Congested spaces, contested scales – A review of spatial planning for wind energy in Ireland

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Research Paper

Congested spaces, contested scales – A review of spatial planning for wind energy in Ireland

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HIGHLIGHTS

- Achievement of wind energy targets poses strategic spatial planning challenges.
- Scale is used to crystallise key governmental political strategies.
- A review of Irish wind energy strategies reveals inconsistent policy and methods.
- Rescaling local assessment criteria can facilitate a coordinated national framework.
- Systematic spatial assessment can enhance strategic renewable planning.

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ABSTRACT

The achievement of Ireland's renewable energy targets requires an approximate doubling of installed onshore wind capacity by 2020. However, the growing accumulation of new wind energy networks in the landscape is encountering increasingly trenchant social and political resistance. This dilemma suggests an enhanced role for national scale strategic spatial planning to tighten centralised spatial control in order to more precisely steer developments to selected locations. However, to date the Irish government has avoided greater centralised coordination, preferring instead to devolve planning responsibilities to the local scale, which has resulted in highly disjointed and heterogeneous policy settings. Drawing on recent academic interest in the depoliticisation of strategic spatial planning, this paper seeks to interrogate why Ireland has adopted this particular scale of governance for wind energy planning. It is argued that the approach is a deliberate scalar strategy designed to disavow and displace a contentious public policy issue as part of a wider post-political management of dissent. In order to explore the opportunities for more repoliticised and reflexive scalar deliberation in framing national renewable energy technology and strategic policy choices, a structured review of local wind energy strategies is presented. It is concluded that by bringing a focus on the differentiated socio-spatial contexts of particular places, it could serve to trigger much wider political debate around the spatial challenges associated with the roll-out of onshore wind energy networks in highly congested and contested spaces, and the possibilities for alternative energy pathways.

1. Introduction

European Union (EU) energy policy, which aims to achieve a 20% share of energy consumption produced from renewable sources by 2020, is currently driving a major expansion of terrestrial wind energy development across Europe (EC, 2009). Onshore wind is a mature and cost-effective technology which, often supported by generous public subsidies, attracts significant market investment. Therefore, it is considered by many EU member states to offer the only realistic technical option for achieving binding national targets for renewable energy production within rapidly shortening time-frames (Cowell, 2010). Between 2005 and 2012, the contribution of onshore wind to renewable electricity production across Europe increased by 15.8%, bringing the total installed capacity in 2013 to 110.7 gigawatts, and involving an overall investment of between €8 and €12 billion (EWEA, 2014). Over the period to 2020, it is estimated that a further 8% per annum increase in capacity will be required to achieve Europe-wide targets (EEA, 2014). Beyond 2020,

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the EU has further established an additional framework to achieve 27% energy consumption from renewable sources by 2030 – on a pathway towards a radical decarbonisation of energy production by 2050.

Despite this unprecedented ongoing expansion and public and private investment in onshore wind energy and associated grid infrastructure, to date the spatial implications of such a large-scale technology deployment has been relatively under-examined in academic literature. As noted by Ritchie, Hardy, Lloyd, and McGreal (2013), the intensive roll-out of renewable energy networks pose exacting questions for spatial planning which must balance the increasingly wicked challenges of facilitating renewable energy policy ambitions, on the one hand, while also giving sufficient attention to all other material considerations (e.g. grid connectivity, effects on landscape and amenity, public concerns), on the other. Furthermore, apart from Cowell (2007, 2010), questions of how particular scalar arrangements of spatial governance are operationalised in seeking to steer wind energy development to selected 'acceptable locations' has thus far received surprisingly little research attention. Pursuant to EU law, each member state is obliged to produce a National Renewable Energy Action Plan (NREAP) to detail a stepwise programme for achieving binding national renewable energy targets (EC, 2009). The resulting NREAPs are typically aspatial policy statements which privilege supply-side market discourses around resource availability, technical capacity and economic viability. They are generally produced in abstract purity of the situated socio-cultural and environment conditions of particular environments and places into which renewable energy technologies will be inserted (Cowell, 2010; Iglesias, del Río, & Dopico, 2011; Shove, 1998; Tabassum-Abbasi, Tasneem Abbasi, & Abbasi, 2014). Instead, such contextual issues are chiefly positioned as malleable and negotiable, and relegated to lower-order and exogenous local 'siting' factors, with planning practitioners tasked with the secondary responsibility of removing downstream barriers to deployment (Cowell, 2010; Lewis & Wiser, 2007; Saidur, Islam, Rahim, & Solangi, 2010).

