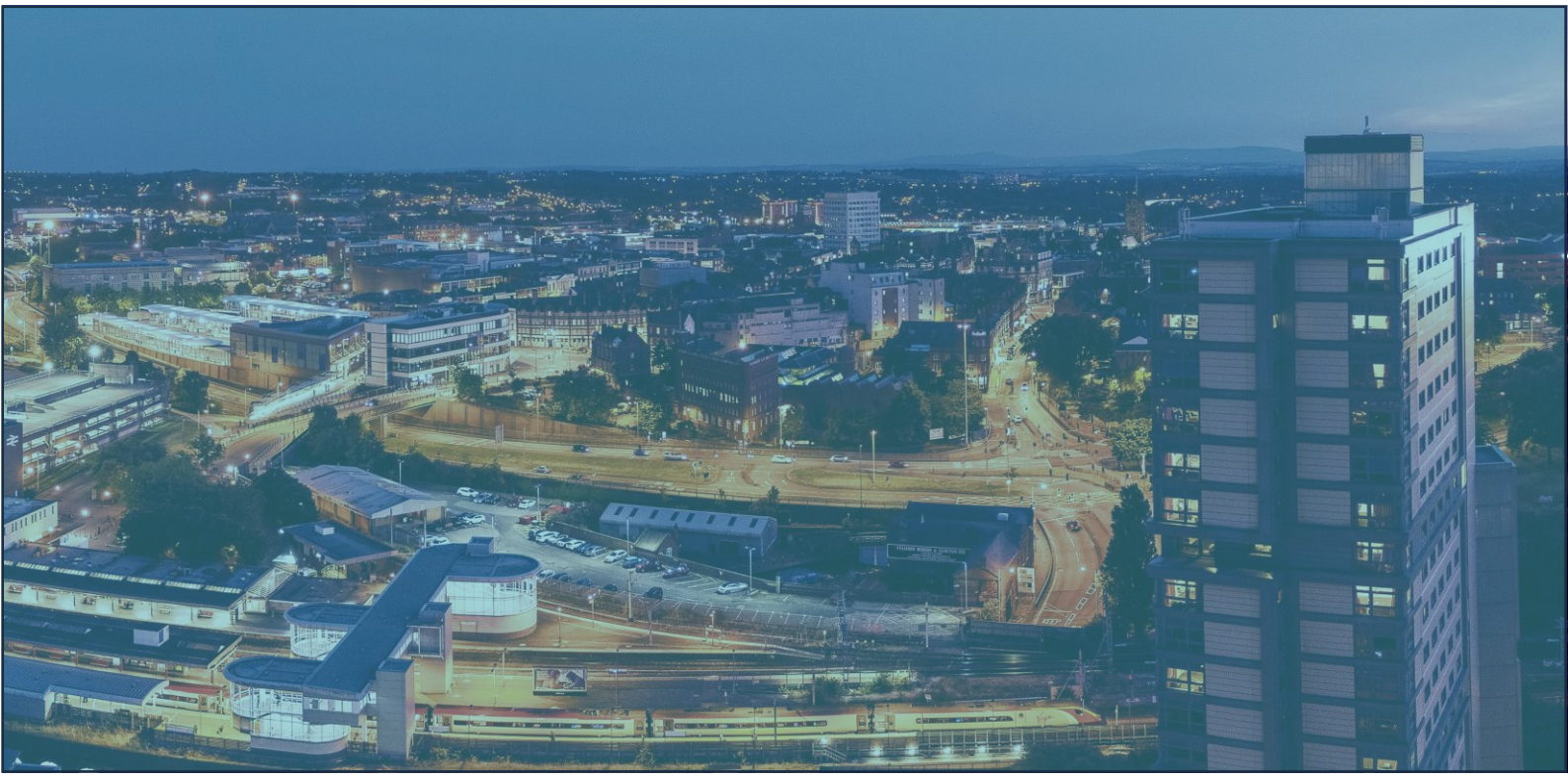


Levelling Up, Emissions Down: Framework

A framework to support Key Cities to accelerate action towards Net Zero

Report prepared by Metro Dynamics and Opergy on behalf of the Key Cities network

Metro Dynamics

Opergy Group

Overview – State of Play

This framework has been written in conjunction with a net zero report to help inform councils about their transition to Net Zero. The findings from this research and engagement were brought together across nine thematic areas. These themes were partially informed by the Net Zero Strategy (2021) and then fully developed with a steering group to reflect the most relevant activities associated with net zero for Key Cities members.

The framework provides a broad analysis of the underlying context and trends that impact each of the net zero themes across the Key City Members. It then goes on to outline best in case examples which have been drawn from our extensive engagement with Key Cities members, as well as research of wider UK. The framework also identifies a suite of tools, resources and support that members can draw from as well as information on funding/financing opportunities to help members accelerate action across each theme. The final section of every thematic area includes recommendations that can help Key City members achieve net zero at both organisational and territorial level.

The framework's design is user friendly and contains a directory with relevant hyperlinks to document pages, to enhance the speed that members can access information.

Overall, the framework has been created for Key Cities members. However, we recognise that it will be relevant for a much broader set of local authorities in the UK, and therefore hope it will stimulate wider collaboration opportunities beyond the Key Cities membership and aid in sharing best practice.

1 Net Zero Strategy Review

In 2021 the UK published its overarching Net Zero Strategy[1] which aims to reduce the UKs greenhouse gas emissions to net zero in the UK by 2050. It also set out further legally binding intermediary targets of 68% reduction by 2030 and a 78% reduction by 2035. In January 2022, the 'Local Government and the Path to Net Zero'[2] report outlined several recommendations that would support local government through the transition to net zero, these covered topics such as; Roles & Responsibilities, Data Metrics and Reporting, Green Skills and Support Organisations, Financing and Funding and Infrastructure.

During engagement with Key City members throughout late 2022, many of the barriers and challenges faced by local government fell within each of these themes, and as such we have used them to inform each section of the framework.

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

[2] Government response: local government and the path to net zero (publishing.service.gov.uk)

On the 13th of January 2023 the Mission Zero: Independent Review of Net Zero final report was published[3]. Upon review, several of the recommendations defined within the report overlap with key messages coming from the Key City members. Therefore, the section below draws on aligned findings from this Key Cities work and the Mission Zero review under each of the aforementioned themes to add value and aid prioritisation of net zero action.

A full breakdown of the 129 recommendations laid out in the Mission Zero review, and whether they have been addressed within the framework can be found in Appendix A.

1.1 Roles & Responsibilities

The review states that "there must be more place-based, locally led action on net zero" and that government must "empower people and places to deliver". It goes on to highlight that every community within the UK is different and as such local understanding and approaches are key - "a place-specific approach delivers more benefit for less cost" (UKRI). However currently there is a "lack of clarity around roles and responsibilities which is creating blocks in the system for those local authorities that want to be proactive in delivering net zero."

Upon analysis of the Mission Zero review, these statements most aligned with Key City member suggestions:

- Implement a statutory duty for local authorities to consider UK's net-zero targets, with a defined structure for local duties and responsibilities.
- Grant devolved net-zero powers to facilitate a local focus on achieving net-zero. The recommendation is for the government to fully support one or more Trailblazer cities, local authorities, and communities to reach net-zero by 2030.
- Central government should revise the local planning system and the National Planning Policy Framework immediately to establish a clearer vision for net-zero, with a plan to implement a net-zero assessment. It should also provide clarity on when local areas can surpass national standards, guidance on Local Authority Energy and Carbon Reduction Strategies, promote the use of spatial planning and the creation of net-zero neighbourhood plans, and outline a framework for community benefits. The government should conduct a quick review of obstacles for net-zero and energy efficiency projects in the planning system and ensure that local planning authorities have the necessary resources to achieve faster processing times.

Each of these recommendations aligns closely with the findings of our engagement across the 27 Key Cities. In particular, Key Cities emphasised that a clear framework is needed to avoid confusion and duplication of work by local authorities in tackling carbon emissions. Furthermore, without defined roles and responsibilities backed by clearer statutory duties, the full potential of local government in decarbonising society cannot be realised, risking failure to reach the UK's net zero goal.

1.2 Data Metrics & Reporting

Mission Zero indicated that both the public and local government 'needs more information about net zero – including authoritative official data that is trustworthy and engaging'.

[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1128689/mission-zero-independent-review.pdf

Upon analysis of the Mission Zero review, these statements most aligned with Key City member suggestions:

- Central government should offer guidance, reporting tools, and support for increased capacity and capability to help local authorities better track and report their net-zero progress.
- Government must 'significantly expand its public reporting on net zero'. This could be through collaboration with the Climate Change Committee.
- Create a roadmap, by Autumn 2023, detailing decision points for R&D and technology deployment to enable the net zero pathway to 2050 by working backwards from 2050 and using 'whole system' data and thinking.
- Mission Zero highlights the absence of data on green job statistics, hindering focused training. It urges the government to establish this database with visibility at the local authority level.

These recommendations were emphasised by Key Cities who echoed that guidance and reporting mechanisms do exist, but limited capacity to perform necessary work for gathering and verifying data for emissions calculation is a resource-intensive task, making government support within this area needed. Furthermore, engagement found Key Cities could improve their 'whole systems' data approach, as there are currently gaps or delays within planning processes, particularly when engaging with their DNO or conurbations.

Members disclosed that the lack of decisive regulations on carbon accounting and progress tracking towards net zero has affected their ability to effectively transition to net zero. Mission Zero failed to acknowledge this which ultimately undermines the significance of other beneficial policy suggestions. Without reliable tracking and emission reporting, the effectiveness of these proposals made within the Mission Zero review become questionable.

Notably when engaging with BEIS it was suggested that data produced and reported on locally was best placed to provide a developing and accurate national picture.

1.3 Green Skills and Support Organisations

Mission Zero acknowledges the need for a change in perspective regarding the required skill set for a successful transition to a green economy across all industries. Part of the review also advocates for driving forwards the 'Green Jobs Taskforce' which highlights that "one in five jobs in the UK (approximately 6.3 million workers) will require skills which may experience demand growth (approximately 10% of UK jobs) in the transition.".

Upon analysis of the Mission Zero review, these statements most aligned with Key City member suggestions:

- The report iterated offering secure, long-term funding for net-zero carbon projects benefits the economy by providing stability for suppliers, employers, and skill providers, leading to an increase in green jobs and investment in the green economy, such as retrofitting.
- Mission Zero acknowledged the need for a change in perspective regarding the skill sets required for a comprehensive green transition across all industries.
- The review recognised the essential role the public have in delivering Net Zero, noting that "almost half of the actions in the Government's Net Zero Strategy require public action".

Lack of skilled worker capacity within the climate sector has been repeatedly emphasized by Key Cities as one of the biggest barriers to local authorities for their transition to Net Zero. Key Cities stated this issue was apparent within both the public and private sectors, and that carbon literacy needs to be increased across the board. This would also help enhance customer satisfaction.

1.4 Financing & Funding

The review highlights that local authorities play a crucial role in achieving net-zero, but the current government funding approach impedes their ability to act effectively. It presents evidence of the cost and inefficiencies of competitive funding pots and how this limits local authorities from planning for climate action strategically. For example, local authorities are struggling to "aggregate projects into an investible size and scale" and suggests that "government must provide additional support to make sure regions can attract green investment and build regional green clusters". Upon analysis of the Mission Zero review, these statements most aligned with Key City member suggestions:

- Central government should simplify the funding for local authorities towards net-zero by the next budget review as currently funding is 'disjointed, unfair, and expensive". This includes combining separate funding sources, decreasing competitive bidding, extending lead-in times for bidding, and offering medium-term rather than short-term funding.
- Central government should release a comprehensive financing strategy that outlines how government spending, policies, and regulation will increase private finance to achieve the UK's goals of net zero growth and energy security.

Key City members have consistently stated that reducing the complexity of net zero funding for local government by central government and securing long-term commitments to future programs is crucial. In addition, Key City members have emphasised the 'unfair and expensive' funding is in part due to authorities that have a history of success, local knowledge, and the capacity to utilise prior investment to build supply chains and develop skills will continue to acquire funding. Smaller authorities with less capacity have tended to struggle and fall behind.

1.5 Infrastructure

Mission Zero acknowledges the fragmented delivery of Net Zero, with multiple departments handling responsibilities despite complex interconnections between programs. It prioritizes a systemic approach to handle these interactions, recognizing the common energy infrastructure as the foundation and considering cross-cutting factors like the planning system. It also recognises the necessity for a shift in delivering low-carbon energy infrastructure, with a focus on the major hindrance of electricity network capacity, evidenced by the increasing costs from constraint.

Upon analysis of the Mission Zero review, these statements most aligned with Key City member suggestions:

- Shift the policy and regulatory framework from a project-by-project approach where grid development occurs only after sufficient demand is established to a long-term planning system that supports anticipatory investments.
- A plan for decarbonizing industry and investing in net zero technologies is necessary. Long-term storage, multi-purpose interconnectors, and carbon capture must be emphasized for increased supply-side flexibility.

- Assist low EPC rated property owners in implementing green upgrades and explore ways to combine public funding with private investment.

Key City members have been explicit in their need for infrastructure improvements, particularly with regards to grid capacity issues delaying renewable energy generation projects. The shift away from the current DNO project-by-project approach would be a welcome change, but members also highlighted that investment must be directed and utilized efficiently to help minimize consumer expenses. Furthermore, there is little within the Mission Zero review which establishes how local authorities should support less vulnerable residents over retrofit.

2 Net Zero Support Organisations and Programmes

Throughout our engagement with each of the Key City members, support organisations have been identified. The most relevant of the organisations have been assigned and then explained within the most applicable theme of the framework. URL links to the appropriate website for further information are also provided.

3 Funding and Financing Opportunities

Throughout our research and engagement with each of the Key City members, funding, and financing opportunities for each of the themes have been identified. The most relevant of the funding opportunities have been assigned and then explained within the most applicable theme of the framework. URL links to the appropriate website for further information are also provided.

4 Framework Outline

Each of the Key Cities play a crucial role in the areas they serve. Although they only account for a small portion of the emissions generated by their own activities, they can act in a trusted position to show public sector leadership and influence local climate action. They largely accomplish this by taking steps to lower their own CO2 emissions. However, they also play a significant role in influencing and mobilising people to act at the local and community level.

To support local authorities in the UK to transition to net zero, Net Zero East and Metro Dynamics have developed a comprehensive framework.

This framework tackles nine themes:

	**Energy and Utilities** Energy systems, carriers, storage, and utilization is the focus of this thematic group. Included within this theme is, production, storage, transmission, distribution, water, and communications networks.
	**Transport and Logistics** Transportation, alternative fuels, parking, and road networks are the focus of this thematic group. Included within this theme is fleet, freight and ancillary vehicle decarbonization, fuelling and charging infrastructure and active travel.
	**Residential, Industrial and Commercial Retrofit** Public and private sector energy efficiency measures and retrofit of existing buildings and estates is the focus of this thematic group. Included within this theme is public sector, social housing, domestic and non-domestic buildings, private landlords and owner-occupied buildings.
	**Climate Resilience and Adaptation** Climate risk, mitigation and adaptation measures are the focus of this thematic group. Included within this theme are the requirements to continually mitigate against the impacts of climate change and further prepare to adapt in areas of irreversible change as well as where further impact and change is anticipated.
	**New Building and Planning** Local authority planning and development of communities is the focus of this thematic group. Included in this theme is energy efficiency, low carbon and renewable materials and sustainable design. Furthermore cross directorate opportunities, technology and holistic planning are also referenced.
	**Communication and Community Engagement** Effective communication and sharing information are the focus of this thematic group. Included within this theme is goal and progress sharing, inputs and feedback from residents, businesses and stakeholders and involving community groups, organisations

	and leaders in planning processes. As well as the use of public resources, websites, social media, assemblies, forums, internal.
	**Land Use and Natural Capital** How the UK utilises land is the focus of this thematic group. Included within this theme is afforestation, new housing developments, leveraging natural capital, land use change, protecting and restoring land, as well as energy generation plants including biomass, nuclear, solar or wind.
	**Waste and Circular Economy** Management of Waste and the implementation of a circular economy are the focus of this thematic group. Included in this theme is promoting and facilitating reduction, reuse and recycling of waste through the waste hierarchy, implementing sustainable material uses and the creation of closed loop systems.
	**Public Sector Operations and Supply Chains** Considering impacts of public sector operations and how environments are affected by supply chains are the focus of this thematic group. Included in this theme is reducing greenhouse gas emissions, increasing energy efficiency and lowering environmental impacts from products and services.

5 Framework Directory

Heading Outputs	Energy and Utilities	Transport and Logistics	Industry, Commercial and Residential Retrofit
Trends and Further Information	DNO Processes Grid Capacity Insufficient Headroom Community Energy Battery Technology DNO data Digitalisation	Electrification of fleet Lack of EVI knowledge Role of LAs in transportation Challenge of making EVI more accessible Pushback from public Impact of digital technology Need for a modal sustainable shift	Financial constraints Support from LAs Fuel poor or deprived households Timeframe Constraints Low worker capacity Private Sector Market Challenges Non-domestic and commercial buildings Mass retrofitting
Current Initiatives	Lancaster: Leisure Centres Newport: Rooftop Solar Portsmouth: Port Solar Panels Salford: Solar panels on school roofs Warrington: Community Municipal Bonds	BCP: Lowering fleet emissions Doncaster: 100% electric fleet Gloucester: Active Travel Kirklees: Electrifying Fleet Essex: DigiGo Brighton and Hove: Green Deliveries	Coventry: Retrofitting Schools Exeter: Tackling Retrofitting Medway: Building Retrofit programme Southampton: PSDS Plymouth: Retrofitting council buildings Sutton: Utilising the Energiesprong approach
Tools, Resources and Support	Community Energy State of the Sector Reports Energy Systems Catapult CARES Toolkit	Transport Data Sets Charge Fairy Gul-e	3CI Passivhaus Green Open Homes Interactive Policy Map on Retrofit

	Connected Energy		
Funding and Financing Opportunities	Industrial Decarbonisation and Hydrogen Revenue Support PSDS SALIX	ORCS Workplace Charging Scheme LEVI EV ChargePoint Grant Rapid Charging Fund Third-party developers	ECO4 Home Upgrade Grant Industrial Energy Transformation Fund Phase 2 SHDF Boiler Upgrade Scheme
Linking Themes	Transport and Logistics Building and Planning Residential, Industrial and Commercial Retrofit	Energy and Utilities Public Sector Operations and Supply Chains	Energy and Utilities
Recommendations	Energy Audits Smart Meters Benchmarking Non-Profit Energy Company Engage with DNOS and OFGEM Streamline Planning Engage with Conurbations Private Incentives Educate Energy Studies	Public Transport Flexible Transport Renewable/Closed System Sources Fleet Replacement GPS Tracking and Telematics Emission Tracking Travel Schemes Distribute EV Chargers Congestion Charge Ride-Sharing Active Travel	Retrofit Training Energy Audit Target Fuel Poor Energy Management System Data gathering Comprehensive Retrofitting Programme Retrofit Incentives Balancing need for conservation Public Awareness Financial Incentives to Landlords Technical Assistance

	Public Private Partnerships	CAMZs	Targeted Programmes Legal Measures Collaborate to Provide Tools for Landlords

Heading Outputs	Climate Resilience and Adaptation	New Build and Planning	Communication and Community Engagement
Trends and Further Information	Lack of discourse around damage possibilities Adaptation over mitigation Essential infrastructure Weather extremities in retrofitting Increased climate resilience Need for transparency High threshold for flooding	Low Worker Capacity New Build Standards Planning Consents Holistic Development	Political Differences across Conurbations Improve Climate Advertising Prioritising vulnerable communities Creating behavioural change
Current Initiatives	Blackpool: Renewable data centres and heat networks Carlisle: Civic centre to reduce flood damage Hull: River drainage system adaptation Dundee: Climate Action for the Vulnerable Blaenau: Community Climate Actions	Lincoln: Housing Strategy Reading: Low Carbon Leisure Facilities Southend: Nature Smart Cities	Sunderland: Behavioural Change through Better Points
Tools, Resources and Support	SCATTER IMPACT Tyndall Carbon Trust UK Climate Projections	UKGBC	Net Zero Innovation Programme
Funding and Financing Opportunities	UK Climate Resilience Programme Natural Environment Investment Readiness Fund	Housing Infrastructure Fund New Homes Bonus	Net Zero Living: Fast followers

Linking Themes	Communication and Community Engagement		Climate Resilience and Adaptation
Recommendations	Adaptation Plan Green Infrastructure Flexible Approach Cross-departmental Approach Behavioural Change Projected Climactic Risks Emergency Response Plans Educate Consistent Tools	Housing Strategy Mixed-Use Communities Low-Carbon Materials Renewable Generation Green Building Codes Building Standards Land Use Policies Green Infrastructure Heating Schemes Gas Connections	Outreach Programme Council Platform Updates Social Media Platforms Educate residents Community-based Renewable energy Develop Local Programmes Climate Assemblies Co-Production

Heading Outputs	Land Use and Natural Capital	Waste and Circular Economy	Public Sector and Supply Chains
Trends and Further Information	Role considered insignificant Effect on climate resilience	Circular economies underemphasised Utilising PPPs Inefficient delivery of waste strategies	Lack of Skilled Worker Capacity Covid-19 Delayed Action Cross-Departmental Services are Reliant on a few Experts Net Zero Timeframes Vary Widely Move to devolution Disparity between larger and smaller LAs Need for more defined roles and powers Unaffordable skilled workers Support from Net Zero Hubs

Current Initiatives	Southend: Nature Smart Cities Approach Wirral: 210,00 trees by 2030	Bath & Northeast Somerset: Improved waste services Derry and Strabane: Zero-Waste Circular Economy Leeds: Sustainable Foods	Preston: Sustainable community wealth building
Tools, Resources and Support	Zero Carbon Britain Hub Net Zero Plus NEVO	WRAP	Net Zero Technology Centre Net Zero Estate Playbook
Funding and Financing Opportunities	National Lottery: Climate Action Fund Brownfield Land Release Fund	Water Discovery Challenge	
Linking Themes	Climate Resilience and Adaptation Communication and Community Engagement New Build and Planning Energy and Utilities	Communication and Community Engagement	New Build and Planning
Recommendations	Protecting and Restoring Natural Ecosystems Wildlife/Rights of Way Protection Peatland Restoration	Composting Programme Recycling Programme usings VCSEs Plastic Policies Energy from Waste Technologies	Emissions Reduction Sustainable Procurement Practices De-investment in Fossil Fuels Social Value Framework Carbon Literacy training

	Bio-energy Production Anaerobic digestors Carbon-intensive Foods Nature-based Solutions and Co-Benefits Sustainable Land Practices Sustainably Managed Forests Develop Natural Capital Assets Reduce Damaging Practices Low Carbon Farming Local Energy Opportunities Tree management Incentives Market Opportunities Public Private Partnerships	Waste Hierarchy Biogas Production Food waste Reduction Programme Feedback Public Private Partnerships	Carbon Certification Green jobs data Bulk procurement

6 Energy and Utilities

For the government to meet its climate targets, clean energy generation must increase. By 2035 the UK government aims to have decarbonised the electricity network, however The CCC estimates that in order to achieve net zero, the emissions intensity of generating electricity must decrease by 95% from approximately 200 gCO2/kWh currently to approximately 10 gCO2/kWh in just 12 years[4].

The level of investment needed to create this energy is unprecedented. It will require an offshore grid; major upgrades to transmission and distribution to handle the new decentralised generation and the intermittency; storage assets; carbon capture and storage (CCS); hydrogen; heat pumps; a new pressurised water reactor (PWR) at Sizewell; 50 GW of offshore wind by 2030; 75 GW of solar by 2035; a string of small modular reactors (SMRs); the electrification of road transportation; and so on. Furthermore, as the UKs reliance on renewables increases, intermittency issues will force batteries and storage to be installed. Overall, it is likely that this will cost substantially more than the 1% that the UK Committee on Climate Change (CCC) estimates, and if the inefficiencies of government policy are considered, it may even cost as much as 3-4% of GDP[5].

There is also a growing concern around sustainable utilities, particularly water and telecommunications. Recently water companies have been exposed by their handling of drought, sewage overflows, hosepipe bans and public outrage about executive pay. Furthermore, new homes that are not net nutrient-neutral and housing developments in improper locations are adding to this, which results in expensive end-of-pipes pollution clean-up procedures[6].

The key to increasing clean local energy production and improving utility sustainability, will be understanding the technologies appropriate for the area whilst also meeting increasing demand sustainably. Understanding each local need – be that increasing electric vehicle numbers or pushing for a fibre network– will enable local authorities to take a 'whole systems' approach.

It is important to note that the majority of emission savings will be achieved through decreases in emissions-intensity of generation. However, demand-side measures will also play a crucial supporting role, particularly in giving the flexibility needed to balance a system based on renewable energy sources that are weather-dependent[7].

[4] **www.theccc.org.uk/publication/sixth-carbon-budget**

[5] Why social tariffs are needed - Dieter Helm

[6] Water – a new start - Dieter Helm

[7] CCC Monitoring Framework - Climate Change Committee (theccc.org.uk)

6.1 Trends and Further Information

6.1.1 Key Cities have found engaging with DNOs to be a lengthy process causing issues when trying to develop renewable energy generation assets

Discussions with UK DNOs suggests there is a confusion between local authorities around the timeframe it can take to increase grid capacity. Currently, DNO licenses force them to manage connections on a first come first served basis meaning they cannot prioritize projects that are ready, over those that are not, as they must follow the order of the queue. Furthermore, DNOs operate across a much wider area, with a key role of theirs being to balance grid connections across many local authorities whilst also fulfilling their legal obligations to consumers to provide value for money. This has created a conflict between local authorities' growing need to connect renewable energy projects to the grid and DNOs being unable to expand and transform the grid quickly enough to accommodate.

6.1.2 Key City members are struggling to reach net zero due to lack of grid capacity and an aging electricity grid infrastructure

The UK faces major challenges in transitioning to net zero for the power sector, as it requires updating electricity transmission and distribution networks to support current and growing demands, a shift in the timing and location of electricity demands, as well as new requirements such as electric transport, decentralised generation, handling of intermittent small-scale renewable generation, air conditioning, heat pumps, and the growing demand to support the digital economy. However, the current grid and distribution networks were not designed to handle these demands and were built on the assumption of large coal and nuclear power stations, with no provision for storage at scale or active demand side management.

6.1.3 Local authorities are struggling to support large-scale increases in residential EV uptake due to insufficient head room.

As EV technology improves, the demand for rapid and ultra-rapid charging will increase, however these chargers are restricted by substation headroom. In order to create a wide network of EV chargers across each city, a substantial upgrade to substation capacities is required before new EV chargers can be installed. There is also a lack support towards connecting small scale generation, for example domestic and commercial roof top solar. Stimulating and enabling self-sufficiency (with export potential) will promote home and work EV chargers whilst also supporting increased load when heat pumps are rolled out at scale. Additionally, when coupled with batteries and the developing V2G and V2H (vehicle to grid and vehicle to home) technology further support from central and local government would be beneficial.

6.1.4 Across Key City members there has been a slow uptake in community energy schemes.

Community energy schemes across the UK have consistently been subject to lack of capacity, technical expertise and early-stage funding creating barriers to project development in recent years. Partnership approaches were mentioned during engagement as assisting to address these issues, bringing mutual benefits such as the sharing of financial resources, expertise, and best practice, and enhancing available staff time and capacity. However, without significant

regulatory change a long-duration minimum export price for exported electricity, community energy schemes will continue to struggle

6.1.5 Across engagement with Key City members the use of battery technology appears less well advanced.

Whilst renewable energy sources will be instrumental in the UKs transition to net zero, the intermittency of renewable energy sources such as wind and solar is a growing issue. The need for back-up capacity is often not discussed but as energy sources dependent on meteorological conditions make up a larger share of the UKs energy mix, the ability to store rather than curtail is paramount. Furthermore, the cost of emerging technologies that could one day solve this problem is now prohibitive, and the rise in electricity consumption brought on by the adoption of electric vehicles and the digital revolution will further exacerbate the issue of intermittent power. Currently however, the cost benefit against other measures takes priority for residential storage, and at grid scale it is a multi-million pound infrastructure project requiring private sector investment.

6.1.6 Key City members highlighted that their own lack of data on future energy projects is a barrier when trying to engage with DNOs.

6.1.7 The need to bolster the UKs electricity and fibre network, such that the digitization of our economy is not hampered, must be addressed.

