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Evolving energy landscapes in the South Wales Valleys: Exploring community perception and participation☆

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ABSTRACT

Emerging and future sustainable energy systems will greatly impact upon landscapes and are likely to require wholesale societal transformation. In Wales, recent policy proposals to achieve decarbonisation prescribe greater roles for local and community energy. However, wider citizen engagement and public discourse on comprehensive energy transformations appear somewhat stagnant. The 'Stories of Change' project has sought to catalyse more plural public debates around energy futures. As part of the project, we explored past and present everyday energy relationships with communities in the Valleys of south Wales. At a time of energy transition, and legislative and policy flux, the Valleys afford opportunities to reveal stories about past and present energy experiences and relationships in order to gain enhanced understanding into emerging social meanings of new energy infrastructures and evolving energy landscapes. Here we focus on relationships with 'old' energy landscapes; how these and the prevailing socio-economic landscape influence the perceptions and creation of emerging ones; and, how communities are engaged and involved in the making of new energy landscapes. We consider finally how these might inform implementation of proposed energy policy, especially in a Welsh context.

1. Introduction

Wales was arguably the 'world's first carbon-based economy' with energy-based societal transitions resulting from its early development of iron and coal industries (Wang and Eames, 2010). Having led global carbonisation, unwittingly in the vanguard of a revolution that now presents an existential threat through climate change, the Welsh Government,[1] has sought to lead a low-carbon agenda. It has proposed decarbonisation targets that exceed those set by the UK Government Climate Change Act (2008) (Welsh Assembly Government, 2010). However, there is sometimes a perceived lack of clarity over control of energy powers between the UK and Welsh Governments (Upton, 2014). Importantly, the Welsh administration is dependent upon the UK Government for planning decisions over large-scale energy generation (see Table 1), and constraints in its devolved powers militate against a more comprehensive Welsh-specific energy policy (Strachan et al., 2015).

Nevertheless, the Environment and Sustainability Committee of the National Assembly of Wales[2] has proposed that Wales should establish a clear vision for its energy future, arguing that use of its existing powers and levers can help achieve that (National Assembly for Wales, 2016). Amongst its recommendations is greater support for local and community energy. Moreover, it proposes that reduced carbon emissions and energy demand should be delivered through the Well-being of Future Generations Act (WFGA) (Welsh Government, 2016a). This Act came into force in April 2016 and is viewed as 'one of the most holistic pieces of sustainable legislation to be passed worldwide' (FuturePolicy.org, 2016). It is a keystone of the new legislative landscape in Wales that enshrines sustainable development as a central organising principle. As such, it is intended to work in harness with the Environment Act (2016), aimed at sustainable natural resource management to create a low-carbon economy (Welsh Government, 2016b), and the Planning (Wales) Act 2015 (Welsh Government, 2015).

The WFGA places a duty on public bodies to improve the social, economic, and cultural well-being of current and future generations. It sets out seven well-being goals that must be considered across their

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[1] The devolved Welsh Assembly Government was renamed Welsh Government (Llywodraeth Cymru) under the Wales Act 2014.

[2] The National Assembly for Wales is the democratically elected body that represents the interests of Wales and its people, makes laws for Wales and holds the Welsh Government to account.

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Table 1
Devolved energy powers in Wales.

Offshore	Projects of 350 MW or below in Welsh territorial waters
Onshore – dealt with through local authority planning powers	Generation projects of up to 350 MW Sub-stations and distribution networks up to 132 kV

The table shows which the devolved planning and consenting powers held by the Welsh Government (Wales Act, 2017).

whole decision-making. Three directly reference the low-carbon agenda and climate change:

- *Prosperous Wales* – 'a low-carbon society which recognises the limits of the global environment and uses resources efficiently and proportionately (including acting on climate change)'.
- *Resilient Wales* – 'a nation… with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example, climate change)'.
- *Globally Responsible Wales* – 'a nation which takes account of its actions making a positive contribution to global well-being'.

In addition, through the WFGA, public bodies must adopt five ways of working that necessitate greater public engagement: Long-term Thinking; Prevention; Integration; Collaboration; and, Involvement. The Act also requires Welsh Government ministers to produce a set of measurable national indicators to assess progress towards the well-being goals (Welsh Government, 2016c). Some are directly relevant to future energy directions in Wales:

- increasing renewable energy capacity.
- percentage of dwellings with adequate energy performance.
- reducing emissions of greenhouse gases.

Other indicators too, however, have implications for energy policy. These include the percentages of people who feel able to influence decisions affecting their local area and are satisfied with its liveability.

Arguably, the legislation and proposed policy provide impetus towards the 'soft' energy pathway characterised by Lovins (1977). This is starting to manifest itself in the emergence of decentralised and smart grids for example, mainly involving renewables (Verbong et al., 2013; Juntunen and Hyysalo, 2015). Recently, the Re-energising Wales project (2016) has proposed that Wales can meet projected energy demands wholly from renewables by 2035, through a dispersed model maximising community and locally-based generation.

Importantly, the implications of these and other developments, such as peer-to-peer energy generation, extend beyond simple public acceptance of new technologies. Rather, they demand enhanced public participation (Goulden et al., 2014), and wholesale societal transformation, including changes in cultural norms (Owens and Driffill, 2008). However, in the UK, meaningful public debate on energy appears somewhat stagnant. There is a relative dearth of citizen engagement around comprehensive energy transformations (Demski et al., 2015), and a tendency to neglect the diversity of everyday experiences of energy (Day, 2015). Moreover, there can be exclusion of social dimensions in future energy prospects (Demski et al., 2015), and a danger that policy makers discount public voices deemed not to be appropriately 'neutral' (Mohr et al., 2013).

