

Energy across the authority 2023

Case study examples of how local authorities are engaging in the energy agenda





The Association for Public Service Excellence (APSE) is a not-for-profit membership based organisation dedicated to promoting excellence in the delivery of frontline services to local communities. We work with more than 300 local authorities across the UK.

APSE Energy is a division of APSE which involves a group of over 100 pioneering local authorities who are looking to work in collaboration to forward the following vision:

“To enable and facilitate the local municipalisation of energy services and increase the role of local authorities in the energy agenda within their communities. Local authorities working together in this way would have great influence and would be able to deliver economies of scale in green energy to promote economic growth and combat fuel poverty.”

The goal of this collaboration is to deliver the local municipalisation of energy services and in doing so:

- Address social objectives and deliver community benefits, such as a reduction in fuel poverty and increases in jobs and skills;
- Save money and make money for local authorities to safeguard local services.

Contents

1. Foreword	4
2. Executive summary	5
3. Why are local authorities engaged?	7
4. What is the local authority role?	8
5. Case studies	10
5.1 Lancaster City Council - Decarbonisation of Salt Ayre leisure centre	10
5.2 Swansea Council - Homes as Power Stations	13
5.3 East Lothian Council - On street residential bollard-style EV chargers	17
5.4 Oxfordshire County Council - Community Action Groups	19
5.5 Dundee City Council - Engaging the public in climate change	21
5.6 London Borough of Waltham Forest - School streets	23
5.7 Glasgow City Council - Dual fuel road maintenance fleet	25
5.8 Highland Council - Hydro Ness	27
6. APSE Energy services	31

1. Foreword

In recent years, over three quarters of local authorities in the UK have declared a climate emergency. Many have set ambitious net-zero goals and with deadlines quickly approaching, it is vital that councils act promptly to adopt policies and take forward projects to reduce carbon emissions and continue striving towards achieving their goals. Average global temperatures have risen by more than 1°C since the 1850s and if we are to limit global heating to 1.5 degrees by 2050, as stipulated by the Paris Agreement, local authorities will have to play a key role.

The record-breaking temperatures recorded in the UK this year are just one example of how climate change is already impacting the UK. With 7 of the 10 hottest days ever recorded in the UK occurring since the year 2000, the increased occurrence of extreme temperatures in the UK is something that we will have to get used to. The Intergovernmental Panel on Climate Change's most recent report was described as a "reality check", predicting increased extreme weather across the globe.

However, it is not too late to act against the impacts of climate change and if we act now, we will be able to avoid the worst impacts. The outlook is not all doom and gloom and there are many benefits that come with addressing climate change, for example, increased investment in renewable energy generation will enable local authorities to generate revenue and limit emissions; retrofitting homes can dramatically reduce energy bills and therefore reduce the impact of fuel poverty; transferring the fleet to low emissions vehicles will improve local air quality. Through investment in combatting climate change, hundreds of thousands of new green jobs could be created and local authorities have the potential to be at the forefront of this.

The case studies included in this document demonstrate a variety of different ways that local authorities are engaging with the energy agenda. It is important to remember that no two councils are the same, meaning that everyone is at a different point in their climate action journey, therefore in this document we have included a broad range of initiatives which vary in nature and scale. It is hoped that by doing this, we are able to inspire local authorities to find new and innovative ways to achieve their net-zero targets.

The case studies included in Energy Across the Authority outline cases of good practice, whilst the main learning points show how councils have overcome challenges, enabling future projects to potentially avoid some of the issues that have arisen in the past.

This is the fourth iteration of 'Energy across the authority' and the case studies from previous versions remain informative as examples for others to follow just as the examples in this version are.

Alderman Tommy Nicholl MBE
APSE National Chair 2022-23

2. Executive summary

This is the 4th edition of APSE Energy's 'Energy across the authority'. The aim of this document is to give members an insight into some of the energy related projects that are being carried out by local authorities, showing a variety of ways that councils are engaging with the energy agenda.

The projects highlighted in this document are real life examples of how different councils are committing to the urgent need for drastic reductions in greenhouse gas emissions.

There are lessons to be learnt for all local authorities within this publication, from insight into relatively small-scale projects, to substantial and expensive carbon reduction programmes.

Lancaster City Council – Decarbonisation of Salt Ayre Leisure Centre:

Lancaster City Council is working towards creating a carbon zero district by 2030. The Council has recently used funding from the Public Sector Decarbonisation Scheme to decarbonise the Salt Ayre leisure centre which was one of the council's highest emitters of carbon. A solar PV farm has also been installed on an adjacent plot of land. The decarbonisation project won the 'Best Climate Action or Decarbonisation' project award at APSE's 2022 Service Awards.

