Mediating the form and direction of regional sustainable development: the role of the State in renewable energy deployment in selected regions

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Abstract

This paper analyses and critically discusses the role of regions in implementing renewable energy policies, examining the relationship between state policy and renewable energy deployment. Using evidence from four case studies regions, two in Italy and two in the UK, the paper teases out some differences in terms of regional competencies to implement RE policies across the two countries. Both the national governments in Italy and the UK have constructed regulatory and governance relationships to orchestrate and reorder economic, social and ecological challenges and devolving responsibilities at the sub-national level. This has offered an opportunity for the peculiarities of regional setups to be taken into account and regions have contributed towards the promotion of green and sustainable path development via the route of promoting renewable energy deployment. The paper argues that the downscaling and distribution of responsibility in the cases investigated reflect the capacity and willingness of nation states to respond to and mediate the strategic goals and outcomes formulated at national and international levels. Nevertheless, while the regions investigated display differences in their incentives, capacities and capabilities to increase renewable energy deployment, their ability to act is very much influenced by nation-states, stressing the important role of the state in mediating the form and direction of renewable energy deployment.

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1.0 Introduction

The rates of successful renewable energy (hereafter RE) deployment vary from country to country (REN21, 2018). While a range of support mechanisms to ensure that ambitious low-carbon energy targets are met have been applied in different countries (Kitzing et al., 2012, Haas et al., 2011), these have produced significant spatial variations in terms of the outcomes, not only across countries but often within the same country. Despite the fact that financial incentives for deployment have often been applied consistently across the same country, there have been differences in the local and regional distribution of RE deployment (see for instance De Laurentis and Pearson (2018) and Dewald and Truffer (2012) for examples of regional disparities in Italy and Germany, respectively).

The sub-national level of the region is increasingly represented as an important site for action to promote low carbon energy systems (REN21, 2018). RE deployment is therefore not only confined to arenas of international negotiations or national policy making but has also increasingly become a critical issue at the regional level. Regional development strategies have increasingly focussed on the economic development opportunities of RE technologies as both a response to environmental problems and a source of regional development opportunities (Gibbs, 2018). Thus, the regional level is seen as an important governance scale where many environmental responsibilities and policies are implemented and realised (Gibbs and Jonas, 2000, Morgan, 2004, While et al., 2010). The achievement of higher-level decarbonisation targets will depend significantly upon the successful and rapid implementation of projects at sub-national levels, such as regions and their cities. These are the levels at which decisions about investments in, and the siting of, RE power schemes are crucial. Regions, therefore, can play a key role in translating national and supranational low carbon energy visions into realities.

This paper examines the relationship between state policy and regional sustainability, in relation to RE deployment, stressing the important role of the state in mediating the form and direction of RE deployment. In doing so, the paper engages primarily with the concept of eco-

state restructuring (While et al., 2010) that emerged in the early 2000s to describe the role of the state in directing and regulating environmental concerns. The paper reflects on, and uses, the concept of eco-state restructuring as a vehicle for examining the relationship between state policy and RE deployment across four regions (two in Italy and two in the UK) and discusses the implications on the practice and outcomes of the territorial governance of RE. Regional governments in many parts of the world 'hold a wide range of the competences to implement policy actions for both adaptation and mitigations' (Galarraga et al., 2011: 164) and, in the regions under investigation, RE deployment has been influenced via processes of regional policy-making in the areas of targets creation, spatial planning and regional energy strategies. Nevertheless, as national governments seek to deliver on commitments to a low carbon future and to embed energy-carbon rationalities at different spatial levels, the salience of energy policy (vis-à-vis economic competitiveness, governmental goals, energy security and infrastructure provision) has also helped shape the relationship between the national state and the scope of regional responses.

These arguments are structured in the paper in the following way. The paper starts by situating the discussion presented in the paper exploring the concept of the eco-restructuring of the state to further understand the complexity around the role of the state and regional intervention in RE. The paper then provides a background to the methodology used for the research, highlighting the role and extent of the comparative analysis conducted. The paper provides examples from the regions investigated on the way in which regional governments have influenced RE deployment, via target setting, RE deployment strategies and spatial planning. It continues by appraising the role of the state in both Italy and the UK, investigating how it has influenced the form and direction of RE deployment. In the conclusion, the paper highlights some critical reflections on the empirical study and the theoretical contribution it offers.

