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Reclaiming the Windy Commons: Landownership, Wind Rights, and the Assetization of Renewable Resources

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Abstract: The ‘second phase’ of the energy transition involves large-scale rollout of renewables, raising wider questions about arrangements for the management and ownership of such resources and how costs and benefits should be distributed. Ideas and practices such as ‘community energy’ and ‘prosumption’ capture the potential for more decentralised systems of ownership and control inherent in renewable energy technologies. However, until now, ownership and control of the key biophysical resources (e.g., wind, wave, solar, geothermal) underpinning the transition have received surprisingly little attention, given the potential for wealth creation and issues of justice that underpin their use. This paper explores this issue using the idea of ‘wind rights’, which highlights the numerous social actors who have rights or claims to use and benefit from wind resources. Key among these are landowners who are silently enclosing the ‘windy commons’ to extract ‘wind rents’ from monopoly property rights. This has profound (but undertheorised) distributive and structural ramifications for the energy transition. Despite this, and with some recent notable exceptions, much energy transition research in social science and humanities portrays landowners as taken-for-granted, apolitical, and sometimes marginal (ised) stakeholders. Combining a Marxist, class-based approach to landownership and wind rent with Ostromian institutional analysis, this paper reviews and expands the (predominantly legal) literature on wind rights. This deepens the understanding of the concept of ‘wind rights’, highlighting that in many instances wind resources are de facto privatised/enclosed via ‘proxy wind rights’ for landowners. We also indicate some alternative wind rights configurations, including nationally and commonly managed wind resources. This analysis leads to a consideration of the potential long-term benefits of alternative socially orientated property rights arrangements, including community wind rights or nationalisation of the wind resource. These social wind rights arrangements could play a key role in securing a more just and widely supported transition.

Keywords: landownership; rent; wind rights; commons; energy transition; political economy

1. Introduction

In response to climate change, 195 countries have pledged to keep global average temperature rise below 2 °C based on preindustrial levels [1,2]. The deployment of renewable energy technologies, including wind, solar, and biomass, is widely considered to play a crucial role in mitigation efforts [3]. Renewables have experienced significant growth in recent years, and this growth must be accelerated to meet international climate targets [4]. In this context, Markard argues that we are now entering the ‘second phase’ of renewables transition in some jurisdictions [5], noting that technological maturation has reached a point where the emphasis is less on cultivating ‘niche innovations’ and more on widespread and rapid rollout. Power struggles may intensify as an increasingly large economic value generated by renewable sources becomes more contested, and industrial actors and institutional arrangements become entrenched. The long-term and indefinite nature of the energy transition raises questions about the distribution of ‘winners and losers’ into different social groupings/coalitions [6–8]. Various actors vie to control and benefit from new sources of value, such as renewable energy. Conflicts have occurred over wages.
and the demand for a just transition from both left and right populist movements [9,10]. Profits have also been a flashpoint for conflict, ranging from the tactics of incumbency of the fossil fuel industry [11,12] to movements for community energy [13–15]. Finally, impacted communities have been key sites of opposition to new energy infrastructure [16].

The decentralised and scalable materiality of renewable energy technologies provides an opportunity to rethink fundamental sociotechnical relations [17]. Some authors have outlined potential political economic trajectories of the low-carbon transition, from the dominant corporate-led green growth model to more authoritarian and rational-bureaucratic pathways, or more decentralised, distributed visions of community production and governance [18,19]. Concepts such as energy democracy, community energy, and prosumption have become key (but contested) issues in the energy transition [14,15,20–22].

Although there has been debate over ownership and control of production and transmission infrastructure, there has been less consideration of the property rights associated with the natural resources that fuel renewable technologies, despite a long tradition of wider academic debate on sustainable governance of natural resources [23,24]. Rights to energy resources such as coal, oil, and minerals have been nationalised in different contexts in recognition of their strategic value [25–27]. Biomass resources tend to have the same ownership regimes as other agricultural or forestry commodities. Water resources are owned by state/municipal governments in Germany, Norway, and Switzerland [28,29], while in Texas, oil and groundwater resources are owned by landowners [30]. Socialised ownership of natural resources has been recognised as helping to overcome coordination problems posed by exclusive ownership, as well as capturing economic value for public benefit [25]. However, questions around the ownership of the resources powering the low-carbon transition have received relatively little attention. Resources such as wind, wave, solar, and geothermal energy now have considerable strategic value, and could be subject to alternative ownership regimes, but their ephemeral and intangible nature has tended to blur the arrangements around their control and ownership.

Given the lack of scholarly attention given to resource-based perspectives on renewable energy, by focussing on issues around wind energy, this paper contributes to questions around the ownership of renewables in two ways:

- It first reflects on how we should consider ‘ownership’ of renewables by examining ‘wind rights’.
- It then critically reviews the role of landownership as a carrier of such wind rights and offers alternative ways through which these could be conceptualised.

The next section sets out our conceptual perspective. Drawing on a mixture of Ostrom’s institutional economics and Marxist rent theory, we argue that wind resources have been treated, by default, as rent-bearing assets of landowners. We apply this conceptual framework to review social science literature on landownership and wind energy, summarising and highlighting a number of current theoretical blind spots (Section 3). In Section 4, we review the legal literature on wind rights, corroborating the claim that landowners are generally regarded as ‘owning’ the wind, which thus has largely unseen implications for the nature and pace of energy transition. Through this review, we also identify and conceptualise alternative wind rights regimes, such as nationalisation and commons. These are the focus of Section 5, which makes the case for socialised wind rights using Ostrom’s SES (social-ecological systems) framework, outlining their potential to contribute to a fair and rapid energy transition.

2. Rentier Capitalism and the Silent Enclosure of the ‘Windy Commons’

How can (ownership of) wind resources be conceptualised? Neoclassical/institutional economics tends to conceptualise property rights by starting with the ‘object’ rather than social relations. This is epitomised by the standard classification of goods as public, common, private, or club, following the foundational work of Samuelson and Buchanan [31,32]. Such classifications are based on two attributes: ‘The first attribute is that the benefits consumed by one individual subtract from the benefits available to others. The second
attribute is that it is very costly to exclude individuals from using the flow of benefits either through physical barriers or legal instruments’ [33] (p. 119). Arranging subtractability and excludability in a grid, we get Table 1:

Table 1. Traditional institutional economic classification of goods based on two axes: level of subtractability and difficulty of exclusion. Source: [33].

| Subtractability | Exclusion | Difficult | Low | High |
|-----------------|-----------|-----------|-----|------|
|                  |           | Public goods | Common-pool goods |
| Easy             | Club goods | Private goods |

However, these goods are not the same as the property rights that govern them: ‘Using ‘property’ to refer to a type of good reinforces the impression that goods sharing these attributes tend to share uniformly the same property regime. This is certainly not the case’ [33] (p. 119). However, the purported value of this classification is that ‘recognizing a class of goods that shares these two attributes enables scholars to identify the core theoretical problems facing individuals, whenever more than one individual or a group utilizes resources for an extended period of time’ [33] (p. 119). Each ‘core theoretical problem’ emerging from the intrinsic qualities of a good is best addressed through specific governance and property arrangements. Most (in) famous among these is Hardin’s ‘tragedy of the commons’, which postulates how, without the intervention of state or private property rights, common-pool goods would be overexploited as each resource user maximises his or her extraction [24]. In response, Ostrom’s work showed that communities can and do collectively organise to sustainably manage common-pool resources, beyond the market and state [23]. Instead of individuals operating in isolation, people communicate and construct elaborate collective governance mechanisms to ensure resources are properly managed for the collective benefit. Crucially, Ostrom distinguished open-access property regimes from commons governance regimes. Open-access regimes have widespread or unlimited use rights and no rules governing resource use. This is the situation described by Hardin’s tragedy of the commons, or more fittingly labelled, tragedy of open access. ‘Commons’, on the other hand, are collective property arrangements, usually with governance mechanisms in place to regulate the use of the common-pool goods by various users: ‘This is why it is necessary to differentiate between a commons as a resource or resource system and a commons as a property-rights regime. Shared resource systems—called common-pool resources—are types of economic goods, independent of particular property rights. Common property on the other hand is a legal regime—a jointly owned legal set of rights’ [34] (p. 5). Ostrom showed that common-pool resources can be successfully managed under common property, outside the state and market [35], although the appropriate property regime depends on the context [36].

How can we then classify wind resources according to this grid? First, in terms of subtractability, it becomes apparent that the system scale is crucial. At a larger, regional scale, wind resources express low subtractability since their use does not diminish the overall quality of the resource system. However, once we move towards the project/local scale, the picture changes. Here, wind resources can become subtractable, stemming from wake effects from wind turbines which alter the quality and quantity of downwind air flows [37,38]. At a local level, it therefore becomes possible for ‘wind theft’ to occur, whereby an upwind developer/landowner can steal the wind of a downwind neighbour [39,40]. The material subtractability of the wind changes with the scale. Second, looking at excludability, it seems at first glance to be difficult to exclude others from using the resource. Therefore, depending on the scale at which one looks, wind resources can be conceived of as public goods or common-pool resources [34].

