Leveraging local and community energy for a just transition in Scotland

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1 Executive summary

1.1 Aims

The Scottish Government's draft Energy Strategy and Just Transition Plan emphasises the importance of local and community energy projects for supporting Scotland's net zero and just transition ambitions.

This study aimed to understand how those projects can help deliver against these ambitions within devolved powers. The research explored developments in local and community energy and assessed key innovations, opportunities and barriers, and how to leverage those projects to support Scotland's National Just Transition Outcomes (NJTOs).

The methodology included a literature review, interviews with citizens, local and community energy practitioners and other key energy and just transition stakeholders (including just transition experts and researchers; local authorities; fuel poverty and third sector charities; energy finance and investment stakeholders; energy developers and networks; and those working in local energy innovation initiatives such as the Prospering from the Energy Revolution programme and a deliberative 'People's Panel' with Scottish citizens.

1.2 Findings

- Looking at evidence from Scotland and across the UK, we have found that local and community energy can directly contribute to all eight of Scotland's National Just Transition Outcomes.
- There are key barriers to delivering against these outcomes across sectors: limited resources to build capacity for local and community energy projects in underserved areas; challenges around skills and project delivery processes particularly within local authorities; justice and equity issues within projects themselves; and lack of appropriate finance and business models.

1.3 Recommendations

We set out six overarching recommendations to help increase the contribution of the local and community energy sectors to Scotland's Just Transition, and provide a set of 19 evidence-based actions to increase local and community energy as the Scottish Government develops the final version of its flagship Energy Strategy and Just Transition Plan.

The recommendations are designed for Scottish Government policymakers and other key partners, including local government, delivery bodies, the energy industry, communities and wider stakeholders working across energy, heat in buildings, transport, land use and planning, economic development, communities and fuel poverty. There are also wider lessons for those developing local and community energy approaches across the UK and Europe with a just transition in mind.

- **Increase community capacity and outreach**, including resource for and awareness of the local and community energy sectors to support capacity-building, effective project development and outreach, particularly in typically excluded communities.

- **Support the development of new local and community energy models**, including the skills, resource and networks required for communities and local authorities to fully embrace them.

- **Enhance community ownership of energy and governance of projects**, ensuring these are accessible, accountable and transparent, with proactive inclusion of marginalised and excluded groups.

- **Increase participation and engagement**, ensuring that all groups and communities have a fair opportunity to engage with local and community energy projects, to help participate in governance and decision making, and shape projects from the beginning.

- **Develop sustainable finance, funding and investment models** that ensure those who can't afford to pay are not excluded and that maximum value is retained locally, with just transition outcomes explicitly prioritised.

- **Open up benefits** of local and community energy projects to **as wide a range of people and places as possible**, from decarbonisation and bill savings, to skills, through to supply chains.

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2 Abbreviations table

CARES	Community and Renewable Energy Scheme
ESJTP	Energy Strategy and Just Transition Plan
LAEP	Local Area Energy Planning
LCE	Local and Community Energy
LHEES	Local Heat and Energy Efficiency Strategies
NJTO	National Just Transition Outcomes
PPA	Power Purchase Agreement
RESOP	Regional Energy System Optimisation Planning
SSEN	Scottish and Southern Electricity Networks
SPEN	Scottish Power Energy Networks
DNO	District Network Operator

3 Introduction

3.1 Community energy in Scotland

For over a decade, Scotland has strived to lead the way in local and community energy, with a Scottish Government target to reach two gigawatts of installed local and community-owned capacity by 2030 (Scottish Government, 2021a).

While aspects of energy policy and regulation in the UK are reserved, limiting the work that Scottish Government can do to fully enable local and community energy in Scotland, the Scottish Government has fostered a favourable policy environment for this sector. This is mainly through providing funding via the Community and Renewables Energy Scheme (CARES) to support the development and delivery of local and community energy projects. CARES has supported over 800 projects and 1000 organisations with over £61 million in funding (Scottish Government 2023b).

More recently, the Scottish Government has supported local authorities to deliver their own Local Heat and Energy Efficiency Strategies, which will set the foundation for more local energy systems and initiatives (2022a). Alongside this, there has been the announcement of the Onshore Wind Sector Deal (Scottish Government 2023c) – a shared commitment between the Scottish Government and industry to deliver against Scotland's ambition of 20 gigawatts of onshore wind by 2030, in a way that aligns with the principles of a just transition.

Within this positive context, there are clear opportunities to further accelerate Scotland's good work on local and community energy so far. Local and community energy, such as community-owned wind and solar, or district heat projects led by local authorities, can provide substantial social, economic and environmental benefits to people, places and a range of other stakeholders.

The benefits of local and community energy include: new revenue streams for local areas; new business and investment opportunities; reduced emissions; climate education and outreach; climate adaptation and resilience; improved capacity in local communities; new skills and job creation; and reduced fuel poverty (Ford et al., 2019; Gooding et al., 2020; PwC, 2022). Community and local energy also provides an opportunity to make Scotland's net zero transition more local, democratic and inclusive, with energy projects and solutions better tailored to local needs.

These diverse benefits mean that local and community energy is well placed to contribute to achieving against Scotland's eight National Just Transition Outcomes (NJTO) (Box 1). The National Just Transition Outcomes are a set of goals designed by Scottish Government, informed by the Just Transition Commission (2023), to help mitigate the risks of climate action and unlock the opportunities that a just transition presents across sectors and policy areas (Scottish Government 2022b). Within the context of the finalisation of the Energy Strategy and Just Transition Plan (ESJTP) and aligned policies such as the Heat in Buildings Strategy, local and community energy could thus have a significant role to play.

3.2   Methodology

In this report, we outline how to develop the local and community energy sector in Scotland in such a way that it delivers against Scotland's NJTOs. To do so, we conducted a three-step research approach (these are detailed in appendices A and B). First, we conducted an extensive review of academic, policy and project literature and case studies. This allowed us to understand the most recent thinking and developments in the local and community energy space, and identify key just transition trends and issues.

Second, we interviewed 22 expert stakeholders. These included: community energy organisations; just transition experts and researchers; local authorities; fuel poverty and third sector charities; energy finance and investment; energy developers and networks; and those working in local energy innovation initiatives such as the Prospering from the Energy Revolution programme (UKRI, 2023). These stakeholders were chosen to give a breadth of perspectives on leveraging local and community energy for just transition outcomes beyond energy specialists alone, and to understand any key points of conflict between sectors and stakeholders.

Third, we conducted a "People's Panel" with 22 Scottish citizens, most of whom were from lower income areas of the country. This helped to understand the opportunities and barriers people faced to participating in local and community energy projects, and how these sectors could best be opened up to improve buy-in from communities and provide diverse NJTO benefits to people and places.

There was higher representation from both citizens and local and community energy practitioners than renewable energy developers and businesses in this process. This was deliberate, because citizens and local and community organisations, particularly those working on just transition issues, have not always been involved in such discussions, yet can provide crucial insights on how to best open up local and community energy for a wider range of just transition outcomes. This means that our findings in turn reflect the perspective of those stakeholders more. Further engagement with energy developers and businesses would help make recommendations more robust.

Box 1: Scotland's eight National Just Transition Outcomes

1. **Citizens, communities and place**: empowering and invigorating communities and strengthening local economies

2. **Jobs, skills and education**: equipping people with the skills, education and retraining required; providing access to green, fair and high-value work

3. **Fair distribution of costs and benefits**

4. **Business and economy**: supporting a strong, dynamic and productive economy, making Scotland a great place to do business

5. **Adaptation and resilience**: identifying risks and planning for long-term resilience against climate risks

6. **Environmental protection and restoration**

7. **Decarbonisation and efficiencies**

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8. **Further equality and human rights implementation and preventing new inequalities from arising**

3.3   What is local and community energy?

The Local Energy Policy Statement (Scottish Government 2021a) outlines three main categories of community and local energy projects (Table 1Table *1*).

Across these categories, 908 megawatts of Scotland's 2 gigawatt target for local and community energy has been delivered. This includes a mix of community energy projects, local authority energy projects, social and housing association developments, public sector investments, as well as initiatives in businesses and on farms and estates.

Table 1. Three categories of local and community energy per the Local Energy Policy Statement (2021)

Model	Definition
Community energy	The delivery of community-led renewable energy projects, whether wholly owned and/or controlled by communities, or through partnerships with commercial or public sector partners. The Scottish Government views community-led energy projects as a priority within the wider local energy landscape.
Local energy	More wide ranging, involving a variety of different organisations (public, private, and community sector), who can deliver an energy service/project for the benefit of local people operating within a defined geographical area.
Local energy systems	Local energy systems find ways to link the supply and demand of energy services within an area across electricity, heat and transport, deliver real value to everyone in local areas, and support the growth of vibrant, net zero local economies.

Although they share a number of key features, community energy, local energy and local energy systems do have distinct differences.

Community energy is typically characterised by grassroots action, where a community (either a community of place or of shared interest) comes together to design, implement, and manage a renewable energy asset or project. This might be a community energy generation project, such as a wind turbine or solar panels, or a heat, retrofit or transport scheme. These are often driven by a shared mission to deliver environmental, social and economic value for a specific place, with democratic input and governance (Brummer 2018; Creamer et al. 2020; Stewart 2021; Hanke et al. 2021).

Local energy and local energy systems are more diverse. They tend to have less of a primary focus on communities, and can be delivered though multi-stakeholder collaborations, often led by local authorities or the public sector, or through public-private collaborations (Ford et al., 2019; UKRI and Regen, 2022). They are less like the grassroots model seen in community energy and more akin to local authority-led or partnership approaches (Devine-Wright, 2019).

3.4   Value against Scotland's NJTOs

Table 2. Value from local and community energy across National Just Transition Outcomes

National Just Transition Outcome	Advantage of local and community energy
1. Citizens, communities and place	Stronger inclusion of citizens in energy decision making and design; retention of value through local ownership; social and economic benefit such as new revenue and skills opportunities; local development and investment; energy projects reflective of local need.
2. Jobs, skills and education	New job opportunities in installation, fitting, retrofit, and energy advice; grassroots education and upskilling; maximising local supply chains.
3. Fair distribution of costs and benefits	Benefits for typically excluded communities through collective, public or private funding; new models to support uptake of low carbon technologies.
4. Business and economy	Role for businesses and investors, particularly in local energy systems; new business models and opportunities in areas such as data, flexibility and innovation.
5. Adaptation and resilience	Community-led responses to climate adaptation and resilience; holistic local climate and energy planning.
6. Environmental protection and restoration	Community-led responses to protection and restoration; holistic local climate and energy planning.
7. Decarbonisation and efficiencies	Local, tailored approach to energy and buildings decarbonisation; grassroots outreach and education; local network building and knowledge-sharing.
8. Equality and human rights	Inclusive engagement; advocacy and representation; more democratic ownership and governance; locally-tailored solutions targeted at addressing e.g. fuel poverty.