In many European countries, the accelerating deployment and geographical manifestation of wind energy networks is, increasingly resulting in mounting public controversy and political disquiet, chiefly on the grounds of landscape intrusion, residential amenity and ecology (Baerwald, D'Amours, Klug, & Barclay, 2008; Barrios & Rodriguez, 2004; Bourke & Stout, 2012; de Vries, de Groot, & Boers, 2012). As a consequence, a "social gap" (Bell, Gray, & Haggett, 2005) is steadily emerging between the broad societal consensus towards the urgent need for increased decarbonisation of energy supply to address pressing climate change and energy security concerns, on the one hand, and the significant local opposition to renewable energy projects in order to protect the local environments within which they are situated, on the other. It is this paradox which has routinely turned terrestrial wind energy policy into a highly and emotive contentious imbroglio with irreducible discursive dualisms and conflicting environmental visions being played out through the planning system (Woods, 2003). While there is an extensive volume of research on wind energy's 'planning problem', to date this has been largely rationalised on how to find ever more sophisticated means of increasing societal acceptance in order to reduce public opposition to projects (Beddoe & Chamberlin, 2003; Breukers & Wolsink, 2007; Pasqualetti, 2011). As a consequence, and as discussed by Cowell (2010), much of this research remains limitingly managerialist in its horizons. Cowell further argues, that few studies have as yet considered how the social and spatial qualities of territories might 'jump scale' to gain equal prominence alongside technical potential in framing strategic renewable energy technology choices. There is a need to repoliticise the debate around dominant supply-side policy regimes which often lead to the exclusion of less intrusive energy futures and alternative energy pathways.

Using the case study of the Republic of Ireland (Ireland from here on), the aims of this paper are twofold: firstly, to contribute to the international literature on how land-use and wind energy conflicts unfold in differentiated socio-spatial contexts; and, secondly, to elucidate an instructive case study within wider international political debates in strategic spatial planning on how scalar strategies are frequently used to camouflage the spatial politics of implementing highly contentious policy agendas. It is argued that interrogating why Ireland has adopted a particular scale of governance for wind energy and examining the various spatial planning practices and methods deployed is crucial for understanding the longer-term role that planning has to play in providing an integrated framework for a sustainable and resilient energy future. By bringing a focus on the process of contested scale dynamics and heterogeneous practices, our aim is to illustrate how planning debates around the wind energy agenda could be 'rescaled' in order to engender greater political deliberation around the spatial challenges and land-use conflicts associated with strategic renewable energy technology choices in highly congested spaces. Although our argument is drawn primarily from research in Ireland, important features of our analysis transcend national and institutional contexts, giving our research wider appeal. In the following section, the theoretical and methodological contexts for this work are set out before examining in Section 3 the policy and practice of wind energy planning in Ireland. Section 4 presents the results of a structured review of local wind energy strategies. All available spatial datasets were mapped on a single integrated GIS database, including areas which are 'acceptable in principle', 'open for consideration' and 'not normally permissible' using generic zoning types and following national guidance on wind energy planning (DEHLG, 2006). The findings, as discussed in Section 5, illustrate that there is a clear need for rescaled and coordinated approaches to wind energy planning in Ireland that build upon a systematic spatial assessment of place-based contextual conditions in order to stimulate much wider future-orientated political debate around framing renewable energy and planning policy.

2. Theoretical context and methodology

Political concerns significantly shape spatial planning approaches to wind energy (Cowell, 2007). However, there has recently been a groundswell of academic interest in what is referred to as 'the depoliticisation of strategic spatial planning' and the analysis of the ensembles of institutional practices which seem designed to remove conflicting views from spatial strategy-making (Allmendinger & Graham Haughton, 2012; Olesen & Richardson, 2011). A chief concern amongst such scholars is the 'politics of scale', where scale is used as pivotal terrain through which political action crystallises as a key governmental criteria, often to elide or mask contentious spatial policies. As Purcell (2006, pp. 1921–1922) avers:

> "It is dangerous to make any assumption about any scale. Scales are not independent entities with pre-given characteristics. Instead, they are socially constructed strategies to achieve particular ends. Therefore, any scale or scalar strategy can result in any outcome [...] All depends on the agenda of those empowered by a given scalar strategy."

These perspectives seem particularly pertinent to the Irish case where, despite proactive national policies to support onshore wind energy, there has been a conscious political strategy to avoid nationwide site selectivity. Instead, planning responsibilities have been decentralised to local settings with little national

or regional strategic coordination. In this context, Ireland presents as a somewhat atypical case as, the absence of assertive centralised orchestration is generally characteristic of countries with relatively benign public attitudes to onshore wind, such as Denmark, Scotland, Germany and Spain (Cowell, 2007). On the other hand, in The Netherlands and the Welsh devolved administration, for example, there have been greater efforts towards central co-ordination owing to the more antagonistic nature of the spatial politics around wind energy.

Rather than strengthening local democracy and decision-making, the Irish case appears to be a deliberate attempt on the part of government to disavow and displace the handling of controversial public policy issues as part of a wider post-political management of dissent. This has been achieved, in-part, through the exploitation of the particular pre-existing geographical scales and modes of planning governance (Allmendinger & Graham Haughton, 2012). Instead, central government tends to act at a distance through the deployment of a dominant strategic policy discourse and largely playing the role of a 'teacher on playground duty' (Olesen & Richardson, 2011), closely looking over the shoulders of local authorities and to call for local plans in order to force amendments, where necessary (McDonald, 2014; Scanlon, 2014). As political tensions are not confronted during the spatial strategy-making process, they routinely resurface later on during divisive planning application processes in technocratic institutional arenas, such as the quasi-judicial An Bord Pleanála (the national planning appeals board) and the courts. These avenues have become increasingly important for mediating conflict and ventilating opposition, albeit with the inadvertent consequence of simultaneously undermining and limiting the role of strategic spatial planning strategies as a progressive force in facilitating the renewable energy transition.