However, building on Ostrom’s work, Helfrich shows that this basic grid classification of goods may be less helpful than simply focussing on the governance regime [41]. She
argues that the difficulty of excluding others often cannot be imputed from the intrinsic property of an object but is rather primarily a function of social relations (including property rights). This becomes especially problematic (and circular) when authors use this classification of goods as a basis for diagnosing problems and assigning property rights (even if one recognises that the type of good does not determine the suitable governance arrangement, as Ostrom does). Instead, Helfrich argues that ‘what matters is what happens in practice’ [41]. In other words, ‘common goods don’t simply exist—they are created’ [41]. For this reason, some have argued that commons are better understood as a process/practice (‘commoning’) than as an object or resource [42–44], jettisoning the concept of common-pool goods as unnecessary. Similarly, considering knowledge as a commons, Hess and Ostrom suggest ‘that the unifying thread in all commons resources is that they are jointly used, managed by groups of varying sizes and interests’ [34] (p. 5). We might note here that the same argument can be extended to all types of goods—they do not exist but are created by the ways in which they are governed by society: it therefore becomes primarily important to go ‘beyond classifications of goods’ and focus on the property rights and practices that govern the resource instead [41].

How then is the wind governed? Van der Horst and Vermeylen point out that, ‘in Germany, where wind farm zones are strictly controlled, there have already been several lawsuits between different wind farm developers over access rights to the wind’ [40] (p. 57). Some authors characterise these dynamics at the local level as a tragedy of the ‘windy’ commons [37,45]. Van der Horst and Vermeylen [40] trace the evolution of legal rulings on property rights, arguing that, similar to water mill legislation, wind rights will gradually move from absolute ownership (free to do anything on your land as you wish) and prior appropriation (long-established activities are protected) to reasonable rights which limit landowners’ rights to alter the resource flow to ‘reasonable’ actions, so long as they do not significantly hinder neighbour activities [40]. This movement towards reasonable rights allows infilling of windy locations and potentially greater overall output, despite reducing the output of individual turbines. Several authors have proposed similar rules or principles which could be implemented to minimise conflicts and increase equitable outcomes between neighbours, balancing the rights of landowners and developers to harness the resource with the need to install enough capacity in an efficient manner [39,46,47]. While the practical issues addressed are real, the wake effect problem does not stem from a tragedy of common management or property rights, nor does it represent a tragedy of open access since wind use is not completely unregulated [48]. Rather, the issue stems from the fragmented excludability of wind resources at the project/local scale, that is, from the private regulation of their use. This therefore represents a tragedy of the ‘anticommons’, a situation of underuse which ‘arises when there exist multiple rights to exclude’ [49] (p. 1). Whether the situation described above is underuse or overuse is irrelevant—the point is that fragmented and exclusive private property rights lead to coordination issues. Winikoff and Parker have also described the current property regime for wind resources in this way [50].

This discussion provides an entry point to the crux of the issue: if multiple rights to exclude exist, who holds these rights? In other words, who owns the wind? In pursuing this question, McDermott Hughes argues that landowners have ‘seized the wind’ [51] (p. 215). This may seem like an odd claim as it seems counterintuitive that someone can own something as amorphous and intangible as the wind. However, it is widely accepted that property should not be conceptualised primarily in terms of the object or its material properties: ‘property is always normative and can therefore be structured differently with respect to different objects’ [52] (p. 672, own translation). Ownership should be seen as ‘a relation between a person and all other persons in regard to some (tangible or intangible) thing’ [53] (p. 16), composed of ‘bundles of rights’ [54]. Christman identifies this bundle as being composed of six kinds of ‘rights to’: possession, use, management, alienation, transfer, and income [53]. He defines the first four as control rights, while transfer and
income are income rights. Such a classification can help us to identify the owners of wind resources.

Numerous social actors have use and income rights to the wind. For example, Beckers et al. list end users (electricity consumers), landowners, affected parties/communities, public authorities, and project developers as rights holders to the wind [55]. The rights these different actors (claim to) hold form the institutional context for their interactions. While rarely having formalised wind rights, landowners, nonetheless, hold some of the strongest wind energy use rights. Landowners can usually veto developments on their land or extract sizeable rental fees (income rights). While wind rights are unclear in many places, ‘in that vacuum, turbine operators and landowners have established a wind right (although Hughes’s main emphasis is on landowners)’ [51]. We draw on Schlager and Ostrom’s criteria to identify the position of landowners in relation to wind resources [56]. Per Table 2 below, landowners can be considered owners of wind resources because they hold rights of access and withdrawal, management, exclusion, and alienation (selling or leasing) of the wind resource. Furthermore, since these rights are usually not held collectively amongst groups of landowners, but are exercised individually, we can say that the wind is de facto owned by individual landowners, and not in common. Based on these criteria, we can confirm McDermott Hughes’s claim that ‘in this new scramble for eolian wealth, property is three-dimensional and every acre comes with a slice of the sky’ [51] (p. 37).

Table 2. Bundles of rights associated with positions. Source: [56].

|                        | Owner | Proprietor | Claimant | Authorised user |
|------------------------|-------|------------|----------|-----------------|
| Access and withdrawal  | X     | X          | X        | X               |
| Management             | X     | X          | X        |                 |
| Exclusion              | X     | X          |          |                 |
| Alienation             |       |            |          | X               |

Our emphasis so far has been on unpacking the de jure and de facto property rights governing wind resources. This is not to deny the materiality of resources, but rather to emphasise that doing so along the dimensions of excludability and subtractability is reductive and flawed. It is also reductive to consider only property rights in any given analysis of governance regimes. Rather, both materiality and governance interact with each other in complex ways, requiring models capable of dealing with this complexity. Ostrom developed the social-ecological systems (SES) framework (Figure 1) to do just this, recognising that previous ‘scholars have tended to develop simple theoretical models to analyze aspects of resource problems and to prescribe universal solutions’ [57] (p. 419). The SES model accounts for the materiality of resources in the categories of resource system (RS) and resource units (RU), and social conditions in governance system (GS)—which includes property rights—and actors (A). The SES model has been applied to numerous systems (not just commons/common-pool resources), including fisheries, aquaculture, food production systems, irrigation, forestry, pasture/rangelands, stormwater, and drinking water [58]. We apply this framework to wind resources in Section 5.
While institutional analyses, such as Ostrom’s SES framework, are useful at the midrange, and recognise the nesting of institutions within higher-level social, economic, and political settings (S) and related ecosystems (ECO), they ‘seldom ask whether institutions are instantiations of more basic social forms’ or processes, such as commodification [60] (pp. 69–70). Marxist scholars extend and resituate Ostrom’s work on the commons within the broader context of capital accumulation, and ‘see the commons as essential to both capitalist reproduction and to the development of anticapitalist alternatives’ [44] (p. 424), [61,62]. Seen as the antithesis of capital [63], the commons here include the ‘gifts of nature’ ‘provided’ to us by earth, as well as ‘human-made resources (e.g., creative, cultural, social commons) whose creation is based on the accumulated general intellect (and affect) of humankind and, in many cases, are produced through the channels of social cooperation beyond the capital-relation’ [64] (p. 4). From this perspective, the binding of wind rights to land rights described above represents an enclosure of the windy commons on a massive scale [65]. Marxists point out that processes of primitive accumulation/accumulation by dispossession often rest upon appropriation and commodification of commons in this way, historically and presently [66]. It is even understood by many to be an intrinsic and perhaps central element of capitalist commodity relations [67–70], as capital seeks to constantly ‘fix’ the social and ecological crises thrown up by its own internal dynamics [71,72].

Marxist rent theory emphasises a specific form of commodification which is particularly relevant to our analysis through its distinction between landed property and capital, and their two associated ‘phenomenal forms’ or income streams—rent and profits [73,74]. This distinction is somewhat elided in the abovementioned literature on primitive accumulation. Marxist rent theory teases out the specific role and effects of rent relations within capitalism. Marx wrote that ‘landed property presupposes that certain persons enjoy the monopoly of disposing of particular portions of the globe as exclusive spheres of their private will to the exclusion of others’ [75] (p. 752). This monopoly control is fundamentally underpinned by property rights [73]. Since ground rent is the form in which landed property is economically realised [75], rent is understood as ‘payment to monopoly control of an asset’ [76] (p. 306). By emphasising the rootedness of agricultural rent in social property relations, Marx opened the door for heterodox scholars to expand the analysis of rent to various assets, including urban land [77–79], oil [74], mining [25,73,80–83], and fisheries [84]. David Harvey recently reiterated that ‘rent has to be brought forward into the forefront of the analysis’ [85] (p. 183). This call has been met with a resurgence of interest and applications to non-natural objects, such as patents [86], digital platforms [87], and

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**Figure 1.** Social-ecological system (SES) framework. Source: [59].