Swansea Council – Homes as Power Stations:

Swansea Council has an organisational target of net-zero by 2030 and a city-wide net-zero target for 2050. For the Council an important way of achieving this has been to create 'Homes as Power Stations', homes that use renewable and low carbon technology to produce energy and reduce energy use.

East Lothian Council - On Street Residential Bollard-style EV Chargers:

East Lothian Council is addressing the climate emergency by ensuring that all residents have access to electric vehicle chargepoints, with the aim of supporting a 15% switch to electric vehicles by 2023. The Council is particularly focussing on areas where residents are less likely to have access to off-street parking. Described as 'bollard-style' chargers, the 7kW chargepoints can be installed on the side of the road in convenient locations.

Oxfordshire County Council – Community Action Groups:

Oxfordshire County Council's 'Community Action Groups' are a collection of over 80 local community-led groups that bring people together to address climate issues at small and larger scales, from running repair cafes to developing community-owned solar farms. In 2021, over 65,000 hours of voluntary work were dedicated to the groups.

Dundee City Council - Engaging the Public in Climate Change and Sustainability:

During COP 26, Dundee City Council launched a 6-week city wide programme aimed at reaching and educating as many people as possible about the impacts of the climate emergency and how to mitigate future impacts. The launch event attracted over 12,000 spectators in one day and over the course of the programme, the Council was able to reach large audiences with in person and online events.

London Borough of Waltham Forest – School Streets:

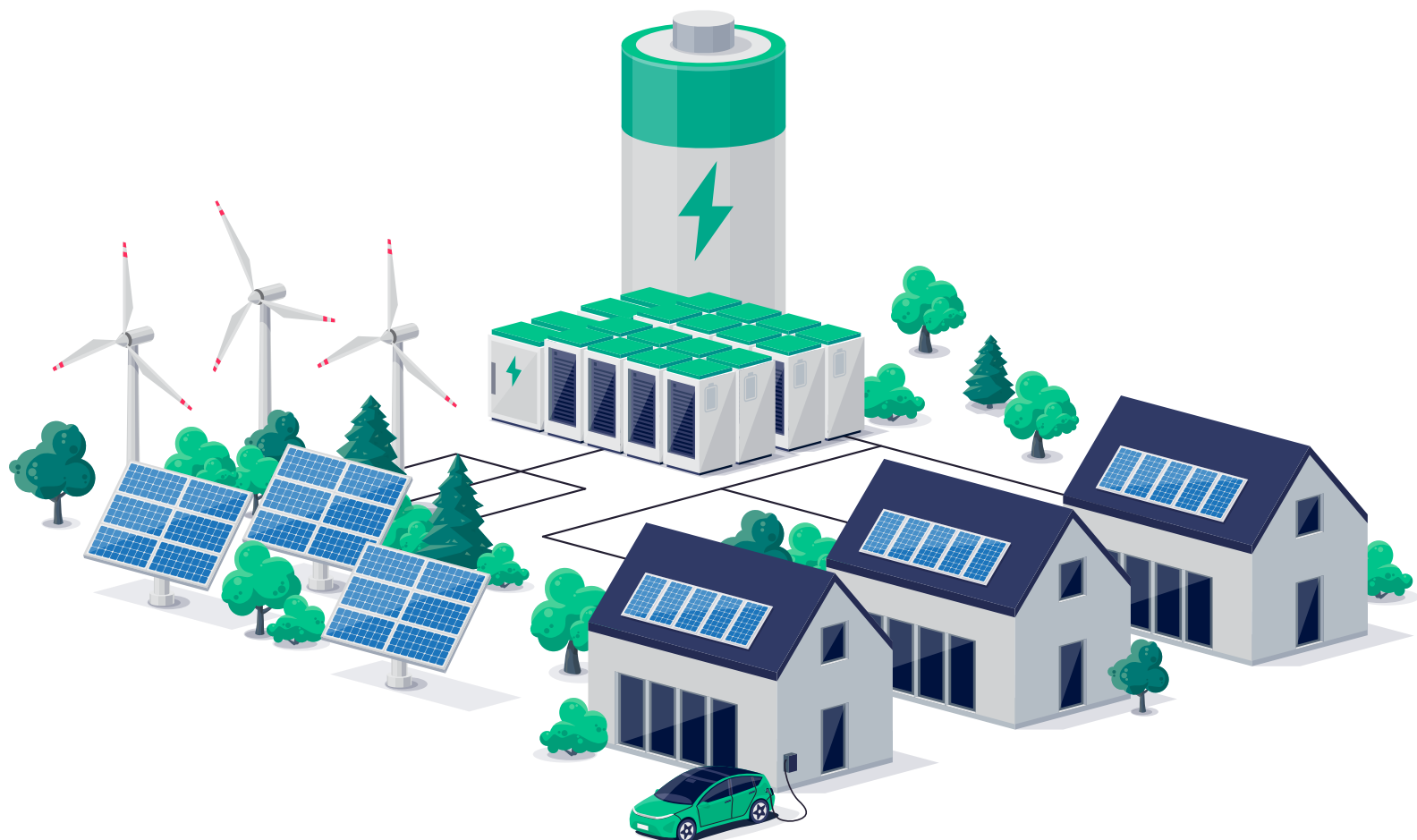
Since declaring a climate emergency in April 2019, London Borough of Waltham Forest Council has introduced a range of initiatives to reduce carbon emissions. One of the ways in which they are reducing emissions is through School Streets. School Streets is an initiative which involved closing streets around streets during pick up and drop off time to improve air quality, make it easier and safer for residents to travel actively to school, and create safer, more pleasant environments.

