, offering more limited resources and capacity for path creation (House of Commons 2012). As a result, the Strategy for Success programme - a central pillar in stimulating the region's offshore wind sector - was terminated. By 2012, as part of the centralization of U.K. science and industry policy, NaREC's regional mission was replaced by a new national role as the operational center for the £50 million Offshore Renewable Energy (ORE) Catapult Centre, to be coordinated by a United Kingdom-wide consortium of stakeholders, focused primarily on Scottish Enterprise (SE) and headquartered in Glasgow. Whilst, on the one hand, the North East would retain a globally renowned R&D site which was now a central component of the government's industrial policy for offshore wind, NaREC's altered governance appears

emblematic of an increasing disconnection from local level activities to support firm-led diversification and transplantation (Dawley 2013; Goddard et al 2012).

In response, attention has focused on reassessing the role of the North East's growth path within the broader offshore wind industry value chain. The region's first mover advantages in offshore wind have been met by increasingly intense levels of inter-territorial competition for investment, particularly from Scotland and most recently Humberside where Siemens has chosen to invest £160million in a UK turbine plant. The heightened competition facing the North East was further compounded in 2011 when liquidity problems forced Clipper to terminate its pioneering turbine plant in Newcastle, and with it the prospect of 1,000 jobs. Although the policies of the two North East LEPs still strive to acquire a turbine manufacturer, they do so with a realization that altered demand in the UK market may now require only one or two turbine manufacturers nationally (Director, North East LEP Authors' Interview 2014) and even if successfully acquired:

“Wind Turbine manufacturing would give a great short-term job boost to the region, but once the turbines are installed, the work will dry up. The main opportunity for the region in the long-term will be to establish ourselves as the knowledge and skills centre for the installation of turbines. The skills and associated hardware will be transferable to locations all over the world” (Vice Chair, North East LEP in McCusker 2013: 1)

In this sense, we return to a key theme of evolutionary approaches in that much of the growth potential in offshore wind lies in the scope for the transfer of knowledge, skills and infrastructure from its historical strengths and relatedness in offshore oil and gas and maritime industries. Yet given reduced regional capacity, it remains open to debate whether

this gap in local contextual policy can be filled by the measures proposed in the national OWIS, in particular by the centrally administered GROW initiative.

## **Scotland**

Scotland has developed a highly ambitious strategy for the development of renewable energy technologies, led by the devolved Scottish Government (SG). As part of its visionary approach to climate change and energy policy (see Cooke and Clifton 2005), the Scottish National Party (SNP) government has set some of the most challenging targets in Europe, establishing the goal of generating 100 per cent of electricity consumption from renewables in 2020 (SG 2012). This reflects Scotland's natural and human resources and assets with an estimated 25 per cent of Europe's offshore wind resources, in addition to offshore and subsea expertise from the North Sea oil and gas industry, and substantial engineering, marine and construction skills (SG 2010). The political will and commitment of the SG has underpinned the rapid development of renewables in Scotland (authors' interviews). The SNP government views the growth of renewable energy as central to the economic dimension of its independence strategy, seeing it as a vehicle of industrial renewal and modernisation (Scottish Government 2012). Partly as a result of the political commitment of the SG, 40.3 per cent of electricity consumption in Scotland was generated from renewables in 2012 compared to 12.2 per cent in 2000 (SG 2013), reflecting the rapid growth of onshore wind in addition to long-standing supplies of hydro-electric power.

Given its industrial scale and potential, offshore wind is central to this re-industrialisation vision. In addition to its UK-wide rounds of leasing, the Crown Estate commissioned a further Scottish Territorial Waters (STW) Round in 2008-9 in response to SG ambitions and

‘industry appetite’ (authors’ interviews), awarding leases to developers for ten sites, although this has subsequently been reduced to three as a result of a SG review of the sites and recent withdrawal by developers (in addition to two large Round 3 zones). Despite the ambitious strategy of the SG and the potential capacity of almost 8GW from the remaining projects, there is only one non-demonstration project in operation, Robin Rigg, generating just 180 MW of electricity.