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culture [88]. Some have gone so far as to claim that modern capitalism is now defined by the dominance of rent relations—aka. rentier capitalism [87,89].

Crucially, as with other forms of commodification, ‘rentierization’ fundamentally rests upon ‘the enclosure and expropriation of the commons’ [64] (p. 4). Marxist rent theory shows that rent, like wages or profits, ultimately derives from social relations between classes. Like these income streams, it can be a source of conflict and ‘value grabbing’ dynamics [90]. We can see how this directly maps on to wind resources: landowners can extract rents via exclusive landed property rights. Furthermore, ‘the imposition of property rights to enable rent relations in wind energy has become a new source of contestation between landlords, the state, and sectors of the population’ [91] (p. 120). Building on the work of McDermott Hughes [51], we contend that this critical, class-based analysis of wind rent and its political dynamics [91], combined with an Ostromian institutional economic analysis of rights to the wind, offers a fertile synthesis to expand the debate on wind rights, contributing to a rapid and just energy transition.

3. Landownership and Wind Energy

The control of land has become more relevant in the context of the large-scale adoption of renewables during the second phase of energy transition, since renewable technologies have relatively extensive spatial requirements compared with fossil fuels, usually expressed as a lower ‘power density’ [92,93]. While there has been some recognition of the role of landowners as important intermediaries or ‘citizens in special positions’ [94], this has not highlighted their role as owners and rentiers of wind resources. In order to improve the understanding of this perspective, this section reviews the existing literature that comments on the relationship between landownership and wind energy, and contrasts it with the Ostromian/Marxist approach outlined above.

3.1. Landowner Payments as a Passive Local Benefit

Much of the academic literature on landownership and wind energy treats landowner payments as a passive ‘local benefit’ of wind energy production with the potential to contribute to rural/community development and social acceptance [95–99]. Often falling within the field of social acceptance, some of this work tries to understand landowner motivations for opposition/acceptance of wind energy projects [100,101]. While not questioning the fundamental position of landowners, some studies draw attention to potential procedural and distributive issues arising from private landowners appropriating benefits [102]. For example, some authors have found that current arrangements have the potential to reproduce existing inequalities within communities and create conflict between those who do and do not own land [103–105]. This is particularly exacerbated with practices of ‘private participation’ whereby landowners are consulted long before wider affected communities [106,107]. A US study found that wind energy projects located on sites where production-oriented farmers lease their land were less contentious than ‘hobby farmers’, reasoning that ‘these ag-centric communities likely see wind development as one more way for their land to be productive’ [108] (p. 9). Interestingly, the study also found that Republican-voting communities were less likely to oppose wind farms, which the authors postulate may be related to the stronger sense of private property rights amongst such groups.

Rand and Hoen summarise how landowner compensation has been conceptualised in North American wind energy acceptance research: ‘Landowners on whose land wind projects exist deserve individual monetary compensation. This compensation may be correlated to acceptance, but it also can create community conflict, exacerbate inequality, and be seen as bribery’ [109] (p. 140). This strand of literature is useful in drawing attention to the potential distributive conflicts arising from landownership relations, as well as the ideological structures mediating these relations [108]. From our perspective, however, these studies do not go far enough in critically examining the structural position of landowners and how this may influence the pace and nature of the energy transition.
3.2. Agency and Processes of Wind Resource Assetization

Some research has explored the role of landowners who actively invest in and erect wind turbines on their own land [110]. For example, Sutherland and Holstead found that ‘farmers undertake wind energy production primarily to ‘future proof’ their farms’ [111] (p. 102). In a German study, Fuchs et al. found that most farmers prefer to rent their land for wind energy rather than investing themselves due to the comparably favourable risk profile [112]. They found that ‘farmers with the necessary funds at their disposal and a high level of optimism were more likely to take the risk to set up a wind turbine on their own land’ [112] (p. 1). A report on Scottish landed estates found that over half of the estates surveyed with wind energy actually owned the turbines themselves [113]. This is likely due to the relative wealth of Scottish landed estates who can afford to cover high-risk, preconsent costs. Geels et al. document how the German energy transition pathway, while initially driven by communities and farmers/landowners deploying wind energy, has shifted recently to a more utility-led, large-scale model [17]. This trend can also be seen in other countries, such as Denmark and the Netherlands. Furthermore, ‘enthusiastic farmers can deploy their local contacts to reduce the scale of planning controversies compared to outside utility or corporate-funded developers’ [114] (p. 1140). These studies, in contrast to the literature (above) on landowner payments, emphasise the agency of landowners. This aligns with recent approaches in the heterodox rent literature, which emphasise the importance of agency, with concepts such as ‘assetization’ and ‘value-grabbing’ highlighting processes and activity required to extract rent [90,115–117]. Some authors have applied agency-centred approaches to wind energy development, touching on landownership. Kirkegaard and Nyborg trace how the land, wind, and people are constructed into a ‘site’, ‘resource/commodity’, and ‘stakeholders’, respectively [118]. They do not disentangle wind rents from other income streams, although they indicate that their approach could complement structural/institutional approaches which deal with property and ownership. Nadaï and Cointe go in this direction when they trace how ‘sunlit rooftops and windy sites are turned into energy assets’ [119] (p. 149). Their study tracks the various calculations, relations, and practices needed to valorise wind and solar resources, including rental streams for rooftop and landowners.

Nadaï and Cointe conclude that ‘the resource (sun, wind) remained res communis’ in their study [119] (p. 162). We unpack this assertion using a structural-institutional approach to the concept of wind rights, which helps delineate precisely what bundles of rights and associated income streams are captured by whom. This does not mean ignoring agency. On the contrary, it enables us to conceptualise distinct practices and processes of wind rent assetization, such as private land option arrangements [106] and various calculative measures for (de)valuing wind/land resources [120]. Even in the absence of any strong agency, wind resources can often be assetized by landowners, perhaps raising questions about the limits of the turn to agency in the heterodox rent literature.

3.3. Green Grabbing for Wind Energy

Some studies more explicitly address the ‘political’ element of landowners’ position. In Galicia, where wind turbines are frequently built on communally owned forest, there have been trends towards increasing expropriation of land by state-backed developers [121]. Similar ‘green grabbing’ dynamics have been documented in Brazil, Greece, India, Kenya, and Mexico, igniting opposition to wind power [122–126]. Van der Ploeg warns that ‘Europe itself may slowly become an important site of green grabbing, with growing corporate investments in renewable energy that involve acquiring land and changing its use, often supported by extensive public subsidies’ [127] (p. 156). In Australia, O’Neill et al. advocate the principle of ‘free, prior, and informed consent’ for First Nations people [128]. They note how establishing a veto right would radically shift the balance of power between indigenous communities and the ‘state and its industrial partners’ [128] (p. 6). The green grabbing literature also shows the informal, often exploitative power relations and practices which can inhere in seemingly voluntary land deals [121,129]. Dunlap describes different
land contracting strategies for renewable energy along a ‘spectrum based on various intensities—or speeds—of coercion’ [129]. These run from expropriation to land grabbing to (noncoercive) land deals. At first glance, this spectrum resembles the wind rights spectrum we present in Section 4.1 below, and indeed, the legal status of wind rights certainly affects the balance of power between landowners and developers. Dunlap makes the crucial point, however, that even supposedly ‘voluntary’ land deals can take on an exploitative/coercive character. Even when landowners have relatively stable land rights, they may be pressured via other practices or circumstances, ranging from direct threats to debt burdens, to give up their land.

3.4. Critical, Class-Based Approaches

Green grabbing approaches highlight the political nature of rights to land/wind. However, as Alonso Serna argues, such accounts can paint a black-and-white picture of neocolonial developers appropriating land from oppressed communities without differentiating landowners from communities more generally [91]. While landowners can also be important members of communities, they are in a unique structural position due to their ownership of a fundamental input into the production process (and can exhibit agency via collective action). Drawing on Marxist/heterodox rent theory, Alonso Serna makes the important contribution that landowner relations are ultimately class relations, demonstrating the contested and dynamic nature of such relations through her case study of wind energy in Oaxaca, Mexico [91]. She argues that ‘rent is a prominent process that the literature of land grabbing has overlooked’ [91] (p. 21). Furthermore, Chandrashekeran notes that ‘the growing body of scholarship on accumulation by energy dispossessions needs to be balanced by attention to the opportunities for benefit-sharing by Indigenous landholding interests. [. . . ] rent-seeking can create value for historically marginalised and formerly dispossessed Indigenous communities’ [130] (p. 379). She calls for ‘greater analysis of the relationship between rent-seeking, reparation and energy justice, with an emphasis on the distribution of benefits not just burdens’ [130] (p. 379). In a similar vein, Tejeda’s study of rural smallholders in the Dominican Republic found that ‘when property rights are well defined, locals can have more agency than often assumed in influencing the contractual outcomes from negotiation processes’ [131] (p. iii). Cormack and Kurewa also show how locals use land claims to seek benefits from wind energy projects in Kenya [126]. Finally, in his ethnographic study of wind energy development in a southern Spanish village, McDermott Hughes emphasises class relations when he documents how landowners have seized the wind to the disadvantage of the wider community [51].