On the face of it, the recent Irish experience appears consistent with the literature which criticises the increasingly hegemonic post-political practices within spatial planning and which seek to address social conflict through striking technical and managerial compromises (Allmendinger & Graham Haughton, 2012). According to Olesen and Richardson (2011), a key medium for depoliticisation are methods of spatial representation which attempt to evade contestation, primarily through the use of 'fuzzy boundaries' and 'soft spaces' in mapped visualisations of space. This is frequently allied with the mobilisation of various 'scalar fixes' (Brenner, 2004), nebulous policies and vague practices, as conscious means to blur spatial politics. The apparent objective here is to avoid the need for explicit choices involving trade-offs, in favour of 'balanced approaches' and 'win–win' policy outcomes for a disparate range of often competing interest groups (Allmendinger & Graham Haughton, 2012). However, these questionable attempts to depoliticise the planning process and hide behind neutrality and technicality have not served to reduce public opposition. Rather, it has very often exacerbated and emboldened vocal opposition to wind energy with lengthy planning and legal battles typically offering the only opportunities for fundamental conflicts to gain a voice.

Spatial planning in Ireland has long been subject to strong policy governance at the national scale, but not well reciprocated in the commensurate practices and prosaic realities at the local scale. Here, selective resistance and local discretion have always guaranteed varying degrees of implementation. In order to explore the opportunities for more repoliticised and reflexive scalar deliberation and given the multi-scalar, discretionary nature of planning and the scope for local autonomy, there is a need to explore the extent to which, national policies are interpreted and implemented at local scales. These questions are tackled by drawing upon qualitative research and textual analysis which has tracked the production of local authority Wind Energy Strategies (WESs) in Ireland. Our research focuses on unpacking the methodological approaches adopted and how the spatial planning framework for wind energy came to be visually represented. The methodology elucidated in the government's Wind Energy Planning Guidelines 2006 (WEPGs – DEHLG, 2006), as further elaborated in the Local Authority Renewable Energy Strategies (LARES) Guidelines published by the Sustainable Energy Authority of Ireland (SEAI, 2013), is used in order to enable a structured comparative analysis based on a four-stage process: policy content; resource assessment; constraints and facilitators; and policy development (see Table 1). Using Geographic Information Systems (GIS) techniques we, for the first time, integrate all available local authority Wind Energy Strategies (WESs) into a single database – viewing Ireland as a consolidated whole – in order to visually represent the complete national spatial policy setting for wind energy. Based on this review, a series of recommendations are presented in order to move towards a more systematic and coherent trans-national approach to wind energy planning in Ireland and to potentially inform debate around future renewable energy policies.

3. Wind energy policy and practice in Ireland

Ireland's geographic location and meteorological conditions mean that it has one of the best wind energy resources in Europe. Indeed, Ireland could theoretically supply all of its energy needs nineteen times over from wind power (Warren, Lumsden, O'Dowd, & Birnie, 2005). Given this abundant potential, Ireland's NREAP established a target of at least 40% of total electricity consumption to come from renewable sources by 2020 (DCENR, 2009). Unsurprisingly, given presently available and viable commercial technologies and resources, 90% of this Renewable Energy Sources for Electricity (RES-E) target is projected to be delivered by onshore wind, supported by a price subsidy scheme (Government of Ireland, 2010). This 'wind-first' strategy aims at stimulating private companies to develop large-scale generating facilities with individual developers independently selecting suitable sites based on resource potential, land availability, policy context, grid connectivity and environmental constraints, and thereafter bringing proposals to the planning process.

Currently there is in the region of 2200 megawatts (MW) of installed capacity in approximately 188 wind farms comprising 1400 turbines operating throughout Ireland, and providing for, on average, 18% of electricity demand (IWEA, 2014) (Fig. 1). Intermittently, however, wind energy has produced enough electricity to meet 50% of demand but can equally dip at times to less than 1% of demand (IWEA, 2014). It is estimated that between 3500 and 4000 MW of installed capacity will be required to meet the 40% NREAP target, meaning an approximate doubling of current capacity (White, 2015). The materialisation of this capacity is contingent on securing the necessary planning consents, the delivery of the required grid infrastructure and timely construction. Beyond 2020, it is estimated that, given favourable developments in policy and infrastructure, it would in theory be possible for Ireland to achieve deployment of between 11 and 16 gigawatts of onshore wind by 2050 (SEAI, 2011). The government is actively seeking to develop this large wind energy surplus as a major renewable energy export opportunity – driven by EU policies aimed at a single energy market and greater electricity interconnection between member states (DCENR, 2012).

Despite the highly favourable policy and resource contexts, recent estimations by the European Environment Agency show that Ireland is only "partly on track" to achieve its 2020 target with rates of RES-E penetration slowing (EEA, 2014). As a consequence, fines may be imposed by the European Commission and the purchase of renewable energy credits may be required. A shortfall of between

Table 1
Stepwise recommendations included in the Wind Energy Planning Guidelines (DEHLG, 2006) and in the LARES (SEAI, 2013).