Different models of local and community energy will have different implications for Scotland's NJTOs. Community-owned energy generation, for instance, is particularly strong on citizens, communities and place, by bringing people together to deliver projects and generating new revenues for local economic development. Community-owned energy generation projects also tend to be strongly motivated by climate and environmental outcomes (Community Energy Scotland, 2022; Community Energy England, 2022; Stewart, 2021).

Local energy and local energy systems tend to focus more on delivering economic value, such as a larger-scale return on investment for stakeholders, and new jobs and skills in retrofit, system installation, maintenance, etc. (Ford et al., 2019; Gooding et al., 2020; PwC 2022).

11 Table 2 above outlines the high-level opportunity of local and community energy approaches for Scotland's NJTOs. Table 3 illustrates the value that each main category has had so far for each of the NJTOs (Low = low value for NJTO) based on our review of empirical research and engagement with local and community energy stakeholders. A detailed qualitative analysis of these relationships across community energy, local energy, and local energy systems can be found in Appendix CAppendix C: Local and community energy just transition outcome impacts.

Table 3. Illustration of how priorities for local and community energy vary against the eight NJTOs

	Community energy	Local energy	Local energy systems
1. Citizens, communities, place	High	Medium	Medium
2. Jobs, skills, education	Medium	High	High
3. Distribution of costs	Medium	Low	Low
4. Business & economy	Low	Medium	High
5. Adaptation & resilience	Low	Low	Medium
6. Environment protection & restoration	High	Low	Low
7. Decarbonise & efficiencies	High	High	High
8. Equality and human rights	Medium	Medium	Low

Table 3 and Appendix C highlight important qualitative differences in how community energy, local energy, and local energy systems deliver value against different NJTOs. However, projects can vary substantially within these broad categories. This also leads to variations in impact on NJTOs.

For example, a local energy project that focuses on decarbonising council buildings, such as leisure centres or commercial properties, will contribute less to NJTOs 1, 3 and 8 than one that supports council housing tenants to decarbonise their homes. A community energy project which uses generation assets to provide new revenues to deliver energy advice and local environmental protection will also contribute more towards NJTOs 1, 2, 6 and 7 than wind turbines installed on a farm or estate.

As such, supporting a balance of different types of projects across regions and areas can help contribute to all of Scotland's just transition outcomes, allowing projects to meet local need. Projects themselves can also be supported to become fairer and more inclusive, which we deal with later in this report.

3.5 Just transition: processes and outcomes

Outcomes are only one part of the picture. As the Scottish Government (2021b) highlights, a just transition is also about process. This means that projects should be designed to enable people to take part in decision-making around the project. Who owns, gets a say, participates in, pays for and benefits from local and community energy projects all have implications for how just projects are considered to be by communities.

From our review of academic evidence and stakeholder engagement, we identified **four key dimensions** along which projects vary, with implications for how just they are considered to be. These dimensions are applicable to all types of local and community energy and should be considered together (Table 4).

Table 4: Key dimensions for 'just' local and community energy projects

| Dimension	Best practise for "just" outcomes
Ownership and governance	Democratic, accessible, and accountable ownership, with proactive involvement of diverse citizens and stakeholders in decision making.
Participation and engagement	Meaningful, proactive engagement with a diverse range of citizens and communities, people supported to help co-design projects from early stages and on an ongoing basis.
Finance, funding and investment	Transparent financial models that prioritise multiple just transition outcomes and do not exclude based on ability-to-pay.
Benefit and beneficiaries	Benefits realised socially, economically and environmentally for people and places first and foremost (including in jobs and skills, healthier homes and environmental protection), both individually and collectively where possible. Diverse opportunities for businesses, investors and industry.

From this analysis, leveraging local and community energy for a just transition means: expanding local and community energy across regions as a whole; and creating the right policy and delivery environment to enable projects to be more just in their processes and outcomes.

In the next section, we provide a high-level overview of key models and developments in each sector. The remainder of the report then provides recommendations for Scottish and Local Government policymakers and delivery bodies working across energy, heat in buildings, transport, land use and planning, economics, local government, communities and fuel poverty.

While this report does not represent Scottish Government policy, it makes recommendations to inform the role of local and community energy in key national policies, including the forthcoming final ESJTP as well as delivery of adjacent strategies such as implementation of Local Heat and Energy Efficiency Strategies (LHEES) and wider Heat in Buildings Strategy, Community Wealth Building, and Local Development Plans under National Planning Framework 4.

4 Community energy

Community energy has flourished in Scotland during the last decade, with 101 megawatts of community-owned generation capacity reported to be in operation or in-development as of December 2022 (Scottish Energy Statistics Hub 2023). Many other projects are also in motion e.g. decarbonisation of heat and transport. This is illustrated in the illustration opposite which shows a community using renewable energy.
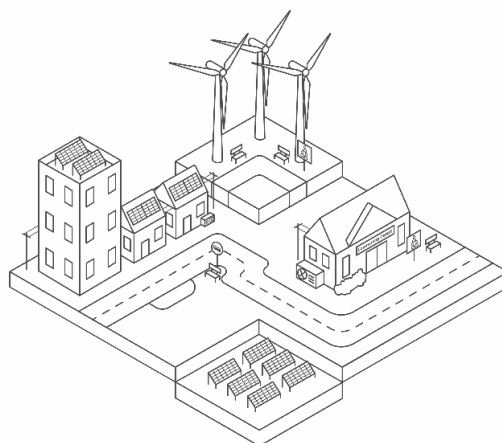
The Community and Renewable Energy Scheme (CARES), administered by Local Energy Scotland, has provided over £60 million development and capital support. Community energy has thus enjoyed a favourable devolved policy ecosystem. Key developments in the community energy sector are as follows:

Generation and supply	'Traditional' community ownership and community shared ownership generation projects; Rooftop solar and 'traditional' wind projects on community land and buildings; many-to-many power purchase agreements with public sector and commercial offtakers; exploring opportunities to link with community-owned land and housing
Heat and energy efficiency	Decarbonisation of community buildings using heat pumps and energy efficiency, providing lower bills to help keep social spaces open and warm hubs over winter; exploring potential for district heat networks and bulk purchase of heat pumps; community-led efficiency and retrofit programmes.
Transport	Community-owned electric vehicle charging, sometimes paired with car sharing.

Just transition outcome contribution: citizens, communities and place; climate adaptation and resilience; environmental protection and restoration; decarbonisation and efficiencies; equality and human rights.

4.1   Key developments

4.1.1.   Generation and supply

Since the winding down of the UK Government Feed-In Tariff – replaced by the less lucrative Smart Export Guarantee – community energy generation in Scotland and the UK has been forced to rely on other models.

This has often taken the form of Power Purchase Agreements (PPAs) with local stakeholders such as councils, colleges, businesses and hospitals – or directly with utility companies (Community Energy England 2022; Crown Commercial Services 2020).

PPA's are arrangements where either utilities or local bodies can purchase energy from community-owned generation for a fixed term at a fixed price. In the case of Edinburgh Solar Cooperative, for instance, the Cooperative installed solar panels on a number of City of Edinburgh Council buildings (City of Edinburgh Council 2014). The solar panels provide some of the electricity generated to the buildings on which they are installed at a reduced rate compared to typical market tariffs. This is facilitated by a Power Purchase Agreement.

The traditional model of selling energy to the national grid is also still used, particularly with larger-scale wind and solar projects using local or community land which are better-placed to make a return than smaller installations (Community Energy England, Scotland, Wales 2022). This in turn provides community benefit funding which can be used to deliver against just transition outcomes. In particular, state of the sector reports show that this has been used for:

- Building capacity in communities through social gathering, engagement, and outreach
- Delivering energy advice and advocacy and helping people in fuel poverty
- Promoting climate education through hosting workshops, events and cafes
- Developing climate adaptation measures, such as investing in green spaces or nature restoration

4.1.2.   Heat and energy efficiency

Decarbonisation of community buildings has been the predominant form of community heat progress in Scotland (Local Energy Scotland, 2023a). This includes installing efficiency measures and heat pumps to reduce bills for public and shared use buildings e.g. community centres. This can help reduce costs for running community spaces, provide sustainable and warm social centres for local residents and support education around new technologies or initiatives.

More ambitious heat projects are being explored, such as bulk purchase of heat pumps for local homes and district heat networks, for instance by Local Energy Scotland's CARES-funded Community Heat Development Programme (2023b).

However, these remain expensive and complex undertakings for community organisations at present. The legal, financial and technical expertise required is significant, meaning organisations that rely on volunteers and limited resource struggle to deliver them effectively. Within Local Heat and Energy Efficiency Strategies (LHEES), there is scope for communities to work with local authorities to identify opportunities and deliver such projects in partnership. Projects elsewhere in the UK, such as Swaffham Prior, show how community heat and community energy generation can work together in partnership with local authorities and the private sector to deliver such projects successfully (Cambridgeshire Country Council, 2023).

There have also been advances in community approaches to energy efficiency and retrofit. Community organisations such as the Carbon Coop in Manchester (People Powered Retrofit, 2021), Loco Home Retrofit in Glasgow (2023), and the Heat Project Blairgowrie (2023) have

been supporting homeowners to install energy efficiency measures along with low carbon technologies such as heat pumps and solar panels.

This provides new opportunities to support people in often disadvantaged or excluded communities to decarbonise, and jobs, skills and education opportunities for local businesses and tradespeople.

4.1.3.   Transport

Local and community transport projects have broadly taken the form of electric vehicle (EV) charging points, either supplied by local generation assets as funded by Brighton Energy Coop's Community Solar Accelerator Grant scheme (2021), or as assets themselves, creating revenue through subscription and pay-as-you-go tariffs as with the Charge My Street initiative (2023).

EV charging is seen as a relatively low-risk project by community energy stakeholders spoken to as part of this research. However, installing chargers does rely on locational factors such as the availability of network capacity and parking facilities, as well as people using the chargers themselves to generate revenue (typically more affluent groups – see Hopkins et al., 2023).

5 Local energy

Local energy has experienced considerable growth in recent years, and has become increasingly salient in energy policy thinking.

Recent research estimates that 1 in 5 UK local authorities now have some form of local energy project, which can take various forms across a range of scales (Arvanitopoulos et al. 2022).