2.0 Understanding the regional capacity to act

Complex architectures of political power and spaces of governance have emerged as governments seek to reconcile environmental protection alongside multiple pressures and demands. To some extent, there has been a re-structuring of the state, from a situation of state dominance in the management of public functions to more multi-actor forms of partnership and networks (Jessop, 1995, Rhodes, 1996). This implies that 'governments' exist

not only at a range of different geographical levels, but also that they are increasingly interdependent and involved in a continuing process of negotiation across a range of policy fields. Arguably, state responsibilities have moved in three directions: 'up' towards supranational organisations and institutions; 'down' towards regional and local levels, and 'out' with a stronger reliance on semi-public and private institutions (cf. Pierre and Peters, 2000). At the urban level, for instance, the processes in place to govern climate change can be examined looking at the way in which resources, competencies and powers are distributed both 'vertically' between different levels of government and 'horizontally' through multiple overlapping and interconnected spheres of authority (Bulkeley and Betsill, 2013). Dawley et al. (2015) and Dawley (2014) suggest that regional governance level is relevant in order to nurture new sustainable development paths. Whereas each element that influences regional path development has regional and extra-regional components, assets and actors are the most regionally embedded (MacKinnon et al., 2019). Furthermore, economic geographers have stressed the interdependencies among institutional configurations at different spatial scales (Gertler, 2010, Martin, 2000) and contend that regional-specific institutions result from processes that take place at, and across, various scales (Goodwin, 2013). Within the context of RE, a number of contributions have focussed, for instance, on the role of institutions and institutional conditions at the national and international levels for RE, such as regulatory support, the role of technological standards and specific R&D programmes in support of RE transitions (Jacobsson and Lauber, 2006, Haas et al., 2004). Furthermore, scholars from the geography of sustainability transitions show how processes of RE deployment are determined through the interplay between international, national, regional and local institutional conditions (Hansen and Coenen, 2015). A constellation of interacting actors, institutional and regulative settings, as well as physical resource and infrastructure endowments, interact at different spatial levels and influence how and why RE technologies are dispersing geographically (De Laurentis and Pearson, 2018).

These contributions have highlighted the role of purposive actors and institutions, at the regional level, in influencing RE deployment and providing economic development opportunities to promote new growth and jobs. Nevertheless, little attention has been paid to investigating the role of the state and the region in mediating the form and direction of RE deployment at the regional level. Arguably, regions can play an important role in translating

national and supranational RE visions into realities, and more could be said about the role of the state in directing and regulating such regional responses. The concept of eco-state restructuring can be useful here.

Discussing the growing geographical interests spurred on by low carbon multi-level governance and regulatory institutions, While et al. (2010) suggest that particular modes of environmental governance needs to focus on how the state seeks to manage the relationship between the economy, the natural environment and competing social goals, stressing 'conflicts and power struggles around the state in environmental regulation' (While et al., 2010: 77). The restructuring of the state in relation to environmental and carbon regulation is understood therefore in terms of 'the reorganisation of state powers, capacities, regulations and territorial structures around institutional pathways and strategic projects which are (at least from the vantage of state interests at a given moment in time) viewed as less environmentally damaging than previous trajectories' (While et al., 2010: 80).

Thus, the state is increasingly becoming involved in orchestrating and regulating environmental concerns as well as mobilising and organising actors, projects and interests in order to be consistent with strategic environmental aims. Nevertheless, there is a 'pressing need' (While et al., 2010: 89) to understand what this might mean for sub-national governance in ascertaining how economic, social and ecological challenges are strategically intertwined at the urban and regional scales. A wider concern of this paper is, therefore, to further investigate the role that the regional level can play in promoting green and sustainable path development, with reference to RE, investigating the relationship between state policy and regional RE deployment and highlighting whether regions go, or can go, beyond their role as carriers of political commitments agreed at higher levels of government.

The paper uses the example of RE deployment at the regional level to investigate further how national governments have enrolled regional actors and institutions to implement ambitious RE deployment goals. However, the relevance of energy policy at the national level- and how it conveys existing governmental priorities around economic competitiveness, achievement of governmental goals, energy security and infrastructure provision- has contributed to shaping the relationship between the national state and the scope of regional responses.

The remainder of this paper uses the concept of eco-restructuring as a useful contextual background in order to situate regional responses and policy initiatives in RE deployment and

to explore the relationship between state policy and regional RE responses across the four regions within two distinct, national modes of RE regulation.

3.0 Study design and methods

This paper draws on multiple-case studies of a selected sub-set of particular regions (Apulia and Tuscany in Italy and Wales and Scotland in the UK) . Both Italy and the UK have been subject to similar pressures from European and international regulatory frameworks and have introduced targets for RE as well as financial and legislative incentives for the expansion of RE. While the Italian central government shares responsibility for energy policies with regional governments, in the UK energy policy is a reserved function much of which is not devolved. Yet, devolution and local government reform have allowed for the emergence of a regional and local governance for RE in the UK. Additionally, there is sufficient institutional difference across Wales, Scotland and the rest of the UK that open up fundamental questions in understanding the development and deployment of RE (for an example of bioenergy in the UK see De Laurentis (2013) and for comparison between England, Scotland, Wales and Northern Ireland, see Cowell et al. (2015)). The two countries also show differences in their institutional make up, as they are often considered examples of a liberal market economy (UK), and a variation of a coordinated market economy (Italy) (Hall and Soskice, 2001). These differences have, to some extent, also influenced RE policies and helped shape the adoption of RE technologies (Ćetković and Buzogány, 2016).

