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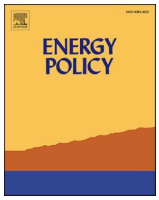

What makes local energy projects acceptable? Probing the connection between ownership structures and community acceptance

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ABSTRACT

Community ownership of wind energy has been found to increase acceptance, but the reasons for this are poorly understood. Here, we compare different communities' attitudes towards local onshore wind energy projects in order to gain a deeper understanding of the characteristics of ownership which are conducive to community acceptance. Using a postal survey in Scotland ($n = 318$), we compared three communities with varying degrees of ownership regarding their (1) support for the local wind project; (2) perceptions of energy justice; (3) perceived impacts; and (4) ownership and benefit preferences. One-way ANOVAs and the Potential for Conflict Index$_2$ identified that residents in the two communities with a degree of ownership were more associated with greater acceptance, processes, and outcomes (i.e. more just and inclusive development processes and more fairly distributed benefits and impacts), than residents living near the privately-owned development. Additionally, we provide evidence that a co-operative can achieve similar acceptance and energy justice as a fully community-owned project. Overall, the results indicate that policymakers should take seriously the connection between the tenets of energy justice and ownership models in their policy and planning efforts.

1. Introduction

Concerns over climate change coupled with increasing energy demand has led to a growth in the renewable energy sector internationally (IEA, 2021). This rapid growth has provoked discussions around the acceptance of such technologies, especially as renewables tend to be smaller scale than traditional power plants and closer to where the energy consumer lives (Wüstenhagen et al., 2007). Onshore wind energy is particularly demonstrative of such issues. Playing a major role in the deployment of renewables, wind energy has incited considerable local opposition despite having broad acceptance (Devine-Wright, 2004). Local opposition can slow or halt projects permanently, delaying the transition (Cohen et al., 2014).

In the interest of increasing support for wind energy, policy-makers and researchers have advocated for the use of community-based ownership (Baxter et al., 2020). Community-based ownership can range from communities fully owning the renewable development (full ownership) to the community becoming a financial partner over the lifetime of the project (shared ownership) (Haggett and Aitken, 2015). Broadly speaking, community owned renewables have been favoured for providing diverse local benefits including substantial monetary benefits (Haggett and Aitken, 2015; Slee, 2020), building resilience (Haggett and Aitken, 2015), and encouraging greater participation from local communities (Warren and McFadyen, 2010). To achieve harmony between the community and the development, local acceptance is paramount. Central to its success is that ownership leads to greater social acceptance (Baxter et al., 2020), but the reasons for this remain under-examined.

In this paper, we compare acceptance across three communities living near wind developments with varying models of ownership in Scotland, a country acknowledged as a global leader in the community ownership model (Kumar and Aiken, 2021). Our aim is to gain a deeper understanding of the characteristics of community-based ownership which are conducive to community acceptance. To explore these subtleties, we compare the three communities' acceptance of a local project, perceptions of energy justice, perceived impacts, and preferences for ownership and benefit options. We use individual communities, rather than representative samples of each ownership model, to gain an in-depth understanding of real and current energy projects. We make key observations that clarify the differences between these ownership

Abbreviations: Point and Sandwick, P&S.

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projects and privately-owned developments. Below we highlight the relevant literature and research aims, followed by an outline of the development of community ownership in Scotland.

1.1. Wind energy and social acceptance: conceptual frameworks

Social acceptance research has progressed from marginal, low-profile studies to the forefront of broader debates in the social sciences (Rand and Hoen, 2017). It builds on the framework developed by Wüstenhagen et al. (2007) which splits acceptance into three categories: socio-political acceptance, community acceptance, and market acceptance (e.g. Roddis et al., 2019, 2018). This research will focus on community acceptance, referring to the specific acceptance of renewable energy projects by local stakeholders. Early research focused on understanding opposition (Baxter et al., 2020). For example, Bell et al. (2013, 2005) suggest that opposition can be explained in four ways: the democratic deficit (i.e. the decision-making process is dominated by a small number of unrepresentative opponents), qualified support (i.e. support that is conditional in some way), NIMBYism (i.e. support wind energy but just not in their backyards), and place-protector (i.e. opposes wind energy in places they value, but may support development in other nearby areas). More recently, there has been a noticeable shift towards the advantages of community ownership/investment and participation in decision-making, elements often found in community ownership (see Baxter et al., 2020). While research points to multiple advantages of community ownership, not every such project achieves these outcomes in practice (van Bommel and Höffken, 2021).

Community ownership has been criticised as being ambiguous because it is open to various interpretations and practices (Devine--Wright, 2019). For example, in this paper we refer to community-based ownership as either full or shared ownership – i.e., either the community fully owns the project or the community is a financial partner. In other cases, community ownership has referred to individuals within the community owning the wind turbines which is ambiguous as the profits are usually personal and are not shared with the whole community. To clarify community ownership, researchers have used Walker and Devine-Wright's (2008) framework which describes the 'ideal' community renewable energy installation as including a high degree of two aspects: process and outcomes (Fig. 1). The process dimension requires a high level of involvement from the locals in the planning, setting up, and potentially running the project. Outcomes describe how and where the benefits are distributed. Under this conceptualization of energy projects, those that occur in the upper right-hand part of the quadrant on Fig. 1 are more locally acceptable. Baxter et al. (2020) reconceptualised this framework to focus on the local aspects of community ownership and include additional aspects such as investment scale, negative impacts, and historical context. However, there is merit in the simplicity of Walker and Devine-Wright's (2008) original diagram as it represents the two key issues of concern (p. 499). This research investigates both processes and outcomes through the two of the three tenets found in energy justice literature known as procedural and distributional justice.

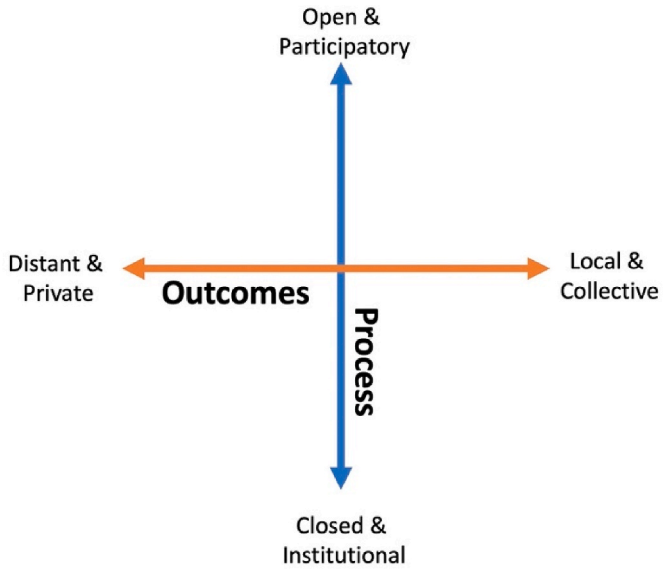

Fig. 1. Conceptual dimensions of community renewable energy projects (adapted from Walker and Devine-Wright (2008)).

1.2. Energy justice, perceived impacts, and community ownership

Discussions around how to achieve a 'just' transition - otherwise known as a fair and equitable future for a post-carbon society (McCauley and Heffron, 2018) - have become widespread (Pastukhova and Westphal, 2020). In the last decade, research into energy justice has expanded rapidly, acknowledging that our energy systems are about more than technology and economics, but also about political power, social cohesion, and moral concerns (McCauley et al., 2019; Sovacool et al., 2016). The most common framework comprises the three tenets of procedural justice, distributional justice and recognition justice (Jenkins et al., 2016; McCauley et al., 2013). Using this framework alongside perceived impacts, we investigate why community ownership may increase acceptance.

Procedural justice ties the three tenets of energy justice together and explores how 'just' the involvement of stakeholders has been in the decision-making process (Ottinger et al., 2014). The concept was first introduced by Thibaut and Walker (1975). In following, communities who are impacted by the technology are treated as equals in decision-making (Ottinger et al., 2014). Similar to Arnstein (1969) eight-rung 'ladder' of citizen participation, whereby involvement goes from non-participation to higher levels of citizen power (e.g. citizen control, delegation, or partnership), procedural justice can have degrees of involvement (Walker and Baxter, 2017a). Further, Arstein's focus on 'citizen power' helps to recognise the importance of ownership structures and aligns well with our theoretical understanding of procedural justice (Walker and Baxter, 2017a).

Distributional justice is spatial, examining the physically unequal distribution of benefits and impacts and who is responsible for them (Walker, 2009). It calls for all benefits and impacts to be distributed fairly across society regardless of social status, race, gender or other social aspects (Jenkins et al., 2019). While distributional justice can be investigated using a whole systems approach (Jenkins et al., 2016), this research is focused locally, identifying whether the local benefits and impacts associated with the energy development are fair from the perspective of local citizens (Agterbosch et al., 2009). Benefits come in the form of payments to the community and must be carefully administered to avoid payments being considered bribes – e.g. compensation as a substitute for safety precautions (Walker and Baxter, 2017b). Impacts are seen as the local costs associated with the development. Due to the various perceived impacts found to influence energy acceptance, Roddis et al. (2018) created a framework including four material impacts: aesthetics; environmental; economic; and project details.

Aesthetic impacts to landscapes are one of the few empirically established factors influencing public acceptance (Warren and Birnie, 2009). *Environmental impacts*, including climate mitigation and impacts to the local environment (e.g. birds, bats, landscape features; Jepson et al., 2012), have also been important in determining acceptance (Leiren et al., 2020). Various *economic impacts* are often expressed such as on property values (Hoen et al., 2011; Mills et al., 2019), tourism (Leiren et al., 2020; Ólafsdóttir and Sæþórsdóttir, 2019), and employment (Lehr et al., 2008; Mostafaeipour, 2010). *Project characteristics* such as number of wind turbines have influenced the type and scope of the impacts experienced, and thus acceptance (Leiren et al., 2020). Finally, while *health* impacts are not addressed often in the literature,

impacts such as noise and general health are often part of media dialogue on conflict with wind energy and likely influence acceptance (see Walker et al., 2015). Overall, if one part of a community benefits or experiences greater economic impacts at the expense of another, it can result in protests, damaged relationships, and divided communities (Gross, 2007).

The final tenet, ***recognition justice*** requires that individuals have fair representation, safety from physical threats, and complete and equal political rights (McCauley et al., 2013). Recently, it was noted that there is less discussion about justice of 'self-recognition' – i.e. whether an individual is aware of how their opinions represent legitimate issues of fairness and their confidence to express their rights within renewable energy conflicts (Bailey and Darkal, 2018). As self-confidence is vital for raising concerns or petitioning for fair treatment (Bailey and Darkal, 2018), self-recognition may play a role in acceptance.

Lastly, according to Devine-Wright (2019) research should examine the communities' perceptions of energy justice alongside ***ownership and benefit preferences***. One such study of two Canadian provinces found that residents preferred local investing and sharing over fully locally owned projects (Walker and Baxter, 2017a). This is an unsurprising result considering that community projects usually face several barriers, such as taking longer to develop and having a larger financial risk for communities (Slee and Harnmeijer, 2017).

