

RESPONSE TO CALL FOR EVIDENCE

Just Transition to Net Zero Wales

Evidence to inform the development of Wales' decarbonisation pathway to Net Zero and Just Transition Framework.

March 2023



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About Regen

Regen is an independent centre of energy expertise with a mission to accelerate the transition to a zero-carbon energy system. We have nearly 20 years' experience in transforming the energy system for net zero and delivering expert advice and market insight on the systemic challenges of decarbonising power, heat, and transport.

Regen is also a membership organisation, managing the Regen membership network and the Electricity Storage Network (ESN) – the voice of the UK storage industry. We have over 150 members who share our mission, including clean energy developers, businesses, local authorities, community energy groups, academic institutions, and research organisations across the energy sector.



Section 1

Introduction

This report is Regen’s response to the Welsh Government’s Call for Evidence on a Just Transition to Net Zero.

A just transition is crucial to achieving a net zero energy system that benefits everyone, avoids widening inequalities, and unlocks the considerable social, economic and environmental opportunities on offer. The recent energy crisis caused by rising gas prices has highlighted the importance of a more resilient, clean, and secure energy system reflective of the needs of people and places first and foremost.

Those who are already socially and economically disadvantaged are most at risk of being left behind in the transition to a cleaner energy system. Without dedicated support and attention, these groups may not benefit from the changes in their homes, communities, and lives that a net zero transition entails. However, they are also the people who often stand to gain the most from these changes, through new jobs and skills, more affordable energy, healthier homes, new technologies and potential sources of income and savings. To achieve a just transition, it is essential to prioritise fairness in the energy system and engage with a diverse range of communities.

Regen is placing a just transition at the forefront of its thinking, ensuring that those on the margins of society are not left behind or penalised. We are developing dedicated projects and thought leadership to bring critical evidence and analysis to this conversation and build a fair, clean energy system. See our latest blog on why a just transition is crucial to net zero [here](#).



We strongly welcome the Welsh Government’s drive to deliver a just transition, and the opportunity to contribute.

From Regen’s previous engagements in Wales, we know that there is a good and strong intention to deliver a fair and inclusive energy transition, with legislation such as the Wellbeing of Future Generations Act setting the standard for more holistic, social and environmental policymaking.

We are happy to work further and more closely on this, as we are currently with the Scottish Government, to support the shaping and evidence required to make these ambitions a reality.



Figure 1: Wellbeing of future generations act goals

Recommendations

Questions 2, 4, 5, 7, 8, 12 and 13 from the Call for Evidence are answered, in order, throughout this document. We have opted to respond to these questions specifically as they cover areas we are currently working in, have experience with, or have robust, clear evidence for.

We offer our insight as the reform process continues following this consultation.

A summary of our recommendations is as follows:

Governance

- ▶ Procedural justice questions should be embedded at the beginning of all decision-making processes and formalised in procurement, funding and development rules.
- ▶ Decision-making should take a ‘citizen first’ approach to designing policies and solutions, particularly in encouraging new behaviours, adopting new solutions, or tackling experiential issues such as fuel poverty.
- ▶ Engagement in decision-making should be proactive, open and inclusive of excluded and marginalised groups.
- ▶ The role of trusted intermediary organisations in advocating within just processes and for just outcomes should be reflected in policymaking and resource.
- ▶ Principles for a just transition should be co-designed with citizens, communities and stakeholders through a deliberative process, with such processes also leveraged on specific issues where appropriate.



Impacts and opportunities

- ▶ Prioritise the upscaling of training programmes to create a workforce with the skills to participate in future energy efficiency and heat decarbonisation industries. Work with industry and education providers to achieve this.
- ▶ Put high carbon industry workers at the centre of just transition planning, by engaging them in the development of the Welsh Just Transition framework.
- ▶ Retain a focus on the principles of a just transition throughout the target setting, planning and development processes to ensure that achieving any future renewable capacity targets delivers as much social and economic value to people and places as possible in a fair and just way.
- ▶ Continue to prioritise local and community benefits in the development of renewable generation projects, focusing on revising rules to mandate just processes and outcomes.
- ▶ Provide local authorities with sufficient funding to ensure that they have the resource and knowledge to develop and deliver a local energy plan that suits their own energy needs, in collaboration with local people, stakeholders, supply chains and industry.
- ▶ Build on the Welsh Government Energy service to provide seed funding, training and access to investment capital to community energy organisations, providing them with support to professionalise and deliver consistently across regions and places.
- ▶ Ensure the next iteration of the energy targets, currently being consulted on, retain commitments to local and community energy, with a steer to incentivise just processes and outcomes.
- ▶ Support DESNZ to oversee the creation and adoption of several standard, industry-wide, non-negotiable PPAs, such as a sleeved PPA or a virtual PPA, to support the widespread adoption of such mechanisms.
- ▶ Explore alternative ways to support small organisations to procure PPAs, such as through the underwriting of contracts.

Support for a Just Transition

- ▶ Extend the Warm Homes programme and work with local social infrastructure to ‘prescribe’ retrofit using updated eligibility criteria.
- ▶ Support the growth of retrofit assessor, advice and advocacy jobs via long-term policy support.



Section 2

Governance

Q2: Decision-making processes and principles

What examples do you have of decision-making processes or guiding principles that could be used across public, private and third sectors to plan for and ensure a just transition?

Securing a just transition requires prioritising not only just outcomes, but also just processes in decision-making and delivery¹. This includes who has a say in the design of new policies and projects, who sets the terms of engagement, and how accountable those processes are. This is often referred to in research as ‘procedural justice’ – justice in the process of engaging, designing policies and making decisions. This is not just about the ‘who’, but the ‘how’ as well.

How ‘just’ a decision-making process is will invariably impact how just the outcomes of that policy or decision will be. Decisions taken about addressing fuel poverty in the private-rented sector that engage landlords but not tenants, for instance, are likely to overlook critical experiences of tenants of how they use energy in the home and what the impacts have been on bills, and may put the burden on the tenants (i.e. those experiencing the fuel poverty) for the costs of energy efficiency or other building upgrades. Likewise, a policy providing funding to support the uptake of new technologies such as heat pumps without meaningful engagement may exclude people unfamiliar with that technology, or people for whom heat pumps are not a viable solution. This is crucial as we ask people to, for example, change behaviours or use a new technology or service.

There is a need to embed justice, inclusion and fairness principles in decision-making processes at all levels, including devolved and central UK governments, but also across local authorities and in the private, third and community sectors. While no standard template exists, there have been efforts to develop key fundamental principles across energy and policy sectors. Bray and Ford (2021)² outline key questions for policymakers in designing new energy policies with fairness in mind, as detailed in Box 1.

¹ Soutar, I., Devine-Wright, P., Rohse, M., Walker, C., Gooding, L., Devine-Wright, H. and Kay, I., 2022
<https://doi.org/10.1016/j.enpol.2022.113279>

² Bray, R. and Ford, R., 2021:
https://strathprints.strath.ac.uk/76421/7/Bray_Ford_CEP_2021_Energy_justice_points_policies_to_create_a_more_sustainable_and_fairer_future.pdf



From the POINTs framework developed by Bray and Ford (2021): Questions to ask when considering more just decision-making processes include:

- What channels have been employed to provide stakeholders with input to decision-making processes? Are these channels appropriate for all stakeholders?
- Have a range of channels been implemented to increase participation? For instance, online consultations may be inappropriate for older people while ‘roundtables’ may be inaccessible to those who work during the day or have caring responsibilities.
- Which stakeholders have been actively engaged? Are there biases toward particular groups due to the engagement channels used?
- Are there any groups who have been systematically (even if unintentionally) shut out due to the processes implemented?
- How has stakeholder input been accounted for in the decision-making processes and resultant policies? Are some voices given priority for deliberate or unintentional reasons? Is this bias (if deliberate) transparent? If unintentional, what action can be taken to remove the bias?

Box 1: Key questions for policymakers in designing new energy policies with fairness in mind. Bray and Ford, 2021.