	Wind Energy Planning Guidelines	Local Authority Renewable Energy Strategies	
Step 1	Assess the areas of wind potential ranging from areas with extensive wind energy resources to lesser wind resources using Sustainable Energy Authority of Ireland's Wind Atlas.	Renewable Energy Policy Review	Understanding of renewable energy policy drivers and "snapshot" of current policy and legislation for inclusion in renewable energy strategy.
Step 2	Prepare or utilise an evaluation of the landscape and its sensitivity for wind energy developments. Factors that can inform landscape sensitivity to wind energy development include scenic quality, rarity, uniqueness and natural and cultural heritage considerations.	Renewable Energy Resource Assessment	Understanding of available resources, and constraint and success factors for utilising those resources. This includes identification of existing renewable energy projects (and the reasons why certain project were successful/unsuccessful in particular locations and at particular scales of development) and to wind energy resource potential (e.g. SEAI's Wind Atlas). Quantification of wind energy resources should also be carried out as follows: (a) Theoretical Resource - the gross energy content that occurs within a given space over time; (b) Technical resource - the theoretical resource, but constrained by the efficiency of the currently available technology; (c) Practicable resource - the technical resource, but constrained by practical and physical incompatibilities; (d) Accessible resource - the practicable resource, but constrained by institutional or regulatory deletions; and (e) Cost-competitive/viable resource - accessible resource that is considered to be commercially viable.
Step 3	Prepare an overlay of the landscape evaluation and sensitivity analysis, and environmental sensitivity and wind energy mapping, together with information regarding built and natural heritage, archaeological and amenity designations. The overlay mapping of landscape, wind and development plan designations will produce a basis for identifying, broadly, the areas where wind energy developments would be 'acceptable in principle', where they would be 'open for consideration', and where they would be 'not normally permissible'.	Analysis of Constraints and Facilitators	As recommended by the Wind Energy Planning Guidelines, constraints and facilitators should be spatially examined. The Guidelines note that the scope of environmental receptors covered in a Strategic Environmental Assessment - SEA (CEC, 2001) process should be considered, including cumulative effects and the consideration of alternatives. The analysis should be supported by mapping to illustrate what types of receptors are particularly sensitive or valuable within the jurisdiction. In this context, three categories are recommended to be included in wind energy mapping: 'acceptable in principle', 'open for consideration' and 'not normally permissible'.
Step 4	Integrate the areas identified in Step 3 with information regarding accessibility to electricity transmission and distribution grids. This process will establish areas where wind energy resources are readily capable of development as well as identifying other areas where wind energy resources are capable of being developed but where there is a need for corresponding development of electricity grid infrastructure.	Develop Renewable Energy Policy	Definition of clear renewable energy policies, objectives and targets, supported by mapping where appropriate. Definition of planning authority aims and "expectation" of proposed projects. Outline a 'plan-led' approach to the proactive identification of objectives for maximising the renewable energy potential which are consistent with the proper planning and sustainable development of the area and clear guidelines on where wind energy developments may or may not occur.

1% and 4% on targets is estimated to have an annual public cost of between €140 m and €600 m (DPER, 2014). In order to meet targets, Ireland will need to achieve record annual rates of growth, averaging at 270 MW per annum (Farrell, 2014). This represents a major land-use and societal challenge as the accumulation of existing and proposed wind farms and associated grid infrastructure is increasingly colliding with hostile public and political opposition, particularly in respect of setbacks to dwellings (de Vries et al., 2012; Krause, 2001). Indeed, one of the most idiosyncratic features of the Irish socio-spatial context is its highly dispersed settlement patterns with a strong presumption in favour of unfettered rights to build housing in the countryside (Gkartzios & Shucksmith, 2015). Rather than a conservation space, the Irish socio-cultural rural idyll is of the countryside as a productivist space with, as a consequence, just 9.4% of the total landmass of the state greater than 1000 m from a dwelling (Ireland after NAMA, 2012 – Fig. 2).

While the majority of existing wind energy installations are generally unevenly concentrated in higher wind speed upland locations along the Atlantic seaboard, such locations are increasingly constrained due to their scenic qualities, tourism importance and prevalence of European designated Natura 2000 conservation sites. As a consequence, these areas are increasingly being shunned by commercial operators due to the risk of planning failure. With the availability of newer technologies, lower wind speed locations are increasingly viable, bringing proposals evermore into closer proximity with human settlements. As a result, there has been mounting calls for the introduction of minimum separation distances to dwellings, on the basis of contended imposition of conspicuous 'industrialised' features out of harmony with the pastoral landscape. The government responded in 2014 by initiating a review of the setback distances in WEPGs which attracted an unprecedented 7497 consultation responses, the vast majority of which opposed wind farms in their localities (DECLG, 2013). The Irish Wind Energy Association, representing the commercial wind industry, countered that the introduction of mandatory setbacks would effectively occlude the expansion of onshore wind energy in Ireland and that a flexible developer-led approach to site selection should be preferred (Ni Fhlatharta, 2013). Despite this, opposition has gained significant traction with repeated public protests, fractious media debates and even prompting a wider critique of the entire justification for renewable energy (Lennon & Scott, 2015). A general state of policy uncertainty persists with a wide disparity between strong pro-wind governance at the national scale vis-à-vis the increasingly trenchant public opposition at the local sale, impacting on policy and decision-making in each locality. The divisive debate and competing environmental narratives very often