Landowners can have agency and are not necessarily victims. Interference with property rights is not necessarily oppressive or undesirable—which the term ‘green grabbing’ seems to assume. Indeed, the term ‘green grabbing’ assumes that landowners should own (or have some exclusive claim on) the wind resource in the first place. Landed private property rights themselves often represent an important power imbalance between landowners and local communities who are affected by land-use choices. Furthermore, this failure to address the structural effects of the rent relation within broader capitalist energy transition dynamics is echoed by Kalkuhl et al., who claim that the ‘role of land rents and lobbying power by landowners (notably farmers) in the context of climate policy has hardly been analysed’ [132] (p. 13). We contend that critical, class-based analysis of landownership and wind energy has the potential to address the shortcomings of the other approaches by offering a new lens to analyse and develop alternative solutions. However, most of these critical, class-based analyses do not adopt an explicit resource-based lens to examine the ownership of the wind resource. In this paper, we therefore follow McDermott Hughes, who suggests that we ‘look up rather than look down’ [51] (p. 215). To do this, we review recent debates on wind rights and outline an expanded notion of such rights by classifying and analysing different extant and possible configurations where landowners’ wind rights are not taken for granted. Finally, we make the case for social wind rights models, teasing out some of their benefits for a fair energy transition.
4. Expanding the Debate on Wind Rights

Before examining legal debates on modern-day wind rights, it is worth briefly mentioning some historical rights to the wind. Despite some thought being given to wind rights in medieval Britain, the most developed concepts of wind rights existed in the Netherlands, where, as far back as the 15th century, management of the wind was linked to polder windmills and the democratic ‘waterschap’ (water board) [133]. However, more generally, most advanced rights to wind were ‘inextricably linked to land rights’ [133] (p. 2403). Millers would pay a wind tax to the feudal landlord for use of the windmill, and ‘in return, the lord ensured that there were no wind obstructions around the mill by imposing a prohibition on buildings and high trees in the area’ [133] (p. 2400). More recently, the concept of *molenbiotoop* (windmill biotope) referred to the area around a windmill which needed to be kept free to ensure unimpeded access to the wind. These historical wind rights declined in importance with the rise of the steam engine and the Industrial Revolution [40]. In the context of the second phase of energy transition and with advances in wind turbine technology, wind resources take on a renewed significance and, with it, the property relations governing their use.

We have so far argued, in line with McDermott Hughes [51], that present-day landowners generally hold exclusive rights to access, manage, exclude, and alienate the wind resource, as per Table 2. In this section, we examine recent legal debates on wind rights to further substantiate this argument. We show that there are existing and potential arrangements, both de jure and de facto, in which the exclusive and fragmented ownership and management of wind resources is not taken for granted [54]. While there may be other bundles of wind rights, for example, proprietors, claimants, and users (as per Table 2), we focus primarily on ‘full ownership’ of the wind resource (i.e., those entities possessing the full set of rights) and how this can relate to landowners, the state, and impacted communities. The rights such primary owners can control are often passed on to commercial parties for project development. Such exchanges can range from voluntary deals to coercive practices [129]. We maintain, however, that there is a clear distinction between developers as authorised users of the resource (as per Table 2 above) and primary owners of the resource in the first place.

4.1. Exclusive Landowner Rights

First, we recall McDermott Hughes’s characterisation of landowner wind rights: ‘property is three-dimensional and every acre comes with a slice of the sky’ [51] (p. 37). The de facto position of landowners as owners of wind resources is by virtue of their ownership of the land, which, based on the basic materiality of current mainstream turbine technology, is essential for the harvesting of the wind resource. If floating/airborne wind turbine technologies become widespread in the future, these could reshape the structure of these relations. For now, and as we shall see, wind use rights are generally assumed to lie with landowners in many jurisdictions. However, the strength of these rights vary and Figure 2 shows a spectrum indicating the relative strength of landownership as a route to securing wind rights. On the left, severable wind estates formally recognise landowners’ wind rights. In the middle are what we term ‘proxy wind rights’, the most common situation, where landowners assume de facto ownership, albeit with no specific legal standing. To the right is where expropriation of land for wind energy development is legally allowed. In this instance, landowners may still possess some access, management, exclusion, and alienation rights. However, these can be stripped under certain conditions, thereby substantially depleting their bargaining power.
4.1.1. Severed Wind Rights for Landowners

‘Severance’ of the wind estate from the surface estate has been a key issue of debate on wind rights in the United States: ‘What constitutes a ‘wind right,’ and whether such a right is a severable property right, are the most debated questions of wind development among legal scholars’ [134] (p. 77). Landowners are automatically assumed to be the holders of any formalised wind rights. Texas is one of the focal points of this debate, perhaps unsurprising given its history of property-rights-based development of energy resources, such as oil, and large proportion of wind energy generation. However, Texan lawmakers have not yet implemented a severable wind estate for landowners, despite some scholars arguing for it [30,135,136]. In contrast, ‘courts in California and New Mexico seem to recognize the severability of wind’ [136] (p. 451). Goals underpinning formal/severed wind rights models include encouraging private investment in wind and efficient resource use [136], boosting agricultural incomes [136], political and economic benefits [135], and ideological/philosophical arguments defending private property on Lockean grounds [137]. These arguments have not had a great deal of purchase, and many states (including Colorado, Kansas, Oklahoma, and Wyoming) have enacted antiseverance statutes for wind energy [138]. Despite this, some US firms purchase landowners’ wind royalties up front so that landowners do not have to wait for annual payments [139,140]. This would seem to indicate some level of informal severance of wind income rights from the land. The aforementioned discussions of coordination problems due to wake effects often also assume that landowners (should) have some property interest in wind which is being damaged [136,141].

4.1.2. Proxy Wind Rights

The middle point in Figure 2 is what we call ‘proxy wind rights’ for landowners, which are the most common arrangement in North America and Europe (and likely elsewhere). In practice, proxy wind rights models operate similarly to severed wind rights for landowners: ‘Wind leases are typically written with the assumption that the rights are severable [...] This is different from the severability of mineral rights; whose severances are backed by protections of the aforementioned legal regimes’ [142] (p. 41). In Texas, where no formalised wind rights exist, Montgomery argues that ‘wind estates in Texas already exist. If the Texas Legislature acts in the best interest of Texans, and supports private property rights, all wind estates will gain permanent validity’ [30] (p. 29). In other words, severance is already happening in practice when landowners sign wind leases [136,143,144]. In the European context, many countries also apply this proxy wind rights model. McDermott Hughes shows how Spanish landowners are de facto privatising wind resources in the ‘vacuum’ of formalised wind rights [51] (p. 37). While the German legal system does not ascribe ownership of the wind to any party, Bäumler argues that landowners are de facto owners of the wind since they have ultimate use rights (and can extract a fee based on these rights) [52].

A potentially relevant legal principle in the US and Europe is the ad coelum maxim, which asserts that landowners own the air above their land as well as the soil and subsoil beneath the surface [145]. In common law jurisdictions such as Ireland and the UK, although
landowners do not have ‘ownership rights over all the airspace above their property, their rights do extend to such height as necessary for the ordinary use and enjoyment of the land’ and the structures on it’ [146] (p. 2). In the absence of any specific rulings on wind rights, it is presumed this is the most relevant common law precedent. In the US, Alexander questions whether the ad coelum doctrine is sufficient to confer a legitimate, severed property interest [136].

It should also be noted that proxy (or formal) wind rights for landowners do not necessarily mean the wind resource is owned by private individuals. Public or community-owned land can similarly act as a carrier of wind rights. In the case of onshore wind energy, what is most common is a patchwork of different ownership regimes. However, in the case of offshore wind resources, the state nearly always lays claim to these, becoming institutionalised via seabed leasing practices, for example. This clearly has implications for the processes and outcomes of offshore wind energy generation in comparison with onshore.

4.1.3. Expropriation

The far-right side of Figure 2 refers to jurisdictions where expropriation of land is legally possible for wind energy development. In these cases, there may still be proxy wind rights for landowners, but the veto rights of landowners can be removed under certain circumstances, thus weakening their bargaining position [95]. This happened in Galicia in Northern Spain after wind farms were declared a public utility, which ‘stripped rural landowners of negotiating strength and granted companies all the guarantees to implement renewable energy projects, regardless of the amount paid to the landowners’ [95] (p. 44), [121,147]. A similar ministerial declaration was implemented in Italy in 2010, which ‘forbid now the recourse to cash payment or royalties as a compensation for the exploitation of the wind’ [148] (p. 13). This restriction of landowners’ wind rights leads to ‘frequent conflicts between landowners and system operators, who often pay little in easement compensation’ [98] (p. 1). Even the terminology of ‘easement compensation’ is a far cry from the strong resource rights language in US debates. Other cases where expropriation of land for wind energy has been documented include the Dominican Republic and Turkey [131,149]. The stated logic behind expropriation models may be to reduce the cost for the electricity consumer/wider public [150], although in many instances it may be mostly in the interest of developers [121,129]. In this sense, expropriation may be seen as a process by which commercial wind energy developers ‘grab’ wind rights.