Similar to community energy, local energy tends to encompass generation and supply projects, heat and energy efficiency schemes, and transport solutions. This is illustrated in the image opposite which shows a variety of buildings being served by the same energy source in a community. Local energy includes:
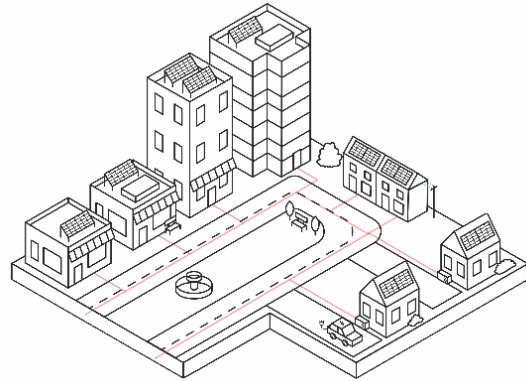
Generation and supply	Local authorities delivering Community Wealth Building-style (CWB) projects (North Ayrshire) and solar in council housing; solar and storage in social/housing associations; commercial and business properties installing own technologies.
Heat and energy efficiency	Local authority and commercial district heat networks (Edinburgh Vattenfall) and heat pumps, including in leisure centres; place-based energy efficiency approaches; commercial and business properties installing own technologies.
Transport	Local authorities delivering e-bikes, EV charging etc., EV charging in social and housing and associations.

Just transition outcome contribution: citizens, communities and place; jobs, skills and education; fair distribution of costs and benefits; decarbonisation and efficiencies; equality and human rights (when targeted at lower income households).

5.1   Key developments

5.1.1.   Generation and supply

At a local level, local authorities, housing associations and social housing providers are increasingly decarbonising their electricity supply (UKRI and Regen 2022). This has mostly taken the form of installing solar panels (often with battery storage) in their housing stock to reduce bills for tenants, and in a wider decarbonisation of public, commercial and industrial buildings.

Often working with low income social housing tenants directly, this has created value for decarbonisation and efficiencies, and had a further impact on equality and human rights through tackling fuel poverty. Compared to community energy, local authorities have direct access to their own housing stock, making installation of measures for lower income groups more straightforward. Delivering measures is still challenging for the private rented or owner-occupier sectors, however.

Some local authorities such as North Ayrshire Council (2020) have been leading the way to deliver just transition value, through advancing plans for using council-owned energy generation to fund work addressing fuel poverty, as well as energy efficiency and Community Wealth Building programmes (Figure 1). In addition to contributions to the just energy transition, this also has the potential to deliver jobs, skills and education, as well as provide a strong boost to citizens, communities and place through enabling local value generation, retention, and more open decision making.
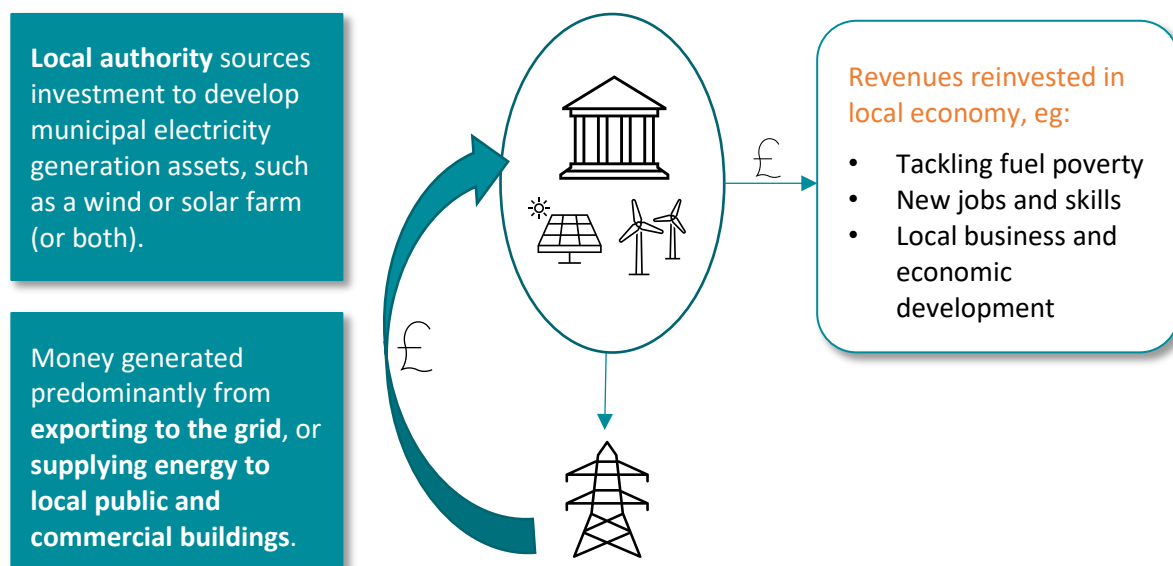
Local authority sources investment to develop municipal electricity generation assets, such as a wind or solar farm (or both).

Money generated predominantly from **exporting to the grid**, or **supplying energy to local public and commercial buildings**.

Revenues reinvested in local economy, eg:

- Tackling fuel poverty
- New jobs and skills
- Local business and economic development

Figure 1. Local authority-led generation for community wealth building example

5.1.2.   Heat and energy efficiency

Alongside generation, the same organisations have been installing heat pumps, often in housing stock but more often to serve larger commercial and public sector buildings. Local authorities have been leading on place-based energy efficiency schemes, with LHEES underway and due to be delivered in late 2023.

As with community energy, these carry benefits for decarbonisation and efficiencies, taking a more tailored, place-based approach to reducing housing stock emissions, while supporting lower income and excluded groups to transition to low carbon technologies (Regen 2022).

Several local authorities, such as Midlothian Council (2022) and Stirling (FES, 2023), are also delivering larger heat network projects to serve a mix of domestic, industrial and commercial properties. This can create wider business and economy opportunities for investors and developers, generating new work and business for local places.

5.1.3. Transport

Beyond coordinating public transport and decarbonising their own transport fleets, local energy transport initiatives today typically take the form of e-bike services led by local authorities, charging in social and housing association properties, or public electric vehicle charging and car clubs. The Plugged-in Communities Scotland Fund (Energy Savings Trust, 2023), for instance, provides funding for community transport organisations – often housing associations – to deliver car clubs and charging for their tenants and the wider community. In terms of value for just transition outcomes, this can support decarbonisation and efficiencies through encouraging more active and public travel, although can be restrictive for those outside of city centres or without driving licenses.
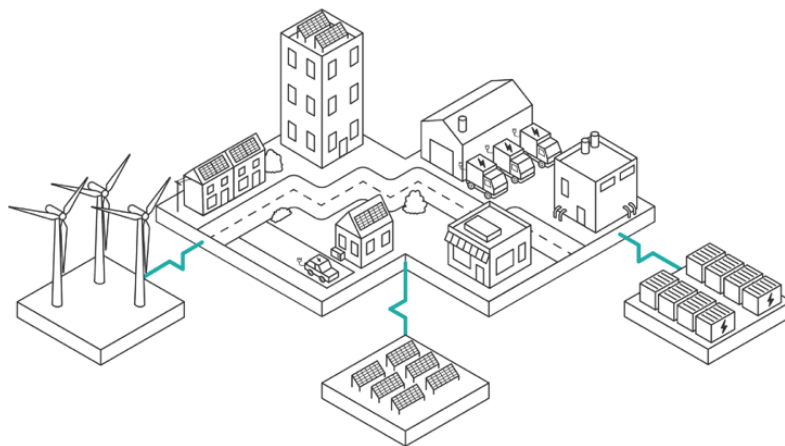
6 Local energy systems

Often known as 'integrated' or 'smart' local energy systems, local energy systems have become increasingly prominent in the local energy landscape.

Spearheaded largely by the Prospering from the Energy Revolution programme (2023), local energy systems bring together a combination of generation, storage, heat, transport and demand at a local level. This is done using physical infrastructure, digital platforms and local energy markets.

These have generally taken trial form at a town or city level and are usually led by local authorities, in conjunction with a wide consortium including communities, academia, businesses and developers. This is illustrated in an image below which shows how solar, wind and heat pump energy sources can be integrated into community energy supplies.

This has been the case in the landmark Bristol City Leap project, for instance, delivered in partnership with Bristol City Council, industrial partners Amaresco, community organisations, and developers Vattenfall (Bristol City Leap, 2022). The project will install and operate new solar, wind, heat pumps and networks, EV charging and energy efficiency measures in homes and businesses across the city to help meet their 2030 climate targets.

'Integrated' or 'smart' local energy systems, largely at innovation stage, now moving more into business-as-usual. Bringing together a combination of electricity, heat, transport, storage and demand at a local level, using smart technologies and digital platforms.

Just transition outcome contribution: jobs, skills and education; business and economy; decarbonisation and efficiencies.

6.1   Key developments

Still in their early stages, integrated local energy systems provide a range of opportunities against each of Scotland's NJTOs, particularly on jobs, skills and education and business and economy. They also provide opportunities for installers, energy businesses and developers, data scientists, engineers and project managers (UKRI and Regen 2022; Chitchyan and Bird 2022).

Within integrated local energy systems, there is also scope to build community benefit and ownership of generation or district heat assets. As part of the current Bristol City LEAP project, a £1.5 million Community Energy Fund has been included as part of the deal to help communities develop their own local energy solutions and hold a stake in the wider initiative (in addition to the LEAP project creating an estimated 1,000 jobs across planning, design, data, installation and retrofit, and deliver £2.8 million to local community projects).

However, these systems can be big undertakings, requiring significant public and private finance to deliver. Given their novelty, they can be seen as risky, and some policy and regulatory issues still remain at UK level (see Section 1.128).

6.2   Local energy planning

Local energy planning is becoming a key function of local authorities in Scotland and across the UK. In Scotland, this has at least partly been driven by Scottish Government requiring Councils to develop their Local Heat and Energy Efficiency Strategies (LHEES), setting out the long-term plan for decarbonising heat in buildings and improving their energy efficiency across an entire local authority area (Scottish Government, 2022a).

Some local authorities, such as Dundee City Council with their Regional Energy System Optimisation Planning (RESOP) project (Scottish and Southern Electricity Networks, 2022), have voluntarily broadened out into local area energy planning (LAEP) to include generation, transport and storage as well as heat and efficiency. Stirling and Clackmannanshire have also delivered a Regional Energy Masterplan which covers a similar scope (Engage Stirling, 2023).

Distribution network operators play a key part in this, supporting local stakeholders to develop plans for network investment and system design, with an increased focus on local planning and delivery under their new funding obligations. Ofgem's Review of Local Energy Institutions and Governance, and Regional System Planning consultations are now exploring what is likely to be a prominent future role for local and community energy in the energy system (Ofgem 2023).

This new prominence of local energy planning can support the development of local energy projects and systems, in close tandem with communities and citizens. It can also allow local authorities to better plan their decarbonisation efforts, and begin to mobilise necessary local skills and finance.