The key rationale for framing this research through the tenets of energy justice is the clear similarities between Walker and Devine-Wright's (2008) process and outcomes and McCauley et al.'s (2013) procedural and distributional justice. These tenets have been explored across various contexts clearly demonstrating positive relationships between acceptance and a fairer process (Gross, 2007; Ki et al., 2022; Langer et al., 2016; Walker and Baxter, 2017a; Wolsink, 2007) and a just distribution of benefits (Gross, 2007; Jepson et al., 2012; Walker and Baxter, 2017b). Baxter et al. (2020) suggest that neither procedural nor distributional justice is sufficient on its own to foster widespread acceptance. Rather, it is when these aspects operate together in a locally focused way (i.e. locally fairer processes and outcomes) that local acceptance increases.

Based on this literature, we examine the concepts of process and outcomes through the lens of procedural and distributional justice. We include aspects of Baxter et al.'s (2020) reconceptualization by investigating different degrees of ownership (investment scales), perceived impacts (negative impacts), and describe the history of community ownership in Scotland (the historical context). As self-recognition is understudied in comparison to distributional or procedural justice (Hurlbert and Rayner, 2018), we also examine it alongside the other tenets. Lastly, to answer the call of Pellegrini-Masini et al. (2020), we explore ownership and benefit preferences to strengthen the validity of energy justice in the policy debate. Below we identify our research aims before outlining the historical context of community energy and ownership in Scotland.

1.3. Research aims

Our aim is to gain a deeper understanding of the characteristics of community ownership which are conducive to community acceptance. Previous research suggests that fair processes and outcomes are vital to greater community acceptance (e.g. Gross, 2007; Ki et al., 2022; Walker and Baxter, 2017b, 2017a; Warren and McFadyen, 2010). However, these studies usually compare acceptance across ownership extremes (e.g. community vs. privately owned; see Walker and Baxter, 2017b, 2017a; Warren and McFadyen, 2010), comparing different co-operative projects (e.g. Bauwens and Devine-Wright, 2018), or do not mention ownership at all (e.g. Gross, 2007; Ki et al., 2022). Using a postal survey, we explore the role of energy justice in three communities using a gradient of ownership found in Scotland (i.e. community, shared, and private ownership; see section 2.0). We compare within and between the communities' (1) wind energy project support; (2) perceptions of energy justice; (3) perceived impacts; and (4) ownership and benefit preferences. By comparing these characteristics across a gradient of ownership, we gain in-depth knowledge of the subtleties of ownership and the conditions which foster cooperation (Bell et al., 2013) which may be lost in larger studies.

2. The development of community-based ownership in scotland

Scottish community energy has been highlighted as a 'pioneering' example of bottom-up policy approaches to renewable energy (Slee and Harnmeijer, 2017). Starting with only a few projects in the 1990s and early 2000s, community energy has grown roughly exponentially since then (Slee and Harnmeijer, 2017). Entangled with the community empowerment movement and land reform legislation, this growth has primarily occurred in the Highlands and Islands region (Slee and Harnmeijer, 2017). Coupled with the communal decision-making preserved in the crofting system,[1] the Scottish Government moved to provide more empowerment opportunities for communities through the 2003 Land Reform Act (Combe et al., 2020; Slee and Harnmeijer, 2017). This Act supported rural communities regaining ownership of their land (Combe et al., 2020) and provided a government-assisted community right to buy, even if the landowner had no wish to sell their land (Slee and Harnmeijer, 2017). At the same time, the Scottish Government encouraged communities to take up renewable projects as a way to generate local sources of income using the UK subsidy schemes, such as Renewables Obligation Certificates (ROCs) (van der Waal, 2020), leading to a 'blossoming' of community energy (Slee, 2020). The UK Government replaced the ROCs with a less flexible incentive in 2016 (Slee and Harnmeijer, 2017). However, the Scottish Government gradually increased financial support for community ownership to reduce barriers for communities to install renewable projects (van der Waal, 2020), such as CARES – i.e. a loan which is only repayable with interest if a scheme is approved (Slee and Harnmeijer, 2017).

While community energy has increased over time, it should be noted that it still only represents about 4% of all onshore renewable energy generation in Scotland (Slee and Harnmeijer, 2017). In 2015, the Scottish Government's target of 500 MW (MW) of 'community and locally-owned' renewable energy capacity was achieved five years early, but only 70MW of the 500MW were considered community-owned (Slee and Harnmeijer, 2017). For wind energy in particular, of the 325MW 'community or locally-owned' in 2019, the majority (214MW; 65%) were owned by farms and estates, while community groups owned less than a fifth (61MW; 19%) of the total capacity (Grillanda and Khanal, 2019). Critically, projects owned by farms and estates are usually for private profit ventures rather than for the community's benefit, illustrating the problematic nature of combining community and local energy under one definition (Slee and Harnmeijer, 2017).

The most widely adopted guidance has been the Scottish Government's Good Practice Principles for Onshore Renewable Energy Developments for Community Benefits and Shared Ownership (Scottish Government, 2019a, 2019b). Within this policy, there are three main structures described: community benefits; shared ownership; and 'community and locally owned' projects.

Community benefits policy encourages renewable energy businesses to provide £5000 per megawatt installed per year for the operational lifetime of the development into a community fund (Scottish Government, 2019a). These benefit schemes are usually used for ***private ownership*** projects. While not obligatory, they are strongly encouraged by the Scottish Government. Apart from Scotland, institutionalised

[1] Unique to Scotland, crofting is a system of landholding in which the crofters are usually tenants to a relatively small agricultural land holding. Common grazing land are areas in which a number of crofters have the right to graze stock on meaning they often work closely together cooperatively (see https://www.crofting.scotland.gov.uk/What-is-Crofting).

community benefits are rare and are usually non-standardised and vary substantially (Rudolph et al., 2017).

Shared Ownership is part of 'community and locally owned' in the Good Practice Principles and is defined as an arrangement in which a community group is a financial partner over the lifetime of the renewable energy project (Scottish Government, 2019b). In addition to a wholly or partly co-operative structure, community benefits are also expected (Scottish Government, 2019b). Communities can participate in Shared Ownership via structures such as development trusts, co-operatives, and community interest companies (Scottish Government, 2019b).

Community Ownership is also part of 'community and locally owned'. Community ownership can take many forms, but community development trusts are the dominant institutional form for community renewable energy in the UK (Slee, 2020). Community development trusts are defined by four criteria: (1) owned and managed by the local community; (2) create sustainable regeneration for the community; (3) not for private profit but can seek to work in partnership with other organisations; (4) aim to reduce dependency on support schemes through enterprise and ownership of assets (Slee, 2020).

Shared ownership is similar to community ownership, particularly in the form of renewable energy co-operatives as they tend to have similar *'community features'* (Bauwens and Devine-Wright, 2018, p. 613). Community features can be defined as elements which involve greater community engagement. For example, co-operatives frequently involve democratic member control (e.g. 'one member – one vote') and have voluntary and open membership (Bauwens and Devine-Wright, 2018). By contrast, private companies are usually more able to deliver large-scale projects due to being able to spread financial risks (Goedkoop and Devine-Wright, 2016). However, larger projects usually face greater local opposition (Roddis et al., 2018). In response to this issue, there was an international trend to encourage a shift towards shared ownership projects as they can provide both larger projects and more local engagement (Goedkoop and Devine-Wright, 2016; Haggett and Aitken, 2015).

The Scottish Government even adopted a goal of having an element of shared ownership in half of newly consented renewables by 2020 (Scottish Government, 2019b). Despite this trend, research on community acceptance has usually focused on contrasting ownership extremes (e.g. community vs. privately owned). Thus, this research compares a gradient of ownership models (i.e. community, shared, and privately owned) in order to understand whether the policy shift is effective in achieving the two-pronged goal of increasing just energy practices and achieving ambitious renewable targets.

3. Methods

3.1. Study areas

Communities living near an onshore wind energy project were chosen using four criteria. Firstly, projects selected yielded benefits for the local communities as benefits have been found to be both controversial and important facets of local acceptance (Gross, 2007; Jepson et al., 2012; Leer Jørgensen et al., 2020; Walker and Baxter, 2017b). Secondly, each project followed a different scheme for ownership/benefit models (i.e. community, shared, and private ownership) in order to explore how attitudes may differ across schemes. Thirdly, the wind developments were all below 30MW of installed capacity with a maximum of 15 turbines as previous research has shown size and number of turbines can influence support (Leiren et al., 2020). Finally, similar to Leer Jørgensen et al. (2020), who studied the fairness of compensation schemes and local acceptance across three projects in Denmark, we focused on individual communities rather than representative samples of each ownership scheme. While using only one community from each subcategory of ownership means that we cannot generalise to the ownership structure, it is a first step in understanding the similarities and differences amongst these ownership schemes and the characteristics that are seen alongside greater acceptance. Furthermore, as wind energy is "alive to context" (Creamer et al., 2019, p. 2), specific sites are more suitable for exploring the subtleties at play in community acceptance. Finally, all three communities are located in the Highlands and Islands of Scotland and have similar demographics – i.e. there are about 51% females and half aged between 44 and 69 (National Records of Scotland, 2011).

3.1.1. Stroupster, Caithness – private ownership

Situated in Northern Scotland (Fig. 2), Stroupster is a 13-turbine and 29.9 MW installed capacity windfarm built in 2015 (Local Energy Scotland, 2021). The windfarm was developed by UK's Npower Renewables and built by Germany's BayWa, but in 2015 was bought for £85m by Greencoat UK wind, whose headquarters are in London (Dorsey, 2015). Npower originally applied for planning permission in 2006 but was refused due to several issues including 240 local objections associated with various perceived impacts (The Highland Council, 2013, p. 2). It was not until 2010 when it was accepted with 19 conditions (The Highland Council, 2013). The community receives an annual community benefit fund totalling £149,500 per year (Local Energy Scotland, 2021). This funding can be used for charitable activities that principally benefit the residents of Dunnet & Canisbay Community Council area in Caithness or if outside the area must have a direct benefit to the residents of Dunnet & Canisbay (Local Energy Scotland, 2021). For example, the fund created an all-weather cycle path for a nursey and outdoor play equipment for local children (Local Energy Scotland, 2021).

3.1.2. Ben Aketil, Dunvegan – shared ownership

The 12-turbine Ben Aketil windfarm, situated near Dunvegan, is a shared ownership scheme of 27.6 MW (Falck Renewables, 2016). In 2008, when the original 10 turbines were built, the community purchased a share in the co-operative, and bought additional shares when two additional turbines were built in 2012 (Isle of Skye Renewables Co-operative, 2022). In order to include as many local shareholders as possible, the developer, Falck Renewables, allowed members to invest between £250 and £20,000. The community derives benefits in two ways: (1) through a community benefit payment of about £45,000 per year into the Dunvegan Community Trust and (2) through payment of interest to the members of the local co-operative - 9.1% of their initial investment each year (Falck Renewables, 2016). The community benefit fund supports local initiatives in the Dunvegan area such as education, community facilities energy conservation, and environmental improvements.