Answering these questions can help lay the groundwork for more just decision-making processes. More effective engagements and decisions can happen from these questions, although the answers to these questions are not an end point in themselves. These questions must be rather a starting point for more effective engagement and decision-making processes overall.

Citizen engagement

Citizen engagement can be an effective tool for designing fairer, more sustainable and more effective policies. Especially as we ask people to change behaviours or use new services and support, understanding what people need is an important starting point for delivering fairly against that need in the longer term.

What is critical is that engagement with people is not simply a tick-box exercise, but is instead meaningful and takes a **citizen-first approach**. That is, where decisions are about policies that will affect people directly – especially with a risk of inequalities or injustices emerging or widening – then those people are engaged directly to help shape that policy or initiative from the early stages.



This can make those policies more reflective of need, creating more sustainable outcomes compared to policies designed at a distance and then imposed citizen-agnostically³.

Citizen engagement can take several different forms, and will look different for different groups of people. For typically marginalised or excluded groups in particular, engagement can be challenging, since there may be additional knowledge, time, resource, language, or trust barriers that must be overcome to ensure that people's views are fairly represented.

This places a duty on decision-makers in any policy, project or initiative to ensure that: a) language is simple and accessible; b) processes are transparent and accountable; c) people are fairly rewarded for their time in any engagement process; d) people are not excluded without prior efforts to engage due to assumptions about willingness or resource; and e) engagement is not on the decision maker's terms only, i.e. 'we have a solution that we want you to accept'.

► **Recommendation: Procedural justice questions should be embedded at the beginning of all decision-making processes and formalised in procurement, funding and development rules.**

► **Recommendation: Engagement in decision-making should be proactive, open and inclusive of excluded and marginalised groups.**

► **Recommendation: Decision-making should take a 'citizen-first' approach to designing policies and solutions, particularly in encouraging new behaviours or uptake.**

Trusted intermediaries

Overcoming these issues can be aided by using trusted intermediaries such as local, advocacy and community organisations, who are well-known and embedded within their respective communities⁴. Such organisations have typically developed close ties and connections with the people in their area or community over several years and know the needs and issues in those communities well.

Trusted intermediaries are not a new concept in decision-making, but they have special relevance to just transition decision-making. Because intermediaries have access to excluded or marginalised groups, they can be a powerful 'in' to engage with those groups directly. They can advocate strongly in the other direction to ensure that the views of those groups and communities are fairly fought

³ Wahlund, M. and Palm, J., 2022: <https://doi.org/10.1016/j.erss.2021.102482>

⁴ Lacey-Barnacle, M. and Bird, C., 2018: <https://doi.org/10.1016/j.apenergy.2018.05.088>



for within higher-level decision-making⁵. This advocacy role is also key; while engaging citizens directly is important, organisations such as these are well-placed to collate views and represent them in more formal decision-making processes. This is not a direct substitute for speaking with citizens, but rather a function intermediaries can play.

For this central role, such organisations largely operate on third and charitable sector funding, which can be short-term and competitive. They have also been increasingly stretched by the energy and cost-of-living crises – particularly those working in energy specifically. As such, it is necessary to recognise their role in just transition decision-making and reflect this with more sustainable resources to fully deliver this function.

► **Recommendation: The role of trusted intermediary organisations in advocating for just processes and outcomes should be reflected in policymaking and resource.**

Deliberative and co-design processes

One way to meaningfully engage with people in decision-making is through deliberative processes. Deliberative processes, such as citizens' juries and assemblies, are becoming increasingly prominent in energy and wider policy decision-making⁶. Such processes bring together a representative sample of the population – or a key subsample, such as of typically marginalised or excluded people – to help interactively teach them about a topic via 'expert witnesses' before 'co-creating' solutions that reflect their needs and perspectives. Juries and assemblies can be anything from a small group of around a dozen people over a few weeks to hundreds of people over months or even years.

Examples of recent juries and assemblies include the Scottish Government's Climate Assembly, which digs into just transition policies and outcomes specifically⁷, and the Greater Manchester Local Energy Market citizens' jury, dealing with the more complex topic of ownership and governance in local energy innovations⁸.

There are distinct advantages to juries and assemblies for enabling more just processes and outcomes. These types of engagement can help bring people up to speed on any issue at hand, helping to eliminate barriers in expertise and information that often restrict lower income, ethnic

⁵ Lacey-Barnacle, M. and Bird, C, 2018: <https://doi.org/10.1016/j.apenergy.2018.05.088>

⁶ Citizens' Assembly: <https://citizensassembly.co.uk/>

⁷ Scottish Government, 2022: <https://www.gov.scot/publications/scotlands-climate-assembly-research-report-process-impact-assembly-member-experience/#:~:text=the%20Assembly%20brought%20together%20a,an%20effective%20and%20fair%20way.>

⁸ Carbon Coop, 2022: <https://carbon.coop/2022/04/citizens-jury-people-powered-energy-transition/>



minority, and other marginalised people from participating more directly in energy decisions or processes (compared to more engaged, more affluent middle-class communities)⁹. They can also lead to decisions directly informed by citizens, making for more reflective, sustainable solutions and improving legitimacy for policymakers – although, as with not being tick-box exercises, legitimacy should not be the primary purpose.

Where juries and assemblies have an especially important role to play is in **developing principles**. While some basic principles for effective decision-making are already highlighted here (early and meaningful engagement, and embedding questions of procedural justice in our thinking), citizens' juries and assemblies are well-placed to help develop broader **principles for a just transition** that help shape all subsequent decisions. There are examples of this already happening in Scottish Government Local and Community Energy policy, for instance, and calls for similar in the UK Government's reform of electricity markets (please contact Regen for more information on this subject).

Principles may include who should have a say in what decisions, who should own and benefit from new energy systems and innovations, what is considered 'fair' or 'just' in policies and outcomes, and what role citizens and communities should play within those and within the energy system more broadly. These can also be revised after some time, reflecting the changing need and landscape of people, energy and politics.

► **Recommendation: Principles for a just transition should be co-designed with citizens and communities through a deliberative process, with those such processes also leveraged on specific issues where appropriate.**

⁹ Stewart, F. 2021: <https://doi.org/10.1016/j.enpol.2021.112512>



Section 3

Impacts and opportunities

Q4: Net zero pathways; impacts and opportunities

What evidence do you have on the main impacts and opportunities associated with meeting Wales' transition to net zero? Please provide evidence (or identify evidence gaps) for the short (2022 to 2025), medium (2026 to 2035) and long term (2036 to 2050).

From a **power sector** perspective, transitioning from fossil fuels to renewables represents an opportunity for Wales. This transition could reduce the cost of energy for everyone, help redistribute wealth via community ownership, and provide job opportunities.

This is because the properties of fossil generation and renewables differ. The current UK energy system was built on the principle of having a small number of large-scale fossil fuel generators connected to the transmission grid. In contrast, the future energy system will have many more small, decentralised renewable sources connected to both the transmission and distribution grids. As a result, transitioning to a high-renewables energy system will result in a fundamentally different system. In this section we discuss the impacts and opportunities of:

- Decentralised energy: local skills
- Target setting
- Community benefit and local and community ownership
- Eradicating fuel poverty

Decentralised energy: local skills

The National Grid's [Future Energy Scenarios \(FES\)](#) and the Distribution Network Operators' (DNO) [Distributed Future Energy Scenarios \(DFES\)](#) represent a range of different, credible ways to decarbonise our energy system, at both a national (FES) and a more regional (DFES) level. As Figure 2 shows, most of the net zero scenarios from both of these sources project a five to six-fold increase in onshore renewable energy capacity in Wales by 2050. Achieving this future system, hosting a huge amount of decentralised generation, will require local skills and the development of local supply chains, creating increased job opportunities across various levels and entry points.