Benefits of case study research design (Yin, 2014) are often discussed by both regional development and institutions scholars. For instance, Farole et al. (2011: 59) argue that 'since social, cultural and institutional forces vary considerably across territories, the geographical context of these factors should provide critical input' and Wirth et al. (2013), similarly, contend that examining the influence of institutions is highly contextual. While case studies are helpful to interrogate, examine and tease out some of the effects of the context and of different contextual conditions, there is also a need to extend case study methods to incorporate comparative methodologies (e.g. cross-regional and transnational fieldwork) that can aid in identifying the influence of context and the validity and transferability of research findings and contributing towards theory building (Peck, 2003). Comparative case study analysis is also important to understand the role that institutions play in economic processes at different geographical scales (Gertler, 2010).

In this paper the role of comparative analysis comes into play more at the national level and/or as a meta-theoretical tool to investigate and analyse national-regional processes and relations in respect of RE policy. Thus, the paper does not engage in an explicit comparison of the four regions in question but rather uses evidence from the case studies to tease out some differences in terms of regional competencies across the UK and Italy to implement RE policies and to explore the different capacities and competencies of the regional level in implementing RE policies in relation to a national steer.

Data were obtained via documentary analysis and 35 extensive in-depth interviews across the two countries (De Laurentis, 2018). The documentary analysis included material collected from an extensive review of the academic literature, press reports and policy documents associated with the greening of energy systems, with attention to RE deployment at the regional level. The interviews were conducted both in Italy and the UK and included energy policy makers, regional and national government representatives, organisations that supported innovation and RE development (e.g. development agency, business associations), firms, and private and public research organisations. The interviews offered the opportunity to collect more detailed information about recent RE deployment and policy frameworks at national and regional levels and explore the role of regional actors in promoting RE deployment.

4.0 Unpacking the relationship between state policy and regional renewable energy responses

Both Italy and the UK have been subject to similar pressures to promote the generation of electricity from renewables and were challenged to achieve a significant increase in the deployment of RE. In Italy, to some extent, due to the absence, for some time, of a national energy strategy and/ or a clear roadmap for RE, RE deployment occurred mainly driven by market forces and support mechanisms that ensured high remuneration for large-scale investments (De Laurentis and Pearson, 2018, Antonelli and Desideri, 2014). In the UK, the overall design of RE support schemes has reflected the UK government's commitment to reducing greenhouse gas emissions while minimising government intervention in markets and seeing competition as a key element to drive costs down (Keay, 2016, Woodman and Mitchell, 2011).

Both the national governments in Italy and the UK have constructed regulatory and governance relationships to orchestrate and reorder economic, social and ecological challenges and devolving responsibilities at the sub-national level. The varying degree of responsibilities for energy policy at the regional level is represented in table 1.

The table highlights the different regulatory and governance relationship between the Italian and the UK central governments with their regional governments. According to table 1 (and supported by the literature referenced in brackets), the areas under which the regional level has played a purposive role in influencing RE sits under the following:

- the creation of regional targets and strategies (route-maps and plans) for RE deployment, that are translated into visions (in some instances shared and coherent) for the exploitation of regions' indigenous renewable resources to contribute towards

Table 1 Overview of the formal distribution of energy related powers in Italy and the UK at the regional level

		Energy Policy	Provision of Market support for RE	Planning and Consents	Economic Development spending
Italy					
	Regions*	*Concurrent Legislation*	None	Strategic planning; General planning power for RE varies across regions Provision for authorisation procedures and operation of energy production plants.	Regional innovation and industrial support programmes; EU framework programmes for research and technological development
UK***					
	Wales	No Powers	No powers	onshore: partial powers over planning policy and consent for smaller schemes <50 MW** offshore: Power to determine applications up to 1 MW	Fully devolved

	Scotland	*Executively devolved*	Executive Devolution of some support Schemes (ROs)	onshore: Fully devolved offshore: Fully devolved	Fully devolved

* Italy is organised into 20 Regions, including four autonomous Regions and two autonomous Provinces.

** Application over 50 up to 350 Mw to be determined by the Welsh Government under the Wales Bill 2016; over 350 MW centrally by UK government.