Outside of LHEES, there is no set standard for the level of energy planning local authorities or stakeholders are currently expected to deliver – in Scotland or across the UK. The level of skills and resource that local authorities have in-house can also vary substantially, making it difficult to deliver more ambitious projects consistently across the country.

7 Recommendations

It is clear that different forms of local and community energy can make a significant contribution to Scotland's eight National Just Transition Outcomes. New developments, particularly in community heat and efficiency, local energy systems and local energy planning, also present new opportunities.

However, key barriers remain to realising these at scale. Local or community-owned energy is also not automatically more 'just' than larger-scale developments. Who owns, governs, participates in, funds and benefits from local and community energy projects will impact how 'just' they ultimately are. Leveraging local and community energy for just transition outcomes thus means:

- Better enabling the delivery of more projects in more places
- Making sure projects embed just transition principles throughout

To support this, we have developed the following six key overarching recommendations for Scottish policymakers and delivery bodies, energy industries, communities and wider stakeholders, which can help unlock local and community energy going forward:

- **Increase community capacity and outreach:** Increase resource for and awareness of local and community energy, to support capacity-building and effective project engagement – particularly in underserved communities.

- **Support delivery and innovation:** Support the development of new local and community energy models, including the skills and networks required for community and local authorities to fully embrace them.

- **Enhance ownership and governance:** Expand community and local ownership of energy, ensuring that ownership and governance of projects are accessible, accountable and transparent, with proactive inclusion of marginalised or excluded groups.

- **Increase participation and engagement:** Ensure that all groups and communities can realistically engage with local and community energy projects, to participate in governance and decision making, and shape ideas from the beginning.

- **Develop finance, funding and investment:** Develop sustainable finance and business models that ensure those who can't afford to pay are not excluded from participation or benefit and that maximum value is retained locally, with just transition outcomes explicitly prioritised.

- **Open up benefits to beneficiaries:** Open the benefits of local and community energy projects to as wide a range of people and places as possible, including everything from household decarbonisation and bill savings, to skills and supply chains.

These recommendations are applicable across community energy, local energy, and local energy systems. The following sections give specific actions to realise these, and explain how these suggested actions are supported by research.

7.1   Increase community capacity and outreach

Recommendation 1: Increase resource for and awareness of local and community energy, to support capacity-building and effective project engagement – particularly in underserved communities.

Community energy projects often aim to target lower income areas, to challenge fuel poverty and deliver benefits to often disadvantaged places (Stewart 2021; Community Energy Scotland 2022; Community Energy England 2022; Cairns et al 2023). However, projects in lower income areas can still be few and far between. Community energy literature highlights that in Scotland, the UK and more broadly, areas of higher deprivation and places without strong existing development associations or community energy groups can struggle to develop and participate in community energy projects (Hanke et al 2021; Brummer 2018).

Although Scotland has fostered a favourable policy environment for community energy, community energy organisations and third sector stakeholders recognise this issue, and note that there remains a lack of consistent capacity and resource within communities to deliver or participate in projects at a wider scale.

This makes it challenging for more communities to participate in community energy, local energy developments, or to pursue shared ownership arrangements. Expanding resource for capacity building and raising awareness for local and community energy would help develop National Just Transition Outcomes in these areas.

Action: Run a large-scale awareness-raising campaign around community energy, the potential benefits it brings, and entry points for communities

Our research with community energy stakeholders, third sector organisations working directly with the public, and citizens in our People's Panel has shown that awareness of community energy among the general public remains low. Of the 22 participants in our People's Panel, only one had heard of community energy prior to this engagement. Community energy groups and wider community organisations also reported encountering a lack of awareness when they engage in new areas.

To deliver more community energy projects for just transition outcomes, there is a need to improve awareness of the sector, and its possibilities, across the board.

Action: Support the hiring of local and community energy development officers at a more consistent local level

Research from Slee (2020) highlights that the success of community energy projects largely depends on there being skilled and knowledgeable actors with local as well as business and technical knowledge in a particular community. At present, Local Energy Scotland have eight regional development officers. However, this is not seen by local, community or energy innovation stakeholders as granular enough to build meaningful local capacity in diverse communities across the country.

Local and community energy stakeholders (again highlighted by Slee, 2020) likewise cited that it is often the same organisations, groups and development trusts which apply for funding because they know the process and have some capacity and expertise already, with limited applications from new groups or areas.

To better unlock new projects in new areas for just transition outcomes, skilled development officers employed at a more granular spatial scale, such as local authority for instance, could allow for more targeted local development and encourage better links between local authorities and communities.

Action: Expand CARES funding to provide a wider range of support, such as capacity building and more substantial core staff resource for community energy organisations

The CARES programme, managed by Local Energy Scotland, successfully supports community energy projects in Scotland with loans, grants, and procedural assistance. To date, it has been one of the first ports-of-call for community energy. However, local and community energy stakeholders called for two key improvements to be made to the CARES programme.

Firstly, local and community energy stakeholders argue that CARES may benefit from being more flexible in its funding criteria across calls and programmes. Organisations involved in our research noted there is not enough funding available to build capacity or pay community energy volunteers for their time without there first being a project in place, which makes it difficult to develop sustainable projects, particularly in new areas, or retain people to drive projects forward. Enabling more funding for capacity building and core community energy staff in particular would allow existing projects to expand, explore new models and options and help more projects to come to fruition in new and different places.

Action: Develop a roadmap of the support that CARES provides throughout the project process to make it clearer to local and community organisations

Second, our research participants commented that the support that CARES can offer to community organisations, particularly once a project has been established, is not always clear. Signposting to the website is useful but once there, community organisations note that specifics on the support available at different project stages is lacking in detail. An accessible, easy-to-navigate roadmap outlining precisely the support available at each stage of different types of project (wind, solar, hydro, generation, heat, transport, etc.) would help demystify this for prospective new community energy organisations.

7.2. Support delivery and innovation

Recommendation 2: Support the development of new local and community energy models, including the skills and networks required for community and local authorities to fully embrace them.

Innovation has been a cornerstone for both local and community energy. Community energy has often innovated by necessity, while local energy systems such as those trialled under the Prospering from the Energy Revolution programme have pushed innovation at the nexus of technology, business models and regulation in recent years. These innovations present new opportunities to deliver against just transition outcomes which the Scottish Government can more effectively support.

Action: Build on Heat in Buildings and Net Zero Skills Strategies to include training around local energy systems for local authorities and interested industry stakeholders

A wealth of evidence already exists on the opportunity, barriers and operationalisation of local energy systems across the UK (Regen 2023; Energy Systems Catapult 2022).

A key challenge that remains relates to the lack of skills within local authorities to spearhead local energy system developments (Chitchyan and Bird, 2022). While LHEES has improved local energy understanding, local authority stakeholders note that there is still often a lack of skills (and resource) for local energy projects in general. These skills gaps include creating appropriate partnerships, engaging the community, knowledge-sharing and developing successful business models and governance structures within current regulatory frameworks.

Developing flexible, modular training with bodies such as Skills Development Scotland or the Improvement Service, or learning from knowledge-sharing initiatives such as the GreenSCIES local energy Centre for Excellence (UKRI and Regen 2022) could help to overcome this issue, and help contribute to the capacity within local authorities to take local energy projects forward.

Action: Work with prospective public and commercial sector stakeholders to promote community energy as an option for their energy supply

In the absence of a steady revenue stream for community energy generation projects, some are increasingly exploring Power Purchase Agreements (PPAs) with public and commercial organisations.

These PPAs can help to provide revenues through which community energy can deliver across all NJTOs to some degree (depending on local need and ambition). Bringing several PPAs together (i.e. selling community generated electricity across several sites to feed a single community benefit fund) can also make projects more attractive to local businesses and investors.

However, community organisations within our research noted they often struggle to find suitable organisations or to explain to key individuals within the organisation why this would benefit them and their local community.

The Scottish Government could support this process by convening public and commercial sector energy users to raise wider awareness of local or community energy power purchase arrangements, and highlight the option of partnership with community energy in public and commercial sector procurement guidance.

Action: Develop new funding models for local and community approaches to energy efficiency, retrofit and advice

Energy efficiency and retrofit services have been a rapid growth area for community energy. However, stakeholders note that community-led efficiency and retrofit relies heavily on short-term competitive grant funding, with business models still in early stages. This makes it challenging to develop effective, sustainable community-led solutions.

To enable this value, community organisations working in this space note there is a need to support them to develop new business and delivery models, potentially in partnership with local authorities. Building on existing funding routes such as CARES, the future National Public Energy Agency could work with community and local partners to support the coordination of investment and development of new community efficiency and retrofit funding arrangements.

Action: Work with the Convention of Scottish Local Authorities (COSLA) and local authorities directly to identify and address key friction points within the local energy planning, approval and delivery processes

In our People's Panel, participants noted that communities and local authorities should face a minimum of red tape in getting projects up-and-running, allowing them to innovate, demonstrate and deliver value sooner. Local authority stakeholders also noted that this is a key issue.

Because projects must navigate a range of local authority departments and sign-off processes (not including wider processes such as securing grid connections and meeting regulatory requirements), they can be held-up or fail due to political timeframes and pressures such as local or Scottish Government elections. There is thus a need to ensure that projects can progress more efficiently within and alongside these democratic processes. Local authority stakeholders and examples from other local energy projects such as GreenSCIES in London suggest that streamlined project processes within local authorities (potentially with a single embedded local energy officer) would help to ensure projects can progress overall, both within election cycles and in the longer-term.

7.7 Enhance ownership and governance

Recommendation 3: Expand community and local ownership of energy, ensuring that ownership and governance of projects are accessible, accountable and transparent, with proactive inclusion of marginalised or excluded groups.

Who owns local and community energy projects can have a direct impact on how much they contribute to just transition outcomes. Research from Aquatera (2021) compared 9 community owned winds farms against 4 commercial wind farms and found that the community-owned wind turbines in Scotland have generated, on average, 34x more in community benefit payments than the developer-led projects.

Where projects are locally or community owned – particularly by communities and local authorities – evidence suggests that the main outcomes tend to be aligned with just transition principles (Stewart 2021; Creamer et al 2019; Hanke et al 2021). This can also enable more value to be captured locally overall than, say, projects led by developers alone. As such, enabling more local and community ownership of energy can help to deliver greater value against just transition outcomes.

Community and local ownership is not fairer by default, however, with a need to ensure that ownership and governance structures are fair, accessible, and transparent (see Section 1.14).

Action: Develop clear targets for community energy

Although cited as a priority for Scottish Government in the Local Energy Policy Statement, community-owned projects account for only 11.1% - 101 megawatts - of total operational local and community energy capacity as of December 2023 (Scottish Government Energy Statistics Hub, 2023). Scottish Government does have a target of 2 gigawatts operational local and community energy by 2030. However, this target also includes non-community owned projects such as public sector and local authority projects, and projects led by farms and estates.