Consequently, our Stories of Change project has sought to catalyse more imaginative thinking and action on low-carbon futures by unearthing the vitality and variety of relationships between society and energy (Stories of Change, 2015). Importantly, co-production between researchers, arts practitioners and communities is fundamental. Together, we have sought to create space for shared exploration of energy relationships using creative approaches including digital storytelling, oral histories, and performance; these are explored further in a series of related papers, e.g. Tyszczuk and Udall (2015). Crucially, stories are a central motif and organising principle for these approaches. They offer a universal and engaging route to explore energy relationships and imagine possible energy futures. Moreover, they can help to conceptualise new energy systems, helping to create sociality, and lead to wider engagement. They can also facilitate multi-disciplinary co-working (Tyszczuk and Udall, 2015). In addition, stories can communicate different ideas about the consequences of change for everyday life by unearthing and illuminating different perspectives and attitudes towards those (Andrews, 2014). With respect to low-carbon transitions and climate change, stories can facilitate collective wider engagement (Gearty, 2008, 2015; Project Aspect, 2011) and have been suggested as a way to help shape energy policy (Janda and Topouzi, 2015).

Through a specific work package of the Stories of Change project, entitled 'Everyday Lives', we worked with communities in the Valleys of south Wales. One of the UK's former major coalfields, the Valleys have struggled socio-economically since the demise of deep coalmining. Now, some thirty years later, the region is witnessing the emergence of new renewable energy landscapes, especially wind. Accordingly, at a time of energy transition, and policy flux in Wales, the Valleys afford a great opportunity to reveal stories about past and present energy experiences and relationships in communities with the aim of gaining enhanced understanding into emerging social meanings of new energy infrastructures and evolving energy landscapes. Thus, in this paper, we focus on relationships with 'old' energy landscapes; how these and the prevailing socio-economic landscape influence the perceptions and creation of emerging ones; and, how these communities are engaged and involved in the making of new energy landscapes. Taken together, we consider how these might inform implementation of proposed energy policy, especially in a Welsh context.

2. Landscape perspectives in energy transitions

It has been proposed that a landscape-focused perspective can augment not only our understanding of energies, but also energy policies (Nadaï and Van Der Horst, 2010). Dynamic interactions between natural and cultural forces change landscapes, impacting not only the physical environment, but importantly people's perceptions and values affecting the ways in which landscapes are subsequently shaped and used (Antrop, 2005). Energy production is a foremost driver of landscape change (e.g. Selman, 2010; Nadaï and Van Der Horst, 2010; Plieninger and Bieling, 2012) and, with commitments to decarbonisation, will be increasingly so in future. This will necessitate 'unprecedented transformation' of the physical and intangible environment (Stremke, 2012), with new energy sources surfacing 'literally and figuratively' and becoming ever more 'tangible and visible' in the everyday environment (Sijmons and Van Dorst, 2012).

As such, landscape transformation is a common source of contention in energy transitions (Pasqualetti, 2011a). Often, this has resulted in opposition with windfarms, for example, triggering dissent especially over their siting (e.g. Wolsink, 1989, 2000, 2007; Devine-Wright and Howes, 2010). As is well established, objections extend to wind beyond so-called NIMBYism (e.g. Wolsink, 2000; Van der Horst, 2007; Devine-Wright, 2007). Pasqualetti (2011a) has identified common central issues, regardless of location, ranging from immobility and immutability through to solidarity, imposition and place, which are responses to everyday relationships with landscape.

Based on experience of the Danish island of Samsø, Stremke and Van den Dobbelsteen (2012) contend that close collaboration with residents and appropriate community leadership can create new energy landscapes resulting in environmental, societal and economic benefits. As they admit, however, the island's environmental and socio-economic characteristics offer a particular set of circumstances and other landscapes, especially urban, present more difficult challenges.

To produce better understanding of the future, Bridge et al. (2013) indicated the need to pay greater attention to the spaces and places that transition to a low-carbon economy. Recently, based largely on empiric study in a North Sea coastal community in Germany, Süsser et al. (2017) addressed a perceived gap in the understanding of the influence of socio-geographic elements upon localised energy transitions. Crucially, they highlight the importance of individual and collective place meanings as well as the actions of local entrepreneurial individuals and groups as significant factors in their success. Consequently, greater consideration is required of 'the relationship between landscapes and the people who occupy and value them…', with more adept reading of energy landscapes required to gain greater insight into relationships between the past and present and the consequences for the future (Pasqualetti, 2011b, 2012).

This begs the questions whether and how new low-carbon energy landscapes can be created in a collective manner that engenders greater acceptance and even pride. Whilst acknowledging their often 'heretical and contested' nature, Selman (2010) has suggested the conceivability of creating new energy landscapes that tell stories of 'human ingenuity, adaptation and wisdom'. Communities in the Valleys have previously witnessed radically transformed landscapes through changing energy needs and are doing so again. Consequently, they offer fertile territory to explore new or grounded stories to create new ways of relating to or reframing evolving energy landscapes and their intangibles.

3. Case study and methodology

3.1. Study communities

Our case study is the south Wales valleys, a region on a journey from fossil-fuel based industry to renewable energy. The Valleys, an area of around 2000 km^2, lie just north of the coastal plain around the cities of Cardiff, Swansea and Newport in south Wales (Fig. 1).

Protracted industrial demise, particularly since deep coal mining ceased in the 1980s, has left a legacy of socio-economic decline. Of the 620 working deep mines, employing nearly 250,000 men, just over a century ago, none remain today. Consequently, significant areas of the Valleys have struggled with a legacy of ill-health and economic inactivity (Foden et al., 2014), with GDP per head amongst the poorest in western Europe (Eurostat, 2013).

The work in this paper was carried out in two former coalmining communities (Fig. 1). Ynysybwl developed with the opening of Lady Windsor Colliery in 1886. Despite modernisation in the 1960s, mining was already contracting and exerting less influence on local employment (Jones, 2004). In 1988, the colliery closed and today its site remains undeveloped. Treherbert is situated in the upper Rhondda Fawr valley where seven coalmines were in operation in the early twentieth century. Mining ceased with the closure of Fernhill Colliery in 1978.