3.1.3. Beinn Ghrideag, Point and Sandwick (P&S) – Community Ownership

The community councils of Point and Sandwick (P&S) own three turbines, and the 9 MW scheme is developed and controlled through the Point and Sandwick Trust. With help from CARES loan from the Scottish Government, planning consent was obtained in 2009 and the turbines were installed in 2015 (Point and Sandwick Trust, 2021). Planning permission was granted on several conditions following objections from the Civil Aviation Authority and the owner of the common grazing land, the Stornoway Trust, who had already leased the land to Lewis WindPower (LWP), a private consortium owned jointly by Amec and EDF (Point and Sandwick Trust, 2021). According to Point and Sandwick Trust (2021), LWP demanded that the trust agree not to support any further community schemes in this area, which the trust originally objected to. However, the landowner insisted on making this a condition of leasing the land and the community had to accept it in order to move forward with the proposed project. LWP now has planning consent for a 36-turbine private wind farm on the land owned by the Stornoway Trust (EDF, 2022).

Beinn Ghrideag is one of the largest community-owned windfarms in the UK (Point and Sandwick Trust, 2021). The wind turbines produce £900,000 each year in profits, increasing to £2 million once the initial

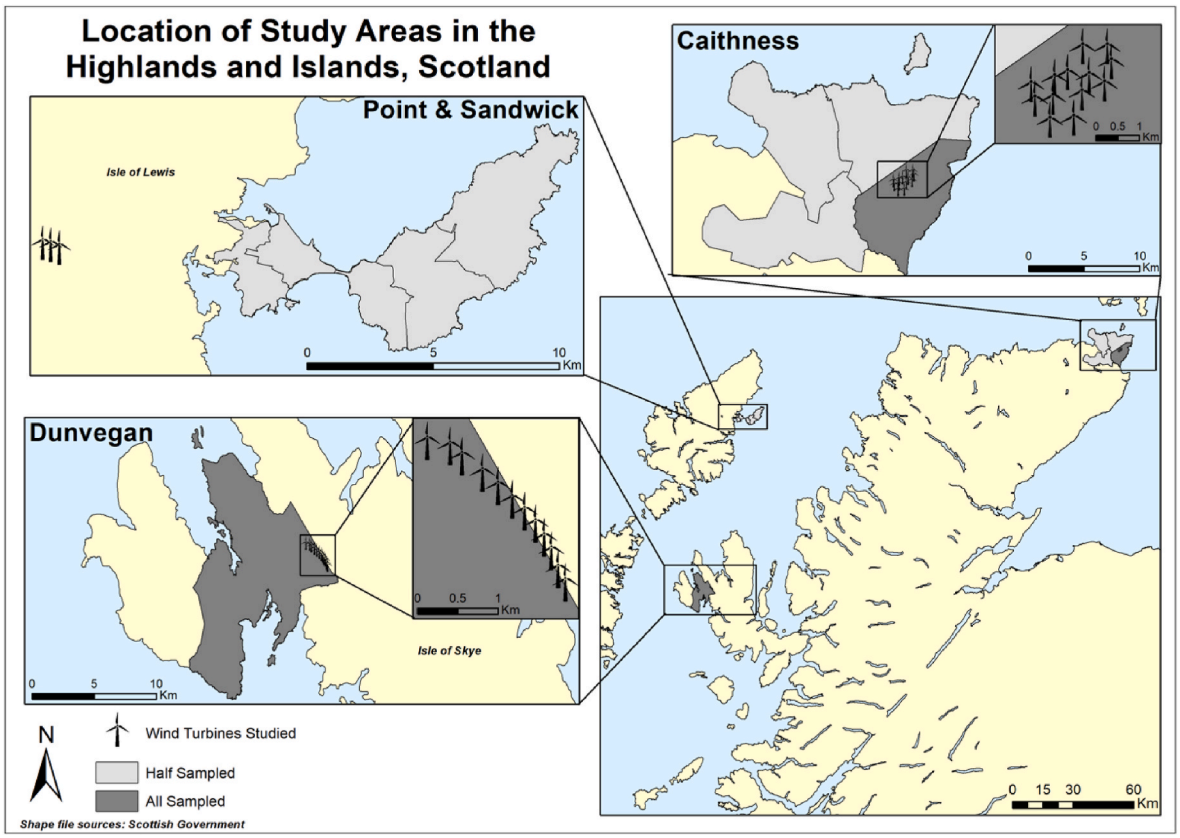

Fig. 2. Location of study areas and windfarms. Scalebar of 10 km at the bottom of each study area to compare distance from the wind turbines.

costs have been paid off (Point and Sandwick Trust, 2021). All of the profits go to the local and wider Western Isles communities. Projects supported by the fund include the creation of a local woodland, construction of a coastal path, and free installation of LED lightbulbs to reduce fuel poverty (Point and Sandwick Trust, 2021).

3.2. Data collection

Data were collected from residents (age ≥18) living within community councils who own or benefit from the windfarms – i.e. Dunvegan and Caithness within a radius of about 10 km and P&S of about 15 km (see Fig. 2). The survey was designed based on previous literature (e.g. Bailey and Darkal, 2018; Roddis et al., 2018; Walker and Baxter, 2017a) and then pre-tested. A mixture of cluster and systematic sampling was used, where all addresses within the dark grey areas on Fig. 2 were sampled (e.g. in Dunvegan where the sample was smaller) and for other lighter grey areas every second household was selected for a sample of half of the households.

Following Vaske's (2019) 4-contact mail-out method, surveys were sent in the following order: (a) pre-notification postcard; (b) first questionnaire packet; (c) reminder postcard; and (d) replacement questionnaire packet. These were administered from February to April 2021. The overall response rate from each area was: Caithness 32% (n = 125 useable questionnaires), Dunvegan 51% (n = 93 useable questionnaires), and P&S 33% (n = 158 useable questionnaires). Surveys with more than 15% of values missing were deleted (9 cases in total: Caithness $n = 4$; Dunvegan $n = 3$; P&S $n = 2$). Of the variables included in this study, 2% or less had missing data. The missing data were randomly distributed and had no distinct pattern. Following Vaske (2019), missing values were replaced with the mean of the variables for analysis. To enable questions on energy justice to be addressed, only participants who were living in the community when the windfarm was built were included in the analysis: Caithness (n = 111; 89% of the sample), Dunvegan (n = 71; 76% of the sample), P&S (n = 135; 85% of the sample).

3.3. Variables

Communities were the independent variables to explore the similarities and differences in support (3 items), procedural justice (4 items), distributional justice (2 items), recognition justice (3 items), aesthetic/environmental perceived impacts (3 items), economic/health perceived impacts (5 items), and ownership and benefit preferences (4 items), a total of 24 variables. The questions were asked on a scale from 1 to 5, but for the purpose of communicating the results more clearly, the scale was recorded in SPSS to be −2 to +2 (Vaske, 2019). Each statement asked the residents to rate to what extent they agreed or disagreed with the statements using a 5-point scale from "Strongly Disagree" (−2) to "Strongly Agree" (+2).

3.4. Statistical analysis

One-way Analysis of Variance (ANOVA) compared the communities across each of the 24 variables. The Levene Statistic was used for the test of homogeneity of variances. If equal variances were assumed, Bonferroni post-hoc tests were used and if equal variances were not assumed, Tamhane post-hoc tests were used (Vaske, 2019). Effect size (Eta^2) compared the three groups responses for each question. To display the results from the ANOVAs and the level of consensus, the Potential for Conflict Index$_2$ (PCI_2) was used (Vaske et al., 2010). The PCI_2 difference test was used to compare the PCI_2 values (Vaske et al., 2010). As a respondent may perceive no conflict with another who is neutral on the topic, we did not include "neither disagree or agree" when calculating distance, known as the PCI_2 values. Finally, there was a total of 122 comments left on the surveys (Caithness $n = 50$; Dunvegan $n = 30$; P&S $n = 42$) which were systematically read through and coded in order to

discern patterns that may provide additional insight for the discussion.

3.5. Potential for Conflict Index$_2$ (PCI$_2$)

Communities are often assumed to be unified and homogenous units of measurement (Genus and Coles, 2008; Shove and Walker, 2007). However, this has been criticised as an oversimplification and several studies have found disagreements within communities on the acceptance of energy projects (Avila-Calero, 2017; Fischhendler et al., 2021). To ensure we investigate within and between community differences, we used PCI$_2$ (Vaske et al., 2010). This tool has been helpful to facilitate communication between academics, decision-makers, and the general public by visualising results (Engel and Vaske, 2022). PCI$_2$ has been used primarily for wildlife management issues (Bath et al., 2022; Doney et al., 2018), but has also been used for the management of marine protected areas (Engel and Vaske, 2022), perceptions of all-terrain vehicle impact (Hogan et al., 2019), and invasive species management (Sharp et al., 2011). Despite the variety of contexts in which PCI$_2$ has been used, it is novel in energy research.

PCI$_2$ is displayed on a graph with the response scale on the y-axis (e.g. from strongly disagree to agree), a line down the middle of the y-axis to display neither disagree or agree, and the survey questions across the x-axis. Each of the groups are displayed as bubbles, where the size is depicted by the PCI$_2$ values, scaling from 0 to 1, where 0 (a small bubble), is the least potential for conflict (i.e. everyone strongly agrees with a statement) and 1 (a large bubble) is the most potential for conflict (i.e. 50% strongly disagree and 50% strongly agree with a statement) (Hogan et al., 2019). By using this tool, we can better understand and more effectively communicate the results.

4. Results

4.1. Summary of demographics

Over half of the respondents in all samples were aged 44–69 in age (Caithness = 53%; Dunvegan = 52%; and P&S = 62%), with about one fifth aged 74 years or more (Caithness = 20.7%; Dunvegan = 21.1%; and P&S = 22.8%), and around half were female (Caithness = 55%; Dunvegan = 50%; and P&S = 45%). Around two-thirds of each sample had at least a college, bachelors, or postgraduate degree (Caithness = 65%, Dunvegan = 67%, and P&S = 65%) and an income under £54,999 per year (Caithness = 81%, Dunvegan = 94%, and P&S = 86%), with between 40 and 44% making between £25,000 to £54,999. Caithness and P&S have slightly more than in Dunvegan who earn higher than £55,000 (19%; 14%; and 5.7%, respectively). Overall, our samples were similar to each other and to demographics of the Highlands and Islands, Scotland (National Records of Scotland, 2011).

Table 1
One-way analysis of variance comparisons between three schemes (benefits, co-operative, and community owned) for 24 statements.

