Just Transitions Within Sectors and Industries Globally

Final report: Wind Energy and the Just Transition

Political and socio-economic pinch points in wind turbine manufacturing and windfarm communities in Europe and South Africa

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Dr. Lisa Schulte, Middlesex University, Spring 2022

Abbreviations

B-BBEE – Broad-based Black Economic Empowerment

BEIS – (Department of) Business, Energy and Industrial Strategy

CEO – Chief Executive Officer

CFO – Chief Financial Officer

CDF – Community Development Fund

CDT – Community Development Trust

CfD – Contracts for Difference

DR – Danish Broadcasting Corporation

CDU – Christlich Demokratische Union Deutschlands – Christian Democratic Union Germany

CSI – Corporate Social Investment

EEG – Eneuerbare Energiengesetz – Renewable Energy Act

EIF – Energy Investment Fund

FDP – Freie Demokratische Partei Deutschland – Free Democratic Party

FTE – Full-Time Equivalent

HDSA – Historically Disadvantaged South Africans

IGBCE – Industriegewerkschaft Bergbau, Chemie, Energie – Mining, Cheminal and Energy Utility Workers Trade Union

IG Metall – Industriegewerkschaft Metall – Metal Workers Trade Union

LCITP – Low Carbon Infrastructure Transition Programme

NPPF – National Planning Policy Framework

OEM – Original Equipment Manufacturer

R&D – Research and Development

REIPPP – Renewable Energy Independent Power Producer Procurement Programme

SPD – Sozialdemokratische Partei Deutschland – Social Democratic Party

Ver.di – Vereinigte Dienstleistungsgewerkschaft – Service Sector Trade union

VDMA – Verband Deutscher Maschinen und Anlagen Bauer – Association of the German Mechanical and Plant Engineering Industr

Summary

This report has been funded by the British Academy under the call the '*Just Transition within Sectors and Industries Globally*' (grant COVJT210011, October 27th, 2021 – March 22nd, 2022). It presents our finding from the research project '*Wind energy and the Just Transition: Political and socio-economic pinch points in wind turbine manufacturing and windfarm communities in Europe and South Africa*'. In this project, we explored four key pinch-points of the Just Transition: community outcomes leading to either acceptance or resistance to windfarms and skill formation, job quality and social dialogue in the wind turbine manufacturing industry.

This report presents our findings regarding these four pinch points and four key questions that were informed by the British Academy's call:

1. How is the Just Transition defined by workers, managers, social partners, and community stakeholders in the industry?

2. What are the political and socio-economic pinch points at windfarm manufacturing sites and in communities where windfarms are located?

3. How are work intensification and intensified use of the natural environment resulting from the political imperative to deploy wind turbines quickly and at large scale dealt with?

4. How can the process of structural change, meaning here the expansion of the wind turbine industry, be managed equitably so that communities and workers benefit more broadly?

Our findings are based on data from windfarm communities and the wind turbine industry in Germany, Denmark, South Africa and the UK, which we collected between the years 2012 and 2022. The bulk of our data consists of semi structured interviews and focus groups with in total 156 participants including industry experts, local citizens, activists, trade union and industry representatives, managers in the industry and workers, managers and instructors from skill formation providers, and municipal policy makers. We complemented this data with secondary sources, news clippings and policy documents to develop community and industry case studies for each country.

Some country differences were noted in the conception of the Just Transition. While Denmark, Germany and England had not explicit Just Transition policies, Scotland and South Africa did.

Participants from the manufacturing industry in Denmark, Germany and the UK had relatively narrow conceptions of the Just Transition with hopes that the energy transition would not lead to more social harm, that the individuals affected would receive some form of compensation, and that the process would involve social dialogue between employers and worker representatives. One important finding is that while trade unions and worker representation structures within companies need to be strong to protect skill formation, job quality and social dialogue, the wind turbine industry is mostly lacking these strong structures.

The conception of the Just Transition in windfarm communities across the countries tended to be broader; for instance, co-ownership schemes and community ownership schemes were seen as opportunities to challenge existing power relationships in the electricity supply industry.

Political and socio-economic pinch points included questions of the distribution of economic benefits and burdens, questions of inclusivity of decision making processes, the speed of the energy transition and electrification and concerns over rising energy costs, political and economic power struggles between local citizens' windfarms and large utilities and manufacturers, and – in the wind turbine manufacturing industry – global competition between manufacturers, the trend to ever

larger turbines, and the implications of highly ambitious or 'stop and go' renewable energy policies and the impact of local content requirements. These issues are far from being resolved.

Pressures on the cost of energy and of wind turbines put pressure on working conditions at the manufacturers and the service and maintenance industry for instance. The sector is not highly unionised and hence social dialogue and good labour standards are far from being ensured throughout. Participants reported that the sector still lacks the strength of labour rights and the level of perceived social and environmental commitment of more established energy industries. Although some good practice examples could be identified, for example in Scotland, South Africa and Nord Friesland, Germany, where windfarms provided important community benefits and at one of the two studied manufacturers where social dialogue and collective representation are relatively strong due to historical legacies of trade union presence and works councillors' effectively used rights of co-determination.

Our findings have important implications for the potential of success when framing the Just Transition as a 'global project of saving the planet' or as a 'global project of social solidarity'. While saving the climate de facto needs a global effort, individuals' specific, local concerns and their material interests in the energy transition need to be taken seriously and concretely addressed so that a global change can gain momentum.

Our policy recommendations therefore address two areas: (1) local co-ownership and community ownership schemes should be facilitated by policymakers as these, if implemented transparently and inclusively, increase local redistribution of economic benefits and participation in decision making with a concern for local social and environmental impact; (2) worker representation rights and social dialogue should be strengthened to ensure skill formation and good jobs in the wind turbine industry in the context of cost pressures and global competition.

Introduction

Lisa Schulte

> *"The concept of a 'Just Transition' encompasses political and policy imperatives to minimize the harmful impacts of industrial and economic transitions on workers, communities, and society more generally, and to maximize their potential benefits."*
>
> (Krawchenko and Gordon 2021, abstract)

The global wind turbine industry is key to developing low carbon energy systems. The EU's Green Deal Offshore Renewable Energy Strategy (2020) proposes actions to deploy an additional 300 GW of offshore wind by the year 2050 (European Commission, 2020). This is almost five times the current government commitments across Europe for the same year. The wind turbine industry is also suggested an important provider of new green jobs and a source of income and identity for the communities where wind turbines are manufactured and installed. The Danish wind turbine industry employed about 33,000 individuals and had a revenue of 128.5 billion DKK, which are roughly £13 billion in the year 2020 (Wind Denmark, 2021). In 2021 the German wind industry boasts one hundred thousand FTE (Deutsche Windguard, 2021). Similarly, highlighting the importance of the industry, the UK Prime Minister's "Ten Point Plan for a Green Industrial Revolution" estimates that the UK offshore wind industry would provide 60,000 jobs by 2030 (UK Government, 2020). Onshore and offshore wind energy also play a key role in South Africa where economic development experts estimate that leapfrogging into the large-scale expansion of renewable energy technology, such as wind, will help job creation and development (IRENA, 2021). However our findings suggest that local job creation and the wider redistribution across communities of the economic benefits of windfarms and the wind turbine industry are very much contingent upon policy choices and the underlying economic structure as well as the distribution of political power within countries and the sector.

The academic literature on the Just Transition attaches diverse meanings to the concept (e.g. Galgóczi, 2020; Heffron and McCauley, 2018; McCauley and Heffron, 2018; Newell and Mulvaney 2013). These conceptions however are not systematically grounded in research that gives voice to the individuals directly affected by the transition. With the concept originating from the North American labour movement (e.g. Mazzocchi, 1994) much empirical research focusses on the Just Transition of fossil fuel industries (Evans and Phelan, 2016; Goddard and Farrelly, 2018; Harrahill and Douglas, 2019; Kuriyama and Abe, 2021; Obeng-Odoom, 2021). Virtually no publication explores how renewable energy technologies may support the Just Transition, although great hopes are attached by policymakers to the renewables industry's ability to provide quality jobs and economic development (see for example US president Biden's widely received speech from April 2021 (The White House, 2021)). Moreover, the attention to fossil fuel industries comes with a focus on regions that still have a strong industrial base, whilst neglecting the position and lack of bargaining strength of communities who welcome renewable energy industries hoping to revitalise their local economies and recreate identities after many decades of industrial decline.

The academic literature identifies a spectrum of approaches to the concept Just Transition (Galgóczi, 2020). The narrow approach focusses on social dialogue and equitable outcomes for trade union members. In contrast, the broad approach is a more radical social project that focusses on the eradication of inequality and the inclusion of stakeholders across the globe in the process of greening economies and societies. Both conceptions have in common the concern with

distributive and procedural justice. Without discussing these more in depth, the literature accepts that distributive justice means the equal or equitable distribution of burdens and benefits and procedural justice means transparent and fair processes with participation of stakeholders. Who these stakeholders are and who are the burden bearers or beneficiaries defines the scope of one's concept of the Just Transition, narrow or broad. The ILO Guidelines (ILO, 2015), the Solidarity and Just Transition Silesia Declaration (UNFCC, 2018) and the UNFCC Gender Action Plan (UNFCC, 2020) are examples of a broad conceptualisation of the Just Transition. The table below gives a summary overview of what distinguishes the narrow and the broad conceptions from one another.

Table 1: The differences and commonalities of narrow and broad conceptions of Just Transition

Points in common: Concern with questions of distributive and procedural justice	
Points of difference:	
Narrow	**Broad**
How can negative effects of transition be mitigated for trade union members/workers in fossil fuel/polluting industries?	How can transition be achieved while increasing or at least maintaining equality/equity in political processes and economic transactions?
Aims to transform the jobs vs environment narrative -> creation of a 'win-win scenario'	Aims to transform economic relations within societies and between the global North and South
Selective view on polluting industries	Inclusive/ cosmopolitan view
Workplace and industry	Power relations in society/ economy
No challenge to the status quo of power relations	Expand participation of the range of actors who decide and benefit
Avoiding more inequality and social harm	More equality; decent work for all, eradicate poverty
Compensation, retraining, supporting transition to low-carbon jobs Support of decent, 'good quality' low carbon jobs	Broadening ownership of (energy) industry Benefits for disadvantaged individuals Cleaning up local pollution Creating income options for local communities Inclusive employment and training Improving living conditions
"Green Keynesianism" – Green growth Shared solutions: benefits all parties and is advocated by both industry and labour movement	Radical project of redistribution Transformative action Social/Environmental/Global energy/ Recognition/Restorative/Intergenerational/ Climate justice

(Based on a review of Bainton al., 2021; Galgóczi, 2020; Heffron and McCauley, 2018; Krawchenko and Gordon, 2021; McCauley and Heffron, 2018; Newell and Mulvaney, 2013; Stevis and Felli, 2015)

Galgóczi (2020) from the European Trade Union Institute (ETUI) states that the shape of the Just Transition will depend on existing capital and labour relationships, the way they are mediated by state institutions, the given socio-economic context, and the either conflictual or cooperative relations between social and economic stakeholders. In his words, there will be 'Varieties of Just Transitions'. Galgóczi makes implicit reference to the, among comparative political economy

scholars well-known, Varieties of Capitalisms approach (Hall and Soskice, 2001).

We intuitively agreed with Galgóczi's proposition and decided to explore it in more depth in case studies from countries chosen based on their institutional differences – liberal (England, Scotland, South Africa) and coordinated market economies (Germany and Denmark, the latter has also been referred to as hybrid between coordination and liberalism (Cambell and Pedersen, 2007)) (Hall and Soskice, 2001), as well as their differences in welfare state provisions – liberal (England and Scotland), conservative (Germany), social democratic (Denmark) (Esping-Andersen, 1990) and developmental/unconventional (South Africa), and their geographic location – Europe and the global South.

In our case studies we included dimensions that fit a narrow and a broad conception of the Just Transition. These dimensions are the distribution of community benefits in windfarm communities, leading either to acceptance or resistance, and the challenges to skill formation, job quality and social dialogue at wind turbine manufacturers. Our exploratory research indicated that these were salient issues in the wind turbine industry (Schulte, 2016; Robinson and Stephens, 2021; Stephens and Robinson, 2021). Our report addresses four key questions:

1. How is the Just Transition defined by workers, managers, social partners, and community stakeholders in the industry?

2. What are the political and socio-economic pinch points[1] at windfarm manufacturing sites and in communities where windfarms are located?

3. How are work intensification and intensified use of the natural environment resulting from the political imperative to deploy wind turbines quickly and at large scale dealt with?

4. How can the process of structural change, meaning here the expansion of the wind turbine industry, be managed equitably so that communities and workers benefit more broadly?

Our findings are based on data from windfarm communities and the wind turbine industry in Germany, Denmark, South Africa and the UK, which we collected over the past decade between the years 2012 and 2022. The bulk of our data consists of semi structured interviews and focus groups with in total 156 participants including industry experts, local citizens, activists, trade union and industry representatives, managers in the industry and workers, managers and instructors from skill formation providers, and municipal policy makers. We conducted the most recent wave of interviews over the past five months (November 2021-March 2022) and explored the four research questions stated above in a more systematic manner.

We complemented our interviews with data from secondary sources, industry reports, policy documents, news clippings, publicly available statistics and academic articles. We discussed our research design, preliminary findings and their implications for achieving a Just Transition in two round table events with stakeholders and academics held in South Africa in February 2022, one roundtable event with stakeholders in the UK held in March 2022, and two research advisory board meetings, in November 2021 and January 2022, with representatives from United the Union, Danish Trade Union Confederation, Oxfam Ibis, WAB e.V., ITUC Africa, Slaughter and May, IG Metall and the Confederation of Danish Employers, as well as academics from the University of Leeds, the University of Greenwich, the University of Bremen, and Middlesex University.

1 The term pinch point originates from the funder's call for this project. We discussed its meaning in our team, as we found that in Danish the word did not have a direct translation, whereas in German it could be translated as the word *Knackpunkt*. Also the English native speakers on the team were unclear about the term's meaning. We eventually agreed that the term pinch point can mean all of the following: challenges, opportunities and obstacles.

One thing that is important to note before summarizing our findings: none of our research participants denied climate change and all agreed that something needed to be done to drastically reduce carbon emissions, and although they differed in details or emphasis and also with regards to acceptance and support of windfarms in their neighbourhood, overall there were striking similarities across all interviewees' responses across the five countries.

The key findings from our research are the following:

Since our initial data collection, spanning from 2012 to 2018, the highly dynamic wind turbine industry has transformed into a mature global industry with a number of important implications for communities in windfarm locations and workers in the wind turbine industry.

Acceptance/resistance

- In most locations, except in Scotland where the 'gaining energy independence from Great Britain narrative' superseded, locals tended to perceive windfarms by large energy utilities, large manufacturers, and anonymous non-local investors and planners as invasive.
- Although mopping up resistance via some kind of payments to individual opponents worked in some cases, this also tended to harden the position of those who refused payments, and potentially reinforced a 'winners and losers' narrative as well as the perception of corruption.
- Framing wind as a 'national resource' may help to gain support from some.
- More importantly, distributive and procedural justice were key issues to be addressed for fostering acceptance in windfarm communities: redistribution of economic benefits needed to be tangible either as co-ownership, community trust or part local authority-owned wind turbines; procedures needed to be transparent and inclusive.
- Ideally onshore windfarm projects are developed and run by locals and profits are reinvested locally, with the implication of needing appropriate financing provisions and knowledge transfer.
- Given the enormous costs and logistical challenges, and hence the related investment risk of offshore windfarms, offshore wind farms may be more suitably developed by large private or public sector companies. However, we have limited evidence for making this point as we did not investigate successful or failed attempts of community ownership of offshore windfarms.

Skill formation, job quality, and social dialogue

- Governmental support for wind turbine deployment onshore and offshore varied across countries in terms of timing of commitment, consistency and scale.
- Large scale windfarm projects, such as the offshore projects around the UK coast, have advantaged the largest OEMs and consolidated the landscape of OEMs.
- The use of staged competition for access to subsidies, as well as the reduction of subsidies leading to open market competition puts pressures on working conditions at OEMs and in their supply chain.
- Institutions in place, such as labour law, statutorily protected collective bargaining and workplace representation come under pressure as the large global OEMs pit their own sites against each other and compete with other OEMs on price.
- Market competition and instability make it difficult for SMEs to enter and survive in the wind turbine industry.

- OEMs and therefore jobs follow countries' local content requirements, but ultimately, the investments of OEMs into specific production sites are temporary, usually for a few years, as manufacturers compete for markets globally.

The production process of wind turbines is entering the mature phase, with increasing numbers of sites moving to automated and lean production, although there is still potential to rationalise products and processes, which will significantly reduce skill requirements and the bargaining power of skilled workers.

There are several ways to protect skills, job quality and social dialog, and ensure that the energy transition is also just for the workers who help it come about:

- Governments could introduce legislation that supports procurement for windfarms based on manufacturers' recognising trade unions.
- Government or employers should fund the certification of skills used in the sector and include transferable skills training ideally through training in multi-company run training schools.
- Government or employers should provide skilled re-training for workers who become victim to the sector's volatility.
- Government should provide an adequate social security system and/or obligate manufacturers to provide adequate 'reconciliation of interest' and compensation packages.
- Government should enhance or protect trade unions' collective bargaining rights.
- Government should enhance or protect workplace representation rights and adequate skills and knowledge transfer to workers who take on this role.
- Trade unions and employers should support the development of global union networks in the wind turbine industry to enhance the strength of local worker representation and facilitate exchange of information.
- Government should enforce existing labour law with regards to working conditions, in particular in terms of working time and health and safety.

At the industrial policy level, we have different recommendations for the European countries in our research and South Africa:

- To tackle risks of policy uncertainty, government should craft policies engaging multiple stakeholders. This would increase the likelihood of policies being appropriate and implementable, engendering investment in the wind energy sector and contributing to skills formation and job creation
- While the REIPPPP in South Africa de facto will lead to the privatisation of electricity generation in the country, it also sets a number of social standards; hence this might be a way out of systemically poor governance of the Electricity Supply System. However, there is a risk of becoming political hostage to large foreign manufacturers, servicing companies, and investors. Hence some of our recommendations to Europe might also be helpful in the South African context.
- In Denmark and Germany long-term and consistent policy support in terms of research and development, skill formation, and subsidies for, in particular, the deployment of small windfarms was helpful for the growth of medium sized manufacturers and citizen-owned generation infrastructure. Later, when the industry and turbines grew in size, support of large-scale deployment in Europe, in particular in the UK, helped to interest large utilities in the

technology. However the staged competition for subsidies and, later, strong market competition led to negative outcomes for workers in the sector. Hence, we recommend close monitoring of the working conditions in the industry and stronger involvement of trade unions and community stakeholders in industrial policy making.

Governments' growing ambitions regarding wind turbine deployment will be good for manufacturers and large utilities, but ultimately, they may jeopardize broad acceptance, if local citizens and workers in the industry are left out of the process and do not receive any tangible benefits.

Just Transition

The large majority of our research participants, who came from different stakeholder groups of the wind turbine industry, had narrow conceptions of the Just Transition, meaning their main concerns were about their jobs, their community, their country. This has important implications for the potential of success when framing the Just Transition as a 'global project of saving the planet' or as a 'global project of social solidarity'. For this, although it de facto needs a global effort, to gain momentum at the level of individuals, individuals' specific, local concerns and their material interests in the energy transition need to be taken seriously and need to be concretely addressed.

The report is structured into two main sections (1) Local acceptance and resistance in windfarm communities and (2) Skill formation, job quality and social dialogue. Each section contains chapters dedicated to each country and presents the policy context, our data collection, and findings per country. Each section ends with an overall comparison and conclusion. The concluding chapter summarises our findings, highlights the political dilemmas encountered in each country and discusses their implications for policymakers.

Section 1

Local acceptance and resistance in windfarm communities

Introduction

Siân Stephens

In order to investigate the way in which community acceptance and protest regarding wind energy can aid in our understanding of the Just Transition we undertook research in five countries. The socio-economic, industrial and policy contexts of each differ in significant ways, allowing for a fruitful consideration of the factors at play in the different attitudes which can be found in communities affected by the presence of wind turbines.

Our primary research consists of data collected in 2018 and 2021-22. The data from interviews conducted in Scotland and South Africa in 2018 has been re-analysed with a view to addressing the issues relating to the Just Transition as understood by communities affected by the presence of wind farms. To this has been added data collected by interview and focus group in Denmark, England and Germany at the end of 2021 and early 2022. Our interviews were conducted with a range of people identified as 'experts', due to their formal involvement in issues relating to communities and wind energy developments. Our focus groups included members of communities near to onshore wind farms, or involved in opposition to proposed new developments. The full sample for the research conducted for this project relating to Community Acceptance and Resistance can be found in Table 2.

Table 2: Sample of the research on community acceptance and resistance

	Interviews	Focus Groups
England	1 x 'Expert Interview' with County Council ecologist	Two residents of Community 2, who sit on the Parish Council
	1 x 'Expert Interview' with leading member of organized campaign against further onshore wind development in the county	
	2 x residents in Community 1 (also classified as 'expert interviews' due to involvement in more organized campaigning and environmental groups)	
Germany	1 x Co-owner and mayor	Two experts on community engagement
	1 x Co-owner and manager	One local activist and one industry expert
	1 x Co-owner and farmer	Two co-owners of windfarm
	1 x Local activist	Two employees at company that manages the windfarm
Denmark	1 x Social Democratic councillor who is also the vice-mayor of the municipality	Four protesters, all members of the Coordination Group against the Expansion of Lem Kær.
	1 x Lobbyist from Wind Denmark, an interest group representing the Danish wind sector	
	1 x follow-up interview with protestor who participated in the focus group	
Scotland (data collected 2018)	4 x Company employees involved in policy and planning/ ecology/ community engagement	
	4 x Windfarm staff in a variety of roles	
	2 x Local council representatives, from two different local councils	
	2 x Beneficiaries of the community investment fund	
South Africa (data collected 2018)	2 x Representatives from company management	
	1 x Community Liaison Officer	
	6 x Members of local communities	
	1 x CSI fund recipient	
	1 x Local Councillor	

Our discussions with our participants focussed on perceptions of and attitudes to wind energy and the Just Transition, with reference to the individual's personal experiences. We followed a loose interview guide to ensure we addressed the following points:

1. What the transition from a fossil fuel-based economy to a low emission/low carbon economy means to our participants
2. What role they believe wind turbine have to play in the energy transition
3. What participants believe a fair transition to low carbon economies should entail
4. Who our participants believe to be responsible for ensuring a Just Transition

It should be noted that the term 'just' was often replaced with 'fair', as a term that is more readily understood.

While there was much diversity in the views of those consulted, there are also some notable commonalities. The dominant finding, running through each country and case study, was the need for meaningful local consultation on decisions leading to the development of wind farms, and local participation; the South African and German case studies for example demonstrate the efficacy of community co-ownership in gaining at least some degree of a social license to operate of onshore wind farms. In areas where the opposition was strongest, research participants expressed frustration with the decision-making processes which led to the wind farm being developed or expanded (or not as in England Community 1 and Denmark). It was often suggested that the impacts of wind farms on local communities were not considered, in part because the people making the decisions were not the people who had to live with the consequences. This led to some resentment among people who felt the energy transition was being forced upon them or, as one participant in England expressed, '*Well I'm sorry, you're a casualty of this war, the war of green energy and that's just it'.*

Where the presence of windfarms was accepted, the roots of this acceptance could be traced to tangible benefits which the community received – local benefits unrelated to global issues of climate change or decarbonisation. In Denmark, the corporate tax which benefit the local area was cited as a reason for supporting the proposed expansion. In South Africa the high-profile community investments made by the windfarm were effective tools in gaining the support of local people, and in Germany Case 1 the somewhat blunter tool of direct payment to would-be opponents was also found to be effective. The nature of the incentives differ case to case, reflecting the need for local sensitivity, but what all identified incentives have in common is their tangibility. In the Scotland case study, it was the access and attraction of the wind farm itself which was considered to be the major benefit offered, not the payments made via the Community Benefit Fund as these were not widely associated with the windfarm. For the benefits to be effective, it seems, they must be easily recognisable and closely associated with the wind operation.

In this section of our report we present our findings under the theme of Community Acceptance and Protest as they relate to each country. Within our analysis we touch on some of the following themes, which emerged from our data. However, there is too much diversity within the cases for this to be applied rigorously:

- Distributive Justice
- Procedural Justice
- Outsider/ Insider Tensions
- Impact (environmental or other) of Windfarms
- 'David and Goliath'

In the final chapter of this section we conclude with a discussion identifying the prevalent themes emergent from the data set as a whole, as well as a reflection on notable differences. Finally, we offer policy recommendations, grounded in the evidence presented, made with a view to better realising a just transition to a decarbonised energy economy.

Denmark

Mads-Peter Klindt

> *"I have been in local politics for 14 years,* [Lem Kær's expansion] *is absolutely the most difficult case I have ever dealt with, I've been sleepless because of it, the stakes are unprecedented."*
>
> (Interview with city councillor)

Overview

The Danish case study focuses on benefits and protests relating to the Lem Kær onshore windfarm and test site in Ringkøbing-Skjern Municipality in Western Jutland. Established in 2010-11, Lem Kær consists of eleven medium-sized turbines. The windfarm is owned and operated by two energy investment companies but also functions as a test and preparation site for the Danish wind turbine manufacturer Vestas. In 2020, Vestas and the two investors revealed plans for an expansion of Lem Kær, including the erection of ten new larger turbines to replace the existing ones, solar panels, and an energy storage facility. A community-organising group consisting of citizens from nearby villages Velling and Højmark forms the main opposition to the expansion plans. Their resistance is rooted in deep frustration with the prospect of becoming neighbours to some of the world's largest onshore wind turbines. They fear the consequences of increased noise and light pollution and the destruction of the area's scenery and natural habitats, which they claim is their local community's main attraction. A coalition in the city council consisting of Liberals and Social Democrats remains the primary advocate of the project. Founded in Lem, Vestas has become part of the municipality's identity. Moreover, the company's provision of an increasing number of well-paid industry and engineering jobs, they argue, is a major contribution to the municipality after years of declining employment in agriculture and fishery. The investors ruled out co-ownership from the beginning (neighbours' legal purchasing option was also phased out in the 2019 reform of the Danish Act on Renewable Energy) and have accepted only minor changes to the project (from ten to eight turbines) hence a compromise or reconciliation along the lines of a fairer distribution of profits between the conflicting parties seems unachievable.

Case study context

Lem Kær is an area in Ringkøbing-Skjern Municipality in the western part of Denmark where Vestas has access to eleven medium-sized (up to 150 meters) wind turbines for testing and R&D purposes. Built in 2010-11 and owned by two energy investment companies, the wind farm also produces electricity to the regular energy network.

In collaboration with the owners, Vestas plans to expand the Lem Kær site and establish an integrated test centre for renewable energy including wind turbines, solar panels, storage, and power-to-x facilities. New larger turbines (between 200 and 270 meters) in preparation for Vestas's future offshore projects will replace the existing ones at the site (Shrøder, 2020).

Vestas and the two investors revealed their plan in the summer of 2020 but before implementation, the project needs approval from Ringkøbing-Skjern municipality, which is the local planning authority. The approval involves a two-phase process; the first part being the *planning phase* including a public hearing and the city council's adoption of a plan framework. The second phase is the *authorization phase.* This phase includes environmental appraisals of the project's different

components, new hearings and the city council's final adoption (Ringkøbing-Skjern Kommune, 2021a).

The planning phase commenced in January 2021, culminating with city council's adoption of a slightly revised project in September the same year. The adopted project includes eight new turbines (instead of ten), a reduced power-to-x facility, and an adjusted location of the solar panel area.

The result of the voting was a 'split decision' with sixteen members of the city council voting in favour and twelve against the plan framework. One city councillor, a Christian Democrat, was absent. Those in favour included all the representatives of the Social Democratic Party (6), eight Liberals, one councillor from the Danish People's Party and one independent.

Six out of seven Christian Democrats, three from the Socialist People's Party, one from the Conservative Party, one Liberal and one from the Danish People's Party voted no. (Ringkøbing-Skjern Kommune, 2021b).

As such, the city council disagrees not along the traditional left-right division, but has 'red' and 'blue' members on both sides; and two parties – the Liberals and Danish People's Party – are divided internally. The situation in the city council reflects the atmosphere among the local community concerning the new project in Lem Kær.

During the hearing phase, a vast number of citizens signed a petition to stop the project, and more than one hundred individual citizens submitted a formal objection (Møller, 2021). Many of the protesting citizens come from Lem or nearby villages Velling and Højmark, and in the spring of 2021, they established a community-organizing group, The Coordination Group against the Expansion of Lem Kær, mobilizing resistance through Facebook and other social media platforms.

On November 16th, 2021, local elections were held in Denmark. Ahead of Election Day, the Lem Kær project was subject to a number of debates and town hall meetings in the Ringkøbing-Skjern municipality. The dispute reached national media and Denmark's Radio (a national Danish public service broadcaster) produced a broadcast about Lem Kær, *The Detested Wind Turbines*, as part of a four-show series focusing on cases of community resistance around the country (Danmarks Radio, 2021).

The election result in Ringkøbing-Skjern was quite dramatic. Although Mayor Hans *Østergaard* from the Liberals, was re-elected with a result similar to the 2017-election, the Social Democrats lost two seats while the Conservatives gained two. Moreover, the councillor from the Danish People's Party who voted in favour of Lem Kær lost his seat. All other things being equal, this means that the yes-coalition now has a minority, but it is yet to be seen whether the new council will use its powers to block the project or adopt further revisions. In 2022, the project enters the *authorization phase* in which the city council ultimately must confirm or reverse its approval.

Data collection and methodology

As part of the case study, we draw on different material accessible online, factual information and the local debate and decision-making process, i.e. newspaper articles and material from Ringkøbing-Skjern municipality. Further, we used the DR Broadcast *The Detested Wind Turbines* which includes substantial clippings from interviews with a Vestas manager and one of the investors behind project, and clippings from interviews with citizens that are either for or against the project. In addition to these data sources, we have conducted four interviews:

- One interview with a Social Democratic councillor who is also the vice-mayor of Ringkøbing-Skjern Municipality and a moderate supporter of the project.

- One interview with a lobbyist from Wind Denmark, an interest group representing the Danish wind sector (including turbine manufacturers, owners and energy companies).
- A focus group interview with four protesters all members of the Coordination Group against the Expansion of Lem Kær.
- A follow-up interview with one of the protesters.

We also approached the Danish National Association of Giant Wind Turbine Neighbours but they declined to participate in the project sending us this reply:

> *"The Danish Wind Turbine Act is framed so that it protects industry, not people. The population is aware of this and, thus, resistance taking place and will intensify until the protection of people 24/7 becomes included in the act. Under the current Wind Turbine Act, a 'just transition' is not possible, and on that account the National Association of Giant Wind Turbine Neighbours cannot contribute to your project."*
>
> (E-mail reply from spokesperson from the Danish National Association of Giant Wind Turbine Neighbours)

Findings

In the findings section, we explore the support for and the resistance towards the Lem Kær project, including the way the different positions have materialised so far in the decision-making process in Ringkøbing-Skjern municipality. As part of the analysis, we address the question of how to achieve a Just Transition through procedural and distributional justice. In this way, we also address the issue of co-ownership (as a hypothetical compromise) although Vestas and the two investors have already ruled out this option.

Support

Besides Vestas and their collaborators, the supporters of the Lem Kær-project which we have identified include a coalition of Liberals and Social Democrats in the city council and a number of citizens who have voiced their support in the media. Their arguments broadly revolve around climate action, job creation, innovation and local identity.

Lem Kær is just outside the town of Lem where Peder Hansen in 1946 restructured his company and named it Vestas (short for West Jutland Steel Factory) and the place where his grandson produced the first turbine in 1979 (Dyrekilde and Christensen, 2017). The story about the company's development - from a small kitchenware producer in the 19th century, thereafter a supplier of components and machinery to the agricultural sector in the 20th century, to becoming the world leading wind turbine manufacturer in the new Millennium - is a reflection of Ringkøbing-Skjern municipality's own modern history and transition.

> *"Intentionally, we have a vast amount of wind turbines in Ringkøbing-Skjern municipality, and these wind turbines have been raised on the lands that once were farmland (…) it's interesting to observe that the farmlands that used to be part of our cultural heritage now play a crucial role in the green transition."*
>
> (Interview with city councillor)

Moreover, the company is synonymous with a self-preservation instinct and entrepreneurial spirit that is representative of the population in the Ringkøbing-area and maybe all of Western Jutland; it tells a story of survival and the ability to adapt to societal changes by use of one's own means:

> *"The culture in West Jutland is characterised by moderation and thrift but also ingenuity (…) out here, life has always been a struggle, and things don't come by themselves."*
>
> (Ibid)

The supporters of the expansion of Lem Kær also emphasize the innovation dimension. Future energy systems will consist of different integrated energy sources, including wind energy, solar power, geothermics, and other renewables. Yet because the output of many of these sources is fluctuating, finding ways to store and convert energy is just as important if economies want to phase out coal and gas completely. The purpose of the expansion of Lem Kær is to test the integration of different renewables *and* to find ways to store and convert wind energy. Thus:

> *"Vestas, the world's largest wind turbine manufacturer, in their heartland out here where they also provide a lot of jobs, they ask kindly for a playground where they can develop the technology of the future, something they will be able to sell all over the world, one simply cannot be against that."*
>
> (Statement by Jørgen Skovgaard, owner of Skovgaard Invest and co-owner of Lem Kær, made in Denmark's Radio broadcast "The Detested Wind Turbines")

As indicated in the above quote, the impact on jobs and welfare in the community is another argument raised by supporters, including that a city council rejection of the expansion plans allegedly will compel Vestas to outsource R&D activities. Ringkøbing-Skjern municipality has approximately 56,000 inhabitants and although Vestas moved their headquarters to Aarhus (Denmark's second largest city) in the late 1990s, the company still directly provides some 2,000 jobs across their three remaining locations in the municipality (including the blade factory in Lem, the nacelle factory in Ringkøbing, and the service division in Videbæk). In addition to this, between 3,000 and 4,000 jobs in subcontracting firms are more or less dependent on Vestas's activities.

Furthermore

> *"…they also pay a substantial corporate tax to the municipality."*
>
> (Interview with city councillor)

The final argument favouring Lem Kær's expansion involves the direct coupling of the project to the climate crisis and the general need for climate action and massive deployment of renewable energy sources. The climate crisis is an enormous challenge and humankind cannot tackle it without sacrifice:

> *"'Our very existence is threatened', that's what I hear, when I listen to the radio. If I should put it even more dramatically, what I hear is that 'the world – as we know it – is coming to an end'. If this is true, and part of the solution is massively reducing our carbon emissions to the atmosphere (…) we should stop pretending that we can achieve this without something or somebody is going to pay a price."*
>
> (Ibid)

The green transition requires vast investments in R&D, the rapid phase out of old polluting energy sources, and the introduction and expansion of renewables. For the individual, this will imply more than having to buy a new car or finding a new job. The green transition will radically change our infrastructure and landscape; it is *"going to be visible from a lot of kitchen windows in Denmark"* (Ibid)

The representative from Wind Denmark expressed similar expectations. Theoretically, Wind Denmark supports a Just Transition, but their position is that the battle against climate change has the highest priority. As they see it, placing wind turbines offshore is an improvement, but it is time-consuming and insufficient. If Denmark is serious about a 70 percent reduction in 2030, the construction and expansion of large-scale onshore wind farms and energy storage facilities as well is paramount:

> *"For the climate, time is crucial. The turbines raised now has a much larger climate effect than the ones we will erect in the middle of the 2030s. Onshore windfarms and solar power are deployable in the short run (…) whereas the offshore farms we decide upon today, they will be ready in 2029.*
>
> (Interview with Wind Denmark representative)

Resistance

Various actors are opposed to the Lem Kær-project, however the fiercest resistance comes from a group of citizens living in the villages Velling and Højmark, which is within 1½ kilometres from the Lem Kær windfarm and test site.