New energy landscapes are emerging in the Valleys primarily through commercial activity and, on very much smaller scales, community-led projects. Although deep coalmining effectively ceased thirty years ago, some opencast mining activity has continued along the coalfield's northern outcrop. Recently, considerable commercial wind developments have become apparent on the hilltops, especially in the central Valleys. Located close to Treherbert, Pen-y-Cymoedd is the biggest of these, owned and run by Swedish state company Vattenfall on land leased from Natural Resources Wales (NRW), the Welsh Government-sponsored environmental body.

3.2. Methodologies

In keeping with our commitment to co-production, we worked with local communities for several months identifying suitable groups and organisations willing to work with us before engaging in research activities. Through regular visits and meetings, we increasingly developed a joint understanding of the project and its aims and explored how best to work together for mutual benefit.

In Ynysybwl, we undertook oral history interviews with 11 women and 5 men aged between 61 and 81 in mid-2015. Through team deliberations, we decided on open questions and prompts to focus contributions primarily on past and present experiences of energy. These allowed us to surface changes through time in people's personal experiences of energy and the landscape (Andrews et al., 2006; Riley and Harvey, 2007). Participants were recruited through three local organisations; a social welfare organisation for ex-miners and families; a sheltered housing association; and, the local regeneration partnership. All the women were born in the village or neighbouring valleys, other than two who have lived there for at least 35 years, whilst the men were all born in Ynysybwl. Contributions ranged from 31 to 62 minutes.

In Treherbert, we established what we termed a 'Story Studio' in a centrally-situated disused building, formerly a chapel, then library. It was organised by the research team working with a group of local community organisations. Over eleven days in summer 2015, locals were invited to contribute and share stories and experiences on energy and the landscape. It was publicised through social media, postcard flyers and a community magazine delivered to every household, as well as a banner outside the venue. We found that the number of people visiting increased through word of mouth. To engage people around the

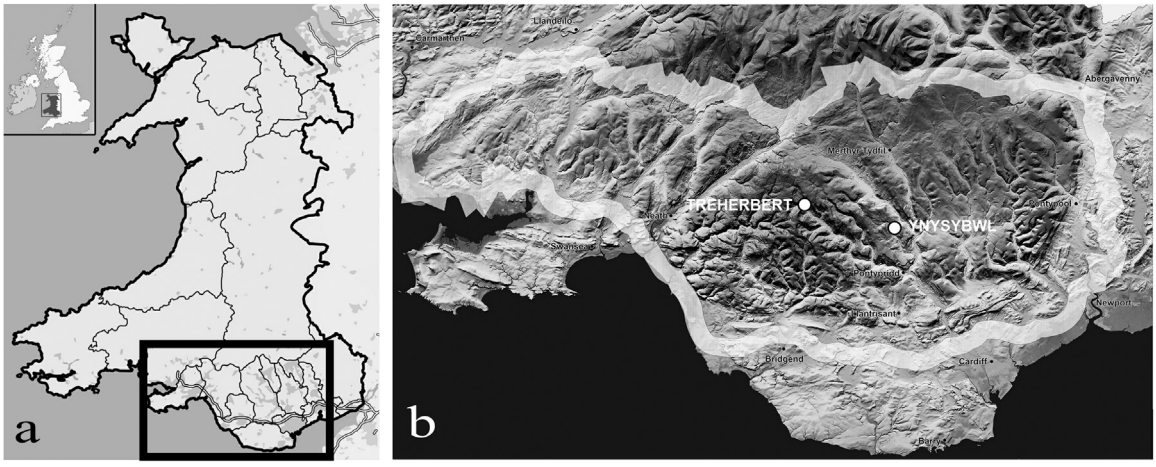

Fig. 1. The South Wales Valleys indicating locations of the study communities. (a) The geographical location of the Valleys (within the lower box) with respect to Wales and the British Isles. (b) A relief map showing the Valleys within the hatched area, generally considered to be the former south Wales coalfield. As shown, Treherbert is located towards the northern end of the Rhondda Fawr valley. Ynysybwl is in the small Clydach valley, just off the Cynon and Taff valleys.

Fig. 2. Exchanging energy stories at the Story Studio, Treherbert (2015). Image – Lisa Heledd Jones, Storyworks UK (July, 2015).

themes of energy and landscape, we created a setting where past and present everyday appliances, local film and photograph archive, and landscape maps were exhibited and used as prompts (Fig. 2). We also used audio excerpts from the Ynysybwl oral histories to stimulate deliberation and discussions amongst visitors.

Access was free and open to all and nearly 500 different people visited. Because the space worked mostly as an exhibition, we did not gather detailed socio-demographic information about visitors. Nevertheless, we observed a majority were aged 50 and above. Without obligation, visitors (except children for consent reasons) were invited to record audio contributions with the research team. These had no set structure other than the opportunity to talk about their experiences with occasional prompts and clarification questions. Forty individual contributions were recorded, varying between 18 minutes and an hour.

In addition to the work at Ynysybwl and Treherbert, we gathered audio contributions from six practitioners involved in developing or supporting energy projects in our communities and the Valleys. These were identified through existing contacts within Community Energy Wales. Contributions were gathered as in Treherbert, focusing on personal reflections rather than technical aspects of energy generation.

3.3. Analysis of qualitative material

Audio contributions from the oral histories, the Story Studio, and community energy practitioners were professionally transcribed. Transcripts were examined in detail first to identify themes around the roles of energy and energy landscapes in community life, landscape impacts, perceptions of benefits or otherwise from emerging energy landscapes, and community involvement. With respect to the oral histories and Treherbert contributions, codes within these themes were identified by different members of the research team and discussed to produce agreement. These were refined to produce categories concerning influences upon community and everyday life, including employment, commerce and leisure, domestic activities, community cohesion (sharing practices), place attachment, and community participation in emerging energy landscapes.