Survey Items	Caithness ($\bar{X}$)	Dunvegan ($\bar{X}$)	Point and Sandwick ($\bar{X}$)	F-Value	P-value	Eta^2 (η^2)	Levene Statistic
Beliefs:							
I support the existing wind power project in my area.	0.0^a	1.35^b	1.35^b	58.28	<0.001	0.27	<0.001
I support building more turbines near my community.	-0.69^a	0.82^b	0.74^b	47.74	<0.001	0.23	0.22
I support using more wind power to meet UK's energy needs.	0.25^a	1.32^b	1.31^b	32.60	<0.001	0.17	0.00
Procedural Justice:							
I felt encouraged to take part in the planning process.	-0.46^a	0.37^b	0.15^b	15.45	<0.001	0.09	0.33
I had ample opportunity to voice concerns about the wind development before it was approved.	-0.15^a	0.75^b	0.56^b	20.03	<0.001	0.11	0.01
I felt that community participation in the planning process resulted in changes to the outcome.	-0.61^a	0.11^b	0.20^b	26.84	<0.001	0.15	<0.001
I felt in control in terms of whether or not the turbines were going to be built in my area.	-1.0^a	0.06^b	-0.1^b	31.39	<0.001	0.17	0.79
Distributional Justice:							
I believe the wind turbine development	-0.55^a	0.51^b	0.71^b	39.91	<0.001	0.20	0.46
provides enough economic benefits to my area.							
creates positive impacts which are distributed fairly.	-0.57^a	0.48^b	0.67^b	38.83	<0.001	0.20	0.22
Recognition Justice:							
I felt I had as equal a chance as others in my community to express my opinion.	0.22^a	0.9^b	0.72^b	12.07	<0.001	0.07	0.05
I felt confident in expressing my concerns before the project was approved.	0.05^a	0.68^b	0.43^b	9.26	<0.001	0.06	0.06
I know that my concerns were legitimate.	0.62	0.48	0.40	2.31	0.10	0.01	0.59
Perceived Risks:							
Wind turbines …	0.77^a	0.01^b	0.23^b	11.22	<0.001	0.07	0.10
make the natural landscape less appealing.							
are a threat to birds and bats.	0.43^a	-0.55^b	-0.06^c	17.48	<0.001	0.1	0.04
help tackle climate change.	0.32^a	1.28^b	1.13^b	24.14	<0.001	0.13	<0.001
provide local jobs.	-0.13^a	0.52^b	0.63^b	14.64	<0.001	0.09	<0.001
lower local property values.	0.53^a	-0.49^b	-0.15^b	24.50	<0.001	0.14	0.45
damage tourism.	-0.09^a	-0.73^b	-0.48^b	8.72	<0.001	0.05	0.72
are a threat to human health.	-0.34^a	-1.28^b	-0.95^c	22.71	<0.001	0.13	<0.001
make an annoying noise.	0.02^a	-0.87^b	-0.32^c	15.95	<0.001	0.09	0.51
Policies							
Wind energy is best when it is fully owned by local communities.	0.63^a	0.52^a	1.21^b	16.68	<0.001	0.10	0.28
Wind energy is best when the local communities own a minority of the project (e.g., 10%).	-0.20^a	0.01^a	-0.61^b	9.07	<0.001	0.05	<0.001
Local residents should be able to invest in and share in the profits from local wind energy.	0.82^a	1.23^b	1.16^b	7.27	0.01	0.44	0.17
I believe the wind turbines development should have a fund that contributes to community projects (i.e. community benefits).	-0.38^a	0.92^b	0.30^c	31.85	<0.001	0.17	<0.001

[a,b,c] The letter superscripts denote significant differences between means based on either Tamhane's or Bonferoni's posthoc test, depending on whether the variances were equal or not (Vaske, 2019). If no superscripts, there was no significant difference.

4.2. Wind energy support

On average, residents of Dunvegan and P&S - i.e. those with a form of ownership, tended to agree more than Caithness residents with the following wind support statements (Table 1, Fig. 3a): (1) "I support the existing wind power project in my area" ($p < 0.001$; $p < 0.001$); (2) "I support building more turbines near my community" ($p < 0.001$; $p < 0.001$); (3) "I support using more wind power to meet UK's energy needs" ($p < 0.001$; $p < 0.001$). Caithness respondents tended to disagree with statement 2 while for the other statements they tended to be more neutral or agree. Across the three wind support statements, views between the communities of Dunvegan and P&S did not differ ($p = 1$; $p = 1$; $p = 1$).

The PCI_2 values ranged from 0.11 to 0.39, low to moderate values, across the statements (Fig. 3a). P&S tended to have lower PCI_2 values than Caithness for statement 1 and 3 ($p < 0.05$). There were no significant differences between Dunvegan and either Caithness or P&S for statement 1 or 3 and no differences found for statement 2.s.

4.3. Procedural justice

Dunvegan and P&S residents agreed more on average than Caithness residents, who were more neutral or disagreed, with the following procedural justice statements (Table 1, Fig. 3b): (4) "I felt encouraged to take part in the planning process" ($p < 0.001$; $p < 0.001$); (5) "I had ample opportunity to voice concerns about the wind development before it was approved" ($p < 0.001$; $p < 0.001$); and (6) "I felt that community participation in the planning process resulted in changes to the outcome" ($p < 0.001$; $p < 0.001$). For the final statement, (7) "I felt in control in terms of whether or not the turbines were going to be built in my area", Caithness respondents disagreed more than Dunvegan or P&S, who were more neutral on average ($p < 0.001$; $p < 0.001$). Across statements 4–7, Dunvegan and P&S residents did not differ ($p = 0.5$; $p = 0.47$; $p = 0.86$; $p = 0.88$).

The PCI_2 values ranged from 0.06 to 0.29, low to moderate values, across the procedural statements (Fig. 3b). The difference test comparing PCI_2 values found no difference between groups for statement 4 and 6 ($p > 0.05$). However, for statement 5, residents of Dunvegan were found to have lower PCI_2 values than Caithness ($p < 0.05$; $p < 0.05$), but P&S did not differ from either group ($p > 0.05$). For the statement 7, residents of P&S have a higher PCI_2 value than Caithness ($p < 0.05$), but both have relatively low PCI_2 values (0.19 and 0.09, respectively). Dunvegan residents did not differ from either ($p > 0.05$).

4.4. Distributional justice

Contrasting views were held between Caithness and both Dunvegan and P&S for the following distributional justice statements (Table 1; Fig. 3c): (8) "provides enough economic benefits to my area" and (9) "creates positive impacts which are distributed fairly", finding that Caithness disagreed while Dunvegan and P&S agreed (all $p < 0.001$). Differences were not found across statements 8–9 between Dunvegan and P&S ($p = 0.65$; $p = 0.77$).

The PCI_2 values ranged from 0.20 to 0.27, low to moderate values, across the distributional justice statements (Fig. 3c). The difference test revealed no significant differences in PCI_2 values between any groups across for either statements ($p > 0.05$).

4.5. Recognition justice

Agreement was found across recognition justice statements (Table 1; Fig. 3d). Dunvegan and P&S held greater agreement than Caithness with

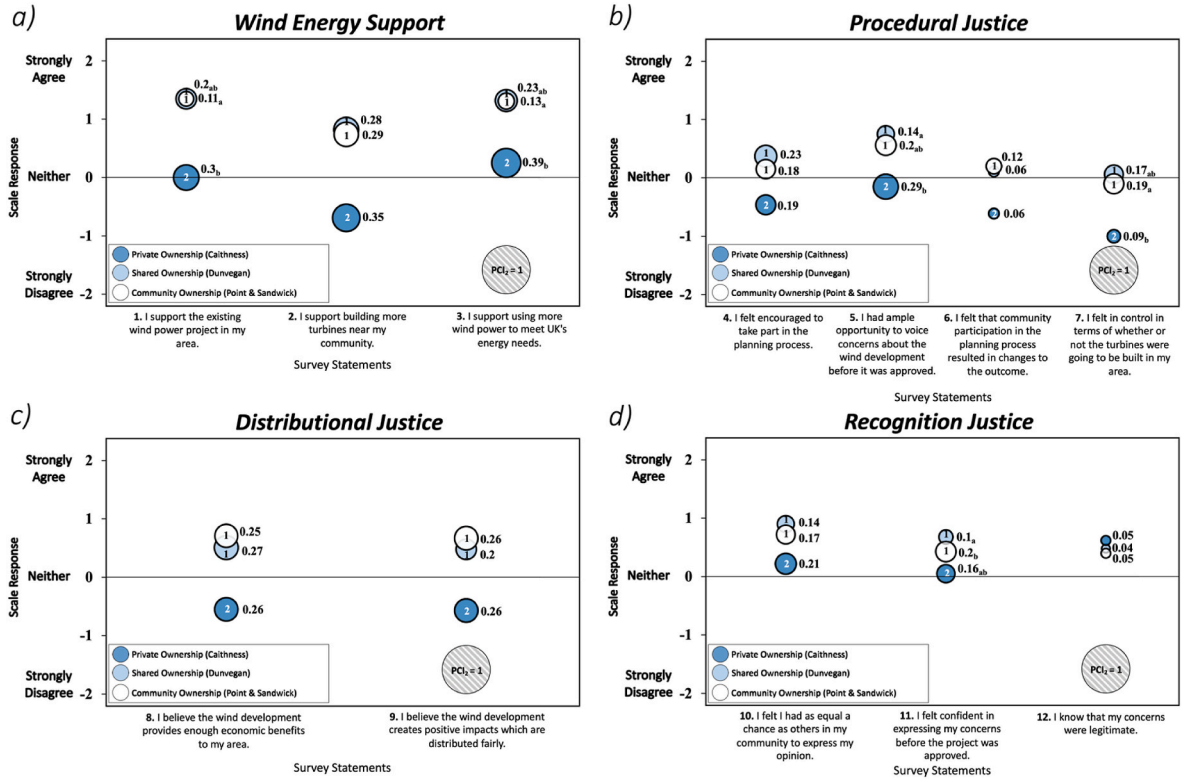

Fig. 3. The mean response for Caithness, Dunvegan, and Point and Sandwick and PCI_2 values for (a) wind energy support, (b) procedural justice, (c) distributional justice, and (d) recognition justice statements. The numbers within the bubbles (1, 2, 3) denote if there is a significant difference between the means tested using one-way ANOVAs. The subscript (a, b, c) beside the PCI_2 values show if there is a significant difference in the PCI_2 for the three groups tested using difference test. If there is no number within the bubbles (i.e. all 1s) and/or a subscript beside the PCI_2 value, then there is no significant difference. For reference, the grey bubble depicts a PCI_2 value of 1.

(10) "I felt I had as equal a chance as others in my community to express my opinion" ($p < 0.001$; $p < 0.001$) and (11) "I felt confident in expressing my concerns before the project was approved" ($p < 0.001$; $p < 0.01$). Across these statements, views did not differ between Dunvegan and P&S ($p = 0.67$; $p = 0.27$). For (12) "I know that my concerns were legitimate" there was general agreement across communities (Caithness and Dunvegan $p = 0.71$; Caithness and P&S $p = 0.10$; Dunvegan and P&S $p = 1.0$).

The PCI_2 values ranged from 0.04 to 0.21, low PCI_2 values, across the recognition justice statements (Fig. 3d). There were no significant differences in PCI_2 values between any communities across statement 10 or 12 ($p > 0.05$). For statement 11, respondents of P&S had higher PCI_2 values than that of Dunvegan ($p < 0.05$). However, these values were generally low (0.2 and 0.1, respectively). For statement 12, no differences were found between communities.

4.6. Perceived impacts

4.6.1. Aesthetic/environmental perceived impacts

Perceived risks were separated into aesthetic/environmental and economic/health perceived impacts. For aesthetic/environmental statements, the differences varied across statements (Table 1; Fig. 4a). For (13) "wind turbines make the natural landscape less appealing", Caithness respondents agreed more, on average, than Dunvegan or P&S, whose views did not differ and tended to be more neutral or agree ($p > 0.05$). For (14) "wind turbines are a threat to birds and bats", the views were mixed, whereby Caithness agreed more than P&S and Dunvegan ($p = 0.002$; $p = 0.01$, respectively), followed by P&S who were more neutral than Dunvegan, who tended to disagree ($p < 0.01$). Finally, general agreement was expressed for (15) "wind turbines help tackle climate change", but Dunvegan and P&S respondents agreed more than Caithness ($p < 0.001$; $p < 0.001$) and did not differ from each other ($p = 0.59$).