Anger at the project is for a number of concrete reasons, including noise, light pollution, disruption of natural habitats, falling property values, etc. Citizens formed a formal association – The Coordination Group against the Expansion of Lem Kær – in the summer of 2021 in order to achieve legitimate status as hearing partner in the decision-making process towards approval of the project.

However, they also oppose Lem Kær for more structural reasons. In their eyes, the expansion of Lem Kær is undemocratic and unjust, and they accuse the two energy investment companies for hunting a profit paid by taxpayers and at the expense of the local community, and Vestas for blackmailing the city council.

We will review the concrete aspects of resistance first, and then the more structural perspective.

If the expansion of Lem Kær is completed, it will be the home to some of the largest onshore turbines in the world. The existing eleven turbines make an unpleasant noise, for example consistent whispers coming from the rotating blades and low frequent rumbling coming from mechanical movements in the nacelles and the turbine towers. The protesters fear these disturbances; in particular, that the low frequency noise will increase when the existing turbines will be replaced with larger ones:

> *"…it sounds like when the tripods march forward in 'The War of the Worlds'* [a 2019 television series about an extra-terrestrial species invasion of the earth] *and this just goes on and on all night long."*
>
> (Interview with protesters)

Next, there is the light pollution from the giant turbines, which the protesters see as a source of irritation for the individual but even more unfortunate something that will ruin the beauty of the local scenery and the areas attraction.

> *"What I fear the most is the flashes (…) red and light all day because of air traffic. The two turbines in Velling Mærsk [another wind farm in the area] does so and it's really frustrating…"*

> *"…they have ruined the view over Velling Bay, you don't see the moonlight reflected in the water anymore, you only see the flashes."*
>
> (Ibid)

In connection to these problems, interviewees underlined that the reasons people move to the area east of Ringkøbing Fjord are the silence, the nature, and the vast expanses, and these are the same qualities the municipality refer to in settlement campaigns aimed at attracting more people to the region.

> *"The one hand wants to develop the periphery, while the other plasters the whole area with new renewable energy plants."*
>
> (Ibid)

The third argument raised by the protesters is the destruction of animal habitats in Lem Kær. Today, the site has eleven turbines but in the area around them live bats, frogs, birds, and other wildlife. Interviewees fear that much of this fauna will perish following the industrial areas expansion that is tantamount to more heavy traffic, construction and maintenance work on the ground.

> *"It breaks my heart if there's a frog or and otter that has to die because of this."*
>
> (Ibid)

The final tangible argument raised in the focus group is falling property value. Among the inhabitants in the village of Velling, some had already asked a local real estate agent for a forecast of the project's effect on housing prices. The estimate was that prices most likely would drop up to 25 percent. According to the protesters, this will fetter debtors to their homes, while credit institutions would force others to payback an amount equivalent to the depreciation of their mortgage.

Just Transition, procedural and distributional justice

The data collection and the four interviews addressed explicitly the question of how to achieve a Just Transition for local communities living next door to onshore windfarms and also presented ideas about co-ownership and other forms of compensation as a way to make justice or enhance acceptance.

Answers to these questions of course related to the concrete case in Lem Kær, but also brought up some general reflections about Just Transition on the national level.

The protesters from the Coordination Group against the Expansion of Lem Kær stressed that besides the tangible reasons reviewed above, part of their anger is due to the structural power they feel is being wielded against them by greedy 'profit makers'. For them, a just transition in Lem Kær is out of reach. It is essentially a story about taxpayers' and energy consumers' money going into the already deep pockets of so-called green capitalists while their local community is paying the price.

Their interpretation is that the expansion of Lem Kær is first and foremostly a good business case, with climate considerations coming only second; and that Vestas is manipulating the city council in Ringkøbing-Skjern municipality when talking about the necessity of outsourcing in case Lem Kær's expansion halts.

They point to the fact that the idea behind the project came from the two investing companies, not Vestas, and that Vestas already has access to the two national test sites in Northern Denmark (test centre Østerild and Høvsøre). According to the project's opponents, the two investing firms' motive is the prospect of making huge profits because of the rising energy prices and the subsidies to green energy production paid by the government as stipulated in the Danish Renewable Energy Act (the so-called 'VE-law').

The law encompasses regulations on sales options and compensation in the case of property value losses and until 2019 it also included a purchase option for locals, and we confronted the protesters with these aspects. However, the message we got was that these regulations are outdated and do not work as intended; this point was also raised by the Wind Denmark representative we interviewed.

> *"I have sympathy for local wind turbine guilds and the role they have played (…) but today, the challenge is that wind energy investments have such a magnitude, that they are impossible for local actors to carry."*
>
> (Interview with Wind Denmark representative)

In the case of Lem Kær, the investors ruled out co-ownership from the beginning, but even if they had not:

> *"…the common man would not have an earthly chance to buy shares."*
>
> (Interview with protester)

Furthermore, the protesters claim that compensations are 'peanuts' compared to the losses – directly or indirectly – imposed on them. Compensation may also come with strings attached in case the project developers make private bilateral agreements with individual neighbours, for example including clauses where recipients must refrain from taking action or making negative expressions about the project in the future. In the case of Lem Kær, so claim the protesters, this kind of 'bribing' has already happened in a number of instances and it illustrates that the energy companies disrupt deliberation and the local democratic process. As such, the process is no longer transparent and the promise of procedural justice is broken.

More generally, the impression from the research is that a Just Transition would imply a fairer nationwide distribution of the burdens associated with the expansion of wind energy and the green transition. Ringkøbing-Skjern municipality's is the home of approximately 1 percent of Denmark's population; however, the municipality produces more than 10 percent of Denmark's wind turbine generated electricity:

> *"When we're talking about Just Transition, this is part of the problem, somehow there has to be a fairer distribution (…) we know that in the outskirts of the country, there's a lot of space (…) yet we have yielded our part. 12 out of Denmark's 98 municipalities delivers 100 percent of the accumulated wind energy, if there is solidarity, somebody has to step up a contribute."*
>
> (Interview with protesters)

A moderate supporter of Lem Kær, the city councillor agrees with the protesters on this matter. His statement also points to an imbalance between the national political establishment's discourse on the one hand, and the responsibility of local decision-makers on the other. According to the councillor, the Government's and the Parliament's majority support of a number of climate packages emphasises the necessity and the many prospects of the green transition, but both bodies neglect to talk about the costs associated and how to handle the many citizens caught up; something they leave to mayors and councillors.

> *"My experience is, to some extent, that this is what happens (…) I think they turn their backs on us when the thrashing comes…we don't see them in our town hall meetings, they don't like to be out there, neither do I, but I have to and I will."*
>
> (Interview with city councillor)

The industry does not deny that the green transition comes with costs, but they wonder why the discourse is so hard on renewables compared to the traditional 'black industry', highway constructions, or large pig houses. The industry's organizations have traditionally been in favour of the purchasing option in the 'VE-law' and the profit sharing element, but as argued by the protestors, these regulations have gradually become outdated as the industry has grown into a huge business. Normal citizens cannot afford to buy shares or bear the risks of wind energy investments. The road to a Just Transition includes new tools, such a local trusts benefitting all citizen rather than just those who are able to buy shares, however:

> *"The problem is, that this kind of mandatory co-ownership regulated by the state doesn't produce local engagement, and critics may argue that 'you're just trying to shut us up', so it's an open question whether there is a better way to do it."*
>
> (Interview with Wind Denmark Representative)

Germany

Lisa Schulte

Overview

This section presents our findings on acceptance and protests against windfarms in Germany. In order to better understand these and the role of distributional and procedural justice – the two key dimensions of the Just Transition, we spoke with supporters and opponents. We recruited participants from two Northern Germany counties, Niedersachsen and Schleswig-Holstein, which both have high amounts of wind turbines and the largest German windfarms. In Schleswig-Holstein, in particular in Nordfriesland, the concept of 'Bürgerwindpark' ('citizen windfarm', meaning co-ownership by locals) is common and has proven successful in fostering acceptance. We will present findings from two case studies of 'citizen windfarms'. In Niedersachsen the picture we gauged was more mixed, and this is where (not so) co-incidentally, our case of opposition against wind turbines was located. Our findings are based on data from interviews and focus groups conducted between October 2021 and January 2022 and secondary data. However our participants' accounts covered experiences of protest and engagement in windfarm projects since the 1980s.

This chapter begins with the regulatory framework relevant for wind farm deployment in Germany and 'Bürgerwindparks' and the public the debate on protests and acceptance. We then describe our data collection and cases. The chapter ends with our findings on participants' reasons for acceptance and opposition and views on the energy transition. Our findings support the importance of procedural and distributive justice, but also tensions between 'insiders' (locals) and 'outsiders' (usually non-local investors) and a David and Goliath narrative (local citizens against powerful corporations). The energy transition was seen by supporters as an opportunity, by opponents as an (overwhelming) challenge.

The regulatory framework

Wind energy plays an important role in Germany's energy mix. In 2020, electricity from wind provided about a quarter of all electricity produced (Statistisches Bundesamt, 2021). On 11th January 2022, Robert Habeck, the Minister for Economic Affairs and Climate Action of the newly constituted federal government (social democratic Party (SPD), green party (Bündnis 90/Die Grünen) and liberal democrats (FDP)) presented his policy plans for the coming years (BMWI 2022). The government aims to expand renewables in the energy mix to eighty percent by 2030 and reaching zero emissions by 2045. Habeck promised to publish two climate action packages (one by the end of April and one during summer 2022), and all necessary legal changes by the end of 2022. These include faster designation of land for wind turbines, accelerated approval procedures, and a quick addition of land for up to 8GW wind turbine capacity.

Industrial policies for onshore wind go back to the late 1980s and have contributed to a rapid expansion (and the development of a German wind turbine industry, see chapter in section 2). Due to Germany's federal structure and the principle of subsidiarity, federal, county and municipal regulations play a role in wind turbine deployment and contribute to regional diversity. Since 1990, the federal law on electricity feed-in (Stromeinspeisegesetz) and since the year 2000 the EEG (Erneuerbare-Energien-Gesetz) have provided subsidies through feed-in tariffs to electricity generated from wind (and other renewable sources), giving them priority access to the grid and a guaranteed price per MW and wind turbine for the first twenty years from grid connection (Netzwerkagentur Erneuerbare Energien, 2019). The costs of subsidies are shared across all

electricity consumers (EEG Umlage) and are set annually; any costs going beyond this are paid by the federal budget, i.e. funded through taxes.

The think tank FA Wind highlights two key changes of the law: the first in 2014, which fostered the sale of wind electricity and a subsidy on the market price; the second in 2017, which introduced competitive tenders for wind energy, providing subsidies only to those who offered electricity at the lowest price. Small wind turbines (below 750kW) and test turbines were exempt from the new rule. There was a policy of 'limitless' deployment, but in 2017, an annual maximum for the capacity to be tendered and eligible for subsidies was set as government aimed to better control wind turbine deployment (Netzwerkagentur Erneuerbare Energien, 2019). In fact, the introduction of this competitive mechanisms was followed by a dip in turbine installations onshore (Deutsche Windguard, 2021). Other factors contributing to the dip may have been planning complexity and variety across counties, the duration of planning approval processes, community resistance, and the need to adapt the power grid to decentralised electricity generation (Bett et al., 2021).

Without going into the details of each regulation, federal and county construction laws, planning laws, conservation laws, immission laws, wind energy usage accords and aviation law need to be taken into account when planning windfarms (FA Wind, 2021). Other important regulations are those that govern access to land. Private and public landowners' agreement to lease out their land and roads for windfarm construction are vital for wind turbine deployment of any kind (Netzwerkagentur Erneuerbare Energien, 2019). The distribution of landownership, the perceived need for additional income sources and the will to take the risk with wind turbine investments played a decisive role for early movers in the late 1980s and early 1990s, which often were family-owned agriculture businesses in the north of Germany (Grashof et al., 2015).

Bürgerwindparks/"citizen windfarms"

The 2017 update of the EEG defined the conditions for windfarms being recognized as citizen windfarm and hence eligibility for more favourable price setting mechanism under the EEG (Netzwerkagentur Erneuerbare Energien, 2019). Citizen windfarms are windfarms of which at least 51 percent are co-owned by at least ten natural persons from the district of the windfarm location. None of the co-owners shall have more than 10 percent of the voting rights. Citizen windfarms with less than six wind turbines and less than 18MW capacity have the right to 'uniform pricing', meaning they are eligible for EEG subsidies even if the stipulated capacity for the auction round has been reached. Initially, initiators of citizen windfarms were allowed to apply for EEG subsidies without planning permission. As this led to oversubscription and delays in realisation of projects, this rule was scrapped after the early rounds.

The EEG's definition of citizen windfarm is a watered-down version of the 'original' citizen windfarm concept and is contested by citizen windfarm pioneers. For example the guidance document issued by Netzwerkagentur Erneuerbare Energien (2019) and developed in collaboration with owners, developers and managers of the first Bürgerwindparks from Nordfriesland, where the idea of citizen co-owned windfarms originated as the document claims, sets much higher standards through its examples of best practice which include:

- Consultation with the affected landowners and gaining their consent with a memorandum of understanding about the land lease (MOU)
- Consultation with the mayor, the municipality and local population from the conception of the project
- Co-ownership by *all citizens* who will be affected by the wind turbines
- Limitation of *all* shareholding to local citizens, *exclusion of non-locals*

- As much as possible equal distribution of shares – a rounding method for this is recommended ('Rundungsverfahren': first everyone gets one share, then in the next round everyone who wants to gets a second share, third round…etc).
- Resale should only be possible among locals, the family of the shareholder, while the cooperative or limited society has priority rights to an available share.
- Registration of the society or cooperative and payment of business tax should be in the municipality where the turbines are installed.
- Local firms should be used to build the windfarm.
- Some part of the windfarm's revenues should be used to support of local social or sports clubs, charities or cultural institutions

It is difficult to find recent information on the regional spread of Bürgerwindparks and of the ratio of different set-ups of Bürgerwindparks. However a study from 2015, funded by FA Wind, distinguished between various types of citizen windfarm: (1) windfarms initiated, developed and managed by local citizens who contract professional planning agencies to assist with the process, (2) windfarms developed by professional development agencies which offer all shares to local citizens after windfarm construction, (3) windfarms developed by professional development agencies which offer some of the shares to local citizens after windfarm construction, (4) windfarms developed by professional development agencies which offer some of the shares, usually less than 25 per cent of all shares, to individual citizens after windfarm construction, while the rest of the shares is offered to larger investors, for example municipal utilities, banks, and investment funds (Grashof et al. 2015). As stated above windfarms with less than 51 per cent of the shares owned by local citizens do not count as citizen windfarms under the renewed EEG from 2017. Windfarms in our cases 2 and 3 correspond to type 1.

The regional distribution of different types of citizen windfarms varies according to Grashof et al. (2015). Their respondents reported Type 1 windfarms as predominant form of windfarms in the west of Schleswig-Holstein, hence Nordfriesland, and around the town Münster in North Rhine-Westphalia. In other regions of North Rhine Westphalia, Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt and Thüringen the share of type 1 windfarms was estimated to be between 20 and 40 percent. In other regions type 1 windfarms were rarer. Type 2 and 3 windfarms existed across all regions with no specific regional concentration. Overall about eleven or seventeen per cent across all projects in Germany were estimated to be Type 2 or 3 windfarms. The study's authors however noted limitations to their findings, e.g. these numbers were estimates by only two banks operating across all regions in Germany. In Germany individual and business loans are often provided by lose networks of regionally operating banks and bank branches. In 2019, Mecklenburg-Vorpommern was the first county in Germany to have made offers of stakes to local citizens a statutory obligation (Der Spiegel-Online, 2021).

The current debate on acceptance and protest

Wind energy onshore and offshore, both technologies are strongly accepted by the wider public in Germany FA Wind (2021b). The realisation of individual windfarm projects, however, encounters resistance in local communities. It has been suggested that this is related to frustrated local expectations as to the process in which windfarm projects are realised. Another reason that has been suggested are a number of well-resourced 'windfarm bashers' who, funded by energy intensive and dirty industries, help organising local dissent and opposition as a Greenpeace-funded research report from early 2021 suggests (Redelfs, 2021).

The FA Wind – a governmental think tank supporting wind turbine deployment – lists a number of

common reasons for local opposition (2021c): visual emissions (lights, shadow), acoustic emissions (noise), impact on the landscape, and impact on animal species (e.g. birds and bats). According the FA Wind this is a well-researched area and research has contributed to finding solutions to these. However, another key topic identified by FA Wind is the question of trust and equity, in particular distributive and procedural justice, hence the two key aspects of the Just Transition. FA Wind states that successful processes of local participation usually consider both, and another aspect, transparency (FA Wind, 2021d).

FA Wind (2021d) suggests that information of local citizens about local wind farm projects alone is not sufficient as a communication strategy. It proposes rather some form of dialogue that considers local concerns, interests and questions (procedural justice) and some form of financial participation (distributive justice). FA Wind distinguishes between formal and informal participation procedures, defining the *formal* as participation opportunities offered and managed by local authorities that are part of the formal planning application and consent processes, and defining the *informal* as participation opportunities offered by the wind farm developer. *Formal opportunities* can be the consultation and co-decision making of local populations regarding how projects are to be realised; *informal opportunities* can be the presentation of plans and project by the developer at a very early stage of the planning process and the developer's dialogue with the local community that aims to tailor the project to local needs and context.

Second, FA Wind suggests financial participation, which can take shape in two ways: active and passive. Active participation can mean the designation of a wind turbine that will generate financial benefits for the community (*Bürgerwindrad*), or local communities/citizens can participate in the financing of the wind turbine project by holding public shares. Passive participation may mean that local citizens receive ground rent or electricity at reduced costs or that local communities receive payments or that a community charity is funded where local citizens can decide how generated funds will be used to benefit the community.

Data collection

In order to better understand acceptance and resistance to windfarms and the role of distributional and procedural justice – the two key dimensions of the Just Transition, we chose to give voice to both supporters and opponents to windfarms. As a first step, we chose to contact participants in towns close to relatively large windfarms and in areas with a long history of wind farming and where windfarms are generally very common. Hence the large majority of our participants came from the two counties Niedersachsen and Schleswig-Holstein in Northern Germany. Suspecting that local context is important we recruited participants from two different kinds of cases: (1) one municipality were initially and for a long time there was no broad co-ownership by local citizens and (2) two municipalities with one or several windfarms that are co-owned by local citizens.

In order to better understand the general debate, we also aimed to include experts from lobby organisations. We could interview two experts on community engagement at a multipartite lobby association that is supported by a variety of organisations: electricity utilities, state actors, and environmental groups.

We found our focus group participants by contacting (1) the local branch of an environmental group and snowballed from our first successful expert interview, which led to three focus group participants (one could not contribute to due technical issues on the day of the focus group), (2) the managing company of a citizen co-owned windfarm, which led to a mini-focus group with two participants, (3) a personal contact recommending three extended family members and friends who had stakes in local windfarms (one cancelled on the day of the focus group). We arranged two more local expert interviews with co-owners of a 'citizen windfarm' via its management company.

Overall we conducted four focus groups with two participants each lasting between 60 and 90 minutes and four expert interviews lasting between 60 and 90 minutes. All data collection sessions were conducted via the online platform zoom, except one phone interview. Each interview was recorded digitally, transcribed, and then thematically analysed. Interviewees were given the participant information sheet before the data collection session and gave their written consent to contribute to the study. Although we are making the distinction between experts in interviews and focus group participants, all participants were in a way experts as they all had been involved in the wind industry, either as professionals, as co-owners, as initiators or as activists. It was not possible to recruit any non- expert citizens for our study in Germany although we tried different routes which are outlined in the next paragraph. The table below gives an overview of our data collection sessions.

Table 3: Sample of research on community acceptance and resistance in Germany

Data collection	Interviewee	Type of interviewee	Position	Access	Case
Focus group A	1 and 2	Two experts on community engagement	Supporter Supporter	Via org website	-
Focus group B	3 and 4	One local activist and one industry expert	Critic Supporter	12 recommended 3; 3 invited 4	A
Focus group C	5 and 6	Co-owners of windfarm	Supporter	Via colleague of researcher	B
Focus group D	7 and 8	Two employees at managing company	Supporter	Via org website with general consent of manager	C
Interview A	9	co-owner and mayor	Supporter	Recommended by 10	C
Interview B	10	Co-owner and manager	Supporter	Via org website	C
Interview C	11	Co-owner and farmer	Supporter	Recommended by 10	C
Interview D	12	Local activist	Critic	Via org website	A

With regards to transparency of the data collection process it is also important to say who we contacted but could not get interviews with: for expert interviews we contacted two environmental organisations (one declined and referred us to its website, one referred us to the global atlas on land grabbing – which was interesting as this organisation recently had published a widely received report in support of wind energy in Germany), one national level wind industry association (no response), the Federal Ministry for Environmental Affairs (we were informed that it currently [November 2021] had no position as the new government was in the process of being formed), and the managing director of the private investor-owned windfarm in case 1. To access focus group participants we unsuccessfully used various tools: posts on the project's Facebook page and on three regional Facebook groups, posts on the LinkedIn page of the German speaking researcher on our team, the local church of a town next to a citizen windfarm who delegated us to the climate change manager of its regional umbrella association, three personal contacts asking around in their own networks.

The cases

Regional context

Case one was located in the county Niedersachsen in a community consisting of an assembly of villages with a total population of roughly 7300 inhabitants (Statistische Ämter des Bundes und der Länder, 2022). Case two and three were located in the county Schleswig-Holstein in two relatively small villages of about 400 and 300 inhabitants. Both counties are in the North of Germany and wind turbine manufacturers and supply chain companies have production sites in both. In both counties, gross domestic product per inhabitant is below national average (IW Medien, 2021). However, within both counties large income discrepancies may be found when economic hubs and more rural areas are compared. Schleswig-Holstein has about a quarter of the population of Niedersachsen but they are fairly similar in terms of average population density (Destatis – Statistisches Bundesamt, 2021).

The following gives an overview of the importance of the wind industry in each county.

Region 1: Niedersachsen

In June 2021 the county Niedersachsen had 6,379 wind turbines and a wind power capacity of 11.619MW (Deutsche Windguard, 2021). In 2020 energy consumption was covered 96 percent with renewable energy, however this could be partly explained by the reduction in energy use by businesses and industries due to corona induced lockdowns (Niedersächsisches Ministerium für Umwelt, Energie, Bauen und Klimaschutz, 2021). The county is currently governed by a coalition of the social democratic (SPD) and the Christian democratic (CDU) parties (2017-2022). Their coalition agreement states the government's ambitions to maintain the county's leadership position in terms of renewable energy generation and its support for community shareholder and co-ownership in energy generation (CDU/SPD 2017). The county government delegates regional planning and approval of windfarms to the subcounties (Landkreise) and cities, but its wind energy law statute (*Windenergieerlass, 2021)* sets baseline requirements for the suitability of the land (FA Wind, 2021e). The statute's purpose is to support the county's aim to use 2.1 percent of its land for the installation of wind turbines and the achievement of its zero emissions target by the year 2040 (Niedersächsisches Ministerium für Umwelt, Energie, Bauen und Klimaschutz, 2021). The county's economy is very diverse ranging from ports industry, ship building, automotive and aeroplane development and manufacturing to agriculture, food industry, and tourism. It is also strong in research and industry in the renewable energy sector (Niedersächsisches Ministerium für Wirtschaft, Arbeit, Verkehr und Digitalisierung, 2021).

Despite the coalition agreement's stated support of citizen windfarms, a research report from 2015 did not highlight playing an important role in the county (Grashof et al., 2015). Recent news reporting points to the watered-down versions of 'citizen windfarms' with an article on shares available to local citizens from six different windfarms with a total of 41 turbines; a project initiated by a local planning agency and a local bank (Weber, 2020). The windfarm would be supplied by the local wind turbine manufacturer Enercon. Another report was about the decommissioning of a small community wind farm with only three turbines, which was decommissioned in 2021 due to changed regional planning and EEG subsidies (NDR, 2021). Another example of the wide definition of the concept and that not all windfarms that are labelled citizen windfarm are exclusive to locals was the project advertised on its website by EUeco/Prowind (no year).

Region 2: Schleswig-Holstein

Schleswig-Holstein, and in particular Nordfriesland in the north west of the county, is the birthplace of the 'original' citizen windfarm concept (Netzwerkagentur Erneuerbare Energien, 2019). In 2022 the county Schleswig-Holstein had 3,379 installed wind turbines with a capacity of 8,713.8 MW (Landesamt für Landwirtschaft, Umwelt und ländliche Räume, 2022). In 2019 electricity from wind turbines amounted to 49.1 percent of installed energy generation capacity. Revenues from EEG subsidies amounted to 2.2 billion Euros for electricity generated from onshore wind turbines and 1.4 billion Euros for electricity for offshore wind turbines, nevertheless the price of energy generated from wind stayed below the national average (Land Schleswig-Holstein, 2021).

The current county government (2017-2022), a coalition between the Christian democratic party (CDU), the green party (Bündnes 90/Die Grünen), and the liberal democrats (FDP) emphasised the importance of wind energy as an economic driver in its coalition agreement and highlighted the role of citizens' co-ownership in windfarms to help acceptance (CDU/Bündnes 90/Die Grünen/FDP, 2017). From January 2021 regional planning designated two percent of the county's land for wind turbine deployment (Ministerium für Inneres, ländliche Räume, Integration und Gleichstellung, 2020). This followed a six-year moratorium on wind turbine deployment, in force since 2015, during which turbines could only be installed with exceptional planning permissions (Kupke and Sittig-Behm, 2020). In particular between the years 2017 and 2019 the approval of new wind turbines fell to less than 60 per year and only 24 in 2018 (Landesamt für Landwirtschaft, Umwelt und ländlichen Raum, 2022).

The county's economy is highly diversified and current economic policy aims to support key sectors (maritime, life science, renewables, food, IT and tourism) through facilitation of networking between different businesses, public bodies and research institutes (Ministerium für Wirtschaft, Verkehr, Arbeit, Technologie und Tourismus, no year). Wind energy had been particularly important in the western part of the county, where, since the 1980s, about 2000MW wind turbine capacity have been installed and ninety percent of all windfarms are community or citizen co-owned windfarms (Netzwerkagentur Erneuerbare Energien, 2019).

Findings from interviews and focus groups

The following section presents each of our three case studies, commencing by the case of local resistance we encountered in a small town in Niedersachsen, and followed by two cases of citizen and community co-ownership in Schleswig-Holstein.

Case 1: Years of battle but eventually to no avail

This case study is based on a focus group and an interview with senior citizens from a community that is located in between mainly privately owned windfarms, which have been built since the 1980s. Since 2020, there is also a community windfarm, where local citizens could buy shares with individual investments from 2000 Euros upward. The case reminded us of the parable of Don Quixote's battle against the wind turbines, as initially successful resistance due to various concerns by citizens, got increasingly broken by the promise of financial benefits for locals, and eventually resistance subsided. Opponents were disenchanted by the economic disparities that resulted from the local deployment of wind turbines and the concentration of financial benefits among a few landowners and early investors.

In the 1980s local farmers built wind turbines on their own land close to their farm houses. Then, in the early 1990s, local politicians designated more land for potential wind turbine locations on both sides, west and east, of the village and close to residential buildings. This was announced in

the local newspaper and citizens were invited to a consultation event. Only a few locals showed up and the first investors from Bavaria, 'who naturally supported [the windfarm]'.

During this event, participants learnt that each area was designated to accommodate 90 wind turbines and that they had fourteen days to oppose to the plan. One local citizen took it onto herself to visit all households and to collect signatures against one of the windfarms as it was planned directly next to where she lived. Another local citizen paid a lawyer. One powerful argument that gave their objection weight was the – convenient – discovery of a protected type of waterway (*naturschutzgeschütztes Gewässer*). Based on this evidence and the long list of signatures the local council rejected the plan for the windfarm on the eastern side of the village.

At that time, reasons for opposition, at the individual level, were about not being able to cope with the sound and sight of wind turbines, but there was also concern about the region's economic future. Local citizens' traditional source of income was tourism, which, since the windfarms have been built in the region, it was said in our interviews, had fallen significantly.

A little later local farmers built four wind turbines on the eastern side of the village and tried getting local citizens' consent by offering them stakes. Some accepted, while others didn't 'because of nature protection concerns, fear and feeling stressful about the whole situation'. One tried to object to the plan and looked for legal counsel, but it was impossible for her to find a lawyer locally, so she went to look for one from the next larger city. Her lawsuit was unsuccessful and she had to shelf a bill of a few thousand D-Marks (German currency until the Euro was introduced for citizens in 2002).

Due to her activism, she was asked to join and was elected into the local council together with other windfarm opponents. During that time, in the early 2010s, the first generation of wind turbines was to be replaced ('repowered' in technical jargon). In Germany, this entails a completely new planning permission. This time the same local farmers and their co-investors, who – as it is often the case, with some regional exceptions in Nordfriesland and Münsterland in Germany (Grashof et al., 2015) – were not locals, had a more proactive strategy for gaining the support of local citizens and consent from the local council.

Members of the local council were invited to visit the nearby factory of a major German wind turbine manufacturer, which would supply the turbines for the windfarm. Investors promised to buy hybrid ferries for visiting the nearby islands, and talked about the increase in tax revenues for the local authority.

> *"These were very seducing things, where one thought, if that happens, that wouldn't be too bad, if it really makes a difference for our community."*

Initially, one thought that repowering only meant replacing and maybe even reducing the number of turbines because of capacity increases for individual turbines, but then it transpired that investors were looking to access additional land and that the land in the east of the village, that had been saved from wind turbine deployment by the council's rejection in the early 1990s, was also part of the new plan.

> *"It seemed so that the rich farmers, who by now had made a lot of money, had again lobbied for this land to be included…and they wrote in the newspaper 'we are taking down seventeen turbines', but then they built a completely new windfarm here. (…) Publicly they said, they would make this a community windfarm and then the citizens thought 'Oh, we will soon earn some money', and then they did not contribute anymore* [to the campaign against the windfarm]."

Still opposing, two citizens were going to organise a lawsuit against the building of the windfarm, this time with a lawyer from even further away. But one of the two was offered a large package of compensation and then dropped out of the case and local farmers were compensated too:

> *"Large sums of money were passed around. (…) So eventually, the windfarm was built* [and has been online since 2013]."

Only in 2020, the long-promised community windfarm materialised. Stakes were exclusively offered to local citizens. Every household received an offer letter. Each stake was 2000 Euros, which for local citizens who worked in the main industry, tourism, was a large sum of money.

> *"I can see that most people here, and these are women, who earn money in tourism as waitresses. (…). They don't have any savings. For them 2000 Euros are a lot of money. 500 Euros* [for a stake in the wind farm] *might have been appropriate. And they call this a citizens windfarm.*"

Prospects of a large pay-out are small, as subsidies for wind energy will soon be discontinued.

The next two cases present findings from interviews with co-owners of windfarms. Both cases were located in a different county, in Schleswig-Holstein.

Case 2: Co-ownership of several local windfarms

This case study is based on a focus group with one of the initiators of several co-owned windfarms and one young shareholder in one of the local windfarms. The village where the windfarms are located has a population of roughly 400 and almost all adults own shares in one or several of the currently three local windfarms.

Early learning about wind farming took place in the early 1990s when one of the research participants joint a venture of four turbines with three co-owners in a village about ten kilometres away. Then, in the early 2000s, he was part of a group of seventeen locals who built the first co-owned windfarm in his village. His motivation was to diversify his agricultural business and to create an additional source of income. But it was still a time where he perceived his investment into wind energy as risk capital.

The group initially contacted the local landowners and neighbours and offered them stakes in the windfarm, which at the time would have consisted of seven 2MW turbines – today these are 5MW turbines. Once they had secured the land, they invited all citizens living in the village to invest into the windfarm. This brought the number of investors to seventeen. In order to keep acceptance within the village two additional turbines were built and its stakes sold exclusively to local investors. This time twenty-eight invested.

In 2013 the same group of people added another windfarm with seven turbines, which was to 100 percent sold to two hundred local investors, each receiving an equal share. The landowners were compensated via lease agreements.

> "*We had realised, this is really becoming big, it's not a risky investment, and the awareness that you can make money with wind turbines was there* [in the community]."

Recently, around 2021/22 another windfarm has been developed by a small group of twenty-two, for which in total 210 local investors registered. Every local citizen who was a local resident by a certain data and 18 years old or above could buy a share.

The participants very openly discussed financial accessibility. Banks calculated the share of capital that was needed as security from investors. This security was then divided by the number of shareholders, meaning each investor owned an equal stake within the windfarm. Initially, with few co-owners the deposit for a share in a small windfarm needed the whole agricultural business as investment security. The later windfarms with a larger number of investors meant a smaller investment per person and loans taken out by individuals to fund their deposit could often be repaid within one to four years.

> *"Almost everyone could* [invest]. *The hurdle is not that high anymore, because banks in this region are relatively willing, I believe, to give a loan* [for wind farming]."

Case 3: Co-ownership of one of the largest German windfarms

Case 3 is located in the coastal region of the west of Schleswig-Holstein and, as case two, it is part of the sub-region Nordfriesland.

One interviewee recounted the history of the place. A few centuries ago the land was gained from the sea. It was offered as farmland to the second sons of farmers from other regions, who due to local custom would not inherit any land from their fathers. In the 20th century farming intensified and, as in other places, small scale farming became less profitable and there was a trend to industrialize and large farms incorporating smaller farm. In case 3, however, the revenues from wind turbines protected farmers from the economic pressures to sell out and they could stay independent, whilst venturing into organic farming and other businesses.

The first generation of windfarm owners who built turbines in the late 1980s were true pioneers. Their houses, farms, land, all served as capital security and banks were not keen on financing the first ventures, interviewees reported. However, during the 1990s more trust in wind technology developed and banks became more interested in funding turbines. The next generation of owners – the children of the pioneers – could invest into the citizen windfarms with hardly any of their own capital (Eigenkapital). In the 2020s the aim and challenge was to secure the transition of ownership between the different generations and to secure the economic future of the area through diversifying into other industries by using the local windfarms' capital and infrastructure.

Initially wind turbines in the village were installed by individual farmers. This was due to the regulatory framework which stipulated that wind turbines had to belong to an agricultural farm. The first turbines were built at the end of the 1980s. In the early 1990s, eighteen local wind turbine owners merged their ownership of individual turbines to create the first co-owned windfarm. Every increase in turbines led to the creation of a new windfarm, where local citizens could buy stakes. Over the years this happened five times and this resulted in six citizen windfarms.