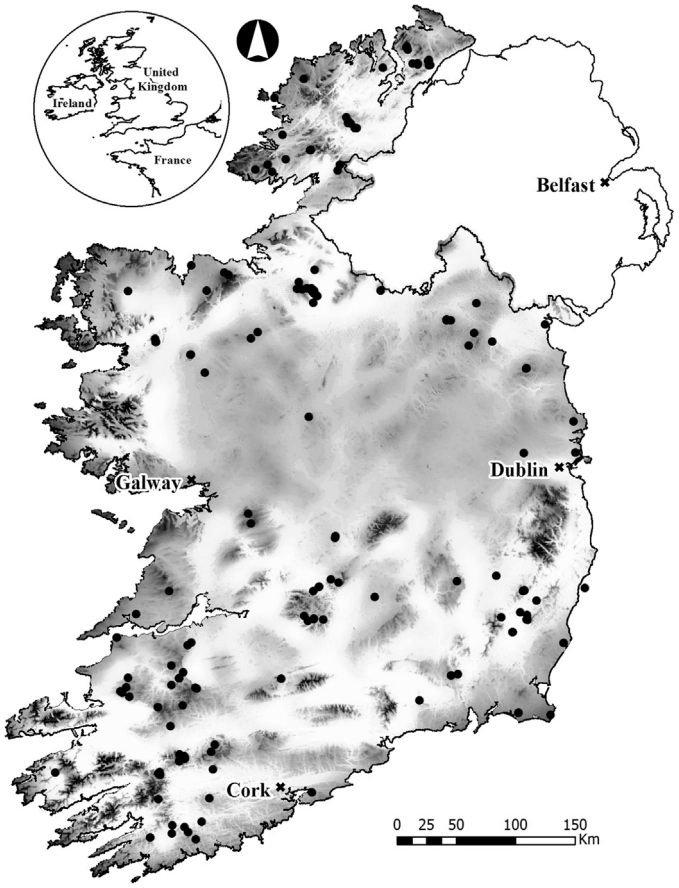

Fig. 1. Location of installed wind farms in the Republic of Ireland in 2014 against the mean wind speed at 100 m above ground level ($m\,s^{-1}$), where shaded areas indicate wind speeds above 7.5 $m\,s^{-1}$. No data available for Northern Ireland.

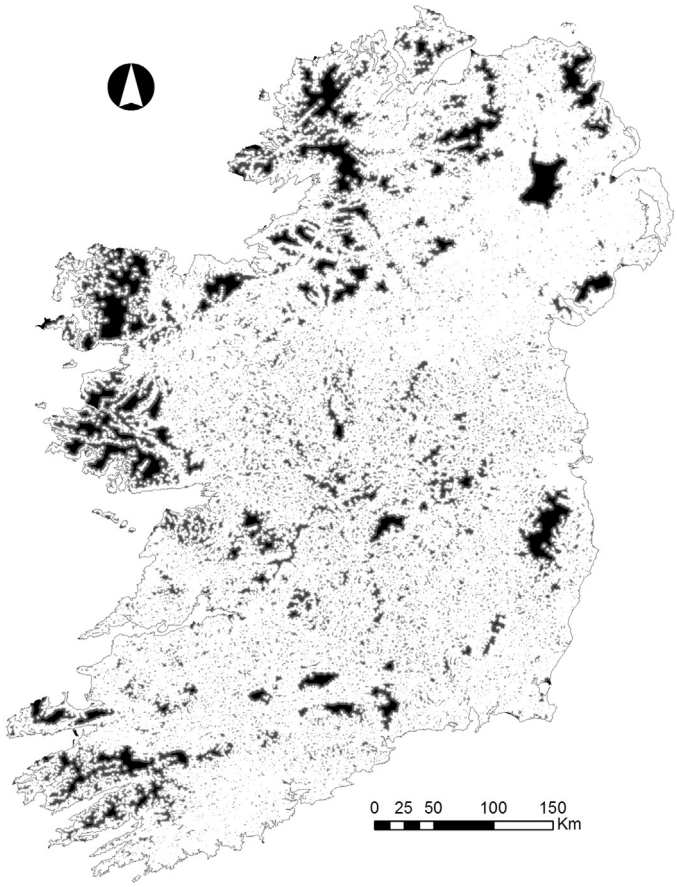

Fig. 2. Set back distances from dwellings, where light grey indicates a 500 m set back, dark grey refers to 1000 m set back, and the black areas show lands that are 2000 m away from existing dwellings.

splits communities, environmental organisations and development interests. Such is the extent of the conflict-ridden spatial politics that the publication of the review of setback distances has been continuously deferred, leaving a highly-fragmented, contradictory and uncertain policy vacuum and an appreciable slowdown in wind projects.