The PCI_2 values ranged from 0.11 to 0.32, low to moderate values, across the statements 13–15 (Fig. 4a). The difference test revealed no significant differences in PCI_2 values between any groups for statements 13–14 ($p > 0.05$; Fig. 4a However, for the statement 15, Dunvegan and P&S residents were found to have lower PCI_2 values than those of Caithness ($p < 0.05$; $p < 0.05$, respectively).

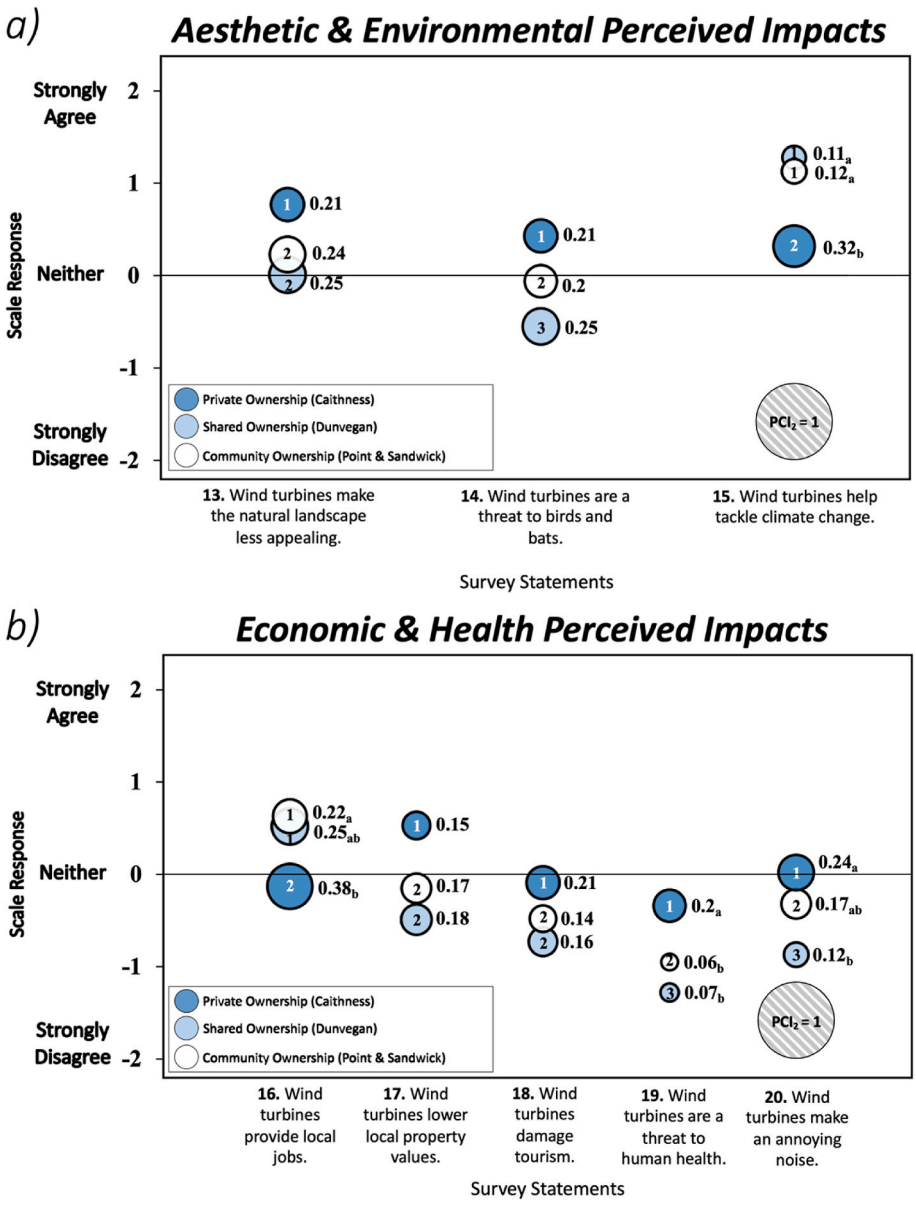

Fig. 4. The mean response for Caithness, Dunvegan, and Point and Sandwick and PCI_2 values for (a) aesthetic and environmental perceived impacts and (b) economic and health perceived impacts statements. The numbers within the bubbles (1, 2, 3) denote if there is a significant difference between the means tested using one-way ANOVAs. The subscript (a, b, c) beside the PCI_2 values show if there is a significant difference in the PCI_2 for the three groups tested using difference test. If there is no number within the bubbles (i.e. all 1s) and/or a subscript beside the PCI_2 value, then there is no significant difference. For reference, the grey bubble depicts a PCI_2 value of 1.

4.6.2. Economic and health perceived impacts. Reactions were mixed across the statement for economic and health perceived impacts (Table 1, Fig. 4b). Dunvegan and P&S respondents tended to agree more than Caithness who were neutral on average, with (16) "wind turbines provide local jobs" ($p = 0.001$; $p < 0.001$). A similar trend was found across both statements (17) "wind turbines lower local property values" and (18) "wind turbines damage tourism", whereby Caithness respondents either agreed or were more neutral than Dunvegan and P&S who tended to disagree ($p < 0.001$; $p < 0.001$, $p < 0.001$; $p = 0.01$), but were similar to each other ($p = 0.86$; $p = 0.08$; $p = 0.30$). For (19) "wind turbines are a threat to human health" and (20) "wind turbines make an annoying noise", there was general disagreement, whereby Dunvegan respondents disagreed more than P&S and Caithness ($p = .\ 0.31$; $p < 0.001$; $p = 0.001$; $p < 0.001$), and P&S disagreed more than Caithness ($p < 0.001$; $p = 0.032$).

The PCI_2 values ranged from 0.06 to 0.38, low to moderate values, across the economic/health statements (Fig. 4b). For statement 16, views differed between P&S and Caithness ($p < 0.05$), but no difference found between Dunvegan and the other communities ($p > 0.05$). PCI_2 values for statements 17 and 18 did not differ ($p > 0.05$). For statement 19, P&S and Dunvegan respondents had lower PCI_2 values than Caithness ($p < 0.05$), but did not differ from each other ($p > 0.05$). For the statement 20, Dunvegan residents had a lower PCI_2 value than Caithness ($p < 0.05$), but no other differences between communities were found ($p > 0.05$).

4.7. Ownership and benefit preferences

Views also varied across ownership and benefit options (Table 1; Fig. 5). There was general agreement across communities that (21) "Wind energy is best when it is fully owned by local communities", but P&S agreed more than the others ($p < 0.001$; $p < 0.001$). No other differences were found ($p = 1$). In contrast, all communities disagreed, on average, with the statement (22) "Wind energy is best when the local communities own a minority of the project (e.g., 10%)", where P&S residents disagreed more than Caithness or Dunvegan residents ($p = 0.01$; $p < 0.001$). Responses in Dunvegan and Caithness were similar ($p = 0.41$). While all were in agreement, with (23) "Local residents should be able to invest in and share in the profits from local wind energy", Dunvegan or P&S tended to agree more than respondents in Caithness ($p < 0.005$; $p < 0.005$), but did not differ from each other ($p = 1$). Finally, views were mixed for (24) "I believe the wind turbine development should have a fund that contributes to community projects (i.e. community benefits)", finding that respondents in Caithness disagreed more than P&S or Dunvegan ($p < 0.001$; $p < 0.001$), and Dunvegan agreed more than P&S respondents ($p < 0.001$).

The PCI_2 values ranged from 0.03 to 0.27, low to moderate values, across the benefit statements (Fig. 5). No differences were found in PCI_2 values between any groups across all statements ($p > 0.05$), except for statement 22, where P&S had a higher PCI_2 value, than Dunvegan and Caithness ($p < 0.05$).

5. Discussion

Research has demonstrated that community ownership fosters higher local acceptance because it is, at least somewhat, interwoven with more just processes and outcomes (Baxter et al., 2020; Walker and Devine-Wright, 2008). Similarly, we found that the residents in the two communities with varying degrees of community ownership, P&S (Community Ownership) and Dunvegan (Shared Ownership – i.e. a co-operative), are more associated with supporting their local wind project and wind energy generally, perceiving greater procedural justice and distributional justice (i.e. process and outcomes), perceiving less risks, and preferring more their own form of ownership and benefits, than residents near the project in Caithness, which is privately owned. Through this detailed comparison of community attitudes across a gradient of ownership, we extract several nuances that elucidate what makes these ownership projects different from a privately owned development. Additionally, we reveal striking similarities between different forms of ownership, providing evidence that a co-operative can achieve similar levels of acceptance and energy justice as a fully community-owned project. Below we highlight several important findings.

5.1. Investigating energy justice and perceived impacts in community ownership

Complementary to Walker and Devine-Wright's (2008) 'ideal' community energy projects, both the processes and the outcomes surrounding the local wind development were perceived more favourably within communities who were more accepting of the windfarm and had a degree of ownership (Fig. 3b&c). It is noteworthy that while both P&S

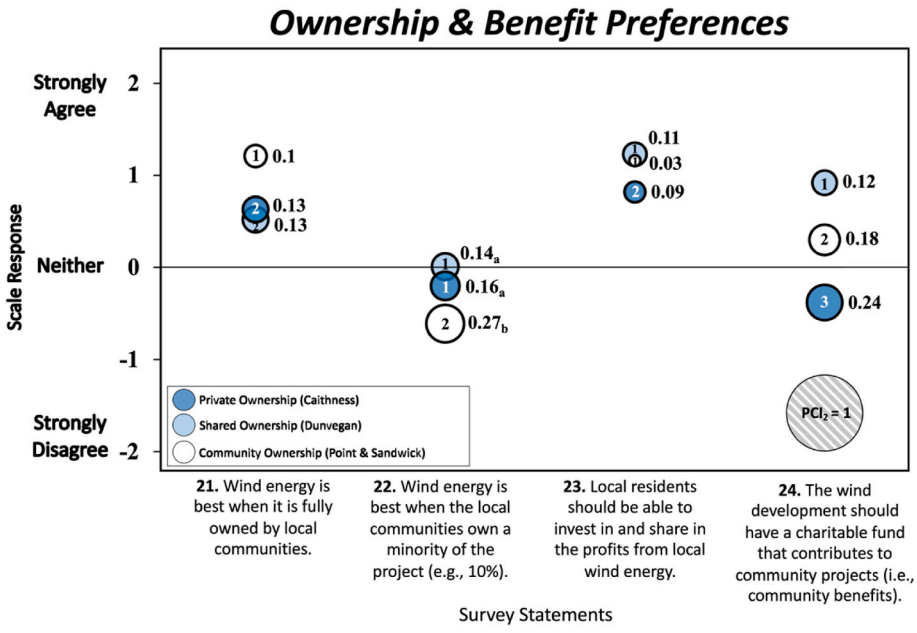

Fig. 5. The mean response for Caithness, Dunvegan, and Point and Sandwick and PCI_2 values for ownership and benefit preferences. The numbers within the bubbles (1, 2, 3) denote if there is a significant difference between the means tested using one-way ANOVAs. The superscript (a, b, c) beside the PCI_2 values show if there is a significant difference in the PCI_2 for the three groups tested using difference test. If there is no number within the bubbles (i.e. all 1s) and/or a superscript beside the PCI_2 value, then there is no significant difference. For reference, the grey bubble depicts a PCI_2 value of 1.

and Dunvegan projects include some ownership, their models differ – i.e. P&S own and receive full profits whereas Dunvegan is part of a co-operative and only receives a share of the profits. Thus, while both communities perceived similarly just outcomes (distributional justice, Fig. 3d), P&S actually receives greater financial benefits overall. There are several possible explanations for these findings. Firstly, as seen in previous research, the benefits provided for community ownership may far exceed the communities' expectations (Rogers et al., 2008). Secondly, some value clashes cannot be addressed through compensation and, thus, require fair procedures and transparency (Leer Jørgensen et al., 2020). These points both support Cowell et al., 2011 argument that more attention needs to be paid to procedural justice.