This growth in renewable energy capacity and energy sector employment is already happening – renewable electricity generation has increased in Wales by over 600% since 2005, and in 2021 Wales generated a total of 7.7 TWh of electricity from renewables. In the same timeframe, the

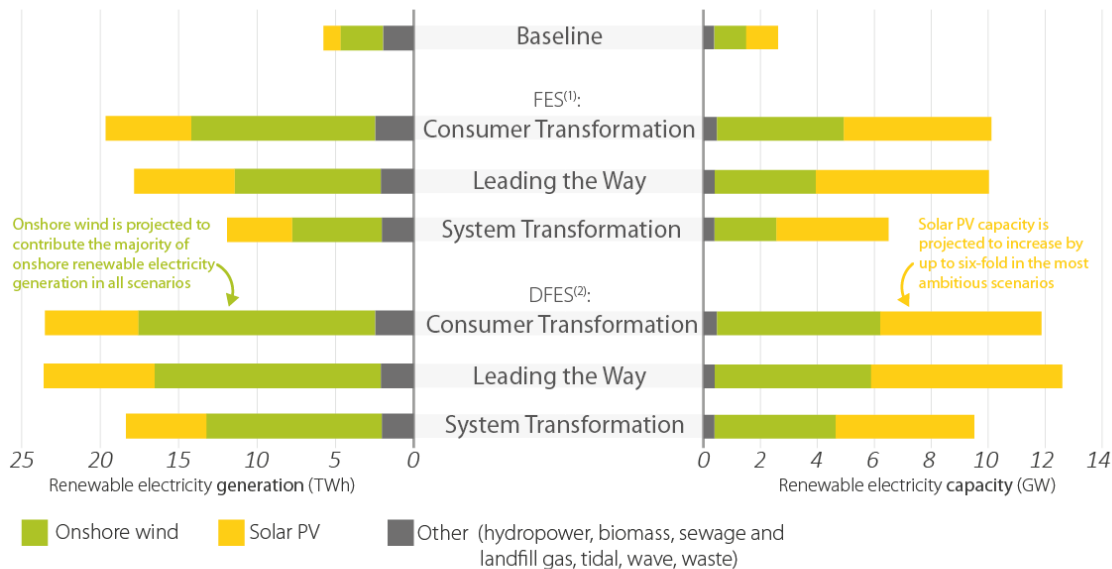


number of jobs in electricity, gas, steam and air conditioning supply in Wales rose from 3,400 in 2005 to 8,300 in 2019 – an increase of over 144%¹⁰.

Onshore renewable electricity future trends



Most net zero FES and DFES scenarios project an approximate five to six-fold increase in onshore renewable electricity capacity by 2050, highlighting the high levels of resource opportunities for the continued deployment of onshore renewable electricity projects in Wales



⁽¹⁾ National Grid ESO, Future Energy Scenarios (FES) 2022.

⁽²⁾ WPD Distributed Future Energy Scenarios (DFES), 2021; SPEN Distributed Future Energy Scenarios (DFES), 2021.

Figure 2: Baseline and future projections of annual Welsh renewable electricity generation

Furthermore, a UK Energy Research Centre study¹¹ found that renewable energy creates three times as many jobs per £million invested compared to fossil fuels, and for energy efficiency this rises to a five-fold increase. This means transitioning from fossil fuels to renewables provides greater employment opportunities than can be realised by maintaining the status quo.

Achieving net zero requires us to decarbonise our homes and businesses, meaning there is also a massive need for a nationwide programme of energy efficiency and heat decarbonisation retrofitting in UK buildings which could help to stimulate ongoing, countrywide demand for low carbon jobs over several decades. To meet its net zero target, the UK needs to replace roughly 25 million oil and gas boilers with low-carbon heating systems over the next three decades. As such, the UK government has set out a target to increase annual installations of heat pumps in homes from around 30,000 before 2020 to 600,000 by 2028¹².

¹⁰ StatsWales, 2023: <https://statswales.gov.wales/Catalogue/Business-Economy-and-Labour-Market/People-and-Work/Employment/Jobs/Whole-Workforce/workplaceemployment-by-industry-area>

¹¹ UK Energy Research Centre, 2022: <https://ukerc.ac.uk/publications/green-jobs/>

¹² UKGOV, 2023: <https://www.gov.uk/government/publications/energy-security-bill-factsheets/energy-security-bill-factsheet-low-carbon-heat-scheme>



To achieve this target, at least 27,000 trained heat pump engineers will be needed in the next six years – a recent study published by the charity Nesta estimates that there are currently only 3,000 such engineers in the UK¹³. They state that this means we need to see an increase of 4,000-6,000 per year, training more new engineers every year than are currently in the whole industry. While these figures are UK-wide rather than Wales-specific, they highlight the massive opportunity for skilled and stable employment presented by the energy transition.

Beyond this, there are also several opportunities to support a more diverse workforce, with varying entry levels to allow access to those opportunities for other communities. For example, energy advice, advocacy and retrofit assessments are critical to ensuring people can access the support they need to decarbonise their homes, requiring well-resourced organisations and officers to administer. These are skilled and important roles with different entry points. Finally, there is an opportunity to promote a more diverse workforce to help overcome barriers to new net zero jobs, for example for women, who have tended to face systemic discrimination in this area.¹⁴

► **Recommendation: Prioritise the scaling up of training programmes, to ensure the creation of a workforce with the skills to participate in the energy efficiency and heat decarbonisation industries of the future. Work with industry and education providers to achieve this.**

Finally, a decentralised system of renewables, coupled with a nationwide growth in the energy efficiency and heat decarbonisation industries, means that employment opportunities will be present across Wales, rather than being concentrated in a single industrial hub. This highlights the importance of location for a just transition – maximising the opportunity to develop supply chains and cultivate skills locally to serve local needs. With the more local energy systems and approaches that Wales already has ambitions for, local skills and supply can be better mobilised and leveraged.

However, as the offshore sector's recent call for a just transition¹⁵ highlights, it is imperative that any transition away from fossil fuels to renewables is managed in a just way from an employment perspective, so that those moving from fossil fuel industries have new, comparable quality work to enter into. As a 2018 study from the World Bank¹⁶ highlights, there are many lessons that can be learnt from previous energy transitions, such the closure of coal mines, and a number of measures governments can take to minimise social conflict and economic distress associated with transitioning away from one set of fuels to another.

¹³ Nesta, 2022: <https://www.nesta.org.uk/press-release/shortage-of-trained-heat-pump-installers-could-set-back-net-zero/>

¹⁴ Women on the Tools, 2022: <https://www.onthetools.tv/sign-up-for-women-ott-white-paper/>

¹⁵ Friends of the Earth Scotland, 2023: <https://foe.scot/wp-content/uploads/2023/03/Our-Power-Report.pdf>

¹⁶ The World Bank, 2018: <https://www.worldbank.org/en/topic/extractiveindustries/publication/managing-coal-mine-closure>



► **Recommendation: Put high carbon industry workers at the centre of just transition planning, by engaging them in the development of the Welsh Just Transition framework.**

Target setting

In 2017, the Welsh Government set a target for Wales to meet the equivalent of 70% of its electricity demand from Welsh renewable electricity sources by 2030 – this figure was 55% in 2021¹⁷. Recently, the Welsh Government published a consultation exploring the future evolution of their renewable energy targets, with a headline proposal for the Welsh Government to set a target of meeting the equivalent of 100% of Welsh annual electricity consumption from renewable electricity sources by 2035¹⁸. Regen was commissioned to gather evidence of future energy trends to inform the consultation and the evolution of these targets in the future.

As Figure 3 highlights, analysis of the pipeline of in-development projects indicates that the deployment of Welsh offshore wind could be critical to achieving the current 2030 70% target, and a future 100% target. Coupled with the five to six-fold increase in onshore generation also required, there is a risk of focusing solely on generation without considering who is benefitting from that generation and where other value is being realised. A just transition requires all communities, especially the most marginalised, to be able to participate and benefit from the resources around them, and while achieving the build-out in renewable generation capacity required to meet targets is important, it is also important to do this in a way that considers the ownership structures of the generation being built and maximises the opportunities for value retention in Wales.