While the threat of expropriation can reduce the bargaining power of landowners, the balance of power also depends on actual practice. In Norway, for example, while expropriation is legally possible for the construction of wind farms, it is rarely used, and developers usually enter into voluntary lease/compensation agreements with landowners [151]. Similarly, project developers in Greece, despite having the legal option of expropriation, prefer to enter into voluntary compensation agreements with landowners in order to avoid the lengthy legal process of expropriation [125], highlighting how the strength of landowners’ rights here can be blurred, depending on other contextual conditions [121,129,131,149,150].

4.2. Nationalisation Models

The second major model presented here is exemplified by the case of Heilongjiang province in China, where climatic resources, such as wind, have been severed from the land and nationalised. A passage of the Heilongjiang Province Regulation on Climate Resources Survey and Protection, Article 7, ‘stipulates that climate resources’, defined as ‘wind energy, solar energy, precipitation and any component of the atmosphere that is capable of being used by human activities, are owned by the state and require regulatory approval by the provincial meteorological bureau before being utilized or even surveyed’ [145] (p. 83). The regulation only applies to commercial uses.

Chen and Cui disagree with some commentators’ argument that this regulation represents a ‘grab’ of public property by the state [145]. The authors deal with this in two
ways: First, they make a legal argument that, unlike civil law jurisdictions, there is no notion of public property in the open-access sense. In China, public property is equated with either state or collective property. Furthermore, since all land in China is formally owned by the state or collectives (with use rights being divorced from ownership) [152,153], and since transfer of use rights in leases does not explicitly contain reference to climatic resources, these resources must belong to the state (or collectives) in the first place. Their second argument is a socioeconomic one. They reason that, even if climatic resources were to remain formally open access, this amounts to de facto privatisation by those with use rights to the land: ‘Unrestricted access to a resource does not guarantee actual and equal access by all members of the public. Instead, unrestricted access merely allocates the resource to segments of the population that are poised to exploit the resources’ [145] (p. 106). This applies to the case of both European countries where the ad coelum or a similar rule applies, as we have shown, and China, where private land-use rights holders dictate the spatial coordination of wind and solar development via hoarding practices. These private hoarding practices are ‘in fact the purported justification for the Regulation’ [145] (p. 107).

Concerns about private appropriation of benefits from a common resource apply in Europe too. Such concerns compel McDermott Hughes to make an impassioned claim for an ‘eolian commons’, whereby wind rights would be severed from the land and nationalised [51] (p. 221). Several legal scholars in Germany have also advanced suggestions of nationalising wind rights [52,154]. Since the air and wind are legally understood as commons in a broad sense, direct public ownership of the wind resource would not be possible in Germany. However, an ‘asset-based legal position’ which redistributes rights to exploit the wind to the state would be legally possible [32]. Hanschel verifies that such legislative changes at the national level would not be hindered by EU law, although the EU itself has limited opportunities to enact such changes [155]. Lifshitz seems alone in the US in suggesting public wind rights and permitting [45]. In Section 5 below, we examine in more detail some of the reasons suggested by these authors for nationalisation.

4.3. Commons Models

The final major model are common property arrangements. These may take various forms, including de jure property rights and informal collaborative practices/de facto rights [56]. Here, we differentiate between commons among landowners and wider community commons:

4.3.1. Commons among Landowners/Users

Existing commons regimes for wind resources are centred around landowners organising collectively. They can occur within a variety of the above models, including severed wind rights, proxy wind rights, and perhaps even expropriation models. Practices of common governance of the wind go by various names, but we use the following terms to denote two different forms: land lease pooling and landowner wind energy associations (LWEAs).

First, land lease pooling/socialised ground rent models have been around for at least two decades [156]. These are top–down, usually developer-led practices that involve developers suggesting equitable rent sharing arrangements to the landowners. This is in contrast to the traditional model in which developers approach all the landowners in a project area, but only those whose parcels are finally selected benefit. This traditional model is perceived to create tension between neighbours and opposition to projects and, as such, gave rise to pooling models as a response. The technique for distributing rent in pooling models varies: some use concentric rings around final turbine locations, with landowner parcels in the innermost rings earning more than those farther out. Others use deliberative processes among landowners to agree on distribution rules. Land lease pooling models may also resolve tensions when repowering projects with fewer, more powerful turbines. Since not all landowners in an area who previously hosted turbines can be guaranteed they will host one in a repowered project, pooling rent can allay these fears.
Landowner wind energy associations (LWEAs) denote a more bottom-up practice whereby landowners proactively self-organise to govern the use of the wind resource [157]. In doing so, landowners increase their bargaining power, thereby ‘diminishing the power of developers’ [157]. Similar to landowner pooling models, usually these associations guarantee some income for everyone in the collective regardless of whether one hosts a turbine in the final agreement. Land and wind rent commoning practices such as this can also develop within the context of (or perhaps form the embryo of) cooperative energy investment projects among landowners. For example, the 320 MW Windpark Zeewolde project in the Netherlands is cooperatively owned by over 200 landowners and farmers. Not only do the landowners own the project collectively, but also they collectively agree on the distribution of rent and the turbine siting.

These common-pool resource arrangements which currently apply to wind energy are practices/de facto property rights as opposed to de jure arrangements. Nonetheless, such collective governance practices may become formally institutionalised and recognised by government authority once agreements on the rights and rules are established [23]. Vollprecht suggests formalising common wind rights among landowners, arguing that German hunting/fishing law could provide a useful precedent to form ‘community wind harvesting districts’ (‘Gemeinschaftliche Windernsbereiche’) formed by landowners [158] (p. 701). A bill to make land lease pooling compulsory was introduced but did not pass in North Dakota in 2011 [46]. Both LWEAs and land lease pooling models may also assist in overcoming spatial coordination problems related to fragmented property ownership, such as wake effects [37,39].

4.3.2. Community Wind Rights

The above commons arrangements share the assumption that landowners should be the primary (implicit) wind rights holders, who may or may not choose to engage in these commoning practices with other landowners. However, it may be possible to conceive of commoning practices/laws which break from this assumed connection between land and wind rights. Diamond and Crivella hint at this when they suggest expanding LWEAs ‘to include other substantially impacted stakeholders’ [39] (pp. 233–234). For example, could we envisage a de jure community right to the wind resource that is severed from landownership, and what would this look like? In taking some steps to answer this, we address the call for more attention to the ‘roles, potentials and challenges of commoning practices’ in sustainability transitions [159] (p. 2). Ostrom’s design principles for effective common-pool resource (CPR) governance can provide a starting point for thinking through what community wind rights might look like [23]:

1. Clearly defined boundaries;
2. Congruence between appropriation and provision rules and local conditions;
3. Collective choice arrangements;
4. Monitoring;
5. Graduated sanctions (against violators);
6. Conflict resolution mechanisms;
7. Minimal recognition of rights to organise by external government authorities;
8. Nested enterprises (for CPRs that are part of larger systems).

Principle 1 above already raises questions of how to define the boundaries of rights holders for an ephemeral and intangible resource when one is not simply relying on pre-existing landownership boundaries. This could be done in various ways. One idea could be to list anyone who lives within a certain radius of a proposed development as a rights holder. This would ensure that those most impacted by a development have much stronger procedural control over projects and would also benefit economically. As we have seen, this radius approach is already practised among landowners in many instances—there is no reason to assume that this radius model could not simply be extended to nonlandowners. Landowners could still be compensated for the displaced value of the underlying land (and would still participate as community wind rights holders assuming they live in the
community), but the resource value would be captured by the community. Landowners might also lose the individual right to veto a development, since this would lie with the wider wind community. An alternative model would be to proactively distribute wind rights to citizens along existing administrative lines. This could then tie in with Principle 8 and the idea of nested, polycentric governance for energy systems [160]. Could we imagine a system of polycentric governance of wind resources starting at the community level, moving up to the regional and national? This would help ensure that wind resource use is suited to local conditions [161] (Principle 2).

It should also be noted that new configurations of common wind rights do not necessarily need to involve transfers of full, exclusive ownership rights [54,56,162]. Common resource users need not be confined to owners but can also be proprietors, claimants, or authorised users (see Table 2 above). The fundamental principle underpinning commoning practices—self-organised ‘reciprocity in perpetuity’—can be organised in different ways: by establishing clear boundaries between users and non-users in Ostrom’s analysis (who is to use how much), or defining conditions of use (what can it be used for) [44] (p. 435). We could imagine this leading to a community energy right to the wind, in which landowners may still retain significant rights. Other nuanced discussions over rights could include whether wind rights supersede surface rights. This would likely need to be the case if redistributing wind rights is to be meaningful. Or, whether wind or mineral or groundwater rights take precedence [30,142]. Furthermore, should wind use permits be tradeable, as advocated by Lifshitz [45]? We could also imagine extending ownership beyond impacted communities to also include other relevant stakeholders, such as local environmental NGOs, or other representative bodies. These could collectively form ‘community wind trusts’, drawing inspiration from land trusts. All of these questions are open for further debate.