In between 2012 and 2014, responding to federal government ambitions to increase but also regulate wind turbine deployment, the county mapped out the areas where wind turbines could be deployed. The co-owners realised that they could add turbines, but that the possible locations often lay in between the six citizen windfarms, which were owned by different people. In order to use this space and overcome conflicts over access rights, a number co-owners brokered the merger of the six windfarms. The process was mediated by an external economic auditing company which evaluated individual shares and then advised on the reallocation of shares within the new structure. The merger became effective in 2015.

Initially each household could only hold one share per windfarm and all shares were equal; all landowners received the same amount of rent for land use. Later each partner in a household was allowed to hold one share, and even later, every individual of the age of 18 and above living

in the village. In 2021, around 95 percent of the village's households owned shares in the citizen windfarm. Over the years the local management company and developer of the windfarms, originally an agricultural business, developed and managed wind turbines and windfarms in other parts of Germany, in France, in Turkey and in other places in Europe.

Comparative findings

Both opponents and supporters in our sample agreed that something needed to be done against climate change. The conflict was about the how. The next paragraphs compare our cases along the dimensions acceptance and protest. Acceptance was generally linked to procedural justice (and therein transparency and participation in decision making processes) and distributive justice (co-ownership, wider economic benefits for the community, and jobs). Protest or resistance was generally linked – in addition to common arguments related to impact on the natural environment – to tensions between insiders and outsiders and to a narrative over perceived power relationships (Davide against Goliath) between locals and large energy utilities. Interestingly these two narratives were also used by participants to explain support for co-owned community windfarms.

Acceptance, distributive and procedural justice

Generally distributive justice refers to the equal distribution of benefits and burdens; procedural justice refers to an equitable process of decision making. Practitioners recognise that both are important dimensions for fostering local acceptance of windfarms (FA Wind, 2021e). In the cases 2 and 3 these two dimensions are illustrated consistently and throughout the history of windfarm co-ownership. Procedural justice is illustrated by the recurrent involvement and consultation of all households in the communities from the inception of the project and further throughout the operation of the windfarm. This was combined with distributive justice, as all households were invited to buy shares and they were supported by local banks that provided – from the late 1990s onwards – loans for deposits and capital at accessible conditions.

Procedural justice

In case 2 and 3 processes were inclusive and always made transparent. Local initiators included the local council and the mayor, a letter was sent to local households. It was published who the initiators where and the processes were clearly explained. It helped that the villages were small, with only 400 people. Everyone knew everyone and people contacted each other about the windfarm plans. In case 3 external expertise was sought to resolve complicated technical questions and consultation included all co-owners:

> "[Before merging our windfarms] *we consulted an independent auditor, who explained transparently and to every group, how they should proceed. (…) [There were] polls everywhere* [among the co-owners]. *And in each group, we had two or three assemblies.*"

In addition our interviewees in case 3 said that if there was any opposition, this would usually be dealt with through dialogue.

> *"Internally we discuss everything, and really openly. And we don't always agree, but to the outside we always present a united front."*

The importance of transparency was also clear from interviews with windfarm opponents:

> "*They were looking for and found new locations* [for wind turbines], *and suddenly there was again the land where we* [the city council] *had successfully vetoed* [wind farming]. *It was* [pushed] *much more strongly, and for me it was totally intransparent (…).*"

Although unequal amounts of shares held across local citizens led to income inequality, the transparency of the process helped to foster acceptance.

> "*Yes, when we started and the people who initiated* [the windfarms and invested early] *they earn significantly more than the* [later investors]. *But, I believe, because we always played with an open deck of cards and everyone was invited to invest at any moment, that they don't say anymore 'these fools', but they say now 'we were fools* [and missed the opportunity]*.'*"

Distributive justice

The distributions of economic benefits materialised in various ways: co-ownership, investment into nature conservation and research, re-investment in other businesses and public services, and the creation of local jobs.

Co-ownership

Participants in case 2 and 3 emphasised the link between co-ownership and acceptance of windfarms:

> *"If you calculate this, every adult above 18 years or almost every adult has a stake or has a relative, a friend or a neighbour who has a stake, then there comes no resistance."*

> *"Here in this region, wind turbines have been deployed for many years. And, in my opinion, the best acceptance has always occurred, when local people could participate, and ownership was broadly spread, ideally, everyone with an equal share. Then people get this 'We-here-locally-feeling' and then people support this* [project]."

A participant (third generation of local wind farmers), who bought his share later saw locally co-owned windfarms as

> *"an opportunity to make the energy transition into something positive for society, that money is distributed more equally and will stay distributed more equally in the future. (…) If the profits are staying local, in the community, (…) and the community becomes more cohesive because of this, (…) and every household is in some way part of this project.…"*

Investment into conservation and research

In case 3 nature organisations had successfully negotiated conversation areas for the local fauna and times and seasons when certain wind turbines are halted to let wild birds and bats pass through. Local environmental activists – usually go to people for opposition to windfarms – refused contributing to the research claiming they had no relevant knowledge on the matter. Moreover, the local windfarm management company invested into research on the local natural environment and technology to mitigate the environmental impact of wind turbines.

Re-investment in local businesses and public services

Co-ownership led to wider economic and social benefits in cases 2 and 3 where farmers could diversify their businesses thanks to the additional revenues from the windfarms. One opened up a completely new business. Another experimented with organic farming, diversifying livestock, whilst his wife ran a local building business:

> *"Something will always work out, even if times are bad for one of our family businesses."*

Participants stated that this experience and approach was common across the community and that the additional incomes resulting from the ownership of windfarm stakes could be immediately felt in the wealth of the community. People were spending locally, were investing into their properties, which in turn benefited local trades. The aim of the citizen windfarms was to create local economic value ('locale Wertschöpfung').

> *"90 percent owned by [95 percent] of the local citizens. (…) The money stays local, and you can see this in the* [local] *businesses and co-owners. They invest into their houses, farms, machinery ...."*

> *"Here we have everything. Building sites, nurseries, sports clubs. Every municipality is blooming. But in between there are municipalities (…) who vetoed windfarms, and it is immediately visible, when you drive from one to the other, where wind energy backs* [the local economy] *and where it doesn't."*

The idea of creating economic value is taken further by one windfarm's management company, which in addition to running the day-to-day business, actively develops future projects. A current aim is to branch out into the production of green hydrogen which will supply a local service station for automobiles and, potentially, datacentres or other electricity intensive industries. Another aim is to take over and manage the local electricity grid.

Local jobs

Furthermore, in case 3, the redistribution of the windfarm benefits comes from the jobs at the local windfarm management company. Around thirty-five people work here, mostly in highly skilled professional jobs, ranging from management executives over engineers, planning, building, construction specialists, IT development, project management and finance to administrative assistants.

The management company actively engages in research and development in collaboration with research facilities such as the Fraunhofer-Institut für Hochfrequenzphysik und Radartechnik FHR and other research universities across Germany, which resulted, for example, in the development of a system that helps reducing light emissions from wind turbines. One team at the company exclusively works on the development and negotiation of business innovations. They identify and apply for public funding streams and cooperated with a number of high-profile research universities. A manager stated that the aim was always to provide local benefits and employment.

In all cases local participation, transparency of procedures and distribution of economic benefits were important for local support. However, also remaining in control and having agency played a role for example through the rule of not letting non-locals invest. Similarly the perceived lack of agency in case 1 appeared to be one reason for opposition against windfarms.

Remaining in control: outsider/insider tensions, David & Goliath

Outsider/insider tensions

Opponents and supporters had in common the notion that investment from anonymous outsiders – interviewees referred to large towns or the most southern county in Germany – would provoke or were reasons for local opposition.

> *"And here there is no investor from Hamburg or Frankfurt who* [builds] *the windfarm (…) it was always opened up* [for the local people] *and everyone could join in."*
>
> (Supporter)

Indeed outside influence was associated with a lack of transparency:

> "[At the consultation] *there were the first investors who were from Bavaria (…). And from us* [locals] *we were the only ones who opposed,* [because] *no-one had any idea."*
>
> (Opponent)

In case 2 local initiators made a point in using the support and expertise of a local planning office from a nearby town and could arrange co-ownership for the planning office instead of paying a fee. Also for the more recent windfarms a small local planning office was contracted:

> "*When* [a windfarm project] *is initiated by locals and transparent, and on an equal footing with the people, the acceptance is quickly good."*
>
> (Supporter)

Also in case 3 the developer and management company of the windfarm was local.

Sometimes opposition to windfarms came from outsiders: in case 3 there had been some resistance to the local wind turbines early on in the 1990s from property owners who had no local roots. They were offered a stake in the windfarm and this usually turned them.

David & Goliath

Large utilities were seen as opponents of citizen windfarms. In case 2, considering the possibility of utilities' investing, participants stated that this would probably result in local opposition:

> *"I can only imagine that if RWE would start to collect land here and would want ninety percent* [of the profits]*, that suddenly there would be a lot of headwind. In particular as people know that you can earn money with* [wind turbines] *and then it is a stranger…The feeling that* [the utility] *would install itself in front of people's door and try to take away our opportunities. I believe, automatically people would switch, and then this* [windfarm will be perceived to] *make noise, and then people would find* [the protected species] *sea eagle and newt. People would look at* [the windfarm project] *differently.*"

Participants' view on the energy transition

Supporters of windfarms saw the energy transition, because they could partake in it as 'wind farmers', as an economic opportunity. Another supporter – who did not own windfarm shares – saw the energy transition as a social challenge. Opponents felt that the energy transition was overwhelming and expected more support from windfarm developers and government. Opponents also criticised the financial motivation of windfarm investors, but wind turbine owners from agricultural businesses commonly saw their investment into wind turbines as a source of economic security.

> "[Initially,] *it was an entrepreneurial risk. The wish to earn extra revenue and to have a second income source.*"

One supporter of wind farming described the energy transition as a social challenge that required behavioural change globally and locally:

> *"I need to stop driving a car, if I don't, I cannot expect people in China to* [not drive cars]."

People in industrialised countries would have to learn again how to live sustainably:

> *"How did they do this before (…)? All the knowledge [about self-sustained living] that has been lost [within one generation]. (…) How alienated am I? I am dependent on the organic shop.*"

Some interviewees, in particular from the first and second generation of wind farmers, had invested parts of their revenues in energy efficiency, solar panels, and organic farming. However, one participant, who had worked as an engineer and business owner in the wind turbine industry for forty years, stated that the deployment of renewable sources would never be sufficient to cover energy needs if consumption patterns remained as or became more energy intensive.

One opponent who did not partake in a citizen windfarm and had not been offered a stake until very recently explained that she had experienced a lack of support over the past decades:

> "[I would have wished] *that someone comes and asks 'how can we help?' That they make an offer* [for my land]. *Or that they provide direct electricity or lower energy prices. (…) So that the little citizen thinks, 'I am important too, I am part of the transition'".*

> *"…I experience this helplessness, a powerlessness (…)"*

But there was also frustration with money being so decisive for local wind farming and that economic outcomes were unequal:

> *"…always because of the money. People with a lot of money, who earn really well from this so-called transition, but the 'poor people', and I include myself here,* [have to] *accept everything as it comes and no power to act against this. Not legally, and in no other way."*

> "[I wish for more interpersonal warmth]. *We need to get away from money being decisive for everything."*

However, this was an isolated position in our sample; overall economic incentives (combined with transparent and inclusive processes), in particular, co-ownership was seen as an effective tool for gaining acceptance for wind turbines.

England

Siân Stephens

"…the losers are, in an area like ours, the losers are the workforce, the workers. Because they haven't a genuine argument. 'Yes, close me open-cast, are you going to give us a job on the wind?' 'No.' There's no job for me there, because they're highly skilled, they don't take labourers on.… 'Well, I'm sorry, you're a casualty of this war, the war of green energy' and that's just it."

Overview

This case study focusses on one county in England, which as fifteen operational onshore windfarms and a growing offshore site. Data collection was conducted via zoom and in person in 2022. The research focusses on two communities in this county; one which successfully opposed proposals to develop an onshore windfarm nearby and one which has two local windfarms which were not considered particularly welcome by our research participants. It should be noted that all onshore wind farms, or wind farm proposals, referred to by our participants were built under a policy framework quite different to that which is currently in place. The current policy framework provides local communities a significant input into decisions about the development of onshore wind farms, and local planning authorities may make the final decision.

However, the windfarms which were developed under the previous framework remain, and opposition to the wind farms and to onshore wind in general is rooted in a sense of imposition and a belief that a disproportionate burden is placed on the region in terms of onshore wind energy. Community 1 is opposed the presence of wind turbines on environmental and aesthetic grounds. The opposition of Community 2 is based on a sense that the open-cast mines for which the land was used previously offered much more to the community socially and economically. In both communities, and in the case study as a whole, it is clear that the Just Transition is yet to be realised, and the findings point to some important opportunities for fairness in the development of alternative energy sources. In particular, a much more localised approach to decisions regarding what should go where would go a long way to creating a sense of fairness and inclusion.

Case study context

Government support for the UK wind energy industry has historically been varied; the sector benefitted from subsidies and public investment throughout the 1990s and the 2000s. In 2002 the (Labour) Government introduced the Renewables Obligation, a plan designed to incentivise investment in renewable energy production in the UK, including wind energy. The scheme included an obligation for suppliers to buy a portion of their energy from renewable suppliers, acting as an indirect subsidy for renewable energy producers (Renewable Energy Foundation, 2011). In the 2010s the government's focus shifted to other energy sources, including offshore wind energy (International Renewable Energy Agency, 2013). In 2015 the UK Conservative government announced the early end of subsidisation for onshore wind energy (Department of Energy & Climate Change, 2015), as well as the fulfilment of an election manifesto promise to give local people in England a greater say in the placement of wind turbines, by requiring all new onshore wind farms over 50MW to apply for planning permission from the local planning authority (Department for Business, Energy & Industrial Strategy, 2021). This would ultimately give a veto to local councils to proposals for new onshore developments. It should be noted that this rule does not apply to the devolved nations, including Scotland. This shift was understood to be in response to resistance from local people to the development of onshore wind energy sites near their homes.

However, in 2020 the government announced a reversal, and onshore wind projects can now bid in Contracts for Difference (CfD) auctions, where the investors are protected from potential losses caused by price fluctuations. The latest CfD auction for low carbon energy, including onshore wind for the first time since 2015, opened on the 13th of December 2021. This move was taken in alignment with the current Net Zero strategy, launched in 2021, aiming to fully decarbonise the country's electricity supply by 2035 (Department for Business, Energy and Industrial Strategy, 2021). Within this strategy is a commitment to increased productivity from onshore wind sites, although the wind-energy commitments are primarily to do with off-shore development and include a target to produce 40GW of offshore wind by 2030 (HM Government, 2021). However, the current National Planning Policy Framework (NPPF) (2018) still gives significant powers to local planning authorities to deny proposals for the development of onshore wind farms, and it is stated:

> *"Except for applications for the repowering of existing wind turbines, a proposed wind energy development involving one or more turbines should not be considered acceptable unless it is in an area identified as suitable for wind energy development in the development plan; and, following consultation, it can be demonstrated that the planning impacts identified by the affected local community have been fully addressed and the proposal has their backing."*
>
> ([Local] County Council, 2018)

In effect, this means that local councils are both obliged to establish local support for the development of new onshore wind farms before approval, and where this local support is lacking the council must veto the application.

There are currently 1,500 operational onshore wind farms in the UK (Renewables UK, 2021) and 40 operational offshore sites (4C Offshore, 2021). In 2020 onshore wind energy accounted for 11% of energy generation in the country, and offshore accounted for 13% (Office for National Statistics, 2021). The wind energy industry is not currently a major employer in the UK, with 4,400 people employed in onshore wind as of 2019, and 7,200 employed in offshore wind. For comparison, 30,600 people were employed directly by the oil and gas industry in the UK in 2019 (Statista, 2021). Onshore and offshore wind energy enjoy relatively high levels of public support; 70% and 76% of respondents to a government survey expressed support for onshore and offshore wind energy respectively (solar energy enjoys the most support with 84%) (Department for Business, Energy & Industrial Strategy, 2021).

The wind farms and the community

Research for this case study was conducted in a largely rural county that is geographically large but with a sparse population, relative to other UK counties. About a quarter of the county is a national park, and the much of the coastal region of the county is an Area of Outstanding Natural Beauty. Large parts of the area suffered economically and socially following industrial decline, and a significant number of jobs were lost in manufacturing, mining and other heavy industries in the mid and late twentieth century (OECD Directorate for Education, 2006). In the 21st century unemployment levels have been roughly in-line with the country as a whole (Office for National Statistics, 2022), although pockets of deprivation and unemployment remain. Employment now relies quite heavily on the public sector, and the majority of private sector employers are small businesses (Office for National Statistics, 2022). There are four constituencies in the county, three of which currently have Conservative MPs and one of which currently has a Labour MP. The Conservatives also have a small majority in the County Council.

There are currently fifteen operational onshore sites (total 122 turbines, sites ranging from one to eighteen turbines, the tallest being 160 meters in height) (Local) County Council, 2018) in county, and a growing offshore site (Renewables UK, 2021). Onshore wind is the biggest source of energy production in the county, generating 63% of the total in 2021 (plant biomass is the second biggest energy produced with 17%, followed by offshore wind which produced 14% of total energy production in the county in 2020) (Jack, 2021).

Primary data collection for this case study involved speaking with people from two communities, with quite distinct experiences of the wind energy industry. Community 1 successfully opposed proposals for the development of a five-turbine site on farmland near their small hamlet in 2013. The proposals were made by a German company, and faced strong and well-organized opposition from local residents. The debates surrounding the proposal became quite fraught, with one campaigner being threatened with legal action by the company for altering, and then distributing, a poster produced by the company to inform the public of an exhibition of the wind farm proposals (Black D., 2012). According to reports the council received over nine hundred objections to the proposal (ITV, 2013), and the application was declined unanimously by the county council in 2013 (Black D., 2013). The decision was appealed by the company, and the appeal was turned down in 2014. The outcome of the appeal is publicly available, and the document cites the infringement on the greenbelt and visual impact of the proposed development as reasons for rejecting the appeal (Department for Communities and Local Government, 2014). The experience seems to have galvanized some members of the community to be involved in opposition to other developments in the county and there is a network of people in the region who are involved in offering opposition to proposals to develop onshore wind farms in the county as a whole. This network continues to engage with, and often oppose, the local councils' efforts to identify areas suitable for further development of onshore wind sites. The hamlet which is the focus of Community 1 is very small. Those I spoke with were professionals, some retired, which suggests the area is relatively affluent, but it is not possible to draw stronger conclusions regarding the demographics.

Community 2 is a village with a population of around 2,700 (City Population, 2022), although it is currently experiencing significant expansion due to the development of new housing estates in and around the village. Employment in the village had relied heavily on open-cast mining, but the last open-case mine in the area closed in 2005 (Unknown). Proposals to develop a new open-cast mine nearby were finally rejected in 2020, following appeal, in the face of substantial opposition from environmental groups both national and international. It is possible that the voices of local people were lost in this outcry, and there is little coverage of the impact that the one hundred jobs which the developers claimed the mine would offer, would have had on the local communities suffering from the recent closure of a similar site. The village has two onshore windfarms nearby; there is a nine-turbine site on land which is now owned by the operating company and a four-turbine site on private land. The larger of the two stands on land that was an open-cast mine site until 1991. The smaller of the two is also situated on an ex-open-cast mine, and the site was more recently one of the main burial grounds for the animals culled in the region during the foot and mouth outbreak in 2001 (Daniel, 2015). Both wind farms are owned by the same company. The operations gained consent and planning permission in 2014 and 2012 respectively, and became operational in 2015 (Ventient Energy). The proposals for the larger development were made as part of a larger proposal for a £200 million-project to develop a substantial tourism industry in the area, including a golf course, sports academy and artificial ski slope and creating between 800 and 1,000 jobs (Daniel, 2015). However, in the time since the wind farms gained approval, were built and became operational, no progress has been made on the tourism proposal. There are some reports of objections to the wind farms from the local parish council, but little coverage suggested the level of organized (or well-funded) opposition demonstrated by Community 1. The wind farm company runs a community benefit fund which is open to applications from parish councils in the local area.

Data collection

The sample for this case study includes:

Interviews

- 1 x 'Expert Interview' with a County Council employee
- 1 x 'Expert Interview' with leading member of an organized campaign against further onshore wind development in the county
- 2 x residents in Community 1 (also classified as 'expert interviews' due to involvement in more organized campaigning and environmental groups) – labelled (a) and (b) in the quotations below.

Focus group

- Two residents of Community 2, who sit on the Parish Council - labelled (a) and (b) in the quotations below.

Contact with interviewees was made through email, Facebook and snowballing. The expert interviewees were identified firstly through their relevant organization websites and then contacted either directly or through a general enquiries email address. Participants from Community 2 were contacted indirectly; we sent a Facebook message to a local yoga teacher. She very kindly passed the researcher's details on to the Parish Council.

When recruiting for interviews the criterion was that participants lived or worked in the case study county, and could be expected to have a reasonable degree of expertise and experience of the community response to windfarm development. The sampling criterion for community members was to be living or working near a wind farm in the case study county.

Findings

Opposition to onshore developments in England seems to have peaked in 2015, prior to the ending of subsidization of onshore UK wind energy. No respondent mentioned the new subsidization scheme and it seems likely that it is not widely known. There was some support for current national policy, and some concern about the approach of the local county council who were thought to be too enthusiastic in their approach to onshore wind development in the region.

Prior to the change in policy in 2015 there was a sense that the region, and the country more generally, was being exploited by private companies, perhaps foreign, making use of the subsidies being offered by the UK government with little consideration for the impact or efficacy of the developments on local people. During this time, it was felt that the attitude of the local council led to clusters of turbines with strong visual and possibly environmental impacts on local people, with some areas affected much more than others. Response to the transition to a decarbonized energy economy was split; in Community 1 there was no opposition to the transition; the respondents were clear that they believed climate change was real and urgent and that new forms of energy technology were needed. They expressed the view that if onshore wind were the only, or even best, solution there would be more support but that they believed on-shore wind to be inefficient with a cost-benefit imbalance (cost to the local environment vs benefit to transition). A more diverse mix of energy sources was also thought to be fairer; including offshore wind, solar and in particular nuclear energy. In Community 2, where the transition had made a much more immediate impact, there was resistance and some skepticism about the transition to greener energy sources. Mining had been an important part of the community identity; its loss was felt keenly and the wind farms offered no substitute in terms of employment or community presence. A more diverse energy mix,

which included open-cast mining, was thought to be fairer. For both communities a Just Transition would be bottom-up, with local people better consulted and more consideration given to balancing out the impacts across communities.

Distributive justice

A perception of uneven distribution and clustering of onshore windfarms was a concern for almost all participants, and there was a sense that little consideration had been given to the impact of the placement of turbines on the local community;

> *"... so long as its subsidized ... the subsidies overwhelm ...the balance of whether this wonderful resource of countryside... can be sacrificed to a rather inefficient and dubious but profitable placement of turbines"*
>
> (Community 1/ Expert Interview(a))

There was a sense that the case study county was bearing a disproportionate burden in the country's efforts to introduce green energy sources and this sense of unfairness was present in both communities. Community 2 were also concerned with the distribution of jobs and opportunities, and unhappy with the significant social and economic losses they faced in the exchange of open cast mining for windfarms.

> *"…the losers are, in an area like ours, the losers are the workforce, the workers. Because they haven't a genuine argument. 'Yes, close me open-cast, are you going to give us a job on the wind?' 'No.' There's no job for me there, because they're highly skilled, they don't take labourers on… 'Well, I'm sorry, you're a casualty of this war, the war of green energy' and that's just it.'*
>
> (Community 1 Member(a))

There was also some sense in Community 2 that a return to mining in the UK was inevitable, and those who campaigned against the new open-cast mine were naive and unconcerned with more immediate benefits that mining offered to a community such as theirs in terms of employment.

Procedural justice

A dominant theme, identified by all respondents, was the need for much more weight to be given to local consultation when determining where to locate onshore wind farms.

> *"There has to be social justice on the grand scale, and on a very small scale. It has to be done with consultation, taking the people with* [them]."
>
> (Community 1 / Expert Interview(b))

It was clear that in the experiences of both communities, the level of local consultation was viewed to be inadequate and that the bureaucracy they were faced with was obstructive:

> *"Essentially we saw them off... they were an absolute shower, they couldn't organise a piss-up in a proverbial, and they just didn't then... nothing happened for the next three years and eventually it just fizzled*

> *right out so we were really quite cross with them. And there were all sorts of, it was all smoke and mirrors, it was very frustrating. After a while we heard, we'd been contacting them asking 'what's happening, what's happening?' Getting nowhere. Eventually we heard* [the wind farm proposal] *was axed."*
>
> (Community 1/ Expert Interview(b))

However, while community 1 was able to organise and offer effective opposition, Community 2 was not:

> *"... it was very much a closed group of people, and unfortunately – or fortunately – I was invited to a meeting... and what they said to me was that* [an energy company] *had (just) come on board... and when I did my homework I found that no* [energy company] *had inclusive rights on the site, and had had them for eight years to put wind turbines up....so that's how that came about. It wasn't a case of we wanted it, it's just that that's how it came about, that's what happened."*
>
> (Community 2 Member(a))

Outside/insider tensions

The threat from outsiders was present in almost all of the interviews and in both communities. Many interviewees, including those from Community 1, felt that foreign companies were taking advantage of generous subsidies with little regard for the effects on the people who were actually local to the development.

> *"A single landowner, let's say, plus the development companies were in effect creaming it on the back of the destruction of our landscapes."*
>
> (Expert Interview)

> *"... they're big schemes that are contributing the national supply, as opposed to something that's being imposed on* [the county] *for the benefit of* [the county] *... I think there are people that feel that this is an imposition on the county to benefit people elsewhere."*
>
> (County Council Employee)

In Community 2 it was felt that outsiders were making decisions about the closure/ refusal to develop open-pit mines and replace them with wind turbines, with little regard for those most affected by these decisions.

> *"If you look at where the actual wind turbines are positioned, you'll not find any in David Cameron's* [Prime Minister between 2010 and 2016, when many of the wind farms were built] *constituencies will you? Why? They've still got wind there, the same as us. But for some strange reason they haven't got a wind turbine. But they use electric, so why aren't they getting them? Why shove them in the North?... If you look at a map of the UK, where the wind turbines are, it is very unfairly distributed.…. There's a lot of high-up politicians, if you look at their areas, their constituencies, they haven't got any wind turbines, at all."*
>
> (Community 2 Member(b))

Further, in Community 2, while the mining company had felt like a part of the community the wind farm company did not:

> "[Mining company] *have always had a community funding spirit.... UK Coal went into Receivership, and they were going to sell the mineral rights, Rio Tinto wanted them... but* [mining company] *bought them, and they bought them at the top rate, which allowed UK coal to pay their men their last wage... Now when* [mining company] *came in ... when they saw what we used to do here* [provide a free Christmas lunch to local pensioners], *we applied and we got tables, chairs, banqueting cloths, and the ... second time we did the Christmas lunch, I knew nothing till I got the check, we got a check for £500 to cover the cost of the lunch – we hadn't asked for anything – he just said 'long may your community strive'."*
>
> (Community 2 Member (a))

And when asked if the wind farm owners took a similar approach:

> *"...No.... they don't. A lot of people will stay well away from a Parish Council. They won't get involved in the fray."*
>
> (Community 2 Member(a), with sounds of assent from CM2(b))

Environmental impact

Much of the opposition to the onshore wind farms, particularly from Community 1, was rooted in the belief that onshore wind turbines were not the best way to produce green energy. Concern for the environment – in a global sense – was present in many of the interviews, but coupled with an understanding that other forms of energy were better.

> *"You need a huge number of turbines, you almost need to cover all of your land area with turbines in order to generate* [enough energy]*.... It all adds to the mix, and I think we need a diverse energy supply, and I'm sure wind has a part, solar energy absolutely has a part.... but everything needs to be factored in, and there needs to be a realistic appreciation of what is feasible."*
>
> (Community 1 Member/ Expert(a))

Offshore wind was identified as a better alternative to onshore because it was seen as more reliable, and nuclear was also identified by both respondents from Community 1 as an avenue worthy of consideration. In general, a diversity of energy sources which would allow better distribution of negative externalities was sought. In Community 1 there was less concern for the environment in a global sense; the land had always been in use and for much of the 20th century in industrial use and as such onshore wind farms where not perceives as a new risk to (the aesthetics of) nature as in Community 1.

David & Goliath

In both communities participants expressed feelings of being at the mercy of forces beyond their control. In Community 1 this force was the companies which were attempting to develop local land to make (undue) profits, bolstered by the County Council who were facilitating this exploitation.

> *"... it was so cut and dried; the winners were the large ... multinational conglomerates who had all the power balance, and ... no interest in (the county) whatsoever and were only interested in lining their pockets at our expense and the absolute losers were the small communities."*
>
> (Community 1 Member/ Expert Interview(b))

Participants in community 2 felt themselves to be on the receiving end of a number of unwelcome developments. These developments included the larger of the two windfarms, but their primary concerns were elsewhere. The use of local land to bury the animals culled during foot and mouth outbreak was a particularly unwelcome intrusion, the decision by central government to refuse the development of a new open-cast mine was viewed as very damaging to their community, and the current rapid development of new housing estates was considered to be an imposition made with little consideration of the impact on those who already live in the village. The wind farms fitted into this pattern of imposition, but were not objected to on the same scale.

Scotland

Siân Stephens

Overview

Research for this case study was conducted on and around a large onshore wind farm in Scotland in 2018. Attitudes towards the windfarm among those consulted were overwhelmingly positive and as such this case study may serve as an opportunity to learn from good practice regarding the Just Transition. As was recognised by many of the respondents the wind farm is quite unique, both in its positioning and in terms of what is offered to the public through access to the land and other visitor attractions. The site attracts 200,000 visitors annually and as such the most noticeable 'resource' being offered by the site is the recreational use of the land on which the windfarm is placed, and there were no complaints about the way in which this resource was distributed. Where there were concerns with justice or fairness they had to do with the way in which the UK government of the time was seen to be interfering with the Scottish ambitions to expand the onshore wind provision in the country. The main policy recommendation from this case study therefore is to ensure the development of nuanced policy tools that do not risk over-reacting to perceived opposition to the development of onshore wind farms, and inadvertently missing opportunities to develop energy sources where there are high levels of local public support.

Case study context

Policies relating to onshore and offshore wind energy in Scotland are affected by both Scottish and UK politics. Scotland gained a devolved parliament in 1997, and while energy policy is reserved to the UK government, environmental policy is devolved to the Scottish government. In practice this means that the Scottish government has some control over Scotland's renewable energy projects.

UK government policy toward onshore wind has already been discussed in the previous chapter. The Scottish government has a stated aim to '[argue] constructively for the UK Government to ensure that such support matches Scotland's ambitions' (Energy and Climate Change Directorate, 2021). To this end, a number of high profile and ambitious targets for renewable energy have been set; the target to meet 100% of Scotland's electricity demand from renewable sources by 2020 was narrowly missed at 97.4% (Scottish Government, 2021), and the country is currently working towards a target to generate 50% of overall energy consumption from renewable sources by 2030, and to have decarbonised the country's energy system 'almost completely' by 2050 (Energy and Climate Change Directorate, 2021). It should be noted however that energy consumption in Scotland remains dominated by oil and gas, at 74.8% (Energy and Climate Change Directorate, 2020). Onshore wind investment generated £2 billion in turnover in Scotland in 2019, and around 2,900 full time equivalent jobs are supported by the industry (Energy and Climate Change Directorate, 2021), although employment in the renewable energy sector in Scotland is currently in decline (Meighan, 2021). Energy as whole accounts for 2.7% of employment in Scotland, compared to 2.1% in the UK overall (Office of the Chief Economic Advisor, 2021)

The Scottish energy identity is closely associated with wind energy (Diamond, 2020). Somewhat out of step with the rest of the UK, and England in particular, the Scottish government remains publicly committed to onshore wind energy as the 'lowest-cost new-build electricity generation in the UK' (Energy and Climate Change Directorate, Scottish Government, 2021) and the Scottish government has a stated aim to double onshore wind capacity by 2030 (Diamond, 2020). A number of policy tools have been implemented to encourage the development of renewable energy, such

as the Community and Renewable Energy Scheme (CARES) which offered a total of £5 million between 2018 and 2019 to community and local energy projects (Energy and Climate Change Directorate, 2021). The Low Carbon Infrastructure Transition Programme (LCITP) offers investment to accelerate the development of renewable energy infrastructure respectively (Minister for Energy, Connectivity and the Islands, 2019), and the Energy Investment Fund (EIF), launched in 2018, offers further funding for both community and commercial renewable energy ventures (Scottish Enterprise, 2022). The majority of Scotland's renewable electricity generation comes from wind; 3.5 TWh were generated in 2019 by offshore turbines, and 19.7TWh were generated onshore (Scottish Government, 2021).

The wind farm and community

Research for this case study was conducted on and around the site of a large onshore windfarm in Scotland. A high level of anonymity was offered to all participants, and as such we are unable to provide significant detail about the site or the community. The windfarm is owned and operated by a company which is headquartered in Scotland. The company was established during the privatisation of the energy supply industry of the 1980s and 1990s, and it is now a wholly owned subsidiary of a foreign company. The windfarm was completed in 2009 and is under the jurisdiction of three local councils. Much work has been done to ensure the windfarm is accessible to visitors and there is a visitors centre with a café and an educational facility. There is a community benefit fund associated with the windfarm which is administered by the three local authorities that cover the site, but the association between the fund and the windfarm is not widely known in the community. The site is in a rural location, but within commuting distance to a major city. The local area in one of the least deprived in Scotland (Housing and Social Justice Directorate, 2020).

Interviews were conducted in 2018, almost ten years after the wind farm first opened and there was little mention of local opposition. However, a search of news reports from the preceding decade suggest that there has been some opposition, although it is not possible to judge the scale of this. For example, there was opposition to the development of the site by the British Airports Authority due to potential disruption to the radar at a nearby airport, but this was overcome with a technological solution (PagerPower: Urban & Renewables, 2022). In 2013 the Scientific Alliance Scotland (who campaign against the wind energy industry, among other things) made a formal complaint to the Advertising Standards Authority. The complaint maintained that the company running the windfarm had significantly overstated the capacity of the site to generate electricity (WindPower Monthly, 2013). It has not been possible to confirm the outcome of the complaint, but it is in itself indicative of some opposition to the operation. More recently, a relatively local opponent of the windfarm made a contribution to the Letters page of the The Herald (29th of May 2021).

Data collection

Interviews were conducted with the following:

- 4 x Company employees involved in policy and planning/ ecology/ community engagement. Referred to as Sc001 - Sc004 below)
- 4 x Windfarm staff in a variety of roles (note that windfarm employees were not necessarily employed by the company that owns and operates the windfarm, some were employed by one of the local councils and some by an educational charity). Referred to as Sc005 – Sc007 and Sc009 below.

- 2 x Local council representatives, from two different local councils. Referred to as Sc008 and Sc010 below.
- 2 x Beneficiaries of the community investment fund. Referred to as Sc011 and Sc012 below.

Contact was made initially via the company who owns and operates the windfarm. Through this initial contact we were able to speak with some senior employees in the company that owns and operates the wind farm and wind farm employees. We were also given the contact details of members of the local county councils who were involved in administering the community benefit fund, who put the researcher in touch with recipients of the community benefit fund. Interviews were held in person, on site, in the summer 2018.