3.4. Study limitations

Clearly particular circumstances prevail in the Valleys and Wales and not all observations or potential lessons are applicable in other places. Yet, with general moves globally towards more disbursed energy systems that necessitate greater public participation and involvement, insights into emerging social meanings of new and evolving energy infrastructures landscapes can and will resonate elsewhere. Regarding the methodology, creative approaches can bring difficulties. Other emerging team papers focus and expound specifically on this but we are conscious, for example, that curating 'stories' might result in subjectivity regarding the way they are listened to and presented, despite the best efforts of objective analysis. To address this, nearly all the material across the project is being made publicly available on a Stories platform.[3] More especially with respect to the oral histories and Story Studio, we are aware of the age demography and suggest that future work might target younger people more specifically. Despite the open invitation at the Story Studio, we cannot discount self-selection bias; as Table 2 shows, contributors had varied backgrounds and experiences.

4. Findings and discussion

We explore first what the biographical stories and experiences reveal about relationships with energy and energy landscapes in everyday life and placemaking in the Valleys in the past. Most of this emanates from the Oral Histories in Ynysybwl although pertinent material from Treherbert is also included. We then proceed to explore community perceptions of new and emerging energy landscapes, focusing mainly on material gathered at the Story Studio, although similarly we have included relevant material from Ynysybwl. We conclude this section by exploring how communities in the Valleys are involved in the collaborative making of energy landscapes.

Appropriately anonymised contextual biographical details of contributors are provided in Table 2.

4.1. Past energy and energy landscapes in community life in the valleys

Mitchell (2010) has argued that fossil fuel, coal originally, 'allowed the reorganization of energy systems that made possible… novel forms of collective life'. This was exemplified within the Valleys where communities utilised coal, but importantly also produced it. As demonstrated by this Ynysybwl resident, coalmining intimately shaped everyday existence and community life.

> *"Everything revolved around the pit… it provided employment and not only for the people in the pit - the add-ons and goodness knows what… it was very important… (in) all the villages in South Wales.* (Y1).

Much of the employment in Valleys' towns and villages was in the pits. Within the mines, working conditions were fraught with danger. One contributor at Ynysybwl recalled the awful experience of visiting Clydach Vale with her father in 1965, immediately after the Cambrian Colliery explosion – the last major mining disaster in Wales – and seeing the bodies laid out in sacks at the Assembly Hall. This everyday mortal danger forged tight bonds and solidarity amongst pit workers, illustrated by this former Treherbert miner.

> *"You would help people, they'd help you, and you were one for all like… camaraderie it really was… everybody who went down the pit took their life in their hands, you know. So, you cared about people…"* (T1).

The influence of mining extended beyond employment to social organisation and participation, often through the efforts of workers. This further imbued a strong sense of community.

> *"The colliery gave men work… and they contributed in more ways*

[3] www.storiesofchange.ac.uk This now hosts an online platform where nearly all material across the project, subject to licensing agreements and anonymity requests for example, is held. As such it is available for academics and members of public to access and utilise the material.

Table 2
Outline biographical details of audio contributors.

Ref	Community	Gender	Age (if known)	Born in area	Notes
Y1	Ynysybwl	Male	67	Y	Retired Former Teacher
Y2	Ynysybwl	Female	62	Y	Retired
Y3	Ynysybwl	Male	63	Y	Retired Former Teacher
Y4	Ynysybwl	Female	68	Y	Widowed – community volunteer
Y5	Ynysybwl	Female	72	Y	Widow of Ex-Miner – community volunteer
Y6	Ynysybwl	Male	61	Y	Community Councillor
Y7	Ynysybwl	Female	65	Y	Wife of Ex-Miner
Y8	Ynysybwl	Female	65	N	community volunteer; Long-time resident
T1	Treherbert	Male	82	Y	Retired Ex-Miner
T2	Treherbert	Female	57	Y	Community Worker
T3	Treherbert	Male	46	Y	Employed
T4	Treherbert	Female	60s	Y	Retired
T5	Treherbert	Male	30s	N	Writer; recently moved into the area
T6	Treherbert	Male	40s	Y	Employed – brother of Ex-Miner
T7	Treherbert	Female	71	Y	Retired; Wife of Ex-Miner
T8	Treherbert	Female	30s	N	Community Worker in the area
T9	Treherbert	Female	30s	N	Community Worker in the area
T10	Treherbert	Male	59	N	Community Volunteer
T11	Treherbert	Male	55	N*	Long-time resident – * born in Cardiff
T12	Treherbert	Female	70s	Y	Retired, now living away – former community volunteer

This table details listed some biographical details of those quoted in the paper to provide additional context where required.

than one to the community… (such as a) Nursing Fund. People like my grandmother, who couldn't afford the bus fare to go to hospital for an appointment or to visit someone, could take the bus there and get the money back from the Fund. That was very important." (Y2).

Such collectivist action by working-class communities was not exclusive to mining areas, e.g. Bloor (2002). Yet, using Ynysybwl as its case study, Gilbert (1991) argued that institutional structures and the ensuing sense of collective identity in mining communities in south Wales emanated from social struggle rather than the cooperative municipalism witnessed in other UK mining areas. This viewpoint is too simplistic (Jones, 2004). For example, the Health and Education Fund in Tredegar in the Valleys, a forerunner of the Tredegar Medical Aid Society that provided a model for the National Health Service (Featherstone et al., 2012), was established by workers and managers. Nevertheless, the stories emphasise the fundamental role of community-led action and organisation in the Valleys. This was also seen in areas like education and entertainment, again strengthening community bonds and cohesion.

"The greatest attribute was the workmen's hall, the centre of the village. The cinema was also used for theatre… it had a billiard hall, the library, a reading room…" (Y3).

The tangibility of energy relationships was experienced in the mines, but importantly too in domestic life where coal dominated for heating and cooking, especially prior to the introduction of gas and electricity.

"You had a coal fire (with) two ovens on the side. My mother used to dry the sticks in one of them… then we had one where you'd keep things warm like your meals." (T2).

There was a close connection between coal production and usage in Valleys' communities. Living with coal instilled physical domestic ritual and, importantly, imposed wider social obligations, illustrated for example by coal deliveries, where whole families would be involved in storing the coal and then, as several contributors attested, removing and cleaning any ensuing mess from the streets.