****Note: Northern Ireland is not included in the analysis as Northern Ireland has its own systems and complexities.

Source: Author's elaboration following Cowell et al. (2017)

- economic development goals (see for instance Essletzbichler (2012), Späth and Rohracher (2010), De Laurentis et al. (2016);
- the use of spatial planning in reflecting the capacities and willingness (or lack of) of local and regional actors in identifying the challenges that renewables present for the management of land use and to render land available for RE development (see for instance Wolsink (2017), Nadaï and Labussière (2009), Cowell (2010), Ellis et al. (2013).

The paper now discusses how RE deployment has been influenced via processes of regional policy making in the areas of target setting, regional energy strategies and spatial planning, providing examples from the case studies. I will return to the relationship between the national state and the scope for regional responses later.

4.1 The regional development framing of renewable energy deployment

As discussed above, the framing of RE deployment at the regional level is often set within the prospects for regional actors to exploit renewable resources to provide economic development opportunities that promote new growth and jobs. To a certain extent, both Italy and the UK, have provided the regional level with the capacity to act within the overall political-administrative system that allowed regions to create new opportunities for RE deployment.

In terms of the creation of regional targets, in both countries, there have been differences in the way in which national targets have been distilled to the regional level. A principle of 'burden sharing' was adopted in Italy that identified how the national target for RE deployment would be divided between the Italian regions following a shared methodology

(MISE, 2010). The delays that occurred in the development of this methodology left regions to decide on their own targets and whether to set targets at all. While some targets appeared in regional plans, they did not consider technological and legislative developments, thereby underestimating RE potential and opportunities (Gianni et al., 2012). In Tuscany and Apulia, targets have not played any specific role in influencing deployment opportunities and even the 2020 burden sharing targets were reached as early as 2014 (GSE 2016). In Scotland and Wales, on the contrary, targets were not influenced by Westminster seeking to steer the devolved organisations into delivering any specific share of the national commitments. Targets, it has been argued, have become a key feature, and a policy output of devolution, providing an important act of differentiation from Westminster (Cowell et al., 2015). Scotland and Wales produced their own energy strategies, which set their RE targets or aims together with their own regional visions and aspiration for RE development, exceeding the UK national target for 2020. As Cowell et al. (2015) claim, they reflected mainly 'domestic' processes: such as political agenda setting, along with assessment of the resources available in each territory and projects in the pipeline.

In terms of the development of regional strategies for RE deployment, in both Italy and the UK, regional policy makers, have promoted RE projects to capitalise on the potential economic benefits (e.g. local job creation), as well as the potential for climate change mitigation. The regions investigated have mobilised different compelling visions to promote RE deployment, exploiting regional renewable resources, for the benefit of their territory, identifying priorities that differ from and contrast with those set at national levels, and prioritising specific RE sources over other energy sources (renewables and non-renewables). RE deployment in Apulia was seen not only as an opportunity to assume a leadership role in RE but as a way of shedding the region's image of being part of the 'poor' Italian Mezzogiorno. Of most significance was the way in which the Apulian regional government streamlined the bureaucratic procedures of license concessions, promoting public sector deployment and financial support for the creation of energy parks. By contrast, the measures adopted for the diffusion of RE in Tuscany were primarily aimed at overcoming a shortage of industrial leaders and projects, due to a lack of technology transfer processes from university to industry. Support was based on an industrial strategy for RE that would stimulate networking and

technology transfer activities between local research institutes (public and private) and the small and medium firm base.

Similarly, Scotland and Wales have each produced energy strategies that stress their own regional visions and aspirations for RE development. Successive Scottish Governments have positioned RE expansion as central to Scotland's national economic future, with a sustained emphasis on green jobs, economic growth and international competitive advantage, developing an ambitious strategy for the development and deployment of indigenous natural resources. Yet, the vision(s) for RE deployment became part of a much stronger drive towards Scottish independence and an opportunity to gain further control over energy policy (Dawley et al., 2015, Toke et al., 2013). Significantly, this political vision of harnessing the comparative advantage of Scotland's natural resource potential benefitted from cross- party support that also opposed nuclear power new-build.

Welsh governments have sought to 'act' on energy as an integral part of their wider economic and environmental agendas and to 'maximise the potential for RE in Wales', based on harnessing the region's natural resources, to attract significant new investment. Nonetheless, there has been, to some extent, a tentativeness regarding the 'visions' for RE deployment in Wales due to a lack of clarity and focus in the economic development thinking of RE policy and a feeling that ministerial drive was lacking in the face of public dissent.