Glasgow City Council – Dual Fuel Road Maintenance Fleet:

Glasgow hosted COP 26 in 2021 and in the same year Glasgow City Council successfully implemented 11 new hydrogen dual fuel gritters into its fleet. These dual fuel gritters have interchangeable bodies meaning that they can be used for other purposes in the summer months when gritters aren't required.

Highland Council – Hydro Ness

Utilising historic infrastructure and situated on the banks of the River Ness, this Archimedes screw project will generate and supply over 500,000 kWh of green electricity annually to the nearby Inverness Leisure Centre, offsetting the organisations reliance on grid supplied electricity, therefore reducing the Council's spend and carbon footprint. The innovative structure and supporting interactive content, which will act as a STEM learning hub, will ensure the scheme is a welcome addition to a high footfall area of the city.



3. Why are local authorities engaged?

What does the APSE Energy vision of 'the municipalisation of energy' mean?

As leaders within their localities, local authorities have a duty to ensure they help to provide services that support their local communities and economies in their day to day lives and businesses. Energy is a fundamental element of life and local authorities have a role to play in the agenda. There are opportunities for local authorities to provide energy services, utilise their assets for renewable energy generation, reduce the corporate energy bill, generate income and address fuel poverty, air quality and climate change. The municipalisation of energy means councils making the most of engaging in the energy agenda in their area.

The ever increasing role that local authorities are taking to address climate change, makes their involvement in energy even more relevant. Energy is a fundamental element to consider in a climate emergency action plan.

The ongoing energy crisis and its impact upon fuel poverty means that, now more than ever, making the switch towards renewable energy will have both financial and environmental benefits. Reducing our dependence on fossil fuels has the potential to enhance energy security and dramatically reduce energy bills for both local authorities and domestic consumers.

Energising your locality:

Through the municipalisation of energy, local authorities can generate more opportunities across their localities. Energy is relevant to all areas of local authorities and the services they provide. Therefore, by engaging with the energy agenda councils can reduce the cost, increase the reliability and efficiency and minimise the environmental impact of their services.

Energy flows through all areas of a locality; it is an essential service and questions about how it is produced, supplied and its cost are highly relevant to local authorities. Investing in renewable energy developments provides councils with the opportunity to have greater autonomy over a utility that is vital for their locality to function effectively, as well as addressing climate change. Through innovative energy policies and renewable energy projects councils can not only generate income and improve vital services but also play a key role in managing climate change and poor air quality.

It is vital that local authorities do not think of energy in isolation to the rest of the services that they deliver. It shouldn't be seen as a side issue for departments such as transport, health and social care, housing, leisure and building maintenance, but rather considered as an intrinsic component of all council services and an important way to improve their delivery and cost.

Investing in energy projects is an important method for councils to generate income, which can then be used to fund other services within the authority. APSE Energy encourages and assists councils to embark on initiatives such as setting up their own solar farm. Investment in renewable energy projects can enable councils to provide affordable, clean energy, which is attractive to consumers, while generating income, addressing fuel poverty and playing a vital role in combating climate change. Selling renewable energy at an affordable rate to local businesses also boosts the local economy and helps towards creating a thriving locality.

Therefore, APSE Energy's aim is to encourage the successful municipalisation of energy, which delivers a variety of benefits and opportunities to localities. APSE Energy helps local authorities to engage with the energy agenda by providing knowledge, learning, consultancy and advocacy.