This section presented a range of existing and possible wind rights models from exclusive landowner rights to nationalised wind rights, and commonly managed wind rights. Understanding the implications of new wind rent configurations requires sensitivity to the specific social and historical conditions [83]. We should also consider whether the desired outcomes of a ‘big solution’, such as redistributed wind rights, could be achieved through a combination of other means (e.g., designation of renewables as critical infrastructure, opening the possibility for expropriation; community benefit funds; restricting landowner rents; permitting; taxation) [163] (p. 681), [145,164]. We could also have a mixture of ownership regimes, for example, nationalised offshore wind resources but community-owned onshore wind resources. McDermott Hughes also acknowledges the need for context sensitivity when he says, ‘Let the context determine the unit of ownership’ [51] (p. 222). This is in keeping with Ostrom et al.’s warning that thinking in terms of panaceas tends to fail for solving social-ecological problems [36].

With this in mind, we maintain that reconceiving wind rights arrangements holds great potential to aid the goals of a fair and rapid energy transition. How, then, are we to evaluate the relative benefits of different models? We have already discussed how the existing literature on landownership and wind energy does not adequately conceptualise ownership and wind rent relations. Furthermore, proxy wind rights are by far the most common, with only one very limited case of nationalisation and no cases of community wind rights. There is thus an absence of evidence which systematically compares the outcomes of different models. However, we can still use much of this existing literature, combined with abductive reasoning to hypothesise some of the potential benefits of alternative, social wind rights configurations, in particular, nationalisation and community wind rights. We suggest that it is not enough to simply support protection of existing land-use rights holders in the deployment of renewable energy (as the green grabbing literature sometimes implies). This merely serves to reproduce existing inequalities in land rights. This applies to both the Global North and South. Even customary land-use rights in the Global South are often dominated by chieftaincy relations [73]. Severing wind rights from land rights presents an opportunity to reimagine truly progressive economic relations instead of simply reproducing old ones, thus contributing to a truly just energy transition.
5. The Case for Social Wind Rights

Countries have historically taken different approaches to respond to the problems thrown up by the position of landowners in production processes. Landowners’ rights to energy resources, such as coal, oil, and minerals, have been nationalised in different contexts [25–27]. Water resources are owned by state/municipal governments in Germany, Norway, and Switzerland [28,29], while in Texas, oil and groundwater resources are owned by landowners [30]. With the maturation and growth of wind energy, we can pose similar questions regarding wind ownership. Some scholars in the US have pushed for stronger consolidation of exclusive wind rights for landowners via severance of wind rights [30,134,135]. We agree with severing the right to harvest wind from the bundle of rights attached to the land. However, we want to expand this debate away from both landownership and private property, towards alternative ideas, such as nationalisation and commons.

In this section, we use Ostrom’s SES framework to tease out the reasons for supporting some form of social wind rights. In doing so, we illustrate issues thrown up by exclusive landowner wind rights. Drawing inspiration from critical Marxist theory, we also connect this institutional analysis to ‘deeper’ power relations and broader themes around the emancipatory potential of commons as a third way beyond the state and market [62,63]. Our emphasis is on one crucial part of the governance system (GS): property rights. We show how changes in wind property rights have ramifications for the entire system of wind resource governance. In the following, we compare three broad scenarios using the SES framework: proxy landowner wind rights, state wind rights (with a concession tendering model), and community wind rights (nested in polycentric governance networks) (Figures 3–5). For each of these scenarios, we assume the overarching resource system (RS) to be wind resources contained within national boundaries (we do not address the materiality of wind (or turbine technology) in this paper in great detail but recognise its importance in setting the parameters for ways in which society can interact with it).

![Figure 3. Scenario 1: Social-ecological model for wind energy under proxy landowner wind rights. Source: authors, based on Ostrom’s SES framework.](image-url)
Figure 4. Scenario 2: Social-ecological model for wind energy under state-owned wind rights. Source: authors, based on Ostrom’s SES framework.

Figure 5. Scenario 3: Social-ecological model for wind energy under community-owned wind rights nested in polycentric governance. Source: authors, based on Ostrom’s SES framework.

5.1. Governance System (GS) and Resource Units (RU)

As discussed above, landowner wind rights (Scenario 1), the most common arrangement at present, come in various iterations. In those contexts where wind rights are conceived of as a distinct property interest (severed wind rights for landowners), state regulation tends to play a more marginal role in resource governance [141]. In contrast,
jurisdictions which do not recognise formal wind rights (i.e., have proxy wind rights) regulate wind energy development more actively (e.g., via permitting and zoning) \[141\]. Finally, expropriation models can rely even more heavily on state regulation to coordinate development, depending on the context. Therefore, each of these models represents a different governance system (GS). In the following discussion, we refer primarily to proxy wind rights as Scenario 1. However, despite their differences, these three models tend take market negotiations between project developers and landowners as their starting point for the GS. This has implications for how resource units (RU) are conceptualised—with a more fragmented approach to harvesting the resource, based on which landowner parcels can be successfully leased or purchased.

State wind rights (Scenario 2) could be organised in various ways. Heilongjiang province’s regulation uses a system of administrative permits which ‘can include a limitation on the number of permits issued and the default allocation of those permits via ‘tender, auction and other fair competitive measures’ \[145\] (p. 118). This permit system seems to be reactive, though, which leads Chen and Cui to question whether this will achieve ‘the purported legislative objective to prevent enterprises from staking their claims in climate resources by making pre-emptive investments’ \[145\] (p. 120). German scholars have suggested a more proactive concession system in which the state identifies and tenders sites to prospective developers, similar to those found in mining, water, and offshore wind resources \[52,154\]. Such a system would enable more integrated or holistic ways of managing the onshore wind resource units (RU), once the barrier of landownership has been removed for rational siting. Scenario 2 assumes such a concession model.

While not existing in practice to the best of our knowledge, we suggest community wind rights (Scenario 3) as a third way of organising the GS for wind resources. Community wind rights could be distributed reactively, activating once a wind energy development is proposed in an area. A more proactive model would be to distribute wind rights along administrative boundaries. Scenario 3 assumes this latter, proactive model. While there is a risk that this could lead to fragmented resource units, nesting community wind rights within a polycentric governance network extending from local to regional and national levels could allow for a holistic, integrated approach.

5.2. Actors (A)

The governance system defines and sets the rules for actors. Beckers et al. list end users (electricity consumers), landowners, affected parties/communities, public authorities, and project developers as key actors to consider in any institutional analysis of wind energy \[55\]. The basic distribution of wind property rights conditions the role and relative power of each of these actors in each scenario.

In Scenario 1, the use of the wind resource is coordinated primarily via negotiations between landowners and resource users within the parameters set by spatial planning and regulation. Impacted communities are secondary actors here \[106\]. The widespread absence of substantial state support for community energy in the broader social, economic, and political Settings (S) means that community energy initiatives are more susceptible to greater impacts when a project fails. This, combined with the fact that landowners will tend to lease or sell land to the highest bidder, often binding them to speculative option agreements with commercial developers, means that community energy initiatives operate within a system that is adverse to their goals \[13,14,165\]. A report for the Scottish government by Roberts and McKee shows that landowner relations can pose a barrier to community energy development, despite relatively strong supports from the Scottish government for the community energy sector \[166\]. Commercial developers thus tend to dominate these systems. Consumers benefit from the competitive dynamics which drive down electricity prices, although some have raised concerns around the effect of super-rents for landowners on prices \[167\].

How impacted communities would participate in state tendering models (Scenario 2) would depend on the local context and relative power of communities vis-à-vis other
social forces, which we discuss below. Landowners’ role would be greatly reduced in this scenario, although if they reside locally, they would be able to engage as a community member. A concession tendering system would have the consumer benefit of retaining competitive dynamics amongst project developers. Perhaps most significantly, Scenario 2 could enable the state to give preference to certain types of developers over others. Bäumler makes analogy to Norway, where public actors are given first preference for use of state hydropower resources, arguing that this could be an option for German wind resources [52]. Under the current institutional arrangement in Germany, municipal governments’ hands are tied by German and European laws against favouring community energy initiatives over other developers [168]. State/municipality tendering processes might be a way around these barriers, reducing risk, providing more certainty, and serving as a stepping-stone for community energy initiatives. We could also imagine local governments setting aside a concession for a local energy cooperative with prefeasibility studies completed by the state and guaranteed planning permission and grid connection. This model would fundamentally shift the conditions in which community initiatives operate from one which is high risk and tailored to large, commercial actors to one in which project risk is socialised and therefore more suitable to community investment. The upfront costs on the state’s side could be repaid via concession fees over a project lifetime.