At the same time, Scotland has had considerable success in attracting and developing a number of strategic projects, providing a basis for path creation. These include several research and development initiatives such as: the International Technology and Renewable Energy Zone in Glasgow, which builds on the presence of the headquarters of two of the ‘big six’ UK energy companies (Scottish Power and SEE) and incorporates the ORE Catapult Centre established by the UK government; the European Marine Energy Centre in Orkney; the Mitsubishi Heavy Industries Centre for Advanced Technology in Edinburgh; and the Hunterston Test Site in Ayrshire. In addition, the Green Investment Bank is based in Edinburgh (as well as London). Universities are involved in these initiatives, particularly Strathclyde and Edinburgh, but this is not a particularly indigenous form of path creation, with both inward investors and UK government initiatives playing an important role (Winchester 2013). In addition, Scottish Enterprise (SE) has established a specific innovation support scheme, the Prototype Offshore Wind Energy Renewables Scotland Fund (POWERS) with a budget of £40 million whilst also offering test and demonstration sites at Hunterston in Ayrshire and Energy Park Fife in Methil (Scottish Enterprise official, author’s interviews, January 2014). Compared to North East England which has focused largely on the growth opportunities for its manufacturing sector, Scotland has concentrated more on establishing a niche in the innovation and design segment of the offshore wind value chain

(Lema et al. 2011). This involves an important element of path creation through the introduction of new forms of knowledge into the region (Isaksen 2014).

The SG has also been successful in signing Memoranda of Understandings (MoUs) with several turbine manufacturers to establish factories in Scotland, notably Gamesa and Areva (OWIG 2012), although actual construction is dependent on the scale of the UK offshore wind market for turbines (authors' interviews). Scotland's ability to secure such agreements and its strong performance in attracting inward investment projects more generally (Ernst and Young 2013) would seem to reflect its comparative institutional and political advantage over English regions and localities in terms of the presence of a powerful devolved government and regional development agencies (SE and Highlands and Islands Enterprise). Transplantation is a key mechanism of path creation in the Scottish offshore wind sector, providing some parallels with the development of other recent growth sectors such as electronics and oil and gas, although, as indicated above, transplantation extends to research and development in offshore renewables, in contrast to the branch plant nature of electronics in particular (Turok 1993).

In a similar fashion to the North East, the scope for branching from other sectors, particularly oil and gas, has been strongly emphasised by policy-makers, generating a number of contextual policy initiatives. Thus, as well as maintaining an offshore wind supply chain directory, SE runs a number of workshops and events to raise market awareness among potential supply chain companies (SE official, authors' interviews January 2014). In addition, SE has introduced an Offshore and Expert Support Programme which offer firms interested in diversifying into the sector two days of free consultancy and advice from industry experts. Whilst such initiatives have had positive effects in increasing market awareness among SMEs, diversification remains rather limited in scale, partly a result of the buoyant nature of

the oil and gas. A common response from interested oil and gas-based firms is the setting up of small teams of two or three people “with a remit, looking at offshore renewables, just waiting to see when it’s the right time to step in” (Industry representative, authors’ interviews, February 2014). These questions of timing and market uncertainty in the context of a changed UK regulatory and market environment were emphasised by the Managing Director (MD) of a leading manufacturing firm in evidence to a Scottish Parliament Committee in 2012:

We are an oil and gas company. We recognised the opportunity offered by alternative energy back in 2006. We have been involved in the Beatrice project and demonstration projects for Germany, so there are also international opportunities. The issue for us is that offshore wind will not really hit the UK until 2015, ... so our company has had to revert to oil and gas opportunities for the next two to three years to fill the gap ... Therein lies the issue ... We may become a major importer if we do not get the right investment in place as soon as possible ... We will ... invest in our companies only when we know that there is a healthy order book. (John Robertson, MD of Burntisland Fabricators Ltd, Economy, Energy and Tourism Committee 2012).

These difficulties have worsened since 2012, with the level of investment in offshore wind in Scotland falling by more than half between 2012-13 and 2013-14, reflecting continuing uncertainties over financial support under CfD and perceived delays in achieving planning consent.