In both Italy and the UK, it is often the regional (and local) levels, which are tasked with weighing resource potential and different environmental values against RE targets which are often articulated through deliberation between national, regional and local stakeholders via land use planning and energy consenting. In Italy, the national government was set to provide since the Legislative Decree 387/2003 a set of guidelines for the siting of RE plants, under the principle that RE installations were considered of 'public utility, urgent and could not be deferred'. However, such guidelines were issued in 2010, seven years later than planned, contributing to the emergence of a great variety of spatial planning approaches for RE at the regional level. Tuscany adopted a coordinated approach between the regional and the provincial levels, that identified resource potential but also the environmental implications of RE deployment. Landscape discourses (Nadaï and van der Horst, 2010) have been an integral part of the regional 'fabric', and a higher capacity of RE resources already deployed (e.g. geothermal and hydro) limited and constrained large-scale development. Contrariwise,

Apulia created a fast track approval and simplified licensing system that helped streamline the authorisation process for RE planning, project approval and installation. This provided 'a positive image' of the region leading to an increased interest from RE developers and investors attracted by lucrative incentives and favourable natural resource conditions.

Land use planning and energy consenting have been critical for both Scotland and Wales in shaping RE deployment, offering much scope for autonomous policy development and influencing outcomes. In Wales the Technical Advice Note 8: Planning for RE (TAN 8) represents the sphere in which the regional government has done most to steer energy development (especially on-shore wind) within its territory, acting as a 'national zoning framework' (Cowell et al., 2017: 175). Nevertheless, wind deployment has been slower and patchier than in Scotland (see Ellis et al., 2013) and this casted a shadow over the suitability of the zoning approach to yield the desired implementation targets for renewables. Planning is often seen as another ingredient of Scotland's success in delivering RE, especially onshore wind (Cowell et al., 2015) with the Scottish Government playing an instrumental role in steering RE consent.

In summary, the examples presented offer an account of how regional governments have sought to organise the relationship between energy resource, land-use values and interests, constructing opportunities for, and barriers against, RE development. The discussion above stresses how the regions investigated have to some extent displayed the governance capacity over energy and have made use of targets, energy strategies/ visions and spatial panning to promote RE deployment. Regional governments have had varied powers to mediate the exploitation of RE, playing an important role in translating national RE aims and objectives into realities (Gibbs, 2018). Agreeing with Morgan (2013) regions have organised policy implementation and design to promote green and sustainable regional path development capitalising on the region's asset. However, the question this paper raises relates to being able to further understand the regional capacity to act in RE deployment and how this is somewhat orchestrated at the national level and in what ways. The paper now turns to discuss how the Italian and UK governments have influenced the regional capacity to act in ways that go beyond the overall political-administrative system of distribution of power.

4.2 The eco-state restructuring framing of renewable energy deployment

As argued earlier in this paper, the eco-state restructuring literature suggests that while regions have differential incentives, capacities and capabilities to influence a low carbon future via RE deployment, more needs to be said about how the state seeks to manage the relationship between the economy, the natural environment and competing social goals, thereby influencing the regional capacity to act. The attention here shifts to discuss whether the regions investigated had sufficient and appropriate levers to influence RE deployment and further investigates the role played by the state in steering RE deployment and its implications for the practices and outcomes of territorial governance.

The case study regions benefitted from a nation-wide pool of market support to promote RE deployment. Certainly, this support was utilised, at the regional level, to mobilise different narratives around the opportunities offered by RE deployment. These involved the promotion of clustering activities to foster economic development and innovation within their territory, to promote networking and knowledge transfer across the many actors involved and to foster regional identity and independence.

Nevertheless, in Italy, the financial and economic support available for RE has been applied consistently across the country and this had an important role to play in RE deployment in all Italian regions, even the least isolated areas of northern Italy (Antonelli and Desideri, 2014). The requirement to accelerate RE deployment to meet EU 2020 targets, the need to tackle the vulnerability of the Italian energy system, in terms of the limited coal and gas resources, and in order to increase the security of energy supply, has made the deployment of RE sources one of the main priorities of Italy's energy policy for some time.

In the UK, Scotland was able to control some market support mechanisms. These might have not been overly relevant in shaping the overall volumes of RE deployed in the territory, but they signalled Scotland's influence over national energy policy. At the point at which the UK national government changed the market support mechanisms with the introduction of the Contracts for Difference (CfDs), Scotland has lost is power to control energy market mechanisms. The CfDs framework is set to finance nuclear energy and the Scottish Government has opposed this mechanism as it is taking away resources from renewables to finance new nuclear capacity (Toke, 2017). The implementation of the CfDs also coincided with the withdrawal of support for onshore wind. This withdrawal had a wider spatial reach

limiting significant increases in onshore wind in both Wales and Scotland. This had a twofold effect. Firstly, regional targets are unlikely to be achieved with these alterations and, secondly, it signalled the greater role of the national level in setting future financial mechanisms across all devolved regions (Toke, 2014, Upton, 2014).