► **Recommendation: Retain a focus on the principles of a just transition throughout the target setting, planning and development processes to ensure that achieving any future renewable capacity targets delivers as much social and economic value to people and places as possible in a fair and just way.**

¹⁷ Welsh Gov, 2022: <https://www.gov.wales/sites/default/files/publications/2022-12/energy-generation-in-wales-2021.pdf>

¹⁸ Welsh Gov, 2023: <https://www.gov.wales/review-wales-renewable-energy-targets>



A route to 2035

Although Wales has the renewable energy resources to achieve more, the below is an illustrative route for Wales to generate the equivalent of 100% of its electricity demand from renewable electricity sources in 2035

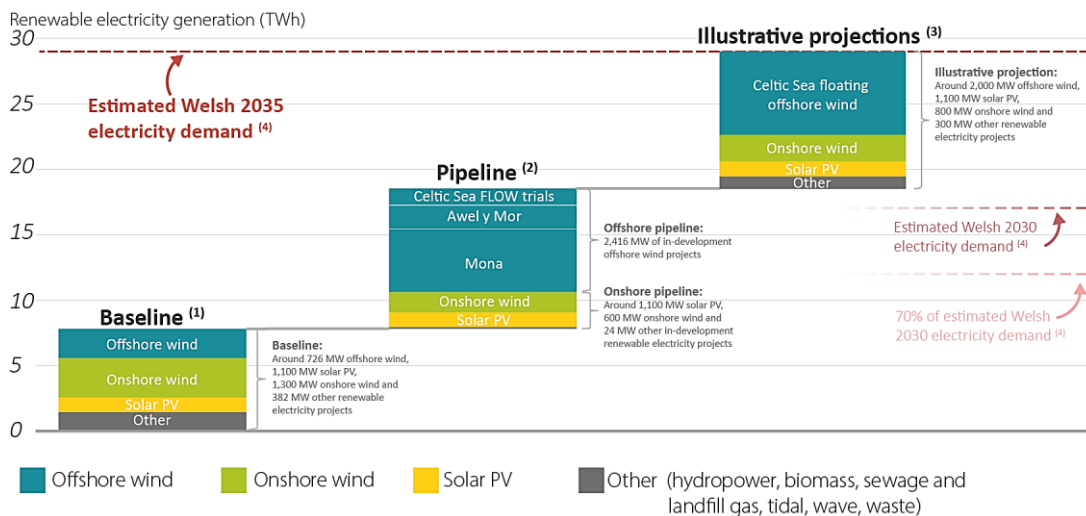


Figure 3: Illustrative 2035 Welsh renewable electricity generation, by technology and current status, required to generate the equivalent of 100% of Welsh electricity demand from Welsh renewable electricity capacity.

Community benefit

One solution to the above challenge is the concept of community ownership and benefit, which Regen has explored in more detail in our recent insight paper: [Delivering local benefit from offshore renewables](#). With the scale of offshore wind and the potential benefit to communities, there is a real opportunity to support those on lower incomes and disadvantaged groups to address fuel poverty, improve local areas, and create new revenue and opportunities.

While offshore developments provide regional value by creating jobs and supply chain opportunities, these more holistic benefits do not always reach those excluded communities. Even with traditional community benefit funds, the loudest or most engaged (who are also often more affluent) often decide how funds are spent. This means that already excluded people and places do not necessarily experience the benefits or get to play a role in those decisions. By providing dedicated community benefit funds *with an express focus on addressing just transition issues and embedding inclusive processes* ([Box 2, p18](#)), not only is direct funding on offer, but communities can use their local knowledge and connections to steward that money in a more inclusive and equitable way. This means revising rules around community benefit to encourage the participation of typically excluded people and with ambitions aligned to just outcomes where appropriate for that community.

► **Recommendation: Continue to prioritise local and community benefit in the development of renewable generation projects, with a focus on revising rules to mandate just processes and outcomes.**

Local and community ownership

The decentralised energy system of the future provides far greater opportunities for local ownership of generation in Wales at various scales – from rooftop solar, to local authority-led energy-smart places¹⁹, to community-owned wind turbines. Research from Aquatera shows that community-owned energy assets delivered 34 times more financial return to communities than developer-led community benefit schemes alone²⁰. Community energy organisations are a vital component of a decarbonised energy system, for a number of reasons. In addition to installing renewable generation assets, community energy organisations can help establish public consent for the energy transition, and facilitate a just transition by better involving excluded and marginalised groups, as outlined in the Governance section of this document. They can also decarbonise social buildings like community and faith centres, which can stimulate learning and dissemination, as well as alleviating fuel poverty and supporting the green recovery by reinvesting the economic returns of community-owned generation into the local area.

Increasingly, local authorities have also been leading in developing their own local energy systems and approaches, such as through local area energy planning. The Climate Change Committee’s Sixth Carbon Budget argues that local authorities are pivotal in net zero energy overall²¹. Local authorities are well-placed to overcome justice issues in the net zero transition, in that they have access to a vast range of building stock such as social housing that they can lead on upgrading, access to a range of finance options, connections with local people and organisations, and a democratic mandate for action. Because of this, local authorities can take ownership and leadership of their energy systems and assets, absorb the financial and procedural burden of transitioning (for example, for transitioning social housing tenants to renewable heat) and help to shape locally reflective projects and supply chains in the interest of people rather than profit.

For this role, local authorities are not equally equipped to deliver their own local energy plans or systems, with resourcing constraints and a need for more consistent upskilling. Some local areas are far better placed than others, creating a potential regional justice issue. Similarly, community energy organisations have so far operated largely voluntarily. Reflecting on the role these organisations could play for just outcomes, there is a need to consider the available resources and support.

► **Recommendation: Provide local authorities with sufficient funding to ensure that they have the resource and knowledge to develop and deliver**

¹⁹University of Strathclyde, 2023: <https://www.strath.ac.uk/whystrathclyde/news/2023/energysmartplaceswhytheukneedsthemwhatsholdingthemback/>

²⁰ Aquatera, 2021: <https://www.aquatera.co.uk/news/community-owned-wind-farms-have-paid-their-communities-34-times-more-than-commercial-counterparts>

²¹ UK Climate Change Committee, 2020: <https://www.theccc.org.uk/publication/local-authorities-and-the-sixth-carbon-budget/>



a local energy plan that suits their own energy needs, in collaboration with local people, stakeholders, supply chains and industry.

► **Recommendation: Build on the Welsh Government Energy service to provide seed funding, training and access to investment capital to community energy organisations, providing them with support to professionalise and deliver consistently across regions and places.**

The Welsh Government has a target for at least 1 GW of renewable energy to be locally owned by 2030, with all new energy developments encouraged to have at least an element of local ownership. In this regard, Wales has achieved nearly 90% of its target. As Table 1 shows, there is now 897 MW of locally owned renewable capacity in Wales from over 78,000 projects, meaning the financial benefit of this generation is being retained in Wales. At present, 62% of locally owned renewable energy is small-scale (<1 MW), while 38% is large-scale (>1 MW). According to DFES projections of small-scale technologies (Figure 4), this growth has the potential to continue, with almost 2.4 GW of capacity projected to be delivered by small-scale, locally owned generators in 2050 under net zero scenarios.