Research shows that clarity in government targets can provide a signal to stakeholders to help stimulate innovation and action among businesses, developers, and communities towards net zero – including in community energy when paired with wider measures and support (Hewitt et al 2019; Yeow et al 2017). Community energy and just transition stakeholders similarly note that making clear how much of the 2030 target is expected to be community-owned would set a clearer vision for communities overall.

As a means to stimulating more community ownership and innovation and redoubling this ambition within the final ESJTP, the Scottish Government could outline how much of the remaining 2 gigawatt target is to be met by new community-owned projects specifically.

Action: Enable greater community ownership through local energy planning

Identified by both local authority and wider local energy stakeholders, local energy planning presents a new opportunity to support community ownership and more democratic input on local energy ambitions overall. Within local energy planning processes, such as LHEES, LAEP or heat network zoning, local authorities can identify sites that would be appropriate for community energy projects, particularly generation and heat, and work with community organisations to develop them.

In theory, this is a win-win situation: community energy organisations have a wider scope of potential projects, while local authorities can be supported by community organisations to deliver against their energy ambitions.

Action: Develop the potential for local authority shared ownership

While the Scottish Government has set out its principles for community shared ownership of renewable energy developments (2019), there is no similar guidance at present for local authorities. With the development of the Regional System Planner at UK-level and other trends towards greater local authority participation in energy decision making and projects (Ofgem, 2023; PwC, 2022; Green Finance Institute, 2022), local energy and finance stakeholders highlight that this could be a useful vehicle for establishing more local ownership of energy assets.

Where communities are deemed less-well equipped to participate in shared ownership, providing guidance for local authorities to invest in shared ownership projects could create a new avenue to capture value from larger developments, potentially creating new local authority revenue streams or community benefit funds. This is already included in shared ownership guidance in Wales, for instance (Welsh Government, 2022). Building on Scottish Government's existing Community Shared Ownership Best Practice Principles (Scottish Government, 2019), working with COSLA to understand the potential role and opportunity for local authorities in shared ownership arrangements could be a useful undertaking.

7.9   Participation and engagement

Recommendation 4: Ensure that all groups and communities can realistically engage with local and community energy projects, to participate in governance and decision making, and shape ideas from the beginning.

Often those groups typically already excluded or disadvantaged in society also face risk of exclusion within local and community projects (Knox et al 2022). Without ensuring that those most at-risk of exclusion can engage and participate directly, there is a risk that projects do not reflect the needs of those groups and people, and that those people are in turn excluded from wider benefit. Table 6 illustrates key barriers for specific excluded groups as identified in our academic literature review.

Expanding capacity and outreach as outlined in Recommendation 1 can go some way to overcoming this issue. However, it is important to consider the specific needs of these groups to ensure they can participate in, and benefit from local and community energy projects. This includes paying attention to project design, engagement, decision making, governance and benefit allocation (Knox et al 2022; Huggins 2022).

Table 6: Groups with additional barriers to engagement and participation

Group	Key barrier(s)	Need
Low income	Upfront financial cost of share-based community energy; material time and resources.	Exemption from up-front costs; tailored, rewarding and inclusive engagement; alleviated responsibility for legal, procedural or technical issues.
Disabled people	Additional/unique energy needs; material time and resources.	Tailored, rewarding and inclusive engagement; deeper understanding of need; alleviated responsibility for legal, procedural or technical issues by qualified or experienced actors.
Migrant and ethnic minority communities	Language, communication and engagement; ownership and legal rights.	Tailored, rewarding and inclusive engagement; multilingual and accessible resources (on energy but also in housing and legal rights).
Older people	Understanding of new technologies or systems; communication and engagement.	Tailored, rewarding engagement and support; alleviated responsibility for legal, procedural or technical issues by qualified or experienced actors.
Private rented sector	Ownership and legal rights.	Clear outlining of responsibilities; working with PRS landlords and tenants to shape potential project frameworks.
Residents of flats and tenements	Ownership and legal rights; physical and housing.	Multi-occupancy building solutions; projects with more holistic local benefit; working with PRS landlords and tenants to shape potential project frameworks.
Rural and off-gas grid	Physical and housing.	Tailored solutions; support with local energy infrastructure.
Young people	Ownership and legal rights; finance and governance.	Tailored engagement; consideration of future generations in project and policy planning.

Action: Ensure best practice principles for co-design and engagement

Ensuring as many people as possible can help to shape, participate in and benefit from local and community energy requires proactive, targeted and meaningful engagement with all groups within a community or area – particularly those most disadvantaged or at risk of exclusion already.

To do so, our People's Panel echoed that there is a need for a shared standard of best practice in community engagement across local and community energy projects, starting at the earliest possible stage with broad promotion, to allow citizens and communities to meaningfully co-design projects from the very beginning. As highlighted above, using trusted intermediaries can be one effective way of reaching groups most at-risk of exclusion, although other methods such as targeted doorstep or community engagement may be more appropriate in some circumstances.

Several organisations such as the Scottish Community Development Centre and Project LEO in Oxfordshire have already created standards for community engagement and local energy respectively (Huggins 2022). For example, the Scottish Government and COSLA recently delivered their own 'Planning With People' initiative which outlines best practice for community engagement on local health and social policy. The Scottish Government has also been leading a trial of green participatory budgeting. This activity can provide useful groundwork for increasing local and community energy.

Our research therefore suggests that the Scottish Government should build on other examples of best practice, such as the Good Practice Principles for Community Benefit in Onshore Wind Developments (2019) and encourage local authorities, community energy groups, developers and relevant stakeholders to adopt a shared best practice standard for citizen and community engagement in all new local and community energy projects.

Action: Make governance of projects more transparent, inclusive and accountable

Once projects are established, how they are then governed (who makes decisions, what the processes for decision making look like) has key justice implications. Issues have been noted in the energy justice literature (see Hanke et al 2021), for instance, with community benefit funds that are determined by developers and spent largely by those more active and engaged members of a community, excluding those more socially isolated, meaning outcomes could fail to reflect their needs.

Likewise, experience from previous innovation projects shows that local projects can be decided by leading partners and organisations, with limited local or community direction. Ensuring proactive engagement with communities and inclusive, accountable governance structures that do not rely on people paying money to participate can help increase public support and promote fairer outcomes and processes.

Action: Formalise the role of third sector and advocacy organisations as trusted intermediaries

Trusted intermediary organisations such as fuel poverty charities, community groups, mutual aid initiatives, faith groups and third sector more generally are crucial to supporting

people into local and community energy projects, and net zero more widely (Slee, 2020; Stewart, 2021). Such organisations can support engagement and outreach with often-excluded communities, and help to advocate for their needs within policy, project and development processes.

However, third sector and fuel poverty stakeholders note consistently that these organisations are under resourced – an issue made especially acute during the recent energy crisis (Citizens Advice, 2023). This means that although many organisations are open to supporting energy and just transition projects, they are severely limited in their capacity to do so. Funding for these organisations tends to be competitive on an annual basis, meaning that staff spend a lot of time applying for the next round of support. This also means that longer-term capacity building, upskilling, and working with people and places is difficult.

Third sector stakeholders working in equalities and fuel poverty in particular, along with just transition researchers, highlight that more stable, longer-term resourcing for trusted intermediary organisations such as their own (including established community energy groups) would help to enable better capacity building and representation of excluded communities, along with clarifying the role Scottish Government expects these organisations to play across the ESJTP. The Climate Policy Engagement Network could provide one forum for engagement with these partners.

7.7   Develop finance, funding and investment

Recommendation 5: Develop sustainable finance and business models that ensure those who can't afford to pay are not excluded from participation or benefit, and that maximum value is retained locally with just transition outcomes explicitly prioritised.

Local and community energy projects rely on a range of finance and funding sources (Cairns et al. 2023). Where this funding comes from, who pays, and what happens to the revenues are all important just transition questions.

All funding types can support NJTOs and a wider just transition in theory, but not necessarily by default (as discussed in section 3).

Table 7 outlines the key issues with different funding models. As such, supporting a just transition means ensuring that finance, funding and investment are fundamentally aligned with just transition outcomes first and foremost.

Table 7. Overview of finance and funding sources for local and community energy

Type	Overview	Types of projects	Risks and barriers
Share offer	Citizens buy shares in a community or shared project, for a small return on investment (proportionate to size of share) and say in decision making.	Community energy (generation, supply, heat, transport, services); shared ownership.	Only people with money to invest get a share of ownership or say in decision making; investors are not always local.
Grant and innovation	Innovation funders such as UKRI provide grant funding for new projects.	Partnership; research, innovation and demonstration; development.	Often focussed on 'cutting edge' tech innovations with limited consideration of social, replicability or more incremental changes; can prioritise innovation-first with just transition impacts secondary; limited accountability or legacy.
Public	Government or similar, such as CARES or the Low Carbon Infrastructure Transition Programme (the latter now closed).	Community energy; local authority.	Limited amounts available; funding can be designed for a specific or narrow purpose.
Public-private finance	Public sector such as a local authority (or community group) works with private investors or businesses to raise capital for projects.	Integrated local energy systems (local authority-led, see Bristol City LEAP); larger community energy projects.	Projects often need to be larger-scale; just transition may be a secondary consideration.
Community benefit payments	Community benefit payments, either from developers, networks, or via private philanthropy.	Community energy predominantly, although could be leveraged by public bodies such as local authorities.	More active community members decide how funds are spent; risk of prescribing what communities should do with their funds; potential for some communities to lose out.

From this analysis, there are four key issues for just transition outcomes:

- **Share offers** are often exclusionary of lower income groups within community or shared ownership. However, individual projects can stipulate exemptions to ensure people can still participate, with a need to encourage this on a consistent basis.

- **Grant and innovation funding** is often short-term and overly innovation-focussed, with a lack of support for scaling-up or more social and business model innovation. It can also prioritise innovation first with just transition value treated as secondary, while projects often wind down with no lasting legacy for communities.

- **Public funds** are available and welcome, such as in the recent Heat Networks Fund, although there is a strong sense that these are not adequate at present for local authorities to fully deliver LHEES, for instance, or for community energy projects to be established at scale.

- **Private finance** is playing an increasing role in local authority and larger-scale integrated projects, such as Bristol City LEAP. However, stakeholders interviewed across different sectors are cautious about previous experiences with the Public Finance Initiative and the risk that private investment may lead to value leaving local areas.

Action: Explore new private sector funding models for local and community energy

With more public-private finance models, there are various opportunities for businesses and organisations to invest in local and community energy projects, which in turn can support other just transition outcomes (such as decarbonisation & efficiencies, and citizens, communities & place). Many already do invest in community energy share offers, via community or municipal bonds, or through partners such as Triodos Bank and Abundance Investment.