As discussed, in Italy regulatory competences have become less centralised, granting the regional level the capability to determine and influence changes in energy systems (via RE deployment). However, the urgency and need to intensify the mobilisation of RE sources, due to their perceived role as a 'public utility', has required the Italian government to strengthen their levers, undermining the regional autonomy in approving RE deployment. While the system of spatial governance has shown a 'withdrawal' of the State from the spatial planning dimension, there have been many cases in which the national government has intervened (Servillo and Lingua, 2014). These issues have had a profound effect on energy and RE planning in the country. In implementing the EU Directive 2001/77/EC on the promotion of electricity produced from RE sources, the national government found itself in a situation of urgency, leading to some extent to the strengthening of the influence of the national level over the planning sphere. The national state, in order to accelerate the uptake of RE, intervened in the planning sphere through simplifying the authorization and administrative processes for building and operating all types of RE projects. This represented an attempt to reduce the long delays caused at the subnational level in authorizing RE projects, but also provided a clear indication that RE installations (and the infrastructures required for the operation of the plants) were considered of national public utility, urgent in nature and that could not be deferred. Moreover, although regions had the opportunity to set limits to the installation of RE on their territory, these limits were set around the national guidelines. These represented the instrument to provide a common framework for the identification of areas and sites unsuitable for RE deployment. Whilst following the guidelines could be seen as an imposition, to a certain extent, to limit the power of regions to regulate the siting of RE plants in their territory, the guidelines were only published in 2010, getting caught up in the Italian planning system's inertia (Servillo and Lingua, 2014). In their absence, the regional laws that have sought to identify criteria to regulate the siting of RE were adjudged unconstitutional and abolished by the Constitutional Court (such as in the case of the Apulian Territorial and Development Plan, see Perrotti (2015)).

Scotland and Wales have also used land use planning arenas to steer RE deployment. Conflicts between the national and regional levels around planning responsibilities in Wales highlighted the trade-off between the need to enable greater territorial coherence in energy governance (e.g. with further devolution of consenting power to Wales) and the problems of achieving other national objectives (e.g. energy security and the achievement of overall national targets). Furthermore, offshore arrays are authorised by central government, with local or regional authorities having no more than a consultative role. While one clear advantage has been to produce large quantities of RE away from people's local amenities (Kern et al., 2014), Scotland could miss out as material constraints (e.g. deeper water) make the exploitation of the offshore wind resource in the coast of Scotland more expensive. This represents a critical factor that is shaping project realisation especially as the UK energy policy agenda has increasingly emphasised cost reduction and a competitiveness agenda associated with the potential of offshore wind.

In summary, the institutional conditions for RE deployment- and the incentives (and or barriers) they create at the regional level, become entwined with the institutional architecture at the national scale, stressing the important role of the state in mediating the form and direction of sustainable regional development. Revisiting the relationship between state policy and regional sustainability across the four regions has highlighted that RE deployment in both Italy and the UK is shaped by processes of negotiation, and the promotion of different interests, within and across different scales of territoriality. Furthermore, the discussion presented also shows how the relevance of energy policy at the national level has contributed in shaping the relationship between the national state and influenced the scope of regional responses. In Italy, national governments have been required to intervene to ensure the achievement of governmental goals, in particular national targets, and energy security ambitions, to increase RE deployment to contrast the country's heavy dependence on imported fossil fuels. In the UK, the path to deliver ambitious low carbon targets has been set within a broader economic competitiveness and growth agenda around the potential offered by offshore wind (Kern et al., 2014).

Unquestionably, a further aspect that has constrained the regional capability to act refers to the lack of legitimacy to shape the electricity infrastructure networks as RE uptake increases. This is discussed in the next section.

4.2.1 The legitimacy to shape the electricity infrastructure networks

The upgrade of the transmission and distribution networks has been considered critical for the successful integration of renewable power (Tenggren et al., 2016). With the expansion of RE capacity, the electricity network has increasingly become a strategic concern in many countries (Sataøen et al., 2015) and a 'national sustainable development priority' (Cotton and Devine-Wright, 2013: 1226)). Electricity infrastructure renewal is complex and, the national level has played an important role in steering infrastructure renewal. While this steering at the regional level is considered problematic (Cowell, 2016), grid capacity and infrastructure upgrades becomes a site-specific issue that questions the role of the region in steering infrastructure requirements, and this includes planning approvals (Sataøen et al., 2015, Balta-Ozkan et al., 2015).