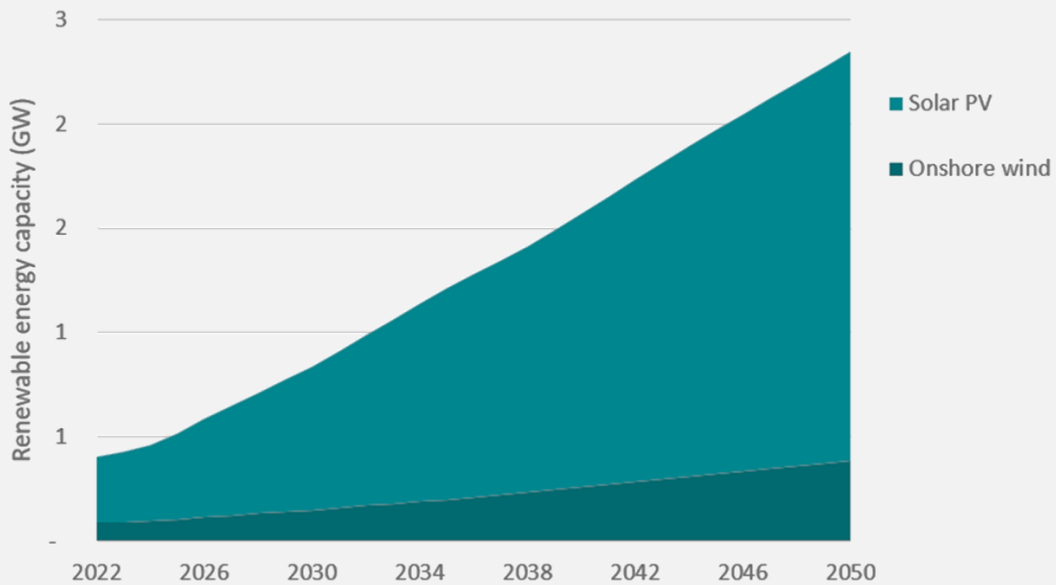
Table 1: Locally owned renewable energy in Wales summary²²

Ownership category	Total number of projects	Capacity (MWe)	Capacity (MWth)	Estimated generation (GWh)
Community	198	40	1	54
Domestic	70,575	209	142	500
Farms and estates	798	23	126	444
Housing association	5,687	7	5	9
Local authority	303	22	3	40
Local business	394	271	16	797
Other public sector/charity	418	9	24	84
Total	78,373	581	316	1,928

²² Welsh Gov, 2022: <https://www.gov.wales/sites/default/files/publications/2022-12/energy-generation-in-wales-2021.pdf>



Net zero scenarios show continued growth of small-scale renewable energy



Source: Average of Welsh net zero DFES projections

Note: small-scale is defined as <1MW



Figure 4: Small-scale (<1 MW) renewable electricity capacity of solar PV and onshore wind, according to DFES scenarios

The current energy crisis has highlighted the risk of relying on an international energy market, with soaring energy prices as a result of the rising cost of gas causing severe hardship for people and communities across the country. As the Brynwhillach Solar Farm case study highlights, home-grown, local renewable generation can reduce reliance on the international energy market and provide financial stability for those organisations with high levels of energy demand.

Case study:

Brynwhillach Solar Farm

This 4 MW solar farm in Swansea is the first solar farm in the UK to be owned by a health board, and is connected by a 3 km private wire to power Morriston Hospital in Swansea. The solar farm is comprised of 10,000 panels and cost £5.7 million to construct. It was built under the Wales funding programme loan scheme, set up to support public sector decarbonisation by 2030, and supported by the Welsh Government Energy Service.

The solar farm began exporting in November 2021 and, as of March 2022, had saved £120,000 in electricity bills, even meeting 100% of the hospital's electricity demand on some days. 30,000 kWh of surplus energy has also been exported back to the grid, at a profit to the organisation.



However, it is crucial to note that energy is not necessarily fairer simply by virtue of being more local or community-owned. Groups and places already excluded face key barriers to participating in and benefitting from local and community energy projects, such as a lack of resource or expertise, language and technical barriers, and time pressures. These can make it challenging to meaningfully participate in local energy projects in the same way that more affluent communities have been able to do.

As such, there is a need for just transition principles to be embedded within local and community approaches, too – building on our Governance recommendations in the first section. Box 2 below sets out a set of principles Regen has developed with the Scottish Government in a project exploring how to unlock local and community energy approaches specifically for a just transition, based on extensive literature review and stakeholder engagement with people working in the local, community, energy and climate justice spaces. We are happy to share a version of this report separately.

Box 2: Regen principles developed with the Scottish Government for unlocking local and community energy approaches for a just transition.

Emerging principles for more just outcomes

- 1. Accessible, accountable and transparent ownership and governance** of local and community energy projects, with proactive inclusion of identified marginalised and excluded groups.
- 2. Leadership** by communities facilitated, but the **procedural burden on professional organisations** (including well-resourced community energy groups).
- 3. Meaningful, rewarding and inclusive co-design** (not just tick-box), where communities and trusted organisations can shape projects from the beginning.
- 4. Business models** that ensure those who cannot afford to pay are not excluded from governance or benefit, are sustainable beyond short-term innovation, and in which co-benefits are explicitly prioritised.
- 5. Goals, benefits and beneficiaries aligned with just transition outcomes**, incentivised in policy, financial support and procurement rules.
- 6. Equitable ‘floor’ of policy support, skills, and resource**, including installers and supply chains, to ensure all communities can realistically develop their own solutions and unlock business, environmental and economic potential.



► **Recommendation: Ensure the next iteration of the energy targets, currently being consulted on, retain commitments to local and community energy, with a steer to incentivise just processes and outcomes.**

Challenges for local and community energy business models

The challenges for local and community energy in the absence of the Feed-in Tariff support scheme, in terms of revenue certainty and stability, have been well-noted. However, there are alternatives that can allow local generation to thrive, creating new revenues to funnel into other local or community initiatives such as tackling fuel poverty or developing new social justice and energy projects.

Site developers seeking a commercial proposition to sell their generation, such as a Power Purchase Agreement (PPA), are increasingly struggling to procure an offtaker for their energy, as suppliers perceive the risk as too great. PPAs are a well-established tool allowing generators to sell power to an offtaker, whether that be a supplier or, via a ‘sleeved PPA’, a third party. While sleeved PPAs have been in operation for some time, the cost and complexity of such agreements – compounded by the need to partner with a licensed supplier who would administer the scheme – has limited their take-up at scale. The recent spate of energy supplier collapses has increased this challenge, as credit risk presents a significant cost and generators can be unwilling to broker a contract via an offtaker that might collapse. This is even more of a challenge for generators with on-site usage.

The South West Net Zero Hub, which supports public sector and not-for-profit organisations to complete green energy projects, reported to us that almost 65% of the projects they support have business models that rely on trading power, either via a PPA or a private wire. If they are not able to procure an offtaker for these deals, there is a risk that such investment in future renewables projects may stall.

As part of our response to the UK Government’s Review of Electricity Market Arrangements (REMA) consultation²³, we received the following testimonial from another member of Regen, who supports sites in procuring PPAs:

“With the market being so volatile these last couple of months, we’ve noticed a change in behaviour in offtakers. Some suppliers may be less inclined to bid if the site is small-scale, multi-tech, has a lot of onsite usage or has a lower load factor than expected.

It’s certainly not impossible to get prices for sites with the above criteria, there is just a limited number of suppliers currently willing to offer fixed prices. This has changed over time – a year ago we could expect 3-5 bids for smaller sites, whereas now it’s more like 1-2 bids. We’ve also noticed an increase in registrations to our platform from smaller-scale installations. This is due to them

²³ Regen, 2022: <https://www.regen.co.uk/publications/regens-rem-a-consultation-response/>



struggling to contract with their existing supplier. As some currently aren't even renewing current contracts.

We've also noticed that small-scale generators seem to be less familiar with the types of PPAs available (fixed, floating and flexible). Not knowing about floating or variable PPAs means they haven't known to ask for that with their existing supplier."

For the clean energy transition to be just, all generators should be able to procure contracts to sell their generation, regardless of their size. In our REMA consultation response, we recommended that the UK Government oversee the creation and adoption of several standard, industry-wide, non-negotiable PPAs, such as a sleeved PPA or a virtual PPA, to encourage widespread adoption of such mechanisms in the wholesale market. These can provide revenue for local and community projects to tackle fuel poverty and support other just transition outcomes.

There is scope for the Welsh Government to support DESNZ in undertaking this, or they could support the uptake of such contracts in Wales in other ways, such as through the underwriting of contracts to manage the risk to those smaller organisations looking to procure a PPA.