"Coal deliveries… used to be delivered onto the side of the road and you'd see dads coming out, you'd see grandmas coming out, and mams and us kids, filling the buckets. We had little buckets and that was our contribution, taking the coal in…" (Y4).

Coal also provided agency for people to share fuel resources and address issues of hardship; when households ran out, others would provide, sometimes furtively to ensure that rules governing the use of concessionary coal for miners' families were not breached.

"I've seen us borrowing coal because we've run out of it, but we always gave it back" (Y5).

"Nobody would go without coal, nobody would go without heat in the house, there was no worry about bills for heat because everybody was looked after and it was special…" (Y6).

Whilst such recollections can overlook the real hardships endured in pit villages, they nevertheless highlight the fundamental role of energy in place attachment. The stories also emphasise the people's physical and sensory relationships with coal and energy in everyday personal and community life. Mining generated everyday smells, sights and sounds that were often unfamiliar to visitors but largely accepted as part and parcel of communal life in the mining villages, as shown by these contrasting views.

"we used to travel up the valley… (at) the beginning of Treherbert, you'd hear the noises of the wagons clanking together, the smell, the lights… and you'd think, oh my god, why does anybody want to live up here, 'cause it's noisy… it must have been a 24 hour experience for the people… (T3).

"The sounds when the coal went to the washeries… it would be an enormous conveyor belt and the coal would drop out… and you'd hear the (pit) hooter of course. We just became less aware of them because they were part of our life all the time." (Y3).

The physical impacts of coal extraction upon the immediate environment was enormously damaging: 'coal-tips spread about the floors of the valleys and on nearby hillsides… (and) once fair valleys, with woodlands, pure streams and pastoral scenery widely despoiled' (Lloyd and Jackson, 1949) (Fig. 3). Pasqualetti (2012) described such 'energy landscapes (with) scars, pits, shafts, piles of debris, and dismal assemblages of squalid housing', as 'sordid, unsafe, and pathetic', which were endured as part of economic progress. Interestingly, none of the contributors described their own living conditions or communities in such pejorative terms, although they freely admitted the destructive impacts of mining on the Valleys' landscapes. The proximity of unspoilt countryside in the Valleys provided amenity; however, the coal spoil tips too, along with buildings and paraphernalia associated with the collieries, provided settings for the everyday play

Fig. 3. Past Energy Landscapes – The Upper Rhondda Fawr valley looking south towards Treherbert showing working collieries and coal spoil tips (1965). Image produced courtesy of Rhondda Cynon Taf Archives.

of children and young people.

> *"... after you'd been up in the slurry bays, you'd have to go into the river... to try and wash off this mess, otherwise your mother'd find out that you'd been up there and you'd be in serious trouble! It was really, really dirty."* (Y2).

The devastating and dangerous environmental impacts of mining were brought home tragically at Aberfan in 1966, when a hillside waste tip slipped and engulfed part of the village below including a school; 144 people were killed, 116 of them schoolchildren (Miller, 1974). The tragedy was a catalyst for significant reclamation and remediation measures to remove the landscape scars in the Valleys, especially tips. The resulting physical transformation has been overwhelmingly welcomed.

> *"The colliery has gone, (it's) back from being dark grey slag to countryside... it's a beautiful walk now. If a miner went from this village say back in the early nineties came back and wanted to walk over the colliery, he wouldn't recognise it because it is now countryside..."* (Y7).

In contrast to the re-greened landscapes of the Valleys, the demise of mining, the economic mainstay for most communities, has greatly exacerbated the area's socio-economic ills. Some contributors admitted their views were tinged with romanticism, often ignoring past hardships. But many bemoaned the loss of amenities and especially a diminished sense of community, sometimes with a sense of resignation.

> *"There'd be loads of shops in Ynysybwl... but there's nothing here now, all you've got is the Co-op or what they call the Pound Shop... but there's nothing here, nothing at all... What can you do? Everything's going."* (Y8).

> *"It is a nicer place to live, prettier, but without that community spirit. There's a price to pay, I think."* (T2).

Undoubtedly other social factors are at play in these aspects. Nevertheless, as the stories attest, mining was at the heart of the working, domestic and community lives in the Valleys. The physical upshot was highly-violated despoiled landscapes, whilst most of the wealth produced was retained by the land and mine owners. But, through tangible connections to energy, these landscapes provided employment, shaped everyday life, and forged strong community spirit and keen senses of identity and place attachment within the Valleys.

4.2. Community perceptions of emerging energy landscapes

The Valleys have begun to witness the emergence of new energy landscapes in the last decade, particularly in the central areas, with a recent proliferation of commercial windfarms on the hilltops. In our study locations, as elsewhere in the Valleys, community organisations too have been seeking to establish their own smaller-scale energy generation projects in recent years.

Unsurprisingly, with respect to the landscape, large-scale windfarms were a focus for many at the Story Studio in view of the nearby Pen-y-Cymoedd development. Corroborating the findings of Wolsink (2007), for example, that opposition to specific windfarms should not be confused with broader supportive attitudes, there appeared to be strong support for renewable energy itself. Nevertheless, contributors expressed a variety of opinions on the local wind developments. These ranged from favourable through to indifference, resigned acceptance, and some vehement hostility. Views of those in favour were sometimes due to aesthetic considerations.

> *"I actually quite like windfarms. I think they're quite attractive. I don't think they're unlike (how) windmills looked to the generation back then. They probably thought they were a monstrosity when they first went up, but I'm quite happy to have windfarms all around everywhere."* (T4).

For a small minority, the technological aspects proved appealing, e.g. this resident, a science fiction writer, recently moved from London.

> *"I walked up the mountains... and the first time I saw one of these wind turbines, it was really awesome... like something out of a science fiction film. I saw it and thought, yes... It's unbelievable peaceful. All you can hear is this whoo-whoo-whoo of the turbine. It made me think this is the future."* (T5).

The Valleys' topography means that windfarms are mostly perched on the hilltops above the communities (Fig. 4), which can influence people's perceptions.