4. Review of local spatial planning policies for wind energy in Ireland

Outside of city and town councils, Ireland has 29 local authorities which have the capacity to accommodate large scale wind energy networks. Twenty-two of these local authorities have approved or drafted WESs. Each of these strategies and their supporting spatial datasets were reviewed in order to investigate current practice. The WEPGs and LARES require local authorities to develop wind energy planning policies and provide detail on their implementation to include, inter alia, a broad supportive vision statement on the provision of wind energy and associated supporting infrastructure, a definition of clear objectives and use of targets for maximising the potential from wind resources in the context of national targets, and, using a 'sieve' analysis approach, a clear spatial categorisation where wind energy development would be 'acceptable in principle', 'open for consideration', or 'not normally permissible' (SEAI, 2013).

Despite this universal standardised guidance, the desk-based research of each WES reviewed, typically reveals a highly inconsistent policy environment, with multiple conflicting approaches being adopted. Local authority WESs characteristically approach land-use policy for wind energy from a passive perspective, where national policy is dictated as a mandatory, top-down input received into the policy development process, rather than from the viewpoint of developing proactive policies to fully harness local renewable energy resource potential. In the absence of any incentive for achieving targets, proactive planning is not seen as a priority and key national policy frameworks are largely ignored in favour of more restrictive locally mandated policies. As discussed above, this may be seen as reflective of the escalating local political tension and extreme unease around the spatial implications of the roll-out of wind energy. For example, only a small minority (14%) of WESs reviewed defined clear objectives or targets for maximising the local wind energy potential. While some local authorities include an approximation of the theoretical wind resource available, none have undertaken a more sophisticated resource assessment to identify technical, practical, accessible and cost-competitive resources, including the capacity of local grid networks to accommodate additional intermittent generation capacity (de Alegría et al., 2007; ÓGallochóir, Gardner, Snodin, & McKeogh, 2007; Singh & Singh, 2009).

By far the most controversial spatial issue, given Ireland's prevailing settlement patterns, is residential amenity (visual impact, noise and shadow flicker) including setback distances to houses (Ireland after NAMA, 2012; Westmeath Examiner, 2014; Wind Turbines Bill, 2012). Some local authorities have adopted an increasing combative stance proposing a contingent 'height to distance' matrix proportional to turbine height, with a setback distance of 10 times the height of a turbine being proposed as an appropriate buffer – i.e. up to 1500 m (Wind Turbines Bill,

Table 2
Overview of wind energy zoning categories used by local authorities.

Wind Energy Guidelines/LARES Categorisations	Acceptable in Principle	Open for Consideration	Not Normally Permissible
Local Authority Wind Energy Strategy Categorisations (and number of wind energy strategies using that category)	Preferred Areas (6) Acceptable in Principle (5) Preferred Location (2) Most Favoured (2) Areas Suitable (1) High Capacity (1) Strategic Search Areas (1)	Open for Consideration (12) Less Favoured Areas (1) Medium Capacity (1)	Not Normally Permissible (5) Not Favoured Areas (1) Not Acceptable Areas Unsuitable (4) Areas Not Open for Consideration (1) Highly Sensitive Areas (1) Non-Preferable Locations (1) No-Go Areas (1) Low Capacity (1) Less Favoured (1)