6.2 Current Initiatives

6.2.1 Key Cities

6.2.1.1 How Lancaster is decarbonising the Salt Ayre Leisure Centre

SALC Decarbonisation Project - Lancaster City Council

Overview

Lancaster City Council in the UK has secured £6.8 million in funding for a project to decarbonize Salt Ayre Leisure Centre. The project aims to eliminate the leisure centre's direct emissions by the end of 2021 and will save 642 tonnes of CO_2, the equivalent of heating around 600 homes. The project will involve the removal of the old gas heating system, a glazing upgrade, an upgrade to the substation, the installation of air source heat pumps, and external LED lighting. A 1.3 MW solar farm will also be constructed on an adjacent landfill site to generate electricity. During winter months and overnight, electricity will be provided by an independently audited green energy tariff (REGO). The project is expected to make Salt Ayre Leisure Centre one of the first carbon-zero leisure centres in the UK and support the council's goal of becoming carbon neutral by 2030.

What impact has the project had?

The impacts of the decarbonization project at Salt Ayre Leisure include:

By replacing the old gas heating system with electrically powered heating and generating electricity through a solar farm, the project is expected to significantly reduce the leisure centre's carbon emissions. This could help to address the climate crisis and contribute to the council's goal of becoming carbon neutral by 2030.

The project is expected to reduce the leisure centre's natural gas emissions, which could help to improve local air quality and make the area healthier for residents and visitors.

The use of renewable energy sources such as solar and air source heat pumps may result in cost savings for the leisure centre in the long term due to lower energy costs.

By becoming one of the first carbon-zero leisure centres in the UK, Salt Ayre Leisure Centre will be setting an example for other organizations to follow and demonstrating the council's commitment to sustainability. This could encourage other organizations and governments to adopt similar measures.

What made this work? Funding Mechanisms?

- Public Sector Decarbonisation Scheme (PSDS)
- Lancaster city council commissioned the Energy and Building Fabric Thermal Performance Appraisal
- Supported by Salix Finance – with the BEIS PSDS 1 funding.

Lessons learnt

- Identify key stakeholders and involve them in the planning process: Engaging key stakeholders, such as local community members, government officials, and business leaders, can help to build support for the project and ensure that it aligns with the needs and priorities of the community.
- Conduct a thorough analysis of the current energy use and carbon emissions: Understanding the current energy use and carbon emissions of the organization or facility is essential to developing an effective decarbonization plan. This can help to identify the most impactful measures to implement.
- Consider the long-term costs and benefits: While some decarbonization measures may have higher upfront costs, they may result in significant cost savings over the long term. It is important to consider both the short-term and long-term costs and benefits of different measures.
- Engage the community in the implementation process: Involving the community in the implementation process can help to build support for the project and encourage people to adopt sustainable practices in their own lives.
- Monitor and evaluate the progress of the project: Regularly monitoring and evaluating the progress of the project can help to identify areas where the project is falling short of its goals and adjust the plan accordingly. It can also help to demonstrate the project's successes and build support for future initiatives.

6.2.1.2 How Newport is showing its green credentials with solar installations

Geraint Thomas National Velodrome of Wales shows its green credentials with solar installation (newport.gov.uk)

Overview

Work has begun on a solar energy rooftop project at the Geraint Thomas National Velodrome in Newport, Wales. The project, which is being carried out in partnership with Sustainable Communities Wales and the Wales Co-operative Centre, will involve the installation of over 2,000 solar panels and is expected to reduce Newport City Council's carbon emissions by 348 tonnes per year. The project is part of the council's wider plan to install 6,000 solar panels on 21 council-owned buildings across the city with the goal of becoming a carbon neutral organization by 2030. The National Velodrome has already implemented a state-of-the-art LED floodlight system that has reduced energy consumption and improved the facility's offering and LED lighting will be fitted throughout the rest of the National Velodrome over the next year, resulting in an estimated saving of 750 tonnes of carbon over the lifetime of the lights.

What impact has the project had?

The project is expected to lead to a reduction of 348 tonnes of carbon emissions per year and will generate a combined total of 1,973,000 units of clean renewable electricity per year. Other potential impacts of the project could include economic benefits such as the creation of jobs during the construction and installation of the solar panels, as well as long-term energy cost savings for the council and potentially for residents and businesses if excess electricity is sold back to the grid.

What made this work? Funding Mechanisms?

The project was carried out in partnership with Sustainable Communities Wales and the Wales Co-operative Centre, and it is possible that these partnerships were crucial in facilitating the planning and implementation of the project. It is also likely that the project received funding from a variety of sources, such as government grants, private funding, and/or the council's own budget.

Funds:

- Welsh Government Energy Service – in partnership with Sustainable Communities Wales and Wales Co-operative Centre
- Egni Co-op

Lessons learnt

- The importance of partnerships and collaborations in the planning and implementation of renewable energy projects, particularly when working with community organizations and local authorities.
- The potential benefits of investing in renewable energy projects, such as carbon emissions reductions, cost savings, and the creation of jobs.
- The value of conducting detailed feasibility studies to assess the potential impacts and risks of a renewable energy project, as well as the potential benefits.
- The importance of setting clear goals and targets for renewable energy projects and regularly evaluating progress towards achieving them.
- The potential for renewable energy projects to contribute to broader sustainability goals, such as reducing reliance on fossil fuels and transitioning to a low carbon economy.
- The ability to dim lights can allow energy to be saved when not in use or less light is required.

6.2.1.3 How Portsmouth Port is switching to solar panels

Solar project at Portsmouth's port is powering ahead - Portsmouth City Council

Overview

Portsmouth International Port, the UK's largest municipal port, has switched on 888 of a planned 2,660 solar panels. These will generate 400 kW of renewable energy and meet 35% of the port's energy needs. When completed in January 2023, the 1.2 MW solar panel and 1.5 MWh battery system will be the largest such installation by Portsmouth City Council and will reduce annual carbon emissions by 239 tonnes.

The project also includes solar canopies, which are a UK first at a port, and the scheme recently won the Commercial Solar and/or Storage Project of the Year award at the Solar & Storage Live 2022 Awards. The system will eventually allow the port to offer shore power, allowing smaller ships to switch off their engines and draw electricity from the local grid.

What impact has the project had?

- *Environmental benefits:* The project will generate emission-free, renewable energy and reduce the port's carbon emissions by 239 tonnes per year. This will contribute to the port's goal of reaching net-zero carbon emissions by 2030. Local air quality will also be improved once shore power is enabled.
- *Energy security and independence:* Solar panels and battery system will allow the port to generate and store its own energy, reducing its reliance on the local electricity grid.
- *Financial savings:* Generating and using clean energy will reduce purchase from the grid and result in financial savings for the port.
- *Economic benefits:* The project will create jobs during the construction phase and could potentially stimulate economic growth in the region. There are some additional benefits received from installed a megawatt battery, including the ability to carry out various grid services, that could provide an additional income stream to the council.
- *Community engagement:* The project has increased public awareness of clean energy and encourage more individuals and organizations to adopt renewable energy technologies.
- *Innovation:* The project incorporates solar canopies, which is a UK port first. This helped maximise the available space on site and could inspire other ports and organizations to adopt similar technologies and approaches.

What made this work? Funding Mechanisms?

The works were financed through Portsmouth City Council's Solar PV Investment Fund and Low Carbon Projects Fund. Both internal funding mechanisms were enabled by the Public Works Loan Board. Other bankable carbon saving projects will also be funded through the council's £30 million Low Carbon Projects Fund.

The project was managed by Portsmouth City Council's energy services team and supported by Portsmouth International Port's engineering department.

For the installation, specialist contractors Custom Solar were brought in.

Lessons learnt

- Solar panels and batteries can work together to provide clean energy both during times of high sunlight but also times of high demand or darkness through the battery storage.
- Energy security can be provided through onsite generation and onsite storage.
- Financing savings can be achieved through renewable generation.

- Carbon emissions can be reduced significantly by the installation of solar panels minimising dependence on fossil fuels for energy

6.2.1.4 How Salford are installing solar panels on school roofs to lower energy costs

Sun to shine on Salford schools as community energy scheme takes off | SalfordOnline.com

Overview

Seven schools in Salford will be fitted with solar panels after a community share offer reached its fundraising target. Primrose Hill Primary in Ordsall, Irlam Primary School and Fiddlers Lane Community Primary School will have the panels installed in summer 2022, which will generate clean energy and result in lower electricity bills for the schools. So far over 900MWh have been generated, saving 215 tonnes of CO_2. This has also led to savings of £63,540 on energy bills.
Any profits from the generation of electricity will be used to support eco-friendly projects through a community fund. The project is being run by volunteers from community benefit societies Greater Manchester Community Renewables and Moss Community Energy, and was funded by grants from the Department of Energy and Climate Change's Urban Community Energy Fund and Unicorn Grocery, as well as investments from members of the community. GMCR has also provided £15,000 of community grants to the Salford schools for projects relating to carbon reduction and environmental education.

What impact has the project had?

- *Environmental benefits*: The solar panels will generate clean energy and reduce carbon emissions by 50 tonnes in the first year alone. Helping to transition to a more sustainable energy system.
- *Financial benefits:* The solar panels will generate electricity that can be used by the schools, resulting in lower electricity bills for the schools. Additionally, any profits from the generation of electricity will be used to support eco-friendly projects through a community fund.
- *Educational benefits*: The schools will also be used to teach young people about climate change and the benefits of renewable energy and energy efficiency. This can help to raise awareness and understanding of these important issues and inspire action to address them.
- *Community benefits:* The project was funded through a community share offer, which invited members of the community to invest in the scheme from as little as £100. This can help to build a sense of community ownership and engagement in the project, and any profits from the generation of electricity will be used to support eco-friendly projects through a community fund.

What made this work? Funding Mechanisms?

The project received grants to develop the project from the Department of Energy and Climate Change's Urban Community Energy Fund and Unicorn Grocery. This provided financial support and helped to cover the upfront costs of the project, making it more feasible.

Lessons learnt

The importance of community involvement: The project was funded through a community share offer, which can help to build a sense of community ownership and engagement in the project.
The value of partnerships and collaboration: Collaboration and partnerships can help to bring together different expertise, resources, and perspectives, and can lead to more effective and successful projects.
The importance of a strong business case: The project is expected to generate clean energy and reduce carbon emissions, as well as provide financial and educational benefits to the schools and the local community. This can help to make the project attractive to investors and increase the chances of success.

6.2.2 UK Wide

6.2.2.1 How Warrington Invested in Renewable Energy with Community Municipal Bonds

UK public backs Warrington's green vision with £1m investment

Overview

Warrington Borough Council has raised funds from community municipal bonds for renewable energy projects and low carbon infrastructure. These bonds enable councils to raise money from residents and give back through delivering low carbon projects.

What impact has this project had?

The funds have helped develop a solar farm and a battery storage facility aiming to produce electricity surpassing annual energy consumption levels. The revenue generated from the surplus would then be to the Green Energy Strategy. The council's bit to the Department for Transport's Zero Emission Bus Regional Areas (ZEBRA) scheme could potentially replace the entire bus fleet to electric vehicles powered by the farm.

The project has many social impacts such as reduction of fuel poverty from the revenue of the solar farm. The project has boosted the council's reputation among the public making them engage more in climate action.

What made this work?

The council's commitment to strong climate ambitions goes back to 2007 when it first launched its climate strategy. The council also has strong expertise through previous experience in raising bonds and renewable energy activities. Abundance, the council's partner in structuring the bond, aided in making it low maintenance for the local authority.

The bonds have made the council less reliant on unstable fundings, are easy to run and quite accessible. For residents, these are low risk investments and their attachment to the town as well as the transparency of the bonds has encouraged them to invest. the project also provides residents an opportunity to improve financial security and improve the region's economic health after the pandemic hit.

£12,000 put in to meet legal costs was the only direct cost for the council and the rest was 15-20 hours of staff time.

Lessons learnt

Although implementation of the bond has been quite smooth, gaining the support of councillors was a struggle. The council is an example of how a community municipal bond can lead to a fair and green economy and how important building consensus early on is.

Although the partnership with Abundance helped in handling communications, more involvement from the council's end for the same will highlight local benefits and encourage public engagement.

With the success of the pilot in Warrington, this project could be replicated in other councils and the Institute and Abundance have been working towards it. Although, local authorities might be hesitant due to lack of knowledge or experience, it is quite a simple and straightforward concept to implement.

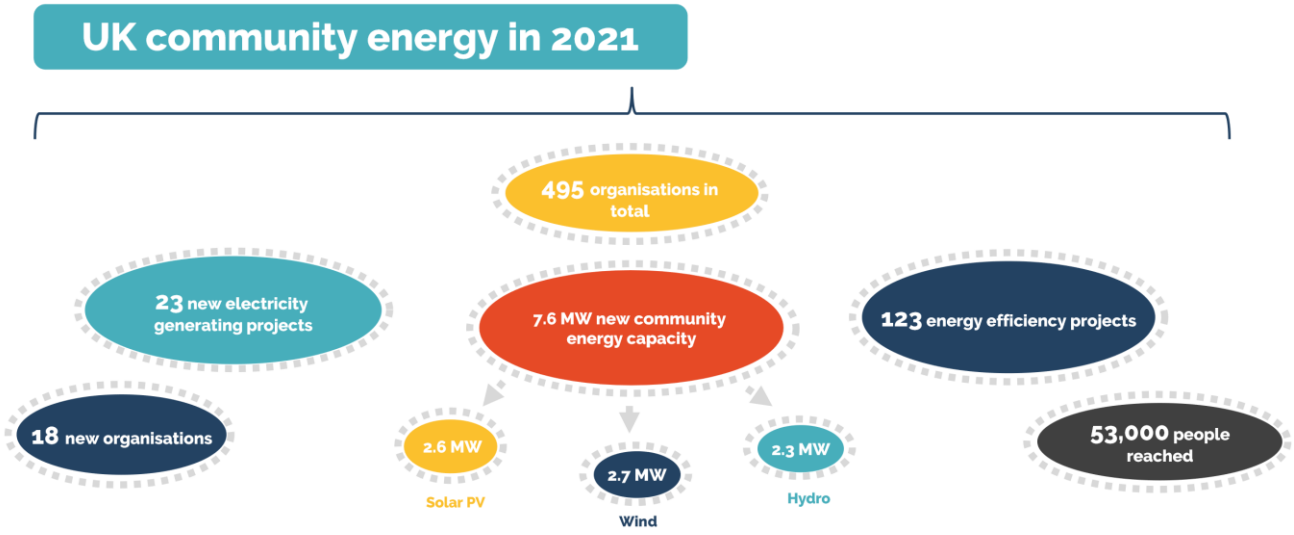
6.3 Tools, Resources and Support

6.3.1 Community Energy State of the Sector Reports

https://communityenergyengland.org/pages/state-of-the-sector

Community Energy England is a not-for-profit organisation founded in 2014 by community energy sector practitioners to help clear obstacles, create connections between practitioners and stakeholders and facilitate the work community energy organisations are doing[8]. The organisation is collecting survey response from CE schemes and puts them in the context of broader policy landscape, economic outlook, and energy system. Their key objectives are to lobby for supportive policy and regulations for community energy and provide opportunities and mechanisms for active community energy practitioners to connect and share knowledge.

Community Energy England's annual State of the Sector surveys and reports have provided insight into the UK community energy sector since 2017. The reports outline how and why the community energy sector is changing and provides evidence base to encourage a more supportive policy landscape. The diagram below summarises the 2021-2022 state of sector report.



For further information on Community Energy State of the Sector reports see Appendix B.

6.3.2 Energy Systems Catapult

6.3.2.1 Catapult: Net Zero Go

https://es.catapult.org.uk/tools-and-labs/our-place-based-net-zero-toolkit/net-zero-go/

Net Zero Go is an online platform provided by Energy Systems Catapult which brings together a variety of tools, support mechanisms and information to help local authorities develop and deliver local zero carbon projects.

6.3.2.2 Local Energy Assets Representation (LEAR)

Local Energy Asset Representation - Energy Systems Catapult

[8] Community Energy in England – Google My Maps

Local energy asset representation (LEAR) is a tool developed by Energy Systems Catapult in order to aid the transformation and growth of regional energy systems within the UK. It aims to detail how businesses or local governance could improve their carbon emissions in line with current UK Net Zero goals. The tool models key metrics for your chosen area which can help inform net zero action for things such as demand, generation, storage and distribution assets, energy network constraints,

6.3.2.3 Local Area Energy Planning (LAEP)

Local Area Energy Planning - Energy Systems Catapult

LAEP is a process which has the potential to "inform, shape and enable key aspects of the transition to a net zero carbon energy system." If done well, LAEP "can provide sound foundations for effective and sustained local action to cut carbon emissions taken by well-informed local leaders and initiative-takers." The resulting plan can potentially underpin specific proposals to upgrade local energy networks to enable decarbonisation in line with local objectives.

The approach is intended to deliver "cost-effective strategies that build the confidence needed to unlock investment in low-carbon energy systems", through a process to enable data-driven, spatial and collaborative planning of local energy systems, to ensure cost-effective decarbonisation of local areas. It builds on the work on the Energy Data Task Force and sets out Data Best Practice Principles "to help networks open up relevant data and unlock innovation to help decarbonise local areas

6.3.3 CARES Tool Kit

https://localenergy.scot/resources-overview/

The CARES toolkit enables users to be guided through the process of developing a renewable energy project, from determining your goals to helping you achieve them. It includes information on:

- Technology Types
- Business Planning
- Downloadable tools and templates
- Project organisation
- Setting up an organisation

6.3.4 Connected Energy

https://c-e-int.com/

One of the few companies to do this in the UK, Connected Energy recycles used electric vehicle (EV) batteries for use in large-scale energy storage projects. This benefits clients, including universities, councils, and industrial locations, by lowering expenses and reducing carbon emissions,

The Newcastle and Norfolk-based company develops and produces battery energy storage devices that can increase the lifespan of electric vehicle battery packs by up to ten years. In order to store energy produced by alternative renewable energy sources, such as solar panels or directly from the grid, the batteries are reprogrammed and then put into units that can store that energy.

The systems can provide improved energy management that can address capacity concerns, control peak loads, make EV charging easier, enable grid services revenue, and aid in energy cost reduction.

6.4 Funding and Financing Opportunities

6.4.1 Industrial Decarbonisation and Hydrogen Revenue Support

The Industrial Decarbonisation and Hydrogen Revenue Support is a £140 million UK government program aimed at supporting the development of low carbon technologies in the industrial sector. This includes the use of hydrogen as a renewable energy source in industrial processes. The program provides funding for projects that demonstrate the commercial viability of using hydrogen, with the goal of reducing greenhouse gas emissions and contributing to the UK's net zero emissions target. The program is administered by the Department for Business, Energy and Industrial Strategy, and is part of the wider Industrial Strategy Challenge Fund.

6.4.2 Public Sector Decarbonisation Scheme

Public Sector Decarbonisation Scheme - GOV.UK (www.gov.uk)

The Public Sector Decarbonisation Scheme is a UK government program that provides financial support through grants for energy efficiency and renewable energy projects in the public sector. It is administered by the Department for Business, Energy and Industrial Strategy with up to £635 million in funding available. Eligible projects include the installation of energy efficient lighting, heating, and ventilation systems, as well as renewable energy technologies such as solar panels and wind turbines.

6.4.3 Salix

https://www.salixfinance.co.uk/

Salix is a financial support scheme in the UK that provides funding for energy efficiency and renewable energy projects in the public sector. It is administered by the Department for Business, Energy, and Industrial Strategy, and is designed to help public sector organizations reduce their energy use, lower their carbon emissions, and save money on energy bills. Eligible projects include the installation of energy efficient lighting, heating, and ventilation systems, as well as renewable energy technologies such as solar panels and wind turbines. Funding is provided through interest-free loans that are repaid over a period of time from the energy savings generated by the project.

6.5 Recommendations to boost the net zero agenda

6.5.1 Organisational

- Local authorities should seek to undertake an energy audit of all buildings where renewable energy generation could be permitted and appropriate. This could include things like installing solar panels on the roofs of local government buildings, small scale wind turbines, and batteries to balance supply and demand during different meteorological conditions. Findings from this could be used to create an investment programme which prioritises high impact, low-cost solutions first.
- Installing smart meters across council buildings such as halls, schools and office buildings could provide real-time data on energy usage, allowing local authorities to identify areas where energy is being wasted and energy efficiency improvements could be made.

- Local authorities can implement energy reporting and benchmarking systems to track their energy usage over time and compare it to similar organizations.
- Local authorities could create a non-profit energy company to provide affordable, renewable energy to their communities. This can be done by determining the purpose and goals of the company, developing a business plan, choosing a legal structure, obtaining necessary licenses and permits, securing funding, establishing a board of directors or trustees, and implementing the business plan. Examples of areas doing this include Frome Town Council, and Bristol City Energy. In Norwich, Roar Power has been set up as a 'white label' energy company, acting in partnership with a licensed supplier to offer cheaper tariffs for residents through bulk purchasing.
- Local authorities should engage regularly with DNOs and OFGEM to anticipate grid connections and their associated investments well ahead of schedule.
- Local authorities should work with regulators, industry and key stakeholders to provide input to central government to streamline any environmental and planning permitting processes to ensure new power generation can be established as soon as required.
- Local authorities that are part of broader conurbations / city regions need to engage with surrounding areas in order to create a holistic view of the electricity network and the current pipeline for grid connections across their DNO area. In creating a joined-up understanding of current and future capacity requirements it will enable local authorities to better anticipate need and engage with DNOs. These discussions could be mediated through a CA (where present), or via LEPs or Net Zero Hubs.
-

6.5.2 Territorial

- Providing incentives or subsidies to property owners and businesses who install renewable energy systems. This could include things like:
  - Financial incentives such as grants, loans, or other forms of financial assistance to help property owners cover the upfront costs of installing renewable energy systems.
  - Tax incentives or credits to property owners who install renewable energy systems.
  - Regulatory incentives or policies that make it easier for property owners to install renewable energy systems, such as streamlined permitting processes or relaxed zoning requirements.
  - Marketing incentives to promote the use of renewable energy through marketing campaigns or other public outreach efforts.
- Provide educational resources and information to property owners and businesses about the benefits of renewable energy and how to go about implementing it. This could include things like information sessions, workshops, accessible online resources, one-on-one consultations, and guides on how to choose and install renewable energy systems.
- Potential funding to do energy studies for certain development areas and looking at future housing and regeneration sites, not just around rebuilding, but how to produce the energy, the heat and renewable energy for that development.

6.5.3 Public Private Partnerships

- Increase renewable energy generation by partnering with private companies to develop and implement renewable energy projects. This could include things like solar or wind farms, or other renewable energy generation facilities. The local authority and the private company could work together to identify potential sites for the project, secure funding, and develop and implement the project.
- Partner with private companies to provide financing or other support to property owners and businesses who want to install renewable energy systems on their own property. For example, a local authority and private company could develop a program that provides low-interest loans or other financial assistance to property owners who want to install solar panels or other renewable energy systems.
- Use PPPs to support the development of new technologies and innovations in the renewable energy field. For example, they could partner with private companies to fund research and development projects, or to provide support for start-ups working on new renewable energy technologies.

7 Transport and Logistics

In order to tackle the full scale of emissions across the transport and logistics sector, there are three key aspects to recognise.

Firstly, that transport is a universal service obligation, without it, it is very difficult for citizens to participate in UK society. Transport poverty for people living in rural or deprived areas, is a very real issue, particularly for those who cannot afford or access cars or rail.

Secondly, everything that we consume, at some point will be associated with a transport cost. Whilst decarbonising transport such as buses, trains and cars will be crucial in achieving net zero, it must also be acknowledged that much of what we can eat, use and see will have been transported, and often through supply lines from outside of the UK. Therefore, to truly reach net zero within the transport and logistics sector, government must tackle net zero carbon consumption alongside net zero carbon production (from within the UK),

Finally, within the UK, central government has created a series of frameworks to analyse public investments (i.e. The Green Book), and for how regulators should behave on the basis of cost-benefit analysis, which looks at each project individually. However, without building an integrated low-carbon transport plan, which looks at road, rail, air and water as whole system, it will be impossible to provide good, reliable transport systems and reach net zero. This will require planning to understand what it is each local authority will require, how this will affect surrounding areas, and what should be required of system regulators and operators.

It is also important to note the digitisation of our society, in part spurred on by the Covid-19 pandemic, is heavily influencing the way we connect, and has in some cases dramatically lowered our need to travel for work. Communication and IT and how it affects the decisions we make around transport must be included in any transport strategies central government or local authorities now make.

It is estimated that in 2019 that UK produced 455 MtCO2e of GHG emissions from the domestic transport alone. In response, the UK Government has established goals around the reduction of emissions from transport and logistics. For example, the decision to phase-out of gasoline and diesel cars and vans, which will necessitate the construction of infrastructure for the charging of electric vehicles. Additionally, the government's goal for 50% of all trips made in towns and cities be through active travel, will call for new ways to approach urban design, with precedence given to cyclists and pedestrians.

In December 2021 over a quarter of all new cars sold in the UK were battery electric, compared to 2019 which was just 2%[9]. However central government have highlighted that the pace of EV charge point roll out is too slow, with excessive charging costs, poor reliability and lack of availability.

All of this points back to our infrastructure, and particularly the need for the UK to bolster its electricity grid to account for the unprecedented increase in devices being connected to our system.

[9] Taking charge.: the electric vehicle infrastructure strategy (publishing.service.gov.uk)

7.1 Trends and Further Information

7.1.1 A large proportion of Key Cities Members are focussing on reducing emissions from their own fleet – often through electrification of fleet vehicles.

During engagement challenges relating to fleet operation, installation and maintenance were highlighted as key barriers to local authorities pushing ahead with full fleet conversion to ULEV.

7.1.2 Across the Key City members there was a general lack of technical understanding for EV charging infrastructure (for example capacity ratings and charger types).

7.1.3 Engagement with Key City members suggested there was a confusion about the roles different local authority types play with regards to transportation.

7.1.4 Whilst the uptake of EVs across the Key City members has been growing, ensuring there is even spread of EV chargers, with different charging options has been challenging.

7.1.5 Key City members have found pushback from the public when introducing strategies that promote active travel and discourage the use of personal vehicles.

7.1.6 There is a missing discourse around how digital technology will have an impact in the way we use transport.

The Covid-19 outbreak of 2020 has significantly increased the requirement for digital transformation. There has been a huge increase in digital solutions during the past few years. From the expansion of technology to for work from home, to the implementation of e-commerce solutions for takeaway food and drinks, to the requirement to inform passengers about the volumes of passengers on public transportation in real-time.

7.1.7 Key city members underlined that the focus of decarbonizing transport should not be on EVs but should be on modal shift and ensuring sustainable, reliable mass transit.

7.2 Current Initiatives

7.2.1 Key Cities

7.2.1.1 How Bournemouth, Christchurch, and Poole Council are Lowering their Fleet Emissions

Four new electric refuse vehicles are now collecting waste across Bournemouth, Christchurch, and Poole. – bcp (bcpconservatives.com)

Overview

Bournemouth, Christchurch, and Poole Council has added four new Dennis Eagle e-Collect electric refuse vehicles to its fleet, powered by 100% green electricity (January 2022).
The four electric vehicles were introduced after a successful trial in 2020 and following a successful tender procedure. The council's declaration of a climate and ecological emergency, which promises to make operations carbon neutral by 2030, is supported by the deployment of these all-electric vehicles.

What impact has the project had?

The four new vehicles are making a positive difference to the region. Air quality has improved as the new vehicles have no direct emissions. Residential waste collections are still timely and effective after the switch to electric. Overall, each electric refuse collection vehicle is expected to save between 30-40 tonnes of carbon dioxide annually.
Noise pollution has also been reduced from the louder, diesel-powered vehicles.

What made this work?

BCP made a clear commitment to residents to make Bournemouth, Christchurch, and Poole cleaner, greener and safer for all. The council's awareness in needing to transition away from diesel powered vehicles to cleaner alternatives like electric vehicles is quickly transforming into one of the most progressive city-regions in the country, by promoting sustainable innovation and transformation.
BCP is the first council in the south of England to buy four new refuse vehicles of this caliber.

Lessons learnt

This case study in Bournemouth, Christchurch and Poole demonstrates that electric refuse collection vehicles can successfully replace the current diesel-powered vehicles used across the region, but also the UK. If all 104 vehicles in the BCP fleet are swapped to electric, over 3,100 tonnes of CO_2 can be saved annually.

7.2.1.2 How Doncaster is Establishing a 100% Electric Fleet

Doncaster accelerates fully electric fleet - transportandenergy

Overview

Doncaster Council is establishing a fleet of 100% electric vehicles as part of its efforts to address the climate emergency. The plan involves replacing the council's current transport fleet with green vehicles that reduce carbon emissions and improve air quality. The council is partnering with ENGIE to install charging points for the new fleet and is aiming to phase out its reliance on fossil fuel vehicles. The electric vehicles will support operational teams such as the Street Scene and Highways teams and will be used 24/7 year-round. The council aims to have a zero emissions fleet in the future.