Despite its highly ambitious 2020 targets, under the UK model of asymmetric devolution the power of energy market regulation is reserved to the central UK government, meaning that the SG is unable to control the subsidy regime. Indeed, the powers of the SG have actually

been reduced by EMR since it lost its powers over the banding of the RO that it used to provide higher levels of support to immature technologies like marine and tidal energy. Furthermore, DECC's announcement of the preliminary results of the transitional Final Investment Decision (FID) enabling round in December 2013 – established to ease the transition between RO and CfD – which initially selected ten 'qualifying projects' to receive financial support, represented a setback for the offshore wind industry in Scotland:

Yeah, the recent announcement, prior to Christmas wasn't the best for Scotland. The projects that got through the process, the offshore wind projects, two fell out of the first stage, and then the remaining ones in the process, although the official party line, they're still in it, DECC published an alphabetical list of the top ten affordable projects. None of them were in Scotland, and we understand that the only way they'll allow us to move up that ranking is if the projects above them drop out, so, as a result, you can imagine our ministers were not exactly thrilled about that (Scottish Government official, authors' interviews, January 2014).

Yet the fact that the Beatrice offshore wind project was ultimately awarded an investment contrast in April 2014 after being granted planning permission by the SG (helping it to move up the ranking) is indicative of the continuing influence of the SG on UK renewable energy policy. Notwithstanding the success of the Beatrice project and its clear institutional and political advantage over English regions like the North East, prospects for offshore wind path creation in Scotland look less optimistic in 2014 than in 2011-2012 with the effects of a range of 'contextual' policy initiatives being undermined by more fundamental shifts in energy market regulation at the UK scale.

## **Conclusions**

We have adopted a multi-actor and multi-scalar perspective on regional path creation in this paper, focusing on the role of state agencies and personnel in fostering path creation in the offshore wind sector in two peripheral UK regions. A range of ‘contextual policy’ interventions were developed in each region, focusing particularly on innovation and R and D, support for diversification and the attraction of inward investment, as regional policy-makers sought to orchestrate key mechanisms of path creation. In practice, the workings of such mechanisms may overlap in certain respects, with evidence of significant transplantation in innovation functions in Scotland, or remain separate and misaligned, as indicated by increasing divergence between NaREC and other dimensions of North East England’s growth path. Scotland holds substantial institutional and political advantages over the English regions such as the North East through the powers of its devolved government and retention of a structure of regional development agencies which has been abolished in England. The effects of this are evident in the offshore wind sector, particularly in terms of Scotland’s setting of ambitious renewables and climate change targets, strong political support for the sector, and greater capacity to attract investment from both international firms and the UK government. Consequently, Scotland offers more evidence of emerging path creation through the transplantation of new knowledge in the form of R&D facilities in particular (Isaksen 2014), relative to more limited evidence of diversification in North East England, resulting largely to the perpetuation of existing paths. The crucial distinction here is between path creation and path extension – in addition to the other categories of path exhaustion and path renewal discussed by Isaksen 2014. In this sense, mechanisms such as path branching may feed into the development of differing path outcomes, depending on the nature of knowledge involved in the branching process and the degree of novelty between established paths and those sectors and activities targeted for future development.