While the above suggestion for state concessions supporting community energy might work in principle, how can we be sure the state would do so given nationalised wind rights? The track record for state support for community energy initiatives is relatively poor, mostly being treated secondary to commercial wind energy production [13,14]. In Galicia, where the state intervenes in wind rights via expropriation, this is done for the benefit of capitalist developers (and arguably energy consumers), often disenfranchising private and common landowners in the process [121,147]. The UK Forestry Commission in Wales and Scotland is supportive of community energy initiatives but, at the same time, divided ‘its wind energy potential into very large blocks and encouraged bids for the development rights. A similar approach is emerging in Northern Ireland. The main effect of such strategies is, again, to channel opportunity towards major corporate actors’ [14] (p. 103). State control of offshore wind resources via proxy wind rights has certainly not been used to decentralise ownership of projects but rather the opposite. Offshore projects are widely seen as the realm of huge capital and far too complex an undertaking for more democratic forms of ownership. There is therefore no guarantee that state wind rights would not simply be a Trojan horse for more intense commercial wind energy development, aligning with Jessop’s view that the state is responsive to certain social forces [169,170]. As long as communities remain weak, the state is unlikely to serve their interests.

Community wind rights (Scenario 3) could dramatically shift the underlying balance of power between communities and developers by giving communities veto power. Granting full ownership rights would actually empower communities, in contrast with more tokenistic policy tools such as community benefit funds (CBFs) or public consultations [171]. This empowerment effect could in turn influence how the state and land-use planning facilitates community interests. Furthermore, having a stronger fundamental asset position as a starting point would provide crucial structural and symbolic resources, which are key for mobilising community energy [172]. The wind resource asset could also be used as security to obtain debt financing for project initiation, for example, similar to reserve-based finance used in the oil and gas industry [173], or asset-based community development (ABCD) [174]. Community wind rights could provide crucial structural conditions necessary (but not sufficient) for community energy to challenge corporate renewable energy actors and associated state policy.

5.3. Focal Action Situations: Interactions (I) → Outcomes (O)

The outcomes of interactions differ across each scenario. In addition to the actor roles/industrial model and balance of power discussed above, we deal with these across four broad headings, the results of which are presented together in Table 3 below:
Table 3. Comparison of outcomes across three wind rights scenarios. Source: authors.

|                                | Proxy Wind Rights for Landowners and Market for Land | State Concession Tendering Model | Community wind Rights and Polycentric Governance Network |
|--------------------------------|-----------------------------------------------------|---------------------------------|----------------------------------------------------------|
| **Industrial model (e.g., community energy)** | Competition for land with commercial developers and community disempowerment | State control of project developers | Community empowerment |
| **Distributive justice** | Distributive grievances for impacted communities | Distributive justice for impacted communities/fossil fuel workers | Distributive justice for impacted communities |
| **Participation and procedural justice** | ‘Private participation’ disembedded from local values | State-led public participation | Procedural justice embedded in local values |
| **Symbolic meaning** | Symbolic disconnect to energy transition | Symbolic mobilisation | Symbolic mobilisation |
| **Spatial coordination** | Fragmented spatial coordination (e.g., wake effects, developer-led grid development) | Centralised, rationalised spatial coordination | Polycentric spatial coordination |

5.3.1. Distributive Justice

Under Scenario 1, wind rents captured by landowners can reproduce existing inequalities within communities and lead to conflict between those who do and do not own land [103–105]. This is especially relevant in places like Spain, where archaic and concentrated landownership patterns are reproduced as ‘latifundios of air’ [51]. Even in countries where landownership is generally more equitably distributed, such as Ireland [175], land remains concentrated among wealthier households [176]. Furthermore, class often intersects with other structural inequalities, such as race and gender. McDermott Hughes notes that 98% of farmland in the US is owned by white people [51]. Globally, women are also far less likely to own land than men [177]. Social wind rights provide an avenue to reimagine these relations. However, if rent, like profit, is a redistribution of society’s surplus value produced by workers, the question then becomes, for what segments of society would social wind rights represent a transfer?

Scenario 2 could entail state appropriation of rent via concession fees. While Beckers et al. support reducing wind rents for landowners, they advise against wind rents simply being transferred to the state, since it ultimately amounts to a tax on electricity consumers [55,178]. In a country like Germany, where the state already mediates between electricity consumers and producers via EEG (Erneuerbare-Energien-Gesetz) subsidies, this merely represents ‘right-pocket–left-pocket financial flows’ (’rechte-Tasche-linke-Tasche-Finanzflüsse’) [55] (p. 19). Nonetheless, Schmidt-Eichstaedt argues that state wind rents may still make sense if these funds are directed towards impacted communities [154]. He calculates that if German municipalities were to obtain 10% of the gross revenues of electricity generated via a concession levy, then ‘an average household would therefore [only] have to pay €3 more for electricity per year than it would have to pay without this levy—if the levy were to be imposed nationwide’ [154] (p. 8, own translation). Furthermore, he reasons, ‘Is it not more than right and proper for all electricity customers to contribute to this minimal extent so that the ‘wind power-damaged’ municipalities have an economically visible share in the proceeds of wind power use in their municipal area?’ [154] (p. 8, own translation). Compensation for land values could still be paid to landowners (or maybe slightly higher, depending on what is decided), but the bulk of value of the wind resource would be so-
cialised and redistributed to impacted communities [154]. Redistributed wind rents could remedy the ‘peripheralisation’ of communities who host turbines but do not benefit from the energy transition [179,180]. Scenario 3 would also have a similar distributive effect on communities, although without relying on the state as a direct mediator.

Under Scenario 2, one could also imagine wind rents being redistributed to laid-off fossil fuel industry workers as a just transition initiative. Finally, with internationally integrated electricity markets being prioritised by the EU, and the prospect of green hydrogen being sold and shipped around the world, state appropriation of wind rent could take on the character of a transfer from foreign consumers to rentier states. The potential for this long-term income stream is captured by popular Irish economist David McWilliams, who claims Ireland could be the ‘Qatar of renewable energy’ if it chooses to harness its substantial offshore wind resources [181]. Ireland could become a ‘rentier state’, with the rents being used for any number of progressive social goals, such as buying back oil and gas exploration concessions, presently considered too costly [182].

5.3.2. Procedural Justice

Scenario 1 frequently leads to ‘private participation’ practices between developers and landowners [106] and the hushed signing of options and lease agreements. This can breed resentment in locally affected communities and is particularly problematic where landowners ‘treat the land as a pure financial asset’ with little regard for local values or negative externalities [78] (p. 368) [145].

Nationalisation (Scenario 2) would not necessarily lead to the eradication of rent, although it might take a different form and logic [183]. Socialising the wind resource could enable greater (democratic) control of production, the state being better placed to guard the public and environmental interest than private landowners [45]. In Polanyian terms, this could represent at least a partial re-embedding of the economic process in society and nature [67]. In some contexts, state or municipality ownership of wind resources might provide a stronger position for the state to guard social/environmental interests than regulations and spatial planning powers [145]. It could enable more joined-up, proactive environmental protection, in contrast to frequently reactive or negative spatial planning powers employed under Scenario 1. This could have positive ramifications for the interaction between the wind resource SES and related ecosystems and habitats (ECO).

However, the state has also been historically prone to failure at incorporating local knowledge and values [184]. Even municipal wind rights would not guarantee against tokenistic community participation. We should avoid a naïve view of state policymaking as a neutral ‘welfare-maximizing’ process [185] (p. 34). Rather, the state favours certain actors and strategies over others [170] and can be subject to corruption [145]. Indeed, the early experience of offshore wind energy participation processes would not seem to indicate a radical shift towards more inclusive practices compared with onshore [186].

Community wind rights (Scenario 3) could perhaps enable a deeper, direct ‘re-embedding’ of the economic process within the communities most affected by it, especially if in the form of a community wind trust including environmental groups. However, we should also recognise that communities come in many shapes and sizes and can be imbued with pre-existing, oppressive power relations. Polycentric governance needs to be attentive to ‘less visible’ power dynamics [187] (p. 5) and be aware that ‘actual commons can be distorted, oppressive or emancipatory’ [63] (p. 613). This ‘social embeddedness’ is often neglected by common-pool resource theory [188] (p. 636). Furthermore, not all communities have viable wind resources, potentially leading to intercommunity conflict.

5.3.3. Symbolic Mobilisation and Green Coalitions

Ameliorating the distributional and procedural problems of Scenario 1 is advantageous not only for justice reasons but also potentially for propagating green coalitions to advance pro-climate policies [7,8,189]. McDermott Hughes notes that wind energy lacks the traditional romance of other energy sources, such as coal: ‘wind power is not just
safe but sterile’ [51] (p. 115). This is likely also due to the relatively limited success of the ‘green collar jobs’ movement [9]. McDermott Hughes reasons that nationalising the wind (Scenario 2) could be the key to linking material interests and symbolic values [51]. Other redistributive mechanisms, such as community benefit funds, have failed to do this, often being framed as a bribe [190–192] and lacking symbolic power. The same could be said about taxation.