- Doncaster Council's current fleet consists of 36 electric vehicles (July 2022)
- Current EV Chargers are located at North Bridge Depot, Balby Family Centre, Mexborough Library and Sandall Beat Environment Centre

What impact has the project had?

Latest electric cars were all procured within Doncaster and supported the local economy and jobs. The project is changing the way people travel as well as encouraging more walking and cycling.

What made this work? Funding Mechanisms?

The success of a project like this depends on a variety of factors, including the availability of funding, the support of the local community, the efficiency, and the effectiveness of the implementation process. The partnership with ENGIE and the installation of charging points for the electric vehicles were key factors in the success of the project.

Lessons learnt

By replacing fossil fuel vehicles with electric vehicles, Doncaster Council will see a reduction in its carbon emissions and an improvement in air quality. These changes could have a range of benefits for the local community, including potentially improving public health and contributing to efforts to address climate change. It is also possible that the installation of charging points for the electric vehicles could help to promote the use of electric transportation in the community.

7.2.1.3 How Gloucester is creating behavioral change to promote active travel

Council announces further details of green travel plans - Gloucestershire County Council
Travel Plan Guide - Gloucestershire County Council

Overview
Gloucestershire County Council has announced plans to make it easier to walk and cycle during the Covid-19 restrictions, following the announcement of £250m in national investment to promote sustainable travel. The council has requested that district councils work with county councillors to put forward their top priority schemes, including installing pop-up cycle facilities, widening footways and crossings with cones and barriers, reducing speed limits, and adding additional cycle parking at key locations. The schemes will need to support strong social distancing, promote sustainable transport, improve air quality, assist in economic recovery, and be necessary and practical. The council is also seeking input from district councils on the best locations for these measures. The county council has previously invested over £4.7m in cycling and walking and is looking to do even more this year.
Gloucester Council have expressed they are happy to share this work with other key cities.

What impact has the project had?
Improved health: Encouraging active transportation, such as walking and cycling, can help improve the physical health of individuals by increasing their physical activity levels. This can help prevent a range of health problems, including obesity, heart disease, and diabetes.
Reduced carbon emissions: Walking and cycling are environmentally friendly modes of transportation that do not produce carbon emissions. By promoting these modes of transportation, organizations can help reduce their carbon footprint and contribute to the fight against climate change.
Improved air quality: Walking and cycling can also help improve air quality by reducing the number of cars on the road, which are a major contributor to air pollution.
Economic benefits: Promoting walking and cycling can also have economic benefits, as it can reduce the need for expensive infrastructure such as roads and parking lots and can also help stimulate local economic activity by attracting more visitors to an area.
Enhanced social connections: Walking and cycling can also have social benefits, as they can encourage people to interact with each other and their local community, which can help build stronger social connections and a sense of community.

What made this work? Funding Mechanisms?
Gloucester City Council announced the travel plans following the government announcements of £250 million to promote sustainable travel across the UK. No clear value was stated in the articles, but the government was the main source of funding for the project. Other investors might have included foundations, private businesses, and community organisations.

Lessons learnt
There are many benefits of sustainable travel projects, which are initiatives that promote modes of transportation that are environmentally friendly, efficient, and accessible. Some of the key benefits of these types of projects include:
Improved health: Encouraging active transportation, such as walking and cycling, can help improve the physical health of individuals by increasing their physical activity levels. This can help prevent a range of health problems, including obesity, heart disease, and diabetes.
Reduced carbon emissions: Sustainable transportation modes, such as public transit, walking, and cycling, do not produce carbon emissions and can therefore help reduce an organization's or community's carbon footprint and contribute to the fight against climate change.
Improved air quality: Sustainable transportation can also help improve air quality by reducing the number of cars on the road, which are a major contributor to air pollution.

Economic benefits: Promoting sustainable transportation can also have economic benefits, as it can reduce the need for expensive infrastructure such as roads and parking lots and can also help stimulate local economic activity by attracting more visitors to an area. Enhanced social connections: Sustainable transportation can also have social benefits, as it can encourage people to interact with each other and their local community, which can help build stronger social connections and a sense of community. Improved accessibility: Sustainable transportation can also improve accessibility for all members of a community, including those who may have mobility challenges or do not have access to a car. This can help promote social inclusion and equality.

7.2.1.3.1 How Kirklees Council is electrifying its fleet

Council takes big steps towards greening its fleet with a total of £7.25m investments - Kirklees Together

Overview

Kirklees Council has again invested in new, greener vehicles for its fleet, including electric vehicles and investments. The recent capital investment is an extension of a previous vehicle replacement program and is intended to support the council's commitment to becoming carbon neutral and climate ready by 2038. This includes an electric refuse collection vehicle, following a successful trial. The council's goal is to transition to an entirely electric fleet, and currently 69% of the council's operated cars are electric or partially electrically powered.
Another investment included £1 million for 35 electric light commercial vehicles, bringing the percentage of electric vehicles in the fleet to 13%. Transport Services department manage the phased implementation of the vehicle replacement program.

- A total of £7.25 million recently invested into Kirklees fleet.
- New high-tech electric vehicles, alongside newer, greener engine models for its fleet
- For the Waste and Recycling services, an electric refuse collection vehicle, following a successful trial (2021)

What impact has the project had?
The project has been successful in helping Kirklees to achieve a reduction of more than 53% in emissions over the last decade. The air quality has been improved as a result of the project. The running costs have been reduced due to the project's implementation. Downtime has been decreased as a result of the project. The project has led to an improvement in service delivery.

What made this work?
The Vehicle Replacement Programme Capital Investment was implemented as a part of the organization's plan.
£1 million of the £2 million Climate Emergency Fund was invested in the acquisition of additional 35 electric Light Commercial Vehicles (LCVs) to support the organization's sustainability goals.

Lessons learnt
Transitioning to electric and other greener vehicles can be an effective way to reduce carbon emissions and work towards meeting climate goals.
A phased approach to vehicle replacement, in which vehicles are replaced gradually over time, can help to ensure a smooth transition and allow for the delivery of vehicles as needed to meet service needs.
Investing in an electric refuse collection vehicle for the Waste and Recycling Service can provide environmental benefits and improve service delivery.
Working towards a goal of transitioning to an entirely electric fleet can be a challenging but worthwhile long-term goal for the organization.
Collaborating with other organizations, such as BP, can help to support efforts to address climate change and improve sustainability for the organization.

7.2.2 UK Wide

7.2.2.1 How Essex is Providing On-Demand Low Carbon Transport with DigiGo

DigiGo (essexhighways.org)

Overview

DigiGo is a fully electric minibus service which runs across areas of Essex and offers 'on-demand and pre-bookable travel with no fixed route or timetable'[1]. The service is aimed at residents who have limited access to public transport, or who do not have access to ULEV private vehicles.

The scheme utilises an app which allows users to book the journeys up to 7 days in advance, the minibuses can also be tracked in-app. The pilot scheme has been running for two years, and currently operates within two rural and suburban areas, but given its success Essex plan to continue its expansion across the region.

DigiGo was created with Moovit, an Intel company and a Mobility-as-a-Service solution provider, who powered the technology behind the app and service.

Currently concessions always travel for free on any DigiGo service after 9am on weekdays, and all day on weekends.

What impact has the project had?

DigiGo has increased residents access to health, education, and employment opportunities, with local schools, hospitals and tourist attractions noting DigiGo's usefulness. The service has created a sustainable travel option, which is easy to use ad its in-app live alerts have been designed to enable users to say up-to-date with travel disruptions.

What made the project work?

Funded by the UK Department for Transport's Rural Mobility Fund, DigiGo will run for two years, with learnings and development used to inform future potential future rollout to other areas of the UK

7.2.2.2 How Brighton & Hove are turning city centre deliveries green

eCargo Bike Accelerator Project (brighton-hove.gov.uk)

Overview
Brighton and Hove City has introduced electric bikes for greener deliveries under Action 26, that are used by council teams and small businesses in the city. This is aimed towards demonstrating how electric bikes can replace diesel vans for deliveries on urban streets and encourage the growth of small businesses to adopt these changes. The council also offers subsidies for this switch along with advice on what bike would suit businesses, rider training and webpage promotion. The project aligns with the council's priority of carbon neutrality by 2030.

What impact has the project had?
Feedback from council teams has been positive with the bikes helping them work with more ease.
The Brighton & Hove Energy Services Co-op is using electric cargo bikes to help residents, especially those vulnerable, in surveying homes and installing energy-saving methods in fewer visits, thus making homes more comfortable.
The project has helped local businesses grow immensely.

What made this work?
The council has had many external partnerships such as those with Energy Savings Trust, MP Smarter Travel and The Living Coast that have made the project a success in many ways. These have helped in providing knowledge of the electric bike sector ad business engagement.
The council has raised awareness and involved companies through benefits such as cheaper purchasing and operating costs, convenient loading areas and a good image for business.
Major funds of about £80000, that were used to purchase the 12 bikes and a trailer, were awarded by the Department for Transport's £1.2m e-Cargo Bike Grant Fund.

Lessons learnt
There is a need to ensure maximum utilisation of these bikes and all staff is trained to use them for more efficiency.

7.3 Tools, Resources and Support

7.3.1 Transport Data Sets

https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-tables

Central government releases detailed statistics about all vehicle's licenses and registered vehicles within the UK. This includes detailed breakdowns of plug-in vehicles and ULEVs by upper and lower local authority tier. These data sets can be useful for understanding trends and informing net zero action within the transport sector.

7.3.2 Charge Fairy

Charge Fairy

Where residents want an EV but cannot identify a safe, convenient cost-effective option to home charging or there are no practical solutions to public or shared EV infrastructure, there are novel services available to cater for specific needs. For example, Charge Fairy offer a mobile electric van service complete with onboard battery pack.

Mobile Delivery of EV charging is proposed to be a convenient, hassle-free option to charging EV's without the need for home installations or the need to identify and wait for local infrastructure to be available.

It is also suggested that through the subscription service and via a free app, Charge Fairy can monitor usage and habits and predict when the next charge will be required. This way, they can visit the vehicle and charge it at a time that is convenient to the consumer.

7.3.3 Gul-e

Home - Gul-e | No Driveway? No Problem!

Gul-e is an EV charging solution currently being trialled in Oxfordshire. The innovation enables people who don't have access to off-street parking to run charging cables across gullies within the pavement from their home. This method reduces the hazard of pedestrians tripping on charging cables.

7.4 Funding and Financing Opportunities

There are multiple funding streams available to Local Authorities in order to improve EV charging infrastructure provision for their residents[10]. These are explored below, along with some alternative commercial propositions that could be considered. These opportunities would need to be scoped in more detail as a strategy emerges.

7.4.1 On-Street Residential Chargepoint Scheme (ORCS)

On-Street Residential Chargepoint Scheme guidance for local authorities - GOV.UK (www.gov.uk)

The On-Street Residential Chargepoint Scheme[11] for Local Authorities provides grant funding towards the cost of installing on-street residential chargepoints to ensure that on-street parking is not a barrier to realising the benefits of owning an electric vehicle.

[10] The Local Government Support Programme can offer advice on procurement best-practise and help with funding applications

[11] https://www.gov.uk/government/publications/grants-for-local-authorities-to-provide-residential-on-street-chargepoints/grants-to-provide-residential-on-street-chargepoints-for-plug-in-electric-vehicles-guidance-for-local-authorities

The scheme provides up to a maximum of 60% of capital costs[12] of procuring and installing the chargepoint and an associated dedicated parking bay. The scheme anticipates that the total project cost will not exceed £7,500 per chargepoint, although £13,000 can per provided in areas where the electrical grid connection costs are exceptionally high. The local authority must fund the remaining 40%+ cost or find a partner to do so.

There is no minimum/maximum project size, but installations must be completed by 31st March 2024 and only chargers rated at 22kW or lower are eligible. There are also requirements to meet minimum technical specifications and ensure simple payment methods, such as contactless card payments. In rural areas, chargepoints can be installed on a discretionary basis in community spaces (e.g. village hall car parks) where Local Authority-owned land is not available/suitable.

7.4.2 Workplace Charging Scheme

Workplace Charging Scheme: guidance for applicants - GOV.UK (www.gov.uk)

There are other streams of funding available specifically for increasing charging infrastructure at the workplace, such as the Workplace Charging Scheme[13], which is a voucher-based scheme that provides support towards the up-front costs of the purchase and installation of electric vehicle chargepoints.

The scheme is available to eligible businesses, charities, and public sector organisations. The grant covers up to 75% of the total costs of the purchase and installation of chargepoints (inclusive of VAT), capped at a minimum of: £350 per socket, with 40 sockets across all sites per applicant.

The chargepoints must be situated in parking spaces designated solely for the use of staff or fleet vehicles and not open to the public.

7.4.2.1 EV Chargepoint Grant

Electric vehicle chargepoint and infrastructure grants for landlords: Overview - GOV.UK (www.gov.uk)

The Electric Vehicle Chargepoint Grants is a funding scheme available for the installation of chargepoints for the use of, flat owners, tenants of rented properties, staff and fleets of small businesses and residential car parks. The grant covers up to 75% of the costs of installation (£350/socket) and can be claimed by the installers on behalf of the end-user.

7.4.2.2 Rapid Charging Fund

Rapid charging fund - GOV.UK (www.gov.uk)

The Rapid Charging Fund is a £950 million fund that will 'future-proof electrical capacity at motorway and major A road service areas to prepare the network for 100% zero emissions vehicles (ZEV) uptake'[14]. The fund is not yet open to applicants but will be eligible from bids of any motorway and major A road service area operators.

7.4.3 Arrangements with third-party developers

Key City members should consider public private partnerships (PPP) to aid with the implementation and maintenance of electric vehicle charging points across the city. There are existing frameworks for shared procurement schemes between local authorities and the private sector, whether the arrangement is a fixed contract, a flexible agreement, demand side services

[12] Draft applications pre-1 April 2022, could still receive up to 75% capex support
[13] https://www.gov.uk/guidance/workplace-charging-scheme-guidance-for-applicants
[14] Rapid charging fund - GOV.UK (www.gov.uk)

or management systems, Key City members could benefit from the support of the private sector. PPPs could offer the opportunity to secure financial support as well as EV expert taskforces to address the key challenges the city will face during the project. There are several useful case studies of councils or local authorities partnering with third-party developers in order to provide a network of charge points throughout the area.

Kent County Council are working with Connected Kerb with the aim to install 600 new charging points over the next 2 years[15]. Connected Kerb will provide the funding, whilst Kent County Council will provide the 150 car parking locations

and will also receive a revenue share from the scheme. It is hoped that each car park will contain four charging points with a mixture of fast and rapid connections[16].

In Scotland PPPs are helping to drive the network expansion of EV chargepoints, with Scotland's transport minister stating that PPPs will be key to 'attracting investment and scaling provision at pace'[17]. Osprey Charging is initially planned to provide 10 sites in Scotland each with up to six high-powered chargers capable of adding 100 miles in as little as 10 minutes. Meanwhile Ubitricity plans to roll out EV chargers in seven Scottish local authority areas this year[18].

Through a PPP scheme in the US between the City of Texarkana, SWEPCO and Homeserve[19] charge points were installed along the Interstate 30 and town square to reduce range anxiety and increase tourism[20]. Finally in China, PPPs are being increasingly used to support the construction of EV charging infrastructure as well as re-allocate associated financial, constructional, and operational risks towards the private sector[21].

The case studies help exemplify how PPPs could support the implementation of an electric vehicle charging system across Key Cities. For example, cities could partner with a charging station provider to lease their infrastructure from them, with the financial benefit to the company being the rental fees for the technology. Alternatively, the city could hold an arrangement with the developers to install the infrastructure and take a share of the charging fees from demand users.

7.5 Recommendations to boost the net zero agenda

7.5.1 Organisational

- Investing in public transportation infrastructure, such as bus networks, and encouraging people to use these modes of transport instead of private cars. This can be done through measures such as improving the frequency and reliability of public transportation services, or by making them more affordable for users.

[15] Public and private partnership brings 600 extra electric vehicle charging points to Kent - KCC Media Hub
[16] Kent chargepoint network with hundreds of EV chargepoints (connectedkerb.com)
[17] Private and public initiatives drive Scottish EV charging network expansion (eva.scot)
[18] ubitricity | GREENFLEET Events
[19] EV charging stations provided through public-private partnership | Homeserve for Energy Utilities (homeserveutility.com)
[20] The Texarkana Gazette (pressreader.com)
[21] Public-Private Partnerships in the Electric Vehicle Charging Infrastructure in China: An Illustrative Case Study (hindawi.com)

- Implementing a demand-responsive transport or flexible transport, which adjusts the supply of service to meet the demand for travel in a particular area. This can be achieved through the use of technology such as real-time scheduling and routing algorithms, as well as by allowing customers to request service through a smartphone app or other booking platform. Demand-responsive transport can take many forms, including bus or shuttle services that operate on fixed routes but can deviate from those routes to pick up and drop off passengers at specific locations upon request, or ride-hailing services that use a network of privately owned vehicles to provide door-to-door service. An example of this is DigiGo in Essex which can be found within the current initiatives section of this theme.
- Support the development of renewable energy sources, such as solar or wind power, to power their transportation systems. Should grid constraints be an issue, the use of closed system technologies (for example a solar canopy over EV charging locations) could be a more feasible option.
- Where possible replace fleet vehicles with ULEVs, be that electric or. For hydrogen there are a number of local authority depots across the UK. These host mixed fleets across different teams including waste collection, grounds maintenance and housing. These can offer interesting demonstration opportunities as the fleets will typically operate a back-to-base hydrogen refuelling model. The current cost disparity between conventional vehicles and hydrogen vehicles and a cut of fossil-fuelled-powered vehicle mean the transition to hydrogen fleets will be a gradual one. A key consideration raised is the difference between refuelling with hydrogen and recharging a battery. For operational reasons, fleet owners may opt for hydrogen because refuelling can be reduced to 3-20 minutes, compared to a minimum rapid EV charge of 60minutes or overnight charge of 8 hours with shorter distance. The public sector and its contractors are best placed to become early adopters of the technology and become anchor customers that would de-risk hydrogen producers. The infrastructure could also provide confidence to the private sector, acting as a catalyst to drive further decarbonisation across the county and develop a local hydrogen economy with the jobs and skills that come with it. Due to the cost differentials and different fleet lifecycles, big fleets companies like National Express fleet could also introduce hydrogen vehicles ahead of some of the smaller local coach fleets.
- GPS tracking and data analytics can help local authorities track the movements of their vehicles and identify opportunities to optimize routes and reduce fuel consumption. Telematics systems can also provide real-time data on vehicle performance, allowing local authorities to identify areas where fuel efficiency can be improved. Such software can help reduce engine idle time, monitor speeds, optimize routing, maintain accurate records and lead to more proactive vehicle maintenance. For example Exactrak specialise in cloud based vehicle tracking for local authorities.
- Fleet emissions monitoring scheme, which includes data collection for each vehicle owned/on contract. This includes: distance travelled for contract in miles, type of vehicle, engine type and EURO emissions standard of vehicle.

- Create a travel schemes available to employees (subsidised public transport, subsidised cycling schemes and storage, sustainable transport such as electric bus from public station to facilities).

7.5.2 Territorial

- Create low traffic neighbourhoods to aid in the reduction of vehicles within a specific area, promote active travel and increase air quality. More information can be found on low traffic neighbour hoods in Appendix C.
- Implement 20 minute neighbourhoods, the purpose being to create an area where residents have access to everyday needs within a 20-minute walk. The aim is to promote walking, cycling, and public transport over cars. Local authorities can work with transport authorities and other councils to plan homes, transport, and infrastructure in urban and rural areas. This is already being trialled in Norfolk[22].
- Promoting and incentivizing the use of low-emission vehicles, such as electric or hydrogen-powered cars, buses, and trucks. This can be done through measures such as offering grants or subsidies to individuals and businesses who want to purchase low-emission vehicles, or by creating dedicated lanes or parking spaces for such vehicles.
- Ensure there is an even distribution of a variety of EV charger points across all parking zones, local authorities should look to assess charging volume requirements at the different car parks and begin discussions with companies that could install 'destination' charging option. Third-party developers may be willing to cover the cost of ChargePoint installs provided they see a return on their investment, either recouping costs through a lease-model or fee included in the charging rates.
- Local authorities could implement a congestion pricing program that charges a fee for driving in congested areas, encouraging the use of alternative modes of transportation.
- Local authorities could implement a ride-sharing program that connects residents who are traveling to the same destination, reducing the number of single-occupancy vehicles on the road, for example Liftshare[23].
- Local authorities can invest in infrastructure that supports active transportation, such as bike lanes and pedestrian walkways, as well as promoting the use of non-motorized modes of transportation. For example, in Bury St Edmunds, St Edmunds Catholic School have introduced a 'Bike Train' to reduce school run congestion and lower the number of cars on the road. The Bike Train allows for children to ride their own bikes to and from school in a group supported by adult bikers[24].
- Encouraging the location of tourist attractions and facilities to sites where public transport is accessible, and advise said attractions to implement green travel plans.

[22] 20-minute neighbourhoods could be trialled in Norfolk | Eastern Daily Press (edp24.co.uk)

[23] Car share with trusted, reviewed and rated Liftshare.com members

[24] https://ecocarriersbse.co.uk/bury-bike-train/

- Introducing clean air management zones (CAMZs) within local authorities where traffic is high and Nitrogen oxides (NOx) or particulate matters (PM) form in high concentrations. This could include setting more stringent emissions limits in order to enter the zones, investing and promoting the use of public transportation options within the zones, introducing tolls to pass through the area in a high emissions vehicle. A useful resource for further research into CAMZs is the Clean Air Zone Framework[25], which outlines the necessary steps local authorities must consider and take to implement CAMZs. Oxford council have successfully introduced a zero emissions zone, which promotes a hierarchy of travel options (active travel, public transport and then private vehicles) and uses auto-recognition of number plates to track vehicles and toll vehicles during certain time periods to try reduce emissions[26].

8 Industrial, Commercial and Residential Retrofitting

The CCC has also highlighted retrofitting as a key mechanism for delivering on the UK's Net Zero targets, In the UK homes are responsible for 35% of the UKs energy use and produce 23% of our carbon emissions, making our housing stock some of the most energy efficient in Europe[27]. By, retrofitting all existing homes to the highest energy efficiency standards by 2050 it could also save households around £250 per year on their energy bills and reduce the UK's carbon emissions by 9%.

Central government is aiming for sustained growth of new markets in the low-carbon heat sector, such that at least 600,000 heat pumps are installed each year by 2028, and up to 1.9 million per year by 2033. In commercial buildings, the UK government has established the Minimum Energy Efficiency Standards (MEES), which requires landlords to upgrade their properties to at least an E rating on the Energy Performance Certificate scale. This is expected to improve the energy efficiency of around 20% of commercial buildings in the UK.

To bring about this retrofit revolution, local and national governments will need to act decisively and closely coordinate with one another.

8.1 Trends and Further Information

8.1.1 Key City members highlighted they do not have sufficient financial resources to address retrofitting concerns.

Through the Social Housing Decarbonization Fund and Sustainable Warmth Fund, the government offers funding for retrofitting low-income residents' homes, but the amount is insufficient, especially given rising labour and material costs. For councils to establish retrofit advice services for residents who are not fuel-poor, there is little financial support available.

[25] https://www.gov.uk/government/publications/air-quality-clean-air-zone-framework-for-england/clean-air-zone-framework

[26] https://www.oxfordshire.gov.uk/residents/roads-and-transport/oxford-zero-emission-zone-zez

[27] https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/

8.1.2 Key City members emphasised that central government have failed to clarify how much support should be provided from local authorities to retrofit owner-occupied and private properties.

8.1.3 Key City members expressed their frustrations with the lack of funding opportunities for households which are not considered fuel poor or deprived.

Residents' desire to increase their homes' energy efficiency is growing as costs rise. However, many people lack the funds to upgrade their homes, and there aren't any current incentives for retrofitting, like reduced stamp duty. Residents require reliable advice and funding opportunities because they are unsure of where to begin.

Currently central government funding for retrofitting has been focussed on households which aren't able to pay. However, given that local authorities are legally obligated to reach Net Zero by 2050, and the scale at which retrofit will have to be rolled out, greater central government financial support is required.

8.1.4 Local authorities have found that if they receive funding for retrofitting the timeframes for to spend are too short, leading to funding being returned.

Central governments aversion to longer timeframes on funding places strain on supply-side and skilled worker capacity. This has resulted in funding being returned before it can be spent. For example, the Greater Southeast Net Zero Hub has recently returned over £53 million from the Sustainable Warmth programme to BEIS[28].

The financial environment inhibits the expansion of regional economies. The CCC argues, for instance, that "Funds also have to be spent quickly, preventing the development of a competent local supplier chain … short term, unexpected financing possibilities fail to provide the best ideas.[29]"

Local authorities would be able to create a more cohesive plan of action from which they could construct supplier chains, develop local skills, and coordinate activity to take advantage of economies of scale and attract private financing if the funding landscape was longer-term and simpler.

8.1.5 Key Cities have struggled with low worker capacity within the retrofitting industry. This has been worsened by national policy gaps.

Due to high demand, many construction firms are hesitant to invest in new certifications and skills unless they are certain that there will be future demand for their products. Despite being ambitious, the Government's October 2021 Heat and Buildings Strategy lacks the specifics needed to inspire trust in contractors and skill providers. Whilst having the potential to reduce fuel poverty and generate jobs across the UK, retrofit received little attention in the government's levelling up white paper, published in February 2022. Furthermore, timeframes to spend funding are too short, this has resulted in some areas having to return funding before they could spend the grant. This has been further exacerbated by lack of worker capacity increasing timeframes.

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[28] Net zero homes need £150bn and workforce of 46,000 - BBC News

[29] Local Authorities and the Sixth Carbon Budget - Climate Change Committee (theccc.org.uk)

Therefore, from both a national and local government perspective it is critical to communicate to the business trades industry, that this is a large market for them to get into. Better support is required to entice businesses into the market as well as create easier options for them to get accreditation.

8.1.6 Key City members have found it challenging breaking into the private sector market, particularly owner occupiers. Across the Key Cities the most successful local government interventions have been focused on social housing, where they have complete control over the outcomes.

8.1.7 Across Key City members minimal focus has been placed on retrofitting non-domestic and commercial buildings. Whilst progression has been made within many of the cities council owned building stock, this only makes up a small proportion of the total sector.

8.1.8 Key City members have struggled coordinating mass retrofitting.

Retrofitting is a complicated process that requires the cooperation of many trades. There is a risk that local government procurement is not clear about the responsibility of each retrofit on an overall basis. The use of a hands-on retrofit coordinator who is independent of the installers completing the work can prevent low-quality retrofits, but these individuals are hard to come by.

8.2 Current Initiatives

8.2.1 Key Cities

8.2.1.1 How Coventry is Retrofitting Schools

Coventry schools to receive £2.4m energy efficiency retrofit - CoventryLive

Overview

The West Midlands Combined Authority (WMCA) in the UK is investing £2.86 million in 300 homes as part of its plans to tackle climate change and reduce fuel poverty.
The homes, located in Elmdon, Solihull, and Foleshill, Coventry, will undergo a "deep retrofit" using insulation, solar panels, and low carbon heating systems.
The WMCA also plans to help another 1,700 homes across public funded retrofit programs as part of its goal to become net zero within the next 20 years.
The WMCA Sustainable Warmth Competition project will engage local residents and take a whole area approach to retrofit, rather than just individual houses. The project is also part of the WMCA's Net Zero Neighbourhood program, which seeks to secure private sector investment and partnerships with local authorities in the region. Demonstrator schemes could also include new pocket parks, playgrounds, communal food growing initiatives, sustainable transport options, and opportunities for social enterprise.

What impact has the project had?

In Coventry, the retrofit programme has helped to reduce greenhouse gas emissions through the installation of insulation, solar panels, and low carbon heating systems. The project also reduces fuel poverty by helping households to reduce their energy consumption and bills.
The project takes a whole area approach to retrofit, engaging residents, and encouraging them to take up retrofit opportunities.

In addition to retrofitting homes, the demonstrator schemes could also include new pocket parks, playgrounds, communal food growing initiatives, sustainable transport options, and opportunities for social enterprise, all at a neighbourhood scale.

What made this work? Funding Mechanisms?

The project to retrofit homes in the West Midlands region of the UK was funded by the £19 million Sustainable Warmth Competition funding secured by the Midlands Energy Hub from the government.
In addition, the WMCA's Net Zero Neighbourhood program has been supported by more than £2 million from the WMCA, with a goal of securing major private sector investment alongside partnerships with local authorities in the region.
The funding to encourage green investment was received from the Government's Public Sector Decarbonisation Scheme.