However, stakeholders in the finance and investment space note that without the Feed-In Tariff, the return for local or community projects is generally less attractive unless projects get to a larger scale (e.g. a high number of aggregated PPA agreements or more ambitious integrated local energy systems).

Closer working between the Scottish Government and the Scottish National Investment Bank (SNIB) on community and local energy is one viable option to help to overcome this issue. While the SNIB typically invests in £1 million+ projects, it could begin to work closely with local and community sectors to develop new models and instruments and help build better financial networks. It could also help aggregate projects to create a larger, packaged proposition which is more lucrative to investors. 3Ci's (2022) regional net zero investment forum, which brings together the finance community, local authorities, policymakers, developers, businesses and community enterprises in different regions across the UK, has already made some progress on this.

Action: Incentivise just transition outcomes in policy, procurement, and funding decisions around local energy projects or systems – especially where commercial, innovation or private finance are involved

There is also general understanding across stakeholders that private investment has a strong role to play in reaching net zero and delivering more ambitious local projects (Green Finance Institute 2022; UKRI and Regen, 2022a). Our People's Panel participants likewise told us that it does not strictly matter where money comes from, so long as the primary beneficiaries are people and places first, with strong consideration of just transition outcomes and an offer of shared ownership as standard.

To ensure this, where innovation or private finance is involved in local and community energy projects, there is a need for just transition guidance in funding and procurement processes. This should also be considered together with Community Wealth Building and relevant National Planning Framework legislation.

Action: Ensure adequate strategic funding for local energy delivery (and beyond)

Beyond project funding models, local authorities note that short-term annual budget cycles make it difficult to develop longer-term projects or strategies. Local authority and wider UK local energy stakeholders note that this current model of funding has led to a disparity across local authorities in energy efficiency schemes in particular, with many drastically underspending on their allocated budgets.

This makes it difficult to mobilise local jobs and skills to meet decarbonisation and efficiency plans (and fuel poverty targets), limiting the appetite for businesses to emerge, upskill, or retrain to deliver on these ambitions – and for investors. Skills and jobs for the delivery of energy projects are a well-cited and evidenced barrier to progress here more generally (Chitchyan and Bird, 2022; UKRI and Regen, 2022b). This was also highlighted in the Scottish Parliament's 'Role of local government and its cross sectoral partners in and delivering a net-zero Scotland' report (Scottish Parliament, 2023).

Our research shows the importance of reviewing funding required for the on-the-ground delivery of local energy plans and projects such as LHEES, and reforming existing budgets and processes to allow for more strategic, longer-term planning and investment. Much of this work is already underway in the delivery of the Heat in Buildings Strategy. As such, there is a need for the Scottish Government to accelerate efforts with local authorities to develop more appropriate funding models, and deliver long-term budgetary plans as a signal to investors, and to industry, to mobilise skills and supply chains.

7.8   Open up benefits and beneficiaries

Recommendation 6: Open the benefits of local and community energy projects to as wide a range of people and places as possible, including everything from household decarbonisation and bill savings to skills and supply chains.

As evidenced throughout this report, local and community energy can carry substantial benefit against Scotland's NJTOs and for local people and places more broadly.

However, not everyone can currently experience those benefits directly, due to financial, physical or other reasons. For instance, people on low incomes will struggle to buy in to community share offers and so will not receive any financial return from projects, nor have a say in project governance.

Similarly, people in the private rented sector or multi-occupancy buildings will struggle to benefit from initiatives which include new technologies or energy efficiency measures due to legal and physical challenges.

In addition, some of the benefits identified in previous sections of this report have yet to be fully enabled. This includes the realisation of new jobs and skills, which is a common issue in net zero energy delivery more broadly (Chitchyan and Bird, 2022; UKRI and Regen 2022b).

Beyond the recommendations already provided, there is thus a need to consider how to enable benefits of all kinds that reach a wider number of people, and that carry impact against Scotland's net zero, energy and just transition ambitions at scale.

Action: Conduct policy engagement with identified groups (e.g. low incomes, those in the private rented sector and multi-occupancy buildings) to establish new ways for them to participate in and benefit from local and community energy projects

Where local or community energy projects include installing measures in people's homes which deliver financial, health or environmental value – such as solar and storage, heat pumps, heat networks, efficiency or as part of wider local energy systems – certain groups face key barriers to benefitting directly.

Research such as that by Knox et al (2022) outline how people living in the private rented sector in particular will struggle to participate and experience benefit due to legal questions over ownership and responsibility. This is also true of those living in flats with different housing tenures.

People living on lower incomes will likewise struggle to invest in community share offers, meaning they have limited opportunity to gain individual returns or participate in the governance of projects that require up-front investment as a result.

As such, there is a need to work directly with these groups, tenant associations such as Living Rent, landlords and local authorities to develop frameworks that allow people living in those situations to also participate and benefit. As outlined by our People's Panel, this should also encourage projects to deliver wide benefits to the local community, not based solely on ability to pay or invest.

Action: Work with education and training providers, industry, and local energy stakeholders to set out the skills and business opportunities for local and community energy

Local jobs and skills are often slated as a key opportunity from local and community energy, including within the Scottish Government's Local Energy Policy Statement (2021). However, these opportunities are still to materialise at scale in Scotland and the UK more broadly, with a stubborn reliance on volunteers in the community sector in particular (Institute for Public Policy Research, 2023; UKRI and Regen, 2022; Community Energy Scotland 2022; Climate Change Committee 2023).

Reviewing the Heat in Buildings Supply Chain Delivery Plans and Climate Emergency Skills Action Plan (CESAP) could provide an opportunity to outline requirements for local energy skills specifically. This could include working with energy and training organisations such as Skills Development Scotland and local and community energy partners including industry and local authorities, to provide a clear analysis of opportunities within the local and community energy sectors.

This could also include specific assessment of the jobs and skills needed to deliver on the 2 gigawatt target (and to enable local and community energy at scale more broadly), and an articulation of pathways for people and businesses to access new opportunities.

8 Policy dependencies and responsibilities

8.1 Policy dependencies

Outside of the immediate local and community energy policy space, there are some key policy interdependencies that should be considered when aiming to better enable local and community energy approaches. Working across these areas will be crucial to ensuring effective delivery of local and community energy going forward.

Based on the research covered in this report and Regen's own critical analysis, Table 8 sets out potential additional actions for a (non-exhaustive) list of key dependencies that could help move local and community energy forwards for just transition outcomes.

Table 8: Policy dependencies and suggested actions

Policy/area	Suggested action(s)
Community Wealth Building	Explore the specific findings from the current Community Wealth Building consultation (2023) around local and community energy, in light of the analysis and recommendations presented within this work.
Heat in Buildings (HiB) Strategy	Identify opportunities for local and community models to formally support a more inclusive heat and efficiency transition within LHEES, including reaching those in the private rented sector.
	Develop local and community demonstration projects targeted to support those in fuel poverty and assess their scalability, in line with Scottish Government statutory targets to eradicate fuel poverty by 2040.
National Public Energy Agency	Establish role of NPEA in supporting community energy, heat and efficiency approaches, and expected role in supporting local authority project delivery, including potential for coordinating investment.

National Planning Framework 4	Prioritise community projects and ensure consideration of community ownership opportunities in planning decisions, particularly which speak to just transition outcomes and key climate adaptation, resilience, and environmental protection standards.
Land reform and community right-to-buy	Research the viability of community-owned land and energy together, with a focus on the business model and widening access to identify suitable sites both rurally and in towns and cities.
	This should include local authorities as a potential buyer/seller of land, and discussions with partners such as Crown Estate Scotland.
Heat Networks (Scotland) Act (2021)	Ensure timely delivery of the regulatory provisions set out in the Heat Networks Act within the 2024 timeframe to enable rollout and acceleration of heat networks across Scotland, particularly for local authorities.
	Encourage consideration of local and community approaches that can enable better just transition outcomes and benefits for other key dependencies, such as in tackling fuel poverty.

8.2   Reserved policy areas

As aspects of energy policy and regulation in the UK are reserved, there are limitations to the work that Scottish Government can do to fully enable local and community energy. Many of the policies required to support local and community energy – particularly in energy market regulations which govern electricity supply, Feed-in Tariffs or Contracts for Difference, and recognising the value that local energy systems can offer to the energy system more widely within regulatory incentives – are not within the Scottish Government's remit.

However, there are a number of key reform packages and opportunities currently open to the Scottish Government to seek to influence the UK Government to promote Scotland's local and community energy and just transition ambitions. These include but are not limited to:

- Review of Electricity Market Arrangements (DESNZ, REMA)
- Contracts for Difference (DESNZ, separately and under REMA)
- Review of Local Governance and Institutions and the development of the regional energy strategic planner (Ofgem)
- Grid connections reform (Ofgem, National Grid ESO)

Table 9 gives a high-level overview of key reserved issues. This sets out some of the primary issues, how primed each currently is for delivery, and some suggestions for what is required to meet Scotland's local and community energy and just transition ambitions at once.

Table 9: Reserved issues

Issue	Issue	Need	Opportunities for influence	Benefit
Revenue certainty	Absence of Feed-in Tariff and comparatively low Smart Export Guarantee makes for challenging financial proposition.	Predictable revenue stream for local and community generators, potentially through a Contracts for Difference scheme or similar.	Reform of Contracts for Difference and Review of Electricity Market Arrangements.	Revenue certainty for new projects, allowing for expansion of LCE overall and new income for JT outcomes.
Grid connections	LCE struggling to compete with established developers for grid connections, long delays in queue management.	Priority (or parity) within grid connections process, recognising value of LCE; more proactive collaboration from DNOs to support LCE in the process.	Ofgem grid connections review, ongoing engagement with DNOs (particularly SPEN and SSEN with Just Transition strategies).	LCE can connect to the grid more easily, allowing projects to come online faster and generate benefit.
Centralised planning of energy system	Energy system planning still very centralised in the UK, with limited local input at present.	Energy system planning that recognises opportunity of LCE and includes local and community partners within the process directly.	Regional Energy Strategic Planner consultation and detailed design phase (next step of review of Local Governance and Institutions), DNO move towards system optimiser role; Consultation on Distributed Flex.	More localised thinking in energy system planning, with more locally-minded solutions and value.

9. Conclusions

This report has analysed the potential role of local and community energy in delivering against Scotland's National Just Transition Outcomes. This analysis and the subsequent recommendations have been informed by extensive review of literature and research, stakeholder engagement and discussion with citizens directly via our People's Panel.

From this analysis, it is clear that local and community energy can be a critical part of Scotland's just transition ambitions, contributing across all of Scotland's National Just Transition Outcomes. This contribution could be supported through locally-tailored solutions and maximising inclusive ownership, participation, governance and benefit captured from Scotland's immense energy landscape.