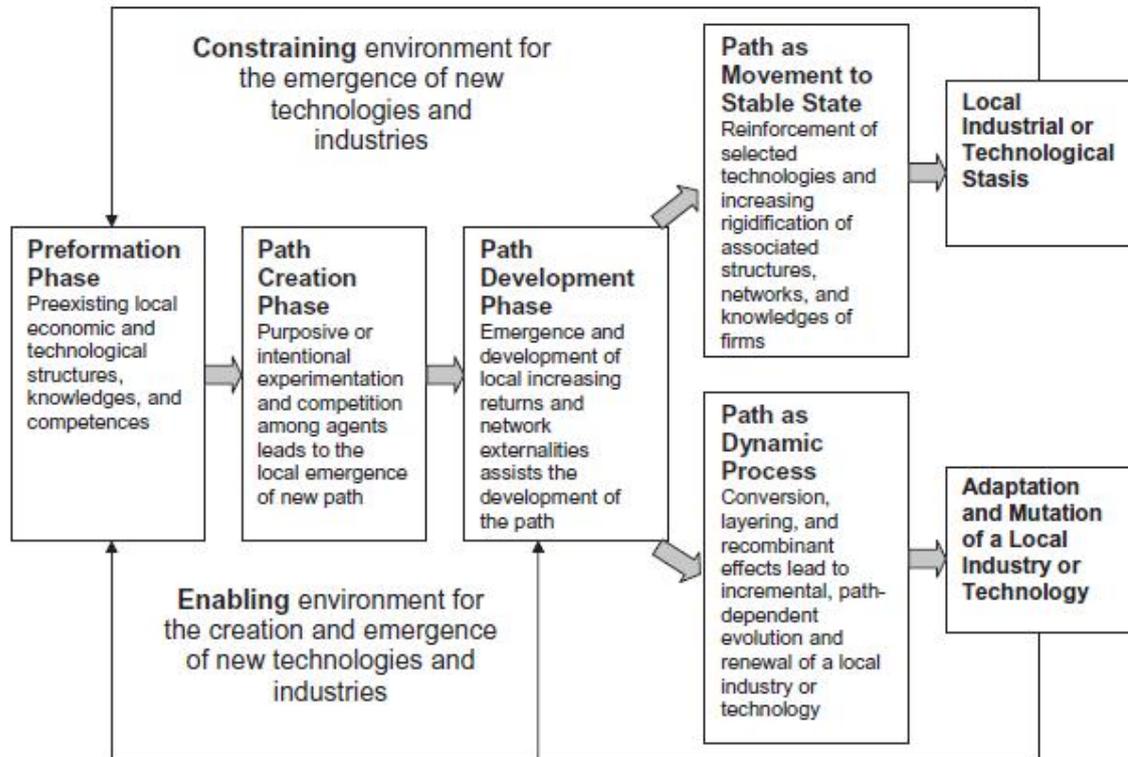
In the context of a sector which is not yet price competitive with fossil fuels and therefore state-anchored, the effects of regional ‘contextual policy interventions’ are crucially conditioned by the national political economy of energy regulation. In particular, the move to a more austere financial environment in the UK, involving the introduction of a new competitive allocation mechanism, is threatening to constrain the development of the sector, with adverse effects on the sectoral ambitions of peripheral regions like Scotland and North East England. This reflects the UK variant of the wider international shift towards a consolidation or austerity state (Schafer and Streeck 2013) which is re-configuring governments’ responses to the challenge of climate change and energy transition (Bridge et al. 2013). The shift to austerity is being played out in complex ways in the UK offshore wind sector, with tensions emerging between the constraining effects of the reconfigured ‘horizontal’ policy framework of EMR and the CFD and efforts to strengthen the ‘vertical’ dimension through the OWIS. At the same time, the government’s reduction of the financial support for onshore wind in the face of political opposition to it is reinforcing the claim of offshore wind on the remaining resources, something which is effectively at odds with austerity given the far higher costs of offshore deployment. As this indicates, path creation in regions cannot be seen as a purely endogenous and micro-economic process, but is also, as we have shown, shaped by broader macro-political, institutional and economic factors.

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Figure 1. Towards an alternative model of local industrial evolution (Source: Martin 2010: 21)



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## Notes

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<sup>1</sup> In the remainder of the paper, we use the term ‘regional’ rather than ‘local and regional’ as this is our primary scale of analysis.

<sup>2</sup> This should be distinguished from the multi-level perspective (MLP) often deployed to assess processes of energy transition (Essletzbichler 2012; Geels 2004) which has been criticised for its neglect of spatial structures and relations (Hansen and Coenen 2013).

<sup>3</sup> The RO was preceded by the Non Fossil-Fuel Obligation, established by the Electricity Act 1989 which privatised the industry.

<sup>4</sup> Although the RO is calculated to cost only £21 of an average annual electricity bill of £531 and total ‘environmental costs (the RO plus other energy efficiency and fuel poverty schemes) amount to 11 per cent of an average bill (Ofgem 2013)