Lessons Learnt

Retrofitting homes can be an effective way to reduce greenhouse gas emissions and reduce fuel poverty by helping households to reduce their energy consumption and energy bills.
Collaboration between the government, local authorities, and private sector organisations can be effective in funding and implementing projects that address climate change and support net zero goals.
Demonstrator schemes that include retrofitting homes as well as other initiatives, such as new pocket parks, playgrounds, communal food growing initiatives, sustainable transport options, and opportunities for social enterprise, can have a positive impact on neighbourhoods

8.2.1.2 How Exeter is Tackling Retrofitting

[Tackling the Climate Emergency in Exeter with retrofit programme - Exeter City Council News]

Overview

The city council of Exeter, UK is working to make council homes in the city more energy efficient to address the climate emergency and fuel poverty. The work is being funded by a £1.3 million investment from the council and a £1.1 million government grant. The retrofit program includes refurbishment of 120 properties off Burnthouse Lane and 100 additional homes, with the goal of making the homes carbon neutral by 2030. The work includes installation of new heating systems, insulation, windows and doors, and photovoltaic roof panels. The goal is to make the homes more energy efficient, which will help to reduce heating costs and make the homes more comfortable in the winter.

What impact has the project had?

Around 220 properties were retrofitted by September 2021. Not only are these properties now more fuel efficient, benefitting the tenants, but they also help the Council's housing stock transition towards becoming carbon neutral by 2030. For the tenants, this project has delivered considerable savings on heating bills.

What made this work? Funding Mechanisms?

£1.3 million investment from came from the City Council and an additional £1.1 million government grant, to tackle fuel poverty in the city's least energy efficient homes, was received.

Lessons Learnt

- The benefits of retrofitting homes include energy savings, improved comfort and reduced carbon footprints.
- Collaborations between governments, local councils and communities can maximise chances of achieving energy efficiency goals
- Small scale power generation through renewable sources like rooftop solar can power homes solely at certain times, reducing overall demand for energy from the grid

8.2.1.3 How Medway Council has been implementing a Building Retrofit Programme

Building retrofit programme | Medway Council

Overview

Medway Council is implementing a building retrofit program to improve the energy efficiency of its 3,000 council-owned properties. The council plans to work with residents and landlords to improve the energy efficiency of rented homes and support residents and businesses to improve the energy efficiency of their properties. The council has identified a range of actions to support its journey towards net-zero emissions, including developing plans to ensure council housing meets national and government targets for energy efficiency, identifying and delivering priority actions for key buildings through the Re:fit Energy Efficiency and Low Carbon Program, completing a low-energy LED smart street lighting upgrade program, and carrying out a condition survey of car park lighting to inform energy efficiency standards. The council has also supported 137 households to sign up for energy efficiency grants and 80 households to join the Sustainable Warmth Scheme and is working to improve the energy efficiency of its housing stock through phase one of the Re:fit program.

What impact has the project had?

Positive impacts from this project include reducing energy consumption and greenhouse gas emissions, lowering energy bills for participating households, and improving the comfort and liveability of homes. These benefits can contribute to a more sustainable and liveable community and can also have economic and health benefits for the residents involved.
Largescale introduction of:

- Improved building management systems – heating controls
- Energy efficient appliances
- LED lightning
- Water use reduction and conservation
- Conversion of existing heating systems to low carbon heat pumps or equivalent
- Solar PV

What made this work? Funding Mechanisms?

The project was funded through a combination of sources alongside the government grants, likely including private funding, and/or the council's own budget. These included:

- Sustainable Warmth Scheme – 2022 – government grant scheme
- Medway Council
- Green Homes Grant

Lessons learnt

Retrofitting programs can offer a range of benefits, such as improving energy efficiency and reducing carbon emissions, but they can also be complex and challenging to implement, particularly in the case of large-scale programs.
Lessons that could be learned from this program include:

- The importance of setting clear goals and targets for retrofitting programs and regularly evaluating progress towards achieving them
- The need to engage and involve stakeholders, such as residents, landlords, and businesses, in the planning and implementation of retrofitting programs.
- The value of using data and analysis to inform decisions about which retrofitting measures to prioritize and how to implement them effectively
- The importance of addressing any legal, regulatory, or financial barriers that may hinder the success of a retrofitting program

- The potential benefits of collaborating with other organizations or agencies to share resources, knowledge, and expertise in the implementation of retrofitting programs

8.2.1.4 How Plymouth have Retrofitted Council Buildings to Reduce Emissions

Council continues to decarbonise buildings | PLYMOUTH.GOV.UK

Overview

Plymouth has installed air source heat pumps in two buildings, the Lord Mayor's residence at Elliot Terrace and the main office accommodation at Ballard House, as part of its efforts to become carbon neutral by 2030. In addition, 195 solar panels have been installed on a newly insulated roof at Ballard House, while secondary glazing and draught proofing have been added at Elliot Terrace. The decarbonization project, which also includes nine other Council buildings, is funded by the £3.9 million Salix Finance Public Sector Decarbonization Scheme, which is administered by the Department of Business, Energy and Industrial Strategy and can be used on a range of carbon reduction projects.

What impact has the project had?

- *Carbon emissions reduction*: By replacing gas-based heating systems with air source heat pumps, which use renewable energy sources, the Council is reducing its carbon emissions. The solar panels will also generate clean, renewable energy, which will further reduce the carbon footprint of the buildings.
- *Cost savings:* Using renewable energy sources such as air source heat pumps and solar panels can help the Council save money on energy costs in the long run
- *Improved air quality:* Using gas-based heating systems can contribute to air pollution, while renewable energy sources do not produce any air pollutants. The installation of air source heat pumps and solar panels may help to improve air quality in the surrounding areas
- *Increased energy security:* By relying on renewable energy sources, the Council is reducing its reliance on fossil fuels, which can be vulnerable to price fluctuations and supply disruptions.

What made this work? Funding Mechanisms?

The Council's Corporate Carbon Reduction Plan sets out the things the Council will do to reduce emissions in the day-to-day running of the Council.
The project was funded by the £3.9 million Salix Finance Public Sector Decarbonization Scheme. Salix is an organization that administers funding provided by the Department of Business, Energy, and Industrial Strategy (BEIS).

Lessons learnt

Renewable energy sources can be used effectively to reduce carbon emissions and improve energy efficiency in buildings. The installation of air source heat pumps and solar panels in the Council buildings is likely to have a significant impact on reducing their carbon footprint and energy consumption.
Funding schemes like the Salix Finance Public Sector Decarbonization Scheme can help organizations finance carbon reduction projects. These types of schemes can provide a valuable source of funding for organizations looking to adopt more sustainable practices.
Carbon neutrality is an ambitious but achievable goal. The Council's efforts to become carbon neutral by 2030 demonstrate that it is possible for organizations to set and work towards ambitious sustainability targets.
Leadership is important in driving change. By leading the way in the use of renewable energy sources, the Council is setting an example for other organizations and individuals to follow, helping to accelerate the transition to a low-carbon society.

Collaboration and partnerships can help drive change, like Plymouth City Council and BEIS, using the Salix Finance Public Sector Decarbonization Scheme.

8.2.1.5 How Southampton have used the Public Sector Decarbonisation scheme to improve energy efficiency

Southampton City Council secures £1.68 million for public sector decarbonisation

Overview

Southampton City Council has received £1.68 million from the UK government's Public Sector Decarbonisation Scheme to fund energy efficiency and heat decarbonisation projects in public sector non-domestic buildings. The funding will be used for over 20 projects, including investment in solar panels and lighting and heating efficiency measures, across nine corporate sites, including The Sea City Museum, The Quays Swimming & Diving Complex and Lordshill Library. The projects aim to support the council's commitment to making its buildings carbon neutral by 2030 and contribute to the council's Green City Plan 2030, which aims for a cleaner, greener, healthier, and more sustainable city. The works funded by the Public Sector Decarbonisation Scheme are expected to be completed by September 2021.

What impact has the project had?

By investing in energy efficiency and heat decarbonisation measures, the council can reduce its carbon dioxide emissions and move closer to its goal of making its buildings carbon neutral by 2030. This could have a number of benefits, including reducing the council's energy consumption and associated costs, improving air quality and public health, and helping to mitigate the negative impacts of climate change on the local community.

What made this work? Funding Mechanisms?

The PSDS is a government-funded scheme that provides capital funding for energy efficiency and heat decarbonisation projects within public sector non-domestic buildings. Funding is administered by Salix Finance Ltd and is allocated on a first come, first served basis.

Lessons learnt

- *The importance of clear and well-defined plans*: Developing a clear and well-defined plan for how funding will be used can help to increase the chances of success in securing funding and can also make it easier to track progress and measure the impact of the projects.
- *The value of building support from local stakeholders:* Engaging with local stakeholders, such as businesses, community groups and residents, can help to build support for the project and demonstrate the wider benefits of the initiative.
- *The need to consider the long-term sustainability of projects:* It is important to consider the long-term sustainability of projects and ensure that they are designed in a way that maximizes their impact and minimizes their environmental footprint. This may involve investing in technologies and practices that are designed to be energy efficient and environmentally friendly.

8.2.2 UK Wide

8.2.2.1 How Sutton are utilising the Energiesprong approach to retrofit homes

Sutton's Zero Carbon Energiesprong Retrofit Pilot Project - Sutton Council

Overview

The goal of the Energiesprong approach is to design attractive homes that consume very little energy. An Energiesprong retrofit (or new construction) leverages the money spent on energy bills and maintenance to pay for the work because it has the highest energy standard attainable. The Energiesprong technique accomplishes this without increasing living expenses because the standard provides real-world performance guarantees for up to 30 years for both interior comfort and energy use.

The approach treats the whole house in one go, targeting utilities and ventilation to create homes with 90% reductions in carbon emission. This is accomplished by using new, off-site constructed walls and roofs that are delivered with doors and windows already installed. The current house can then have these components put around it to give it a new façade and bring its insulation and ventilation up to the necessary standards.

Housing providers are using this Energiesprong to further share learning, and bring down the cost of whole house retrofit.

What impact has this project had?

Using the innovative Energiesprong model, 100 homes will have works carried out on them. The initial pilot phase has already delivered 9 retrofits in the Worcester Park and Coulsdon estates.

What made this work? Funding Mechanisms?

Through the energy company's obligation programme, Sutton Council has received funds from the Greater London Authority, the Department for Business, Energy, and Industrial Strategy (BEIS), and British Gas (ECO3i).

Lessons learnt

The current marketplace has created challenges around procuring offsite manufactured components.

The pilot project highlighted how a joined-up tenant and liaison strategy between landlord and contractor is essential to create understanding amongst the tenants.

8.3 Tools, Resources and Support

8.3.1 3CI

3Ci

3Ci is a collaboration between connected Places Catapult, Core Cities UK, London Councils, and other local authorities across the UK with the aim of 'supporting local authorities to secure the necessary long-term finance for achieving net zero.'

Their latest proposed programme, which considers the UK's Net Zero Strategy, hopes to unlock barriers and provide opportunities by creating a blended finance model which coordinates investment across different asset types.

8.3.2 Passivhaus

Home (passivhaustrust.org.uk)

Passivhaus (also known as Passive House) is a high-performance building standard that focuses on energy efficiency and comfort. It is based on the principles of minimizing energy consumption while maintaining a comfortable indoor environment.

The main goals of Passivhaus design are to reduce a building's energy consumption for heating and cooling, as well as to improve air quality and thermal comfort. To achieve these goals, Passivhaus buildings are designed to be highly insulated, airtight, and equipped with high-performance windows. They also use energy-efficient heating and cooling systems and may incorporate other energy-saving features such as solar panels or geothermal systems.

Passivhaus is a voluntary standard that has been developed and promoted by the Passivhaus Institute, a non-profit organization based in Germany. The standard is internationally recognized and has been adopted in many countries around the world.

8.3.3 Green Open Homes

About Green Open Homes | Green Open Homes

The Green Open Homes network aims to support low-carbon open homes events across the country with free resources and advice.

A Green Open Homes event is an opportunity to ask a neighbour about an energy saving improvement that they've made. On an event day, people who have made energy saving improvements open up their homes to share their experiences. Visiting a home is a great way to find out about the reality of getting solar panels, insulation, triple glazing, or new heating options without talking to a salesman. The participants can have a good look at the technology, ask the residents whether the installation was a hassle, and find out how much they're really saving on their energy bills as a result.

Some events feature half a dozen homes, others up to 40 or more. They are characterised by a welcoming and friendly atmosphere, candid discussions about home improvements and a sharing of experiences and advice.

The website allows potential organisers to set up their own micro site to promote their event and enable people interested in visiting a green open home, to find it. The website also provides numerous resources for event organisers around funding and finance, legal arrangements and insurance, marketing and publicity and other organisational issues.

8.3.4 Interactive Policy Map on Retrofit

https://www.ukgbc.org/interactive-policy-map/

The interactive map highlights good examples of domestic retrofit (and new home) initiatives across local authorities in the UK.

8.4 Funding and Financing Opportunities

8.4.1 ECO4

ECO4 and ECO+ Plus Scheme 2023

ECO is a government energy efficiency scheme which was set up to help customers in England, Wales, and Scotland, to make their homes more energy efficient and tackle fuel poverty. Under ECO, large energy companies such as British Gas, EDF, EON etc are required to deliver energy efficiency measures to domestic premises. It is up to the energy companies to determine which measures they choose to fund, the level of funding they provide and the installer they choose to work with. Ofgem currently administers the scheme on behalf of the Department for Business Energy & Industrial Strategy (BEIS).

ECO4 is the fourth phase of the Government's Energy Company Obligation. ECO4 is set to run from April 2022 until March 2026 and is expected to deliver measures worth £1 billion per year. This is a significant jump from the £640mn/year spend seen within ECO3.

Compared to ECO3, there are additional requirements for minimum increases in the energy-efficiency rating of properties after measures have been installed. Where a property has an existing Energy Performance Certificate (EPC) band of F or G the grants will need to improve the rating to at least a D rating. Where a property has an existing Energy Performance Certificate (EPC) band of D or E the grants will need to improve the rating to at least a C rating. The Government is also proposing that a minimum number of band E, F and G homes will be upgraded, so that most inefficient homes are not left behind.

Almost 134,000 boilers were installed under ECO3 whereas under ECO4 boilers will be limited to 5,000 and there are additional rules around the types of boilers that qualify, meaning that very few households will be eligible for boiler grants under the new rules.

During ECO3 energy companies were allowed to use a maximum of 25% of their obligation through Local Authority Flexible Energy rules (Local Authority Flexible Energy is often called LA Flex).

As part of the changes proposed for ECO4 suppliers can now deliver up to 50% of their obligation through LA Flex.

8.4.2 Home Upgrade Grant: Phase 2

https://www.gov.uk/government/publications/home-upgrade-grant-phase-2

The scheme phase, which continues till March 2025, contributes to the government's long-term goal of bringing as many fuel-poor households to Energy Performance Certificate Band C by 2030. The initiative falls under the government's local authority delivery scheme. In order to qualify for the HUG, household income must be below £30,000, and the EPC rating for the house must be between D-G The HUG will contribute towards the cost of installing the following types of insulation:

- loft insulation

- draught proofing

- cavity wall insulation

- room-in-roof insulation.

Homeowners and residential landlords can apply for home upgrade grants through the local authorities as of summer 2021, through local council websites. It's important to note that the availability and specifics of this scheme change according to the region and might not be available in all parts of the UK or be subject to changes.

8.4.3 Industrial Energy Transformation Fund Phase 2

https://www.gov.uk/government/publications/industrial-energy-transformation-fund-ietf-phase-2-spring-2022

The Industrial Energy Transformation Fund (IETF) is a program launched by the UK government in 2020 to provide funding for businesses to install energy and carbon reduction measures, including heat pumps, in their industrial processes. The program is managed by the Department of Business, Energy and Industrial Strategy (BEIS) and is available in two phases. Phase 1, which ran from July to October 2020 and March to July 2021, supported the deployment of energy efficiency projects as well as energy efficiency and decarbonisation studies. Phase 2, which will run from Autumn 2021 to 2027, expands the scope of the IETF to include the deployment of decarbonisation technologies and will provide around £220 million in funding. The IETF has a total of £315 million in funding available until 2027. Its goal is to help businesses with high energy use cut their energy bills and carbon emissions using energy efficiency and low carbon technologies.

Spring 2021 Phase

- £40 million in funding is open and split equally between two strands.

Future phases

- Offers the £245 million
- It will provide around £220 million in funding between Autumn 2021 and 2027

8.4.4 Social Housing Decarbonisation Fund (SHDF)

https://www.gov.uk/government/publications/social-housing-decarbonisation-fund-wave-2

The Social Housing Decarbonisation Fund (SHDF) is a UK-wide grant program launched in June 2020 as part of the COVID-19 Economic Recovery Plan. It aims to support social landlords in demonstrating innovative approaches to retrofitting social housing at scale, with the goal of reducing energy demand, energy bills, and carbon emissions, as well as supporting green jobs and local supply chains.

The SHDF Demonstrator is an initial investment to learn lessons and catalyse innovation in retrofitting for the Social Housing Decarbonisation Fund, which has £3.8 billion of new funding committed to it in the Conservative manifesto. The objectives of the SHDF also include improving the health, comfort, and well-being of occupants, and providing evidence on replicability and scale-up for future projects. *Whilst wave 2.1 of the fund has closed, there will be future funding opportunities.*

8.4.5 Boiler Upgrade Scheme

https://www.gov.uk/apply-boiler-upgrade-scheme

The Boiler Upgrade Scheme (BUS) is a government initiative in England and Wales that aims to support the decarbonisation of heat in buildings by providing upfront capital grants to property owners for the installation of low carbon heating systems, such as heat pumps and biomass

boilers. The scheme is open to homeowners as well as small business owners and offers grants of £5000 for the installation of an air source heat pump, £5000 for a biomass boiler, and £6000 for a ground or water source heat pump. To be eligible for the grant, property owners must own their own property, have an installation capacity of up to 45kWth, and have a valid Energy Performance Certificate without any outstanding recommendations for loft or cavity wall insulation. The scheme is running from 2022 to 2025, and payments can be made from 23 May 2022 at the earliest. Installers will apply for the grant on behalf of the customer, and the final grant value will be deducted from the final price paid.

8.5 Recommendations to boost the net zero agenda

8.5.1 Organisational

- Local authorities could leverage procurement to develop retrofit skills:
    - Aggregate demand from regional housing providers and municipal programmes to demonstrate to employers that there is a substantial backlog of work. Working with municipalities like East Sussex and Belfast, Retrofit Academy[30] established the UK Retrofit Training Network, which trains people in retrofit skills and places them in jobs through a network of employer sponsors.
    - Use social value provisions in your retrofit contracts to encourage the development and use of these skills. B4Box, a construction company, is utilising social value in creative ways to recruit unemployed people for home renovation and retrofit projects.
    - Bring together local businesses and institutions to discuss how they may collaborate to increase course availability and student demand. For example, a Net Zero Training Hub at Portsmouth City College[31] is being funded by Portsmouth City Council.
    - Develop your own teams' skills with assistance from retrofit coordinator training.
    - Encourage young people to enter the industry through working with schools.
- Local authorities can implement a building energy audit program to identify opportunities for energy efficiency improvements in existing buildings.
- Local authorities can partner with energy companies to target deprived, vulnerable or fuel poor households to improve energy efficiency measures.
- Using energy management software can help local authorities track and monitor energy usage in real-time, allowing them to identify and address inefficiencies. Energy management systems can also automate buildings to optimise energy usage. For example, the use of Digital Twins, which could build a digital version of the local authority's housing stock, can be used by buildings managers to assess problem areas. This can help reduce energy inefficiencies and experiment with energy-saving measures

[30] https://retrofitacademy.org/

[31] Net Zero | City of Portsmouth College (city-of-portsmouth-college.ac.uk)

before implementing them in real life at cost. This technology has already been successfully utilised at Perth and Kinross Council[32].

- Targeting local authority retrofit programmes requires accurate data on worker capacity. Therefore, developing a strong evidence base for local opportunities in skills development is crucial. This could include information on skills gaps, the local supply chain, and the courses offered by regional educational institutions. Solutions could include:
    - Fulfilling a retrofit skills market analysis which looks at local opportunities to accelerate skills, retrofit skill gaps and potential jobs.
    - Mapping out demand for labour within the low-carbon construction sector against current market supply, then approaching local colleges and training facilities to fill the gap.
    - Investigate obstacles into local skills development. This was completed by London local authorities and led to the creation of the LSBU Green Skills Hub.

- Data gathering around the availability of housing, fuel poverty, and housing stock is key to creating an effective, targeted retrofitting programme. The development of a funding pipeline, the targeting of initiatives like Solar Together for the sector with the means to pay, and the promotion of the government's new boiler upgrade programme will all be aided by good data. This could be achieved by:
    - Using a stock analysis programme like Parity Project's Portfolio[33]. Through this software Greater Manchester combined authority identified over 200,000 local properties could have heat pumps installed without needing to be retrofitted.
    - Utilizing external data sources to get information about the occupants of a property as well as information about the property itself. For instance, work with regional clinical commissioning groups to target areas with high rates of respiratory disease and fuel stress and use benefits data when available.
    - Locating communities where early adopters of retrofit may reside in order to target able-to-pay programmes. Early adopters are likely to share some traits.
    - Locate and map the installers of low carbon and retrofit heating systems.

- Local authorities should aim for holistic retrofitting requirements which seek to not only increase the thermal efficiency measures of houses but also increase the uptake of passive cooling measures (shading and ventilation); measures to reduce indoor moisture; improved air quality and water efficiency; and, in homes at risk of flooding, the installation of property-level flood protection.

- Leverage the councils own spending power on retrofit to influence skills training, supply chains, and retrofit delivery. To do this, Key City Members must outline their long-term plans for retrofit, assuring the supply chain and educational institutions that there will be local jobs in the field in the years to come.

[32] How can local authorities achieve net-zero targets by 2030? (openaccessgovernment.org)

[33] https://parityprojects.com/services/portfolio/

8.5.2 Territorial

8.5.2.1 Owner-occupied property

- Develop a comprehensive retrofitting program that includes a range of measures and incentives to encourage property owners to upgrade their homes. This could include things like low-interest loans, grants, and other financial assistance to help property owners cover the cost of retrofitting work.
- Work with utility companies to offer discounted rates or other incentives to property owners who retrofit their homes. This could help to make retrofitting more affordable and attractive to property owners.
- Make sure the planning team is able to balance between the urgency of the climate emergency and the need for conservation. The Royal Borough of Kensington and Chelsea recently removed the necessity for planning permission to put solar panels on listed buildings, while the Bath & Northeast Somerset Council has issued supplemental planning guidance to encourage home conversion and support planning officers.
- Create a public awareness campaign to educate property owners about the benefits of retrofitting and how it can save them money on energy bills and improve the comfort of their homes. This could include things like brochures, website resources, and public information sessions. In Greater Manchester they have begun offering an over-the-phone retrofit consultation helping provide house plans and retrofit coordination. This was done by hiring a management agent.

8.5.2.2 Private Property

- Offer financial incentives, such as grants or low-interest loans, to help landlords cover the cost of retrofitting. This can help make the process more affordable and make it easier for landlords to invest in energy-efficient technologies and improvements. For example, in Southwest England Lendology[34] is presently collaborating with numerous councils to form a joint venture which assists with finance.
- Provide technical assistance and support to help landlords understand the benefits of retrofitting and navigate the process. This can include information on available funding options, guidance on how to identify cost-effective retrofit measures, and advice on how to choose the right contractors and suppliers.
- Work with landlords and other stakeholders to develop targeted programs and initiatives that promote retrofitting and raise awareness of the benefits. This could include public outreach campaigns, educational workshops, and networking events.
- Use regulations (such as MEES) or other legal measures to require landlords to retrofit their properties in certain circumstances. For example, local authorities may be able to set minimum energy efficiency standards for rental properties or require landlords to disclose the energy performance of their properties to potential tenants.

[34] https://www.lendology.org.uk/

- Collaborate with utilities and other organizations to provide landlords with access to bulk purchasing discounts, energy audits, and other resources that can help them save money and reduce their carbon footprint.

Overall, the key to increasing retrofitting in the UK will be to develop a comprehensive, well-coordinated program that includes a range of measures and incentives to encourage property owners to upgrade their homes. By working with local businesses, organizations, and utility companies, local authorities can help to make retrofitting more accessible and affordable for property owners in the UK.

9 Climate Resilience and Adaptation

Climate resilience refers to the ability of a community or region to withstand and recover from the impacts of climate change, such as extreme weather events or sea level rise. The UK's second National Programme of Adaptation (NAP), which was released in July 2018, came ten years after the Climate Change Act of 2008 was imposed. The paper highlights how local government play a pivotal role in adapting to our changing climate, emphasising that it will require collaboration across 'civil society, local authorities, private and public sectors, and infrastructure providers'. Currently, the third instalment of the NAP is out for public consultation and dialogue. Furthermore, the UK Climate Change Risk Assessment[35] sets out the opportunities and risks that local authorities in the UK will face as a consequence of climate change

However, across the Key City members (as well as the UK), there are varying responsibilities and capabilities when it comes to addressing climate resilience and adaptation. This has to inconsistent messages from central government, and as such some authorities have prioritised climate resilience and adaption more than others. In many cases this has led to local authorities falling behind within this sector.

9.1 Trends and Further Information

9.1.1 The discussion around climate adaptation is still further behind other climate sectors, with little reference during engagement to climate adaption plans

There seems to be lack of discourse around the level of investment needed to prevent large scale damage in the long term, be that social, economic, or environmental.

9.1.2 Some cities have begun to shift their focus from mitigation to adaptation, as they begin to face the increasing reality of climate change events such as flooding, droughts and heatwaves.

They acknowledge that mitigation is important for reducing the long-term risk of climate change however now see adaptation as vital to protecting communities and infrastructure from the immediate impacts weather extremes. By focusing on adaptation, local authorities have been taking proactive steps to reduce the vulnerability of their communities and ensure that they are better prepared to cope.

9.1.3 Across the engagement sessions, very few members mentioned adapting essential services and infrastructure to reduce the effects of climate change. For example, energy supplies, schools, transport systems or crucial supply chains.

9.1.4 Focus within the retrofitting sector is often placed on insulation and improving the thermal capabilities of the housing stock rather than adapting to different weather extremes including heatwaves.

As stated in the UK Climate Change Risk Assessment 2017 Evidence Report, action is also required to ensure houses and public buildings prevent overheating.

[35] UK Climate Change Risk Assessment 2017 - GOV.UK (www.gov.uk)

9.1.5 Some of the cities have experienced issues with conurbations effecting a Key Cities climate resilience.

9.1.6 Many Key City members felt they needed to increase publicity around climate adaption and create transparency with the public for the need to change.

9.1.7 Some Key City members highlighted that the threshold for a flood coming from central government is too high. Local authorities are therefore limited in their responses to flooding but people are still heavily affected.

9.2 Current Initiatives

9.2.1 Key Cities

9.2.1.1.1 How Blackpool are adapting to create data centres, and heat networks from renewable energy

Blackpool could become world leader in ethically powered data - with help from Lancaster University | Blackpool Gazette

Overview
The Blackpool Innovation Catalyst is a six-month project which aims to develop a cutting-edge digital industry in the popular tourist destination. It is centred around a group of ethically powered data centres that use renewable energy and redistribute excess energy into social heat networks using cutting-edge green technologies.

What impact has the project had?
This initiative could be utilised for projects that benefit society, such heating public housing or operating transportation systems.
As a result of the North Atlantic Loop (discussed below), the resort is ideally situated to benefit from ultra-fast internet speeds and extremely low latency, supporting emerging technologies like robotics.
Ideas developed as part of the catalyst could have a truly transformative impact on Blackpool, not only by encouraging a thriving digital economy and high-value jobs there, but also by assisting lower-income families who are struggling to pay their bills and significantly improving some of the town's most deprived communities.

What made this work? Funding Mechanisms?
To lay the groundwork for a brand-new and prosperous economy for Blackpool and the surrounding areas, the project team, led by Lancaster University and Blackpool Council, worked together to plan, and build a thriving digital ecosystem that can benefit from Blackpool's distinctive infrastructure.
Blackpool's location on the North Atlantic Loop, a next-generation subsea fibre cable system that provides a diverse, high-capacity network connection to the USA and Northern Europe, is one of the factors driving this new opportunity.
The project was funded by the Government's Community Renewal Fund and the mechanisms were developed by Lancaster University.