Since privatisation in the UK, key decisions are taken by arms-length regulators that operate on a UK-basis. Regulatory arrangements might increase the difficulty to drive forward major system reinforcements and network developments. The constitution of energy markets and the presumption in favour of competition has promoted infrastructure renewal largely driven by demand, with new grid elements or upgrades being added as producers wish to connect to the grid. However, some authors argue that the extent of upgrading the land-based grid does require a more strategic approach that goes beyond the single project and the 'response mode' adopted in the UK (Cowell, 2016). In the case of Wales, infrastructure networks reflect post-War agendas of integration and centralisation, ignoring the Welsh/ English border. Partially as a consequence of this, the WG has not been able to exercise control over grid regulation or the financial resources governed through it (Cowell, 2016). Moreover, network constraints have hampered the development of RE projects in mid Wales, where the capacities of the electricity networks have not been sufficient to accommodate new generation. In Scotland, the Scottish Government highlighted how, in order to achieve targets and maximise the potential for renewable resources, Scotland will have an 'excess generation capacity that can be exported through existing and planned export links' (SG, 2013: 35). As a result, a number of investments are planned to overcome network's congestion problem in the region. As much of the renewable resources in the UK are situated in Scotland, infrastructure renewal becomes an issue of national significance if the UK wishes to achieve its low carbon electricity aspiration. Arguably, one of the most significant pieces of grid

investment that has occurred in recent years in Scotland has been the reinforcement of the transmission line that goes from Beauly to Denny. While this development was seen as the beginning of 'a staged infrastructural programme across the UK' (Ritchie et al., 2013: 316), this investment- and the associated delays in its completion- revealed important issues regarding the steering of infrastructure renewal.

Italy displays a more coordinated approach to infrastructure renewal and governance. The transmission operator is required by law to provide a National Electricity Transmission Grid Development Plan, which lays out expected grid investments over a ten-year period, allowing for significant grid investments to upgrade the transmission and distribution network with the explicit goal of reducing congestion (IEA, 2010). The development and construction of new transmission lines, substations and power plants requires permits mandated by state and regional legislation to ensure environment protection and compatibility with existing infrastructure. The overwhelming number of RE initiatives in Apulia resulted in negative effects on the national electricity system. In Apulia, pending connection requests relate to about 30,000 MW of wind power plants and about 6,000 MW of photovoltaic systems. They represent almost 50% of the entire national figure, 3-4 times larger than those of other southern regions and significantly above the national average (BURP, 2014). While Tuscany has been affected to some extent by infrastructural issues, the 2014 Development Plan of the Italian transmission operator TERNA shows that against the two interventions necessary in the north and in the centre of Italy, Apulia required 12 (3 for new interregional interconnections and 9 for the development of 380 kV high-voltage stations).

Regional responses to RE deployment are therefore influenced by the established infrastructure networks and by the way these become intimately connected through the materially embedded transmission and distribution networks within specific territories (Hiteva and Maltby, 2014) and the interconnections between them. However, the regions under consideration have participated in, and supported, decision-making processes for infrastructure renewal to overcome the type of constraints and limits the infrastructure has posed in the selected regions. For instance, Apulia and Scotland have had the capacity to establish relationships with those who own the electricity network infrastructure, operate it, and regulate it, helping to shape infrastructure renewal and reducing the constraints on RE deployment in their territory. These relationships have helped to facilitate and speed up the

consenting processes and to steer the programming of the enhancement of the electricity networks. Infrastructure limitations have also offered the opportunities for some areas to become key regions for the experimentation of innovative technologies identifying further regional economic development opportunities (e.g. electricity storage in Apulia).

5.0 Concluding Remarks

This paper aimed at examining the relationship between state policy and regional sustainability, in relation to RE deployment, stressing the important role of the state in mediating the form and direction of RE deployment. In doing so, it has used the concept of eco-state restructuring as a vehicle for examining the relationship between state policy and RE deployment across four regions (two in Italy and two in the UK), seeking to contribute towards the ongoing work on the emerging spatial dimension of climate policy, with specific reference to RE, and state regulation.

The paper has provided empirical evidence of how the regions under investigation have played an important role in translating RE visions into realities. Both Italy and the UK, to a varying degree, have provided the regional level with the capacity to act within the overall political-administrative system. This allowed regions to manage the relationship between regional energy resources, land-use values and interests, and constructing opportunities for, and barriers against, RE development. The framing of RE deployment, at the regional level, in the case-study regions, has been set within the prospects for regional actors to exploit renewable resources to provide economic development opportunities to promote new growth and jobs. As discussed, the regional governance capacity to act for RE has been expressed predominantly via regional RE targets, RE strategies and spatial panning to promote RE deployment. To some extent, this reflected the fact that regional governments have had varied powers to mediate the exploitation of RE, capitalising on regional assets and translating national objectives and targets into a concrete agenda for action that reflected regional specificities.

While the paper has teased out some differences in terms of regional competencies across the two countries to implement RE policies, it has also sought to investigate the relationship between state policy and regional sustainability, in order to understand whether regions can go beyond their role as carriers of political commitments agreed at higher levels of government.