Findings

Attitudes to wind energy, and the focal windfarm for this case study, were generally very positive. Where there were concerns with fairness or justice, these had to do with the extent to which Scottish energy policy is restricted by UK government policy. It seems that for these participants a Just Transition would be one where 'local' (in this context 'Scottish') interests were fully recognized, and wind energy was seen as an important contributor to this. The energy transition was seen as an opportunity to redesign energy supply in a way that better suits Scottish needs and interests.

Distributive justice

There was very limited discussion of opposition, and on the whole the attitudes to the wind farm were very positive ;

> *"Well, the impact on the community it's a bit of a love-hate relationship that we have with the local residents... if you go to different areas around the windfarm you get different responses, like I know there is a very anti-windfarm setup of people based in _____.... but [in other areas they] see it as a good source of employment for locals you know, a good investment in the area. The local landowners are I think very very happy with the setup they get, because they get a lot of money every year to have the turbines on their land."*
>
> (Windfarm Employee Sc009)

The main resources offered by the development of the case study wind farm were access to the land and associated amenities, and the Community Development Fund associated with the windfarm. There was no sense of injustice with regard to the distribution of either of these resources, but it was also pointed out that the site was relatively unique in terms of what it was able to offer as a visitors' attraction:

> *"I think* [the case study windfarm] *is quite unique because it's a very big windfarm, very close to a big city, so it has a potential which probably other windfarms elsewhere don't have to the same extent where people can come up and actually benefit from access to the countryside, with all the sorts of health benefits and such like that that brings... I think it's a community benefit which by and large people do appreciate."*
>
> (Windfarm Employee Sc005)

This was supported by a community member (also a recipient of the Community Benefit Fund, which had been awarded to help restore a local playground), who described the area in positive terms:

> *"It's somewhere that people go to walk at actually. It's a nice area and its very unusual, and there's a nice café up there so it's a great place for waling your dogs and things up there, so on a nice day its always busy because people go up to the wind farm'"*
>
> (Community Benefit Fund Recipient Sc012)

Speaking to recipients of the Community Benefit Fund we came to understand that there was not a strong association between the fund and the wind farm, and despite this being a key resource of the operation it was not viewed in terms of fairness or justice.

Procedural justice

The consent process, which the company undertook in order to gain permission for the project is identified in the interviews as the procedure through which the available resources have been allocated. The visitor centre and the way in which the land has been made accessible were all conditions of the site's planning permission. This was well understood by those interviewed;

> *"I think they've done what they've had to in terms of putting money aside, the amount they pay* [at the windfarm, to the Community Benefit Fund] *... is £10,000 per megawatt, which is very low to compared to a lot of other windfarms now."*
>
> (Windfarm Employee Sc005)

When asked about the motivations for the way in which the company engaged with local communities, it was explained that it was not fairness that was at the heart of the decision making, but the demands of the consent process in Scotland:

> *"'Why do we do it?' To get consent. The reality is we have a stakeholder team, we go out to speak to people, we want people to have the best information about what we do, we want them to have the greatest understanding of what we're doing it....* [And we] *have a much better chance of getting consent, and a much smoother path through construction, a better relationship through operations in order to be able to repower to extend the life, or build another wind farm a few miles down the road. So really, it is about getting consent."*
>
> (Company Employee Sc002)

Outsider/insider tensions

Where there was some sense of threats from outsiders, the 'outsider' was not the windfarm, but the UK government. The involvement of the UK government came up in many of the interviews, and it was discussed as an obstacle to the ability of the Scottish government to pursue its own aims and ambitions with regard to onshore wind energy;

"So we have a generally supportive Scottish government, and that's nested within the UK government policy which, if you look at the kind of general focus of renewable energy policy... in reality, from an onshore wind perspective since 2015 we've seen a very very different approach which is manifestly negative.... in Scotland we're sort of caught between two conflicting approaches."

(Company Employee Sc003)

"I think the Scottish government is very encouraging of onshore wind. The messaging they give out certainly seems to show that. I think the problem is that they have their hands tied by the UK government because, as you know, for onshore wind to be profitable.... up till now we have needed support from the UK government financially and the current Tory government have stopped financially supporting onshore wind.... I think that if it was up to the Scottish government themselves, they seem to be very pro-onshore wind."

(Company Employee Sc004)

Impacts of wind energy

The global environmental impact of climate change was not a significant feature of the interviews. Two interviewees expressed a general support for the wind energy for environmental reasons. More common was reference to the impact of wind energy in terms of energy provision, and there was a sense that onshore wind energy was required in order to meet energy demand simply as a source of energy; the decline of other forms of energy was not mentioned;

"So as an industry it's important for us to get the support to ensure that there is investment to continue to develop new projects so that we have enough energy for everybody to go home and turn on their kettle."

(Company Employee Sc002)

"And what's the alternative, we always ask the kids – 'are you going to give up your PlayStation, mobile phone, TV, and all the rest of it?' 'No.' Well then we need to consider ... [alternatives like wind energy].

(Windfarm Employee Sc007)

South Africa

Siân Stephens, Bryan Robinson

Overview

Research for this case study was conducted on and around an onshore windfarm in South Africa in 2018. The communities local to the operation were socio-economically diverse, although generally the area is quite deprived. While 26.6% of the operation is owned by a Community Development Trust, there was very limited awareness of this among the interviewees. Awareness of the wind farm among community interviewees was driven by the projects which had been funded by the wind farm either through the Community Development Trust or the company's Corporate Social Investment budget. The primary issues of justice raised by interviewees had to do with the allocation of these funds. There was a strong sense of gratitude among those who had benefitted from the funds, but also elements of competition and some suggestions of perceived unfairness in the way in which these benefits had been administered within an area of such need. Global environmental concerns and issues relating to the energy transition were not raised. The data collected for this case study provides evidence of the efficacy of policy tools which privilege community ownership; while knowledge of this aspect of the operation low, the benefits which were accrued were clear. In order to bolster the judiciousness of projects such asgreater transparency and more concerted efforts to raise awareness of the community ownership element are recommended.

Case study context

South Africa remains heavily dependent on coal for its energy usage (69% in 2016, the latest data available) (Department of Energy: Republic of South Africa, 2019) but there are plans to reduce the country's reliance on coal to only 29.7% in 2030 through the development of hydroelectric power, nuclear, solar, wind energy sources (Department of Energy: South African Energy Sector, 2013). To this end, the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) was introduced in 2011. The REIPPPP is a competitive bidding process, which invites tenders for renewable energy projects which address the following aims:

1. Addressing the concerns of electrical energy shortages
2. A national commitment to transition to a low carbon economy that supports environmentally sustainable growth
3. The identified socio-economic development objectives of the Department of Energy (Independent Power Producer's Office, 2021)

Bids are evaluated on the following criteria, with indicated weighting:

- Pricing – 70% weighting
- Economic development factors such as job creation, local content, ownership, management control, preferential procurement, enterprise and socioeconomic development – 30% weighting.
    - ◊ Within this criterion shareholding by local communities in the seller, shareholding by black people in the construction contractor and shareholding by black people in the operations contractor) is given a 15% weighting, or 4.5% of total weighting. (Eberhard & Naude, 2017)

The REIPPP policy framework is applied in conjunction with the Broad-Based Black Economic Empowerment (B-BBEE) legislation applied to all businesses in South Africa. The B-BBEE offers preferential scoring to all government bids which address any or all of the following areas of Black South African economic participation:

- Ownership
- Management control
- Employment equity
- Skills development
- Preferential procurement
- Enterprise development
- Socio-economic development

(Liebenberg, 2013)

The REIPPPP and the B-BBEE policy tools have together created an environment which favours new energy projects with an element of community ownership as well as contributing to the socio-economic development of black South Africans.

The wind farm and community

Research for this case study was conducted with managers and community members of a wind farm which operates 32 turbines along the coastline of the Eastern Cape Province. The windfarm was built between 2013 and 2015. In accordance with the conditions set out by the REIPPPP bidding process the consortium lead made the commitment that the benefits of the project would

> *"...be particularly prominent for the project proponents, landowners on the site, historically disadvantaged South Africans* [HDSAs] *residing within the geographic location of the (…) through the proposed B-BBEE trust, the general community through CSI* [Corporate Social Investment] *initiatives and in the achievement of national and regional energy policy goals. The project would result in significant positive economic spin-offs, primarily because of the large expenditure injection associated with it both directly and through the trust and CSI initiatives."*
>
> ([South African Windfarm Company], 2011)

The windfarm consortium consists of a community development trust (CDT) and four other private investors. The CDT owns 26.6% of the operation, which is significantly higher than most projects developed under the REIPPP, (most of which have a up to 5% community ownership (Montmasson-Clair & das Nair, 2017). The vast majority of shares (98.8%) for the company, including those owned by the CDT, are held in South Africa.

Finance for the CDT's shares was made available via loan from the Industrial Development Corporation, which is a government funded investor established to finance projects such as these which contribute to the economic growth and industrial development of South Africa. The CDT is administered by a board of community representatives, who identify community investment projects. There is a separate CSI budget administered by the company which is targeted at projects in the same community.

The windfarm is local to a diverse range of communities, including a relatively poor rural area, a rural coastal town, an affluent coastal resort town, a rural agricultural community where the wind turbines were erected, and a neighbouring town. The area is characterised by quite extreme disparities in wealth, which is not uncommon in South Africa.

Data collection

Interviews were conducted on and around the wind farm in 2018. Using purposive sampling we were able to gain interviews with the Chief Executive Officer (CEO), the Chief Financial Officer (CFO) and the Community Engagement Officer of the wind farm. In order to represent the diversity of the local communities, participants were drawn from three distinct local areas (see Fig. 1) and include a grant recipient from the 'township', a holiday-homeowner from the affluent community, a farmer on whose land the wind-turbines were erected, and a small business owner. We were also able to speak with a municipal councillor, who represented the wind farm's ring-fenced 50 km radius of community engagement. See Table 4 for information about our sample.

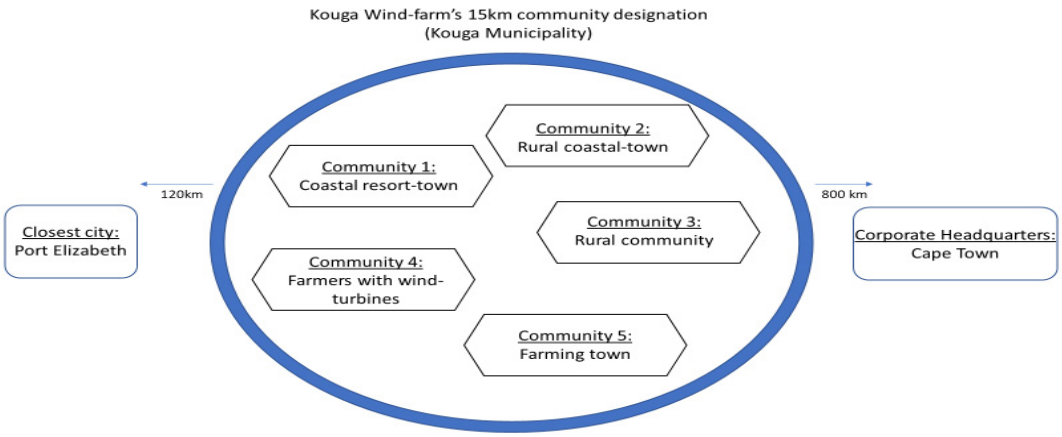

Fig. 1 Conceptual map of communities local to the windfarm

Interviewees:

Table 4 Interviewees – community acceptance and resistance in South Africa

Windfarm management	X 2
Community liaison officer	X 1
Members of local communities	X 6
Beneficiary of CSI funds	X 1
Local councillor	X 1

Findings

Our findings from this case study relate primarily to the community benefits offered by the company and via the Community Development Trust. This is no doubt due in part to the research aims of the original interviews, but as is demonstrated in the discussion below, this may also be attributable to the primary concerns of the local community, which have not to do with the transition from carbon-based to greener sources of energy but instead focus on more immediate concerns such as education, childcare and infrastructure. On the whole, all of our participants were well-disposed to the windfarm. Where there was contention this was due to perceptions of unfair distribution of community benefits, rather than objection to the presence of the turbines themselves, or the process by which the site was approved and developed. Tensions created by a sense of competition between 'outsiders and insiders' was not evident; where there was competition it was *between* local communities and there was very little discussion of 'outsiders' at all. Concerns about the impact of the wind turbines on the local environment were also limited, and those who had been concerned about this in the past explained that their fears had not been realised.

There was some discussion of the preferable ownership structure and conflicting views about the benefits of community ownership. It should be noted that there was quite a low level of understanding of the ownership structure of the company, or the policies which governed this.

The communities consulted for this case study did not have any views relating specifically to the 'Just Transition', but their responses offer an invaluable insight into the hopes of a community offered the opportunity to benefit from renewable energy operations, something which we may hope is characteristic of the current transition.

Distributive justice

Issues of distributive justice, as they relate to the ways in which resources are allocated, were discussed by our interviewees primarily with reference to the distribution of benefits via the company's Corporate Social Investment (CSI) and Community Development Trust. There was a sense of competition between better-off areas and more deprived areas, and some interviewees complaint that this inequality was not better balanced by the offering of the windfarm:

> "*They understand your needs in* [more affluent area]*, but it is a different story, they are not here. They are that side, everything they do is* [on] *that side.*"
>
> (Community Member)

Further, there was some reference to perceived injustice in the policies which governed the community ownership and benefit, specifically the BB BEE which was viewed as unfairly privileging black members of the community:

> *"Some of the landowners were a bit upset – who is the community? Is the community just by colour, or is it the whole community?"*
>
> (Local Farmer)

There was also some limited discussion of job creation and local content, with two respondents expressing concerns that the opportunity to provide jobs for local people related to the wind farm were not realised.

> *"We were told by government that they were bringing job opportunities and for me, within the wind farm for example certain amount of jobs would be brought in, but we don't see that happening. So it doesn't have as much of an impact on our local employment – local economy… The training that they did is good, but it ends there. If they can maybe just follow-through with their projects, and not just do a project that is going to be for a month or two."*
>
> (SME Owner)

> *"Very few people got involved* [during construction phase] *from what I saw. There was a person, a councillor, living in the area, he made sure only him and his two or three friends – it wasn't spread between everybody and everybody getting an opportunity. Pull in the local guys rather than bringing in people from outside."*
>
> (Community Member)

Procedural justice

There was limited discussion of issues relating to procedural justice, although there was widespread support for the way in which the community had been consulted from the early stages of the project's development. Four of our ten interviewees identified early consultation with the community as a notable aspect of the company's involvement in the area, indicative of a belief that it is advantageous and desirable that the development of sites such as this adopts a 'bottom-up' approach. For example:

> *"They came to us when they first wanted to start the wind-farm, they came to us and told us what they planned. They didn't set us aside when they started. They come to the community, they asked permission, and we gave them permission to do it. And they are really involved, they come to the communities, we have meetings with them, we tell them what we need.* [At the start] *we had big meetings with them, and they tell us this plan that they have, and we agreed with the plan.* [The community liaison officer sees]*us on a regular basis , it is not like they are doing something and disappear, they are involved hands-on. We know if we have a problem we can go to them and ask. They are open to us all the time. They are familiar faces in the community."*
>
> (Community Member)

Outsider/insider tensions

Discussions of outsider/ insider interest presented some conflicting views. While there was support for the idea of some local ownership of the windfarm there were also some concerns that local involvement would lead to conflict and competition within the local community. The way in which these issues were understood was affected by a lack of understanding regarding the ownership structure of the windfarm; most views were expressed hypothetically reflecting a view on how things should be rather than are view on how things were at the time. For example;

> *"I think there should be ownership from the community side, then they will know exactly what the community needs."*
>
> (Community Member)

> *"But then my worry* [about community ownership] *would be, who was going to make sure that the money goes to the community? Jealousy creates problems … and therefore it is better that no community members have a finger in the pie."*
>
> (Community Member)

One respondent was concerned that potential benefits were leaving the area, or even the country entirely. As above, may be partly attributable to a misunderstanding of the ownership of the company:

> *"The people that are benefitting the most is the farmers and turbine owners who are mostly based in Europe."*
>
> (SME Owner)

On the whole, however there was little discussion of outsiders, and frequent reference to the presence and visibility of the company locally, primarily via the Community Liaison Officer.

Local and environmental impact

Concerns with the impact of the wind turbines in terms of the environment were quite limited. When prompted, two interviewees explained that any fears that the operation would have an aesthetic impact had not been realised:

> *"I think in the beginning… you have to get used to it. And now to be quite honest, if you don't ask me about it, I don't realise that it's there. Obviously, you adapt to it, you get used to it…We as land owners got into a bit of slack in the beginning from people in* [an upmarket rural coastal town] *because obviously it is going to have a huge impact on the area visually wise… and they all changed. I don't think it looks ugly. My view, rather this than nuclear plant, such as* [a planned Nuclear Plant in the area that elicited public outcry]. *If you look at the amount of electricity they generate… they don't bother me anymore."*
>
> (Local Farmer)

> *"That was the main complaint when the whole study started – the impact study from the guys who wanted to erect the farms. People felt it was going to really damage the look of the whole area because it was a farming community with clean air, just some cows and grass. We moved just before they built them. Coming back, the first time we saw these big* [turbines]*, but then the aesthetic thing is as you come in because it is on the road to Oyster Bay. The moment you are in Oyster Bay, the houses all face the sea, so you don't see them. So it doesn't really bother."*
>
> (Community Member)

The impact of windfarm on farming was mentioned by two respondents, referring to both the environmental impact and the impact of the money farmers received in exchange for use of their land. One interviewee explained that the Department for Agriculture had been concerned that the payments would dis-incentivise farming, but our interviewee explained that the payments had in fact allowed investment in equipment which increased output:

> *"It is quite interesting seeing how the Department of Agriculture see it… For them, it was a problem taking productive land out of the system and replace with tower. But it is such a small percentage of land – I think it is 1% . The roads* [built by the wind farm] *actually help us with the infrastructure, and they maintain the roads as well. So that's a nice deal in itself.... So from the department of agriculture, they came to my farm about two months ago, they were also concerned that the extra money the land owners are going to get, aren't those farmers going to stop farming? …but not one of these farmers have actually stopped farming. They have started growing their farms because you have that financial back-up."*
>
> (Local Farmer)

Conclusion

Siân Stephens

Discussion and policy implications

Summary

The data presented here from five countries evidences the many ways in which proposal for new onshore wind developments can fall foul of local communities, as well as offering some insight into ways in which the risks of opposition can be overcome. Broadly, the communities in England were largely opposed to onshore windfarms, while our interviewees in Germany Case 2 & 3, Scotland and South Africa were generally well-disposed to their local wind farm, and to onshore wind energy more generally. Germany Case 1 and the Danish case study offer a nuanced insight into a complex web of qualified support and reluctance.

Within the interviews and focus groups can be found many references to issues of fairness and justice. The community ownership of wind farms in Germany demonstrate the efficacy of procedural justice via transparency and inclusivity, while in England and Denmark there was dissatisfaction with the way decisions were made and what was seen, in England at least, a lack of clarity over beneficial ownership.

Concerns with distributive justice were raised in all countries, although in Scotland and to a lesser extent South Africa, there was a sense that the benefits were well-received and there was little to no resentment in this regard. In England and Denmark what was perceived as an unfair distribution of the turbines themselves was raised as a concern, as well as a strong sense of 'winners and losers'; with the local communities themselves often viewed as the losers.

In the following sections we discuss our findings as they relate to procedural justice, distributive justice and the other emergent themes of insider/outsider tensions, environmental impact and the David & Goliath' dynamic. We conclude with policy recommendations based on our findings.

Procedural justice

Procedural Justice, understood here as to do with the fairness of how processes and rules are applied, was discussed primarily in relation to opposition. Failures of procedural justice were identified by respondents in England, Denmark and to a lesser extent Germany (Case 1). In England there were concrete concerns to do with the polices in place during the time of the 'wind farm boom' of the early 2000s, and it was viewed as unfair that decisions which had such significant local impacts were made with minimal local input. In Germany and Denmark it was believed that local opponents had benefited from direct payment, effectively targeted to neutralise their opposition. In Denmark in particular this was viewed as a significant barrier to procedural justice, as well as a leading to a failure of distributive justice. German case studies 2 and 3 offer insight into the benefits of procedural justice when well-applied, and the transparency of the co-ownership structure and the local management and decision making were identified as significant contributors to the processes legitimacy and fairness. In South Africa, where arguably the greatest attention has been paid by policy makers to designing rules and processes which promote fairness, no comment was made on this at all, and it seemed likely that there was little understanding of the relationship between the policies in place and the outcome in terms of windfarms and community benefit.

Distributive justice

Issues of distributive justice, here understood as relating to the fairness in the allocation of resources, were raised in reference to a range of specific benefits and harms posed to the relevant communities. In Scotland, South Africa and Germany the benefits of the local windfarms were clear; in Scotland this was the main benefit was increased recreational access to the land, and in South Africa resources included a number of community initiatives which had been financed by the Community Development Trust or the company's CSI budget. In South Africa however there was also some indication of resentment and a belief that some communities were receiving more than others, and that this was unfair. In Germany the benefits of co-ownership fostered a sense of distributive justice, particularly when bolstered by support from banks which made share ownership accessible to almost everyone. In Denmark there was a more mixed picture; the proposed expansion was not going to offer community ownership and so the main benefit offered to the community would be the highly-skilled jobs which would be offered by the new development. From the case study we can see that this offering was considered inadequate by many. In England and Denmark there was also sense that the distribution of windfarms themselves was unfair, and this was particularly strong in the England case study. In England it was believed that all that was being distributed in the region was negative externalities and that if there were any benefits to be reaped from wind farms they were being reaped elsewhere.

Insider/outsider tensions

A perceived threat from what might be termed 'outsiders' was evident in much of the opposition found in our data. Indeed, in Denmark, the sound of the wind turbines was compared to that of the invading Martians in H.G. Wells' War of the Worlds. In England, the lack of consultation regarding the placement of new wind farms was viewed as painful imposition, where large, foreign owned companies turn up and set-up, with little consideration of the effects of their actions on local people. In Scotland however, where the windfarm was owned by a wholly-owned-subsidiary of a foreign company, the outside threat against which the community were steeling themselves was the UK government, and as such the windfarm was considered to be an insider who was aligned with local, Scottish, interests.

Community acceptance could be found most clearly in those operations which entailed an element of community ownership, as in Germany and South Africa. It should be noted that Community Ownership, or 'Co-Ownership, in the European case studies indicated something different to the South African context. In the German cases and in Denmark 'Community Ownership' indicated that a certain percentage of shares in the project was owned by local people. In South Africa, Community Ownership indicated that a certain percentage of the shares were owned by the Community Development Trust (CDT), using money from a government loan, earmarked for community projects and the spending of which was governed by a board of trustees which included community representatives. Therefore, while in the European case studies the ability of (non-local) private citizens to buy shares in windfarm operations was identified as a potential barrier to local participation, this was not a relevant concern in South Africa. Nonetheless, it should be noted that in South Africa awareness among the community of the CDT was very low, and indeed some raised concerns about what they believed to be a private company siphoning money away from the community.

Environmental impact

Many of our participants indicated a discomfort around their difficulty reconciling the urgency of the global climate crisis with the immediacy of their experiences as someone living near a

windfarm. There was a widespread acceptance of the reality of climate change and the need for action. Even in England Community 1, where the local community effectively opposed proposals for a small windfarm in their local area, there was a strong consensus that alternative energy sources were vital – but just not onshore wind, and just not right outside their door. Some opposition was stated in terms of aesthetics and noise pollution, and some was explained with reference to local environmental damage. In Germany Case 1 opposition was initially made due to both, the impact on a local waterway and on the local tourism industry. In Scottish media it seemed that there were some concerns about the environmental impact of wind farms more generally, and in England it was clear that the environmental and aesthetic impact of the proposed development was the primary concern of Community 1, although this was coupled with the belief that the turbines were not/ would not make a meaningful impact in addressing carbon emissions and climate change. The Danish protestors identified the destruction of a beautiful area and the destruction of animal habitats as two key reasons for their opposition and in South Africa there was some minor mention of concerns relating to the impact of the windfarm on the local environment, although these were discussed as having been unfounded.

David & Goliath

Many of the communities consulted felt that they were the 'little guy' facing an up-hill battle against powerful forces. Danish protestors felt that they were facing insurmountable structural power, designed to benefit private companies and profit makers posed to roll over concerns about local impacts. This view was shared by the communities in England; Community 1 rallied against this power and, after great effort and expense were successful. Community 2 did not even consider organised opposition. In the German cases the fear of such imposition was hypothetical, but sufficiently present to be commented on, with interviewees stating clearly that there would be significantly more opposition were the turbines to be owned and operated by the utility companies. The 'David & Goliath' dynamic was absent in Scotland and South Africa. In Scotland the wind farm was well-accepted by the community, although it's possible the data would have presented a different picture had it been collected at the time of the operations construction. In South Africa the Wind Farm was viewed as having power, but a power that was being used to distribute community benefits.

Implications for policy

There are valuable lessons to be learned from the data here, both from the success stories and the communities suffering the unwelcome imposition of onshore wind energy. Based on the findings presented in this report it is argued that community acceptance can best be achieved by addressing issues of procedural justice and distributive justice. The primary concern presented above with regard to procedural justice is the involvement – or lack of involvement – of local people in the decision making processes which leads to the development of onshore wind turbines. The issues raised regarding distributive justice relate to unfair distribution of negative externalities (i.e. the windfarms themselves and associated environmental and aesthetic harm) and the distribution of tangible community benefit.

The clearest success story, addressing both issues of procedural and distributive justice, can be found in the German case studies. The early introduction of community and co-ownership schemes has ensured a perception of procedural justice and effectively pre-empted much of the opposition found in the other case studies. Remaining opposition seems to have been dealt with by direct payments, which does not address issues of procedural justice but no doubt feels like distributive justice to the recipients. Such an approach is not recommended as it is likely to exacerbate tensions between supporters and opponents; not least in contexts where competition for resources is fierce

such as South Africa. However, the prevalence of community ownership and involvement in Germany has proven to be an effective way of ensuring both procedural and distributive justice and, however, the 'mopping-up' of opposition with direct payments hardened the lines between opponents and supporters.

Community and co-ownership was not an option in the Danish case-study, as it would not be considered by the investing company. This could perhaps be overcome with a policy environment similar to that found in South Africa, where the pursuit of a low-carbon economy is paired with that of a fairer socio-economic landscape and renewable projects with a community ownership element are heavily favoured in bidding processes. Given the European framework, where community ownership entails local people buying shares directly, this should be coupled with schemes to ensure that share-ownership was widely available, as in Germany, in order to ensure distributive justice as well as procedural justice.

Scotland poses an interesting counter-point, offering as it does an example of a widely accepted operation that is wholly owned by a private company, that is in itself wholly owned by a foreign company. Despite this, the wind farm is embraced by the local people because it is seen to be leveraging a Scottish resource for Scottish interests. This perhaps offers some insight into how protest can be overcome in the English context, where wind is an abundant natural resource. Opposition from England Community 1 and Community 2 comes from different directions; Community 1 maintain that onshore wind energy is environmentally damaging and a relatively inefficient way of producing green energy while Community 2 maintain that onshore wind energy offers little in the way of socio-economic benefit. In response to the first objection, regarding the efficiency of onshore wind energy production, it is suggested that communication about the value of wind as a national resource be strengthened, as it seems to have been in the Scottish context. This is particularly important given the very current uncertainties around energy security associated with a reliance on oil and gas.

In response to the second objection, regarding the (lack of) socio-economic impact of onshore wind developments it is suggested that the future development of onshore wind farms be paired with projects that will create jobs or at least lead to employment. Such schemes might include funding for new small businesses or paid placements on vocational courses. A closer coupling of positive impacts with the presence of wind farms may well address the concerns found in England and Denmark regarding what was felt to be an unfair clustering of wind farms in certain areas, as the presence of wind turbines would not be simply an imposition but also an opportunity.

Opposition rooted in objection to the environmental and aesthetic damage posed by onshore windfarms will be the most challenging to overcome. As there was a widespread understanding of the need for alternative energy sources to tackle the climate crisis there may well be some scope to capitalise on this to better explain the environmental cost-benefit analysis of onshore wind. Those who are concerned with local environmental impacts could perhaps be well engaged with a clearer narrative regarding the global environmental impacts of onshore wind and there may be technological solutions to be invested in and investigated which could minimise the aesthetic impact of onshore wind turbines. . However, it is also likely that there will be many people who are not for convincing, and onshore windfarms should not be forced on unwilling communities. As we saw in the Scottish case study there are places which are keen for greatly increased onshore wind energy production in their local area but feel stifled by policy designed to protect those are resistant, and this is not helpful. It is possible that the current UK policy, where onshore windfarm developments are subsidised via the Contracts for Difference scheme, but local authorities retain a veto for windfarms in their area, is a good compromise which will overcome the resentment of both those areas that want more onshore wind and those who want less.

While some degree of community opposition to industrial change is inevitable, our evidence suggests that there are reliable ways of overcoming at least some of this. The research presented here points to the significant benefits of policy environments designed to facility community

involvement and investment in, and benefit from, the development of onshore wind farms. Further, we suggest that greater investment in coupling onshore windfarms with sustainable and embedded community benefits will lead to long-lasting support for the presence of onshore windfarms in local communities.

The communities consulted for this project reflected the narrow conception of the Just Transition, and their concerns related to the impact of the transition on their jobs, their communities and on their local environment. There was an awareness of the risks of climate change, but this competed with the immediate urgency of local and personal issues. This has important implications for the potential of success when framing the Just Transition as a 'global project of saving the planet' or as a 'global project of social solidarity'. For this, although it de facto needs a global effort, to gain momentum at the level of individuals, individuals' specific, local concerns and their material interests in the energy transition need to be taken seriously and need to be concretely addressed.

Section 2

Skill formation, job quality and social dialogue in the wind turbine industry

Introduction

Lisa Schulte

In this section we present our findings on the Just Transition in the wind turbine manufacturing industry across the four countries, Denmark, Germany, the United Kingdom and South Africa. As stated in the introduction to this report, the concept Just Transition originates from the North American labour movement and aimed to dissolve the longstanding conflict between the preservation of jobs and the protection and conservation of the environment (e.g. Mazzochi, 1994). A Just Transition would address the problem of job losses in polluting industries, for example coal mining, through social dialogue between employers and trade unions and by compensating workers and opening up avenues for further employment in new industries.

The Just Transition has two main dimensions, distributive and procedural justice. The initial concept – geared towards compensating and reskilling of workers in polluting industries – was narrowly defined. More recently the term has gained a broader conceptualisation including wider redistribution of economic benefits and more egalitarian power relations between societal actors (Galgoczi, 2020). A narrow conception would mean limited redistribution geared mainly towards compensation, avoidance of additional harm, whilst participative procedures and power relations between economic actors, here workers and employers, would remain the same. A broad conception would mean progression to broader redistribution of economic benefits and more inclusive participation in decision making as can be achieved through trade union organising, collective bargaining and changes in ownership structures.

The international labour movement's definitions of the Just Transition as stated in the ILO Guidelines (ILO, 2015), the Solidarity and Just Transition Silesia Declaration (UNFCC, 2018) and the UNFCC Gender Action Plan (UNFCC, 2020) includes skill formation, job quality and social dialogue. All three contain distributive and procedural elements and hence the way they take shape can be discussed within the spectrum from a narrow to a broad conception of the Just Transition.

Different institutional settings in terms of skill formation and social policy have been discussed in the comparative political economy literature as leading to different outcomes in terms of equality (e.g. Thelen 2014). Galgoczi with implicit reference to the Varieties of Capitalisms approach states that how the Just Transition plays out for workers in different countries and industries depends on the way socio economic conflicts – questions of distribution and participation – are mediated through existing institutional frameworks.

For this report we studied the wind turbine industry in countries with different institutional settings (Hall and Soskice, 2001): the UK – a liberal market economy, Germany – a co-ordinated market economy, Denmark – a hybrid between liberal and co-ordinated market economy (Cambell and Pedersen, 2007), and South Africa – a developmental economy. We collected data in these countries between November 2021 and March 2022. The aim of our data collection was to expand our sample of country case studies with data from South Africa and to update our datasets from previous research on Denmark, Germany and the UK conducted between 2012 and 2018.

Our recent interviews and those conducted over the past decade explored four dimensions, skill formation, job quality and social dialogue and the political and market challenges the industry encounters. Although aiming for a more systematic sample across the countries in our more recent wave of data collection, we encountered similar challenges in terms of access as in previous waves. These challenges seem to be symptomatic of the distinct characteristics of the institutional and policy systems in each country.

In our most recent wave of data collection, 2021-2022, we could conduct and arrange interviews with a trade union officer, shop stewards and management at two manufacturers, and focus groups with around five workers each at one site of each manufacturer in Denmark. However one of the two companies cancelled all arranged interviews and the focus group without giving a reason, after a newspaper article by the researchers had appeared in one of the biggest Danish newspapers. None of the two manufacturers' German sites agreed to focus groups with production workers. But we were able to interview several works councillors from different sites of both manufacturers, a manager from one manufacterer, a trade union officer and a sector expert from an industry body.

The ease of arranging interviews and the focus group at one manufacturer in Denmark and the greater challenge of gaining access to another manufacturer, already seemed to give us clues about the adherence of one manufacturer to a more coordinated model of employment relations and of the other manufacturer to a more liberal, or it could be said, more fragmented model of employment relations. This pattern seemed to be confirmed during our field research in Germany.

Keeping in line with the UK's fragmented industrial relations system, both manufacturers were inaccessible to us in the UK despite a number of interview requests sent through various channels from outside and within the company. Therefore, our most recent data collection in the UK in 2021 and 2022 involved interviews with seven interviewees including two officers at a trade union, one officer at an employers' association, a manager from a training provider, officers at a public body and a sector support organisation and one industry expert. In these interviews we explored the challenges to skill formation, job quality, social dialogue and the industry at a more general level.

South Africa does not have any manufacturing site of the major OEMs. The country is currently grappling with the transition from a strong dependency on coal to a more diversified energy supply industry. Our thirteen interviews with a variety of experts representing industry, labour movement, social and environmental activists and foreign aid organisations explored the challenges of this transition.

Findings from our recent interviews could be corroborated with findings from earlier interviews, but – thanks to the time that has passed since the first interviews – our new data gave us a more crystallised picture of each country case. The European wind turbine industry has strongly consolidated over the past decade, with two main manufacturers emerging across all three countries. The structure of these manufacturers' production networks has important implications for skill formation, job quality and social dialogue. For instance, research and development activities take mainly place in Denmark and workers are involved in knowledge transfer to other international production sites. A variety of components is produced in Germany (blades, generators, nacelles) and only blades are produced in the UK. But the effects of the structure of the supply chain cannot be completely isolated from the impact of national institutions of skill formation and social dialogue on the one hand and market pressures on the other.