Indeed, the similarities found may be due to the shared community features (i.e. features which involve greater community engagement) found in co-operatives and community ownership (Bauwens and Devine-Wright, 2018). While Dunvegan's co-operative is not entirely "driven and carried through by a group of local people" (Walker and Devine-Wright, 2008, p. 498), the developer Falck Renewables provides procedural member benefits such as a vote to constitute a board of local members (Isle of Skye Renewables Co-operative, 2022). They also held a competition to name the turbines, with the winner opening the turbine ceremony (Isle of Skye Renewables Co-operative, 2022). Through naming, Dunvegan residents may identify more with the turbines, a practice found in other community-led projects (Warren and McFadyen, 2010) and found in identity research (Bauwens and Devine-Wright, 2018). Nevertheless, not every shared ownership project has these features; for example, in those involving third parties with greater investment risks, members of the co-operative can be excluded from decision-making (van Bommel and Höffken, 2021). Thus, we suggest that a closer inspection of 'community features' across ownership models is needed as they may be important aspects in increased acceptance.

Linked to outcomes, the findings in Caithness were less surprising. Caithness receives considerably lower benefits than the other communities (e.g. P&S receives £750,000 more each year, Point and Sandwick Trust, 2021). In Scotland, community benefits have become a standard aspect of commercial developments and are now broadly consistent across different contexts. This uniformity highlights the lack of say that communities have in deciding what form benefits will take, potentially causing the payments to be viewed as bribery, i.e. money provided to offset or silence serious concerns (Baxter et al., 2013). For example, one resident commented that "community benefits are just a bribe to get planning permissions" (Caithness Resident 1). Similar comments reiterate insufficient consultation involved in community benefits, and they support Walsh's (2016) conclusion that understanding communities' expectations is a vital part of process. This aligns with research looking at the impact of perceived bribes on the acceptance of windfarms (Walker and Baxter, 2017b), but it also raises the question of whether an open and participatory process is more important than local, shared and collective financial benefits (Baxter et al., 2020). For example, would a project which only provides community benefits become more acceptable if it provided more just processes (e.g. democratic structures)?

In our study, those who perceived unjust processes and outcomes (i.e. Caithness residents) also perceived higher risks across all variables including aesthetics, jobs, property values, tourism, health and noise. These results may relate to previous findings that fairness of process (Mills et al., 2019) and the inequality of benefit packages (Kasperson and Kasperson, 2005) influence risk concerns. Nevertheless, these patterns were predictable in Caithness considering 240 representations were received against the initial planning proposal, objecting to potential impacts on landscapes, birds, tourism, and health (Caithness Area Planning and Building Standards Manager, 2006). While planning permission was accepted in 2013, our results indicate unresolved concerns which could be associated with a lack of perceived energy justice in Caithness.

Aligning with previous research (Simcock, 2016; Walker et al., 2015; Walker and Baxter, 2017a), the communities in this research only perceived certain elements of procedural justice during the development of their respective local windfarms. We found that the degree of agreement/disagreement decreased when the statements were more about control (see statements 6 and 7, Fig. 3b). Thus, there may be a disconnect between those who live with and who ultimately make decisions for the windfarm, even for community ownership. Community owned projects are usually developed by a few dedicated community members who typically have some level of expertise, time or funds available to support such a project, leading to a potentially exclusionary process (Park, 2012). This indicates that, regardless of the type of ownership, all projects should clearly invite locals to participate in the decision-making process, especially those who have no obvious control such as locals without landholdings on which turbines could be built (Walsh, 2016).

The differences between communities for statements relating to self-recognition justice were less plain. While residents with ownership schemes agree more that they had an equal chance and confidence to express their concerns than residents with no ownership stake, the differences were matters of degree rather than contrasting views. There was slightly less agreement around confidence which may impact whose voices are heard as self-confidence is an essential part in being able to raise concerns or for petitions to be treated fairly (Bailey and Darkal, 2018). A lack of self-confidence could also be related to the lack of control felt by the residents. Thus, using townhall type of engagements may lead to uneven participation skewed by the "noisiness" of certain actors (Fuller and McCauley, 2016). As recognition is rarely explored alongside the other tenets, further exploration is merited, especially to examine whether different procedural strategies lead to greater confidence.

The patterns discerned for perceptions of energy justice support Walker and Devine-Wright's (2008) components of process and outcomes as key factors in whether renewable energy projects are accepted or opposed by local communities (Walker and Devine-Wright, 2008). These findings are emphasised by Dunvegan's windfarm having nine more turbines than P&S, contrasting previous research findings that smaller onshore wind projects are regarded as more acceptable by the community (Roddis et al., 2018). In order to further understand the impact of process and outcomes, future research should examine the relationships that exist with each other, with perceived impacts, and with acceptance. If similar findings to Mills et al. (2019) and Kasperson and Kasperson (2005) are found, a combination of energy justice and ownership may prove fundamental in the acceptance of onshore wind energy.

5.2. Community coexistence

Considering that communities often experience conflict (Baxter et al., 2013) and that they can feel "fractured between those who are 'in' and 'out'" (Walker et al., 2010, p. 2657), the fact that all communities in this research had fairly high consensus (PCI_2 average about 0.18) is striking. Instead, there was some evidence of conflict between communities of place, those living nearby, and communities of interest, those who do not live nearby but have invested interest in the project (Bauwens and Devine-Wright, 2018; Walker et al., 2010). For example, a Caithness resident commented that "overly expensive wind turbines only benefit the companies and wind owners, many of whom do not live with the effects of said turbines" (Caithness Resident 2). This merits further investigation, especially as Stroupster windfarm in Caithness has changed owner several times and the current owner is based in London. Similarly, in P&S there was a distinct difference in how residents felt about community-owned and privately owned wind developments, especially as there was a private wind farm being proposed in the same area at the time of our survey, which currently has planning consent (EDF, 2022). Several residents made direct comparisons, one stating that "my perception is that locally the Beinn Ghrideag farm is strongly

supported, but the commercial farms are not … Profits leave the local area, but we live with the effects" (P&S Resident 1). Similarly, another commented that "[they] strongly support small scale communities' wind power. However, the EDF windfarm is shocking both in scale and lack of consultation" (P&S Resident 2). These comments emphasise the importance that these residents place on community ownership and consultation, both of which came through as characteristics in communities with greater acceptance.

5.3. Ownership and benefit preferences

Similar to Walker and Baxter's (2017a) findings, residents preferred local investing and sharing over fully locally owned projects, but only by degree. An exception was that P&S residents supported both (Fig. 5). Previous research on the Isle of Lewis has similarly found that ownership can be viewed as a way to "make the best of a bad situation" (Murphy and Smith, 2013, p. 699). However, we also found that all communities tended to disagree with owning a minority of the project (e.g. 10%, statement 22). The disparity between minority ownership and investing may be due to a variety of reasons such as statement 22 not including outcomes as seen in statement 23 (i.e. sharing in profits), the percentage of ownership being too low, or using the wording owning a 'minority' instead of shared ownership. Further research is needed in order to clarify. Community benefits were viewed more variably (statement 24), with negative attitudes towards community benefits expressed in Caithness but positive attitudes in Dunvegan. The recent policy shift in Scotland to include community benefits in shared ownership projects (Scottish Government, 2019b) may be viewed positively in Dunvegan. For example, Falck Renewables implemented a lower investment minimum, complementary to previous research suggestions (Baxter, 2017; Walker and Baxter, 2017b), but not every resident will be able to invest in the project making community benefits more important to the wider community (Grashof, 2019; Walker and Baxter, 2017b). Nonetheless, the Caithness results indicate that care should be taken in how community benefits are implemented.

5.4. Limitations

Several limitations to this study should be noted. Firstly, while our dataset reveals communities' attitudes at a particular moment, it does not document changes over time for which longitudinal data would be required. Secondly, as previous research found differences between members and non-members of a co-operative, it may be important to disentangle these instances (Bauwens and Devine-Wright, 2018) but our data did not permit this. Further, these communities represent particular cases of the different ownership models employed in Scotland, each embodied in a specific socio-geographic setting. Additional research is necessary across different projects with similar benefit schemes as well as being coupled with qualitative methodology to test the broader applicability of these results. Additionally, P&S was sampled as they own the wind turbines (the turbines were built on common land, see Fig. 2), but there are households in Stornoway which would be closer to the turbines and may hold differing opinions. As all residents in the Western Isles can benefit from this community project, perhaps using a 2 km radius around the wind turbines for sampling (as seen in Walker and Baxter, 2017a) would have provided a clearer understanding of local conflicts. Lastly, in order to understand the generalisability of our findings across different contexts, similar questions should also be investigated across various renewable technologies (e.g. solar, wave), across different forms of shared ownership (e.g. joint venture vs co-operatives), and across different socio-political perspectives.

6. Conclusion & policy implications

The aim of this research was to gain a deeper understanding of the characteristics of community-based ownership which are conducive to community acceptance. We found that residents from the two case studies with full or shared ownership were interwoven with enhanced processes and outcomes – i.e. more just and inclusive development processes and more fairly distributed benefits and impacts. Similar patterns are present in other studies (e.g. Gross, 2007; Ki et al., 2022; Walker and Baxter, 2017b, 2017a; Warren and McFadyen, 2010), but do not usually compare acceptance across a gradient of ownership. Through this comparison of three communities with varying ownership (i.e. community, shared, and private ownership), we also reveal striking consistencies between a community and co-operative project (P&S and Dunvegan) providing evidence that a co-operative has the ability to deliver just energy practices.

These results are comparable to early wind developments in Germany, which received greater acceptance and were often controlled by local co-operatives (Warren and Birnie, 2009). More recently, however, wind energy acceptance in Germany has decreased, associated with the transition to competitive auctions which resulted in substantial market shares being held by large companies (Grashof, 2019). This example stresses that if the inclusion of communities is a serious priority, an even playing field between local and private projects is essential. In turn, these findings could also help facilitate achieving ambitious renewable energy targets. Due to the small-scale nature of community renewables, they are unlikely to provide a significant enough contribution to the exponential growth needed in order to reach global renewable energy targets (Warren and McFadyen, 2010). Conversely, co-operatives can deliver large-scale projects due to private owners being able to spread financial risks (Goedkoop and Devine-Wright, 2016; Haggett and Aitken, 2015) and having greater access to experience, skills, and time (Haggett and Aitken, 2015).