Rodi notes that structural change would of course prompt pushback from those whose interests would be harmed (i.e., landowners) [193]. McDermott Hughes recognises this but has hope that wind nationalisation is more feasible than land nationalisation [194], especially since the symbolic/cultural connection between land and wind resources is not yet well developed [51]. Ironically, the widespread perception that the wind is commons (even if it is not managed as such) may prove strategically useful for actually turning it into one, since landowners’ positions can be understood as a form of enclosure. Beckers et al. also think that, from an instrumental social acceptance point of view, the pushback from reducing landowners’ rights would be far outweighed by the benefits of local community support [55]. Community wind rights (Scenario 3) would arguably be even more potent than state wind rights in this respect.

Is there a risk that giving communities full ownership of the wind resource would merely serve to strengthen the position of those who oppose projects? Even if the potential material benefits are not sufficient to incentivise enough communities to choose to harvest their wind resources, polycentric governance allows for the greater good to be internalised via ‘processes of cooperation, competition, conflict, and conflict resolution’ among polycentric units [161] (p. 932). Polycentric networks of wind owners could set targets for wind energy production aligned with decarbonisation goals. Extending wind rights to other actors such as environmental NGOs in ‘community wind trusts’ could also potentially counterbalance opposition. Furthermore, disempowerment of communities already leads to massive social resistance, which jeopardises the feasibility of widespread rollout of wind energy in the coming years.

5.3.4. Spatial-Economic Coordination of Production

The fragmented nature of landownership poses issues for efficient and rational coordination of wind energy generation in Scenario 1. Issues can occur in various ways, including wake effects between turbines, coordination with grid capacity build-out, transaction costs from dealing with many landowners, and issues of repowering with fewer beneficiaries. Winikoff and Parker recently argued that fragmented private landownership patterns (in conjunction with proxy wind rights, we might add) may lead to coordination problems for wind energy [50]. This is echoed by various German scholars [52,55,178,193]. Similar coordination issues have beset coal in the UK [25], oil and gas production in the United States [195,196], and, more recently, shale oil in the US [197].

Scenario 2 could allow the state to control and manage wind resources in a more rational and precise way. Drawing on Hayek’s work on epistemology and economic coordination, Beckers et al. argue that, for wind energy generation, the state has sufficient access to the knowledge required to coordinate production efficiently [178]. Both Bäumler and Schmidt-Eichstaedt suggest a concession model could take various forms, from the state simply selecting and tendering areas for wind energy to actually designing the project specifications in more detail and tendering at a later point in the development process [52,154]. Lifshitz suggests that a state permitting model for wind energy licenses could allow for greater efficiency in the coordination of production (for example, the large amount of failed projects under the current developer-led model whose costs are internalised into electricity prices), and might allay any investor uncertainties around the legal standing of the rights they acquire in leases [45]. Similar considerations around the desirable level of state coordination are also underway for the growing offshore wind industry in Ireland, where the state, by virtue of its seabed rights, is proxy owner of the
offshore wind resource [198]. Community wind rights (Scenario 3) embedded within a nested polycentric governance network could also resolve these coordination issues.

5.4. Social, Economic, and Political Settings (S)

We have seen how Scenarios 2 and 3 hold potential for symbolic mobilisation of green coalitions to interact with the broader social, economic, and political setting and to advance long-term support for pro-climate policies [189]. We also advocate integrating Marxist rent theory insights into an Ostromian institutional analysis of wind rights. This is to connect midlevel processes (e.g., proxy wind rights dynamics) with higher-level dynamics (e.g., rentierisation and green capitalism). The category of social, economic, and political settings (S) can be used to capture the influence of higher-level dynamics on institutional interactions and outcomes. We can also ask what potential changes at the institutional level can hold for supporting higher-level system change.

Scenario 1 contributes to the continuation of green neoliberalism as a system response to environmental crisis [71]. Private rent relations support commodity relations and commercial development of wind energy, furthering the disembedding of society and nature [67]. While the situation looks more promising for Scenarios 2 and 3, we should be aware that both the state and communities are subject to similar forces facing private landowners. In the context of a wider capitalist international political economy, where rural communities are often under various demographic and financial pressures, and where economic growth is a ‘core state imperative’ [199], we should be cautious about romanticising the emancipatory potential of these forms of ownership. Furthermore, rentierism is frequently associated with parasitism and stunting innovation [86,87,117,200–202]. However, we agree with Chandrashekeran, who argues that ‘such negative interpretations of rentier capitalism fail to entertain the possibility that rent can create value for historically marginalised and formerly dispossessed Indigenous communities’ [130] (p. 382) [115].

Indeed, there may be signs of system-level change, with some authors arguing that we are seeing a move back towards greater forms of state involvement in the economy amid ‘Green New Deals’ [203,204]. Could state wind rights be part of a shift towards a ‘Green Keynesian’ political economy [205]? There is perhaps further room for optimism when we recall how Scenario 3 (and potentially Scenario 2) could provide the conditions for community energy initiatives to fulfil their radical potential [13]. In other words, ‘not only organising in the common (i.e., the democratic and sustainable allocation of resources) but also organising for and of the common, that is, the collective and democratic use and (re)production of the commons, respectively’ [64] (p. 5). This echoes McDermott Hughes’s claim that ‘once your government or your community owns the kinesis of the wind, different politics ensue’ [51] (p. 220). In the case of community wind rights, this might provide the conditions which allow commoners to ‘define for themselves alternative social systems that are not mediated by capital or the state’ [64] (p. 6), and which may break free from the seemingly inescapable growth logic [63]. This could include more proactive, citizen-led energy system designs, such as ‘island systems planned by prosumers’ (Prosumern geplante Inselsysteme) [206]. In this way, while simply shifting the ownership of wind assets to communities does not represent a radical shift, community wind rights may be a stepping-stone to alternative modes of production, exchange, and consumption.

6. Conclusions

We have shown how adopting a resource-based lens can open up new ways of thinking through the energy transition. Our conceptual analysis of three governance scenarios for wind rights suggests that problems arising from proxy wind rights attached to landownership could be ameliorated by more social configurations of such rights, and this could contribute to a more just and socially accepted energy transition. Socialised wind rights have the potential to result in better outcomes across a range of factors, and community wind rights, embedded in polycentric governance networks, appear to have the most promise. The relative benefits of community wind rights are especially pronounced when
we consider the empowerment effects such a change would have on communities, potentially fundamentally changing the constellation of roles and balance of power in the energy transition. Community wind rights could help to unlock the inherent democratic potential of the switch to decentralised renewable resource technologies.

It is important to consider how this would play out in different social, economic, and political contexts. For example, the strong property rights discourse among American legal scholars perhaps indicates that proposals to not only sever wind rights from the land but also remove them from the ownership of landowners might struggle to get off the ground in states like Texas. Recognising the particularities of different contexts is key to developing effective strategies for legislative change. In the European context, the relatively large and well-developed network of community energy initiatives could be a vehicle to drive for community wind rights, which could strengthen the enabling conditions for the grassroots energy movement. In postcolonial contexts, indigenous groups could make claims based on historical land-use rights, potentially forging alliances with other impacted residents. Social actors strategically pursuing de jure ownership could start by claiming de facto ownership and using the language of wind rights, just as, as Alonso Serna reports, Mexican landowners are doing to stake their claim to the wind resource [91]. Indeed, encouraging a discourse around different configurations of wind rights can itself reorientate how we think about wind energy and who should own and control it.

We have argued that socialising wind rights could have a key role in securing a just transition. This should be seen in the context of the fundamental nature of the energy transition. Rather than just an initial shift to low-carbon energies, permanent changes in energy systems will require long-term use of wind energy, implying cumulative distributive and structural implications arising from current enclosure of wind. As we enter the ‘second phase’ of the energy transition, it is not too late to redefine and redistribute wind (and other renewable resource) rights for new and repowered projects.

There are ample opportunities for future research using this resource-based approach. We need (more) evidence of how wind rights operate in different contexts. Comparative studies will be useful to understand how existing wind rights interact with contextual conditions. Conceptual development of the future energy pathways facilitated by social wind rights will help explore the advantages that could be accrued from such an approach, and will highlight the strategies for implementation. In this context, existing analyses of the legal arrangements for new wind rights configurations at the national and supranational levels are indispensable but limited by geographic scope [52,155]. There is also a need to explore the political potential of social wind rights amongst key stakeholders and the wider public, with the scope for action research with networks of social and transition movements to explore the discursive value of wind rights in their strategies. Finally, researchers should also transfer and compare this exploration (based on wind) to other renewable resources, such as solar and geothermal. Given their distinctive materiality, a resource-based lens offers a rich and innovative way of exploring a wide range of possibilities arising from energy transition.

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