> *"Some people see it as a bit of an eyesore. If they're out of the way... where people can't see them, I don't think it would be such a fuss. But when it encroaches on the side of the valleys, and over us in plain view of sight, perhaps people don't like that. But I'm all for green energy. It's got to be the future, hasn't it? Perhaps it's a small price to pay."* (T6).

Factors influencing public attitudes towards windfarms have been extensively researched (Wolsink, 2000, 2007; Devine-Wright and Howes, 2010; Devine-Wright, 2013). Unsurprisingly, in our study, arguments such as inefficiency and environmental damage were similarly repeated by some of those opposed. Perceptions of equity

Fig. 4. New Energy Landscapes – Wind turbines on the hilltops between the Rhondda Fach and Rhondda Fawr valleys (2015). Image - David Llewellyn.

and justice are also important, as are place identity and attachment in understanding opposition to windfarms (e.g. Wolsink, 2007; Devine-Wright, 2007, 2013). Pasqualetti (2011a) identified common central issues, regardless of location, ranging from immobility and immutability through to solidarity, imposition and place, which are responses to everyday relationships with landscape. Some contributors indicated that the remarkable landscape transformations in the Valleys affected their opinions.

> *"... the South Wales coalfield (was) filthy dirty... the coal is finished and we are enjoying these beautiful surroundings and now they're putting windmills up. OK, we might have to have them, but when I'm looking at beautiful scenery, you think; 'Oh, not another concrete windmill spinning round,' - it does jar on the landscape."* (Y1).

In some cases, opposition was expressed in more heated terms, articulated through feelings of re-exploitation through energy production.

> *"I would love to see our valley resort to its beauty before we had coal; I would love to see the wind farms taken (away)... I really feel we've been raped a second time."* (T7).

Importantly, analysis of the material suggested some feelings of imposition should be considered within the prevailing socio-economic context. Here, the views of two contributors, both locally-based community regeneration workers, are perhaps instructive.

> *"I think a lot of people here are against the windfarms because... they feel like they're here on their mountains, because no one cares about them, because the deprived communities in the Valleys aren't important, so they feel like the wind turbines are being put on them...* (T8).
>
> *"Most of the policies they don't view are for them, and it's a them and us... you have to understand that mentality to understand why they feel so disempowered and so disenfranchised by everything that's going on around energy."* (T9).

In this view, rather than specific opposition to the windfarms and landscape changes themselves, for some, these effectively materialise perceived indifference and failures in both policy and practice ('them') to heed and address continued deprivation in communities ('us') across the Valleys, leading to feelings of neglect and disempowerment.

Like many other commercial schemes, Pen-y-Cymoedd has established a benefits fund, administered in its case by a specially-formed Community Interest Company. This will provide around £45 million funding over its 25-year lifetime to be distributed amongst communities in adjacent valleys. Bristow et al. (2012) showed such funds can sometimes be divisive with conflicts, for example, over governance and definitions of recipient communities. The funding is undoubtedly welcomed by some in Treherbert; yet, many acknowledge that substantial benefits will accrue.

> *"We're not at this stage at all clear what benefits there will be locally... (but) because they're going directly into the grid, and they are a private company, nobody round here is going to get a rebate on their electricity bills. It's as simple as that... it's going to be amazing to see how it directly benefits this area. One of the good things about turbines is they don't require a huge amount of maintenance... but they also don't create a great deal of employment..."* (T10).

At a community-led energy debate at the Story Studio, some expressed a desire for greater control and ownership in the Pen-y-Cymoedd windfarm.

> *"Vattenfall really should allow some sort of community ownership on these turbines. So, when they've done their 25 years, we can reinvest now as a community, take on the ownership and reduce our bills in our area. And there's no reason why we couldn't do that..."* (T11).

Local attitudes towards windfarms can be more favourable where there is community ownership (Warren and McFadyen, 2010). In Fintry, Scotland, a local development trust has taken ownership of a turbine in a deal with a commercial windfarm (Collins, 2011). Clearly, financial and logistical constraints militate against communities developing projects of the size and scale, such as Pen-y-Cymoedd, needed to address decarbonisation targets. Nevertheless, a Joseph Rowntree Fund (JRF) report urged that large energy infrastructure projects situated in or close to deprived communities should deliver benefits more fundamentally to engender greater resilience (Cowell et al., 2012). Amongst the suggestions were targeted financial support for locally-owned renewable energy projects. Such an approach would be welcomed by this Treherbert resident who was active previously in trying to develop community-led tourism and energy projects.

> *"So possibly when the turbines start appearing all around, (the community are) going to realise that visually, they are not very nice. But we can't do anything about it... make the most of the money that's going to come, not fritter it away on little projects. It's got to go to create benefit which is ongoing, things which are sustainable."* (T12).

In a recent case study in Reußenköge in Germany, Süsser et al. (2017) highlighted the importance of place and landscape attachment and, crucially, the actions of locally-embedded entrepreneurial activity as key factors in the acceptance and success of renewable energy initiatives.

4.3. Community participation in emerging energy landscapes

Community energy comprises a variety of schemes and activities (Walker and Devine-Wright, 2008). Seyfang et al.(2013) defined it broadly as projects in which communities have a high degree of ownership and control, benefitting collectively from the outcomes.

In our study communities, there have been attempts to develop community-led projects. In Treherbert, a 46-ha expanse of land reclaimed after the closure of Fernhill Colliery in 1978 has remained undeveloped despite several proposed schemes. These included community-led proposals for developing a country park, supported by revenues through hydro-electric generation. It was suggested by some that failures in progressing such community-led projects have contributed to and exacerbated the local feelings of apathy, disaffection and disempowerment. Nevertheless, since 2010, a community consortium in Treherbert has been seeking to stimulate sustainable economic activity based on local environmental assets. Central to their plans are renewable energy production schemes. However, an agreement with NRW to harvest local wood for use in locally-constructed stoves failed to materialise. In addition, national issues over abstraction licences delayed the first micro-hydro scheme, whilst failure to obtain access permissions and arrangements meant the deadline for feed-in tariff pre-accreditation was missed. Consequently, opportunities to generate the predicted revenue have been lost.