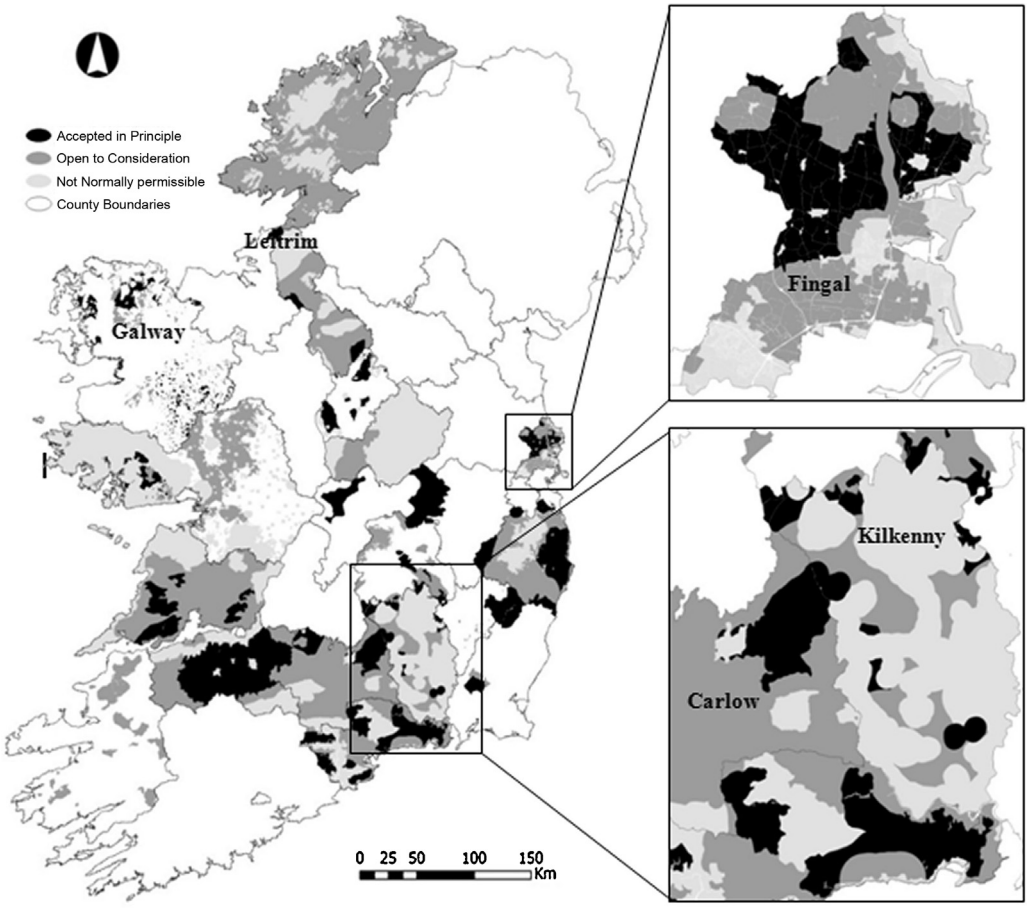

Fig. 3. Local authority wind energy zonings.

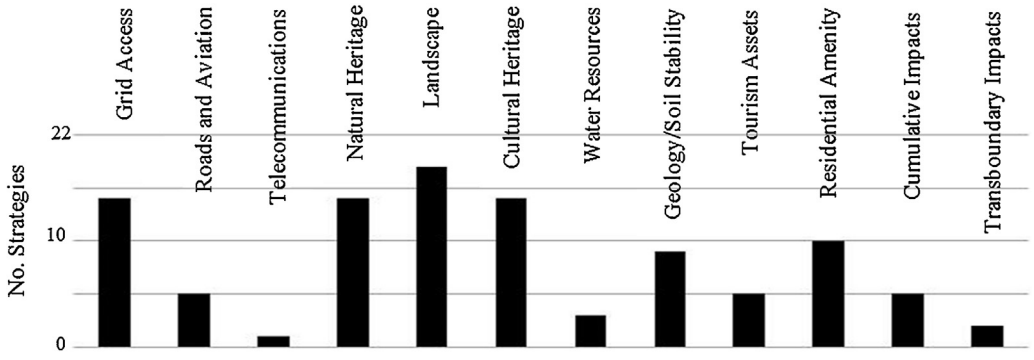

Fig. 4. Overview of constraints and facilitators GIS layers used by local authorities in the preparation of wind energy strategies.

2012). The escalating opposition by local authorities to allocate sufficient land areas as potentially suitable for wind energy development frequently prompts central government intervention to overrule local decision-making. For example, recently the mayor of Donegal County Council initiated legal proceedings against the Minister for Environment for intervening to reduce the setback distances proposed (Scanlon, 2014). As a consequence, local authorities increasingly favour opaque and indeterminate policies over high quality fine-grain analysis in an effort to blur the spatial politics and shift the ultimate burden decision-making to other arenas. Only fourteen of the WESs examined (65%) had produced a mapped strategy to provide a definitive visual representation of potentially suitable locations for wind energy. As noted above, the WEPGs and LARES methodologies recommend a GIS-based 'sieve' mapping approach which identifies areas with development potential and areas sensitive to change (González, Gilmer, Foley, Sweeney, & Fry, 2011). This is a classic international approach for realising wind energy targets and accounting for socio-environmental conflicts (Cowell, 2010). However, even for those WESs which did include a graphically mapped representation, there is little uniformity approach, with individual local authorities using a wide range of differing categorisations and policy approaches (Table 2). Some WESs (14%) fail to define any specific categories, solely focusing on the identification of areas that are deemed less socially problematic for wind energy. Moreover, a number of local authorities (27%) left large geographical areas entirely uncategorised (e.g. Galway Co.Co., 2011 in Fig. 3). As wind energy projects have potential transboundary impacts, these widely differing approaches to categorisation repeatedly result in abrupt and inconsistent policy changes across jurisdictional boundaries. For example, while the Kilkenny Wind Energy Strategy (Kilkenny Co.Co., 2008) indicates the border area as 'not normally permissible' for wind energy development, the Carlow Wind Energy Strategy (Carlow Co.Co., 2008) refers to it as 'open for consideration' (Fig. 3). Variations in the methodological approaches add additional inconsistencies. Different methods result in more or less detailed strategies and wind energy development capacity zonings. In the Fingal Wind Energy Strategy (Fingal Co.Co., 2009), for example, it can be observed that distance from the road network is a key factor in determining the suitability of the area for wind energy development (Fig. 3). In contrast, the Leitrim Wind Energy Strategy (Leitrim Co.Co., 2009) is less detailed, providing broader and less specific wind energy development capacity zonings.