► **Recommendation: Support DESNZ to oversee the creation and adoption of a number of standard, industry-wide non-negotiable PPAs, such as a sleeved PPA or a virtual PPA, to support the widespread adoption of such mechanisms.**

► **Recommendation: Explore other ways to support small organisations to procure PPAs, such as through the underwriting of contracts.**

Eradicating fuel poverty

According to the Welsh Government's latest estimates, up to 45% (614,000) of all households in Wales are in fuel poverty, following the energy price cap increase of April 2022²⁴.

Striving to achieve Wales's net zero goals represents a golden opportunity to address fuel poverty and solve the issue of draughty, cold, inefficient housing, which severely impact health and wellbeing. The best way to achieve a transition is to do so in a just way, by solving these housing issues for those who most need it.

Figure 5 highlights that all of the CCC's pathways for future demand in Wales include significant demand reduction due to efficiency savings. If these efficiency savings are not achieved, it makes

²⁴ National Energy Action, 2022: <https://www.nea.org.uk/fuel-poverty-map/fuel-poverty-in-wales/#:~:text=How%20many%20people%20in%20Wales,be%20in%20severe%20fuel%20poverty>

The Welsh Government metrics define a fuel poverty household as one where 10% or more of their full household income is paid towards maintaining a satisfactory heating regime



the task of achieving net zero that much harder by requiring the deployment of even more low carbon generation to meet that additional demand.

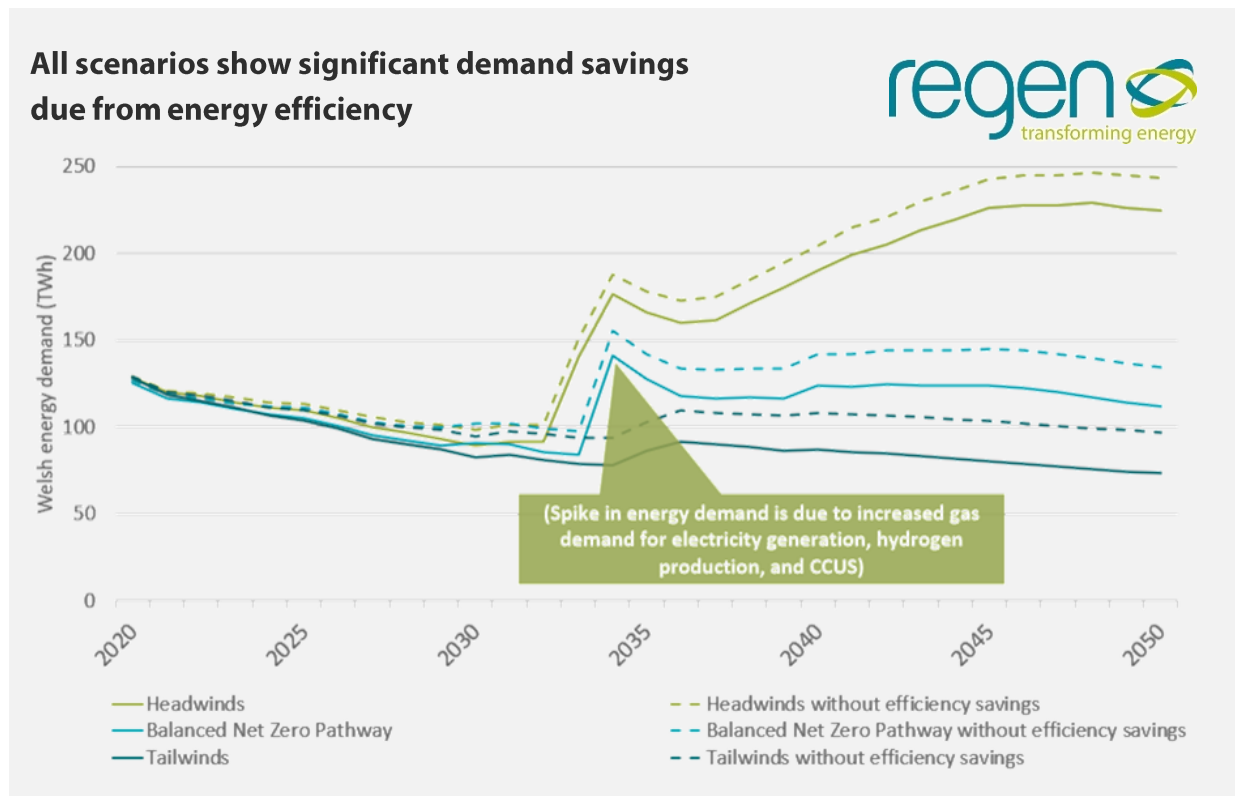


Figure 5: Future projections of Welsh energy demand. Three of the CCC’s pathways are plotted alongside the projections for additional demand if efficiency savings are not realised. Source: CCC 6th Carbon Budget, Regen analysis.

A 2022 housing study by the Office for National Statistics²⁵ found that 25% of Welsh housing stock pre-dates 1900 – the largest proportion in the UK – and 63% was graded EPC Band D or below. This highlights the scale of the issue, and the number of homes that will require retrofit work.

While existing schemes have had some impact, there are many people who have been unable to retrofit the homes they live in. Many live in rented accommodation or cannot afford the cost of capital to make their homes more efficient. Addressing this issue in the private rented sector is especially challenging and requires more dedicated attention.²⁶

Households on lower incomes, as well as those who are unemployed, long-term sick or have young families, are more likely to live in cold, draughty or inefficient homes and spend a higher proportion

²⁵ Office for National Statistics, 2022:

www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/ageofthepropertyisthebiggestsinglefactorinenergyefficiencyofhomes/2021-11-01

²⁶Welsh Parliament Equality and Social Justice Committee: Fuel poverty and the Warm Homes Programme

<https://senedd.wales/media/occhlki/cr-ld15117-e.pdf>

of their income on energy²⁷. The Office for National Statistics states that in the financial year ending in 2020, the poorest 10% of households spent more than half (54%) of their average weekly expenditure (£298.90) on essentials such as housing, including electricity and gas, compared to 42% of those in the richest 10%.

In addition, research from Citizen’s Advice shows that disabled people are four times more likely to be in energy debt than those who do not have a disability or long-term health condition²⁸.

Spending on gas and electricity as a proportion of disposable income is highest for the poorest households

Detailed household expenditure as a percentage of total expenditure by equivalised disposable income decile group, FYE 2020

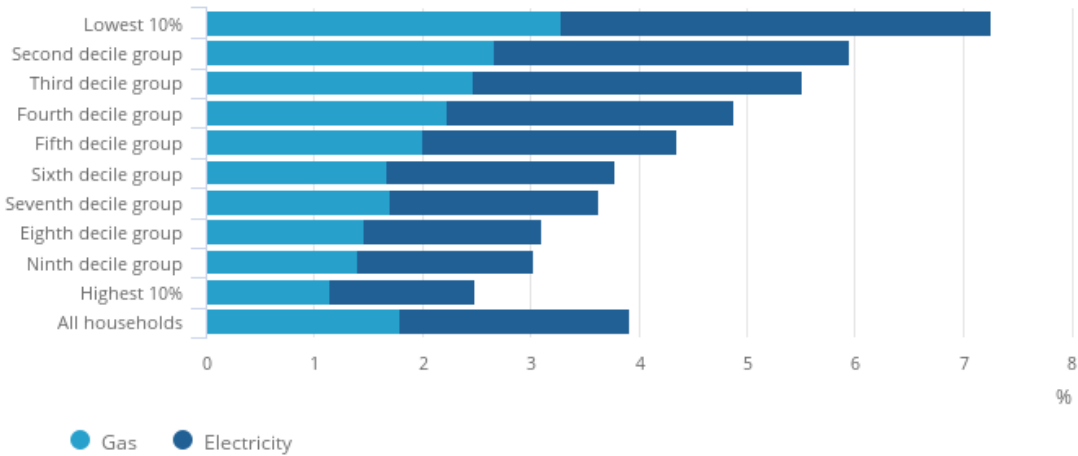


Figure 6: Detailed household expenditure as a percentage of total expenditure by equivalised disposable income decile group. Source: Office for National Statistics - Living Costs and Food Survey.