4. What is the local authority role?

Local authorities play a vital role in shaping their localities and do so by improving job opportunities, providing services such as social care, education and waste collection, as well as being custodians of green spaces and the environment. There is a clear role for local authorities to engage with the energy agenda to improve the quality and sustainability of their services.

The local authority's role starts with the council being a significant energy user itself. There is an opportunity to reduce their own costs and reduce the emissions they produce. Measures such as changing to a green tariff, fitting energy efficiency measures, investing in generation, comparing energy prices and specifying low carbon alternatives in contracts and procurement, are all examples of how the council can reduce its own energy costs and emissions.

All councils have assets that they can utilise to generate their own energy. Examples include, investing in solar panels on the town hall and installing voltage optimisation and combined heat and power in leisure centres. Leisure centres with swimming pools are heavy energy users, therefore generating energy for use at these sites can make significant savings.

Many town halls, civic centres and community facilities are older buildings, therefore energy efficiency measures are vital to reduce energy loss and save money.

Generation is a clear way that councils can intervene in the energy market. The government is promoting a decentralised grid where there will be lots of smaller generators using micro networks, distributed from the national grid and so taking stress off it. Those local authorities who have entered into private wire agreements or are directly using the energy generated on the town hall (or other) roof are helping to address the problem of an overloaded grid.

The fitting of solar panels to council house roofs, the purchase of low emission vehicles and the installation of heat pumps are further examples of how local authorities can get involved in the market.

The air quality issue is another driver for local authorities to engage with the agenda. The need to reduce carbon emissions and improve air quality have moved up the international political agenda, which is encouraging the industry to develop new technologies.

The introduction of the UK's Road to Zero Strategy and the target to phase out petrol and diesel cars, shows the UK government's commitment to the low carbon vehicle agenda.

As users and owners of large fleets of vehicles and custodians of the local environment, local authorities must take action. They must be seen to be leaders in the community by investing in low emission vehicles, enabling charging infrastructure, encouraging low emission buses and taxis, establishing low emission zones, producing educational material and monitoring and publicising air quality data, amongst other actions.

The condition of the locality's housing stock is a further topic of interest. The existence of policies referring to the highest building standards for new housing and other developments within the local development plan is a topic that local authorities can address.

Promoting energy efficiency within the private rented sector and amongst owner-occupiers is also a role that some local authorities have accepted.

The same is true of the decarbonisation of heat. This is a significant national issue and heat networks, heat pumps, hydrogen heating and other approaches are being promoted by BEIS. Funding is available

through schemes such as the Green Homes Grant Local Authority Delivery Scheme and the Home Upgrade Grant Scheme providing funding for upgrades to the energy efficiency of social housing and low-income households, whilst ECO4 has recently been released.

As the smart cities agenda becomes more prevalent and technology-driven transformations alter the infrastructure of our cities, local authorities need to ensure that they are keeping up to date with new asset classes, such as electric vehicle charging points. Energy is a central component to smart cities, which will be increasingly driven by data and digital infrastructure.

There are obvious links between energy, the issues noted above and the wider health, well-being, environmental and education objectives of local authorities. It is up to each local authority, with its own priorities and assets in mind, to identify their role in this agenda.

In order to assist councils with the variety of topics outlined above, APSE Energy has released a range of research documents and briefing papers. We have also undertaken various surveys of our member councils in order to explore topics in more detail. Further information about a selection of these research documents and surveys is outlined below.

EV Infrastructure Survey Report

Our latest document, 'EV Infrastructure Survey Report', helps to inform APSE Energy members about the scale of EV infrastructure and how it has changed within local authorities over the past two years.

All local authorities are investing in low emission vehicles and in the case of EVs the right infrastructure is fundamental to the effective operation of the vehicles and therefore council services. However, investing in infrastructure isn't an everyday occurrence for local authorities so benefitting from experience from elsewhere, understanding existing trends and avoiding problems is vital. This document also includes a range of points to consider when looking to install EV chargers which has been compiled with our partners Boyd Brothers as well as a case study from Falkirk Council.

The Relevance and Legitimacy of Carbon Offsetting in Local Government

This publication is written for local authority officers and councillors to help to inform you about carbon offsetting and its relevance and legitimacy in local authority climate change work. Offsetting has become a major area of interest for local authorities across the country. However, in some circles it is mired in controversy and there is widespread misunderstanding of its legitimacy and also the role that it could properly play in local authority decarbonisation plans. This report seeks to thoroughly examine offsetting and give guidance to local government about the role it should play in their efforts over the coming decades to reach a position of net zero.