Enabling this requires supporting the growth of the local and community sectors overall, and building just transition principles into those projects and processes. The ambitions and recommendations throughout this report set out how to achieve this in practise, with key actions for Scottish policymakers and delivery partners.

Our research has also found key barriers to delivering against these outcomes across sectors: limited resources to build capacity for local and community energy projects in underserved areas; challenges around skills and project delivery processes particularly within local authorities; justice and equity issues within projects themselves; and lack of appropriate finance and business models.

Beyond the research and recommendations presented here, we identified other areas that would benefit from further, specific exploration within the local and community energy and wider energy sectors. These are:

- community ownership of land and housing, the role of local authorities in supporting these and how energy can be brought together within that; and,
- repowering and end-of-life onshore wind projects, and how local authorities and communities can start to take ownership of these; as many wind farms come to the end of their first contracts, there is a need to work with local energy stakeholders and developers to fully understand the potential for community ownership.

While relevant, more detailed analysis of these two issues would help shine a light on potential further opportunities for the local and community energy sectors, and on the delivery of even further value against Scotland's National Just Transition Outcomes.

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11 Appendices

11.1 Appendix A: Methodology

We used three key methods in the delivery of this project. These were:

- Systematic review of academic and policy literature
- Interviews with key stakeholders
- Deliberative "People's Panel" with Scottish citizens (Appendix B)

These methods were selected to give us as rounded a view of the opportunities and barriers for local and community energy as possible. More details on review and interviews are given below, with a more extensive overview of the People's Panel in Appendix B.

Systematic review of academic and policy literature

Leveraging previous academic expertise of the project team, we conducted a review of relevant literature in the field of local and community energy with reference to a just transition. In total, we reviewed nearly 100 documents, including peer-reviewed journal articles, consultant reports, case studies, and policy documents from the Scottish and UK Governments.

Articles were sourced using search terms in Google Scholar. We first searched "local energy", "community energy", and "just transition". We then expanded our search to include local/community energy and the different just transition outcomes.

Policy documents were sourced from the Scottish and UK Government websites, online search engine searches, and early informal interviews with key local and community energy policy experts. Within Regen we have vast experience of the local and community energy space, including developing the Community Energy England, Scotland and Wales state of the sector reports for 2021; delivering ongoing engagement and convening with community energy organisations and the wider energy sector via our network-funded communities programme (Regen 2023); and advocating for community energy within policy and regulatory consultations such as delivering benefits from offshore wind (and supporting community organisations to do the same). Finally, we sourced cases by reviewing innovation projects such as Prospering from the Energy Revolution, and through asking stakeholders for recent developments.

Once documents were sourced, they were reviewed for evidence and analysis around the eight NJTOs specifically, as well as lessons for delivering more just processes and outcomes. These were collated within a single spreadsheet, with this spreadsheet then discussed by the project team to establish key themes and content.

Interviews with key stakeholders

Once this review was complete, we interviewed 22 key expert stakeholders working across local and community energy, community energy organisations, local authorities, innovation, renewable energy businesses, equalities and social justice, just transitions, and third sector.

This diverse base of people was chosen to help give a rounded view not just of local and community energy, but to glean insights from relevant sectors to help shape a future look at local and community energy to ensure it works for NJTOs. These were identified through existing Regen, Scottish Government and industry networks.

It is worth noting that there was higher representation from both citizens and local and community energy practitioners than e.g. renewable energy developers and businesses in this process. This was deliberate – citizens and local and community organisations, particularly those working on just transition issues, have been less often engaged in such discussions yet can provide crucial insights on how to best open up local and community energy for a wider range of just transition outcomes. However, recommendations in turn reflect more the perspective of those stakeholders. Further engagement with energy developers and businesses would help make recommendations more robust.

These interviews took place online during the months of February-April 2023. Each lasted between 45 minutes and 1 hour. Feedback was anonymised during the analysis process. We asked specifically where people had seen local and community energy working for just transition outcomes already, the key issues that local and community energy might face in working for just transition outcomes or processes, where they felt local and community energy could add more JT value with the right support, and how we could best enable this (relevant to people's area of expertise). Questions were developed from a combination of evidence from the literature review, and to target the key research aims of the work agreed at project inception.

To supplement, we also held an informal online workshop of local and community energy stakeholders in the UK, to discuss these themes in an open forum with experts from a more technical and specialist perspective. In this workshop, stakeholders included some of those interviewed, but were mostly made up of local and community energy stakeholders from outside Scotland, allowing us to glean a more rounded view of the sector and recent developments elsewhere in the UK. This workshop did not influence recommendations directly, but rather helped us track any new and emerging trends in this space identify key just transition questions (particularly around local project processes, innovation, system operation and governance) for further investigation in the Scottish context.

11.2 Appendix B: People's Panel

To fully understand how local and community energy can support all communities and regions across Scotland, Regen commissioned Shared Future to co-design and run a People's Panel.

A People's Panel is a deliberative process, bringing together citizens from a sample of the population to learn about a topic and 'co-design' policy recommendations. People's Panels, and other types of deliberative processes, are particularly powerful tools for addressing policy issues that impact and involve people. They allow for ideas – such as different models of community and local energy – to be tested amongst the target population, they help explore barriers around engagement and participation, and they add democratic legitimacy to policy development. The goal of our People's Panel was to answer the question:

"The way we use energy in our homes and communities is changing, with many communities and councils developing their own solutions.

How should this be done so that it involves and benefits people in a fair way?"

To address this question, Shared Future recruited 22 people from across Scotland to participate in four online sessions over the course of three weeks. In these sessions, participants hear from 'expert witnesses' who present on the relevant topic of the day in clear terms, with participants discussing what they've heard and questioning witnesses for more information.

Expert witnesses were chosen by the wider project team (including our academic steering group) as people who either (a) were considered experts or leading practitioners in their field, and/or (b) led an interesting real-world case study. This did not include a "traditional" commercial renewable energy developer. Experts were briefed extensively by the Shared Future team as an impartial partner, to eliminate biases and ensure that presentations were as clear and understandable as possible. The aim was not to promote local and community energy, but to present participants with different models, examples and ideas to understand their perspectives. We had two expert witnesses per each session, covering:

- How the energy system works and how it is changing to become more local and renewable (energy systems expert Calum Watkins - Smarter Grid Solutions, and local energy expert Rebecca Windermere - Regen)
- Community energy (Glasgow Community Energy; Local Energy Scotland who replaced Community Energy Scotland due to scheduling clashes)
- Local energy (North Ayrshire Council; the Blairgowrie Heat Project; smart local energy expert Jess Britton - UKERC) and
- Larger developments and shared ownership (Ripple Energy, Local Energy Scotland)

From these sessions with witnesses and wider discussions, participants then deliberated and worked together to identify 20 key principles for developing local and community energy such that it involves and benefits people in a fair way. These are grouped into 7 key themes (below).

Of these participants, only 1 had heard of local or community energy before. A stratified random sample of the population was used to gain perspectives from people who had not worked in this space before, and from diverse social and economic backgrounds. The same

22 participants attended each session, and were paid £110 each in vouchers of their choosing for their time.

Theme 1) Definitions

This theme relates to clarity of definitions surrounding the energy project itself, the roles and responsibilities of those involved, and the budget.

It includes three principles:

- How the project will work is clear; how long it will last, what are the personal and community benefits of being involved etc. This is made easy to understand.
- It has been agreed and is clear what roles and responsibilities there are and how much time commitment is needed by people who want to take part. This will enable people to play to their strengths and feel ownership.
- Transparency of the budget is clear to all.

Theme 2) Goals and outcomes

This theme brings focus to how aims, success metrics, shared values, priorities, and benefits are established within local and community energy developments.

It includes four principles:

- The aims of the project and what success looks like is clear to all and has been agreed by consensus.
- Shared values are agreed by all involved.
- Priorities are set but, not everything at once, start small and scale it up as more people get interested.
- Fairness: everyone has to benefit, with benefits being evenly distributed.

Theme 3) Participation

This theme takes a very broad view of issues related to participation, including raising awareness of local and community energy generally, engagement and promotion within the community itself, participation opportunities across the whole community, and routes for democratic governance structures.

This theme includes six principles:

- There must be large-scale awareness-raising of the concept of community/local energy so that everyone understands its benefits and what your individual / community entry point might be.
- Developers should be mandated to engage with communities at the earliest possible stage (before planning) to ensure that benefits are relevant to the community and to ensure that there is forward planning so that the community is happy with how the land, and any infrastructure, will be developed or left at the end of the project.
- The project is well promoted to everyone within the community.
- Collaboration is encouraged so that lots of people can get involved and work together sharing lots of ideas.

- Flexibility means that input can be heard from all parts of the community.
- The way that decisions are made is clear and agreed. It is democratic so people are able to express views, and misgivings, it is not controlled by one person and all who have a share (no matter how small) have a vote. At least a proportion of shares must be affordable for those on a low income. Changes are consulted on.

Theme 4) Support and risk

This theme talks to the processes of delivering local and community energy developments, ensuring that support is provided to the community to support project engagement or delivery, and that risks to the community are minimised.

It includes two principles:

- There is support in place all the way through the project so that no-one feels left alone and appropriate extra training is provided. Funding for community-sourced leadership roles should be mandated where it supports equitable and consistent involvement.
- No unnecessary risks are taken.

Theme 5) Local use of energy

This theme relates to Panel members' perspectives that energy generated locally should also be used locally. It includes one principle:

- Wherever possible the energy generated should be used by the local community.

Theme 6) Shared ownership opportunities

This theme focuses specifically on shared ownership energy models and talks to the mechanisms through which people can get involved with shared ownership projects.

It includes two principles:

- In a shared ownership project, there must be the opportunity to invest throughout the lifetime of the project and a clearly defined timeframe for how long it will remain publicly owned.
- In shared ownership projects, developers should have profits capped at a percentage level to ensure they are not making excessive profits whilst there are any households left sitting in the cold.

Theme 7) Roles for government

This theme speaks to the structures that need to be put in place to support the fair growth of community and local energy across Scotland. While many of the other principles and themes relate to specific instances of community and local energy development, this theme is more focussed on widespread action and equality of opportunity across the country.

It includes two principles:

- There has to be conclusive and resounding support (investment and policy) from all levels of government that mean widespread community and local energy is a reality across all our communities.
- To help ensure fairness, national government needs to ensure that all councils are a) able to invest in community energy projects and be held to account if they don't do so and b) face a minimum of red tape in achieving innovation.