Potential community energy schemes have also failed in Ynysybwl. These include proposals micro-hydro on local streams and solar on the former colliery site which, like the Fernhill site near Treherbert, has remained undeveloped since its closure. This has produced frustration and a sense of injustice expressed by this local resident, a member of the community regeneration partnership.

> *"... the community that killed itself extracting coal has ended up with no legacy really except this derelict site and it drives me crackers! They're (the community) paying through the nose for electricity and I keep thinking this is immoral. There must be community gain to come out of whatever we do here about the next phase of energy. But I'll tell you what - trying to actually develop*

these things is a complete nightmare. It's like the world conspires not to let you do it somehow!" (Y8).

We conducted a desktop survey to explore whether this reflected a broader picture concerning community energy in the Valleys and in Wales. This showed that few of the community-led projects, proposed since 2001, had been installed by the end of 2016, corroborating the findings of others (Brook Lyndhurst, 2015).

Recognition of a lack of capacity in communities led to the development of a highly-knowledgeable, yet small, practitioner group providing support through Community Energy Wales (2016) and Renew Wales (2016). We elicited personal experiences from some key individuals involved to gain insights into issues impacting community-led generation projects. Perhaps the most forthright comments came from one of Wales' most-experienced community energy experts, who has advised at Treherbert.

"If you compare us with Scotland then (community energy) has been a disastrous failure… community and locally-owned energy generation in the UK is a tiny fraction. In Wales, it's almost non-existent".

Despite Welsh Government-supported initiatives such as Local Energy Wales (Welsh Government, 2016d), and its predecessor *Ynni'r Fro*, there were some feelings that ambivalence in political leadership impacted on local decision-making, often unduly affecting community projects. Moreover, there was concern that policy does not translate well into practice.

"At a national (Welsh) level there's a willingness or a desire to try and enable these things to happen… I don't think it translates well into policy and I think that policy is very poorly translated onto the ground. So, it's variable across officers, the way policy's interpreted. Inconsistencies make it very, very difficult for communities, any developer really, but particularly communities who maybe don't have the time or the skills or the support that commercial developers have."

With little or no flexibility exercised in the planning process, especially in considering wider community benefits, this can lead to perceptions that local authorities and other public bodies hinder community-led schemes. One long-standing community energy exponent considered the public sector in Wales to take *"its statutory duties more seriously than its community responsibilities."*

Notwithstanding these issues, a feeling nevertheless exists in the community energy sector that much has been achieved, especially through the determination of individuals and groups via the support initiatives they have established.

"When we started there was nothing and now there's a lot more support through Welsh Government programmes… that's led to the current number of projects being built which is really important for changing hearts and minds."

There was acknowledgement amongst the community energy fraternity that community-led projects lack the scale needed to significantly contribute to renewable capacity in Wales. As Strachan et al. (2015) indicate, community-developed or owned schemes in the UK have 'limited scope to replicate or upscale in a wider policy environment' to help meet carbon commitment targets. Nevertheless, community energy projects are considered important in helping to change attitudes towards renewable energy. As well as a sense of ownership and tangible benefits through local income generation, they can provide opportunities for training and employment, generating greater local value than wholly privately-owned schemes (Department of Energy and Climate Change, 2014).

For many in the Welsh community energy sector, there is also a strong sense of a wider commitment towards social justice and sustainability, as articulated by this practitioner.

"I don't think they just care about community energy… I think what they're really looking for is to drive complete social change."

In examining ownership and organisational characteristics, and the motivations of individuals and groups involved, Becker and Kunze (2014) coined the term 'collective and politically motivated projects'. They argue that across Europe the objectives of increasing numbers of community energy projects extend beyond a desire for energy change per se. In our study communities, a key driver behind community energy projects is indeed wider social economic and environmental transformation. Both the community micro-hydro schemes in the Valleys successfully established to date, situated on former colliery sites, are using production revenues to sustain their activities and provide community benefits. Some Valleys community energy projects have a more overt aim to address energy transition and climate change (Egni, 2016). However, they too also seek economic benefits through local democratic control and participation, e.g. a community workspace to provide learning opportunities and work experience in a deprived area.

Consequently, a challenge for policymakers and practitioners is how best to facilitate and support future energy projects to attain the benefits, financial and other, desired by communities. Building on earlier perspectives by Verbong and Loorbach (2012), Strachan et al. (2015) emphasised the need to view community renewable schemes with respect to their potential to contribute to new energy pathways. They produced an analysis of such opportunities, including hybrid initiatives with commercial owners. However, as they admit, these can lock in the community components as adjuncts, thus ceding control to commercial operators. Another route favoured by some community energy proponents in Wales is local supply development through municipal energy schemes, with community involvement a key component.

"(I) call them socially or municipally owned partnerships between local communities, local authorities, state land owners, maybe some private land owners. There's a lot of land in public ownership in Wales… which could and should have been developed. And they need to be developed in a municipal model, and energy bending model, but in a way which works with communities…"

5. Conclusions and policy implications

The work reported here is not intended to be an in-depth study of community attitudes to wind power, nor detailed analysis of the complex nature of community energy. Both subjects have been thoroughly explored by others. Rather, it reflects what emerged through working with communities through a qualitative, empirical, place-based study. This emphasises the importance of landscapes as places and perspectives through which to gain insights into individual and community relationships with energy. This is important since foreseeable energy transformations are likely to continue to be manifest most visibly through landscape change, and remain a key focus for social contestation.

In summarising, this quote from a community energy practitioner is perhaps instructive.

"We're changing a landscape and the people who live there don't either economically benefit from it, or they do in only the most minor way. Yet it dominates and defines where they live. I think that's a terrible repeat of history."