An increase in energy prices disproportionately impacts low-income households – the current system is not just, as the most vulnerable are also more impacted by the volatility of the current energy crisis.

This highlights the current inequity regarding the provision of support for housing upgrades and the potential opportunity presented by the energy transition. By targeting retrofit support to those living in fuel poverty, any scheme would improve the quality of life for those struggling, while also reducing the housing sector’s total energy demand – and carbon emissions – by improving the

²⁷ UKGOV, 2014: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/332122/understanding_behaviours_households_fuel_poverty_review_of_research_evidence.pdf

²⁸ Citizen’s Advice, 2020: [https://www.citizensadvice.org.uk/Global/CitizensAdvice/Wales/Energy%20briefing%20v1%20\(1\).pdf](https://www.citizensadvice.org.uk/Global/CitizensAdvice/Wales/Energy%20briefing%20v1%20(1).pdf)



efficiency of those dwellings which are currently the least efficient. This is discussed further in our response to Q12.

With additional support through trusted intermediaries and more local energy approaches, this can help alleviate the time and resource burden many disadvantaged households face while also allowing local and community actors to leverage public finance to help people transition directly.

Q5: Wellbeing benefits and challenges – heat

Do you have any evidence to show what the wellbeing benefits and challenges for each sector could be?

The pathway to **decarbonised heating** will have physical and mental wellbeing benefits via fabric efficiency upgrades and the phase-out of gas boilers – these benefits are detailed below. The growth of the clean heat sector must make information and advice more pervasive across Wales, such that people are empowered to make the right decision for their home, rather than overwhelmed by options.

Tradeswomen, who are in the overwhelming minority, also currently experience discrimination. There is an opportunity for a culture step change in the transition to clean heating.

Fabric efficiency upgrades: enabling homes to be a comfortable temperature for a lower cost. Cold homes significantly impact mental and physical health, including cardiovascular to respiratory disease. This has been found to particularly impact the elderly and children. Evidence collated by the 'Under one roof' study shows consensus among research and recognition of the issue with health bodies.

Despite the growing awareness of the importance of energy efficiency, progress in Wales has been slow. According to data from the Energy Performance Certificate (EPC) register, only 34% of properties in Wales achieved an EPC Band C or above in 2016, a figure which had increased only slightly to almost 36% by 2019. This is lower than the joint average for England and Wales, which has remained at 40.8% over the same period.

Gas boiler phase out: gas boilers emit NOx emissions, which significantly raise the risk of chronic mortality and asthma in children²⁹. This is particularly prevalent in urban areas, and South Wales is exceeding the UK's 2018 targets to limit this.³⁰

²⁹Ogen, 2020: <https://www.sciencedirect.com/science/article/pii/S0048969720321215>

³⁰ Energy and Climate Intelligence Unit, 2020: <https://ca1-eci.edcdn.com/reports/Gas-boilers-and-NOx-the-hidden-emitter.pdf?v=1633898830>



In the long term, the phase-out of gas for heating could also contribute to more affordable warmth. The current energy crisis is impacted by global gas markets. Whereas, in highly electrified scenarios, heat will be mostly powered by UK-produced, low marginal cost renewable energy.

Empowered decision-making: consumers need to have information and tailored advice available to them on the best options for their area and home. They also need to trust this information and advice. It is currently easy to be overwhelmed by the range of technologies and approaches available, and difficult to find trusted advice and guidance. Information and guidance will become more widely available throughout Wales as the clean heat industry expands. This will empower individuals to make informed decisions for their homes.³¹

Diversity and inclusion: 78% of UK tradeswomen have experienced discrimination. There is an opportunity in the emerging field of low-carbon heating for a step-change in culture to invite a more diverse and inclusive workforce.

Less than 2% of the plumbing and heating workforce are women. The transition from gas heating to clean heat will benefit from a more diverse workforce with a wide range of skills and life experiences. This includes a great variety of technical expertise and specialised knowledge, as well as strong interpersonal skills to engage positively with households across the country.

The opportunity for more inclusive working cultures is relevant across other sectors too. Regen runs a mentoring programme for women in Renewable Energy – ReWiRE.

Q7: Spatial impacts and opportunities

What evidence do you have on the spatial impacts and opportunities across Wales?

As discussed in our response to Q4, a decentralised system of renewables, coupled with nationwide growth in the energy efficiency and heat decarbonisation sectors, means social, economic, environmental and employment opportunities will be present across Wales, rather than being concentrated in a single industrial hub. This highlights the importance of ‘local’ for a just transition – maximising the opportunity to develop citizen- and community-focused energy solutions, develop supply chains, and cultivate skills locally to serve local needs³².

However, each of the four regions of Wales has its own history and challenges that need to be addressed to ensure that the transition to a clean energy system is just. Geographical disparities will also exist within regions. For example, coastal communities will be far more vulnerable to the impacts of sea level rise, which may lead to the loss of property or the need to relocate. Renewable energy projects can also physically impact communities and the local environment. This can include changes to local transport and infrastructure and the countryside and ecosystems. Communities

³¹ Nesta, 2021: <https://media.nesta.org.uk/documents/decarbonisinghomes.pdf>

³² UKRI and Regen, 2022: <https://www.ukri.org/publications/smart-local-energy-systems-skills-and-capabilities/>



undoubtedly 'host' renewable energy developments and their associated infrastructure and impacts, and coastal communities will likely experience the most disruption from the developing offshore wind industry in the Celtic Sea.

Furthermore, a UK-wide study found that the proportion of dwellings that are highly energy inefficient and are therefore more at risk of fuel poverty varies from 7% in urban areas to 50% in the most rural areas³³.

Such evidence suggests that a strategy that works for one region or area might not be appropriate for another, highlighting the importance of engaging with local leaders such as local authorities throughout the transition process. Ofgem's current Review of Local Energy Governance and Institutions³⁴ provides an opportunity for the Welsh Government to influence new devolution of energy resource and responsibility to help make this more tailored approach a reality.

► **Recommendation: Provide local authorities with sufficient funding to ensure that they have the resource and knowledge to develop and deliver a local energy plan that suits their own energy needs, in collaboration with local people, stakeholders, supply chains and industry.**

Q8: Equality impacts and existing disparities

What evidence do you have on the equality impacts of the transition? Where is there existing disparity which could be addressed via transition? What are the risks which need to be managed?

Households on lower incomes and those who are unemployed, long-term sick or have young families are more likely to live in cold, draughty or inefficient homes and spend a higher proportion of their income on energy. Please see our response to Q4 for our recommendations to address this, and other, disparities.

³³ Joseph Rowntree Foundation, 2013: <https://www.vork.ac.uk/media/chp/documents/2013/poverty-housing-options-full.pdf>

³⁴ Ofgem, 2023: <https://www.ofgem.gov.uk/publications/consultation-future-local-energy-institutions-and-governance>



Section 4

Support for the Just Transition

Q12: Finance and social infrastructure

What evidence do you have that demonstrates the role of finance and/ or social infrastructure in facilitating or delivering a just transition?

Cold homes significantly impact mental and physical health, including cardiovascular to respiratory disease. This has been found to particularly impact the elderly and children. Evidence collated by the 'Under one roof' study shows consensus among research and recognition of the issue with health bodies.

While not conclusive evidence, the impact of this is also evident in mortality statistics: in Wales, 18% more deaths are recorded during cold winter months – see Figure 7: Source ONS – Winter mortality in England and Wales.