Lessons learnt
Developing a digital industry using ethically powered data centres that use renewable energy can have a positive impact on society, including by providing low-cost heating to public housing or operating transportation systems.
Emerging technologies such as robotics can benefit from ultra-fast internet speeds and low latency.
Collaboration between universities, local authorities, and other organizations can be effective in planning and implementing projects that have the potential to transform communities and create high-value jobs.
Funding from government programs, such as the Community Renewal Fund, can support the development of innovative projects that address societal challenges.

9.2.1.2 How Carlisle Refitted its Civic Center to Reduce Flood Damage

Civic Centre works given the go-ahead - cumbriacrack.com

Overview

In 2015 Storm Desmond brought significant flooding to parts of Cumbria. During the storm Carlisle's civic center was severely damaged, causing the basement and ground floor to become completely unusable.

In response to this the Civic Center had a £3.6 million remodel to reduce the risk of future flooding and damage as well as provide a modern useable space which could benefit the whole community. Design details included using reinforce concrete on the lower floors that could facilitate quick clean up if the area was to flood. All office and IT equipment is on wheels so that it can be moved quickly to the upper floors and mechanical and electrical components have been moved to high spaces to protect against expensive damage.

What impact has the project had?

Whilst there have been no major flooding events at the civic Center since its renovation was completed, the hope is that should the building flood again, damage to equipment and the building itself will be mitigated.

The building has also be designed to be more accessible for those with disabilities and the acoustics within the chamber have been improved.

What made this work?

- The use of the local contractor, Story Construction, with prior experience in this area, can help ensure the project is completed on time and within budget, as well as benefiting a local company.
- The inclusion of flood resilient measures in the design of the new facilities can help protect the building from future flooding and ensure its long-term viability.
- The development of a new Customer Contact Centre and flexible, resilient meeting space will provide improved facilities for customers and visitors, making the Civic Centre more welcoming and fit for purpose.
- The majority of funding for the scheme will come from the council's flood insurance settlement plus other existing council resources and an invest to save scheme, which will help ensure that the project is well-funded and has the resources it needs to be successful.

Lessons Learnt

- Planning ahead: The Civic Centre's facilities were damaged in the 2015 floods, but it took the council several years to develop plans to improve the facilities. Planning ahead and taking into account potential risks, such as flooding, can help ensure that facilities are better protected in the future.
- Involving local contractors: By appointing a local contractor like Story Construction, the council is able to ensure that the project will be completed on time and within budget, while also providing a boost to the local economy.
- By incorporating flood resilient measures in the design of the new facilities, the council can help protect the building from future flooding and ensure its long-term viability.
- Prioritizing customer and visitor needs: The development of a new Customer Contact Centre and flexible, resilient meeting space will provide improved facilities for customers and visitors, making the Civic Centre more welcoming and fit for purpose.
- By using the council's flood insurance settlement plus other existing council resources and an invest to save scheme, the council was able to ensure that the project was well-funded and had the resources it needs to be successful.

- Virtual meetings: virtual meetings can be a useful tool for decision-making, especially during a crisis, such as COVID, as it allows all council members to take part in the meeting, regardless of their location.

9.2.1.3 How Hull are adapting their river drainage systems to increase climate resilience

Local Flood Risk Management Strategy (hull.gov.uk)

Overview

Although flood defenses already surround the city of Hull, which is situated in a floodplain, there is a risk that they might be breached, putting many residents at risk of flooding. Hull City Council is developing a number of sustainable drainage systems to be installed throughout the city and the nearby towns in order to increase physical resilience to flooding. This could include ponds and wetlands, water butts, and pavements that enable water to permeate them.

By engaging with those whose houses are at danger of flooding and co-designing solutions, the council is also attempting to increase community resilience. Participants must fill out questionnaires with council personnel, select their preferred sustainable drainage options from a variety of possibilities, and attend community seminars in order to take part in the effort.

An initiative to involve schools is educating children about the risk of flooding. The council is also conducting polls of residents on the subject and has started a social media campaign.

In order to offer the co-benefits produced by sustainable drainage systems through actions that the local population will embrace and utilize, the council is incorporating communities in decision-making. Local food production, traffic slowing, and a safer atmosphere for young children playing outside are examples of potential benefits.

What impact has the project had?

The local government is modifying previous designs in response to citizen comments, and it plans to report the results of this process in the spring of 2022.

By allowing locals to participate in decision-making, the council may address resident concerns early on, lowering later public complaints and increasing the likelihood that measures will last over time. Feedback has included demands to improve the aesthetics of the neighbourhood, including a desire for greater vegetation and food production. Other comments stress the value of having access to a reserved parking place.

The necessity for investing in helping people build flexible, resilient behaviours to manage flooding has also been emphasised. Individual actions can be as basic as registering for warnings and making plans to minimise damage or as complex as upgrading sustainable drainage in your garden and installing flood resistance in your house.

What made this work?

The council is speaking with community members who do not generally engage. Over 7,000 letters were issued to specific estates informing homeowners that council employees and partners will be visiting the neighbourhood to discuss flood resilience in order to boost community trust.

Yorkshire Water has been a crucial partner and has incorporated proven engagement techniques. The business provided assistance with communications and with educating the council's existing community networks on regional water challenges.

In order to involve residents, the authority is working with community organisations that already have networks and have local support. Timebank, Groundwork, and The Hull We Want are a few of these. Hull also included important knowledge from Sheffield University and Hull University. Both organisations have carried out community outreach initiatives in Hull to increase understanding of water and flood resistance.

Lessons Learnt

The recycling engagement of Hull City Council's trash team, which was mostly conducted via schools and engaged children to drive behaviour change, served as a model for the flood risk team. The flood risk team followed this strategy, adding lessons and assemblies for students' water and floods to the curriculum.

Navigating budget constraints and key performance measures is a substantial difficulty when including communities in municipal decision-making. The objectives of this initiative, which was sponsored by water companies with the possibility of future funding from the federal

government, included ensuring that retrofitted sustainable drainage systems can store a specific amount of water.

9.2.2 UK Wide

9.2.2.1 How Dundee is Focusing Climate Action on Helping People Most at Risk

How Dundee is focusing climate action on helping people most at risk | Local action (friendsoftheearth.uk)

Overview

Dundee City Council is developing climate policies and prioritising residents vulnerable to extreme events such as floods and fuel poverty. It has worked hard to identify these community members and created a risk and vulnerability plan for them. The use of digital tools and resources enabled the council to recognise areas of social deprivation and climate threats. The authority has also partnered with NHS for the risk register that not only identifies the vulnerable groups but notes the impacts of extreme events to help adapt better.

What impact has the project had?

The project has re-negotiated over £30,000 fuel bills supported more than 600 households with lower fuel bills through social tariffs, helped with dampness issues and distributed over 9,000 low-energy light bulbs.

Dundee Energy Efficiency Advice Project (DEEAP) group has played a key role in dealing with fuel poverty through advice on energy efficiency measures and reduction in energy bills as well as fuel tariffs.

The council now works with the University of Dundee to develop impact assessments on the policies affecting vulnerable people. It is also collaborating with all council departments to include climate resilience into service plans.

What made this work?

The collaboration with local resilience partnerships and NHS has been significant in their contribution to local action plans protecting people at risk of extreme weather events and creating the risk register and active green health partnership.

The training provided to Dundee's Sustainability and Climate Change team staff on climate justice and social deprivation has facilitated in better targeted policies.

The climate vulnerability planning was successfully carried out with 2 council staff members and a Risk Management Officer. The team has been expanded to five members to deliver further tasks.

Lessons learnt

Funding larger projects is a challenge faced by the council and some of the resources are now directed to meet staff costs and communications for climate projects.

A key lesson from the climate change team's work in Dundee is to be versatile and work across different areas to access funds from further sources along with meeting climate targets.

With poverty levels crossing the national average, there are many social vulnerabilities faced by the area, thus making it crucial to understand what policies would suit the communities targeted by the climate action plan well.

9.2.2.2 How Blaenau Gwent involved its community in climate action decisions

How Blaenau Gwent involved its community in climate action decisions | Local action (friendsoftheearth.uk)

Overview
Blaenau Gwent Council delivered a citizen's assembly for £50,000 along with local and national organisations and volunteers. The recommendations included an improved transport system, training to public in green construction and woodland conservation. The 50 assembly members elected by the Sortition Foundation agreed on five key proposals to tackle the climate crisis.

What impact has this project had?
The Blaenau Gwent Public Service Board committed towards all recommendations even though they are not legally binding. There have been discussions on how the assembly's work can set a foundation for future policy plans.

What made this work?
The Blaenau Gwent Public Service Board Climate Mitigation Steering Group aided the council in developing a strategy that involved key stakeholders and made sure the assembly's recommendations were implemented by public bodies in decarbonisation plans. The council-wide buy-in played a crucial part in supporting the project through fair deliverance of the Assembly.
The Citizen's Assembly received funds through the Welsh Government's Innovative Housing Programme but also required additional support from volunteers. Local council staff and housing association helped in the smooth running of the assembly sessions.

Lesson Learnt
The budget set for the project turned out to not be enough for the completion of the tasks which affected the quality of the assembly sessions. Such projects should be planned and implemented after considering the costs they would come with.
Running the assembly came as an administrative challenge for the Welsh council, thus design teams and project managers should be considered by other councils in the future.

9.3 Tools, Resources and Support

9.3.1 SCATTER

SCATTER (scattercities.com)

SCATTER is a tool for local authorities which measures and models emissions to promote and aid in the transition to Net Zero. Local governments and city areas have the chance to standardise their greenhouse gas reporting and integrate with global frameworks, including the formulation of goals in line with the Paris Climate Agreement. All local authorities in the UK are able to utilise it without paying a fee.

9.3.2 IMPACT

Impact | Community carbon calculator (impact-tool.org.uk)

Impact is a carbon calculator tools which helps digitally visualise an areas carbon footprint. It draws on more than 30 datasets to estimate the total amount of greenhouse gases produced directly and indirectly as a result of everyday human activities in the given locality - heating homes, using electricity, transport, producing and distributing food, disposing of waste, etc. The tool produces two footprints:

- Consumption – which shows the emissions produces as a result of people living their daily lives within the area. This can include gas, food and drink, shoes or even financial services.
- Territorial – which shows emissions produced within the territorial boundary of the selected area. This can include emissions from transport systems and local agriculture.

Unfortunately, the data has not been updated since 2017 but it still provides a useful overview for Key City members to consider.

9.3.3 Tyndall

Homepage -Tyndall Centre for Climate Change Research

The University of Manchester and the Tyndall Centre for Climate Change Research have developed an online tool, which is now being used by Local Authorities including Manchester, to understand their role in meeting climate change objectives.106 It focuses on the area footprint. The tool allows users to calculate a carbon budget for any UK administrative area larger than Local Authority scale and set climate change targets which meet the objectives of the United Nations Paris Agreement on Climate Change. The tool is based on latest synthesis report from the Intergovernmental Panel on Climate Change (IPCC) on how quantities of carbon dioxide emissions from human activities relate to global warming[36].

9.3.4 Carbon Trust

Climate Action Plans & Business Sustainability | The Carbon Trust

The Carbon Trust is an independent company that provides expertise and certification to organizations in order to help them reduce their carbon footprint and become more sustainable. The organization was established in 2001 in the United Kingdom and has since expanded to operate in other countries around the world.

Carbon Trust helps organizations reduce their carbon footprint by providing them with advice and guidance on how to improve energy efficiency and reduce energy use. They also work with organizations to help them implement renewable energy technologies and develop low-carbon

[36] Microsoft Word - Main report prefinal with appendices 2.docx (netzeroeast.uk)

products and services. The Carbon Trust also promotes sustainable procurement, helping companies to source and supply goods and services that have a lower environmental impact.

9.4 Funding and Financing Opportunities

9.4.1 UK Climate Resilience Programme

https://www.ukclimateresilience.org/about/faqs-quick-guide-to-ukcr/

The programme is funded under Wave 1 of the Strategic Priorities Fund (SPF) through which it received £18.65m. The fund is to drive an increase in high-quality, multi-, and interdisciplinary research and innovation across 34 themes and deliver climate risk and adaptation solutions.

9.4.2 Natural Environment Investment Readiness Fund

https://www.greenfinanceinstitute.co.uk/gfihive/neirf/

The funding of up to £10 million provides grants up to £100,000 to more than 75 environmental groups, local authorities, businesses and other organisations to help develop nature projects in England to an extent where they can attract private investment. The fund was designed by DEFRA and the Environment Agency, working with Her Majesty's Treasury, Natural England and Access – Foundation for Social Investment.

9.5 Recommendations to boost the net zero agenda

9.5.1 Organisational

- Develop a comprehensive climate adaptation plan that identifies the specific risks and vulnerabilities of the local area and outlines specific measures to address those risks. This could include things like strengthening flood defences, improving the drainage system or retrofitting buildings to make them more resilient to extreme weather events.
- Implement policies and programs to support the development of green infrastructure, such as green roofs, urban forests, and green spaces. Green infrastructure can help to reduce the impact of extreme weather events, such as floods and heatwaves, and can provide important ecosystem services, such as air and water filtration.

- Key City members need to take a more flexible and integrated approach to climate resilience and adaption. This will allow local authorities to consider the various impacts of climate change and how they are interrelated, helping them develop more effective and efficient adaptation strategies, as well as draw out further benefits. Furthermore, such an approach can also help local authorities to anticipate and adapt to future changes in climate conditions, rather than just reacting to current impacts allowing the solutions needed to be continuously adapted and updated.

  Adopting a cross-departmental approach also allows local authorities to address the issue holistically, taking into account the different aspects of the community that are affected. This can include:
  - Establishing a dedicated climate adaptation task force or committee: This can be composed of representatives from different departments, as well as external stakeholders, such as community groups and local businesses. The task force can be responsible for coordinating and aligning the efforts of different departments, as well as identifying and addressing interdepartmental issues and gaps.

  - Developing a cross-departmental climate adaptation plan: This plan should include specific actions, milestones, and responsibilities for different departments and stakeholders, and should be regularly reviewed and updated. The plan should also be aligned with the broader sustainability and resilience goals of the local authority.

  - Conducting regular cross-departmental meetings and workshops: These can be used to share information and best practices, as well as to identify and address interdepartmental issues and gaps.

  - Local authorities should leverage data and analyses from different departments to gain a more comprehensive understanding of the impacts of climate change on their communities and to identify areas of vulnerability.

  - Local authorities should support capacity building within different departments, so that all staff have the knowledge and skills needed to contribute to the climate adaptation efforts. For example, Doncaster City Council have created over 190 trained climate advisors which work across all council departments to inform policy.

  - Many municipalities have found success partnering with other local actors such as businesses, community groups, and schools to build a more resilient and sustainable community. This can be done through joint initiatives, public-private partnerships, and community engagement programs.

- Consumer behavioural change and education will be key to climate mitigation.

- Need long-term adaptation strategies based off projected climactic risks with annual reviews to update the plans based off the previous year and new data. Basing climate adaptation plans on climate projections data allows local authorities to be proactive rather than reactive. By anticipating future impacts and taking action in advance, it can help to minimize the costs and negative impacts of climate change on their communities.

9.5.2 Territorial

- Work with local businesses and organizations to support the development of emergency response plans and training for local emergency responders. This could include things like providing funding for emergency response equipment or coordinating with other organizations to develop emergency response plans and training programs.
- Provide educational resources and information to residents about the risks of climate change and how to prepare for and respond to extreme weather events. This could include things like information sessions, workshops, and guides on how to prepare for natural disasters, such as floods and heatwaves.
- Use consistent tools across the key city members to calculate own emissions across scopes 1, 2 and 3.

10 New Building and Planning

As local authorities play a vital role in the planning and development of their communities, they have a unique opportunity to drive the transition to a low-carbon future through the building and planning sector in the UK. Nearly 20% of the UK's emissions in 2021 came from the buildings sector, excluding emissions from building-related activities and power usage in buildings. 15% of all anticipated UK reductions in 2035 will be attained via the Government's Net Zero Strategy's direct building emissions reduction objectives[37].

There are a number of specific actions that local authorities can take to become net zero through the building and planning sector, including setting ambitious targets for energy efficiency, encouraging the use of low-carbon and renewable materials, and promoting sustainable design. Increasingly the urban heat island

10.1 Trends and Further Information

10.1.1 Key Cities are struggling with low worker capacity, causing increased costs and development delays.

Regular changes to key policies have led to uncertainty and poor focus on new housing design and construction skills in the UK.

10.1.2 Key City members feel there is a lack of clarity around the extent local authorities are permitted to set their own standards for new build homes before 2025.

10.1.3 **Key City members felt they would like greater clarity on planning consents and the extents to which they can impose on developers to contribute towards the green agenda.**

10.1.4 There needs to be a more holistic understanding of housing development which takes into account utility issues including grid connections, transport and water.

[37] CCC Monitoring Framework - Climate Change Committee (theccc.org.uk)

10.2 Current Initiatives

10.2.1 Key Cities

10.2.1.1 How Lincoln have created their own housing strategy

City of Lincoln Council proposes new Housing Strategy to meet demand over next five years – City of Lincoln Council

Overview

Rather than waiting for the 'Future Homes Standard' set by the government to come out in 2025, Lincoln Council has proposed a new Housing Strategy that will be considered by the council's Executive. The strategy aims to meet housing demand and improve standards for all types of housing in the city over the next five years.

It focuses on three main objectives:

- providing housing that meets the diverse needs of residents
- building sustainable communities
- improving housing standards for all

The strategy outlines plans to prevent homelessness, provide suitable accommodation for homeless individuals, increase the availability of affordable housing, and promote independent living for vulnerable residents. It also aims to revitalize the city centre and improve the energy efficiency of homes to reduce fuel poverty and the city's carbon footprint. The strategy will be presented to the Full Council for adoption.

What impact has the project had?

If the project was adopted, it would likely result in an increase affordable housing availability, helping to address the housing needs of low-income residents and reduce homelessness. The strategy's emphasis on building sustainable communities and improving housing standards may lead to improvements in the overall quality of housing in the city, making it more attractive to residents and potentially boosting the local economy. The proposed efforts to revitalize the city centre and bring more empty homes back into use could also have a positive impact on the vibrancy and attractiveness of the city. Additionally, the strategy's focus on promoting independent living for vulnerable residents and improving the energy efficiency of homes may help to reduce fuel poverty and the city's carbon footprint.

What made this work? Funding Mechanisms?

As this project has not yet occurred, there is no clear source of funding, and it is not possible to comment on what made the project a success. It would likely be funded by the Council itself combined with grants from the Government.

Lessons learnt

The proposed Housing Strategy for Lincoln emphasizes the importance of partnership working and the value of working with a variety of partners, including housing associations and private developers, to achieve common goals. The strategy also focuses on improving the energy efficiency of homes to reduce fuel poverty and the city's carbon footprint, addressing homelessness in a comprehensive and compassionate manner, and enabling vulnerable residents to live independently through the provision of aids, adaptations, and other assistance. These elements of the strategy demonstrate the importance of considering all aspects of the housing market to create a sustainable and balanced housing market, and of addressing a range of housing-related issues in a comprehensive and compassionate manner.

10.2.1.2 How Reading is creating low carbon leisure facilities

Council commits almost £1 million additional funding for more carbon reduction measures at brand new leisure sites (reading.gov.uk)

Overview

Reading Borough Council has provided additional funding of £976,000 for carbon reduction measures at its brand-new leisure facilities at Rivermead and Palmer Park. The funding is going towards the installation of additional solar panels and three air source heat pumps (ASHPs) at the sites. The measures are part of the council's plan to achieve net-zero carbon in Reading by 2030 and are being implemented in addition to existing investments of £1.6m in energy-efficiency measures in the new leisure facilities, such as poolside and sports hall climate controls, energy-efficient lighting and combined heat and power boilers. The new facilities are being developed to BREEAM Excellent standards and will use renewables wherever possible. The new Palmer Park leisure centre opened in December 2022 and work is underway on Rivermead.

What impact has the project had?

The implementation of these carbon reduction measures is expected to have a positive impact on the environment and contribute to the council's goal of achieving net-zero carbon in Reading by 2030. The additional heat pumps being installed at Rivermead will reduce the use of gas by c.1,400,000 kWh/year, an 80% reduction in the carbon emission rate of the new centre, with much of the additional electrical load offset by new solar panels. The additional heat pump at Palmer Park will reduce the new centre's use of gas by c.400,000kWh/year, a 57% reduction in the carbon emission rate. Solar panels were already being installed at Palmer Park and will, again, help offset the additional electrical load generated by the heat pump.

The new leisure facilities are also being developed to BREEAM Excellent standards, which is the world's leading sustainability assessment method. This means that they will be designed, constructed and operated to be as environmentally friendly and sustainable as possible, with a focus on reducing energy use, improving energy efficiency and increasing renewable energy generation.
In terms of social impacts, the new leisure facilities are expected to provide a range of benefits for the local community, including improved health and wellbeing, access to new sports and recreational activities, and a welcoming and inclusive environment. The facilities may also create new job opportunities and contribute to the local economy.

What made this work? Funding Mechanisms?

The Council worked with its leisure partner GLL and Pellikaan Construction Ltd to design and build the new facilities under a 25-year Design, Build, Operate, Maintain (DBOM) contract. The £40m project was funded from the Council's capital programme including a £1.5m Sport England grant. The £40m included £1.6m for sustainable energy features to ensure that carbon emissions were minimised and to attain the BREEAM 'Excellent' rating. The £1 million for heat pumps and solar PV was subsequently agreed in addition to this £1.6m,
bringing the total investment in sustainable energy features to £2.6m.

Lessons learnt

The benefits of using renewables: The use of solar panels and air source heat pumps (ASHPs) in the new leisure facilities is expected to reduce carbon emissions and contribute to the council's goal of achieving net-zero carbon. The use of renewables can help to reduce reliance on fossil fuels, which are a major contributor to climate change, and can provide a more stable and secure energy supply. 'Self-supply' of energy via the solar installations also helps reduce exposure to energy price risk.

The value of partnerships and collaboration: Collaboration and partnerships can help to bring together different expertise, resources and perspectives, and can lead to more effective and successful projects.
The importance of considering sustainability at every stage: The council being committed to developing the new leisure facilities to BREEAM Excellent standards, means that the facilities will be designed, constructed, and operated to be as environmentally friendly and sustainable as possible, with a focus on reducing energy use, improving energy efficiency and increasing renewable energy generation. By considering sustainability at every stage, and embedding environmental performance criteria within contracts, organizations can ensure that their projects have a positive environmental and social impact.

10.2.1.3 How Southend-on-Sea is creating green infrastructure through Nature Smart Cities

Nature Smart Cities | Institute of Environment and Sustainable Development | University of Antwerp (uantwerpen.be)

Overview

Nature Smart Cities is a European Union-funded project that aims to help smaller cities engage more fully with nature-based solutions to environmental challenges using green infrastructure. The project brings together city partners from Belgium, the Netherlands, France and the UK, and academic partners from the Universities of Ghent and Antwerp, and Imperial College London, and is funded through the Interreg 2 Seas programme. As part of the project, several pilot projects are being funded to explore green infrastructure solutions in smaller cities, and a business model has been developed to help city officers make a stronger case for green solutions in terms of both ecosystem service delivery and financial comparison with traditional approaches. The goal of the project is to maximize the potential for smaller cities to use green infrastructure to address environmental challenges.

What impact has the project had?

Improving the quality of the local environment: green infrastructure projects, such as the creation of green spaces or the use of green roofs, can help to improve air quality, reduce noise pollution, and provide habitats for wildlife.

Enhancing public health and well-being: green infrastructure can also contribute to public health and well-being by providing areas for people to relax and exercise, which can help to reduce stress and improve mental health.

Providing economic benefits: Green infrastructure can also provide economic benefits by increasing property values, attracting tourists, and supporting local businesses.

What made this work? Funding Mechanisms?

The Nature Smart Cities project is funded by the European Union through its Interreg 2 Seas programme. The Interreg 2 Seas programme is a European territorial cooperation programme that aims to encourage cooperation between regions in the North Sea and the English Channel, with the goal of promoting sustainable and inclusive growth.

The programme is funded through the European Regional Development Fund (ERDF) and the European Social Fund (ESF), which are both part of the European Structural and Investment Funds (ESIF). The ESIF are a key part of the EU's Cohesion Policy, which aims to reduce economic, social, and territorial disparities within the EU and support the implementation of the EU's priorities, including the transition to a low-carbon and circular economy.

Lessons learnt

The importance of collaboration: The Nature Smart Cities project brings together city partners and academic partners from multiple countries, demonstrating the value of collaboration in addressing environmental challenges. Collaboration can help to share knowledge and expertise, pool resources, and increase the impact of projects.

The potential benefits of green infrastructure: The Nature Smart Cities project highlights the potential benefits of green infrastructure for smaller cities, including improving the local environment, enhancing public health and well-being, reducing the urban heat island effect, reducing flood risk, and providing economic benefits.

The value of a business model for green solutions: The Nature Smart Cities project has developed a business model aimed at helping city officers make a stronger case for green solutions, both in terms of ecosystem service delivery and financial comparison with traditional approaches. This demonstrates the value of developing a clear business case for green infrastructure projects, which can help to secure funding and support for the initiatives.

The need for long-term planning: The Nature Smart Cities project is focused on maximising the potential for smaller cities to engage with nature-based solutions to environmental challenges. This suggests the importance of long-term planning and a focus on sustainability to achieve meaningful and lasting change.

10.3 Tools, Resources and Support

10.3.1 Advancing Net Zero- UK Green Building Council (UKGBC)

Advancing Net Zero - UKGBC - UK Green Building Council

The programme was launched in 2018 to help drive the net zero transition in the UK and deliver the emissions reductions required from the construction and property sectors. In 2022-23, UKGBC will be seeking to build on the success of the programme to date and deliver on the ambitions set out in the Net Zero Whole Life Carbon Roadmap.

10.4 Funding and Financing Opportunities

10.4.1 Housing Infrastructure Fund

https://www.gov.uk/government/publications/housing-infrastructure-fund

The Housing Infrastructure Fund (HIF) is a fund established by the UK government to support the delivery of new homes by funding infrastructure projects that enable housing development. The fund is administered by the Homes and Communities Agency (HCA) and is intended to help local authorities and other public sector organizations to deliver new homes in areas where there is a high demand for housing. The fund provides financial assistance to support the development of infrastructure such as roads, bridges, and utilities that is needed to support new housing developments. The HIF is intended to help unlock new housing developments and support economic growth in areas where housing is needed most. The second round of funding runs from 2023/24.

There are two streams within the Fund:

Marginal Viability: All single-tier and lower-tier local authorities in England are eligible for this, which fills in any funding gaps for infrastructure needed to quickly unlock blocked sites or allocate new ones.

Forward Funding Is a resource available to the top tier of English local authorities for a select group of strategically important and high-impact infrastructure projects.

10.4.2 New Homes Bonus

https://www.gov.uk/government/publications/new-homes-bonus-provisional-allocations-2023-to-2024

The New Homes Bonus (NHB) is a scheme established by the UK government to encourage local authorities to support the building of new homes in their area. The scheme provides financial incentives to local authorities for each new home built in their area, including both new-builds and conversions of existing buildings. The amount of funding a local authority receives is based on the number of new homes built and the council tax band of those homes. The funding is intended to help local authorities offset the costs associated with new housing developments, such as providing new infrastructure and services.

10.5 Recommendations to boost the net zero agenda

10.5.1 Organisational

- Key Cities should look to create their own housing strategy prior to central government housing strategy publication in 2025. If Key Cites wait till 2025 they will only be the extending retrofit issues by 2 years. An example of what Lincoln have done to create their own housing strategy can be within the current initiatives section of this theme.

10.5.2 Territorial

- Encourage the development of compact, mixed-use communities: By encouraging the development of communities that are designed to be walkable and bikeable, local authorities can reduce the need for car use and lower emissions.

- Local authorities can encourage the use of low-carbon building materials, such as recycled steel and concrete, and encourage the use of energy-efficient building techniques, such as insulation and energy-efficient windows.

- Local authorities can encourage the use of renewable energy sources, such as solar and wind, in new building developments.

- Local authorities could implement green building codes that require new buildings to meet certain energy efficiency standards. These could also include statutory requirements for reducing overheating risks in new builds, more ambitious water efficiency standards, property-level flood protection in flood risk areas, and increasing requirements for greenspace and sustainable transport.

- The way new homes are built often falls short of design standards. Over the long-term, consumers pay a heavy price for poor-quality build and retrofit. Greater levels of inspection and stricter enforcement of building standards are required, alongside stiffer penalties for non-compliance. This could include creating a set of higher standards for new builds which exceeds those of central government. For example, all new builds should be zero carbon or even Passivhaus standard.

- By implementing land use policies that encourage compact, efficient development, local authorities can help to reduce sprawl and lower emissions.