In Germany, one of the market leaders integrated less successful competitors and continued overall on its distinct employment relations trajectory mostly following the German model. While the other manufacturer – as in its Danish operations - takes a more liberal approach due to low levels of trade union membership among the workforce. Similarly, in Denmark, after some years of upheaval and thanks to some trade union wins, one manufacturer clearly followed management and employment relations strategies in line with the Danish model of industrial relations, whereas the other seemed more liberal in its approach. Data from our new interviews in the UK show a similarly fragmented picture as interviews conducted in earlier waves, also confirming the pervasiveness of the UK's industrial relations model and industrial policy approach. Although wind turbine deployment has been taking place at a massive scale along the UK coast due to governmental efforts, no significant domestic industry has developed and the trade unions have so far failed to strongly organise the workforce in installation and maintenance of wind turbines and the little manufacturing that exists in the UK.

Our semi-structured interviews and focus groups and with trade union officers, managers, works councillors/shop stewards, training providers and workers largely contained sets of questions that were agreed upon by our research team prior to our data collection to ensure comparability across the sample. Interview schedules for other types of interviewees were more customised and designed by individual researchers, however followed the overall objective of learning more about the challenges to the four areas we aimed to compare across the country cases – skill formation, job quality, social dialogue and challenges to industrial development.

Our main finding is that whereas countries' specific institutional frameworks still play a role, the fact that the wind turbine OEMs are internationally operating conglomerates has two important implications. (1) Institutional frameworks of the OEMs' home and host countries dynamically interact, (2) the international structure of OEMs and the maturation of production processes across the industry enable OEMs to stage competition among their production sites, allowing for the dumping of working conditions and the restriction of labour rights. Our findings show that the strength of trade union and work place representation are, quite unsurprisingly, important bastions in protecting labour rights and standards – but their strength is not a given, not even in hybrid and co-ordinated market economies.

Wind turbine manufacturing industries, with a lot of new actors, are by far less strongly trade union organised than fossil fuel industries. And hence the transition to low carbon economies lacks a mechanism – strong trade unions and worker representation – that ensures that the transition leads to similar or better levels of skill formation, job quality and social dialogue. In other words neither the narrow nor the broad conception of the Just Transition may be realised for workers. Our policy recommendations therefore include policies for strengthening worker representation and national level institutions of skill formation.

This section contains separate chapters per country in which our findings on the countries' institutional frameworks and policy contexts, policy and market challenges to the wind turbine industry, skill formation, job quality and social dialogue as well as our participants' conception of the Just Transition will be discussed. This section concludes with a discussion of our comparative findings and our policy recommendations for ensuring a Just Transition in the wind turbine industry.

The table below list the interviews conducted across the different waves and countries.

Table 5: Interviews conducted between 2012 and 2022

Denmark		**Germany**	
Wave 1 – 2014		**Wave 1 2012-2013**	
Manufacturer B	Former manager	Trade Union	Organiser
Manufacturer B	Former worker	Trade Union	Officer HQ A
Manufacturer A	Manager	Trade Union	Officer HQ B
Industry body	Sector expert	Trade Union	Officer local branch
Manufacturer A	Manager	Trade Union	Officer sector
Training provider A	Manager	Training Provider A	Manager
Training provider B	3 instructors	Training Provider B	Instructor and officer
Manufacturer A	2 shop stewards	Training Provider C	Manager
Trade Union	Officer	Training Provider D	Manager
Training provider B	Manager	Municipality A	Manager and PR officer
Wave 2 – 2018		Training Provider E	Owner
Trade Union	Officer	Manufacturer A	Work councillor
Manufacturer A	Shop steward	Training Provider F	Instructor
Training provider A	Instructor	Manufacturer C	Work councillor A
Training provider A	Manager	Manufacturer D	Work councillor
Training provider A	Instructor	Training Provider G	Manager and Instructor
Manufacturer A	Former worker	Manufacturer E	Work councillor
AMU Aalborg	Training provider	Manufacturer B	Work councillor
Wave 3 – 2022		Training Provider A	Training provider
Manufacturer A	Manager and shop steward	Manufacturer E	Manager A
Manufacturer A	Five production workers	Industry body A	Manager
Trade Union	Officer	Manufacturer E	Manager
Manufacturer A	2-hour guided tour	Industry body B	Officer
Training providers B and C	2 managers	Manufacturer C	Work councillor B
		Wave 2 – 2021	
		Trade Union	Officer
		Manufacturer A	Work Councillor A
		Manufacturer B	Work councillor A
		Manufacturer B	Work councillor B
		Training provider A	Instructor
		Manufacturer B	Work councillor C
		Industry Body	Officer
		Manufacturer A	Work councillor B
		Manufacturer A	Manager
		Training provider B	Manager

United Kingdom		**South-Africa – 2021-2022**	
Wave 1 – 2012-2014			
		Renewable Energy Institute	Director
Trade Union	Officer HQ	Training Provider A	Instructor
Industry body	Officer	Training Provider B	Instructor
Local authority	Sector officer	Wind Farm	Worker
Training provider A	Manager	Wind Farm	Manager
Training provider B	PR officer	Manufacturer H	Manager
Local authority	2 officers	SME	Manager
Trade Union	Sector Officer	Trade Union	Officer
Trade Union	Skills Officer	Association for the unemployed	Officer
Manufacturer G	2 Managers A and B	University	Activist/academic
Manufacturer G	1 Manager C	Trade Chamber	Officer
Training Provider C	Manager	Industry body	Officer
Training provider D	Manager and PR officer	Anti-nuclear campaign	Activist
Financial Institution	Manager and officer		
Wave 2 – 2017			
Local authority	Manager		
Manufacturer A	Shop Steward		
Wave 3 – 2021-2022			
Trade Union	Officer HQ A		
Trade Union	Officer HQ B		
Employers' association	Officer		
Training provider	Manager		
Sector support organisation	Officer		
Think Tank	Sector expert		
Public body	Officer		

Denmark

Mads-Peter Klindt

Introduction

Denmark's tradition for modern wind turbine manufacturing dates back to the late 1970's when Vestas and other firms and NGOs in the face of the oil crisis started experimenting with new forms of energy and renewables. Today, Vestas Wind Systems is the world largest wind turbine manufacturer and a multinational corporation with global supply chains. However, the company still has several significant operations in Denmark, including blade factories, nacelle production and R&D units not forgetting the corporate headquarter in Aarhus.

Spanish-German Siemens Gamesa Renewable Energy (SGRE) is the other main wind turbine manufacturer present in Denmark. The company has two large factories and R&D centres, including blade and nacelle plants. Both were originally founded by Danish manufacturer Bonus Energy and acquired by Siemens Wind Power (SGRE's predecessor before the merger) in 2004.

This study on Just Transition, social dialogue, job quality, and skill formation in Danish wind turbine manufacturing zooms in one of the major blade production sites in the country. We conducted a joint interview with plant manager and shop steward and a focus group interview with five production workers. Moreover, we interviewed the local union officer who assists the shop steward in negotiations vis-à-vis the management at the plant.

Before conducting interviews, we also went on a two-hour guided tour around the production facility. To get a more general view of the pinch points related to the provision of skill formation in and to the Danish wind sector, we finally did a focus group interview with the managers of two vocational labour market schools, one of them in near location of the visited blade factory.

In terms of achieving a Just Transition within wind turbine manufacturing, results from the data collection are quite positive. We found that working conditions and social dialogue profoundly abide by the Danish model, including a close relationship between management and shop steward organisation, regular negotiations with the trade union, relatively high wages, widespread use of tenure employment, decent training opportunities, and a strong and continuing focus on the working environment – it's psychological as well as physical aspects. The main problem issue raised in the interviews, was difficulties balancing work life and family life due to the plant's working time schedule. The 12-hour shifts are problematic for workers with small children. However, some of the workers also underlined that the working time arrangement is an asset, allowing them eight days off in the course of two weeks.

More generally, the workers and union reps interviewed were moderately supportive of the green transition. Working with wind turbine manufacturing has raised their awareness of the importance of reducing greenhouse gasses, but not enough to prompt radical changes in lifestyle or consumption patterns. In terms of a Just Transition', the workers we interviewed worry mainly about the risks associated with a too swift phaseout of coal and gas, for instance rising energy prices which could have negative effects on equality in Denmark. This finding is in accordance with survey data reported by the Danish Trade Union Confederation in January 2022 (Fagbevægelsens Hovedorganisation, 2022).

In comparison with the findings among workers in Germany and the UK, the qualitative findings at the Danish blade plant should be seen in light of the fact, that the wind turbine manufacturer considers the Danish plant as their 'trailblazer factory' were blade production and R&D is closely connected. As such, most of the workers at the Danish plant could be considered core workers, while many British and German workers, who belong to mere production units without R&D functions, could be considered periphery.

Country context: Hybrid market economy and wind turbine pioneer

In terms of labour market regulation as well as renewable energy, many scholars proclaim Denmark as a special case or role model. In the Varieties of Capitalism literature, Denmark is known for flexicurity, which is the combination of a flexible labour market, generous unemployment insurance and active labour market policy with a strong focus on retraining (Madsen, 2005). Moreover, the labour market is characterized by strong union coverage and regular social dialogue on the macro and firm levels (Viebrock and Clasen, 2009).

The interplay between these institutional components produces competitiveness, social security, and high worker mobility simultaneously. In the face of globalization and technological change, this means that the model leads Denmark on another path than coordinated and liberal market economies where liberalization equals more inequality one way or another. In Denmark, liberalization and social solidarity go hand in hand (Thelen, 2014) and the hybrid model appears as an alternative, attractive and more just recipe for macro-economic success in the 21st century (Campbell & Pedersen, 2007).

Critical voices claim that after the Global Financial Crisis, cutbacks to Denmark's social safety net accompanied by more rigorous activation were jeopardizing the flexicurity system. However, collective bargaining results in the 2010s to some extent compensated for government retrenchment (Jørgensen and Klindt, 2018). Increased training rights and funding for workers' training leave is a good example. As such, from an institutional perspective, there is not status quo yet there is still flexicurity, high mobility and record-low unemployment.

Within renewables and wind turbine manufacturing, Denmark is also a role model country, and this connection dates even longer back than flexicurity. The modern Danish wind turbine adventure begins in the early 1970s at the time of the first international oil crisis when several firms and NGOs began experimenting with different forms of renewable energy (Meyer, 2013).

Living in a small windswept country at the edge of continental Europe, Danes had exploited wind power for a century, but in the interface of international political dynamics, economic crisis, idealistic grassroots, new technology and a public sceptic to nuclear power, the modern wind turbine was born. Vestas is the embodiment of Denmark's contemporary wind turbine success, technologically and commercially, and Vestas was also one of the pioneers in the industry in 1970s. However, it was a revolutionary folk high school called *Tvind* that created the first example of the modern wind turbine with self-supporting blades made from fiberglass.

Designed by Jan Utzon and engineered with technical assistance from a great number of voluntary experts, the Tvind community completed the turbine in 1978. At the time, it was the largest wind turbine in the world, and it sparked a number of new R&D activities in Denmark, including research in aerodynamics at Denmark's Technical University. Producing 2 MW, Tvind's turbine supplied the entire Tvind school system and colleges with electricity and heating, and in the coming years, the project in effect demonstrated how a modern society could become self-sufficient with cheap, clean energy without the use of nuclear reactors (Christensen, 2013).

In the slipstream of the Tvind-project, commercial actors (including Vestas) advanced the wind turbine design and exporting started in the 1980s. Public funds and subsidies for energy companies investing in green energy backed the industry from 1979, and in 1985 – after massive protests – the government finally ditched its plans for nuclear power.

Nowadays, wind energy is a big business in Denmark and abroad, yet the Danish government persistently supports the industry and technological development within renewables. Government support comes in different formats, for example co-funding for R&D and test sites, but most importantly from several energy reforms backed by a parliament majority that includes the construction of a series of very large offshore wind farms and energy facilities[2].

Case presentation and overview of data collection

The Danish blade factory subject to investigation in the report at hand produces 97-meter blades for 11 MW wind turbines, the manufacturer's newest and largest model. At the time of writing, the blades assembled are for offshore wind parks in the Netherlands, Germany, and the US. The plant has orders corresponding to a full workload in the coming 2½ years.

Some 1500 people are employed at the blade factory, two thirds are production workers. The production facility is divided into five segments: 1) warehouse and cutting, 2) packing department and foundry, 3) after treatment, 4) painting and 5) end assembly. Work in section 4 is outsourced to a Danish company that mainly employ foreign workers. The argument for this is that it's impossible to get any Danes to do this kind of work. Besides production, the factory also encompasses the manufacturer's main blade R&D unit. From time to time, production workers are seconded to the R&D unit for assisting with the construction of casting moulds and prototypes of new blade models.

In the production segments, work is organised in groups headed by a group leader. The groups are subdivided into smaller teams with team leaders. Group leaders are considered as being part of the plant's management structure as they can hire and fire workers. Team leaders cannot and belong on the worker side of employment relations.

Work in the plant's production units is unskilled work in principle, the only mandatory training is a personal safety course in working with epoxy and isocyanates. Nevertheless, most staff members have a professional vocational background too, for instance as a carpenter or auto mechanic. Hiring skilled workers rather than unskilled is a deliberate firm strategy, as the plant continuously seeks to optimise its operation and reduce bugs and errors.

The plant hires workers mainly through a private staffing agency. Collaboration with the public employment service is rare and mainly happens in case of major redundancies. However, all workers in section 1-3 and 5 are hired on permanent basis, temporary work was phased in the mid 2010's after pressure from the trade union.

The basic pay is relatively high when comparing to general wage levels for unskilled workers in Demark. Day-shift workers earn some 200 DKK pr hour resulting in a monthly salary of some 32.000 DKK plus holiday and pension allowance. Night shift workers earn more, so does workers with a skilled vocational background who get a 2.5 % bonus.

Working time arrangements have been amended several times over the last decade. Now, the plant has a two-shift operation, meaning that a regular working day is 12 hours, from 6AM to 6PM or vice versa. In two weeks, production workers therefore have six working days and eight days off.

2 See a list of ongoing public offshore wind tenders here: https://ens.dk/en/our-responsibilities/wind-power/ongoing-offshore-wind-tenders

Some dayshift workers, for example, work Monday, Tuesday, Friday, and Saturday the first week, and Wednesday and Thursday the next.

Our recent data collection in relation to the Danish blade factory include:

- A joint interview with the plant manager and the head shop steward. (The plant's production segments have a total of 10 local shop stewards, one for each segment and shift. The head shop steward works full time with shop steward work.) This interview has a duration of 1 hour and 17 mins.
- A focus group interview with five production workers, who volunteered to contribute. All male, all Danish. One of the participants work in the warehouse (Section 1), two works in the packing department (Section 2) and the last two works in after treatment (Section 3) – physically the most challenging section, though not as dirty as the painting section (Section 4). The interview took 2 hours.
- An interview with a regional union officer responsible for the trade union's industry workers. In relation to the blade plant, the unions officer's role is to negotiate wages and other working conditions together with the head shop steward. He is also involved in negotiations if the plant initiates redundancies or other cutbacks. Union organizing and campaigning, however, is restricted to persons employed at the plant, that is, the shop stewards and their convener. The interview took approximately 1 hour.
- Observations: Before the interviews, we went on a 2-hour guided tour around the production facilities.
- Moreover, we had an e-mail correspondence with the plant administration to clarify different facts about the plant and the wind turbine blades they produce.
- Finally, we interviewed two managers of labour market vocational schools (so-called AMU-centres) focusing on the pinch points related to skill formation in and for the wind turbine industry. This interview lasted for about 50 minutes.

Our findings from these interviews and focus groups corroborated and extended findings from earlier interviews conducted in 2014 and 2018 with management of two OEMs, an industry body, instructors and managers at two skill formation providers and former workers listed in the introduction to this section.

Key findings

We will begin with describing the main structural challenges impacting the Danish wind turbine industry and the operation of running a large blade plant in Denmark, as this impacts employment relations at the factory floor in a number of ways. Next we will report the main findings on employment relations at the plant, including social dialogue, contractual arrangements, working environment, working time, pay and training. Last we will comment on the participant's conception of the Just Transition' and how this should be facilitated in the eyes of the workers interviewed, the shop steward and the union officer.

An industry driven by supply chain dynamics and internal competition

According to the factory manager, there are least three main challenges related to wind turbine manufacturing in Denmark and to the case plant at hand. The first is uneven distribution of revenue between wind farm developers on the one hand, and manufacturers on the other. Wind

energy is a big and growing yet unstable business, and manufacturers' earnings are relatively small, and this puts pressure on the industry and caused several mergers and consolidation efforts in the industry over the last 10 to 15 years. In its lifetime, the factory we visited has experienced many ups and downs including major redundancies in the middle of the 2010s. The fact that wind turbine manufacturing yields relatively small profits contributes to constant pressure to reduce costs locally or – alternatively – outsource production.

The second challenge comes from the fact that in many countries, national tenders of energy projects increasingly come with local content requirements, meaning that some turbine components need to be produced locally. For the Danish plant, which mainly produces blades for export, this is a hurdle but also an opportunity. The plant owner has blade production facilities in several countries in order to abide by local content requirements, and in this context the Danish plant and its workers – because of their trailblazer status – have delivered knowhow and expertise to some of these new sites, for example in France, China, and Brazil.

However, because the corporation's blade production is now spread across several countries, internal competition is increasing. Benchmarked with its sister factories in Europe and elsewhere, the Danish plant has – by far – the highest productions costs. This is due mainly to higher wages, but it is also related to the relatively short standard work week in Denmark compared to the UK or China. Consequently, the Danish plant must continuously perform better than its sister plants abroad including higher effectiveness and fewer production errors:

> *"We have sister plants in England and China and soon one in France, who produce the same products as we do basically. However, new products start with us and are then transferred, and if we are skilled, we can make them [the sister plants] better, but thereby we become less competitive (…) we must be more efficient all the time, yet our raison d'etre is also to transfer knowledge to the owners' factories abroad."*
>
> (Interview with plant manager and shop steward, 2022)

Employment relations

The employment relations at the blade plant generally conform with the characteristics of the so-called 'Nordic model' of labour market regulation that is anchored in sector-level collective agreements between unions and employer organizations rather than labour law. The model furthermore implies institutionalised yet voluntary dialogue and negotiations at the workplace level between management and shop stewards, that is known to be conflict containing and producing responsiveness between capital and labour (Gumbrell-McCormick & Hyman, 2013, p. 8–9). At the blade plant, we found that the shop steward organization was rooted in all production segments including day and night shifts and there is a trustful and friendly atmosphere between management and worker representatives:

> *"We have a fantastic partnership and a shared understanding of why we are here (…) we do not always see things eye to eye, and we shouldn't, but my general impression is, that everyone who works here shows up with a positive attitude and wishes the best for this workplace."*
>
> (Interview with plant manager and shop steward, 2022)

Moreover, in recent years the company has invested in further training of middle managers (group and team leaders) and a new organization to improve occupational safety and job satisfaction. A part of this are frequent 'welfare meetings' to improve teamwork and solve interpersonal bickering between workers or between workers and their superiors. In a way, the welfare meetings constitute a continuation of the social dialogue between management and shop stewards that reaches all the way down to the factory floor.

According to the workers who joined the focus group, the welfare meetings have generally contributed to an improvement of the mental working environment. Welfare meetings are held every two months or more often if needed. They have raised the workers awareness regarding eradicating bad language and fostered a more helpful working climate, something also confirmed by the plant manager and the shop steward:

> *"We still have a competitive spirit (…) we're not angels, but generally I see that people help each other out, lend each other a hand if needed. Some years ago, people would stay with their teammates and wait until the other team had finished. We don't see that today."*

> *"There's competition in all human beings, and they [the workers] want to compete who performs best, but we have become better at helping each other. If a team is done and the other isn't, there's only one thing to do."*
>
> (Interview with plant manager and shop steward, 2022)

Relating to the general improvement of employment relations is also that the plant changed its staffing policy some years ago after negotiations with the shop stewards. Before, the use of temporary workers was widespread – up to 40 percent of total employment – and this caused frustration among workers and in the trade union. Danish flexicurity entails employers can hire and fire easily, so for the trade union, utilizing temporary workers and temp agencies was de facto a violation of the model although it is legal:

> *"That's why we were so angry about the temp workers. They have that right* [to hire and fire easily] *it doesn't cost them … well it does, but not much. If they were running an operation in Germany, they would fucking cry…"*
>
> (Interview with union officer, 2022)

The union and shop stewards jointly called for the plant to stop using temporary workers and use regular open-ended contracts instead. Generally, the employment situation stabilized due to fewer market swings in the late 2010s, so the need for an ultra-flexible workforce was less urgent. But even more decisive, so said the union officer, the union had proof that the temporary agency was underpaying its workers, and the union could use this information to put pressure on management at the blade factory.

Working conditions, working time, and pay

The focus group's discussion about working conditions focussed on the nature of work at the plant, the working time arrangement, pay, and opportunities for training and posting.

As mentioned, work in section 3 (*After Treatment)* is harder and more physically demanding than the tasks in section 1 and 2 (*Warehouse and Cutting/Packing Department and Foundry*). Warehouse

workers in section 1 move goods around with a fork-lift truck or handle machines that cut glass fibre shreds. The packing process in section 2 is a manual process, in which workers places wood, carbon fibre and glass fibre components in the giant blade mould. However, it is precision work rather than hard labour. When the packing is complete, the mould is closed, epoxy gets filled in, and the blade is heated which hardens the epoxy glue, but this final process is fully automatic.

Workers in section 3 carry out the after treatment of the blades. They polish away errors in the blades' surfaces, the inside as well as on the outside (large wind turbine blades are hollow), and sometimes they must fill in holes or cracks with epoxy. Hence, they wear safety gear and masks all day long, while handling heavy tools in all sorts of awkward postures.

> *"It's hard work, and it's hot (…) but if you're in good physical condition, it's not a challenge. I mean, if I compare this job with asphalting … that's hot. I don't think that this is going to wear me down in the end, yet on the other hand, if you're approaching 55 og 60, you should probably consider doing something else."*
>
> (Focus group interview with workers, 2022)

In accordance with this statement is that most workers in section 3 are considerably younger than their colleagues in the warehouse and the packing department. The composition of the focus group also reflected this. The two workers from section 3 were 31 and 33, while the other participants were 42, 52 and 55 years old respectively.

Discussing the working time arrangement gave varying insights. Most of the workers in the focus group were fond of working 12-hour shifts because this allows longer consecutive leisure periods. This means that going to the doctor or taking a longer weekend break is possible without having to spend holidays. Moreover, a 12-hour working day is long but, as one of the workers expressed that it was of great value that when you were off, you were off and didn't have to worry about work.

The downside of 12-hour shifts was the difficulties they inflicted for workers with kids at school age or younger. It was almost impossible to reconcile the plant's schedule with regular family obligations such as bringing kids to kindergarten or picking them up after school. Furthermore, every second weekend was spoiled because Saturday was a regular working day in the plant's production units.

> *"For a family with dependent children it's really tough (…) when they [the plant administration] introduced the current working time schedule (…) a lot of folks quit working here."*
>
> (Focus group interview with workers, 2022)

Having discussed working hours for some time, we changed the subject to pay. The pay scheme is negotiated on an annual basis at the plant, but for more than a decade, the pay level has been high compared to other workplaces in the region. Particularly when comparing to the salaries unskilled workers are earning elsewhere. Normally, it is the union reps and shop stewards that push for higher for wages but in the early 2010s, the plant administration supported a large pay rise to attract skilled workers and better retain core staff members.

Today, the hourly salary at the blade plant is approximately 200 Danish Kroners, on top of this skilled workers get a 2.5 percent bonus. Some 12.5 percent are added in holiday allowance and according to the collective agreement covering the manufacturing sector in Denmark, another 12 percent are paid to the workers' pension fund.

Some of the skilled construction workers at the plant could earn more if they took a job in the construction sector. In the wake of the corona crisis and government stimuli of the economy, unemployment nosedived while demand for skilled workers soared resulting in bottlenecks in different trades and wage inflation. However:

> *"As a carpenter, you slave all day long dragging materials or installing roof tiles. The whip crackles. Do that for several years and your shoulder is worn-out (…) Working as a carpenter in the tempo they have nowadays, I wouldn't last long. They earn more but they're no better off. And you don't get that pad on your shoulder management gives us here."*
>
> (Focus group interview with workers, 2022)

Training

Blue collar workers' continuing education and training have been on top of the Danish trade unions' agenda since the mid-2000s and nowadays, most unions have training funds next to their pension funds. This means that workers covered by collective agreements have training leave rights combined with funding and training allowance. Following this scheme, workers can train up to two weeks per year, and develop vocational qualifications or train more generic skills such as computer skills, reading, writing, math or English. Training to become a team leader or foreman is also an option.

At the blade plant, management and shop stewards collaborate to encourage workers to get training. It is not just the union's agenda but in fact also company policy, because well-trained workers increase the firm's functional flexibility. As mentioned above, the blade plant encompasses not merely production but also a significant R&D unit developing the manufacturer's blades for new offshore turbine models. When such projects are commenced, up to 75 workers are occasionally transferred from the production segments to the plant's technology workshop.

In light of the Danish wind turbine industry's trailblazer role combining innovation and production, a new 2½-year vocational education as "wind turbine operator" was launched some years back. Training to become a wind turbine operator, participants learn all aspects of blade production but also the final assembly of the windmill. Moreover, the training also provides qualifications that can be used outside the wind industry for instance in production of spare parts for airplanes, boats and other vehicles consisting of glass fibre or carbon fibre components.

Vocational training in Denmark follows a two-tier system combining independent blocks of school and firm-based training. The firm-based training is organised as an apprenticeship (see Nelson 2012 for a longer review of the Danish system) and at the blade plant, 11 new wind turbine operator apprenticeships are offered every year.

> *"We mainly recruit apprentices among existing staff (…) and earlier, everyone who completed the wind turbine operator program went directly into our technology workshop where it's really exciting to work. However, today we have an adequate number of permanent staff there, but we also need the wind turbines operator within our operation [that is, in the production segments] and we're open about that."*
>
> (Interview with plant manager and shop steward, 2022)

As such the blade plant offers opportunities for unskilled staff to become skilled wind turbine operators and all the blue-collar workers at the workplace, unskilled or skilled, are encouraged to

participate in short-term further training every year. In relation to the topic, we also found that the company's occupational safety standards including the regular welfare meetings de facto constitute a learning arena for valued vocational competences.

In the middle of the 2010s, after a round of layoff, many of the fired blade plant workers where actually headhunted by firms in the local area. This was not least because of their training in occupational safety.

> *"It's a competence that is portable to the wider labour market, no doubts about that."*
>
> (Interview with plant manager and shop steward, 2022)

This view was also shared by the union representative we interviewed. He underlined that people who have been working in a company or a workplace with high occupational safety standards, for instance in the wind, oil, and gas industries, generally will be *"…accepted enthusiastically"* (Interview with union officer, 2022).

A final observation, which should be added here, is the chance for workers to be posted abroad for longer time periods. Once the Danish plant has developed and tested a new blade concept, the production and knowhow is often outsourced to a plant in another country, and a number of Danish production workers are sent out to assist the training of the local staff for example in China or Brazil. This was perceived an attractive opportunity, in particular among the younger workers in the focus group. The shop steward also expressed satisfaction that normal production workers can get such an experience and he noted that *"there is a number of peculiar international friendships within the company"* (Interview with plant manager and shop steward).

Just Transition and climate change

The focus group and the interview with the union officer both ended with a discussion about the Just Transition, climate change, and wind turbine workers' self-identity in relation to the decarbonization of the economy.

Across the interviews, Just Transition was conceptualized in the narrowest sense, that is, (1) as a process that provides reskilling and good employment opportunities for workers who become redundant and (2) a transition that occurs without increasing domestic inequalities or damage to Danish traditions for labour market regulation. International solidarity and climate action is not at the forefront of their attention (our definition of a *narrow* Just Transition is adopted from Galgóczi, 2020).

Actually, the union representative and the workers were sceptical towards a swift phaseout of coal and gas even though they all work in or in close connection to the Danish the wind sector. This finding is consistent with findings documented by the Danish Trade Union Confederation in a report based on survey data of Danish wage earner attitudes earlier this year (Fagbevægelsen Hovedorganisation, 2022).

What Danish workers fear most is rising energy prices and inflation that will hollow out their incomes. In addition to this, none of the interviewees understand the green transition as a per se Just Transition. In their eyes, the green transition and the distinct political commitments to a zero-carbon economy in 2050 is largely a political discourse. In their daily life, they don't wonder about climatic changes or whether they are resulting from human activities.

We asked more specifically if working in wind turbine manufacturing had stimulated a higher consumer awareness or some new sense of political belonging, yet we didn't get many affirmative

answers. In the hypothetical situation of buying a new car, for instance, more than one of the workers expressed that this could be problematic as the improvement of the infrastructure and erection of charging stations was progressing very slowly – especially in the outskirts of the country where most of them lived.

The workers responded in the same way when asked about how they heated their houses (they still used their wood-burning stoves), or how they travelled (they would rather fly than travel by train), and when we suggested eating less red meat, we got a clear "no thanks".

> *"When it comes to food, I'm not particularly green. Because then I would start eating something I dislike. I mean, I like vegetables, but I love meat (…) actually, I'm on a diet right now on which I have to eat a lot of meat, but I like that so why should I stop?"*
>
> (Focus group interview with workers, 2022)

On of the workers in the focus group admitted that working at the blade plant for more than 10 years had moved him maybe 5 or 10 percent in terms of living greener than he probably would have otherwise. But at the end of the day, being able to choose green depends on how high people are placed in the hierarchy of needs:

> *"There has to be a carrot, otherwise people won't do it [choose a greener lifestyle]. My economic situation is tight, I'm divorced, and I still have our house from back then to pay for. If you haven't got the means, you can talk about green from here and to the moon, it won't change a thing."*
>
> (Focus group interview with workers, 2022)

Germany

Lisa Schulte

Overview

Germany has offices and productions sites of all three major European wind turbine manufacturers, GE, Siemens and Vestas as well as of the manufacturers Nordex and Enercon and a significant number of supply chain companies. In 2021, the VDMA Wind Energy Directory counted as many as two hundred manufacturers and suppliers of wind turbine components and systems (VDMA, 2021).

The wind turbine manufacturers cluster around the North-West of Germany, from the Dutch border, to the North and the Baltic Sea, from the town Viersen by the Dutch border to the town Rostock in Mecklenburg-Vorpommern (ibid). This distribution shows the importance of wind turbine research and development and deployment in the presence of a good wind resource, but also the importance of being close to waterways for the transport of the large and heavy components. In contrast, the production of mechanic, hydraulic and electrical components clusters around Germany's traditional industrial regions in the West and South in the counties of North-Rhine-Westphalia, Hesse, and Baden Würtemberg, and Bavaria, and in the East, the county of Sachsen. Most supply chain companies also serve other industries and many existed long before the German wind turbine industry took off.

Context

Germany was one of the pioneer countries in the developing of the wind turbine technology and, as has been discussed earlier in this report, the German Renewable Energy Act (EEG) and planning regulations had been favourable for the deployment of onshore wind technology in the 1990s and for offshore wind technology from the early 2000s. The expansion of renewables, solar panels and onshore wind turbines in particular, was partly due to financial incentives for citizen-led and citizen-owned renewable energy generation. However, with increasing deployment, rising electricity prices due to the financing mechanism of the EEG transfer payment, large scale regional planning and regional moratoriums on wind turbines, and the large energy utilities entering the market for wind power, local opposition and also the lobby of polluting industries became stronger and policy-makers failed to provide a consistent policy-framework. For the past five years wind turbine deployment decreased significantly costing jobs and leading to the consolidation of the German wind turbine OEMs. In 2016 employment in the wind energy industry peaked at above 150 thousand FTE, but by 2020 the number had declined to 100 thousand FTE (BWE, 2021a). While the large OEMs, Vestas, Siemens, GE and Nordex with access to other international markets could sit out the implosion of the German market, smaller producers such as Senvion, Adwen, and last Enercon got into existential difficulties.

In terms of our comparison it is important to note that Germany has traditionally been seen as the key example of a "coordinated market economy" (Hall and Soskice, 2001). The main features of the 'German model' are the following:

- strong industrial trade unions, in particular the metal workers' trade union IG Metal
- detailed statutory regulation of minimum work conditions
- strongly coordinated systems of skill-formation, in particular dual vocational education and training, where employers and public vocational schools share the responsibility of training apprentices; vocational education and training as part of active labour market policy geared towards reskilling unemployed workers
- strong legal supports for workplace and corporation level co-determination by worker-elected works councillors
- institutionalised social dialogue, not only at the level of the workplace through co-determination and at the company or sector level through collective bargaining, but in terms of industrial policy making; here the dialogue includes all organised stakeholders in society depending on their subject matter

For the latter Germany has also been described to be 'between pluralism and corporatism' (Streeck, 1983). More recently the survival of the coordinated 'German model' has been questioned (Eichhorst, 2015), with authors noting the emergence of a 'new' model with the trend towards dualisation, where parts of the labour market keep strong institutions and other parts not. Others have noted the weakening of these institutions even in industries where they had traditionally been strong (Benassi, 2016).

Data collection

Findings presented in this section are based on transcripts or interview summaries of thirty-five interviews. These were conducted at four OEMs, the trade union IG Metall, three industry bodies, seven training providers and one local authority. Twenty-five interviews were conducted between the years 2012 and 2014 and ten interviews were conducted between November 2021 and January 2022 (see details on the table in the introduction to this section). At all four manufacturers works councillors could be interviewed and at two manufacturers we could also interview management. Interviewees at the trade union came from all levels of the organisation during the first wave of interviews, from the overall strategy level at the board to the local branch. At training providers either managers, educators or coordinators were interviewed in both waves. We also interviewed one manager and one staff member at a local authority in the first wave of interviews.

This research report is also based on secondary data that has been kindly provided by one industry body and the trade union. Interview data from both waves were complemented with information from the companies' websites and press releases, as well as news clippings.

Findings

Our findings are presented in four parts: (1) general findings on social dialogue and skill formation, (2) the general challenges to OEMs in the current market, (3) case studies of two leading OEMs with a focus on skill formation, job quality and social dialogue, and (4) interviewees' conception of the Just Transition.

Social dialogue and skill formation

Features of the old and the new model can be found in the German wind turbine industry. For instance the wind turbine industry shows traits of the typically dense landscape of organised interest groups, albeit, trade union organisation is one of the weaker spots of interest representation, agency work is more broadly used, and the quota of apprentices is lower in particular in companies that are not covered by a collective agreement (IG Metall, 2021).

The organisations VDMA Power Systems, Bundesverband Erneuerbare Energie (BEE), Wirtschaftsverband Windkraftwerke (WVW), Offshore-Forum Windenergie (OFW) represent the political interests of commercial companies along the wind turbine supply chain (KEM Konstruktion, 2021). VDMA Power Systems represents companies that manufacture energy systems. Offshore-Forum Windenergie (OFW) represents commercial companies involved in planning and developing offshore windfarms. Windenergie-Agentur (WAB) and Stiftung Offshore-Windenergie have various types of organisations as members ranging from governmental, research to industry organisations concerned with representing the political interests of both onshore and offshore wind industries. There is also a number of organisations that represent the interests of wind farm operators and a number of think tanks and research institutes that have contributed to the development of the industry.

The trade unions IG Metall and, with a very minor role, IGBCE represent the organised workers at the wind turbine OEMs and supply chain companies. Agency workers, a relatively large part of the wind workforce, are commonly organised by the trade union Ver.di. But degrees of trade union organisation in the wind turbine industry are patchy, with higher degrees of organisation at the traditional supply chain manufacturers and lower degrees of organisation at the OEMs. As a result many wind industry companies are covered by lower quality collective agreements (so-called Anerkennungstarifverträge) or not covered at all (IG Metall, 2021). Also works councillors are not necessarily supported by employers in the wind industry (Kaufner, 2021).