Nevertheless, caution is warranted in these results as we only compared three communities and there is variability in the format in which shared ownership projects take (e.g. co-operatives, joint venture, shared revenue). Moreover, Goedkoop and Devine-Wright's (2016) study of the future potential of shared ownership in the UK warns of a lack of trust, such that community actors saw shared ownership as a way for developers to buy their way past planning permission, while developers viewed community actors as unrepresentative of the whole community and lacking in the skills necessary to build a partnership. However, the co-operative in Dunvegan provides an example of a shared ownership project with fair processes and outcomes. We acknowledge the importance of context and locality in influencing the success of a project, such as Dunvegan's access to Energy4All. Energy4All has been working in the UK to expand co-operatives since 2012 (Energy4all, 2022). They work with communities and build trust by helping to develop a business case, raise funds, and provide technical expertise (Energy4all, 2022). If there is a lack of trust, the future development of co-operatives will likely depend on dedicated organisations such as Energy4all or experienced community actors willing to promote and provide advice based on lived experience. These results support the need for further reflection on the Scottish Government's goal to have an element of shared ownership in half of newly consented renewables by 2020 (Scottish Government, 2019b) and especially on how to support community uptake.

Overall, these findings suggest that policymakers should incorporate the connection between the tenets of energy justice and ownership models within their policy and planning efforts. There was considerable concern from community members about decisions regarding their area being made by 'outsiders' emphasising the importance local involvement in the decision-making process early, in a transparent fashion which promotes equity (Goedkoop and Devine-Wright, 2016). There should also be careful reflection over which scheme is used, taking into account that some non-monetary values cannot be assessed through traditional legal estimates (Leer Jørgensen et al., 2020, p.10). Finally, if the similarities between the community and co-operative projects are due to the shared 'community features', such as greater local engagement and involvement in the decision-making process, then increasing

these aspects across projects, regardless of the form of ownership, may help increase acceptance.

This research represents a step towards better comprehension of the characteristics of community-based ownership which may foster greater acceptance. The results in Dunvegan suggest that future research should test the potential of co-operatives in providing just energy developments. We call for such research to explore these findings across different contexts and geographic locations, but particularly across different co-operatives or shared ownership projects. If future results are consistent with this research, co-operatives may present an opportunity to expand the renewable sector in line with international climate change commitments, while simultaneously fostering greater justice for local onshore wind energy developments.

CRediT authorship contribution statement

Jessica L. Hogan: Primary author, responsible for the, Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review & editing, Funding acquisition. **Charles R. Warren:** Conceptualization, Writing – review & editing, Supervision. **Michael Simpson:** Conceptualization, Writing – review & editing, Supervision. **Darren McCauley:** Writing – review & editing, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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References

Agterbosch, S., Meertens, R.M., Vermeulen, W.J.V., 2009. The relative importance of social and institutional conditions in the planning of wind power projects. Renew. Sustain. Energy Rev. 13, 393–405. https://doi.org/10.1016/j.rser.2007.10.010.

Arnstein, S.R., 1969. A ladder of citizen participation. J. Am. Inst. Plan. 35, 216–224. https://doi.org/10.1080/01944366908977225.

Avila-Calero, S., 2017. Contesting energy transitions: wind power and conflicts in the Isthmus of Tehuantepec. Journal of Political Ecology 24, 992–1012. https://doi.org/10.2458/v24i1.20979.

Bailey, I., Darkal, H., 2018. (Not) talking about justice: justice self-recognition and the integration of energy and environmental-social justice into renewable energy siting. Local Environ. 23, 335–351. https://doi.org/10.1080/13549839.2017.1418848.

Bath, A.J., Engel, M.T., van der Marel, R.C., Kuhn, T.S., Jung, T.S., 2022. Comparative views of the public, hunters, and wildlife managers on the management of reintroduced bison (Bison bison). Global Ecology and Conservation 34, e02015. https://doi.org/10.1016/j.gecco.2022.e02015.

Bauwens, T., Devine-Wright, P., 2018. Positive energies? An empirical study of community energy participation and attitudes to renewable energy. Energy Pol. 118, 612–625. https://doi.org/10.1016/j.enpol.2018.03.062.

Baxter, J., 2017. Energy justice: participation promotes acceptance. Nat. Energy 2, 17128. https://doi.org/10.1038/nenergy.2017.128.

Baxter, J., Morzaria, R., Hirsch, R., 2013. A case-control study of support/opposition to wind turbines: perceptions of health risk, economic benefits, and community conflict. Energy Pol. 61, 931–943. https://doi.org/10.1016/j.enpol.2013.06.050.

Baxter, J., Walker, C., Ellis, G., Devine-Wright, P., Adams, M., Fullerton, R.S., 2020. Scale, history and justice in community wind energy: an empirical review. Energy Res. Social Sci. 68, 101532 https://doi.org/10.1016/j.erss.2020.101532.

Bell, D., Gray, T., Haggett, C., 2005. The 'social gap' in wind farm siting decisions: explanations and policy responses. Environ. Polit. 14, 460–477. https://doi.org/10.1080/09644010500175833.

Bell, D., Gray, T., Haggett, C., Swaffield, J., 2013. Re-visiting the 'social gap': public opinion and relations of power in the local politics of wind energy. Environ. Polit. 22, 115–135. https://doi.org/10.1080/09644016.2013.755793.

Caithness Area Planning and Building Standards (CAPBS) Manager, 2006. In: 05/00273/FULCA - Hill of Stroupster, Auckengill, Wick, Caithness. (Obtained under Section 20 of Freedom of Information (Scotland) Act from the Highland Council. Received March 2022).

Cohen, J.J., Reichl, J., Schmidthaler, M., 2014. Re-focussing research efforts on the public acceptance of energy infrastructure: a critical review. Energy 76, 4–9. https://doi.org/10.1016/j.energy.2013.12.056.

Combe, M., Glass, J., Tindley, A. (Eds.), 2020. Land Reform in Scotland. Edinburgh University Press.

Cowell, R., Bristow, G., Munday, M., 2011. Acceptance, acceptability and environmental justice: the role of community benefits in wind energy development. J. Environ. Plann. Manag. 54, 539–557. https://doi.org/10.1080/09640568.2010.521047.

Creamer, E., Taylor Aiken, G., van Veelen, B., Walker, G., Devine-Wright, P., 2019. Community renewable energy: what does it do? Walker and Devine-Wright (2008) ten years on. Energy Res. Social Sci. 57, 101223 https://doi.org/10.1016/j.erss.2019.101223.

Devine-Wright, P., 2004. Beyond NIMBYism: towards an integrated framework for understanding public perceptions of wind energy. Wind Energy 8, 125–139. https://doi.org/10.1002/we.124.

Devine-Wright, P., 2019. Community versus local energy in a context of climate emergency. Nat. Energy 4, 894–896. https://doi.org/10.1038/s41560-019-0459-2.

Doney, E.D., Bath, A.J., Vaske, J.J., 2018. Understanding conflict and consensus regarding wood bison management in Alaska, USA. Wildl. Res. 45, 229. https://doi.org/10.1071/WR17056.

Dorsey, K., 2015. Caithness Wind Farm Bought by Greencoat for £85m. Scotsman. https://www.scotsman.com/regions/inverness-highlands-and-islands/caithness-wind-farm-bought-greencoat-ps85m-1488557.

EDF, 2022. Stornoway Wind Farm. https://www.edf-re.uk/our-sites/stornoway/. accessed 7.18.22.

Energy4all, 2022. What We Do. https://energy4all.co.uk/about-us/what-do-we-do/. accessed 7.19.22.

Engel, M.T., Vaske, J.J., 2022. Balancing public acceptability and consensus regarding marine protected areas management using the Potential for Conflict Index2. Mar. Pol. 139, 105042 https://doi.org/10.1016/j.marpol.2022.105042.

Fischhendler, I., Herman, L., Barr, A., Rosen, G., 2021. The impact of community split on the acceptance of wind turbines. Sol. Energy 220, 51–62. https://doi.org/10.1016/j.solener.2021.01.055.

Fuller, S., McCauley, D., 2016. Framing energy justice: perspectives from activism and advocacy. Energy Res. Social Sci. 11, 1–8. https://doi.org/10.1016/j.erss.2015.08.004.

Genus, A., Coles, A.-M., 2008. Rethinking the multi-level perspective of technological transitions. Res. Pol. 37, 1436–1445. https://doi.org/10.1016/j.respol.2008.05.006.

Goedkoop, F., Devine-Wright, P., 2016. Partnership or placation? The role of trust and justice in the shared ownership of renewable energy projects. Energy Res. Social Sci. 17, 135–146. https://doi.org/10.1016/j.erss.2016.04.021.

Grashof, K., 2019. Are auctions likely to deter community wind projects? And would this be problematic? Energy Pol. 125, 20–32. https://doi.org/10.1016/j.enpol.2018.10.010.

Grillanda, A., Khanal, P., 2019. Community and Locally Owned Renewable Energy in Scotland at June 2019.

Gross, C., 2007. Community perspectives of wind energy in Australia: the application of a justice and community fairness framework to increase social acceptance. Energy Pol. 35, 2727–2736. https://doi.org/10.1016/j.enpol.2006.12.013.

Haggett, C., Aitken, M., 2015. Grassroots energy innovations: the role of community ownership and investment. Current Sustainable/Renewable Energy Reports 2, 98–104. https://doi.org/10.1007/s40518-015-0035-8.

Hoen, B., Wiser, R., Cappers, P., Thayer, M., Sethi, G., 2011. Wind energy facilities and residential properties: the effect of proximity and view on sales prices. J. R. Estate Res. 33, 279–316. https://doi.org/10.1080/10835547.2011.12091307.

Hogan, J.L., Sponarski, C.C., Bath, A.J., 2019. All-terrain vehicles: differences in perceptions of impact on coastal dunes among communities in New Brunswick, Canada. Journal of Outdoor Recreation and Tourism 26, 61–71. https://doi.org/10.1016/j.jort.2019.02.001.

Hurlbert, M., Rayner, J., 2018. Reconciling power, relations, and processes: the role of recognition in the achievement of energy justice for Aboriginal people. Appl. Energy 228, 1320–1327. https://doi.org/10.1016/j.apenergy.2018.06.054.

IEA, 2021. Renewables 2021: Analysis and Forecasts to 2026. International Energy Agency, Paris.

Isle of Skye Renewables Co-operative (IOSRC), 2022. Home. https://www.skye.coop/ accessed 2.10.22.

Jenkins, K., McCauley, D., Heffron, R., Stephan, H., Rehner, R., 2016. Energy justice: a conceptual review. Energy Res. Social Sci. 11, 174–182. https://doi.org/10.1016/j.erss.2015.10.004.

Jenkins, K., Samarakoon, S., Munro, P., 2019. Energy economics as an energy justice dilemma: case studies of normative trade-offs in Malawi, Mexico, and Germany. In: Routledge Handbook of Energy Economics. Routledge, pp. 79–97.