Firstly, investigating the responsibilities for RE deployment, and how they are distributed between the national and regional levels, has provided examples of how nation states seek to achieve their carbon reduction targets and to reflect on what this might mean for subnational governance. The paper has suggested that the salience of the eco-state restructuring framing has been useful in understanding the implications of the 'downscaling' of responsibility for RE, highlighting the effects of the practice and outcome of the territorial governance of RE. National governments have enrolled regional actors and institutions to implement ambitious RE deployment goals. Yet, national-level governance prevailing norms, in both countries, have not only enabled but also constrained the regional responses to RE deployment.

Both the national governments in Italy and the UK have constructed regulatory and governance relationships to orchestrate and reorder economic, social and ecological challenges devolving responsibilities at the sub-national level. Hitherto, this has offered an opportunity for the peculiarities of local and regional setups to be taken into account and regions have contributed towards the promotion of green and sustainable path development via promoting RE deployment. To some extent, the discussion presented showed that the 'landing' of national policies at the regional level is not a simple cascade down of targets and responsibilities to existing regional governments. Nevertheless, this downscaling and distribution of responsibility reflects the capacity and willingness of nation states to respond to, and mediate, the strategic goals and outcomes – in relation to carbon control as discussed by While et al. (2010)- formulated at national and international levels. In other words, while regions have shown differences in their incentives, capacities and capabilities to increase RE deployment, the ability to act is orchestrated by nation-states and this has strong implications for the practice and outcome of territorial governance.

Secondly, the comparative nature of the paper has allowed for reflection on how the eco-state restructuring framework can be used to explain the conflicts and struggle around the distribution of responsibility for RE deployment and the capacity and willingness of different levels of authorities to respond in contrasting national contexts and, to some extent, distinct national modes of regulation. Both Italy and the UK, as discussed, have been subject to similar pressures to promote the generation of electricity from renewables and were challenged to achieve a significant increase in the deployment of RE. One distinguishing characteristic is that

in Italy, RE deployment occurred mainly driven by market forces and support mechanisms that ensured high remuneration for large-scale investments, while in the UK, the overall design of RE support schemes has reflected the UK government's commitment to reducing greenhouse gas emissions while minimising government intervention in markets and seeing competition as a key element to drive costs down. Nevertheless, the paper has helped to further understand the complexities and variations that are present in the way in which national governments construct new regulatory and spatial governance relationship. A key feature of the paper is that, drawing from case study evidence, this complex relationship between the different spatial levels of governance has come to the fore in relation to RE deployment. The unfolding discussion presented here sheds a necessary light on how the relationship between state policy and regional RE deployment has been influenced by the intersection between state regulation and questions of energy policy. The relevance of energy policy at the national level - and how it conveys existing governmental priorities around economic competitiveness, achievement of governmental goals, energy security and infrastructure provision- has contributed shaping the relationship between the national state and the scope of regional responses. In other words, the reorganisation of state powers, capacities, regulations and territorial structures have been influenced by instrumental questions of national energy policy and their prioritisation (see also Bridge et al, 2018). Any discussion about the governance of RE deployment and the opportunity it offers in terms of regional development and green growth must ultimately confront the fundamental political economic challenge of multi-scalar effects and outcomes of energy investment decisions and their coupling with national energy objectives.

In summary, regional responses and policy initiatives, in RE deployment, sit within a broader carbon-control agenda based around the development of a low carbon green economy, influenced and informed by the salient characteristics of energy policy vis-à-vis economic competitiveness, governmental goals, energy security and infrastructure provision. These have also contributed in shaping the relationship between the national state and the scope for regional responses. The paper revealed the complexity of governance arrangements for RE but also the uncertainties and blurring in the allocation of competences, between the regional and national levels. While the regions investigated have sought to promote ambitious RE objectives, there are gaps between rhetoric and outcomes, determined by the

lack, at the regional level, of competences and capacity to influence energy issues within the regional contexts. The regional autonomy, and capacity, is not only limited but can also change over time. The paper demonstrated that the active role of regions in RE policy is better understood as a question of 'degree and mode' (Fritsch and Stephan, 2005, Uyarra and Flanagan, 2010). A degree and mode that it is both orchestrated and regulated by nation states and reflects the outcome of negotiation and struggles between environmental concerns, local actors, interests, projects and infrastructure requirements. To this extent, the eco-state restructuring frame and the approach followed in the paper, has been helpful to conceptualise the relationship between state policy and regional sustainability as an ongoing process as it focuses its attention to the power struggles and conflicts and the way in which these can vary at spatial and temporal levels. Different modes of environmental governance can emerge while the state seeks to manage the relationship between the economy, the natural environment and competing social goals and this paper has explicitly explored the connections between the eco-state restructuring frame and RE deployment processes in Italy and the UK.

While this paper contributes towards the recent direction of studying energy systems at the sub-national level, one overarching conclusion is that while we seek to understand the role of the regional level in environmental governance, more attention should be paid to the role of the state, and how it responds to environmental pressures and demands in spatial regulation.

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