Dissatisfaction with the former government's industry policy, most OEMs and maintenance and service companies' clear anti-union stance (dpa/HA, 2022), and the resulting pressures on the supply chain and workers has led to a – from an international perspective – unlikely coalition between industry associations and trade unions in the development of a joint proposal for industrial policy. This proposal demands from government the integration of social (for example coverage by collective agreement) and environmental criteria in public procurement of renewable energy systems (IG Metall, 2021a). Both, representatives from industry associations and from IG Metall, stated that working conditions, skill formation and employment creation and destruction needed to be more closely and systematically monitored.

The wind turbine industry was – at the time of writing – suffering from a lack of skilled workers, whilst at the same time not being sufficiently invested into skill formation (IG Metall, 2021a). It relies on traditional electrical and mechanical apprenticeships as well as apprenticeship in the processing of plastics and composite materials. However the training quota is relatively low (IG Metall, 2021). Wind turbine maintenance and service are nowadays only trained by one training provider, which has a strong association with the reskilling of unemployed workers and is owned by a large trade union body. According to one of our interviewees, the number of participants has fallen significantly due to the sector's slump in 2017 and the following years. Training providers

studied in earlier waves seem to have discontinued training wind turbine specific skills. Also one of our advisory board members reported that it was difficult to interest young apprentices to train in the industry due to fears that the sector would not provide as stable employment as other industries. This however might change with the more ambitious policies that have been announced by the new federal Government (see chapter on Germany in section 1).

A dynamic industry in a competitive market

Common to all interviews were criticisms of the former federal government's industrial policy and there was hope that the new traffic-light coalition (SPD, Bündnes 90/Die Grünen and FDP) would be much more ambitious. As reported above, the political framework for onshore and offshore wind manufacturers in Germany had initially been good due to the support from feed-in tariffs under the Renewable Energy Act (EEG), but the feed-in-tariffs had gradually been reduced and now the pressure on price is strong and the economic risk is high as projects, in particular in large international markets like the UK, have dramatically increased the volume per windfarm.

The 'stop-and-go' politics – an expression used by many interviewees – of the past years, the changing federal level targets for offshore wind, the reduction of feed-in tariffs under the CDU-SPD government had not been good for the industry and had destroyed the smaller offshore wind turbine OEMs, which were all bought up by the market leader Siemens-Gamesa. There were no local content requirements in Germany and the local content requirements in other countries, for example France, USA, Turkey, Russia meant that jobs could easily follow them with potentially negative results for the German sites. For example, company B in our sample would build, what one interviewee called, 'mobile factories' to serve its new markets and meet local content requirements. Nevertheless, the large OEMs had sailed safely over the past years, relying on their access to markets in countries with more consistent policies for wind turbine deployment, for example the Netherlands, Belgium, and Denmark, as well as China, and the biggest European market, the UK.

Competitors in China focussed on their domestic market, but their power was noticed and as well as the risk that, once the Chinese market was saturated, it would be easy for Chinese companies to sweep up the rest of the global market as they had done with the German photovoltaics industry a few years back. Global transport costs would in the long-term not be an obstacle to this, as even in the context of high transport costs during the Covid-19 pandemic, the last batch of blades produced by one company in Germany was for a project in Japan and its German generator factory served as back-up for its twin in China.

As the wind turbine market in Europe was highly concentrated, continuous investment in technological innovation and production facilities was necessary. For example one company had recently expanded one of its sites for thirty million Euros and was moving from producing 8MW nacelle to 11MW nacelles.

> *"If I don't make these investments, I will be left behind* [by the competition]. *But I also need money every time. And when I cannot make money in the sector, because there is a battle on price, then there is a financing problem, a cash problem."*
>
> (Works councillor, 2021)

The market dictated ever larger turbines, because larger more powerful turbines can produce electricity more cheaply and this ultimately decides over winning a contract or not.

Also the recent closure of a blade factory and the closure of one and the sale of two German foundries a few years back were explained with the fact that the equipment would have needed reinvestments for which the company did not see financial viability. Demand for onshore blades had imploded over the past years, and for offshore wind blades the production facility was too small and not in the right location, in the East of Germany, far from the sea and relevant offshore ports.

For the big manufacturers it was a good thing that the large energy utilities were entering the market because they had cash flow, they knew the risks, they could negotiate prices and they built huge windfarms to gain economies of scale and meet their capacity needs. Although there was a dilemma, as the more turbines were needed the more difficult it was to serve demand and get supplies at a reasonable price.

Case studies: company A and company B

In this section we will present findings from two company case studies with a focus on job quality, skill formation and the challenges to German style social dialogue. These company case studies are important as they give insights into the challenges of the Just Transition at the workplace level, but they need to be seen as relatively unique cases that are not representative of the sector as a whole, which is extremely diverse in terms company sizes and social dialogue.

Nevertheless, the cases are important as they are about two leading OEMs, which take distinct trajectories: at company A the 'German model' of co-odetermination has come under pressure under new management, but trade union and works councillors are still strong due to historical legacies and this benefits job quality and formal skill formation; company B seems to avoid the 'German model', introduced of a 'positive mindset' corporate culture (a typical tool of US style trade union bashing and manufacturing consent – Burawoy 2021 [1982]), keeps wages comparatively low and puts more emphasis on company specific skills training than vocational skills training. The key causal difference between the companies seems to be the level of trade union penetration. At company A workers benefit from (1) legacies of social dialogue at the German main corporation and (2) trade union wins at subsidiaries; at company B social dialogue suffers from historical anti-trade union feelings among parts of the workforce and a more unitarist management approach.

Company A: The German model under pressure

Company A is an international conglomerate with its main seat in Southern Europe. However, a German technology company owns the majority stake. In 2021 Company A had around 24,000 employees worldwide. It is one of a small number of European leaders in onshore and offshore wind energy technology. The company has rapidly grown over the past ten years due to a series of mergers and acquisitions. In November 2021, the company had fourteen production facilities around the world, with seven in Europe and the plan to add a production site in France; it had two production sites in the US and one in South-America, four production sites in the Asia-Pacific region and one production site in North-Africa. R&D sites were located in Denmark, Germany, the US, Spain, and India. Around fifty sales offices and forty service and maintenance offices around the world served its global markets ([Company A], 2021).

German sites of Company A

The German branch's venture into wind began in 2004 with its purchase of a Danish wind turbine manufacturer. The German wind power division has grown rapidly over the past ten years as it bought parts of the ailing local wind turbine manufacturers. In 2014 the division had about two

hundred employees in Germany and its Danish business had another 3000 world-wide. The workforce grew to 1600 employees at the Germany headquarters with another seven hundred at its only German factory, and another five hundred in its newly acquired service division.

The past series of mergers and acquisitions led to a complex corporate structure with important implications for the coverage by collective agreements and co-determination. While its historical part was covered by the IG Metall collective agreement for the Northern German metal sector, its new greenfield factory had a different IG Metall collective agreement. Workers at the two recently purchased subsidiaries had to keep the lesser collective agreement of their original companies. These were legally attached to the mother company abroad, and not to the German HQ. As a result the German wind power workforce of the overall conglomerate is not represented by one single company works council.

Skill formation

Although there was a trend towards deskilling the labour process, the company rewarded the acquisition of formalised and transferable skills.

The company trained dual apprentices in office based and technical vocations. It also had a number of students who combined work and studies in a dual company-funded higher education programme.

The company's only German production site was still below its targeted quota of apprentices. The new plant had from the start been conceived for standardised mass production and the facility produced in three production lines and a fourth where all parts from the previous three lines were married. The work of individual production workers was narrowly defined, illustrated in pictograms at each work station, and workers would be hired based on only three main criteria: their ability to read, write, and follow instructions.

While workers at company B would be financially compensated for learning new job-relevant, but not formally (externally) certified skills, Company A upgraded pay based on seniority and the completion of formalised qualifications, for example the completion of driver's licences for forklifts and cranes or electrical work certificates. Hence it set incentives for workers to gain transferable skills that would also be valued on the external labour market.

Challenges to job quality

As a result of the different collective agreements the German 'wind' workforces enjoyed different terms and conditions in a number of important aspects. The workers under the main collective agreement received two additional salaries per year and worked 35 hours per week. The workers under the inherited collective agreements did not get any additional salaries and worked 40 hours per week, earned generally less and did not automatically benefit from the IG Metall collective agreement's regular wage increases. As a result, the mother company used these differences to put pressure on the employment conditions of its better placed workforce:

> *"These are all benefits, that we inherited from the* [German mother company]. *And now the company* [wind division's HQ abroad] *is trying to take them away step by step* [to equalize employment conditions]. *They are not willing to give the others more. And we are in international competition. That is simply the problem."*
>
> (Works councillor)

Also the foreign ownership was said to be a challenge to job quality as the mother company rolled out measures that impacted workers, often (initially) ignoring the co-determination processes that, in Germany, had the purpose of protecting labour standards.

Another challenge were global pressures on price and high levels of competition in the market, which put pressures on wages and employment conditions in Germany (and also in Denmark, see previous chapter). Production work was only financially viable with a high degree of automation and a very lean production process, which reduced the bargaining power of skilled workers. Opening the new assembly site in summer 2017 was a step for the company to industrialise and, to a degree, automate production, which was transferred from three different Danish sites that eventually closed or reduced capacity.

The low skill requirements at the manufacturing site had implications for pay:

> *"They certainly wanted to keep them in the lower segment of the collectively agreed pay scale".*
>
> (Manager)

This was very much in contrast with the stereotype of the skilled worker, *Facharbeiter*, which is often hailed to be one of the competitive advantages of German industries.

Agency work is often perceived as a challenge to job quality. Like all other wind turbine manufacturers in Germany, the new site operated with a large amount of agency workers during peak times. Agency work was used because the turbine production was project based. One contract often lasted for an eighteen-month period. Core workers were held because the site needed to keep some key knowledge. Former agency workers, "who had been good", were rehired once a new project started. However one interviewee stated:

> *"Agency work is a necessary evil to be flexible, but socially…it is questionable."*
>
> (Manager)

Challenges to social dialogue

The German law on co-determination (*Betriebsverfassungsgesetz*) and the strength of the trade union IG Metall, which had constructive relationships with work councils and the management at the company, provide unique conditions for workers within the company's global production network.

Employee representation in other countries was weak in comparison: in Spain the three most important trade unions were divided and not very strongly represented at the company, in Denmark the trade unions organised workers per employee group and company level shop stewards, who compared with German works councillors, had very little formally guaranteed autonomy, duties and rights, and in France, where the company was in the process of building a new factory, the trade unions were 'divided but radical' and unpredictable, while in England employee representation was very poor – 'the worst', the site had never been able to name a shop steward for the company's European Works Council and the trade unions were said to be in conflict over who had the right to represent the workers.

With this diversity of regulatory frameworks and being by far in the most regulated country, the German works council needed to regularly remind management at the foreign HQ, which often tried to roll out new measures globally, for example most recently in terms of IT processes, of the required processes and consent from the works council in Germany and it was not a straightforward situation given the potential for competition between the sites:

> *"Yes, it is this bouquet of cultures, which is very difficult for such a global operation. Because we always have to be careful, who sets which standards. Yes, we also get, when we are too bitchy, then we get the answer 'yes, then we will move the jobs to England.' Or 'we will move the jobs to [another country]'. (…) Yes, this is a difficult situation for the works council, because we are ending up in a kind of split. Because on the one hand, I want to protect the rights of the employees, which we secure and we don't want to give these away. On the other hand, in some situations we are almost blackmailed."*
>
> (Works councillor)

Benefits of German co-determination and a strict regulatory framework

Co-determination and the strict regulatory framework also benefits workers in the context of redundancy procedures. When the company had to cut back in 2017, due to a general slump on the wind turbine market, the company worked closely with a transfer company (Beschäftigungsgesellschaft) to which redundant workers were transferred and then could go on trainings whilst being supported in their job search for seventeen months, which was generous. Employees who agreed to the transfer would receive a compensation payment and would be employed temporarily at the transfer company, with 60 to 67 percent of their pay, depending on marital status, being paid by the public employment services and 25 percent being topped up by company A. It was an expensive programme for the company, but given the regulatory framework in Germany it was still preferable as for the company it was a reliable and plannable process for reducing workforce numbers. The alternative would have been a complicated and unpredictable process: consultation with the works council, signature of a reconciliation agreement and social plan, and then a selection of employees based on social criteria and the latter could have been tricky to get right, with potential law suits by large numbers of individual employees following.

Although the works council's role was to protect labour standards this did not mean they were management's nemesis. Their role was ultimately to work also for the company's advantage and to find compromises. For example, when five hundred workers needed to be hired all at once for the greenfield manufacturing site, the works council agreed to accelerate its commonly about three-week long approval procedure. Works council delegates were involved in the assessment of applicants and the target was to make the hiring decision on the day to be able to sign on successful candidates immediately. The rationale for this accelerated process was avoiding attrition in the time between the offer was made by the company and the work contract was signed by the candidate. Before opening the site for the first time the works council had already signed a number of company agreements with the management to regulate all aspects necessary to operate.

Company B: A positive mind-set but no collective agreement

The company is one of the world leaders in onshore and offshore wind technology. In 2021, it had about fifteen production sites globally. Their distribution reflects the company's most important markets and the fact that it keeps research and development predominantly in its country of origin, Denmark. It had blade factories in Denmark, Russia, China, India, the United States and Mexico – its other three European blade factories, one of them in Germany, have recently been shut-down. The company had seven nacelles assembly factories in Denmark, Russia, China, India, United States, Argentina, Mexico and five generator factories in Denmark, Germany, Spain, China, and Brazil (company website 2021). It also had one tower factory in the United States reflecting the local content requirements. Other than that, the company predominantly sourced towers from other

manufacturers (Meek, 2021).

Company B in Germany

As for Company A, the company's German HQ was in Hamburg. In 2021 the company had one sales, maintenance and services division, two production sites, (1) a repair shop and generator production and (2) a blade factory (production ended indefinitely in December 2021), and about sixty warehouses distributed across the country (Google maps, 2021). The company also owned a service and maintenance company which serviced turbines of other companies.

In 2021 the company's service and maintenance division had about 1600 employees, the generator factory had between sixty and seventy workers including support functions, and the repair shop had about one hundred and forty workers.

Challenges to formalised skill formation

One interviewee emphasised that even in highly skilled jobs there was always the risk of standardization and offshoring. Company B was clearly an example of this. Skill formation followed the company's production needs and exclusively company specific skill acquisition was financially incentivised. For example at the generator factory the completion of the one to three levels of training-on-the-job was logged for each worker. Once level 3 was completed in one production segment, workers could apply for 'cross-training' where they would have the opportunity to learn to do jobs of all four production segments. Workers had to spent six or eight weeks in the new process to receive a one-time compensation of between six hundred (for a different unit within the same section) and one thousand Euros (for work in a different section). This bonus was also paid to workers who worked for a different section for at least six to eight weeks per year; each half day counted towards this. From the company's point of view this increased functional flexibility and reduced one-sided wear and tear, hence reduced the likelihood of occupational illnesses.

Slumps in labour demand were used for skill formation and a preferred way, instead of short-time work, for keeping workers busy. In Germany, companies have the possibility to move workers onto short-time work schemes during slumps. This allows them to keep workers on the payroll, whilst they are not working. The wage costs are subsidized by the public employment services if a formal request is made. However, interviewees reported that for short periods of time applying for short time work was a very bureaucratic process and that, at site level, after it had been proposed by one of the office staff, works councillors and managers agreed to use the time, for example four weeks, to advance trainings that had originally been planned for later in the year. These could consist of licenses for operating pickers and cranes or trade chamber certificate courses for the work with electrics. These were externally certified courses that would be paid for by the employer and workers would be paid their regular pay by the employer whilst training. Unlike to company A, completion of this formalised training would not lead to pay increases.

The sales, service and maintenance division and also the now closed blade factory trained their own apprentices in technical and office-based dual vocational education, and the company also offered dual higher education programmes as did company A. Overall, company B had difficulties finding enough skilled workers for its repair shop and agency work was not a remedy for this, because the quality of workers recruited from agencies was deemed to be unreliable. While company B preferred relying on its own apprenticeship graduates for the service and maintenance of new turbines models to keep the knowledge in-house, it used agency workers for routine jobs. In addition, the company had its own 'talent mint' (Talentschmiede) where higher level management and site management were trained.

Because turbines became larger and the technology more complex, a trend toward more skills specialisation was expected. Service technicians for example tended to specialise for on-blade repair or the replacement of large components, others focused on the maintenance of the turbines'

safety equipment, turbine maintenance or remote surveillance. Also the jobs of office staff tended to become increasingly specialised.

Challenges to job quality

The company was not covered by and wages were below the IG Metall collective agreement. One interviewee stated that they were in line with the regional average pay. Another reported that initially, when the generator plant was bought by the company in the mid 2000s wages were set at a level of roughly fifteen percent below the IG Metall collective agreement. Since then wages at the factory had roughly risen by 23 percent, whereas IG Metall wages had increased by almost 46 percent, and this was just a proportional model calculation made by one of the workers, so the real gap was bigger. Overall, however, wages were perceived as good by workers.

> *"As long as people are doing fine, it is difficult to get them in [to the trade union]."*
>
> (Works councillor)

The company's the blade factory operated shifts of twelve hours, which in Germany is only legal with special permits that can be granted under the working time law for offshore (on-sea) work. Upon questioning by the researcher, the works councillor defended the 12-hour shifts as a norm across the European sites and explained that the required permit had been applied for and granted. This is interesting in particular in comparison to company A, where suggestions of a working time model with 12-hour shifts led to raised eye-brows even in an interview with management and the exclamation: "But this is illegal and not possible in Germany!"

Company B's response to international competition and pressures on price led to annual workforce adjustments across the entire company, which is a sanitised word for redundancies and has the implication of permanent job insecurity for the workforce. This had been a practice for a long time as a former Danish manager interviewed in 2014 had described the process to us. Moreover, the generator and blade factories, as other German wind turbine companies, heavily relied on agency workers in times of peak demand (about 30 to 50 percent). And the company was said to outsource all routine work that was not related to strategic knowledge, for example routine maintenance jobs on turbines and standardised processes in wind turbine installation.

As in the case of company A automation was a major challenge to job quality (1) because it led to deskilling and (2) redundancies. The generator factory opened in 2011 was the first lean production facility of a German wind turbine OEM. After the purchase from a trusted supplier who went bankrupt in 2005, the generator production massively ramped up production from yearly three to four hundred machines, to eight hundred, then sixteen hundred and then two thousand eight hundred. Then in 2011 the new automated factory was built on a greenfield site a fifteen-minute drive away and the old factory was converted into a repair shop. This led to a drastic reduction in jobs. Skill-use at the new factory was limited and the work across a handful of segments was very monotonous.

Overall health and safety was an important topic for the company. For maintenance and service workers working time was a challenge with regards to health and safety, because long days were desirable for the company and workers who needed to travel to windfarms, but too long working days were detrimental to health and safety and increased the likelihood of work-related accidents. Blade workers received vouchers for gym and pool memberships to help prevent occupational health problems and the generator factory workers were financially incentivized to rotate jobs. On a positive note, technological innovation in turbines was said to have been a driver for occupational

health and safety over the years also due to machines becoming more ergonomic:

> *"The large turbines today have not only been optimised technologically but also ergonomically. That makes sense for the employer, because if I can repair a machine with standard tools, little personnel and without too much physical strain, then the workers can do this better, longer, faster and they are less off work due to sick leave."*
>
> (Works councillor)

The pressure on production costs also led the foreign mother company to skim off all the profits of the German sites with the said aim to build up a financial buffer to underbid the competition. However a side effect was that it was easier to justify redundancies too, as the company could more easily prove negative cash flow in Germany.

Competition within the company's international production network added risks to job security, although interviewees were confident that their jobs were safe. The most recent generator model had been developed and introduced into serial production synchronously at the German and a Chinese site twin site.

> *"Of course we have some existential fears, because* [producing in] *China is cheaper, much cheaper. (…) [But] China is not getting cheaper either."*
>
> (Works councillor)

And recent new investments in the German plant were seen as a sign that for the next two to five years no jobs would be moved elsewhere, at least until the company had exhausted the tax benefits of the investments (Abschreibung).

Challenges to social dialogue

The sites' low level of trade union organisation, a history of anti-union feelings and the opinion that the trade union levy was too high among parts of the workforce, meant that the company was not covered by any trade union collective agreement. It was also said that it was difficult in particular to organise the office-based employees who had more direct interactions with their managers, where jobs were less standardised and hence employees had a higher level of individual bargaining power.

From all interviews it was clear that ultimately all strategic management decisions were taken in Denmark, the allocation of work to the sites, the expansion to new markets and the opening or closure of factories. All sites were managed by a Danish manager. One German interviewee praised the Danish culture, that communication felt non-hierarchical. The company's main language was English and no one would use the formal German "Sie" (the polite version of 'you'). But Danish managers also seemed to have little regard for German employment relations and when asked about what international managers might find difficult about working in Germany, one works councillor said:

> *"I believe it is the sticking to rules. This precision and the tendency to work with very much detail and follow processes precisely. Depending on who is German, the manager or the subordinate, conflicts manifest in one or the other way: 'Why don't you stick to the process?' Or, 'OMG, why does this have to be exactly so?' That is what we typically see."*

Having the 'right attitude' was important said many interviewees at the company. And in one of our interviews in 2014 we were told that the company had offered employees and workers a 'positive mind-set' training and in our recent interviews recruitment for attitude was emphasised at all sites.

While the company is not covered by a collective agreement, it complied to German law in terms of company-based co-determination. It had works councils at each site and also a European Works Council. The European Works Council, however, was described as a rather informal body, which is not uncommon, which met twice a year and more often if there was a special reason.

Many aspects of work were regulated via company agreements signed by site works councils and management, for example working time, pay, and extra holidays. But there was at least one example, where works councillors made rather unusual concessions to management (see 12-hour shifts above).

In line with German law, the sites had a number of joint committees which consisted of equal numbers of management representatives and works councillors, for example the wage committee in which income groups were decided, the economic committee in which information on financial affairs, innovation and investment should be provided, and an occupational health and safety committee. The works council also had members that represented specifically protected employee groups such as severely disabled workers.

Management was described to support a constructive relationship with the works councillors. But non of the works councillors, in contrast to company A, was willing to help this researcher to access management for interviews. Also management was said to not routinely consult or inform the works council in decisions on innovation and new investments. And although each site had an economic commission (Wirtschaftsausschuss), at least at one site it was perceived as ineffective in financial matters, partly because the site's profits went directly to the foreign mother company. A practice which also complicated collective bargaining and challenging redundancies.

The works council was in a very weak position regarding the company's strategic workforce adjustments.

> *"These are decisions of the mother company, where we have hardly any possibility* [to oppose]. *We can give them many good reasons and we do that. (…) But it is how it is."*
>
> (Works councillor)

> "*When a site is going to be closed, we can, depending on its size and importance, (…) say: "(…) here the law prescribes a social plan and reconciliation of interest (…)." But often it is small units that are not core parts of the enterprise.* [And here] *social plan and reconciliation of interests is optional and this has usually been done. (…)* [Management] *aim to transfer people internally, or (…) provide a financial compensation and some kind of transition* [for example retraining]. *(…) But this is voluntary...."*
>
> (Works councillor)

> *"As works council you are in many aspects relying on compromises. You make agreements with management. As a trade union, you have more possibilities. You have the option of collective dispute."*
>
> (Works councillor)

The strategic workforce adjustments were accompanied with light touch attempts by management to find alternative jobs for workers within the company. Workers would be treated as internal candidates for vacancies at other sites. This was also common practice in the company's international production network. For example at the Danish and the Spanish blade factories, which were closed at the same time as the German factory, the redundant seventy-five and respectively one hundred and thirty workers could all immediately transfer to neighbouring plants. The problem for the German blade workers was that the next site of the company was hundreds of kilometres away and had higher qualification requirements and demanded higher levels of fitness.

In the more international parts of the company the works council had more work with keeping an eye on managers, who were new to the German system, respecting German labour law, which – as stated above – tightly regulates employment relations and working conditions. However, in this regard the HR department and the works council were said to work well together.

Benefits of German co-determination and the regulatory framework

As stated above the company annually adjusted its workforce numbers and there had been various waves of redundancies in the contexts of reduced contracts. For example at the generator factory redundancies were implemented according to a social plan and with compensation packages, which were internally called 'turbo bonus', meaning those who left voluntarily got three additional monthly pays. This was much lower than what Company A workers received as transition offer (see previous case study).

Also when the blade factory's closure was announced in September 2021, this was commented with a statement which was strangely similar to other interview at the company:

> "*Well, this was a decision by the corporation.*"
>
> (Works councillor)

The site was to be closed by the end of 2021. When the closure was announced, a psychologist was on site. The announcement was made in the employee assembly (Mitarbeiterversammlung) by the German and the Danish site manager.

> "*It was over within ten minutes.*"
>
> (Works councillor)

Management seemed to have already taken the decision and wanted to get it done and over with as fast as possible. But because of German law, negotiations with the works council needed to take place. As other sites, there was no collective agreement, but the site's works councillor was assisted nevertheless by the trade union in charge of energy and chemical industries. The trade union provided an expert for the negotiation with management and recommended a lawyer. The company eventually agreed to a social plan and a reconciliation of interests, but the conditions were again much lower compared to the reconciliation of interests at company A, a few years back.

Overall company A had relatively high levels of job quality, effective although challenged social dialogue and rewarded the acquisition of formal and transferable skills. This seems to be the result of a strong legacy of trade union organisation and co-determination by experienced works councillors in Germany. Overall company B had lower levels of job quality, rather ineffective social dialogue and prioritised flexibility and the acquisition of company specific skills over transferable skills. This seems to be the result of a rather unitarist management approach that has not (yet) been sufficiently challenged neither by the industrial relations system from the company originates nor the industrial relations systems in which the company operates internationally.

Conceptions of the Just Transition

No interviewees at the manufacturers denied climate change and all agreed that emissions needed to be reduced. But answers differed in details and most interviewees touched on issues that were related to both, their own industry and to their personal life. Overall this seemed to represent a narrow focus of the Just Transition. Many started with a general critique of the former German Government's energy transition policy, as already discussed above. Other issues raised can be summarised under the headings wishes regarding goals, processes, social outcomes, and concerns.

What goals?

Windfarms should be located where it makes sense in terms of electricity grid and wind speeds, where the local population is supportive, and objective criteria should be used to assess the impact on locals. One hoped for 'autarkic renewable energy' in Germany. Regarding the energy mix there was no consensus. Some stated that there was no alternative to wind, solar and water power and that offshore wind should be further supported. One requested the exit from atomic energy also by the neighbouring countries. One stated that coal was becoming cleaner, that the renaturation of local pits had been positive for the region, and was against the expansion of wind turbines locally.

Interviewees wished for more research and development into linking wind energy with the production of hydrogen as an energy carrier, better, more efficient electricity transfer and more generally the development of adequate energy storage technologies. One said that the government should not push for a simultaneous exit from both coal and nuclear power, because there would not be enough energy to meet the country's needs.

What processes?

Interviewees generally supported the pluralist approach to policy making in Germany. The Federal Government should set appropriate targets and have consistent policies, but differed in their views who else should be involved. One interviewee stated that there should be a referendum over the goals of the energy transition, but said also that organised interest groups, environmental and economic affairs ministries and trade unions should play are role. Policymakers involved should be people who knew the technologies available, and similar, policymakers should involve citizens but also experts in decision making and the process. On the other hand some interviewees stated that there was too much lobbyism and that in particular the lobby of fossil fuels was too strong. At the same time the increasing influence of the solar and wind power lobby was feared to lead to political decisions that were not thought through. The lacking infrastructure for electrical vehicles was given as one example. The opposition of local citizens to windfarms and bureaucratic procedures were said to be holding up the transition. Companies' responsibility was seen as twofold, they should sign collective agreements with trade unions and ensure decent working conditions, and they should produce sustainable, non-polluting products and recyclable components.

What social outcomes?

One interviewee referred to the success of co-ownership of wind turbines by locals as it had predominantly happened in the *Land* Schleswig-Holstein (for example, see case studies 2 and 3 in the chapter on Germany in section 1). In particular worker representatives emphasised that workers should receive decent pay and work in safe working environments and that, globally, there shouldn't be any wage dumping. People should be allowed to go into part-time retirement. It was also said that workers should get more strongly organised to fight for better working conditions and pay. Almost all interviewees requested that electricity and energy prices remain accessible to

every household and to industry. The financial benefits should be shared with local authorities and local populations, for example via reduced electricity prices or free childcare. Windfarms should be distributed across the country and not just be in specific regions.

The burdens and benefits of the energy transition should be shared between windfarm owners and populations in the countryside and in cities. There was the perception that policymakers were favouring city dwellers' needs. One interviewee noted that relying on electricity for the fulfilment of all of one's needs was problematic, but didn't see a way out of this. Several interviewees stated that alternative jobs needed to be created for those in industries that would be phased out.

What concerns?

Participants voiced concerns regarding problems in the supply chain of primary materials, for example steel and copper were becoming more expensive. Also the electrification of the economy and transport, some said, had been too fast. Participants worried that technologies, such as hydrogen, were not developing fast enough and that electricity prices would go up. Some also feared that if energy prices went up, job losses would follow or wages would fall.

United Kingdom

Charles Umney

Overview

The United Kingdom currently has two major wind turbine manufacturing sites: the Vestas operations on the Isle of Wight, and the Siemens-Gamesa operations in the Humber. However, other sites are in development, including on Teesside and in the Port of Nigg. At present, the industry in England needs to be seen in the context of its development trajectory: it is a relatively new industry without deep roots in the country. Despite many strong existing advantages for wind power in the England (for instance, its history of port industry and beneficial physical/geographical context) UK governments did not commit early to wind power and there has been no emergence of a flagship native UK wind manufacturing firm. As such challenges still remain in securing sufficient long-term investment and, particularly, in moving up the wind energy value chain. We will see that this has implications for the future of jobs in the industry, particularly with regard to skills provision.

Context

The UK government's uneven record of support for the wind industry is documented elsewhere in this report. It is also important to set out some context on the UK more generally in terms of its approach to industrial relations and industrial coordination. In typical "Varieties of Capitalism" (VOC) language, the UK is considered an archetypal "liberal market economy" (Hall and Soskice, 2001). Without expounding on this concept in unnecessary depth here, this implies a number of key points which are relevant to the study:

- Relative weakness of legal supports and requirements for concepts such as collective bargaining
- Relatively uncoordinated systems for training and skills acquisition, where public provision provides basic general skills and firms may organise more specific training unilaterally, with little social dialogue over training content
- An emphasis on management autonomy in corporate governance in pursuit of profitability, and limited participation by workers in industrial decisions.

Other authors have characterised the UK as a "competition state" (Evans, 2009), where public policy has increasingly emphasised the need to present itself as an attractive site for profitable investment, as the main priority. This has meant policy emphasis on engineering a comparatively low-cost workforce, including various measures particularly since 2010 including restrictions on aspects of trade union activity, reductions in barriers to dismissing workers, and others. Indeed, while this accelerated after the return to power of the Conservatives in 2010, it is part of a much longer-term trend. Chris Howell (2009) shows how since the 1980s UK industrial relations has been characterised by "decollectivisation": in other words, proactive efforts by governments and employers to reduce the scope and influence of collective bargaining in UK labour markets.

Moreover, the UK also has little tradition of industrial policy. Emphasis has typically been on market forces to guide industrial development, and the state has played a comparatively small role in bolstering key industrial sectors or coordinating industrial development. Across the economy, union membership and collective bargaining levels remain at a historic low ebb.

The UK's efforts to develop the wind turbine manufacturing industry need to be seen in this context. The UK has struggled to attract substantial amounts of foreign investment, for reasons explored further later in the report. Dawley et al's (2019) account of this process is valuable. Public authorities have sought to encourage wind turbine manufacturing through subsidies and a favourable regulatory environment, but this has created problems of rivalries between potential investment sites which could potentially put pressure on costs (where localities may need to engage in a "beauty contest" to win favour of highly mobile international investors"). But Dawley et al also observe that the commitment of these firms to the UK remains fragile, in part because of the UK's desire to radically cut costs of renewable energy, and its uneven record on subsidies and financing (which have increasingly been targeted at short term projects rather than long term industrial development). This vulnerability to the decisions of international manufacturers, and lack of proactive industrial strategy, was previously underlined in the wind industry by earlier experiences with the Danish firm Vestas. In 2009, Vestas divested from two UK sites- in New Cross and the Isle of Wight. Despite Gordon Brown's (the then-Prime Minister) vaunting of a "green jobs revolution", UK public authorities did little to prevent these closures. Workers themselves sought in vain to contest them through factory occupations and other mobilisations (Gibbs and Kerr, 2020).

Finally, to understand the UK context, it is important to note that wind energy in principle forms part of the UK government's current "levelling up" agenda (Tomaney and Pike, 2020). This term refers broadly to attempts to prioritise economic growth in areas suffering the consequences of deindustrialisation, particularly in the North of England. The UK government has sought to create funds, awarded competitively, to support attempts to stimulate economic growth in deindustrialised northern regions. Wind turbine manufacturing, particularly in the Humber region which has suffered greatly from deindustrialization, should be seen against this backdrop.

Data collection

Interviewees are key informants. In other words, they are not chosen to provide a representative sample of a particular population group, but for their specific professional knowledge of the industry, which is held to be valid and reliable in relation to our research questions. Interviews, while being guided by a set of themes to be replicated across the project to ensure comparability, have been semi-structured, and required a responsive approach. To understand the empirical picture, it has been vital to probe and pick up particular problems and developments that only emerge through interviews and could not be determined in advance. So far, seven interviews have been conducted.

- Two interviews with national-level trade union representatives
- One interview with a key training provider
- One interview with a sector support organisation whose mandate is to support innovation and development in UK renewables
- One interview with an experienced UK energy sector engineer and educator
- One interview with a public servant responsible for managing wind energy investment in Scotland

These seven interviews have enabled relatively in-depth and detailed discussions on the trajectory of the wind industry in England and Scotland, from different stakeholder perspectives. There are clear limits to this research data. In particular, it would have been valuable to get more testimony from managers at UK wind energy firms. However, gaining access to these sites proved an intractable problem given the time and resources available. Despite these limitations, the interviews that were conducted led to identification of a clear set of prominent themes, discussed in the next sections.

These themes could also be corroborated with interviews conducted between 2012 and 2014 and in 2017. In earlier waves we conducted interviews with officers at the trade union Unite, an industry body, the local authority in one manufacturing location, managers at an OEM and a shop steward, as well as managers and PR officers at three skill formation providers.

Key themes from findings

An industry growing in a volatile market

A recurrent theme from interviews is a strong critique of the UK government's historic weakness in developing industrial strategy, and its reliance on market-led industrial development. All participants welcomed the development of manufacturing operations in the Humber. However, some participants commented that this incoming investment had not yet had optimal impact because various other aspects required to genuinely transform the area's industrial trajectory were not in place. For example, the relative weakness of the existing infrastructure and the supply chain in the region had led Siemens-Gamesa to equivocate before committing its investment. Investors have been reluctant to make further commitments owing to the UK government's strategy of driving down the cost of wind energy and the lack of a guaranteed order book. Still, today, key aspects of the construction process are handled in other countries rather than in the United Kingdom. As already noted, previous episodes of investment and divestment within the last 15 years are also important parts of this context.