Jepson, W., Brannstrom, C., Persons, N., 2012. We Don't Take the Pledge": environmentality and environmental skepticism at the epicenter of US wind energy development. Geoforum 43, 851–863. https://doi.org/10.1016/j.geoforum.2012.02.002.
Kasperson, J.X., Kasperson, R.E., 2005. The Social Contours of Risk: Risk Analysis, Corporations & the Globalization of Risk. Earthscan, London.
Ki, J., Yun, S.-J., Kim, W.-C., Oh, S., Ha, J., Hwangbo, E., Lee, H., Shin, S., Yoon, S., Youn, H., 2022. Local residents' attitudes about wind farms and associated noise annoyance in South Korea. Energy Pol. 163, 112847 https://doi.org/10.1016/j.enpol.2022.112847.
Kumar, A., Aiken, G.G., 2021. A postcolonial critique of community energy: searching for community as solidarity in India and Scotland. Antipode 53, 200–221. https://doi.org/10.1111/anti.12683.
Langer, K., Decker, T., Roosen, J., Menrad, K., 2016. A qualitative analysis to understand the acceptance of wind energy in Bavaria. Renew. Sustain. Energy Rev. 64, 248–259. https://doi.org/10.1016/j.rser.2016.05.084.
Leer Jørgensen, M., Anker, H.T., Lassen, J., 2020. Distributive fairness and local acceptance of wind turbines: the role of compensation schemes. Energy Pol. 138, 111294 https://doi.org/10.1016/j.enpol.2020.111294.
Lehr, U., Nitsch, J., Kratzat, M., Lutz, C., Edler, D., 2008. Renewable energy and employment in Germany. Energy Pol. 36, 108–117. https://doi.org/10.1016/j.enpol.2007.09.004.
Leiren, M.D., Aakre, S., Linnerud, K., Julsrud, T.E., di Nucci, M.-R., Krug, M., 2020. Community acceptance of wind energy developments: experience from wind energy scarce regions in europe. Sustainability 12, 1754. https://doi.org/10.3390/su12051754.
Local Energy Scotland, 2021. Cares case study: stroupster community fund. https://www.localenergy.scot/media/110708/stroupster-community-fund-cares-case-study.pdf accessed 7.14.21.
McCauley, D., Heffron, R., 2018. Just transition: integrating climate, energy and environmental justice. Energy Pol. 119, 1–7. https://doi.org/10.1016/j.enpol.2018.04.014.
McCauley, D.A., Heffron, R.J., Stephan, H., Jenkins, K., 2013. Advancing energy justice: the triumvirate of tenets. International Energy Law Review 32, 107–110.
McCauley, D., Ramasar, V., Heffron, R.J., Sovacool, B.K., Mebratu, D., Mundaca, L., 2019. Energy justice in the transition to low carbon energy systems: exploring key themes in interdisciplinary research. Appl. Energy 233–234, 916–921. https://doi.org/10.1016/j.apenergy.2018.10.005.
Mills, S.B., Bessette, D., Smith, H., 2019. Exploring landowners' post-construction changes in perceptions of wind energy in Michigan. Land Use Pol. 82, 754–762. https://doi.org/10.1016/j.landusepol.2019.01.010.
Mostafaeipour, A., 2010. Productivity and development issues of global wind turbine industry. Renew. Sustain. Energy Rev. 14, 1048–1058. https://doi.org/10.1016/j.rser.2009.10.031.
Murphy, J., Smith, A., 2013. Understanding transition—periphery dynamics: renewable energy in the highlands and Islands of Scotland. Environ. Plann.: Econ. Space 45, 691–709. https://doi.org/10.1068/a45190.
National Records of Scotland, 2011. Scotland's census 2011. https://www.scotlandscensus.gov.uk/ accessed 8.17.21.
Ólafsdóttir, R., Sæþórsdóttir, A.D., 2019. Wind farms in the Icelandic highlands: attitudes of local residents and tourism service providers. Land Use Pol. 88, 104173 https://doi.org/10.1016/j.landusepol.2019.104173.
Ottinger, G., Hargrave, T.J., Hopson, E., 2014. Procedural justice in wind facility siting: recommendations for state-led siting processes. Energy Pol. 65, 662–669. https://doi.org/10.1016/j.enpol.2013.09.066.
Park, J.J., 2012. Fostering community energy and equal opportunities between communities. Local Environ. 17, 387–408. https://doi.org/10.1080/13549839.2012.678321.
Pastukhova, M., Westphal, K., 2020. Governing the global energy transformation. In: Hafner, M., Tagliapietra, S. (Eds.), The Geopolitics of the Global Energy Transition. Springer International Publishing, Cham, pp. 341–364. https://doi.org/10.1007/978-3-030-39066-2_15.
Pellegrini-Masini, G., Pirni, A., Maran, S., 2020. Energy justice revisited: a critical review on the philosophical and political origins of equality. Energy Res. Social Sci. 59, 101310 https://doi.org/10.1016/j.erss.2019.101310.
Point and Sandwick Trust, 2021. Our wind farm. http://www.pointandsandwick.co.uk/about-us/our-wind-farm/ accessed 7.14.21.
Rand, J., Hoen, B., 2017. Thirty years of North American wind energy acceptance research: what have we learned? Energy Res. Social Sci. 29, 135–148. https://doi.org/10.1016/j.erss.2017.05.019.
Renewables, Falck, 2016. Ben Aketil Wind Farm. https://www.falckrenewables.com/it/business?sc_lang=en. accessed 7.14.21.
Roddis, P., Carver, S., Dallimer, M., Norman, P., Ziv, G., 2018. The role of community acceptance in planning outcomes for onshore wind and solar farms: an energy justice analysis. Appl. Energy 226, 353–364. https://doi.org/10.1016/j.apenergy.2018.05.087.
Roddis, P., Carver, S., Dallimer, M., Ziv, G., 2019. Accounting for taste? Analysing diverging public support for energy sources in Great Britain. Energy Res. Social Sci. 56, 101226 https://doi.org/10.1016/j.erss.2019.101226.
Rogers, J.C., Simmons, E.A., Convery, I., Weatherall, A., 2008. Public perceptions of opportunities for community-based renewable energy projects. Energy Pol. 36, 4217–4226. https://doi.org/10.1016/j.enpol.2008.07.028.
Rudolph, D., Haggett, C., Aitken, M., 2017. Community benefits from offshore renewables: the relationship between different understandings of impact, community, and benefit. Environment and Planning C: Politics and Space 36, 92–117. https://doi.org/10.1177/2399654417699206.
Scottish Government, 2019a. Community benefits from onshore renewable energy developments. https://www.gov.scot/publications/scottish-government-good-practice-principles-community-benefits-onshore-renewable-energy-developments/ accessed 6.29.21.
Scottish Government, 2019b. Shared ownership of onshore renewable energy developments. https://www.gov.scot/publications/scottish-government-good-practice-principles-shared-ownership-onshore-renewable-energy-developments/ accessed 6.29.21.
Sharp, R.L., Larson, L.R., Green, G.T., 2011. Factors influencing public preferences for invasive alien species management. Biol. Conserv. 144, 2097–2104. https://doi.org/10.1016/j.biocon.2011.04.032.
Shove, E., Walker, G., 2007. Caution! Transitions ahead: politics, practice, and sustainable transition management. Environ. Plann.: Econ. Space 39, 763–770. https://doi.org/10.1068/a39310.
Slee, B., 2020. Social innovation in community energy in Scotland: institutional form and sustainability outcomes. Global Transitions 2, 157–166. https://doi.org/10.1016/j.glt.2020.07.001.
Slee, B., Harnmeijer, J., 2017. Community renewables: balancing optimism with reality. In: Wood, G., Baker, K. (Eds.), A Critical Review of Scottish Renewable and Low Carbon Energy Policy. Palgrave Macmillan, Cham, pp. 35–64.
Sovacool, B.K., Heffron, R.J., McCauley, D., Goldthau, A., 2016. Energy decisions reframed as justice and ethical concerns. Nat. Energy 1, 16024. https://doi.org/10.1038/nenergy.2016.24.
The Highland Council, 2013. Appeal Decision Notice with Conditions. https://wam.highland.gov.uk/wam/files/307043F8EDA46B70AC18DFA901897594/pdf/05_00273_FULCA-APPEAL_DECISION_NOTICE_WITH_CONDITIONS-551449.pdf. accessed 2.10.22.
Thibaut, J., Walker, L., 1975. Procedural Justice: A Psychological Analysis.
van Bommel, N., Höffken, J.I., 2021. Energy justice within, between and beyond European community energy initiatives: a review. Energy Res. Social Sci. 79, 102157 https://doi.org/10.1016/j.erss.2021.102157.
van der Waal, E.C., 2020. Local impact of community renewable energy: a case study of an Orcadian community-led wind scheme. Energy Pol. 138, 111193 https://doi.org/10.1016/j.enpol.2019.111193.
Vaske, J.J., 2019. Survey research and analysis. In: second ed. Survey Research and Analysis. Sagamore-Venture., Urbana.
Vaske, J.J., Beaman, J., Barreto, H., Shelby, L., 2010. An extension and further validation of the potential for conflict index. Leisure Sci. 32, 240–254. https://doi.org/10.1080/01490401003712648.
Walker, G., 2009. Beyond distribution and proximity: exploring the multiple spatialities of environmental justice. Antipode 41, 614–636. https://doi.org/10.1111/j.1467-8330.2009.00691.x.
Walker, C., Baxter, J., 2017a. Procedural justice in Canadian wind energy development: a comparison of community-based and technocratic siting processes. Energy Res. Social Sci. 29, 160–169. https://doi.org/10.1016/j.erss.2017.05.016.
Walker, C., Baxter, J., 2017b. It's easy to throw rocks at a corporation": wind energy development and distributive justice in Canada. J. Environ. Pol. Plann. 19, 754–768. https://doi.org/10.1080/1523908X.2016.1267614.
Walker, G., Devine-Wright, P., 2008. Community renewable energy: what should it mean? Energy Pol. 36, 497–500. https://doi.org/10.1016/j.enpol.2007.10.019.
Walker, G., Devine-Wright, P., Hunter, S., High, H., Evans, B., 2010. Trust and community: exploring the meanings, contexts and dynamics of community renewable energy. Energy Pol. 38, 2655–2663. https://doi.org/10.1016/j.enpol.2009.05.055.
Walker, C., Baxter, J., Ouellette, D., 2015. Adding insult to injury: the development of psychosocial stress in Ontario wind turbine communities. Soc. Sci. Med. 133, 358–365. https://doi.org/10.1016/j.socscimed.2014.07.067.
Walsh, B., 2016. Community: a powerful label? Connecting wind energy to rural Ireland. Community Dev. J. 228–245. https://doi.org/10.1093/cdj/bsw038.
Warren, C.R., Birnie, R.v., 2009. Re-Powering Scotland: wind farms and the 'energy or environment?' debate. Scot. Geogr. J. 125, 97–126. https://doi.org/10.1080/14702540802712502.
Warren, C.R., McFadyen, M., 2010. Does community ownership affect public attitudes to wind energy? A case study from south-west Scotland. Land Use Pol. 27, 204–213. https://doi.org/10.1016/j.landusepol.2008.12.010.
Wolsink, M., 2007. Wind power implementation: the nature of public attitudes: equity and fairness instead of 'backyard motives. Renew. Sustain. Energy Rev. 11, 1188–1207. https://doi.org/10.1016/j.rser.2005.10.005.
Wüstenhagen, R., Wolsink, M., Bürer, M.J., 2007. Social acceptance of renewable energy innovation: an introduction to the concept. Energy Pol. 35, 2683–2691. https://doi.org/10.1016/j.enpol.2006.12.001.