- Local authorities could promote the use of green infrastructure, such as green roofs, rain gardens, and permeable pavement, to help absorb and filter stormwater, reduce the urban heat island effect, and lower emissions.

- Local authorities could encourage the development of district heating schemes, this could include:
    - Using low-carbon heat sources such as biomass, geothermal energy, or waste heat from industrial processes to generate heat for the district heating system.
    - Using renewable energy to generate electricity for the district heating system.
    - Improving the efficiency of the district heating system by investing in measures such as insulating pipes, using high-efficiency boilers, and optimizing the operation of the system.

    - Promoting the adoption of district heating by offering incentives for property owners to connect to the system and by raising awareness about the benefits of district heating.
- It is advised there should now be any new homes connected to the gas grid after 2025 under the Future Homes Standard[38]. They should instead be heated using low-carbon methods, be ultra-energy-efficient, with proper ventilation, and, if at all possible, timber-framed.

[38] Title (publishing.service.gov.uk)

11 Communication and Community Engagement

Effective communication and community engagement are critical for local authorities in the UK to successfully implement the net zero strategy. This not only includes being transparent and sharing information about goals and progress of actions but also seeking inputs and feedback from residents, businesses, and other stakeholders. The Climate Change Committee (CCC) indicated in their report that majority (~62%) of emission reductions will require certain societal and behaviour change such as the adoption of low-carbon technologies and changes to the way people live[39].By involving community groups, organisations and leaders in the planning and implementation processes, local authorities can increase buy-in and support for their strategies as well as build trust and credibility. This also ensures that their efforts are aligned with the community's values and priorities and all concerns and barriers are addressed accordingly.

In March of 2021 House of Commons reported that as much as 62% of future emissions reductions will rely on individual chouses and behaviour[40], with the most important consumer choices including buying an electric car, installing a heat pump, and adding housing insulation[41].

11.1 Trends and Explanation

11.1.1 Cross local authority communication and collaboration can be restrictive due to opposing political parties controlling conurbations.

11.1.2 Discussion with BEIS highlighted that advertising the climate work local authorities have done so far could generally be improved.

11.1.3 The vast majority of Key City members have actively prioritised engaging with vulnerable communities.

11.1.4 Key City members have generally struggled to create behavioural change within their residents.

[39] https://www.theccc.org.uk/publication/reducing-uk-emissions-2020-progress-report-to-parliament/

[40] Achieving Net Zero (parliament.uk)

[41] Achieving Net Zero: Follow up (parliament.uk)

11.2 Current Initiatives

11.2.1 Key Cities

11.2.1.1 How Sunderland is causing behavioral change through Better Points

What are we doing? - MySunderland
BetterPoints Sunderland

Overview
Better Points is a free to use award-winning behaviour change platform, targeting a model shift to active and sustainable travel. The app tracks travel movements via GPS using a smartphone and rewards points for using more sustainable transport, such as walking, cycling or public transport. These points can then be exchanged for rewards such as discounts, coffees, vouchers, or charity donations.
'Active travel' includes walking, running, or cycling whereas 'Sustainable travel' includes the bus, metro, or trains.
The rewards come in four forms:

- Better Points (digital currency)
- Better Tickets (prize draw entries)
- Direct vouchers
- Prizes

What impact has the project had?
The campaign in Sunderland ran from March to October 2022, and awarded points to anyone aged 14 or over for active or sustainable journeys made in the Sunderland, Washington, Hetton, and Houghton areas. Thanks to additional funding the project has continued.
At the time the website was written, the app had 687 current users. In total those people made over 740,000 sustainable journeys, travelling 136,700 miles, and saving almost 30 tonnes of carbon dioxide.

Lessons learnt
The importance of incentives: The use of rewards and incentives, such as points that can be exchanged for discounts and prizes, can be an effective way to encourage people to adopt more sustainable modes of transportation.
The value of collaboration: The BetterPoints campaign involves partnerships with local businesses, who can offer rewards and support prize draws, which demonstrates the value of collaboration in achieving behaviour change.
The role of technology: The use of GPS tracking and a smartphone app to track and reward sustainable travel can be a useful tool for encouraging behaviour change and making it easier for people to adopt more sustainable transportation options.
The potential for long-term impact: The BetterPoints campaign in Sunderland has been successful in encouraging sustainable travel. This suggests the potential for long-term impact and the importance of sustained efforts in promoting sustainable transportation.

11.2.2 UK Wide

11.2.2.1 How is Glasgow using communication and community engagement to make a difference?

6 examples of community engagement in climate action (commonplace.is)
Discover Rethink Glasgow to Have Your Say – Commonplace

Overview
The Rethink Glasgow project is a community engagement climate action plan created in partnership with After The Pandemic (ATP), OnePlanet, and the city of Glasgow. The goal of the project is to create a greener and more connected city. The Commonplace website allows residents to make suggestions for making places more sustainable and to flag issues, and these suggestions are being considered in the city's climate action plan.

What impact has the project had?
Since its launch in September 2021, the map has received thousands of comments about suggestions how to make places more sustainable or flag any issues members of the public may have noticed. These comments were factored into the city's climate action plan and continue to identify areas for further work.

What made this work? Funding Mechanisms?
The project was successful due to the effective collaboration between After The Pandemic and OnePlanet.

Lessons learnt
The Rethink Glasgow project shows the importance of community engagement in addressing climate change and creating a more sustainable future. The partnership between After The Pandemic and OnePlanet, along with the use of the Commonplace website, has made it possible for residents to provide suggestions and have their voices heard in the city's climate action plan. The success of the project highlights the benefits of effective collaboration and public involvement in decision-making processes related to sustainability.

11.3 Tools, Resources and Support

11.3.1 Net Zero Innovation Programme

Net Zero Innovation Programme | Local Government Association

In order to address the climate emergency, the Net Zero Innovation Programme creates collaborations between researchers and climate change officials from councils throughout England.

The Local Government Association (LGA) and University College London (UCL) collaborated to deliver the Net Zero Innovation Programme, which brings together councils, universities, and other stakeholders to address local climate and sustainability challenges and find ways to meet councils' commitments to net zero, adaptation, and biodiversity.

11.4 Funding and Financing Opportunities

11.4.1 Net Zero Living: Fast Followers

Competition overview - Net Zero Living: Fast Followers - Innovation Funding Service (apply-for-innovation-funding.service.gov.uk)

A scheme for local authorities to apply for a share of £6 million to build skills and capabilities that can accelerate local progress towards net zero. The funding will help authorities to further develop your net zero delivery plans.

Projects must focus on identifying human, process, and non-technical barriers (skills, consumer engagement, governance, etc.) and deliver net zero activities relating to heat, power, mobility or manufacturing.

Competition opens 18 January 2023 and closes on 1 March 2023.

11.5 Recommendations to boost the net zero agenda

11.5.1 Organisational

- Involve residents in net zero policy and programme development using comprehensive engagement techniques such as public meetings, surveys, or community advisory committees.
- Easily and regularly inform residents with project updates through council platforms like websites, newsletters, or emails.
- Utilise social media platforms to provide transparency and education:
  - Twitter to share updates and information about their efforts to reduce carbon emissions, and to engage with members of the community by asking for feedback and ideas.
  - Facebook to share educational content and resources about sustainable living, and to connect with local organizations and businesses that are involved in the transition to net zero.
  - Instagram to share visual content that showcases the progress they are making towards achieving net zero emissions, and to inspire others in the community to take action.

11.5.2 Territorial

- Create educational resources and programs that teach local residents about the benefits of becoming Net Zero and the steps they can take to reduce their carbon footprint. This could include things like information sessions, workshops, and guides on how to choose and install renewable energy systems, or how to reduce energy use in the home.
- Support the development of community-based renewable energy projects, such as solar or wind farms owned and operated by local residents. Also identify public assets or sites that could host facilities (recycling, renewable generation). This could include providing funding, technical assistance, or other support to help local residents develop and implement renewable energy projects in their community.
- Work with local businesses and organizations to develop programs that support the transition to Net Zero. This could include things like developing recycling programs, promoting the use of electric vehicles, or supporting the development of local food production systems.
- Climate assemblies could provide a platform for members of the public to have their voices heard and to help shape the policies and decisions that will be necessary to achieving net zero. This could include identifying key challenges and priorities, as well as suggesting potential solutions and actions that can be taken. In bringing together a

diverse group of people with different backgrounds, experiences, and perspectives, climate assemblies can help to ensure that the transition to net zero is fair, inclusive, and effective. For example, the Bristol Climate Assembly, which was organized by the city of Bristol in 2019, brought together a representative group of Bristol residents to consider how the city could achieve net zero emissions by 2030. The assembly heard from experts and stakeholders and made recommendations on a range of policy areas, including energy, transport, and waste. Further examples include the Citizens' Assembly on Climate Change, which was commissioned by the UK government in 2019, and Newcastle Climate Assembly.

- Co-production refers to a process in which different stakeholders, including government agencies, community organizations, businesses, and individuals, work together to develop and implement solutions to social and environmental challenges. Co-production can be beneficial in the context of net zero because it can help to ensure that the transition is driven by the needs and priorities of those who are most affected by it. It can also foster greater collaboration and cooperation between different stakeholders, and can lead to more innovative and effective solutions that are based on the expertise and knowledge of all those involved. Additionally, co-production can help to build trust and support for the transition among the general public, which is essential for its success. For example, the UK government has established the Net Zero Innovation Portfolio, which brings together businesses, academia, and public sector organizations to develop and demonstrate low-carbon technologies and practices. There are also a number of local and regional initiatives, such as the Greater Manchester Low Carbon Hub, which brings together businesses, local authorities, and community organizations to support the transition to a low-carbon economy.

12 Land Use and Natural Capital

A key concern for the transition to net zero is how the UK utilises its land. Without acknowledging the critical role that nature-based solutions play in removing carbon from the atmosphere, net zero would not be attainable. For instance, the UK government hopes to have planted 30,000 hectares of forest, with around 40% of the necessary greenhouse gas reductions by 2050 being anticipated to come from natural methods (such planting trees). In 2017, around 28 million tonnes of CO2 and other greenhouse gases were removed just by vegetation in the UK[42]. At the same time, there is increasing demand for other uses of our land, such as the UK's goal of building 300,000 new houses annually by the mid-2020s and burgeoning uses associated with net zero, such biomass, nuclear, solar, or wind power[43][44].

Therefore, local authorities need to bolster the preservation of already existing landscapes that contribute to net zero emissions, as well as leveraging their natural capital. This includes efforts to reduce greenhouse gas emissions from agriculture and land use change, protecting and restoring natural habitats and ecosystems, and promoting sustainable land management practices such as agroforestry and regenerative agriculture. Natural carbon storage and sinks must be continually safeguarded, and there must be long-term holistic strategies in place that go beyond simply restoring natural ecosystems like peat bogs, wetlands and forest land. Notably, every Key City member is an urban local authority, which limits their ability to harness natural capital. However, there are ways to overcome this challenge.

12.1 Trends and Explanations

12.1.1 Very few Key City members highlighted land use or natural capital as being key mechanisms to delivering Net Zero during engagement.

12.1.2 How conurbations utilise their land and natural capital has directly impacted Key City members abilities to increase climate resilience.

[42] https://www.ons.gov.uk/economy/environmentalaccounts/articles/netzeroandthedifferentofficialmeasuresoftheuksgreenhousegasemissions/2019-07-24

[43] Sector-summary-GHG-removals.pdf (theccc.org.uk)

[44] Net Zero Strategy: Build Back Greener - GOV.UK (www.gov.uk)

12.2 Current Initiatives

12.2.1 Key Cities

12.2.1.1 How Southend following a Nature Smart Cities Approach

Nature Smart Cities | Institute of Environment and Sustainable Development | University of Antwerp (uantwerpen.be)

Overview

Nature Smart Cities is a European Union-funded project that aims to help smaller cities engage more fully with nature-based solutions to environmental challenges using green infrastructure. The project brings together city partners from Belgium, the Netherlands, France and the UK, and academic partners from the Universities of Ghent and Antwerp, and Imperial College London, and is funded through the Interreg 2 Seas programme. As part of the project, several pilot projects are being funded to explore green infrastructure solutions in smaller cities, and a business model has been developed to help city officers make a stronger case for green solutions in terms of both ecosystem service delivery and financial comparison with traditional approaches. The goal of the project is to maximize the potential for smaller cities to use green infrastructure to address environmental challenges.

What impact has this project had?

Improving the quality of the local environment: green infrastructure projects, such as the creation of green spaces or the use of green roofs, can help to improve air quality, reduce noise pollution, and provide habitats for wildlife.

Enhancing public health and well-being: green infrastructure can also contribute to public health and well-being by providing areas for people to relax and exercise, which can help to reduce stress and improve mental health.

Providing economic benefits: Green infrastructure can also provide economic benefits by increasing property values, attracting tourists, and supporting local businesses.

What made this work?

The Nature Smart Cities project is funded by the European Union through its Interreg 2 Seas programme. The Interreg 2 Seas programme is a European territorial cooperation programme that aims to encourage cooperation between regions in the North Sea and the English Channel, with the goal of promoting sustainable and inclusive growth. The programme is funded through the European Regional Development Fund (ERDF) and the European Social Fund (ESF), which are both part of the European Structural and Investment Funds (ESIF). The ESIF are a key part of the EU's Cohesion Policy, which aims to reduce economic, social, and territorial disparities within the EU and support the implementation of the EU's priorities, including the transition to a low-carbon and circular economy.

Lessons Learnt

The importance of collaboration: The Nature Smart Cities project brings together city partners and academic partners from multiple countries, demonstrating the value of collaboration in addressing environmental challenges. Collaboration can help to share knowledge and expertise, pool resources, and increase the impact of projects.

The potential benefits of green infrastructure: The Nature Smart Cities project highlights the potential benefits of green infrastructure for smaller cities, including improving the local environment, enhancing public health and well-being, reducing the urban heat island effect, reducing flood risk, and providing economic benefits.

The value of a business model for green solutions: The Nature Smart Cities project has developed a business model aimed at helping city officers make a stronger case for green solutions, both in terms of ecosystem service delivery and financial comparison with traditional approaches. This demonstrates the value of developing a clear business case for green infrastructure projects, which can help to secure funding and support for the initiatives.
The need for long-term planning: The Nature Smart Cities project is focused on maximising the potential for smaller cities to engage with nature-based solutions to environmental challenges. This suggests the importance of long-term planning and a focus on sustainability to achieve meaningful and lasting change.

12.2.2 UK Wide

12.2.2.1 How Wirral's tree strategy will plant 210,000 trees by 2030

How Wirral's tree strategy will plant 210,000 trees by 2030 | Local action (friendsoftheearth.uk)

Overview

Wirral Council is working towards protecting existing trees and plans to plant 210,000 more trees by 2030, under Action 45 that includes doubling tree cover on council owned land. Their ten-year tree strategy aims to help store carbon, offer flood protection and mental health benefits. It has three elements: participation from the community, protection of existing trees and planting of new ones to continue the process.

What impact has the project had?

The project is already ahead of its target, by crossing the annual target of 21,000 trees in 2021 despite the pandemic.
The tree strategy has brought together the council's key partners through the Wirral Initiative on Trees that raises awareness about the council's strategy with communities and receives feedback.
By 2030, the Tree Strategy is projected to have led to 222 tonnes of carbon sequestration.

What made this work?

External expertise and knowledge from consultation groups involved in the Wirral Initiative, has enabled the council to execute the strategy effectively without starting from scratch.
The strategy has received all party support on a council with No Overall Control along with the support of a councillor.
Majority of the trees being planted by volunteers and the use of i-tree, a free online tool estimating tree cover and type, has resulted in the project being quite cost effective.
The trees planted come with many social, health and economic benefits other than their environment positive impacts, thus the support for the project.
The accessibility of tree planting has increased community engagement and cohesion. The council's previous work on planting trees between 2018-20 further helped it meet targets.
Apart from their own dedicated budget, the council uses funds for their tree strategy from the UK Government's Urban Tree Challenge Fund, Mersey Forest's Trees for Climate budget and has applied to a finance programme.

Lessons learnt

The council has realised the importance of protecting existing trees to not only ensure a better impact of the strategy on climate and biodiversity but also gain more support from residents. Due to criticism received around felling of trees, the strategy now states it as a last resort.
Tree strategies must be tailored to local geographies to preserve valuable habitats and landscapes.
Since trees and greenery crosses political boundaries, tree cover can increase through collaboration between neighbouring councils or neighbours employing their own measures.
A significant lesson for councils is recognising how crucial good, up-to-date tree data is to expand tree cover and fill in gaps with new trees.
Tree planting schemes tend to fail due to not being followed up, thus making it essential to make a long-term commitment to reap all benefits.
The final lesson would be how vital strong communication is for this process, in order to keep the communities engaged and up to date.

12.3 Tools, Resources and Support

12.3.1 Zero Carbon Britain Hub

https://cat.org.uk/info-resources/zero-carbon-britain/

the hub and innovation lab supports councils, communities, and other organisations to act on the climate and biodiversity emergency.

12.3.2 Net Zero Plus NEVO

https://netzeroplus.ac.uk/resources/nevo/

NEVO stands for the Natural Environment Valuation Online Tool that been developed by researchers at Land, Environment, Economics and Policy Institute (LEEP) at the University of Exeter. It helps users explore, quantify and make predictions about the benefits that are derived from existing and altered land use across England and Wales.

12.4 Funding Opportunities

12.4.1.1 National Lottery Community Fund: Climate Action Fund linking Nature and Climate

https://www.tnlcommunityfund.org.uk/funding/programmes/climate-action-fund-programme#section-3

The fund provides £1.5 million over a period of 2-5 years with projects between £300,000 and £500,000 and is suitable for community and voluntary organisations, charities, public sector bodies, educational institutions, statutory bodies and NGOs. However, the funding is only available to partnerships made up of a mix of organisations from various sectors.

12.4.1.2 Brownfield Land Release Fund

https://www.local.gov.uk/topics/housing-and-planning/one-public-estate/brownfield-land-release-fund

The Department for Levelling Up, Housing and Communities (DLUHC) has made a further £60m of capital grant funding available to English councils on 18 January 2023. This is the second round of the Brownfield Land Release Fund. Through this opportunity, £180 million is available over a 3-year period to support release of council-owned brownfield land for housing. The first round successfully provided £35m to more than 40 councils, releasing land for at least 2,200 homes by 2026.

12.5 Recommendations to boost the net zero agenda

12.5.1 Organisational

- Protect and restore natural ecosystems, such as forests and wetlands, to enhance their ability to sequester carbon dioxide and provide other ecosystem services.
- Enable carbon reduction through wildlife protection, public access, and rights of way.
- Prioritise the restoration of peatlands.
- Expand the growing of energy crops to support bioenergy production
- Support opportunities for anaerobic digesters
- Educate the public on the consumption of the most carbon-intensive foods and how to shift their eating habits
- Integrate habitat restoration into net zero transition plans, establish and meet ambitious goals for nature-based solutions and maximise climatic and environmental co-benefits whenever possible.

12.5.2 Territorial

- Investing in sustainable land use practices, such as agroforestry and conservation agriculture, to reduce emissions from land use, land use change, and forestry (LULUCF) sectors. Agroforestry is a land management practice that involves combining trees with crops or livestock. In the UK, some examples of agroforestry include planting trees in hedgerows, incorporating trees into silvopastoral systems (where trees are combined with grazing animals), and intercropping trees with crops. Another example of agroforestry in the UK is alley cropping, where trees are planted in rows and crops are grown between the tree rows. Agroforestry has many benefits, including providing habitat for wildlife, improving soil health, and increasing the productivity of the land.

- Promoting the use of wood and other biomass from sustainably managed forests as a low-carbon alternative to fossil fuels for heating, electricity, and transportation.

- Engaging with local communities and stakeholders to develop natural capital assets, such as green spaces and nature reserves, in order to provide multiple benefits, including improved air and water quality, increased biodiversity, and enhanced mental and physical health.

- Try and reduce or if possible, ban damaging practices such as rotational burning on peatland and peat extraction.

- Local authorities should try to incentivise the take-up of low-carbon farming practices (e.g. precision farming) where they go beyond requirements of new regulation and where they imply costs to farmers.

- Incentivise low carbon urban farming or vertical farming.

- Promote district heating and local energy generation as part of any new developments. Specify opportunities to local farmers and landowners to provide heat network services or growing fuel feedstocks as part of a planning condition.

- Incentivise good management of existing tree stocks.

- There is a significant need to scale up market opportunities and encourage new supply chains for bio-based products.

12.5.3 Public Private Partnerships

- Working with national and international organizations to develop and implement policies and programs that support the sustainable use of natural capital, such as sustainable forestry and conservation programs.

13 Waste and the Circular Economy

Waste management and the implementation of a circular economy are crucial components of the UK's net zero strategy. Local authorities play a key role in this effort by promoting and facilitating the reduction, reuse, and recycling of waste in their communities. By implementing policies and programs that encourage the use of sustainable materials and the creation of closed-loop systems, local authorities can help to decrease the amount of waste sent to landfills and decrease the carbon footprint of their communities. WRAP have suggested that a circular economy could save the UK up to £23 billion per year by 2030, while also creating around 180,000 jobs[45].Additionally, local authorities can work to increase public education and awareness about the importance of waste reduction and the circular economy in achieving net zero emissions.

13.1 Trends and Explanations

13.1.1 Throughout engagement with Key Cities, less emphasis was placed on creating circular economies.

13.1.2 It was underlined that collaboration via public private partnerships is required to create and boost commercially viable circular economy business models which can be utilised across different sectors.

13.1.3 Key City members highlighted that the current delivery of existing waste reforms and strategies are too slow, preventing local authorities from moving towards more efficient and circular waste management.

[45] https://wrap.org.uk/taking-action/climate-change/circular-economy/wraps-vision-uk-circular-economy#:~:text=The%20adoption%20of%20a%20circular,of%20resource%20efficiency%20could%20eventually

13.2 Current Initiatives

13.2.1 Key Cities

13.2.1.1 How Bath & Northeast Somerset are improving waste services to help reach net zero

Bath & Northeast council commits tens of millions to help district reach net zero as 'time is ticking' - Somerset Live

Overview:
Bath & Northeast Somerset Council has committed to invest tens of millions of pounds over the next five years to projects designed to drive down carbon emissions to achieve net zero. This includes £38 million in new funding, which will be used to modernize waste services, expand the council's green vehicle fleet, refurbish the council's commercial estate, and invest in green infrastructure. The council will also continue to work with communities, partners, and government to further cut emissions over the next year, including implementing a regional Climate Emergency Action Plan, supporting businesses to decarbonize, and installing solar panels on council property.

What impact has this project had?
Bath & Northeast Somerset (B&NES) Council has allocated £14.2 million to modernize waste services in the region in order to further improve recycling rates. This initiative aims to reduce the amount of waste sent to landfill and increase the reuse of materials through recycling, thus reducing the need for the constant manufacture of new materials and minimizing land pollution. Additionally, B&NES has allocated £41.8 million for the construction of a new state-of-the-art Keynsham Recycling Hub. This facility, designed to assist residents in recycling more, will incorporate various sustainability measures, including on-site renewable energy generation from a 3800m2 solar panel array, which is expected to produce approximately 600,000kwh of electricity per year.

What made this work?
B&NES council allocated over £38 million for the next five years' worth of projects to drive carbon dioxide emissions down. A portion of this was allocated to Waste related projects, as discussed above. The council will work with communities, partners, local, regional and national governments to ensure these projects are successful.

Lessons Learnt:
- Investing in recycling infrastructure can lead to increased recycling rates and reduced waste sent to landfill.
- Incorporating renewable energy generation into recycling facilities can contribute to reducing carbon emissions and promoting sustainability.
- Even under challenging financial pressures, it is possible for local governments to make significant investments in addressing climate change and environmental issues.
- Collaboration with communities and partners can help to ensure the success and effectiveness of such projects.

13.2.2 UK Wide

13.2.2.1 How Derry and Strabane Council Created a Zero-Waste Circular Economy Strategy

How Derry and Strabane Council created a zero-waste circular economy strategy | Local action (friendsoftheearth.uk)

Overview

Derry and Strabane Council is one of the first local authorities in the UK to create a zero-waste circular economy strategy under Action 38: adopt circular-economy waste policies in relevant plans and contracts. Following this the region has won the Zero Waste City Region designation from Zero Waste Europe. The strategy aims to reduce waste generation, prepare waste for re-use and segregate waste collection for further processing and the council aims to achieve this through public education and changing collection methods. As part of the circular economy thinking, the district council is now focussing on the quality of material produced after recycling rather than the quantity of waste material collected.

One of the many ways in which the council plans to implement circular economy waste policies into the city plans is through encouraging reuse and recycling. It has been improving recycling centres and waste collection to reduce the feed into landfills. This has been supported by the work of many local enterprises and projects that involve and educate the public on waste management and reuse.

The green procurement strategy is another part of the plan to show public circular economy elements are implemented in real life.

The council gives immense importance to sustainable food production and supports many projects and movements that encourage food-growing locally.

To handle e-waste, the refurbished laptop donation scheme to support home-schooling during the pandemic, has proven to be an effective initiative.

What impact has the project had?

The project has been successful in raising awareness and bring a change in behaviour quite evident with the increase in cycling rates and falling landfill rates. The society has benefitted in many ways with mental and physical health enhanced through food growing projects and educational benefits of schemes. The added advantage of the strategy is the long term impacts it will have.

What made this work?

Collaborating with grassroots organisations such as Zero Waste Northwest have aided the council in policy action development and wider public engagement.

The council's plan to include circular economy into city plans has not only created savings but also led to more employment opportunities.

Incorporating technology has had quite an impact to the project. The Emergreen Project (founded by the EU) provides people with information on waste through various tools such as apps, chat boxes and a website. Similarly, the City Deal Programme with Ulster University is run to improve reusing and recycling of waste products through digital innovation.

The sustainability budget set by the council served as the main funding for the new plan with the support from other programmes such as DAERA Kerbside Recycling Transformation Programme.

Lessons learnt

The strategic plan and policies were delivered effectively through setting up a series of internal circular economy groups that in turn work with local stakeholders.

13.2.2.2 How Leeds uses Sustainable Food to Help Schools the Combat Climate Crisis

How Leeds uses sustainable food to help schools combat the climate crisis | Local action (friendsoftheearth.uk)

Overview

School food is a major area of procurement for local councils along with the opportunity of providing children a nutritious diet.

Leeds City Council is working with schools and students towards lowering emissions through low carbon meals and aims to reduce 50% of the carbon footprint by 2030. The council has committed to buying local, go meat free and invest in research.

What impact has the project had?

The plant-based meals have cut down Greenhouse Gas Emissions by 75% and are well-received by children. The feedback from teachers and students has also been positive.

The council has also encouraged active transport to schools and fund for scooters as a fun and sustainable mode of travel.

As part of the government's Public Sector Decarbonisation Scheme, the region has received funding to decarbonise around 38 publicly owned buildings, schools being some of them.

The District Council has started an initiative, the Leeds Uniform Exchange, enabling the exchange of old uniforms and recycle them, which is both sustainable and affordable for parents.

What made this work?

After declaring a climate emergency in 2019, the council recognised the many benefits of the revised menus. These were not only healthy but cut down emissions and made the city the first to become a Child Friendly City and a signatory to the Glasgow Food and Climate Declaration. The support from the residents further made the project a success. Moreover, the menus were designed through a consultative approach by involving schoolchildren in discussions and consulting experts.

Above all, this switch in diets through this project involved no direct costs as it used existing resources.

Lessons learnt

Every change takes time, as seen in the case of Leeds, where opting for new menus wasn't compulsory. This time taken by schools for the switch was varied and further affected by the pandemic.

Although the plan received a lot of support, introducing only plant-based meals has still led to some criticism from a minority faced by the council. The council has had to balance these critical views along with the pressure from pro-campaigns.

It is important for the council to go further with this plan whilst remaining within the government guidelines. Since current guidelines require meat to be served three days a week, Leeds has decided to reduce the amount of meat in these meals but should also campaign towards a change in these guidelines. There is a lot more scope for this influence in free schools and academies where the School Food Standards don't apply.

13.3 Tools

13.3.1 WRAP

https://wrap.org.uk/what-we-do/our-services/policy-and-insights

WRAP provides guidance on circular economy benefits and managing food, textiles, and plastics for policymakers. These include nation specific short policy briefs and programmes designed for particular issues. The Extended Producer Responsibility (EPR) scheme is one such example.

13.4 Funding and Financing Opportunities

13.4.1 Water Discovery Challenge

Water Discovery Challenge - Ofwat Innovation Fund (challenges.org)

Hosted by OFWAT and opening in January of 2023, the Waste Discovery Challenge aims to 'accelerate the discovery, development and adoption of promising innovations by the water sector'. The competition is designed to provide a route for early-stage innovations whilst also recognising the importance of 'no strings attached' funding.