As such, the industrial landscape in UK wind manufacturing operations is volatile in some respects. While the key players are established multinationals, the strong emphasis on project-based work means they often rely on subcontracting work to SMEs, among whom there can be a large amount of churn and frequent mergers. This can be problematic from a number of perspectives: for instance in the development of apprenticeship schemes. It also creates a potentially inconsistent demand for labour. Finite construction projects emerge for which specific workforces are needed temporarily. The environment is also rendered more complex and unpredictable by the UK government's drive to reduce the cost of wind energy, while also levering up the proportion of UK-made content. Some major enterprises have missed out on projects in recent bids, which can lead to fierce and sudden downward pressure on costs.

Despite this potential for volatility, there was a consensus among participants so far that jobs in the industry are relatively secure. The fact that the industry is growing means that, when construction projects finish, at present, there is nearly always another to move to. So the consequence of project-based work is job-hopping rather than job insecurity. Workers with the relevant skills can rapidly move between positions. However, it has to be asked whether this will always be the case.

One factor which was frequently cited as a particular challenge for the UK is the absence of a flagship domestic manufacturer in wind energy. Ironically, while the UK has some claim to being a world leader in wind energy (for instance, in terms of volume of wind energy produced), it is dependent on investment from multinationals based elsewhere, and stunted the growth of a

native supply chain. This could prove to be a source of vulnerability for the industry in the UK. One respondent comments that the UK therefore feels like "just a part of a European empire… [companies] will build there until we can't build any more then we'll leave". One interviewee attributed this to historical short-sightedness: the UK had in the 1980s been a world leader in wind research, but investment in wind declined as oil prices declined and wind power moved away from the top of the agenda. Another felt it was connected with a political and ideological stigma associated with nationalised industry.

The rapid pace of growth in the sector means it is providing an expanding number of jobs, and mitigates these concerns. However, they may become highly relevant in the future. One significant potential challenge facing the UK (and elsewhere) is the prospect of increasing competition between different regions and countries for investment. As the industry matures, the danger of companies using competition between potential investment sites to lever down working conditions and other social provisions may become more of a threat. This was particularly of concern to our trade union respondent. The development of freeports in the UK may intensify the potential problem of regime shopping. In order to prevent this, it is important that principles of collective bargaining are embedded in new investment sites. Unfortunately this will remain a challenge because union penetration is highly uneven in the sector already, with some key sites having no collective bargaining. If companies begin investing more in the UK and decline to recognise unions and principles of collective bargaining, the Just Transition would be out of reach.

Other informants testified to the relative absence of unions in key areas of the sector, particularly around training, which is the subject of the next subsection.

Challenges for training and skills

One consequence of these issues is that the UK's progress up the international wind energy value chain has been hindered. The Humber and Isle of Wight are important sites for blade manufacturing. However, more complex engineering tasks, such as nacelles, are constructed elsewhere. The fact that certain complex processes are still done outside the UK, and the fact that companies have relatively shallow roots in the country, are potentially in a self-reinforcing cycle. Compared to higher-complexity activities, blade factories are easier to relocate, and it is easier to train new workforces in new areas to work in them. Hence they are more vulnerable to international competitive pressure.

Moreover, the demand for blades in the UK, while growing, is also finite. There will eventually arrive a point where there are enough wind farms to meet targets, and the work will shift away from construction and towards operations and maintenance. Given that the UK does not tend to export blades internationally, competitive pressure will intensify, as the same companies build blade manufacturing sites in other places. In this sense, the prospect of the UK workforce suffering through international competitive pressure is a real concern in the future; and could be a serious threat from the perspective of a Just Transition. A trade union respondent argues that while the UK government has introduced mandates for locally-produced content, it has done so belatedly, and with little enforceable control over issues like training and supply chain development. Unions argue for more proactive public participation in the supply chain. For instance, they ask whether publicly-owned firms be developed which guarantee to place orders with local SMEs to enable stability in local supply chains, which commit to social dialogue, union recognition, and skills transferability, and which use their procurement processes to reduce risk and improve working conditions in the industry.

When discussing training and skills specifically, a recurrent theme in interviews was the fact that much training and skills development in the UK wind industry is highly company-specific, with little wider coordination. This problem has various aspects. It is partly connected with the

highly migratory nature of the workforce as regards senior managerial and engineering positions. In the construction phase, one training provider notes that these types of positions are filled by individuals arriving from countries such as Germany, the Netherlands, and Denmark, for short term projects, who then "disappear off the face of the earth" until the next project. It is in operations and maintenance that a domestic workforce remains in-place. However, for these positions, employers will tend to draw on workers with basic relevant technical competencies (such as in electrical engineering), and then rely on either top-up courses, to adapt workers' skills. These courses are often handled in-house and in highly company-specific ways. Large employers may recruit individuals at these grades based on attitude rather than specialist expertise, and then develop bespoke training systems for hirees that are only applicable within their operations. This has the advantage of increasing the accessibility of the sector, but not the transferability of skills. Hence, while apprenticeship schemes have made incremental progress in the sector, one training provider notes that they are limited by how company-specific they are.

For unions, the dominance of company-specific training implied a reactive mode, and the lack of transferability was a pressing concern. Unions have sought to enhance the transferability of training records in the industry but with little success to date. Skills transferability may be one respect in which the relative weakness of unions in wind energy is having a concrete negative consequence, since unions are likely to be prominent advocates for this. Moreover, for unions, the more "reactive" nature of training systems increases reliance on agency work, since it is not well-adapted to emerging challenges, necessitating short-term outside expertise.

There are attempts to develop widely-applicable skills standards. The Global Wind Organisation (GWO) is a multilateral initiative created by major firms which seeks to establish globally-applicable training standards in the sector. While in principle this may enhance transferability and standardisation, it faces various challenges. First, there is no union involvement. Second, competitive pressure plays a disruptive role. Major players within the GWO may be advocating for lower standards, for instance around health and safety standards, to facilitate penetrating the American market. Third, power dynamics in the global industry are likely to change significantly in future as major oil and gas firms commit in earnest to renewables. This makes it difficult to predict the future of training and skills in the industry and how international standards will develop. Fourth, in many cases the enforcement of GWO training standards (unlike its oil and gas sector equivalent, OPITO) are based on local accreditation which can be unreliable.

Beyond these challenges, the standards developed via GWO tend to be rather foundational. One training provider speculates that in future a model may emerge where basic standards are established by GWO, but where firms tend to have site-specific individuals with key roles who are trained internally.

Compounding these problems is the fact that, as interviewees argued, the UK government had not been proactive in developing comprehensive and standardised skills profiles. Higher and Further education providers have also struggled in this context. Owing to the sporadic and project-based nature of work, it has generally been uneconomical to run University courses specialised towards training for work in wind. In the Humber, a Further Education college did set up a dedicated training building for Siemens-Gamesa, which ran for a finite period before the company noted they had sufficient workers and could continue with training in-house. Hence the FE provider was left with a dedicated building which was no longer in use, illustrating the dangers of depending on individual firms who have very specific requirements and tend to handle much training in-house.

Challenges of the Just Transition

Respondents' conception of the Just Transition tended to be relatively narrow. For one respondent, for instance, it meant that ensuring that fossil fuel workers avoid the fate of coal mining communities. Another argued that the idea had little traction and features little in discussions among major players. Commonly, respondents referred to the need for proper training to equip workers to transition to renewable energy jobs. While this corresponds to the "narrow" formulation as set down in this project, there are significant barriers even to this. One issue is the attractiveness and accessibility of the sector. Remuneration in renewables tends to be lower than in oil and gas; and, for reasons explained above, it is difficult to access transferable skills that can ease individuals' transition into the industry. As such, many older workers in oil and gas may seek to retire or remain in the industry, potentially moving to services like decommissioning.

Some actors, such as Renewable UK, do have a more developed and systematic notion of the Just Transition, explaining it under three headings of people, place and planet (RenewableUK 2021). They have developed a Just Transition tracker. For others, much emphasis has been placed on workforce diversity in particular, and moving away from a largely white, male workforce in wind energy. This, however, is challenging because for obvious reasons the wind industry tends to cluster in coastal areas which statistically tend to be less ethnically diverse than major cities.

Another challenge to the Just Transition is automation. At present, it is difficult to draw reliable conclusions about the effects of automation on jobs, since the industry is at an early stage of development and likely to continue growing. However, some respondents felt automation was likely to slow the rate of job growth. Even in operations and maintenance which may be more permanent and less project-based than construction, the rate of growth may slow, since the reliability of wind farms is increasing, and the number of dedicated staff required for maintenance purposes per wind farm is decreasing.

Finally, note that some interviewees commented on the relative vagueness and paucity of the UK government's "levelling up" agenda; comparing it unfavourably to the Scottish government's Just Transition bill, which was believed set out more robust standards. Levelling up is a vague concept and has little to say about specific challenges of energy transition, such as those discussed above. Hence there was a sense among participants that Levelling Up was likely to fall short of promoting a Just Transition.

South Africa

Bryan Robinson

Introduction

This chapter further details contextual issues that influence community benefits and protests, and discusses challenges in terms of employment relations, skills formation, job quality and social dialogue.

We begin with an overview of South Africa and its power generation woes, introduce the move towards renewable power generation to improve power capacity and transition towards a greener mix of energy generation, explain the policy priorities of government, and reflect on the labour movement.

A developing nation with an appetite for coal-power generation

South Africa, blessed with abundant natural resources, a young population, and a relatively well industrialised economy, has a number of problems: Poverty levels are high, inequality levels are the highest in the world in terms of the Gini coefficient, unemployment was at 34.9% in the third quarter of 2021 (Stats SA, 2021), and the country's growth is stagnant at a low 1.488 in 2019, dropping to -6.4 in 2021 due to the pandemic (World Bank, 2020).

South Africa derives about 77% of its power from coal resources and is ranked as the lead steam coal user in the world (South African Mineral Resources & Energy, 2022). It has 15 coal plants and is the world's 12th biggest emitter of greenhouse gases (Reuters, 2021). And the trajectory is worrying with South Africa's carbon intensity increasing for the second year by 1.3% while globally this percentage decreased by 2.4%. It is the most carbon intensive economy in the G20, doubling the global average (PWC, 2022).

Eskom is South Africa's state-owned power producer accounting for over 90% of power generation in South Africa, and exports electricity to some neighbouring states. Years of mismanagement, lack of maintenance, poor planning, sabotage, and corruption has resulted in Eskom struggling to meet demand, and since 2007 the country has on numerous occasions had to resort to load-shedding to maintain the power grid. In the 2021/22 financial year, Eskom's average weekly outages have been over 14,000 MW (Kola, 2022). It is estimated load shedding cost the South African economy between R59 billion (GBP 3 billion) and R118 billion (GBP 6 billion) in 2019 (Trade & Industrial Policy Strategies, 2021).

While the South African government has provided more support for the diversification of power sources including renewables, it controversially continues to court coal-powered electricity production with intentions to build 1,500 MW coal-powered capacity, with opposition stating the move would contribute to higher electricity costs and environmental degradation (Centre for Environmental Rights, 2022). Environmental and civil society organisations, groundWork, the African Climate Alliance and Vukani Environmental Justice Movement in Action, have taken the government to court to try halt these plans (Reuters, 2021).

Eskom has committed in principle to achieving net-zero emissions by 2050 with a move away from coal and incorporating a Just Transition element to their strategy (President Climate Commission Report, 2021).

Introducing renewable into the energy mix

South Africa has been slow in adopting renewable energy, and the roll-out of renewable energy through the Independent Power Producers Procurement has been marred by poor implementation, although there does seem to be renewed dedication to the renewable energy sector. There are currently 89 existing projects producing 6,800 MW, while the latest Bid Window 5 will allow 25 Preferred Bidder Projects to produce 2,500 MW of power, while creating an approximate 13,900 new jobs (Kola, 2022).

Decommissioning coal-based generation capacity while the country struggles to produce enough electricity to keep up to demand, is one challenge. The other is thanks to the excessively high unemployment levels that compromises the propensity for a Just Transition: The coal value chain's direct employment is in the region of 150,000 workers (Trade & Industrial Policy Strategies, 2021).

South Africa acknowledged that it needed assistance from the international community to achieve a Just Transitions, and made a plea for assistance at the UN Climate Change Conference (COP26) to support the country. This resulted in the securing of USD 8.5 billion financing from the EU, France, Germany, the UK and the US, funds which are earmarked for renewable energy investments, green hydrogen, electric vehicles and other initiatives.

The move to renewable energy by South Africa is facilitated by the flagship Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), which will be described in the following section.

The Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

The South African National Development Plan (NDP) has developed the Integrated Resource Plan (IRP) that serves as the country's official electricity infrastructural plan. The latest IRP was released in 2019 and provides a timeline of energy infrastructure up to 2030. This plan details an increasingly reliance on a diverse mix of power generation for the anticipated requirement of an additional approximately 40,000 MW of electricity.

Independent Power Producers are key to the implementation of this plan, with 6.800 MW coming from new wind and solar power generation; 513 MW from energy storage; 3,000 from gas; and 1,500 from coal in the interim period of 2022-24/27 (Independent Power Producers Procurement Programme, 2022).

The Independent Power Producer Procurement Programme (IPPPP) came into being in 2010 with the support of the development finance institution, the Development Bank of South Africa, and an office was established to support the roll-out of the programme. One objective of the programme is for electricity to be produced by private, independent, power producers to be sold to the electricity grid.

Another important objective is to contribute to socio-economic development and environmentally sustainable growth.

> *"The IPPPP has been designed not only to procure energy but has also been structured to contribute to the broader national development objectives of job creation, social upliftment and broadening of economic ownership."*
>
> (Independent Power Producers Procurement Programme, 2022).

This objective has important ramifications for the wind energy sector. In order to be selected as an Independent Power Producer, submissions have to demonstrate a commitment to these social aspirations.

This is having a profound impact on the ownership structure of the wind farms and their community engagement and acceptance. As detailed in the community benefit and protest section of the report, this resulted in the ownership structure of the participant wind farm being allocated to a community development trust, and a community engagement and investment being a focal point of the wind farm's activities.

The Just Transitions Policy

The South African Climate Change Bill defines the Just Transition for South Africa as follows (Presidential Climate Commission Report):

> *"Just transition means a shift towards low carbon, climate resilient and ecologically sustainable economies and societies which contributes to the creation goals of decent work for all, social inclusion, and the eradication of poverty."*

The Presidential Climate Commission Report entitled 'Laying the foundation for a Just Transition Framework for South Africa' (2021) provides some valuable insights into the perceived Just Transition pinch points for South Africa by the South African Government and affords a degree of insight into policy considerations for the future.

In achieving the low-carbon economy, the report details five priorities of the Commission:

- Decent work for all
- Social inclusion
- Eradication of poverty
- Protect those most vulnerable to climate change including women, children, people with disabilities, the poor and the unemployed
- Protect workers' jobs and livelihoods.

In order to achieve these priorities, an array of policy priorities is listed that include the empowerment of workers and communities; procedural, distributive and restorative aspects that broaden economic ownership in a decarbonised society; and a stakeholder engagement process.

Justice within the Just Transition is further unpacked for the South African context into three key areas as previously eluded to: Procedural, distributive and restorative.

1. Procedural Justice
   The Report reflects on South Africa's historic grassroots, bottom-up mobilisation that contributed to the democratic progress in South Africa, but which has since been eroded and genuine social dialogue has been compromised. For procedural justice to take place, a rekindling of participatory justice is required.

2. Distributive justice
   South Africa has implemented a wide range of labour market policies, which may be inadequate to protect workers during the transition, but they could form the foundation for an inclusive labour market within a Just Transition. Industrial policy is critiqued for not being aligned to the Just Transition. In addition, while South Africa has implemented a social

protection system to reduce poverty, gaps and inefficiencies in support result in vulnerability for many. Distributive justice would therefore require that these shortcomings be addressed in order to achieve a comprehensive and empowering social security.

3. Restorative justice
   Restorative justice has been a cornerstone of post-apartheid South Africa but has been eroded over time. Similarly, to procedural justice, rekindling the restorative justice agenda and spirit is critical to achieving the Just Transition.

With the coal and petrochemical value chains being a significant employer in South Africa, much of the Report is concerned with this sector. It is acknowledged that clean energy would create opportunities, boost economic growth and job creation, and improve air quality – one example of which is in mining operations to supply clean energy minerals such as platinum, manganese and lithium. Yet, there would be significant costs for business, communities and workers dependent on the coal and petrochemical value chain – companies would need to write off coal reserves and capital investments, mining jobs would disappear, and the region of Mpumalanga where many of the coal mines and coal powered stations are situated, would be impacted. The problem is exacerbated by the fact that the workers and communities' dependent on these value chains do not have the capacity or social, human, and financial capital to adapt to these changes.

The pace of the energy transition is therefore of concern. The Report suggests a phased energy transition. This would entail building up clean energy generation capacity before decommissioning Eskom and closing coal mines. Retrofitting coal plants with recent technologies to reduce emissions would be one of the phases.

Much of the Report is dedicated to considerations of developing alternative economies to mitigate job losses. It suggests that in order for a just and equitable transition to take place in South Africa, jobs should be created, livelihoods enhanced, and opportunities for localised industrialisation should be generated. For this to happen, a focus on building skills pipeline and enterprises; lifting the unemployed into employment by expanding the labour force; and expanding opportunities for livelihoods, small-scale businesses, and community empowerment is proposed. Interventions include social welfare programme; reskilling and education programmes, relocation incentives, and new local manufacturing zones be established to absorb low-skilled labour. The Report supports the view that a Just Transition should facilitate decent work and fair wages, and thus collective bargaining in necessary in the process.

Employment and job quality

As described earlier, the unemployment levels in South Africa are very high, and job losses due to the transition to renewable energy would be inconsistent with a Just Transition.

A bit more detail on unemployment is perhaps of value at this stage, and while it is acknowledged that the Pandemic exasperated the problem, the inability of the economy to provide gainful employment becomes evident when reflecting on the numbers. Statistics South Africa's Quality Labour Force Survey Q3 (2021) shows that the number of employed persons decreased by 660,000 in the quarter to 14,3 million; and the number of discouraged work-seekers increased by 545,000 (16,4%). The unemployment rate decreased to 34.4% from 34.9% in the previous quarter. Unemployment was higher among women (37.3%) to men (32.9%); and there was a greater level of unemployment amongst African women (41.5%) than other races such as white women (9.9%), reflecting the ongoing inequalities of gender and race in South Africa.

South African employment relations were influenced by the International Labour Organisation and social justice, and adopted a cooperative approach incorporating the use of dispute resolution bodies. The National Economic Development and Labour Council (NEDLAC) introduced various

aspects of labour legislation to the South African employment relations landscape: The Labour Relations Act 66 of 1995 encapsulated freedom of association and trade union rights, voluntary collective bargaining, dispute resolution through the courts and the Commission for Conciliation, Mediation and Arbitration (CCMA) and employee participation; the Basic Conditions of Employment Act sets fair standards of working condition; the Skills Development Act aimed to improve skills formation; the Employment Equity Act provides for fair access to employment and representation across occupations; and the Occupational Health and Safety Act provides for safe working conditions (Bowler, 2022).

Organised labour has a high density in the public sector, although such union memberships are decreasing. Private sector density is much lower and found mostly in the mining and manufacturing sectors, but due to these sectors shrinkage recently, union membership numbers are also dropping. Three powerful trade unions dominate the trade union landscape (Bowler, 2022).

The South African Labour Bulletin (2018) published a special edition entitled 'Trade Union responses to the climate crisis' with a specific view on the Just Transition and provides an insider's view into the perspectives of organised labour on the Just Transition. It relays how labour recognises the need to move away from high carbon towards renewables, but that the impact on workers/ labour, for jobs, and for communities have to be recognised. For a Just Transition, this would entail a fair process to soften the impact through initiatives such as redeployment, reskilling and redirecting to similar or new sectors – "In this way, the consequence of transition, which was caused by the capitalist mode of production, is not a consequence borne by labour" (2018, p11). The Just Transition in this Bulletin suggests that the Just Transition should be worker-driven, driving an eco-socialist agenda, and push for structural change to the capitalist system.

Data collection

This section details the participants selected for the research to provide data on the themes of skills formation, job quality and social dialogue.

Personal interviews were conducted with 13 participants. wo round tables were also conducted in South Africa with the researchers Bryan Robinson, Mads Peter Klindt and Siân Stephens attending in person, and Lisa Schulte attending virtually. The first roundtable was held at Nelson Mandela University and comprised academics and thought leaders with a specific interest in the renewable energy sector. The second roundtable was conducted near the wind farm which participated in the research, and participants were a wide array of stakeholders including community members, local government, environmentalists, activists and the wind farm itself. Both roundtables were an opportunity to share preliminary findings and the subsequent findings enriched the understanding of the research outcomes and provided some new perspectives and future research opportunities.

While many of the participants would be able to comment on all the pinch-points, the following list provides the key selection criteria.

Skills formation: The director of the renewable energy institute; a German skills trainer who has facilitated training in South Africa; and a training facilitator on leadership participated in the research.

Job Quality: Two focus groups with employees of the wind farm and the wind turbine manufacturer were initially planned. While both companies agreed to the focus groups, when it came to arranging the events, both companies were hesitant to facilitate the focus groups. No reason was given. n employee at the wind farm was interviewed and various of the social dialogue interviews provided insight into job quality issues for workers in the wind industry.

Social dialogue: Senior managers of awind farm; amanufacturer and an SME owner in the renewable energy sector participated in the research. Three participants from the labour movement were selected to participate: a trade union trade union officer from one of the largest trade unions; a representative from an association for the unemployed; and an activist / academic in the political economy. An environmental and cultural activist; a representative from a European investment organsation; and a representative from the South African wind energy body also also participated in the research.

Key findings

Various participants attempted to articulate what a Just Transition means to them. The senior manager at the wind farm made the analogy of a bridge between the old and the new, but where the bridge was solid enough to carry everyone across. It requires a lot of engagement, consultation, facilitation of the understanding why the move is necessary. It should open up new opportunities that weren't necessarily there in the previous paradigm. There should be opportunities around improvement in the quality of life:

> *"a Just Transition then means moving from what was and gracefully moving to what's, ...the new, to the new paradigm you know. But in doing so you ensure that no one is left behind."*

The leadership training provider reflected on the fact that the Just Transition had to be 'people-centred'. This required a systems approach in order for everyone to participate in the transition. This people-centred approach requires active engagement to ensure a Just Transition. This will contribute to a clear and inclusive policy crafted through engagement and active citizenship, suggested the representative of the wind energy association:

> *"I think they need a clear policy framework, clear objectives and if there are challenges on their part to execute, I think, invite the private sector, invite different associations to provide real input in to how they can support those initiatives. I think eliminating the power play of, you know, 'we can't do this, we can't do that'… So, it's having a clear framework, identifying the areas where they need support and help and allowing active citizenship to actually drive what the Just Transition should look like and a collaborative approach that encompasses citizens. I think having a national policy instead of a policy that is influenced by political changes."*

Considering the 'narrow' versus 'broad' conceptualisation of the Just Transition, it would appear the South African participants viewed a Just Transition as being broad with a focus on procedural and distribute justice. This would entail that citizenry actively participate in the transition facilitated by engagement by the government. It would need to be inclusive and transformative in nature, where all members of society would benefit, especially those disadvantaged socio-economically.

Policy, politics and the wind energy industry

A strong theme emerged regarding policy uncertainty, some even suggested there was a situation of 'policy paralysis' in South Africa, where political shenanigans were disenabling the Just Transition. This could be one of the reasons why there is a disconnect in South Africa between its well-formulated regulations, such as the South African Climate Change Bill, and policy, including the Presidential Climate Commission Report. This section of the report aims to highlight this concern from the participants' perspective.

The wind farm manager suggested that while it is a political imperative for renewable energy, whether there is political will is a different story. There are political dynamics at play, but they are hidden behind the overall programme – he spoke of nuclear energy where there was policy indecision and that government needed to put programmes and systems in place to enable a transition. Support of policy imperatives should be improved. It needs to be faster – he mentioned it taking 3-5 years to approve bidding for renewable energy projects which was too long.

Politics was seen to be a significant stumbling block to the Just Transition by the German institution participant:

> *"So politics, not forward oriented politics I think is the major obstacle, because if you look on energy politics in this country, they are always following the market, rather than leading it, innovatively leading it."*

There was a lack of confidence in government's commitment to a Just Transition, as evidenced by the following quote by (1) the Professor of Political Economy and labour movement activist and (2) environmental activist:

> *"the South African government is really in their pockets on high carbon. It's no accident Gwede Mantashe is the energy minister, he comes out of the coalmines and it's no accident that Ramaphosa is the president, he comes out of mining obviously himself" (1).*

> *"I don't know with the minister we've got at the moment there will be a Just Transition, because he doesn't believe in it. He doesn't see, whoever has got the most money will win at the moment. So, the big money has got his ear at the moment, instead of what is just, equitable for every person in this country" (2).*

Similarly, she suggested that there was a lack of confidence in government's policy, which was viewed as outdated and unaligned:

> *"We are in this absolute and that's where policy comes in, you've got no firm policy to say and someone to stand up and take the heat and say, this is what we are doing, we need a Just Transition, we need to lower our coal, because people are dying in the Highveld because of the pollution levels."*

This policy indecision has far-reaching consequences. One of which is the poor development of the supply chain in renewables. The representative from the wind energy association reflected on the fact that there was reluctance by the industry to support economic development around manufacturing capability, but the fault lay at government's feet – the South African Government hadn't provided much consistency on how the renewable energy programme should be run:

"I'd say maybe they are reluctant or they support economic development. Reluctant maybe because there hasn't been much consistency in how the renewable energy programme is being run. There hasn't been committed data where you know that certain wind mills will start at a certain time and that makes it hard for manufacturing to actually be established locally".

Not only was policy uncertainty and lack of implementation, there was the view that there was a lack of engagement between government and the various stakeholders in the Just Transition.

Lack on engagement by government with stakeholders of the Just Transition

There was concern by the training facilitator engaged in leadership training, that there was a lack of engagement by policy makers with practitioners, and that the sector was under-represented in policy discussions:

> *"It needs to be the practitioners who become policy spokespersons,* [to], *become much more empowered to actively advocate for what they know is true, what is possible and what is required to make project implementation impactful from an economic development, economic transformation perspective."*

The lack of engagement with the employed and unemployed was voiced by the volunteer at the association for the unemployed. He called for government to hold meetings where citizens could provide input:

> *"I think the government must listen to them in coal and there must be meetings that are called where people can make input. It should not be top-down kind of a thing but it should be working out where people are invited, people are putting in-puts, including ourselves."*

He felt that people (society) should not just be told that the Just Transition was going to happen. He wanted to be included in negotiations or any discussions held in terms of the Just Transition, and that the Just Transition didn't 'kill' jobs and would improve the environment:

> *"For starters the government must include in their negotiations or in any discussions that are being held in terms of the Just Transition. So that we can even talk to our own brothers and sisters in* [Mpumalanga – an area of coal power production] *that the Just Transition is not going to kill their jobs but we are moving to create a proper environment for all of us to live and our children, to live longer."*

A contrary view was presented by the wind energy industry association who believed that their organisation was recognised as an important stakeholder with the regulators and Department of Minerals and Energy. They are often invited as well to provide input during public consultations as a representative of the wind sector in South Africa:

> *"It is also very exciting because you are speaking to policy, you are looking ahead, trying to ensure that the industry can grow and that the mechanisms are in place for the industry to grow. So, yeah, I think that the work that we do is very important."*

Other policy and government factors enabling and constraining the Just Transition

Ohe wind turbine manufacturer made an important point that there were no incentives from households and businesses to move to renewable energy, in actual, even if you move your house off the grid, you are still charged for the availability of electricity. In his view, this was a disincentive for investment in renewable energy.

Corruption was a topic often discussed in the interviews, with the environmental activist stating that everything to do with electricity or generation is open to vast corruption.

The local government revenue model was also mentioned as a constraint to local government supporting renewable energy. Local government earns a significant portion of their revenue from selling electricity to residents. This was seen by the environmental activist as a disincentive to produce their own electricity:

> *"So I think that's a real obstacle in the way to a Just Transition is the fact that our municipalities have got a funding structure that's based on profit on electricity. It's the easiest thing in the world if someone doesn't pay you, switch off their electricity. It's a difficult thing to withhold, if everyone decides they are going to withhold payment for this because of the municipality, they cannot because they've got us all you know over a barrel. They just switch off your electricity."*

The SME sector could be a valuable outcome of the Just Transition, creating self-employment and employment of others, while supporting a greater level of economic empowerment. The SME owner who had benefitted from some level of government support, felt more could be done. Departments, local government and social development institutions could partner with her kind of programme. There needs to be a bridge between the SME and government to assist with developing the infrastructure to support the system being rolled-out on a large scale. Not only in rural environments, but also apartment type complexes. There was also a need for funding as the installation can be costly even though the maintenance is not.

The Professor of Political Economy was sceptical whether government and the private sector would be truly incentivised to transition to a green economy, and suggested that the proposed Carbon Border Adjustment Mechanism (CBAM) may be the 'stick' that would force this energy transition. The CBAM aims to adjust the price of imports to the European Union based on the amount of CO2 emissions that were generated in their production – this is aimed at levelling the carbon tax liabilities for EU production and other countries' products exported to the EU which may have lower carbon tax requirements. He mentioned that high energy consuming companies that were already investigating their own renewable energy solutions to avoid these 'climate sanctions'.

A global Just Transition enable South Africa's Just Transition

Three interviews had a strong focus on the relationship between South Africa's Just Transition and the Just Transition globally. In particular the bilateral relationship between South Africa

and Germany was detailed by the renewable energy training institute in South Africa, a German facilitator who has trained South African's, and a German institution supporting the economic investment in South Africa.

South Africa is a 'focal partner' of Germany, as such it is involved in more areas and provides funding and deeper levels of engagement than a 'normal' partner. For 15 years, the topic of energy and climate change mitigation, climate adaptions, or energy and climate action was one of the focal areas of cooperation between Germany and South Africa. Massive funding from Germany to SA through various German stakeholders. The support included government to government; private to private; and access to global support systems.

The reason for Germany's support stemmed from a number of factors, such as a similar historical dependence on coal and the fact that Germany is in the position to make an impact in South Africa.

In 2018 final coal mine in Germany closed. Coal mining was an important factor for the local economy and also for job creation. The phasing out of coal was an extensive process that impacted quite a few regions in terms of jobs. Germany wishes to share their knowledge of structural changes: how to carry the burden or develop something new; how to deal with job losses and environmental legacy burdens.

The fact that SA is carbon heavy is also important for Germany – Germany likes to put its climate funds where they will make an impact.

> *"You can make a heavy impact with the funds in South Africa, you know I mean the economy is not that large on a global perspective and if you compare the economic size of South Africa in relation to their carbon footprint, I think South Africa is number 9 or 10 in the carbon footprint, globally. But I think economic wise they are like somewhere between 40 and 50, you know there is a kind of mismatch on your economic activity and the carbon output. I mean therefore it makes sense to start with South Africa to de-couple that."*

The role of industry in supporting the Just Transition

A representative for a wind industry association spoke of their role in facilitating a Just Transition. The association is advocacy body for the wind industry in South Africa. It supports businesses that are operating in the wind energy value chain through ensuring that there are supportive policy frameworks that are in place to ensure that the businesses can grow. They advocate for the renewable energy market. Provide the evidence that wind energy is feasible for development in South Africa.

The association supports a number of working groups from the industry:

- Asset working group: operational wind farms: they discuss issues that they face and share knowledge on how to address it and challenges that they come across in the operations. Share technical information, best practices and general discussion.
- Technical working group: Companies involved in construction and development phase which face similar issues such as regular compliance. An example was given of the requirement that companies had to provide a forecast in terms of the power purchase agreement with Eskom, failure to adhere to forecast comes with a penalty.
- Environment Working Group: Environmental practitioners and those who are involved in project development and business development, and they discuss various environmental issues.

- Economic Development (ED) working group: Addresses part of the requirements of the Renewable Energy Independent Power Producer Procurement Programme the REIPPP. Part of that is that there are a lot of commitments for the different wind farms and the facilities that are under construction. There are certain obligations for economic development and enterprise development in the areas that they operate. So, Economic Development Practitioners share ideas and share knowledge and discuss the policies that govern ED.
- Local Content and Manufacturing working group: Targeted towards OEMs. Focusses on the different requirements that are part of the REIPPP programme which includes the need to develop manufacturing capability in South Africa.
- Legal working group: Platform for legal issues.
- Gender Diversity Working Group: Discuss diversity and representation of genders within the industry and basically what is hoped for the industry that has women and men across all roles, senior management and junior management and access to different skills to be visible in the industry.

Ownership

Ownership receives particular attention in the findings as there was a great deal of conversation on the issue, often eliciting diverse views. The ownership aspect also confirms the broad interpretation of the Just Transition that was inclusive, and in some cases, argued for a radical redistribution of capital.

The wind farm worker described the wind farm company as an 'asset-manager'. As the OEM took much responsibility for the maintenance of the wind turbines, the wind farm was only left with the responsibility of compliance with the terms of the Power Purchase Agreement; environmental compliance; and socio-economic development in terms of the REIPPP agreement. Wind farms are privately owned and funded by the IDC and private financial institutions:

> *"IPPs at the end of the day they are private companies, private entities, lenders, Nedbank, Standard Bank, it is private entities and private entities do have their own agenda."*

As mentioned previously, 26% of the wind farm was owned by a community development trust, and revenue for the local community engagement and investment accrued by virtue of dividends and dedicated CSI as a percentage of the company's revenue. The senior manager seemed to question whether this was the ideal framework going forward. Deregulation of the industry would lead to a faster roll-out of wind energy projects, but it wouldn't contribute to inclusive ownership as not everyone would have access to resources to invest in wind farms.

The manager stressed the need for increased participation. Referring to a 'stokvel' (a traditional African saving scheme where individuals contribute funds for a period until their day for withdrawal), he explained the following:

> *"A true meaning of stokvel, you know your ordinary mammas, and aunties and uncles who form the stokvel in a township, or in a municipality and over time they are able to raise 2.5 million or whatever. They should be able to buy a stake, or to afford an opportunity to invest in the renewable energy* [sector]."

> *"It is all about increasing participation, you know because what happens now it's revolved mostly around the same capital, you know move, people move capital around you know, once it grows from R2000 that profit they've made there, they can go and buy a stake somewhere else, without necessarily allowing new players in the system. So now I'm saying this stokvel, I'm making an example of that, some of the people in the stokvel are not even working, but from the social grant that they are getting, they are able to deposit a R50 or R75 on a continuous basis. So can we imagine that my R75 which has, together with others has made this 2 million. Now all of a sudden it has an opportunity to grow even further. So those are the type of things when you're talking about 'just transition' and the new future of the sector we were talking about, economic participation. And the beauty about it is that this is a new industry, new sector, we can actually design it, develop it for those who are on the peripheral of the economic participation. For now in the main it is your financial institutions who are investing , but people don't have direct ownership where they (can) pride themselves that I deserve a portion of that plate that is spinning."*

Another option put forward by the manager was the financing of individuals by the Industrial Development Corporation (IDC) to purchase shares in wind farms. Once the capital amount was paid, the dividends would go directly to these individuals and they would be economically emancipated.