The extent of environmental constraints analysed is also markedly divergent between WESs (Fig. 4). Landscape sensitivity together with European designated Natura 2000 sites and cultural heritage sites are most commonly considered. In contrast, other important environmental issues, such as water resources and hydrology are rarely considered. As discussed, the systematic inclusion of landscape considerations directly responds to the heightened social concern for visual impact dominating the wind energy debate (Cowell, 2010; de Vries et al., 2012; Warren et al., 2005). However, a lack of a standardised national methodology for landscape characterisation has resulted in considerable variation of the assessment parameters (e.g. some are largely based on topography and visual catchments, while others incorporate land-use, recreation and tourism infrastructure, etc.). The increasing weight of importance placed on European designated Natura 2000 sites reflects a series of adverse judgements of the Court of Justice of the European Union against Ireland which has resulted in a plethora of strict new regulatory requirements (Jackson, 2011). Ireland originally adopted a laissez-faire approach to the implementation of the 1992 Habitats Directive, primarily due to impositions placed on landowners. Many upland locations in Ireland, historically favoured for wind energy development due to higher wind speeds, are now European designated sites where there is the potential for species disturbance and habitat loss (Baerwald et al., 2008; Barrios & Rodriguez, 2004; Bourke & Stout, 2012; Drewitt & Langston, 2006). The increased legal importance of the Habitats Directive and potential impact on biodiversity, including cumulative ecological effects, are regularly highlighted in submissions against wind farm applications (Bolin, 2012) and often used by groups opposed to wind energy to bring legal cases against planning permissions (Leinster Express, 2015).

5. Conclusion: towards an all-Ireland framework for onshore wind energy?

In the debate over mediating wind energy's 'planning problem' and the dilemma between strengthened governmental orchestration to steer the spatial distribution of wind energy development to strategic locations versus decentralised locally mandated and flexible strategies, Ireland stands out as a highly-instructive case study (Cowell, 2007). To date there has been a marked unwillingness on behalf of the government to visualise the spatial consequences of a 'wind first' policy strategy which will see at least 4000 MW of terrestrial wind energy installations deployed. In many ways this is unsurprising given Ireland's weak political culture of national spatial planning and strategic selectivity (Kitchin, O'Callaghan, Gleeson, Keaveney, & Boyle, 2012). There has been a variety of calls for a nationally, or even regionally, coordinated and integrated spatial policy for onshore wind. However, Cowell (2010) persuasively critiques the Welsh Assembly Government's all-Wales approach to onshore wind energy planning on the grounds of 'technocratic utilitarianism' in that it temporarily crystallises a given mode of technology and generic model of deployment against the background of a persistently fluid policy and technical context. Only crude and readily mappable facets of the landscape 'jumped scale' to feature in national Strategic Search Areas, which was heavily criticised as a crude and deterministic siting methodology. As a consequence, Cowell argues that the Welsh approach confines the scope of renewable energy policies which risk being locked-in to specific social, economic, political expectations and locations which can become difficult to shift as renewable energy technologies evolve. On the positive side, Cowell notes that one of the outcomes of a national approach has been to hasten policy learning around the capacity of the landscape to accommodate wind energy and the potential for alternative approaches, including demand-side social innovations and adjustments.

In contrast, our study shows that the vulnerability of an exclusively local-scale approach in highly contested and congested geographies has been the creation of largely incoherent, fragmented and unstable policy settings which is inimical to the sufficiently rapid roll-out of wind energy networks. These inconsistencies further contribute to difficulties in providing transparent information to the public and prospective developers, simultaneously undermining public confidence in the planning system and social attitudes towards renewable energy. An alternative approach would be a more systematic adoption of specific criteria and practices at a local level which could be scaled up to provide an overall all-Ireland perspective to help stabilise the regulatory context while respecting local flexibility and contextual conditions. Such an approach would not be driven exclusively by the primacy of top-down technical and resource considerations but allow discretion for social, spatial and environmentally differentiated qualities of local territories to be scaled up in order to reflexively shape the debate on national renewable energy policies and technologies. This would include, for example, the operationalisation of standardised methodologies to assess the potential capacity of the places and environments into which wind energy technologies would be inserted. In many ways, this is precisely what the WEPG/LARES Guidelines are seeking to achieve in reversing the

centralising tendencies of national energy policy and encouraging compatible and systematic approaches at local scales in order to exercise more consistent, cross-national control. However, to date adoption of the guidelines in practice has been severely hampered by antagonistic local political discourses around wind energy. To overcome the current impasse and to move towards a more informed agonistic debate on future energy pathways, the consistent use of standardised GIS-based spatial analysis at a local scale could usefully present as an opportunity to visualise the highly constrained and contested nature of the Irish countryside (see Fig. 3).

These dilemmas go to the heart of answering the key questions of this paper of interrogating why Ireland has adopted a particular scale of spatial governance for wind energy. Ireland has already embarked on a statutory process which has allocated approximately 3000 MW of grid connection 'Gate' offers to private developers through to 2020 (Rabbitte, 2014). This strategy is predicated on the market-orientated logic that large-scale onshore wind farms represent the best means for achieving targets. This necessitates creating an attractive regulatory framework for commercial investment, which has a strong preference towards spatial flexibility, with limited powers available to government to retrospectively restructure this regime. As a result, certain path-dependent policy logics have been created which require corresponding spatial governance assemblages to foreclose debate around alternative energy futures. It is evident that graphically representing the spatial consequences of targets in stark visual forms could serve to foreground searching questions around the trade-offs required in reconciling onshore wind with other environmental values, such as landscape aesthetics, ecology and productivist agricultural and housing policies. Moreover, this would enhance the role of spatial planning in providing a long-term integrated framework for a sustainable and resilient energy future.

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