A community-focused lens viewing past energy developments in the Valleys shows that mining, despite inherent dangers and deleterious landscape impacts, generated benefits through employment, fuel provision, and a pervading influence on communal life. Yet, certainly prior to nationalisation of the UK coal industry in 1947, most of the

financial wealth generated was concentrated in the hands of the mine and land owners, often located outside the area.

Echoing the call of Pasqualetti (2011a), Nadaï and Van Der Horst (2010) and others, Selman (2010) proposed that 'loving' new energy landscapes might be plausible where they demonstrate 'placeness' and where stories can be read of 'endeavour, solidarity, enterprise, community and purpose'. Despite their unsustainable and dangerous nature and the subsequent legacy of socio-economic decline, the stories show that past energy landscapes in the Valleys conveyed a narrative that cohered and encapsulated many of those qualities. In contrast, emerging commercial energy landscapes to date largely fail to imbue such traits and no such narrative. Despite general acceptance and support for renewable energy, community perceptions are that few, if any, real benefits accrue in terms of local employment, financial gain, or energy supply. Moreover, as in the past, accumulated wealth largely flows elsewhere. As such, the historic lens and prevailing continued socio-economic deprivation can create a significant compelling narrative for some that these are landscapes of imposition and exploitation rather than landscapes of inclusion and sustainability.

So how might this be addressed? Cowell et al. (2012) suggested that community benefits from commercial wind projects could better support resilience in deprived communities such as through support for local energy developments to address wider sustainability issues. It appears unclear so far whether, for example, the Pen-y-Cymoedd community benefit fund will be used in this manner. Community-led energy generation projects would contribute relatively little to the scale required to meet proposed renewable energy outputs and decarbonisation targets.

Nevertheless, importantly, they generate vital community benefits and can influence wider acceptance of renewable energy technologies. Süsser et al. (2017) recently emphasised the importance of both understanding place and the role of local innovators in developing such projects; energy transitions being 'implemented by, in and for local places and communities'. Our study corroborates this, with local people who understand their communities, key to mobilising and leading these and wider sustainability initiatives. However, in a Welsh context, despite dedicated support from Welsh Government-sponsored initiatives, there are continued difficulties in getting such projects implemented. More effective collaborative relationships between commercial and community projects, not simply based on financial benefits but practical and logistical support, might not only smooth the way for community energy projects, but also help change perceptions of imposition.

Resilience benefits might also be achieved through other ways. We recently proposed the emergence of new landscape identities in the Valleys with attendant opportunities for socio-economic renewal, including sustainable tourism (Llewellyn et al., 2017). With outdoor-based tourism still nascent in the Valleys, some expressed concern that large-scale wind developments might deter visitors. Evidence from a recent Scottish-based study failed to indicate any negative impacts of windfarms on the visitor economy (Biggar Economics, 2016), suggesting such concern might be misplaced. Nevertheless, windfarms in Scotland and elsewhere, are seeking to support tourism. For example, at Whitelee windfarm, significant cycling trails have been created around it. Similar developments at future large-scale windfarms in Valleys might diffuse fears over perceived threats and support developing tourism.

We turn now to the methodological and theoretical aspects of our study. We used what some might consider as experimental, creative practices for community engagement through co-production. An aim was not purely to produce outputs, but also that the activities themselves should engage and connect communities in relevant issues (Durose et al., 2011). The use of stories is a central motif, perhaps seen most clearly here through the co-produced Story Studio. Importantly, the use of storying devices can create 'safe' and often enjoyable settings for engagement and exploration in communities that often feel excluded. Feedback from community partners indicates these were an important catalyst in exploring energy relationships and future opportunities more widely within the communities. Indeed, both communities have since obtained significant funding to progress landscape-focused projects in which their energy generation opportunities are key elements. We do not suggest that the stories work drove this, but rather it helped facilitate wider engagement in imagining change and engendering greater confidence.

As Demski et al. (2015) indicate, enhanced understanding of public perspectives to account for and include social dimensions in energy policy decision is vital. Story-based approaches can offer a way forward in stimulating and opening up more plural debates and discourses about energy transformations to address this. Janda and Topouzi (2015) that energy policy currently emphasises the physical and technical aspects over the social aspects. They suggest that 'learning stories' which take greater account of the greater complexity of social dimensions and potential of energy transitions can provide opportunities to influence and remake better energy policy. Working with communities to listen to and tell stories can play a powerful role in 'visualising' energy, which often can be a difficult topic around which to engage due to its 'invisibility' (Hargreaves et al., 2010). As our study indicates, it can involve considerable investment of time and effort and amongst the challenges for policy makers will be how best to utilise and take advantage of such approaches.

5.1. Policy implications

Within Wales specifically, proposed energy policy and directions advocate increasing roles for local supply and community energy. As suggested by some, this might be done through a municipal framework requiring the collaboration of local communities and Local Authorities and bodies such as NRW. This fits with the vision and recommendations set out by the National Assembly's Environment and Sustainability Committee and adheres to the goals and principles of the WFGA. Importantly, two of the Act's well-being indicators seek to increase renewable capacity and reduce emissions of greenhouse gases. Yet, as we have seen, the required landscape changes might impact adversely on two other WFGA well-being indicators, namely the percentages of people who feel able to influence decisions affecting their local area and are satisfied with it as a place to live. It is unclear yet what influence, if any, the Act, together with the associated Planning and Environment acts, might have in energy planning decisions, particularly in taking community benefits more into account.

Whatever, perceived issues and barriers thus far suggest a change in the dynamics and relationships between community organisations and public bodies in Wales is required. Here, the five ways of working prescribed for public bodies in the WFGA, necessitating greater community involvement, will be vital.

As shown, a major challenge is to ensure that communities feel fully engaged and involved in the creation of new energy landscapes. Our findings emphasise the need for politicians and practitioners involved in energy innovations to obtain greater understandings of communities, place and local socio-economic circumstances. This is vital, not just in Wales, but importantly more widely, e.g. as Süsser et al. (2017) have shown in Germany. In this respect, story-based approaches can offer a key role in unearthing these and engendering more plural and inclusive debates about energy transformations.

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