This would need to be properly managed and certain criteria applied. A proper model would need to be applied. He suggested a mixed model incorporating their current model of a community trust and CSI with direct ownership in some form, because of the need to also build infrastructure and improve the quality of education etc. for the communities.

Contrary to these views were the Union's Secretary General's view that there should be social ownership of renewable energy, and that individual owners, shareholders or directors should be 'ruled-out':

> "*We are completely against is for institutions that will operate on the same basis as the institutions that we have, that operate now on the basis that shareholders must be the first priority."*

Social ownership would ensure the ownership of renewable energy production rests with local government and communities:

> *"They must be owned by the municipalities on behalf of the people, provincial government must do the same, we must not allow this privatisation of energy, because by virtue of people owning the technologies, the source of energy itself is not owned by them. The sun is for everybody, the wind is for everybody, the hydro, if you use hydro, if you use um any other form or source of energy, so there must be that kind of social ownership. Communities must be allowed the resources to own their own energy."*

The concern that the current form of ownership would benefit only those who are already economically active was supported by the training provided in leadership training:

> *"Those able to participate are (economically) active but are more likely to perpetuate existing power dynamics that make our society unjust, and with that I can't help but think that we need to open that up for more diverse actors to participate in that economic opportunities."*

Employment relations

The Provincial Secretary General of a large national union for metalworkers explained how the union got involved in energy in 2011 when they prepared for COP17, as they were going to participate on the side lines of the conference. There was research by the Union focussed on energy. Renewables were still new at that stage, not many knew about solar and wind energy. The Union was a pioneer on the debate on the Just Transition. 10,000 to 15,000 of their members are directly employed by Eskom, and many others are employed in other energy heavy industries. The Union realised that change was imminent and was not going to be stopped by militants in the union, as the world was moving quickly. The concerns at the time was that jobs of workers in the energy sector, in particular what is referred to as the dirty energy as a source, such as coal, diesel and fuel, and members jobs were getting threatened.

So, organised labour was supportive of the move to renewable energy, although they acknowledged that some of the workers they represented, may be vulnerable during this transition. A Political Economy Professor and labour movement activist in South Africa reflected on the large National Union of Metalworkers of South Africa (NUMSA):

> *"It's the metal workers who are in ESKOM, to some extent in the coal fields, but mostly in the coal powered fire stations. They are also in all the metal smelters, there's, some of the men in deep mining and there are some (in) other industry. So between deep mining, smelting, the ESKOM coal fired power plants, some automobiles and some petrochemicals as well, they are basically the most exposed workers to a decarbonisation project."*

The manager of the wind farm raised a concern that there wasn't much engagement between the industry players in the renewable sector, the Government and labour. Referred to mechanisation of the auto industry in SA in the 70's and 80's, where there was "dialogue, talking, engaging and for finding the benefits of that", suggesting this was needed for the Just Transition.

Working conditions, employment opportunities in wind, and high levels of unemployment

In view of the high unemployment levels in South Africa, a Just Transition towards renewables would encapsulate sustainable job creation.

In order to provide a perspective on unemployment and how the wind energy industry would affect their plight, an unskilled unemployed volunteer and manager at an association for the unemployed were approached to participate. He described the frustration facing the mass of unemployed in the country due to the lack of support they are provided:

> *"We have come together and realised that the unemployed, there is no-one for them and when they were working they were under the unions… and then they were losing their jobs."*

He voiced the concern that the youth of the country were particularly vulnerable, and should their plight not be resolved, it could lead to unrest in the country:

> *"That is why now we are seeing 12 – 13 million unemployed people and 25% of that being the youth. Then when you have that number of the youth which is not employed in the country you are sitting on a ticking bomb."*

Some participants were quite cynical about job creation by wind farms themselves. The wind farm worker confirmed that there was not a great deal of job creation or enterprise development by the wind farm once the wind farm was operational – ownership was an asset-manager type of ownership, so it didn't involve itself in the maintenance side of the business. Another view of the Trade Union Provincial Secretary General was that jobs hadn't been created in the renewable energy sector as most companies were foreign based. One activist suggested most jobs created were in security – protecting infrastructure. Other jobs just created 'rolling job creation' – employment for a month or three months thus no job security.

The wind farm worker mentioned that solar power could create more jobs. For the wind farm they employ 6 technicians, at a maximum 20 people are on site. But for solar producing similar energy, 80 people would be on-site – more manually intensive tasks were available such as cleaning the power panes. Alternative sources of 'green' energy such as biogas, also had the propensity to generate local jobs, such as the example provided by the SME owner who was applying the technology of biogas for small rural villages.

The participant from the German institution raised the issue that renewable energy will create more jobs than the coal mining and ESKOM together. Various opportunities in the value chain and a quite diverse mix of skills and lots of giving opportunities for low skilled, or even hardly any skilled people. The problem though is that these jobs might not be created where the jobs that are lost in the coal supply chain are situated. But this can be mitigated with policy and clever skilling.

Job creation is closely related to skills formation. The South African Renewable Energy Technology Centre's Director explained how the centre and the various OEMs made a concerted effort to upskill communities' members and provide them with employment where the wind farms are going to be established. When a wind farm is going to be established, the Centre and the OEM will try to identify individuals from the community in which the wind farm will be established. Engage with the community to identify learners. A committee is established to select the individual/s. Then Centre provides training. It is a long-term view. Employing from the community is also financially motivated as there will not be relocation costs. The director provides the following example:

> *"I'll give you an example now. If there's a wind turbine development taking place in Kakamos for example… we will try and go into the communities surrounding the Kakamos area to do that, because obviously the cost otherwise is going to be astronomical in terms of relocation cost, accommodation and all of those things. … ideally, we want kids, or participants to be from their local constituencies. But we also, what we do then is we cast the net out into the public space and invite people to tell us if they are learners who are interested in this space, then we have a committee that meets and does selection and the*

> *committee normally includes the OEMs, the big manufacturers, because they can see the potential in the interview stage. So by the time the learner is signed up onto the programme, the OEM already has some eyes on that person, and it's decided that's the guy who will go that I want to take into this for long term. So essentially that's the journey. But we do it by public notification and all the OEMS will go into the local communities and enquire from, invite interested parties to apply and then they liaise through us for those applicants."*

The wind farm worker suggested that creating jobs for the local community would have a multiplier effect as they would stay in the area, and spend their money in the area, rather than living and spending elsewhere as migrant labour may do.

The German institution participant discussed the value chain in South Africa, suggesting that South Africa was highly invested in the last stage of the value chain – project development and maintenance. However, moving into the production of wind turbines is not supported by economies of scale. SA is a fairly small market, so not many opportunities to sell a wind turbine.

Due to the fact that the wind farms and manufacturers mostly employ highly skilled labour, a particular line of questioning was around unskilled labour in the context of high unemployment levels, and whether the industry could contribute to job creation in this regard.

The wind turbine manufacturer explained that unskilled labour was used with off-site installations, and they would use communities as a source of labour as failure to do so could lead to protest action:

> *"A lot of the communities that we have worked in before, if you rock up with a TLB or Backhoe they would set it alight, because you are going to employ the people there to dig that trench, may it be 500 metres, may it be 7 kilometres, they are going to dig it by hand."*

Only one worker, an on-site engineer, at a wind farm was interviewed due to difficulties in arranging focus groups. However, the worker described the job quality favourably. The on-site offices overlooked a beautiful landscape, and the open-plan boardroom led onto an outside 'stoep' with 'braai' (veranda with a barbeque), suggesting regular informal social events amongst staff at the site.

He was able to apply his skills and found value in working on the wind farm:

> *"I think it's fantastic. I don't think it's specifically working for (wind farm name), it's working within my position, given my background, technical bias, looking at the turbines themselves or these 'spaceships' on our windfarms!"*

He also felt proud of the contribution that the wind farm was having for local communities:

> *"IPPs do provide, can actually support, or supplement the Department of Education's initiatives, the school itself. … all that initiative does support the community and the municipality … I think that our IPPs integrate into communities, especially when it comes to ED, they think it is beneficial."*

It was also acknowledged that the maintenance workers employed by the OEM worked in difficult conditions:

> *"I have absolute respect for the work that the technicians are doing, it's an extremely difficult work environment. It is a working environment that I came from. It's not often that you work in a confined space and height at the same time."*

Skills formation

Skills formation was a priority from two perspectives: the one being the systemic unemployment in the country, and the second, the need to re-skill workers in the coal supply chain for the renewable sector.

The Trade Union Provincial Secretary General stated that their focus was on the transition of workers towards renewables through skills formation:

> *"And that decision, or resolution of the union was not about abandoning workers who are currently employed in the dirty energy space, fossil fuels so to speak, it was not about that. It was about training them, reskilling them, repositioning them and move towards, but clearly that is not happening."*

The wind farm manager was concerned that the current skills in energy production was fossil based and needed to migrate to renewable, yet nothing was in place (policy implementation) for this massive migration:

> *"And we can't wait for 2050 and say we need to train 5000 engineers and artisans and all this kind of thing in that space. We need to build that capacity now as we approach 2050."*

He suggested that there was an urgent need for faculties and university programmes for the renewable sector. In the region there are 17 windfarms and more coming. There are universities and colleges in the region but these lack specific courses for the renewable sector which is needed such as specialist legal practitioners, environmentalists, development studies and other spheres.

The Union Secretary General was of the view that there was not a shortage of training and skills in South Africa. Eskom used to have its own training centre. There are artisan centres, even the unions are moving into that space and providing training. There are numerous Universities and TVET colleges. He believed these could be leveraged to transform the current skills sets that people possess for their future in renewable energy.

A wide range of skills would be required in the wind energy sector, some of these competencies would be relatively easy to transfer. The skills base is the same in coal as renewable. An engineer would just require retraining. Lower-level skills are also needed. Basic things like turbine painting, rust remover to more complex tasks. At the office, clerical work is required, accounting etc.

The wind turbine manufacturer's manager spoke of the necessity for quality production and those employees would require mechanical, electrical, or electronic education and expertise gained over years of working. In-house training was provided in order for employees to do a number of functions. Training was also provided to installers and freelance sales agents.

One area of skills formation in renewable energy revolved around enterprise development – support for entrepreneurs entering the renewable energy sector. The manager of the SME in the biogas field explained how she had benefitted from an SME incubation project financed by the South African government. While she was a master's graduate, she lacked business skills, and the incubator provided mentorship and training on establishing the project. The incubator is one of many such initiators to support entrepreneurship and innovation in South Africa.

Vocational training for the renewable energy sector

In 2013, a South African delegation travelled to Denmark and Germany to determine what was happening in the renewable energy space. The South African team then made a pitch to the National Skills Fund for a South African Renewable Energy Technology Centre (SARETEC). The National Skills Fund required that the initiative be aligned to a University. Cape Peninsula University of Technology was selected and provided the land for the South African Renewable Energy Technology Centre. The centre provides vocational training specifically for the renewable energy sector. People entering the training are qualified electricians being "diverted into this space". Skills provided are urgently needed – once qualified, learners can easily find jobs according to the Centre's director.

The establishment of SARETEC involved a great deal of engagement with international partners at the inception. Engagement on the theme of Just Transitions with Denmark and Germany continues. OEMs from Germany and USA continue to engage with SARETEC and the wind energy industry in South Africa on the Just Transitions.

Since 1994, skills development was one of the major German cooperation programmes with South Africa, but it achieved very little for the time and effort over 12 years. Mid 2000, this focus was dropped by Germany, but later rekindled at the request of the South African government. Germany now calls it promotion for green employment, or skills development for the green economy, under vocational training. Germany remains heavily involved in the South African Renewable Energy Technology Centre (SARETEC).

Leadership training with a focus on a Just Transition

A training institution was established in 2021 that focussed on leadership training for the renewable energy sector. Three courses are provided: an introduction to social performance; planning and management of stakeholder engagement; and community of practice.

Social performance considered not only the environment, financial, and technical performance, it considered the social imperative. The training introduces technical aspects such as stakeholder mapping, stakeholder analysis, having a community engagement plan, and a community investment plan. Project management encapsulated social impact, risks and benefits.

Conclusion

Lisa Schulte

The four chapters in this section discussed political and market challenges to the wind turbine industry, skill formation, job quality and social dialogue as well as the conception of the Just Transition among research participants for each country. This concluding chapter will briefly situate the findings from our recent data collection in relation to findings from our earlier interviews and will compare the country cases across the five themes covered in each chapter. Last this section presents our policy recommendations derived from our research findings.

Whilst in Denmark and Germany domestic wind turbine industries developed thanks to existing domestic engineering industries and favourable industrial policies in terms of R&D support, infrastructure, and available skills bases, the United Kingdom did not develop a significant domestic supply chain (cf. Simmie, 2012; Simmie et al., 2014). The location of manufacturing sites of wind turbine OEMs in the UK only resulted from the development of significant demand for wind turbines for offshore wind farms around the UK coast. Most components however are supplied by manufacturers on the European mainland and research and development take place in Denmark. In South Africa there are currently no manufacturing sites of large OEMs but we identified an establishment that produces wind turbines for household use and interviewed a worker and a manager at a wind farm. Danish and German foreign aid efforts in South Africa aim to facilitate market access for Danish and German wind turbine manufacturers.

The largest wind turbine OEMs have manufacturing sites near their international markets. Participants across the countries reported that local content requirements, e.g. in Russia and France, play a significant role in term of location decisions for manufacturing sites, but for instance the local content requirements in place in the UK were seen as too weak by UK interviewees. Overall there is a high level of competition in terms of wind turbine capacity resulting in ever larger turbines. In high wage countries like Germany and Denmark the trend towards automatization reduces skill requirements and puts pressure on wages as workers find themselves employed in 'unskilled' jobs at the bottom of trade union wage scales. However, wages and working conditions are still attractive when compared with alternative jobs available to workers in the labour market.

Other challenges to the manufacturers were the volatility of the market itself due to changing government supports, the cost of raw materials, the cost of transport and the availability of transport routes for ever larger wind turbine components. Overall however, for the largest manufacturers' access to markets in various countries provided a certain degree of stability. Thanks to their international production networks, manufacturers are not committed to specific production locations. The closure of three European sites in the past year by one of the manufacturers we studied exemplified this.

Although the growth of the renewable energy industry may have been seen as an opportunity to do things differently in particular in liberal market economies (e.g. Klein, 2014; Mazzucato, 2013), our data collected in Germany, Denmark and the UK over the course of the past decade shows that this new industry over time morphed into similar patterns as the institutional framework in which they developed. This may inspire hope for workers in Denmark and Germany and despair for workers (and policy makers) in the UK and South Africa. But if we zoom in on our cases, the picture for Denmark and Germany is also more nuanced and helps us to identify the factors that keep Danish and German wind turbine manufacturers on track for a Just Transition, notably strong levels of worker organisation and statutory worker representations rights as well as strong employment law.

We have primary data in Germany and Denmark and secondary data in the UK on two large OEMs. In Germany we also have primary data from previous research on OEMs that were later bought by one of the two OEMs in our more recent sample. The OEMs we studied are currently not active in South Africa.

In Denmark OEMs worked closely with the existing institutions for vocational skill formation, recruitment and worker representation. Our data from the mid 2010s showed high levels of agency work, job insecurity due to recurrent waves of redundancies, frustration among the workforce and mismanagement of workers by the temporary work agencies one OEM worked with. Our more recent data shows that temporary work had been discontinued by the OEM thanks to pressure by the trade union. The trade union was also credited for the establishment of vocational training for workers in the industry and the skill formation provider and OEM had strong connections through training contracts but also through the fact the vocational school hired former workers as instructors.

Our previous data on Germany documented trade union and works councillors' successful efforts to organise the wind turbine OEMs and negotiate collective agreements. However, collective agreements stayed below the level of the general metal workers collective agreement. Over the past decade these OEMs were absorbed by the market leader which, being part of a traditional German engineering conglomerate, has strong works council structures (company-based worker representation) and a high-quality collective agreement. The integration of the smaller OEMs did not lead to downward pressures on terms and conditions at these establishments, but did also not lead to an improvement. The lower quality agreements remained in place and our interviewees worried that these would serve as a new benchmark for terms and conditions across the company overall. The trade union IG Metall had some successes over the past years in terms of organising the German wind turbine industry, but levels of organisation and collective agreement coverage stayed below the average of the German metal industry. In terms of skill formation interviewees reported that companies collaborated with vocational education and training schools and universities for dual training programmes but also ran their own training programmes for more specific skills. Automatization of production was an important trend in wind turbine assembly and put pressure on skills and wages.

What seems important for a Just Transition across the German and Danish cases are on the one hand supportive industrial policies and on the other hand strong worker representation. Strong worker representation meaning here high enough levels of trade union organisation (Denmark) combined with statutory rights of worker representation at work place level and strong statutory regulation of working conditions (Germany). High levels of worker organisations and statutory company-based worker representation are preconditions for social dialogue between management and workers. Social dialogue in our Danish and German cases has proven important for problem solving at the workplace level, be it by addressing negative attitudes among workers through regular dialogue meetings or accelerating recruitment procedures. Social dialogue is accepted to be a two-way street, involving the improvement of both working conditions and productivity. For instance, Danish trade unions achieved the phasing out of agency work and a German works council achieved the transfer of existing company agreements to a new greenfield manufacturing site. In times of down turns and redundancies trade unions and works councillors in Germany negotiated social plans and used so called transfer companies to help redundant workers to acquire new skills and find alternative employment.

Our recent UK data does not permit a detailed view of what happens inside manufacturing sites. However, our industry-level stakeholder interviews provided a picture of much more fragmented relations between management, worker representatives, policy makers, and training providers, compared to Germany and Denmark. Data from the early 2010s documents efforts of local policy makers, skill formation providers, and the trade union to engage with the OEMs. Data from the mid 2010s show that there had been some success in terms of developing training collaborations

with a local college, in terms of trade union organisation and worker representation on site. But our more recent data shows that these successes were short lived. The training collaboration had been terminated. The memorandum of understanding on trade union recognition had expired.

The narrative of policy and market challenges in the UK was unchanged between our data collection in the early 2010s and today. Interviewees deplored the lack of an industrial base due to the implosion of UK industry since the 1980s, the volatility of the market, the lack of uniform and high standard skill formation. On a positive note, the high demand for turbine technicians in offshore wind turbine installation provided employment, although not job, security for skilled workers. It may however be that as long as the UK does not provide industrial policy for emerging technologies (cf. Mazzucato, 2013) and a strong statutory role for worker representation there is little hope for the development of a broader high skill and high-performance industrial base in the UK.

Our South African case showed how complex it is to transition from a predominantly coal-based economy to a more diversified electricity supply industry in the context of high levels of poverty and unemployment, a low skill workforce, and the geographical distance between the existing coal industry and renewable energy work opportunities. Another constraint has been the policy uncertainty in the energy transition by the South African government. We identified ambitious Just Transition and renewable energy policies, but interviewees doubted the commitment of leading politicians to these. There were some initiatives for skill formation regarding technical and leadership skills in the wind turbine industry, but the scale of these may not be adequate given the vast number of workers who are employed in the coal industry and who will need to transition to alternative jobs if coal will be discontinued as an energy source in a somewhat near future. Foreign aid played a significant role in the existing training initiatives.

Although the South African trade union movement has Just Transition policies, it is not evident that it reaches workers on the ground at the wind farms and in small scale wind turbine manufacturing. There are real hopes that the energy transition will serve broader aims of social justice, hence lead to redistribution of wealth and more participative governance. These hopes may however be disappointed if government does not ramp up its efforts in implementing its ambitious policies and workers miss out on effective representation in the workplace. Both, governmental policies and strong worker representation, have shown crucial in the European cases for developing a domestic industry, high levels of skill formation and job quality.

Overall our interviewees had fairly narrow conceptions of the Just Transition. Participants worried about rising energy prices. There were also concerns regarding a too fast electrification of the economy with technologies and infrastructure not being ready for broad and affordable use. In Germany and in South Africa interviewees related the Just Transition with job losses in the coal districts reflecting the origins of the Just Transition debate, and in South Africa participants emphasized that a Just Transition would be inclusive with opportunities to benefit and participate for all, workers, the unemployed and communities. In particular, participants with a trade union background highlighted the role of trade unions, that trade unions needed to be strong to make sure that the transition would be just for workers.

Based on our research findings we make the following policy recommendations for realising a Just Transition for the workers in the wind turbine industry:

- To tackle risks of policy uncertainty, government should craft policies engaging multiple stakeholders. This would increase the likelihood of policies being appropriate and implementable, engendering investment in the wind energy sector and contributing to skills formation and job creation.
- Government or employers need to fund the certification of skills in the sector and include transferable skills training ideally through training in multi-company run training schools.

- Government and employers need to provide skilled re-training for workers who fall victim to the sector's volatility.
- Government needs to provide an adequate social security system and/or obligate manufacturers to provide adequate 'reconciliation of interest' and compensation packages.
- Government needs to enhance or protect trade unions collective bargaining rights
- Government needs to Enhance or protect workplace representation rights and trade unions need to provide adequate skills and knowledge transfer to workers who take on this role.
- Trade unions need to support the development of global union networks and participation of worker representatives in European Works Council Structures to enhance the strength of local worker representation and facilitate exchange of information.
- Governments need to enforce existing labour law with regards to working conditions, working time and health and safety.

At the industrial policy level, we have different recommendations for the European countries in our research and South Africa:

- While the REIPPPP in South Africa, if successful, will de facto lead to the privatisation of electricity generation, it also sets a number of social standards; hence this might be a way out of the systemically poor governance of the electricity supply industry, if it will be combined with the provision of a functioning electricity grid. However, there is the risk of becoming political hostage to large foreign manufacturers, servicing companies, and investors. Hence some of our recommendations to Europe might also be helpful in the South African context, if combined with good governance.
- In Europe long-term and consistent policy support in terms of research and development, skill formation, and subsidies for, in particular, the deployment of small windfarms was helpful for the growth of medium sized manufacturers and citizen-owned generation infrastructure (see Germany and Denmark). Later, when the industry and turbines grew, support of large-scale deployment helped to interest large utilities in the technology (see the UK and Denmark). However the staged competition for subsidies and, later, strong market competition put pressure on working conditions in the sector. Hence, we recommend close monitoring of the working conditions in the industry and stronger involvement of trade unions and community stakeholders in industrial policy making.

The next chapter concludes this report with a brief summary and outlook.

Overall conclusions and policy recommendations

Lisa Schulte, Bryan Robinson, Charles Umney

This report presented the findings from research we conducted in Denmark, Germany, the UK and South Africa over the past ten years, with a particular focus on the most recent wave of data collection in 2021-2022. Our research aimed to address four questions related to the four pinch-points: community acceptance and resistance, skill formation, job quality and social dialogue. This conclusion will summarise our findings addressing each of the questions and will then present our policy recommendations.

1. How is Just Transition defined by workers, managers, social partners, and community stakeholders in the industry?

Workers, managers and social partners in Denmark, Germany and the UK had fairly narrow definitions of the Just Transition, with principally compensation for workers in mind, and avoiding problems of large-scale unemployment. In South Africa governmental policies explicitly refer to the term 'Just Transition' and address both, increasing participation in domestic policy making and redistribution of economic benefits, and the international community with calls for financial and logistic support in the transition to renewable energy. In the UK, some industry groups were seeking to monitor progress towards a Just Transition in a more fine-grained way, emphasising themes of "people, place and planet". However, among most interviewees there was a sense that the terminology had little currency and recognition in the industry. While the devolved Scottish government had a more developed Just Transition framework than the UK government, this was still considered to be quite limited in its practical impact.

It needs to be noted that social partners in Denmark and Germany and in the UK play very different roles in public policy making and decision making within companies. Whilst social dialogue is institutionalised by strong trade unions in Denmark and Germany, in the UK the marginalisation and curtailment of trade union rights make it in practice much harder for trade unions to stand up for workers. There is potential to use the Just Transition as a lever to argue for a shift in power relations in favour of more worker and trade union participation in the UK. For instance trade unions in the UK could argue for social criteria in the procurement for windfarms, as do German trade unions, or UK government could push for state or partly state ownership in windfarms to better influence procurement decisions.

Broad conceptions of the Just Transition could be identified in our case studies on community acceptance and resistance, where co-ownership schemes and ownership by community trusts increased participation and the range of beneficiaries of the electricity supply industry. In the South African case there was still potential to increase transparency regarding ownership structures of the community trust. Overall, examples of acceptance and resistance to windfarm projects showed how important it is for local communities to partake in decision making processes (procedural justice) and the economic benefits generated from local windfarms (distributive justice).

2. What are the political and socio-economic pinch points at windfarm manufacturing sites and in communities where windfarms are located?

Large scale windfarm projects, like the offshore projects around the UK coast, have advantaged the largest OEMs and consolidated the landscape of OEMs. Market competition and instability make it difficult for SMEs to enter and survive in the wind turbine industry. OEMs and therefore jobs follow countries' local content requirements, but ultimately, the investments of OEMs into specific production sites are temporary, usually for a few years, as they globally compete for market. The production process of wind turbines is entering the mature phase, with increasing numbers of sites moving to automated and lean production, although and there is potential to rationalise products and processes even more, which will significantly reduce skill requirements and the bargaining power of skilled workers.

As the wind turbine industry has grown rapidly and dynamically over the past three decades, institutions – such as social dialogue and skill formation – needed to be established in a context of volatile markets and changing industrial policies, mergers and acquisitions, rapid technological advances in terms of products and automatization of production processes, internationalisation of production networks and markets. These contextual challenges have provided reasons to companies for relying on agency work, decommissioning plants, and lowering labour standards. The maturation of the sector and time have provided trade unions with opportunities to challenge these – for workers – detrimental practices and skill formation and job quality continue to be negotiated as part of social dialogue and, in some companies, social dialogue itself still needs to be more strongly established.

Political and socio-economic pinch points at windfarm manufacturing sites in Germany and Denmark can therefore be summarised as the struggle to set social dialogue, employment relations and skill formation on par with the standards of the respective industrial relations model. We identified one manufacturer where trade unions and works councillors/shop stewards had been quite successful in achieving this in its German and Danish operations and one manufacturer where trade unions and works councillors/shop stewards have so far been less successful. Overall, the level of trade union membership and representation in the wind turbine industry is lower than in more established industries.

The UK provides a bleaker picture as here social dialogue between employers and trade unions appears absent in much of the industry. While we were not able to get insights from within manufacturing workplaces in our most recent data collection, this is likely to have negative consequences for skill formation and job quality. The key socio-economic pinch-points for our UK interviewees were the lack of a domestic supply chain for wind turbine components and the UK government's inability to provide a framework for growing its own industrial base. In other countries, like Denmark and Germany, domestic industries developed as industrial policies helped domestic demand for onshore wind turbines to pick up (cf. Bednarz and Broekel, 2020). From this industry the offshore wind turbine industry developed. Another pinch-point reported by UK interviewees was the over-reliance on narrow, company-focused training schemes which, in the view of trade unions, were reactive and failed to develop transferable skills.

In South Africa there currently is no manufacturing by large OEMs. Socio-economic economic pinch points are the transition from coal to a more diversified energy supply industry, including wind energy, the provision of alternative jobs for coal workers and upskilling of workers to make jobs in renewable energy industries accessible. Foreign aid plays an important role in this. The need for upskilling coal workers to help them transition to new jobs was also brought up in interviews with UK and German participants. In Germany, vocational skill formation for wind turbine maintenance and installation for unemployed job seekers is provided through active labour market policy programmes – but the uptake has slowed down due to job losses in the local industry. In South Africa, the geographic distance between the coal district and wind farm locations provided an additional obstacle to transferring workers merely from one sector to another.

Socio-economic pinch points in windfarm communities across the four countries were surprisingly similar and can be summed up as questions of redistribution of economic benefits, participation in decision making processes, the wish of local participants to stand up against large companies and investors from outside when these were perceived to make unfair amounts of profits while not giving back enough to the community. We termed these David and Goliath and outsider vs insider tensions.

Wind farming was often associated with land that was still or had previously been used for agriculture and the decision to build windfarms depended on landowners – mostly farmers – seeing an economic opportunity in wind energy. This means that particularly these landowners benefitted from wind turbines, but not necessarily the wider community. Some interviewees noted that this could lead or had led to jealousy and opposition by other locals. German (wind) farmers in our sample (case 2 and 3) had anticipated this problem by initiating co-ownership schemes for local citizens.

3. How are work intensification and intensified use of the natural environment resulting from the political imperative to deploy wind turbines quickly and at large scale dealt with?

Manufacturers frequently relied on agency work to scale up their workforce in times of high demand and automated or reorganised production processes. They also experimented with different shift patterns. And they increasingly used their international production networks for staging competition between their sites. This poses a challenge to the Just transition. Where trade unions and workplace representation exist, potential negative effects of this can be addressed in social dialogue.

Government subsidies and policies as well as demand for green energy have motivated large utilities to invest in wind farming onshore and offshore. In particular with regards to onshore wind this is often met by local opposition, even if populations more generally are supportive of wind energy.

Given the success in terms of local acceptance when wind turbines are deployed under co-ownership or community ownership schemes, it is surprising that these have not been used more broadly. Overall the legal obligation to create some form of co-ownership or community ownership scheme exists so far only in South Africa and the German *Land* Mecklenburg-Vorpommern (since 2019), and existed for a limited amount of time in Denmark (until 2019).

In particular, local citizen-initiated co-ownership schemes in the German Land Schleswig-Holstein have proven very successful in increasing local participation, redistribution of economic benefits and acceptance. In our Scottish case, the developer provided funds for projects in the community and opened up the windfarm as a recreation area. In one of our German cases it was highlighted that the windfarm owners contributed funds and land for nature conservation and research projects on the local flora and fauna. The management company also invested in research and development to decrease the environmental impact of wind turbines.

One German interviewee – opposed to local windfarms – noted that the coal industry had engaged in renaturation and research and development in making coal less impactful on the environment. Similarly in one of our English cases, interviewees praised coal companies' social engagement and saw windfarm operators lacking in this regard. The bottom line here is that wind energy can gain acceptance if the industry gets (locally visible) on par with the level of community engagement, labour relations and research and development of the energy industries it is deemed to replace.

4. How can the process of structural change, meaning here expansion of the wind turbine industry, be managed equitably so that communities and workers benefit more broadly?

In brief the process of structural change could be managed more equitably through more inclusive participation in decision making and redistribution of economic benefits. Different countries' policy and institutional frameworks incorporate these already to different degrees. Our cases showed that co-ownership schemes' success depended on access to affordable finance for stakes in windfarms and that participation in decision making processes would require not only the opportunity to participate but also access to sufficient information, to expert advice and knowledge transfer to promote effective participation. Moreover, co-ownership schemes initiated by locals required willingness of local landowners to support these projects.

Also effective worker participation in co-determination and social dialogue requires a certain level of knowledge transfer and access to expert advice as can be provided by trade unions. But in places where trade unions themselves are not strong, governmental policies and the law need to change and back this important bulwark against the exploitation of workers.

The following summarises our policy recommendations:

Fostering a Just Transition in windfarm community

- Local consultation and transparency of decision-making regarding windfarm location are key.
- Our Scottish case showed that framing wind as a 'national resource' may help to gain support from some.
- Local co-ownership schemes of wind turbines are effective in redistributing economic benefits and broadening participation in decision making.
- Local o-ownership schemes require access to finance, information, and expertise – see German cases.
- The benefit of local co-ownership schemes is that profits stay local, may be reinvested locally, and hence can have economic multiplier effects in the communities where they are located.
- Alternatives to local co-ownership schemes can be wind farm-funded community trusts that can provide expertise and funding for social community projects or mediate windfarm co-ownership – see Scottish and South African case. The last point was discussed at our round table with windfarm stakeholders in South Africa.
- Local benefits should also be generated through windfarms paying business/corporate tax where they are located – see Danish and German cases.
- Wind farms and windfarm management companies can contribute in additional ways to communities and more broadly through providing land for nature conservation, renaturation project, funding organic agriculture (German cases) and investment into new equipment to raise productivity of farming (South African case), participating in research and development on mitigating the environmental impact of wind turbines (German case 3), providing local jobs (Scottish case, German case 3).

Skill formation, job quality, and social dialog

- Government could introduce legislation that supports procurement for windfarms based on manufacturers' recognising trade unions as suggested by the German trade union IG Metall.
- Government or employers should fund the certification of skills used in the sector and include transferable skills training ideally through training in multi-company run training schools and accessible to unemployed job seekers (see Germany).
- Government should provide an adequate social security system and/or obligate manufacturers to provide adequate 'reconciliation of interest' and compensation packages (see German cases).
- Government should enhance or protect trade unions' collective bargaining rights.
- Government should enhance or protect workplace representation rights and trade unions must ensure adequate skills and knowledge transfer to workers who take on this role.
- Trade unions and employers should support the development of global union networks in the wind turbine industry to enhance the strength of local worker representation and facilitate exchange of information.
- Government should enforce existing labour law with regards to working conditions, in particular in terms of working time and health and safety.

Industrial policy

- To tackle risks of policy uncertainty, government should craft policies engaging multiple stakeholders. This would increase the likelihood of policies being appropriate and implementable, engendering investment in the wind energy sector and contributing to skills formation and job creation.
- While the REIPPPP in South Africa de facto will lead to the privatisation of electricity generation in the country, it also sets a number of social standards; hence this might be a way out of systemically poor governance of the Electricity Supply System in the country. However, there is the risk of becoming political hostage to large foreign manufacturers, servicing companies, and investors. Hence some of our recommendations to Europe might also be helpful in the South African context.
- In Europe long-term and consistent policy support in terms of research and development, skill formation, and subsidies for, in particular, the deployment of small windfarms was helpful for the growth of medium sized manufacturers and citizen-owned generation infrastructure (see Germany and Denmark). Later, when the industry and turbines grew in size, support of large-scale deployment helped to interest large utilities in the technology (see the UK and Denmark). However the staged competition for subsidies and, later, strong market competition led to negative outcomes for workers in the sector. Hence, we recommend close monitoring of the working conditions in the industry and stronger involvement of trade unions and community stakeholders in industrial policy making.
- An important diver for domestic wind turbine manufacturing has been significant domestic demand (Bednarz and Broekel 2020). Industrial policy needs to support the early stages as well as the commercialisation of technologies (Mazzucato, 2013). Governments' growing ambitions regarding wind turbine deployment will be good for large manufacturers and large utilities, but ultimately, they may jeopardize broad acceptance, if local citizens and workers in the industry are left out of the process and do not receive any tangible benefits. It may be too late

for the rival of a genuinely domestic wind turbine industry in the UK, but sufficient demand for (onshore) wind turbines, combined with effective local content requirements, worker representation and vocational skill formation, and co- and community ownership schemes may enable a Just Transition with support of the UK wind energy industry.

- Discussion of the role of public actors in the wind energy supply chain should also be on the table. A well-resourced public or part public wind energy manufacturer or operator may be able to use procurement policies to stabilise local supply chains and absorb more risk itself rather than downloading it to SMEs. It might also be able to develop more comprehensive and transferable skills programmes and promote higher levels of social dialogue. However, there is a risk that public actors may act just as any other commercial company. Policy makers need to therefore establish rules for public actors involved in the energy supply chain with the purpose of protecting working conditions and nurturing the domestic supply chain.

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