The competition will run for 18 months over two stages, with successful applicants confirmed by OFWAT in later Spring 2023.

13.5 Recommendations to boost the net zero agenda

Interventions councils are undertaking around circular economy and minimising waste - e.g. repair cafes and refill shops. Libraries where you rent things rather than having to purchase it. A repair café is a community-based initiative that aims to promote the repair of broken or damaged items, rather than throwing them away. Repair cafes are typically run by volunteers who have expertise in fixing a wide range of items, including electronics, clothing, furniture, and appliances.

13.5.1 Organisational

- Local authorities can implement a composting programme to divert organic waste from landfills and reduce methane emissions. For example, diverting ground coffee waste to be used for landscaping/for repurposing.
- Create a recycling program to divert waste from landfills and reduce emissions from waste decomposition. This can include but is not limited to outdated technological equipment repurposed in local VCSEs (Voluntary and Community Organisations and Social Enterprises), discarded furniture or uniforms and similar to be repurposed by local VCSEs
- Introduce policies, such as a ban on single-use plastics or a fee for disposable bags, to encourage waste reduction.
- Invest in waste-to-energy technologies, such as incineration and anaerobic digestion, to generate energy from waste and lower emissions.
- Enforcing a council waste hierarchy which prioritises prevention and reuse over disposal.
- Local Authority waste contracts could stipulate that biogas should be produced from biodegradable waste that is not recyclable. The gas could then go on to heat homes across the area.

13.5.2 Territorial

- Local authorities could implement a food waste reduction program to reduce the amount of food waste sent to landfills and lower emissions, for example food cycle[46].
- Local authorities could engage with the community to solicit feedback and ideas for improving waste management practices.

13.5.3 Public Private Partnerships

- Hard to recycle waste (e.g. cigarette butts, wrappers or cosmetic product packaging including different types of plastics) could be diverted from landfill or incineration through specific recycling partnerships for example Terracycle.
- Local authorities could collaborate with waste management companies to access data on waste generation and identify opportunities for improvement.

[46] Soup Kitchen Volunteering | Volunteer at a soup kitchen near you | Foodcycle

14 Public Sector Operations and Supply Chains

Within the Net Zero Strategy Review: Mission Zero, it relays how heavily the net zero transition pivots on developing and delivering Net Zero supply chains.

The UK's net zero strategy requires local authorities to consider the impacts of their public sector operations and supply chains on the environment. This includes reducing greenhouse gas emissions, increasing energy efficiency, and procuring products and services that have a lower environmental impact. It is estimated that direct emissions from public sector buildings account for around 2% of the UK's total emissions, however this is excluding sources such as electricity, business travel and emissions from goods and services[47].

Local authorities can achieve these goals by implementing sustainable procurement policies, investing in renewable energy, and implementing energy efficiency measures in their buildings and fleets. Additionally, local authorities can work with their suppliers to reduce the environmental impact of their products and services and support local businesses that are committed to sustainability.

14.1 Trends and Further Information

14.1.1 Local authorities are dealing with a lack of capacity, either through lack of funding to hire employees or they cannot find people with the skills required. This is not just for climate activities but across departments.

For councils issues stem from the available capacity to deliver large scale programs/projects. Ambition often exceeds reality, where local authorities can obtain the finance, but can't get the procurement or management processes in place to deliver at pace.

14.1.2 Progress on the Net Zero Transition drastically slowed during Covid-19

Covid-19 delayed action council budgets were frozen and local authorities couldn't recruit. Furthermore, people in councils were shifted to respond to the pandemic.

14.1.3 Many Key City members find that their climate officers are highly sought after across council departments

There is challenge in that services across departments become dependent on climate experts at councils for advice, and it becomes a bottleneck.

14.1.4 The timeframe local authorities set to reach organisational and territorial Net Zero vary widely.

Some local authorities have highlighted that whilst achieving net zero by 2030 will be challenging, a shorter timeframe allows areas to focus attention, any longer and they would struggle to channel funds into the net zero agenda.

14.1.5 Some local authorities have considered devolution.

Devolution could provide local authorities with the flexibility and autonomy they need to tailor their approach to reducing emissions to the specific needs and priorities of their communities.

[47] https://publications.parliament.uk/pa/cm5803/cmselect/cmpubacc/39/report.html

14.1.6 Authorities that have a history of success, local knowledge, and the capacity to utilise prior investment to build supply chains and develop skills will continue to acquire funding. Smaller authorities with less capacity tend to struggle and fall behind.

14.1.7 Key City members have been proactive in delivering net zero, but lack of clarity on roles and powers is creating roadblocks in the system.

Whilst the Net Zero Strategy further clarified duties and responsibilities between central and local government to a greater extent than it had in the past, local authorities still don't fully understand their roles within the transition to net zero.

14.1.8 Many Key City members are unable to afford high enough salaries to attract highly skilled staff.

14.1.9 Key City members have generally felt down by the lack of support from Net Zero Hubs

14.2 Current Initiatives

14.2.1 Key Cities

14.2.1.1 How Preston are pioneers of sustainable community wealth building

Community Wealth Building - Preston City Council

Overview

One of the UK's early adopters of community wealth building, a strategy for local economic development that focuses on utilising a community's existing resources to foster inclusive and local growth, is Preston in the Lancashire County. Since 2012, the City Council has collaborated with other "anchor institutions" in Preston, such as NHS trusts, universities, housing associations, and large local businesses, to use its power as an employer, a landowner and other asset owner, a significant buyer of goods and services, and a leader of place to stop money from leaving the area's economy so that it can be retained and distributed more widely for the benefit of the community.

What impact has the project had?

Spending within Preston increased from 5% to 18% of total procurement spending between 2012 and 2017, while spending within Lancashire it increased from 39% to 79% of total procurement spending. This is as a result of emphasising the purchase of goods and services from local and socially responsible enterprises.

The project has seen £74 million directed backed into the Preston economy through procurement work and a wider £200 million invested into the wider Lancashire economy.

Preston improved its position from 143rd to 130th in the Social Mobility Commission Index.

Between 2014 and 2017 unemployment fell from 6.5% to 3.1%.

Lessons Learnt

The 'Preston Model' of community wealth building works. The model succeeded because it is a shared endeavour involving many individuals across many organisations. However, community wealth building must be unique to place, as it is based on the public services and private companies within the area.

14.3 Tools, Resources and Support

14.3.1 Net Zero Technology Centre

https://www.netzerotc.com/

The UK Net Zero Technology Centre is a research and development facility that aims to accelerate the development and deployment of technologies that can help the UK achieve its goal of net zero greenhouse gas emissions by 2050. The centre focuses on areas such as carbon capture and storage, hydrogen, and other low-carbon technologies.

14.3.2 Net Zero Estate Playbook

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1035417/Net_Zero_Estate_Playbook__1_.pdf

The Net Zero Estate Playbook is a guide to decarbonising government property. It helps government sector bodies to transition their estate towards net zero through approaching design, implementation, and monitoring of a net zero strategy and delivery programme,

14.4 Recommendations to boost the net zero agenda

14.4.1 Organisational

- Local authorities could reduce emissions through public sector operations and supply chains by working with suppliers. This can include setting emissions reduction targets for suppliers and working with them to develop strategies to meet those targets. Local authorities can also promote the use of renewable energy sources in their supply chains, such as using renewable electricity for their operations.
- Local authorities can encourage the use of sustainable procurement practices, such as buying goods and services from suppliers that have a proven track record of reducing emissions. This can help to drive emissions reductions throughout the supply chain, and support the transition to a low-carbon economy.
- Local authorities should de-invest in any fossil fuel or high carbon emitting companies.
- Utilise a social value framework for ethical and sustainable procurement (Social Value Portal TOMS)
- Carbon literacy training to all staff working on contract management, procurement and commissioning, in order to embed net zero priorities as well as identify and exploit carbon reduction opportunities.
- Local Authorities could gain a Carbon Certification (for example Carbon Trust Standard ore Planet Mark).
- Local Authorities need to provide reliable regional green jobs data, breakdowns of green occupations taking into account protected characteristics, and publish information regarding income levels in order to track progress toward a fair Net Zero transition.
- Use bulk procurement as a way to consolidate demand and signal to suppliers that there is demand.

15 Further Funding Opportunities

UK Infrastructure Bank

The UK Infrastructure Bank was announced in 2020, and is owned by the UK government, current capital equates to £22bn and is a combination of £12bn in equity and debt from the Treasury and £10bn of guarantees from the UK government – up to £2.5 billion of guarantees are available per year with a limit of £10 billion. The focus of investment is to support projects that will help the UK reach the net-zero carbon by 2050 target. The aim is to stimulate sectors across renewable energy, carbon capture and storage with low-rate loans and financial advisory services, ultimately to reduce funding constraints that limit net-zero transitions.

The UK Infrastructure Bank provides financial support to private sector projects and local authorities looking to develop economic and environmental infrastructure. Financial support can be acquired through loans, credit enhancements and equity investments.

Since the creation of the UKIB, the Bank has completed five deals, which includes financing the UK's largest solar farm in Wales, and £150 in combined projects to improve digital connectivity across rural homes and businesses across the UK and Northern Ireland. £107 million has also

been allocated to the investment in South Bank Quay at Teesside, which will directly support over 800 jobs.

UKIB Objectives

The core objectives for the Bank are to invest in the development and expansion of the UK's economic and environmental infrastructure relating to the net-zero carbon target of 2050. The Bank has outlined six key priorities in order to reach the main objectives of tackling climate change and support economic growth. The priorities are stated as follows[48]:

1. *To achieve policy objective and generate a positive financial return over time, to tackle climate change, support economic growth, and reduce the burden on the taxpayer.*
2. *To operate in partnership with private and public sector entities together.*
3. *To prioritise investments which lack a significant amount of private sector financing.*
4. *To operate independently of the shareholder while meeting conditions imposed thereby.*
5. *To exist as a long-lasting institution and provide long-term capital through its investments.*
6. *To have the flexibility to respond to differing market conditions to deliver on its mandate.*

Investment Criteria

To be eligible for investment from the Infrastructure Bank, private sector projects must meet the four criteria.

Investment Principle 1: The investment into the project will support the overarching objectives to drive regional and local economic growth or tackling climate change.

Investment Principle 2: The investment goes towards networks or infrastructure assets, or the development of new infrastructure technologies. The Bank will prioritise investment within clean energy, transport, water, and waste, though it will operate across a range of sectors.

Investment Principle 3: The project will deliver financial returns in line with the Bank's financial framework.

Investment Principle 4: The initial investment is expected to stimulate significant private capital investment over time.

The Bank outlines private projects that are not eligible for consideration, which includes any stage of capture or storage of crude oil, natural gas, or thermal coal with 'very limited exemptions. Exemptions are considered if the project aims to improve environmental standards without significant increases to the lifetime of assets and will significantly reduce the emissions of assets in the long term.

Local Authority Lending

The Investment Bank also offers local authorities' opportunities for lending where there are high-value, complex projects that adheres to the four investment criteria and aims to improve the economic and environmental infrastructure within an area. Of the initial £12 billion in funding, the UKIB has allocated £4 billion to support Local Authorities in their transitions to net zero.

[48] "UK Infrastructure Bank Framework Document"

The Bank have also developed an expert advisory panel to support the projects delivered through the local authorities, which was established in connection with and is supported by E3G, Catapult Energy Systems and UK cities Climate Investment Commission.

16 Appendix A: Mission Zero Review – Recommendations

The table below highlights whether each of the 129 recommendations laid out within the Mission Zero Review have been covered within this framework. Some of the 'included in framework' boxes have been left blank, as they are irrelevant or unachievable to local government. If they have been covered, the extent to which they have been covered and under which theme(s) has been noted.

	Area	Recommendation	Included in framework
1	Stable environment for business to plan and invest	Government should publish an overarching financing strategy covering how existing and future government spending, policies, and regulation will scale up private finance to deliver the UK's net zero enabled growth and energy security ambitions. This should include setting out the role of UKIB, BBB, BII, and IPA and UKEF in the transition.	-
2	Long-term funding certainty	At the next Spending Review, government should review options for providing longer-term certainty to a small number of major priorities for net zero – where we know that long-term policy commitment will be essential for success and provide long-term opportunities to save money.	-
3	Well-designed funding schemes	Government to lead a bespoke consultation on funding scheme design – with a ministerial champion – to report on the issues and recommend reforms to government	-
4	Well-designed smart regulation	Government to establish a new forum to coordinate across all regulators on the signals they are sending to businesses and investors across sectors about the net zero transition – including Ofwat, Ofgem, HSE, Environment Agency, Competition and Markets Authority, FCA, and the North Sea Transition Authority	-
5	Well-designed smart regulation	Government should conduct and publish, before Autumn 2023, a review of how we should change regulation for emerging net zero technologies to enable their rapid and safe introduction, to support the net zero transition and boost growth	-
6	Strengthen parliamentary scrutiny	New 'Net Zero select committees' should be created in both Houses of Parliament.	Yes, the need for net zero committees at a local level has been covered across multiple themes.

7	Strong delivery governance	Government to establish an 'Office for Net Zero Delivery' by Spring 2023, to ensure that the cross-departmental priorities for net zero are properly managed.	No
8	Strong delivery governance	Government to consider the case for creating new separate delivery agencies to deliver long-term decarbonisation programmes.	No
9	Data	Government to significantly expand its public reporting on net zero - potentially either through the ONS's climate portal or developed in partnership with the CCC. This will act as a tool both for public communication and greater scrutiny of government's progress towards net zero. It should set out regular and publicly accessible data on key progress indicators.	Yes
10	Data	Government to review how often it publishes data on UK emissions – and represent this alongside GDP	-
11	Data	Government should work with OBR and CCC to set out a process for how it will ensure the climate impacts of fiscal decision making are considered. It should commit to publishing the climate impacts of future spending reviews	-
12	Data	Government to commission the ONS and/or UKRI to lead an engagement exercise with business to define their data needs and develop bespoke recommendations to address these.	-
13	Clarify UK's competitive advantage and green industrial policy	Carry out competitiveness analysis for clean technologies setting out the UK's export and import strategies and where it intends to develop leadership - and utilise this to clarify for investors and industry the UK's current green industrial policy	-
14	Incentivise financial disclosures and standards	Government to endorse and implement the International Sustainability Standards Board (ISSB) standards as soon as possible. The UK should lead by example, launching a formal adoption mechanism as soon as the ISSB standards are published and moving swiftly to assess and endorse the standards for use in the UK. The UK should aim for 2024/25 as the first sustainability reporting cycle for companies in scope, encouraging companies to apply the ISSB's standards voluntarily in 2023/24.	-
15	Standard setting - transition plans, taxonomy, greenwashing, and stewardship	UK to continue its pioneering work in transition plan disclosures led by the UK Transition Plan Taskforce, share them internationally, and once more developed, Transition Plan Taskforce standards to be made mandatory for both listed and private firms to ensure comparable disclosure standards across the economy, in line with previous government commitment.	-

16	Standard setting - transition plans, taxonomy, greenwashing, and stewardship	To ensure government facilitates sufficient investment in transition economic activity, investors need information on transition pathways to put transition plans into context, as well as common categories and definitions on what economic activities are aligned with the transition to net zero. Government to consider the appropriateness of a transition taxonomy (alongside a green taxonomy) that is simple and proportionate; and work with international partners to ensure the UK approach is interoperable and harmonised with others' approaches.	-
17	NZ Charter Mark	Government to consider the adoption of a Net Zero Charter Mark – a mark to acknowledge "best in class" among firms in terms of their role in the transition to net zero.	No
18	Robust supply chains	The Government should, by autumn 2023, undertake net zero infrastructure and technology critical supply chain analyses to inform decisions at the next Spending Review on where support akin to the Automotive Transformation Fund could add value.	-
19	Transmission and distribution	Government and Ofgem should work with network companies to facilitate anticipatory investments in grid infrastructure	Briefly covered as a recommendation in Energy and Utilities
20	Regulation and planning	Government should update Ofgem's remit to incorporate the Government's net zero target as set out in the 2008 Climate Change Act.	-
21	Gas networks and fuel distribution	Government should develop a long-term cross-sectoral infrastructure strategy by 2025, to adapt and build respectively the distribution of liquid and gaseous fuels, electricity, and CO2 networks over the next decade	No
22	Electricity markets	Government should commit to outlining a clear approach to gas vs. electricity 'rebalancing' by the end of 2023/4 (depending on the fossil fuel prices) and should make significant progress affecting relative prices by the end of 2024. In outlining this approach, ensure that the distribution of the costs which make up energy bills are passed through to consumers, through their suppliers, in a way which is fair, affordable, and supports competition, decarbonisation and economic growth	Yes, covered in the energy and utilities theme.
23	Electricity markets	Government should deliver REMA as a priority, to scale up electricity sector investment, unlock the benefits of renewables, reward flexibility and maintain security of supply.	-

24	Renewable energy	Government, regulators, and industry should set up taskforces and develop deployment roadmaps for onshore wind and solar respectively in 2023 to reach required deployment levels for 2035 net zero grid, following the example of the offshore wind sector	-
25	Electricity generation and transmission/ distribution	Government should work with regulators, devolved administrations, local authorities, industry, and key stakeholders to streamline the planning and environmental permitting processes to ensure new power generation can come online as soon as possible.	Yes, fully covered under recommendation to boost net zero agenda for Energy and Utilities
26	Solar	Government, regulators, and industry should set up a taskforce and deployment roadmaps with clear milestones to reach up to 70GW by 2035.	-
27	Solar	Government to assess how low-cost finance options can be provided to households and small businesses	Partially covered across recommendation for Energy and Utilities
28	Electricity generation and transmission/ distribution	Government to ensure there is clear guidance to support case-by-case decisions, for example on sensitive issues such as siting and to allow new, innovative solutions, instead of technology-specific restrictions	No
29	Solar	Build up UK capability and provide the necessary training and certification.	Yes, covered across the energy and utilities and retrofitting themes
30	Onshore wind	Government, regulators, and industry to set up a taskforce and develop roadmap with clear milestones for onshore wind to reach required deployment level for 2035 net zero grid.	-
31	Onshore wind	Build up UK capability and provide the necessary training and certification.	Yes, covered in the energy and utilities themes.
32	Nuclear	Government should implement reforms set out in the British Energy Security Strategy to double down on achieving the UK's nuclear baseload requirement. • Expedite the set-up of Great British Nuclear (GBN) in early 2023, ensuring required funding and skills are in place. • Government and GBN to set out clear roadmap in 2023, including interim targets to reach 2050 ambition. Government to ensure funding is in place. As part of the roadmap, government should assess the possibility to increase the current ambitions supporting the development of supply chain to service a fleet of projects.	-

		• Roadmap to set out clear pathways for different nuclear technologies (including small modular reactors) and the selection process. This should consider how to use programmatic approach to deliver further cost reductions in a competitive environment. Government to deliver on siting strategy by 2024.	
33	Nuclear	Government should ensure Office for Nuclear Regulation (ONR) has necessary capacity to progress applications. Government to explore potential to reduce timelines through international cooperation that would allow recognition of approvals by partner countries.	-
34	Nuclear	Government should work with GBN and industry on UK supply chain & skills. This includes: • On basis of the roadmap, identify key issues and potential dependencies to address. • Agree commitment to boost resilience of UK supply chain and monitor supply chain. • Build UK capacity and skills, provide the necessary training and certification and explore synergies with other sectors.	-
35	Nuclear	Government should ensure continued funding and support for new technologies such as advanced modular reactors (AMRs) and fusion that could play an important role in the future. Government should consider how a programme-approach could be used to drive down costs for AMRs in a competitive setting. Government should also look at the opportunities the nuclear industry provides outside the power sector, for example heat or hydrogen.	-
36	Flexibility	By 2024, government should set a strategy for its market for flexible capacity, including pathways for different technologies to 2035.	-
37	Flexibility	Government should continue to set ambitious targets for the remaining years of the four-year smart meter framework	-
38	Flexibility	Ofgem should maintain focus on a timely implementation of its market-wide half-hourly settlement.	-
39	Hydrogen	By the end of 2023, the government should develop and implement an ambitious and pragmatic '10 year' delivery roadmap for the	-

		scaling up of hydrogen production. This roadmap should include detail on the plan for Track-2 decisions and should also include clear indication of how much capacity government hopes to procure through each future allocation round, including for electrolytic hydrogen, and how the UK will support growth of the electrolyser supply chain.	
40	Hydrogen	Government should deliver transport and storage business models as soon as feasibly possible and take a pragmatic approach to support key 'no regrets' transport and storage projects.	Partially covered within the transport and logistics theme.
41	Hydrogen	Future System Operator (FSO) should take forward a role in setting out a system plan for hydrogen, considering the interactions between hydrogen storage and balancing renewables for the decarbonised grid. Government, with advice from the FSO, takes decisive leadership on naming priority areas for minimum viable pipeline and storage infrastructure, providing strategic direction that shows how we will link up demand and supply. We need early identification of strategic assets that are critical enablers of other infrastructure and therefore require at risk investment.	-
42	Hydrogen	Government should continue the hydrogen heating community trials, to inform decisions on the role hydrogen can play in heating. Additionally, by the end of 2023, government should update its analysis of the whole system costs of the mass roll out of hydrogen for heating, in order to ensure that the case for economic optimality and feasibility still holds.	-
43	Biomass and other low carbon fuels	Government should publish its Biomass Strategy as soon as possible	-
44	Oil and gas	Accelerate the end to routine flaring from 2030 to 2025.	-
45	Oil and gas	Government should ensure all new oil or gas fields have abatement built in now to avoid backwards engineering when they are electrified	-
46	Oil and gas	Government should ensure the Climate Compatibility Checkpoint is an effective tool to shape policymaking	-
47	Oil and gas	Government should consider setting fossil fuel producers operating domestically a 10% storage obligation target to restore carbon dioxide to the geosphere by at least 2035, separate to any investment on nature-based solutions.	-

48	Oil and gas	Government should recognise the importance of geological net zero and work to align international ambitions toward net zero by 2050, in line with net zero.	-
49	Oil and gas	The 2023 consultation on the long-term tax treatment of the North Sea must include an option to create a hypothecated net zero fund	-
50	Oil and gas	Dependent on the response to the consultation, by the end of 2026, HMT should set out a long-term plan for replacing the Energy Profits Levy with a 'Net Zero Fund' that clearly ringfences revenue for investment into clean offshore technologies and/or energy efficiency improvements.	-
51	Oil and gas	Greater transparency and data from industry on the carbon intensity of oil and gas (O&G) imports, and also from the North Sea Transition Authority (NSTA) and industry on O&G that is produced.	-
52	Oil and gas	Government should publish an offshore industry integrated strategy by the end of 2024 which should include roles and responsibilities for electrification of oil and gas infrastructure, how the planning and consenting regime will operate, a plan for how the system will be regulated, timetables and sequencing for the growth and construction of infrastructure, and a skills and supply chain plan for growth of the integrated industries.	-
53	CCUS	As soon as legislation allows, government must finalise the business models and regulatory frameworks across the value chain, including for industrial CCS, Energy from waste with CCS and CO2 transport and storage.	-
54	CCUS	In 2023, HMT should set out the funding envelope available to support Track-1 clusters	-
55	CCUS	In 2023, government must act quickly to re-envisage and implement a clear CCUS roadmap, showing the plan beyond 2030. As part of the roadmap, government should take a pragmatic approach to cluster selection. This means allowing the most advanced clusters to progress more quickly. The roadmap should include:	-
51	Oil and gas	Greater transparency and data from industry on the carbon intensity of oil and gas (O&G) imports, and also from the North Sea Transition Authority (NSTA) and industry on O&G that is produced.	-
52	Oil and gas	Government should publish an offshore industries integrated strategy by the end of 2024 which should include roles and responsibilities for electrification of oil and gas infrastructure, how the planning and consenting regime will	-

		operate, a plan for how the system will be regulated, timetables and sequencing for the growth and construction of infrastructure, and a skills and supply chain plan for growth of the integrated industries.	
53	CCUS	As soon as legislation allows, government must finalise the business models and regulatory frameworks across the value chain, including for industrial CCS, Energy from Waste with CCS and CO2 transport and storage.	-
54	CCUS	In 2023, HMT should set out the funding envelope available to support Track-1 clusters	-
55	CCUS	In 2023, government must act quickly to re-envisage and implement a clear CCUS roadmap, showing the plan beyond 2030. As part of the roadmap, government should take a pragmatic approach to cluster selection. This means allowing the most advanced clusters to progress more quickly. The roadmap should include: • Approach to confirming the pipeline of capture projects, at least up to 2030, that will receive future funding, not limited to Track 1 cluster locations. In doing so, it should set out the process and timeline for Track 2 cluster selection. • Greater clarity on planned investment for CO2 transport and storage, including a streamlined route to market for future CO2 storage sites and a plan for making economic licenses more readily available to those that have safety licenses for CCUS acreage already.	-
57	GGRs	Government should announce, as soon as is possible, its intentions for engineered GGR business models including timings and eligibility. This announcement must clearly outline what standards these business models are expected to require.	-
58	Tax	By Autumn 2023 HMT should review how policy incentivises investment in decarbonisation, including via the tax system and capital allowances.	-
59	Skills	Government should drive forward delivery of the recommendations of the Green Jobs Taskforce and the commitments from the Net Zero Strategy. Government to publish an action plan for Net Zero skills that includes a comprehensive roadmap of when, where, and in which sectors there will be skills needs specific to net zero.	Yes, this has been fully covered. The need to boost UK workforce capability and increase green skills was heavily emphasised during

		Government should look to report on progress made to delivering the recommendations on a regular basis, starting by mid-2023	engagement, and as such is apparent in most themes within the framework
60	Skills	To monitor progress against the just transition, Government should swiftly develop robust regional green jobs statistics (ideally at local authority level, at least for England), breakdowns of green jobs considering protected characteristics, and publish information about salary levels	Yes, this has been covered. Not only the need to increase skills but also that robust, granular data on job statistics is vital.
61	Skills	Government and the Green Jobs Delivery Group should explore a variety of targeted options, including: • Increasing the flexibility of the Apprenticeship Levy, and assessing whether the Levy aligns with Government net zero and growth priorities, whether shorter, more intensive courses should be available alongside exploring the role of IT levels • Options for retaining talent within businesses and access to international labour	-
62	Energy Efficiency	Legislate by 2025 the minimum energy efficiency rating to EPC B for all non-domestic buildings, both rented and owned, by 2030. Legislate for EPC B rating for all new non-domestic buildings from 2025.	Partially covered within the retrofitting and new build themes.
63	Energy efficiency	Government to drive the creation of sustainable material supply chains and influence market development through its public procurement standards by 2027	Partially covered within the retrofitting and public sector operations themes.
64	Energy efficiency	UK to continue to show leadership through ambitious public sector decarbonisation by conducting its own trials to ensure alignment with the targets in the Heat and Buildings and Net Zero Strategies	-
65	SME support	Building on the UK Business Climate Hub, Government should launch a 'Help to Grow Green' campaign, offering information, resources and vouchers for SMEs to plan and invest in the transition by 2024.	-
66	SME support	Government should develop an SME role models programme, which provides mentoring for micro businesses and the self-employed by 2023.	-
67	SME support	Government should establish a taskforce of suppliers, small business landlords and business	-

		groups to agree on how to cut energy use in rented premises by 2023.	
68	Financial services	Review how the UK can become the most competitive financial centre for green and transition listings, capital raising and project financing; to include reviewing prospectus and listing regimes to encourage integrity and growth in the market for green finance instruments, exploring new opportunities arising for professional services, climate and nature data and analytics and innovative product development.	-
69	Financial services	Through its update to the Green Finance Strategy, Government should set out a clear, robust and ambitious approach to disclosure, standard setting, and scaling up green finance – including how it will meet existing commitments to implement Sustainable Disclosure Requirements across the economy; how it will provide a clear, long-term plan for attracting capital to meet net zero ambitions, and how to maintain the UK's position as the leading green finance hub internationally and metrics for success.	-
70	Manufacturing	Government should develop a policy proposal to incentivise on-site generation in Manufacturing by Q2 2024, with options to consult on the funding formula required by the public and private sector to reach the tipping point of adoption.	-
71	Manufacturing	Government should progress its consultation on carbon leakage measures, including a carbon border adjustment mechanism (CBAM) and mandatory product standards by 2023. This will enable Government to implement effective carbon leakage mitigations from 2026.	-
72	Construction	Government to develop a public procurement plan for low-carbon construction and the use of low-carbon materials, by the end of 2023.	Yes, included as recommendations to the New Building and Planning theme
73	Construction	BEIS, DfT and Defra to develop a strategy on the decarbonisation of non-road mobile machinery by the end of 2023.	-
74	Waste, resources and circular economy	Deliver urgently on commitments that the UK has already made on collection and packaging reforms, including extended producer responsibility, standardised collection, and deposit return schemes. Industry engagement must be central to design and rollout of schemes.	No