Support for Principles by theme

This theme

Figure *1* depicts the degree of support held by Panel members for each principle, grouped according to the seven themes outlines above.
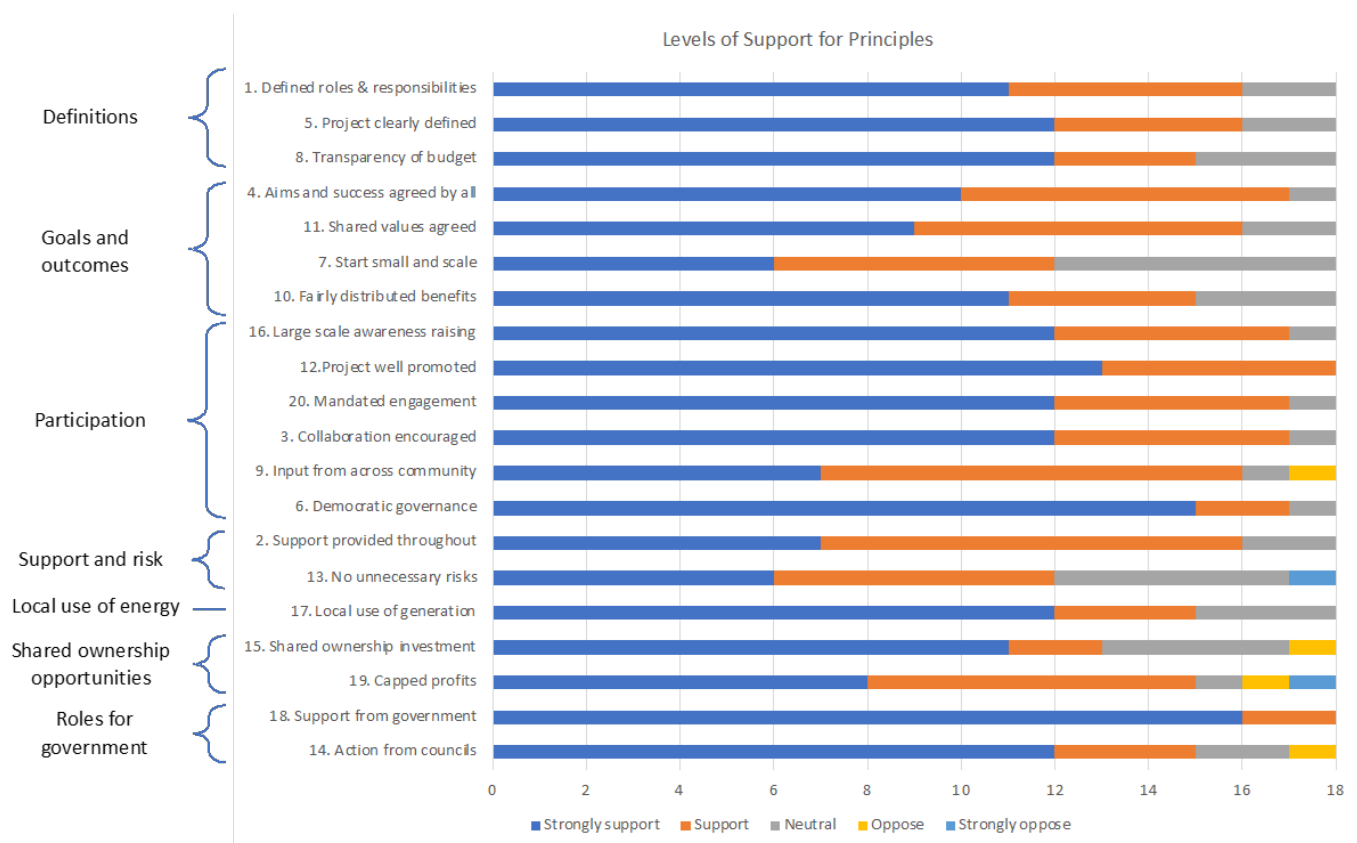

Figure 1: Degrees to which Panel members supported the 20 Local and Community Principles, by theme

Across all themes and principles, the average ratio of support (strongly support and support) to opposition (oppose and strongly oppose) is 52:1. For every vote of opposition, there were 52 votes in support, with only 6 total votes opposing principles in total, showing overwhelming agreement with almost all principles developed.

11.3 Appendix C: Local and community energy just transition outcome impacts

Table: Community energy

Local and community energy approach	Generation and supply	Heat and energy efficiency	Transport
Overview	Community owned wind turbines or solar panels, usually on shared buildings or land.	Clean heating technologies in local buildings or community centres; district heating networks; collective	Community electric vehicle car sharing, charging, and active travel initiatives.
Citizens, communities and place	Democratic ownership and governance for local interest. Revenues used to develop local places and bring people together around a collective, locally owned good.	Locally tailored solutions; 'warm spaces', reduced bills for community hubs; learning and dissemination; bringing people together around a collective local good.	Travel solutions reflective of local places, access to vehicles and infrastructure.
Jobs, skills and education	New roles in capacity building and development; potential for using community benefit to deliver training or employment opportunities, CE groups often conduct climate education and outreach.	Installation of new technologies requires jobs in trades and engineering; training for those shifting from gas to clean heating, and providing EE solutions, sharing lessons from decarbonised community spaces.	Can support switch to new climate-friendly behaviours, such as active travel or electric vehicle use.
Fair distribution of costs and benefits	Money raised from public funds and by those with capital, with benefit then realised in the community. However, typically only those who contribute financially get a say, plus a direct return on investment.	Benefits depend on type of project. Scope to raise substantial capital but technical barriers such as location of demand, building type, housing tenure etc. Can help link people to support, improving health and social outcomes.	Access to new modes of transport for people who otherwise may not be able to afford it; social and health benefits funded by community share offer or public funds.

Business and economy	Limited business and economy impact, although opportunities for businesses to benefit through decarbonisation and investment.	Opportunity for new clean heat businesses to deliver projects on-the-ground.	EV charging and infrastructure providers, better connected places opening new opportunities for people in work and leisure.
Adaptation and resilience	Revenues used for climate adaption such as defences in flood-prone areas, or making buildings more efficient to deal with extreme temperatures.	Less reliance on fossil fuels for heating; more efficient and comfortable buildings.	Less dependence on fossil-based transport; improved health outcomes through reduced emissions and greater mobility.
Environmental protection and restoration	CE volunteers often tie-in work with local climate and environmental action, such as tending to communal green spaces and community gardening.	Less direct benefit here.	Less direct benefit here.
Decarbonisation and efficiencies	Directly contributing to decarbonising of electricity supply, revenues can be used to decarbonise local buildings.	Direct decarbonisation of heat, often paired with energy efficiency, improved health and social outcomes.	Direct decarbonisation of transport and increased use of active alternatives.
Equality and human rights	Democratic ownership of renewable energy redistributes power from large companies to local people. Scope to redress inequalities locally and support e.g. child and fuel poverty.	Potential to deliver clean heat at a local level, overcoming some of the financial and social barriers faced by particularly lower income groups	Better connected people and places; reduced rates of 'transport poverty'; more options for people to travel locally.

Table: Local energy

Local and community energy approach	Generation and supply	Heat and energy efficiency	Transport
Overview	Wind turbines, solar PV and hydro projects led predominantly by local authorities, social housing providers, or the public sector.	Clean heating technologies (e.g., heat pumps, district heat networks) and efficiency measures (e.g., insulation) delivered in social or council housing stock.	Electric vehicle charging infrastructure, active travel initiatives such as e-bikes.
Citizens, communities and place	Locally owned energy projects, generating revenue for e.g. fuel poverty alleviation and Community Wealth Building.	Heat pumps and efficiency in council, social, or public sector buildings and district heat networks serving local houses, businesses and industry.	Travel solutions reflective of local places, access to vehicles and infrastructure.
Jobs, skills and education	Typically larger-scale revenues compared to community model for e.g. delivering energy efficiency, requiring skills in trades and installation.	Can require significant numbers of workers to deliver – training opportunities for trades and gas engineers.	Can support switch to new climate-friendly behaviours, such as active travel or electric vehicle use.
Fair distribution of costs and benefits	Public or private finance leveraged for more 'just' outcomes such as addressing fuel poverty. Risk that benefits to the community are limited -- need for meaningful community input/ownership/just transition value to maximise benefits.	Public or private finance leveraged for more 'just' outcomes, often delivering clean heating directly. Can help link people to support, improving health and social outcomes However, can be exclusive of those in the private rented sector, and reliant on grant support / limited local coverage.	Public or private finance to fund initiatives for public, although can often be limited to central urban areas.
Business and economy	Opportunity for renewable energy developers and businesses to deliver projects, improved	Opportunities for clean heat developers on heat networks in particular, and for heat pump developers.	Opportunities for e.g. e-bike companies or EV charging providers.

	local development leading to more active economic participation.		
Adaptation and resilience	Dependant on how revenues are spent.	Less reliant on fossil fuels for heating, more efficient and comfortable buildings.	Less direct benefit here.
Environmental protection and restoration	Dependant on how revenues are spent.	Less direct benefit here.	Less direct benefit here.
Decarbonisation and efficiencies	Direct decarbonisation of electricity supply in council or social building stock.	Direct decarbonisation of heat, often paired with energy efficiency, improved health and social outcomes.	Direct decarbonisation of transport and increased use of active alternatives.
Equality and human rights	Less direct equalities impact, but can use strong engagement and CWB principles to deliver against e.g. child poverty or develop more inclusive projects.	Opportunity to deliver clean heat at a local level, tailoring to local need, overcoming some of the financial and social barriers faced by particularly lower income groups.	Better connected people and places; reduced rates of 'transport poverty'.

Table: Integrated local energy systems

Overview	Typically larger-scale (town or city-wide) interconnected electricity generation, supply, demand, storage, transport, heat, and efficiency. Brought together at a local level using data and digitalisation.
Citizens, communities and place	Well-connected energy systems across all energy vectors, tailored to local need and maximising local value through optimised energy sharing, smart supply and demand.
Jobs, skills and education	Range of jobs and skills required, from project management to data science to trades, installers, legal support and policy expertise.
Fair distribution of costs and benefits	Public or private finance leveraged for more 'just' outcomes. Risk that benefits to the4 community are limited. Also exclusive of private rented sector. Need for meaningful community input/ownership.

Business and economy	Range of business opportunities in: energy innovation and optimisation, data science, software development, trades and installation, renewable energy developers, transport and service providers.
Adaptation and resilience	Less direct benefit here, although can be matched up with local adaptation and resilience ambitions.
Environmental protection and restoration	Less direct benefit here, although can be matched up with local environmental protection and restoration ambitions.
Decarbonisation and efficiencies	Direct decarbonisation of energy, more efficient buildings, and cleaner transport. Can also support cost-effective grid decarbonisation.
Equality and human rights	Less direct benefit here.

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