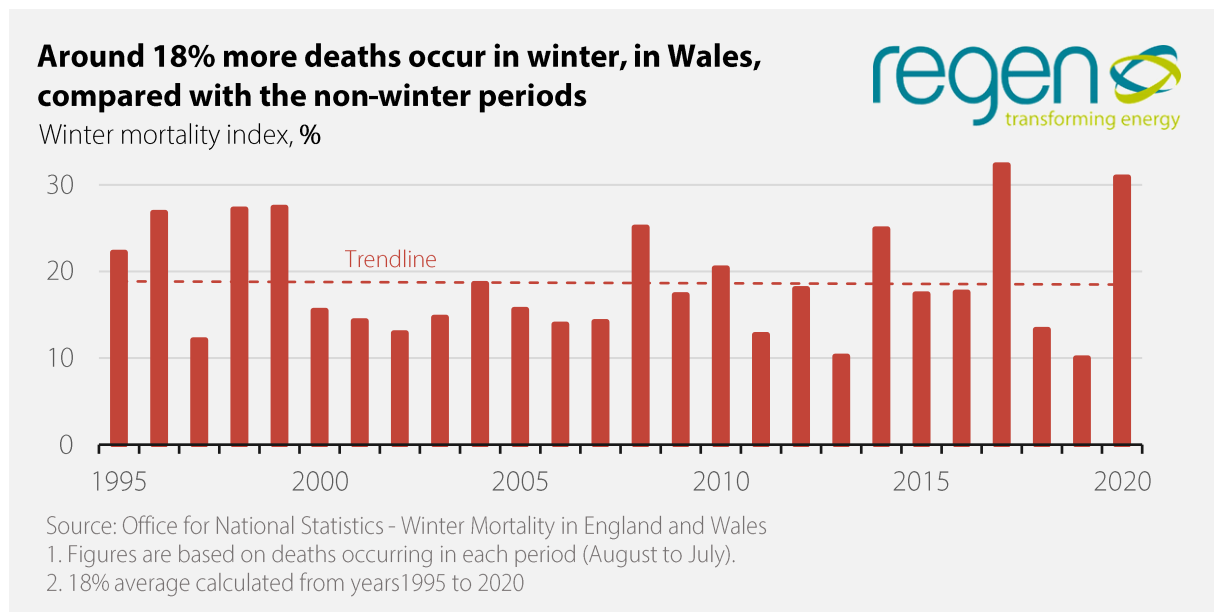


Figure 7: Source ONS – Winter mortality in England and Wales

Despite the growing awareness of the importance of energy efficiency, progress in Wales has been slow. According to data from the Energy Performance Certificate (EPC) register, only 34% of properties in Wales achieved an EPC Band C or above in 2016, a figure which had increased only slightly to almost 36% by 2019. This is lower than the joint average for England and Wales, which has remained at 40.8% over the same period.



The Keeping warm, keeping well project is an example of how social infrastructure and community finance can work together to combat this issue:

Case study:

Keeping warm, keeping well

Keeping warm, keeping well put solar panels on hospital roofs in Staffordshire using community investment. This not only helped reduced carbon emissions, but the money saved on electricity bills helped to support local charity, Beat the Cold.

Beat the Cold works with NHS staff to identify vulnerable people who come in with conditions worsened by the cold. They then help improve homes, such as paying heating bills or making energy efficiency upgrades. Some patients are eligible for free support, which they are helped to access.

The project is also an example of how investing in long-term public health can help us use public money more effectively on social services. Getting support at home instead of via hospital bed relieves pressure on the NHS. This is one reason why the project was successfully integrated into normal procedures at the hospital – NHS staff could easily see the value.

Cold homes cost the NHS £0.9bn per year in England. This was found by a BRE study, which also estimated that ‘prescribing’ retrofit to combat this would see a return on investment within seven years.

Welsh charity, Care & Repair Cymru, operates based on a primary care philosophy: “more preventative, pro-active, and coordinated system which integrates health, local authority and voluntary sector care services and empowers people.” The charity works with multiple hospitals to identify specifically older patients with housing problems (not limited to warmth) offering ‘free healthy homes checks’ and referring them to available support. One such support was the Welsh Warm Homes Programme, which is coming to an end.

Care & Repair Cymru provided written evidence in 2022 on next steps for the Warm Homes Programme, raising issues around patient eligibility, and effectiveness of measures in delivering more affordable warmth and net zero:

“Only 5.5% of properties that received interventions on the Nest scheme in 2020/21 received loft insulation, and 0.1% received draft proofing. A greater range of services, including more rollout of insulation and other energy saving measures need to be made available on the scheme to truly counter fuel poverty.

We also believe that there should be a referral pathway put in place for repeat applications to Nest, bearing in mind that circumstances such as savings levels, health conditions and house moves can all mean that people who were previously ineligible may become eligible but have no way to apply for help.



Offering greener heating technology, including but not limited to, heat pumps and solar power on the scheme will also future proof households' heating systems. In the future, this will mean fewer people in Wales rely on outdated fossil fuels to heat their homes, and do not fall foul of any potential price rises and market volatility as more people switch to more environmentally sound heating systems. These schemes should ensure equitable access to heating for everyone as well as equitable access to environmentally friendly means to do so. Even shifting the programme's priorities to offering more insulation and energy efficiency measures in homes would go a long way to ensuring that Wales's housing market is ready for decarbonisation."

► **Recommendation: Extend the Warm Homes programme and work with local social infrastructure to 'prescribe' retrofit using updated eligibility criteria.**

Q13: Net zero skills

What evidence and information is there across Wales to identify and develop required net zero skills?

The net zero transition presents an opportunity for job creation across Wales. Welsh Government has a crucial role to play in making sure that new green jobs are good jobs. Some risks to this are:

- The burden of retraining costs falling on individuals who cannot afford them.
- Less well-established industries have less well-established unions.
- A continued lack of diversity in senior positions in energy, engineering and construction-related fields.
- A lack of job security due to the nature of emerging markets or unstable policy support.

Regarding the decarbonisation of heat and buildings, there is a concern that trust has been eroded due to the boom and bust cycle of policy. Confidence will need to be restored so that the necessary skills and supply chains required for retrofitting the UK's housing stock are invested in.

Green jobs need to be safe and secure, not least to make retraining worthwhile for individuals and companies. It is essential that the transition to a green economy is not seen as a mere possibility but rather a future that is guaranteed. To achieve this, the Welsh Government's leadership in setting the direction of travel and creating a supportive and stable policy environment is crucial.

The Call for Evidence correctly highlights the criticality of STEM, as well as cross-cutting skills such as project management, communication, and change management. This is further supported by the Green Jobs Taskforce report in 2021, which also identifies skills and jobs needed from well-established sectors to emerging sectors.



We discuss local skills needed for renewable energy deployment and increased electricity grid capacity in Section 3 - Decentralised energy: local skills. A skill and job gap we would like to emphasise further is the role of the retrofit assessor:

Retrofit advisors/assessors/coordinators/designers

While online services offer retrofit advice, only in-home assessments can recommend the right options for a property and estimate the costs. There is currently a lack of specialists able to provide this service. A 2021 NESTA study showed willing heat pump buyers are disincentivised due to this initial hurdle. This skills gap is therefore halting progress on heat decarbonisation.

There are multiple community energy groups in Wales providing retrofit advice services. Community energy groups also often focus on advising those in fuel poverty and those who are hardest to reach.

EPC assessments are not fit for this purpose. PAS 2035 is a new standard that includes whole-house assessments and designated roles for retrofit assessments and coordination, but there is low awareness of these in-home assessments.

Due to the different types of skills needed, retrofit assessors, installers, and maintainers will likely be separate jobs. Therefore, assessors must have a holistic understanding of retrofit approaches, be trusted and ideally, be impartial.

The need to fill this skills gap was identified by industry workshops conducted by Regen and is also recognised by the Retrofit Academy, North East LEP, West of England Combined Authority, the Centre for Sustainable Energy, and the Energy Systems Catapult. Litegreen in North Wales have a Retrofit Assessor Hub and is recruiting.

► **Recommendation: Support the growth of retrofit assessor, advice and advocacy jobs via long-term policy support.**





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