75	Waste, resources and circular	Launch a task force to work jointly with industry to identify barriers and enablers and develop sector-specific circular economy business models for priority sectors. This should have representation from BEIS, Defra, DLUHC, HMT and DIT, and include the role of extended producer responsibility in promoting reuse, repair, remanufacturing, and rental alongside recycling, in line with the powers under the Environment Act 2021.	No
76	Waste, resources and circular economy	End export of UK plastic waste by 2027, and in parallel set an end date for the import of recycled plastic chips, subject to the UK's international legal responsibilities. To drive domestic demand for high-quality recycled materials, ratchet up minimum percentage recycled content targets for a range of products in consultation with industry.	Yes, briefly covered in the Waste and Circular Economy for recommendation for plastic policies
77	Waste, resources and	Delivering UK recycling infrastructure capacity in key areas. Areas to consider include: • plastic processing capacity (an additional one million tonnes) • domestic capabilities in the circular economy of critical minerals • the necessary infrastructure to support textile collection and fibre recycling. In doing this, the Government should consider the expected profile of private sector investment in building UK recycling infrastructure - and explore opportunities to further enable such investment if current expectations fall short of domestic need.	Partially covered under the theme of Waste and Circular Economy along with examples of Current Initiatives and recommendations
78	Waste, resources and circular economy	Task WRAP with developing a report jointly for the BEIS and Defra Secretaries of State to understand the right role for Government in supporting resource matching across the private sector, learning from e.g. Invest NI and the National Industrial Symbiosis Partnership. This must ensure resource planning to achieve symbiosis rather than just waste exchange.	No
79	Transport	Government to swiftly deliver the ZEV mandate, to apply from 2024, while maintaining regulations and funding to support the uptake of electric and other zero emission vehicles, and continuing to drive emission reductions from internal combustion engines	-
80	Transport	Government to publish the Low Carbon Fuels Strategy in 2023 and the necessary legislation for the sustainable aviation fuels (SAF) mandate to apply from 2025. Recognising that an	-

		adequate price stability mechanism is vital for investments in SAF, government to set out evidence for barriers to SAF investments and options to address this.	
81	Transport	Government to set out options for further legislative steps by 2024 and take a leading role in International Maritime Organization (IMO) negotiations to decarbonise the maritime sector.	-
82	Transport	Government should continue to work with industry to set out a clear programme by 2024 to accelerate decarbonisation of the wider freight sector through modal shift and deployment of new technologies, building on the Future of Freight Plan	-
83	Transport	Government to reduce delays to anticipated reforms by bringing forward the delayed Future of Transport Bill this Parliament.	-
84	Food, agriculture, nature and land	Government to publish a Land Use framework as soon as possible, and by mid-2023.	-
85	Food, agriculture, nature and land	Government to publish full details of all Environmental Land Management Schemes and future plans by the end of 2023 - with a particular focus on how participants can take advantage of both public and private finance	No
86	Food, agriculture, nature and land	By 2025, Government to ensure that 50% of UK-based food and drink businesses measure and report their scope 3 emissions against a government- and industry-agreed standard. Defra and UKRI research should prioritise innovations that support on-farm measurement and processes to accurately collect the remainder by 2030.	-
87	Food, agriculture, nature and land England	Deliver accurate monitoring of carbon across broader range of ecosystems, with a view to bringing more habitats into the inventory to drive habitat creation and restoration efforts	Yes, discussed in the Land Use and Natural Capital theme
88	Food, agriculture, nature and land bodies)	In line with wider thinking on voluntary carbon and ecosystem markets, ensure a pipeline of investable nature-based solutions projects is available.	Covered to an extent under the Land Use and Natural Capital theme
89	Tech and digitisation	BEIS to work with DCMS and DIT to develop a campaign by Q2 2023 to promote digital technologies, including AI, robotics, digital twins, and autonomous systems, as a solution to industry's energy efficiency needs in the short term and their role in wider decarbonisation for the long term.	-

90	Tech and digitisation	BEIS to include digitisation and the related energy demand change forecasts in Energy and Emission Projections by 2023.	-
91	Local and regional	Central government should introduce a statutory duty for local authorities to take account of the UK's net zero targets, based on a clear framework of local roles and responsibilities.	Yes, briefly covered in the Roles and Responsibilities section
92	Local and regional	Next SR Central government should simplify the net zero funding landscape for all local authorities by the next Spending Review. This should include consolidating different funding pots, reducing competitive bidding processes, giving longer lead-in times where bidding remains and providing funding over the medium- rather than the short-term.	Yes, discussed as a Key City member suggestion under Financing and Funding
93	Local and regional	Central government should establish local net zero missions in 2023 for a number of key policy areas to encourage places to go further and faster.	Yes, this has been covered for local government throughout the document.
94	Local and regional	Central government should establish core principles for future net zero devolution and ensure that all devolution deals agreed between now and 2030 have a strong net zero element.	-
95	Local and regional	Central government should fully back at least one Trailblazer Net Zero city, local authority and community, with the aim for these places to reach net zero by 2030.	Yes, covered as a recommendation under Roles and Responsibilities
96	Local and regional	Central government should provide guidance, reporting mechanisms and additional capacity and capability support to enable local authorities to better monitor and report their net zero progress.	Yes, covered in the Data Metrics and Reporting section to some extent
97	Local and regional	Central and local government should work together to convene an annual Local Climate Summit that helps to share best practice, attract green investment, and provides an opportunity for areas to update on their Locally Determined Contributions.	Partially covered in Financing and Funding
98	Local and regional	Central government should reform the local planning system and the NPPF now. Have a clearer vision on net zero with the intention to introduce a net zero test, give clarity on when local areas can exceed national standards, give guidance on LAEP, encourage greater use of spatial planning and the creation of Net Zero Neighbourhood plans, and set out a framework for community benefits.	This has been partially covered, with reference to exceeding national standards, LAEP and Net Zero Neighbourhoods.
99	Local and regional	Government should undertake a rapid review of the bottlenecks for net zero and energy efficiency projects in the planning system and	Fully covered in Roles and Responsibilities

		ensure that local planning authorities are properly resourced to deliver faster turnaround times.	and identified as a challenge for Key City members
100	Community	Government should commit to the Local Electricity Bill and publish a Community Energy Strategy that addresses regulatory, legislative, funding and capacity barriers in the sector. The Strategy should also consider what support should be given to innovative projects such as community purchasing and community energy sharing and storage.	No
101	Individuals (general)	Government to publish a public engagement plan for England by 2023, to ramp up public engagement on net zero.	No
102	Individuals (general)	Government to run a competition to create a Carbon Calculator to inform consumers of the carbon intensity of different choices, in 2023.	No
103	Individuals	Government to pursue ecolabelling to help consumers make more informed purchasing decisions, by 2025.	No
104	Affordability	Government should develop the distributional analysis of net zero policies started by the Review in 2023.	-
105	Individuals	Government should amend the regulatory framework to incentivise transport providers to increase demand and improve services, and that it works with them on this vision, by 2024.	Yes, partially covered in the Transport and Logistics theme
106	Transport	Government to equalise VAT on public and private electric vehicle charging in 2024.	-
107	Energy efficiency	Government should regulate through a suite of measures to create the conditions for sustained growth of new markets for low-carbon heat, so that at least 600,000 heat pumps are installed each year by 2028, and up to 1.9 million by 2033. The Government should implement the off-gas grid regulations that envisage the end of new and replacement fossil fuel heating systems in the mid-2020s.	Briefly covered in the introduction to the Industrial, Commercial and Residential Retrofitting theme.
108	Energy efficiency	Government should bring forward all consultations and work to mandate the Future Homes Standards by 2025 to prevent further delays by ensuring the standard applies to all developments. This should include a consultation on mandating new homes to be built with solar and deliver the Net Zero Homes Standard, ensuring that the planning system (discussed in Pillar 4) is flexible enough to enable this.	Yes, it has been covered as a recommendation the New Building and Planning section as well as a case study for Lincoln
109	Energy efficiency	Government should ensure the right policies are in place to achieve the UK's demand reduction	-

		targets, building on the 2022 Autumn Statement announcement, with interim targets and milestones to hit this goal. Noting the UK's 2050 net zero ambitions the government should publish clear analysis of which mix of policy measures gets the UK to the 15% target and assure future funding for those policies.	
110	Energy efficiency	Government should expand its energy efficiency advice service in 2023, ensuring that it helps consumers to access qualified traders and providers in local areas.	Yes, this has been covered for the local government level within the retrofitting theme.
111	Energy efficiency	Government should support establishing retrofit hubs by 2025 to bridge the gap between households and suppliers. These could enable installers to seek training and impartial advice and could connect households to suitable installers.	This has been covered within the retrofitting theme.
112	Energy efficiency	Government should mandate that EPCs are updated on a regular basis, using a new metric which better reflects current relative costs of heat pump and accounts for wider benefits from low-carbon heating systems. Under this new metric, EPC ratings could become a more holistic Net Zero Performance Certificate (NZPC), giving consumers more detailed information about the heating technology used in the property and its associated financial and social effects.	No
113	Energy efficiency	Government should provide certainty by 2024 on the new and replacement gas boiler phase out date to drive industry and investor confidence. The Review recommends bringing the proposed date of 2035 forward and legislating for 2033. Government should set a legislative target for gas free homes and appliances by 2033, to contribute to a gas free grid in future. Government should legislate for all homes sold by 2033 to also have an EPC rating of C or above in line with the aforementioned NZPC, with exclusions around certain properties (e.g. listed properties, on grounds of affordability). Government should also mandate landlords to include 'average bill cost' alongside the EPC (and possible future NZPC) rating, when letting a property out. This will help renters understand what costs to expect, while also helping to put a premium on energy efficient homes.	-
114	Energy efficiency	Government should consider options to support homes to include roof solar panels installation as	Yes, this has been covered to quite

		part of its retrofit provision to support homes reaching the Net Zero Homes Standard.	an extent within the recommendation under Energy and Utilities as well as Industrial, Commercial and Residential Retrofitting
115	Energy efficiency	Government should include an Energy Efficiency Taskforce workstream on green finance products to report by end of 2023. This should help to support those in low EPC rated properties to carry out green home upgrades and should identify opportunities to crowd-in private finance, alongside public funding.	Partially covered in Infrastructure
116	Energy efficiency	Government should deliver the Heat Pump Investment Accelerator to catalyse private investment for at least two major heat pump factories in the UK.	No
117	Energy efficiency	Government should choose from multiple options which could help increase heat pump efficiency: 1"Suppliers say this could be done via a mandate stating the minimum efficiency which needs to be achieved by all installations. Government should test whether this could be done by most major installers for most properties." 2"Set up a heat pump coefficient of performance competition, run for example by the Energy Efficiency taskforce. This will show the state-of-the-art technologies with higher efficiencies and allow others to replicate these." 3Quality of the installation matters; training and installation standards need to be accelerated to support this.	No
118	Energy efficiency	Government should extend the Boiler Upgrade Scheme to 2028 and consider whether grant levels should be increased in light of inflationary pressures, before being scaled down over time. This should happen alongside efforts to increase awareness of government support. Support for those unable to afford the upfront costs associated with improving energy efficiency and moving to low carbon heating systems should be continued and expanded, namely through the Home Upgrade Grant (HUG), Social Housing Decarbonisation Fund (SHDF) and other existing schemes for low-income households.	Partially covered in the framework- highlighted in funding opportunities for Industrial, Commercial and Residential Retrofitting as well as a recommendation

119	Energy efficiency	Government should set the policy framework and supportive investment environment to encourage reskilling and greater training opportunities in the heat pump sector and work to encourage adoption of standards to increase firms able to take up existing schemes.	No
120	R&D landscape BEIS	Government should create a roadmap, by Autumn 2023, which details decision points for developing and deploying R&D and technologies that are critical for enabling the net zero pathway to 2050.	Partially covered as Key Cities members suggestions in Data Metrics & Reporting
121	R&D landscape BEIS, HMT, OSTS	By Autumn 2023, Government should review how to incentivise greater R&D for net zero, including considering the role of clarity on research priorities and government support, tax credits, greater ring-fencing of R&D spend, and enabling regulations.	Partially covered as Key Cities members suggestions in Data Metrics & Reporting
122	R&D landscape BEIS, HMT, OSTS	Government should establish up to three new R&D demonstrator projects, out to 2035, aligning with the ten-year missions set out by this Review. These should be considered when creating the overarching R&D and technology roadmap.	-
123	R&D landscape BEIS, OSTS, GOS	Government should include in forthcoming work from OSTS how regulators can provide more opportunity for demonstrations for net zero technologies.	No
124	Carbon leakage BEIS/ HMT	Government should progress with the consultation on carbon leakage measures and speed up decision-making to enable Government to implement effective carbon leakage mitigations from 2026.	No
125	Carbon markets	By 2024, Government should work within the UK ETS Authority to develop a pathway for the UK ETS until 2040. This pathway should: a) Set out a vision on the future design and operation of the ETS b) Set out a timeline for expanding the coverage to the rest of the UK economy, as well as sectors consulted on including maritime and waste. c) Address inclusion of GGRs to incentivise early	-

		investment in new technologies and potentially naturebased solutions. d) Provide reassurance to businesses around how the Government will mitigate the risk of carbon leakage as a result of expanding the ETS.	
126	Carbon markets	Government should endorse international VCM standards as soon as possible and consult on formally adopting regulated standards for VCMs and setting up a regulator for carbon credits and offsets by 2024.	-
127	Carbon markets	Government should set up a programme for offsets and carbon credits, providing guidance to businesses looking to invest in carbon credits and offsets, for businesses looking to provide carbon credits and offsets, and explore the opportunities to create a market in the UK for offsets through energy efficiency measures.	-
128	International trade	Government should establish baseline environmental and climate protections in Free Trade Agreements (FTAs) and for removal of trade barriers to environmental goods and services	-
129	International leadership	Government should conduct a strategic review of the UK's international climate leadership and ensure the 2030 Strategic Framework on Climate and Nature provides practical direction for the UK's international climate and nature leadership.	-

17 Appendix B: Community Energy State of the Sector Reports

Community Energy England is a not-for-profit organisation founded in 2014 by community energy sector practitioners to help clear obstacles, create connections between practitioners and stakeholders and facilitate the work community energy organisations are doing. The organisation is collecting survey response from CE schemes and puts them in the context of broader policy landscape, economic outlook and energy system. Their key objectives are to lobby for supportive policy and regulations for community energy and provide opportunities and mechanisms for active community energy practitioners to connect and share knowledge.

Community Energy England's annual State of the Sector surveys and reports have provided insight into the UK community energy sector since 2017. The reports outline how and why the community energy sector is changing and provides evidence base to encourage a more supportive policy landscape.

State of the Sector 2017

According to Community Energy England's first survey and report published in 2017, in 2016 there were 222 community energy groups in the UK with 30,000 members and 1,700 volunteers. However, there were only 13 new organisations formed in total in 2016. The study identified '121 MW of electricity generating infrastructure installed by community groups since 1997, generating 265 GWh (equivalent to the energy demand of over 85,000 homes)'. In England, the report

identified 186 organisations engaged in community energy with 118 MW generation capacity. In the whole of UK, 37 new generation project were installed, however, the report points out that numerous projects installed in the year to September 2016 were pre-accredited or pre-registered to receive FITs.

State of the Sector 2018

In 2017 there were 228 organisations active across the England, Wales, and Northern Ireland. Only 1 new community organisation was identified as being found in 2017. The study identified 168 MW of community owned electricity generation capacity across England, Wales, and Northern Ireland. This is an increase of 47 MW on previous year's report and includes 33.5 MW of new generation capacity installed or acquired in 2017. This equates to a growth in community energy capacity of 25% in 2017. New generation capacity in 2017 has been dominated by the purchase of existing generation assets by communities, most often through partnerships or consortiums.

The 2018 State of the Sector Report has introduced a specific focus on the geographical spread of community energy across England. Community energy organisations were found to be most prevalent in the South of England (94), in particular the Southwest of the country, with a moderate number of organisations found in the Midlands (35) and North (33) of England. Interestingly, far fewer organisations were found in the East of the country, an affect which may be related to a several factors, including resource availability, local authority support and the pre-existing expertise of community networks or supporting organisations (e.g. umbrella organisations).

State of the Sector 2019

In total, 275 community energy organisations were identified throughout England, Wales, and Northern Ireland. Just 3 of these organisations were found to have formed in 2018. Organisations with new community energy projects in 2018 were found to centre on urban areas, particularly London, Brighton, Bournemouth, Bristol, and Cardiff.

In total, 7.9 MW of electricity generation was installed in 2018, with heat generation limited to four new projects. Energy efficiency was found to have become an increasing focus, with 92 community energy organisations actively working to raise low carbon awareness and improve energy efficiency in their local areas. 2018 also saw an increasing trend towards innovation, with 33 organisations involved in energy storage projects and 29 investigating low carbon transport. These projects were often related to local supply models, flexibility services, demand side response and non-traditional business models.

State of the Sector 2020

The report identified 300 community energy organisation across the UK in 2019. 15.4 MW of new electricity generation was reported in England, Wales and Northern Ireland, taking the total community owned capacity in the UK to 264.9 MW. Across the 230 community organisations involved in electricity generation, 37 groups installed, or brought into community ownership, 114 new electricity generation projects during 2019, totalling 15.4 MW of community-owned capacity. This included solar PV (14.0 MW), wind (1.2 MW) and hydroelectric (0.2 MW) projects, representing an 8% increase in community-owned electricity capacity. Of the projects installed in 2019, 97% were supported by the Feed-in Tariff scheme, which was likely a result of a push by community organisations to install projects prior to the Feed-in Tariff deadline in March 2020.

State of the Sector 2021

The survey identified 424 active community energy organisations across the UK. Of these, 14 were newly constituted in 2020, compared to three groups constituted in 2019. 232 organisations identified their primary focus as working on renewable electricity generation, however, 89 organisations are also working on energy efficiency and 76 on low carbon transport.

Community energy organisations installed 8.2 MW of new electricity capacity across the UK in 2020, compared to 15.4 MW in England and Wales in 2019, bringing the total installed capacity of survey respondents to 319 MW since data gathering for the report began. This halving of new capacity in 2020 could be due to the closure of the Feed-in Tariff scheme to new projects, resulting in a more challenging business model for renewables.

Solar continues to dominate new project development, as the planning conditions for wind, and licensing and economics for hydropower remain challenging. The new community renewable electricity capacity in 2020 was 88% solar PV (7.3 MW), a similar proportion to 2019. Most installations were smaller-scale rooftop solar PV, with the average capacity dropping to around 250 kW in 2020, down from 450 kW in 2019.

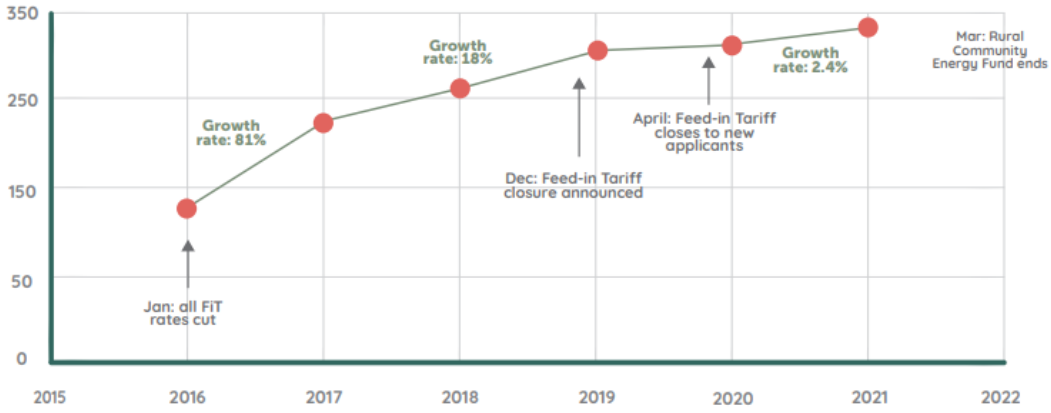
State of the Sector 2022

In 2021, 18 new organisations were registered, bringing the total number of organisations to 495. Despite financial and regulatory barriers, 23 new electricity generating projects were created. The new installations represent 7.6 MW of new community energy capacity, comprising 2.6 MW of solar PV, 2.7 MW of wind and 2.3 MW of hydro. This brings the total community owned electricity generation capacity across the UK to 331 MW.

The most recent report emphasises the difficult situation of the community energy sector, stating that 'in 2021 community energy faced its most challenging year so far due to the government's disappointing response to calls from the sector, and the Environmental Audit Committee, to support sector's growth to deliver vital local climate action and engagement'.

Data, gathered from surveys, shows that the sector experienced rapid growth when governmental support was available and stalled when this was removed (illustrated by the graph below). In areas where even small support is still available such as from the London Community Energy Fund, the sector is able to progress. It suggests that given support from government through reviving development funding, the sector could achieve exponential growth again and as a result become self-sustaining. This should be informed by previous premature ending of support schemes.

The figure below shows the growth of community-owned electricity capacity in UK (Community Energy State of the Sector, 2022).

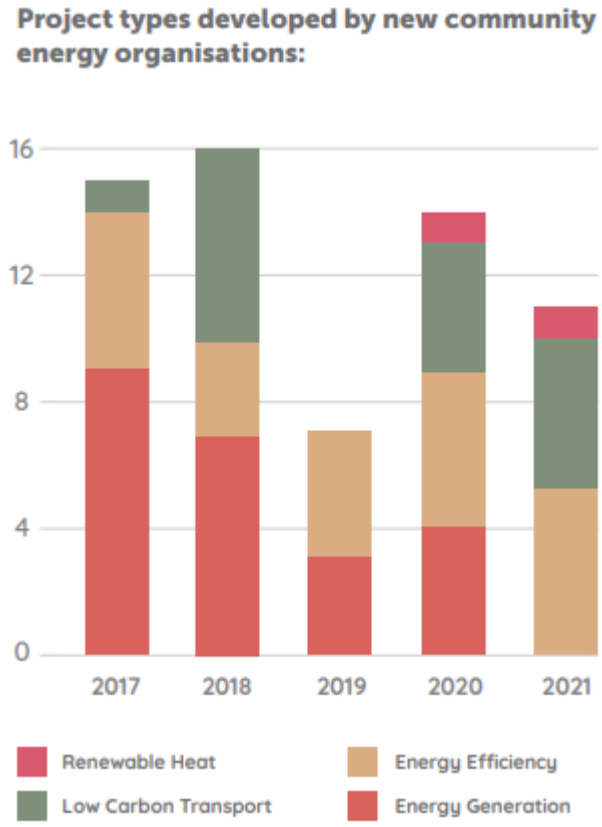


The State of the Sector Report scrutinises recent governmental strategies, pointing out shortcomings in regards to community energy. It details that even though CE was mentioned in the Energy White Paper and Net Zero Strategy, they failed to provide a plan or recognition of its vital role in the just transition, and overlooked including 'practical support measures' as recommended by the Environmental Audit Committee. The report goes on to express that despite the Energy Security Strategy promising to "prioritise putting local communities in control" it only involved "a limited number of supportive communities" being paid to "host new onshore wind infrastructure in return for benefits, including lower energy bills". The PM's Ten Point Plan, the National Infrastructure Strategy and the Spending Review are also criticised for mostly focusing on big cheque, technical, centralised, supply-side measures, ignoring the Climate Change Committee repeatedly stating that it is impossible to achieve net zero targets without engaging with people.

In England, the Rural Community Energy Fund, the last dedicated central government support for community energy, which provided project development funding, closed on 31 March 2021 without any form of replacement. In its place the government recommends community energy 'work closely with local authorities' to access UK-wide capital and revenue growth funds.

Despite this, the sector has delivered new community owned renewable electricity generation, new jobs, millions in community benefit and savings to bill-payers, and is leading on the emergency response to the energy bill crisis.

In 2021 the type of project being developed by new organisations has shifted away from electricity generation focusing instead on energy efficiency, low carbon transport and renewable heat initiatives (see graph below). For the first time in several years, there were no new organisations involved with active electricity generation project. Community Energy England is speculating that this could reflect the perceived difficulty of developing community-scale generation projects in a post-FiT environment.



Source: Community Energy State of the Sector Report (2022).

The survey shows that community energy organisations have consistently highlighted lack of capacity, technical expertise and early-stage funding as key barriers to project development in recent years. Partnership approaches are mentioned as assisting to address these issues, bringing mutual benefits such as the sharing of financial resources, expertise, and best practice, and enhancing available staff time and capacity.

Partnerships with businesses and DNOs were reported to be very important in terms of their technical and financial support, while most partner types were rated highly in terms of accessing sites for renewable energy generation development, particularly property developers, businesses, and housing associations.

In terms of access to sites, local authorities were rated highly for providing opportunities and assistance. Community-owned solar PV assets on schools and other publicly owned buildings have been an increasingly popular business model in recent years, which has led to long-term reductions in electricity bills for schools and income generation for communities.

Community Energy England's report stressed how policy landscape is still unfavourable of community energy sector. The organisation made proposals for change, partly inspired by Environmental Audit Committee's recommendations.

"Actions needed to meet the sector potential':

1. Create a Community Energy Strategy to invest in and re-mobilise community energy by establishing a fair playing field for community-owned generation and a National Community Energy Fund.

2. Prioritise demand reduction and behaviour change by enabling community energy leadership in retrofit, energy advice/fuel poverty alleviation for the energy crisis, demand management systems and driving behaviour change.
3. Take action to put community energy at the heart of the roll-out of Smart Local Energy Systems and Local Area Energy Planning."

18 Appendix C: Low Traffic Neighbourhoods

Low Traffic Neighbourhoods

Low Traffic Neighbourhoods (LTNs) aim to make streets easier to walk and cycle on by restricting access for cars, vans and other vehicles from using quiet roads as shortcuts ('through-traffic' or 'rat-running').

Most side streets are not designed to accommodate lots of fast-moving vehicles. There are fewer or no traffic lights to cross side roads safely and not enough space for vehicles to pass each other or cyclists. if traffic keeps increasing without changes in neighbourhoods, side streets will become more unsafe.

LTNs encourage people to walk or cycle rather than drive, which is better for both mental and physical health. Less cars on the road would also mean more space for vehicles doing essential like emergency services or deliveries.

The UK Government has invested £2 billion into developing LTNs since the start of the COVID pandemic.

What are the benefits of Low Traffic Neighbourhoods?

- Increased physical activity through walking and cycling.
- Benefits local businesses by increasing sales and higher spend in people who walk along high streets
- Improved air quality
- Lower car-use for shorter trips
- Increased social interactions between neighbours, strengthening communities.

Are residents with cars badly affected?

Private vehicles still have easy access to all homes and businesses without driving directly through the neighbourhood. The barriers, such as bollards or plant beds, are situated at one end, with normal access at the other, allowing normal residential use but no through routes. The aim is to reduce through traffic, not remove all traffic.

Do LTNs affect the emergency services?

No. For example, in London meetings are held monthly with emergency services to discuss road changes and issues they may cause, which can be adjusted if necessary.

Do LTNs push traffic elsewhere?

According to research by the University of Westminister, any increases in traffic are unlikely to be permanent. To help reduce traffic, better signage and traffic light timings can be implemented. Three years of data shows that better conditions for walking and cycling encourages people to switch away from cars.

A survey of 345 residents from Low Traffic Neighbourhoods in London found:

- 63% agreed they have improved their lives
- 14% disagree
- 22% neither agree or disagree

Where could LTNs be made or prioritised?

LTNs could be implemented or prioritised on streets that have:

- Poorest air quality
- Highest deprivation
- Poor access to green space
- Highest traffic volumes, particularly percentage of through traffic
- A high density of collisions, particularly for the most vulnerable users
- The greatest number of schools
- Low public transport accessibility
- Low car ownership
- Highest childhood obesity

What things make up a low traffic neighbourhood?

Modal filters – a bollard or planter that stops motor vehicles accessing a particular street

Pocket parks – these are two sets of filters, spaced slightly apart to create a new area that cannot be accessed by motor traffic – bicycles, wheelchairs and scooters can pass through these areas

Diagonal filters – bollards or planters placed diagonally through a cross-roads – These minimise the need for reversing and they make it easier for bin and recycling collection or other large vehicles to manoeuvre

Bus gate – a modal filter which buses and emergency vehicles can travel through – usually camera operated

Banned turns – this stops motorised vehicles turning certain ways in residential areas which slows the flow of traffic

One-way streets – streets that only allow traffic in one direction – these can be effective in combination with banned turns