Understanding Electricity: Reducing costs and increasing income for local authorities

This publication is written for local authority officers and councillors to help to inform you about the benefits of investing in electricity. Having an understanding of electricity is vital to being able to manage energy better and invest effectively to generate, distribute or supply it. This publication provides a clear and concise explanation of the topic of electricity, how it works and, most importantly, how the people and businesses that local authorities serve can benefit from it. Solar investments are becoming more common amongst local authorities, both on their own land and investing in assets owned by others. Solar is known as a safe asset class in which to invest. The publication provides a lot of information about solar and the main steps to a successful project.

Heat Networks as part of the solution for decarbonisation

This publication is written for local authority officers and councillors to help to inform you about the benefits of heat networks. The document provides some initial information to help you to investigate opportunities to develop a heat network. It is clear from the information and case studies presented that there is an opportunity for local authorities to develop heat networks as part of the solution for decarbonisation. A full list of APSE Energy publications can be found on our [webpage](#).

5. Case studies

5.1 Lancaster City Council - Decarbonisation of Salt Ayre Leisure Centre

Background:

On 30th January 2019, Lancaster City Council declared a climate emergency after councillors unanimously voted to work towards creating a zero-carbon district by 2030. This decision meant that the Council had to evolve its approach, therefore, the Council challenged officers to develop new ways of operating services to minimise their impact on the environment.

By 2020, the Council had set up a Climate Emergency Project Team to develop a comprehensive strategy and delivery plan in order to achieve their ambition of being zero-carbon by 2030. The focus of the Council's plan was to target large emitters of CO₂ and create proposals to dramatically reduce these emissions.

Project overview:

With the Council aiming to target large emitters of CO₂, it was immediately clear that the Salt Ayre leisure centre would require improvements to reduce emissions. As the Council facility with the single largest emissions of CO₂, the Council conducted a Heating and Thermal Efficiency Review of the Salt Ayre leisure centre in 2020, with the aim of reviewing decarbonised heating solutions and improving the energy efficiency of the facility. With 81% of the facility's energy consumption coming from gas heating, it was found that significant CO₂ reductions would be made if the leisure centre was to become carbon neutral.

The report from the Heating and Thermal Efficiency Review stated that significant improvements could be made by replacing aging gas boilers with a two-stage system using air source and water to water heat pumps, as well as installing retrofit glazing and LED lighting upgrades. Additionally, Lancaster City Council also worked alongside APSE Energy and other specialist consultants to develop plans to include a 1.3MWp solar farm on a council owned unused landfill site that would be connected to the leisure centre via direct wire.

The Council developed a proposal for the decarbonisation of the Salt Ayre leisure centre and in September 2020, submitted a bid for £6.8m of funding from the Public Sector Decarbonisation Scheme (PSDS) to fund the project. This bid was successful, making Lancaster City Council the third highest recipient of PSDS funding in the North West and the highest recipient of any district council.

Outcomes and benefits:

The decarbonisation of the Salt Ayre leisure centre was completed in March 2022 and is believed to have reduced the Council's total carbon emissions from natural gas by 35%. The leisure centre is one of the first in the country to become carbon neutral.

During the procurement, council officers considered social value and in line with the Council's local wealth building ambitions, a 10% weighting was allocated for all packages over £100k. Thought to be worth around £155,000, it is expected that this weighting will provide a huge benefit to local supply chains and employment.

Over the next 10 years, the Council expects that energy revenue savings from the Salt Ayre leisure centre will be significant and could be as high as £240,000 p/a for 22/23 due to the volatility of the wholesale energy market. Whilst the scheme will also see a significant reduction in the Council's natural gas emissions with a net CO₂ reduction of 35%, marking a large contribution towards the goal of becoming a zero-carbon district by 2030.

Overcoming challenges:

Due to the scale of the decarbonisation project, innovation and creativity was vital in overcoming the various challenges that arose throughout the project. The vast change to the heating system required in order to remove the need for natural gas meant that the Council had to work with energy management experts to develop a heating system that could heat the loads required for the project. It was decided that a two-stage heating system was required, which involved using air source heat pumps connected to water-to-water heat pumps.



The funding received from the PSDS meant that strict deadlines were in place for the completion of the project. This meant that a fast-track approach was adopted by officers to complete the work required. This involved the creation of a comprehensive project group where officers received expert advice to create concise and robust delivery plants to ensure that all necessary diligence was completed and that work was completed swiftly and effectively.

As there were time constraints on the project, it was inevitable that there would be some disruptions to the services provided by the leisure centre during the construction work. In order to minimise these disruptions, the Council adopted a phased approach to construction work. The phased approach meant that although there were some changes to the services available, the Council and contractors were able to work together to minimise the impact from construction work, with customers given plenty of advance notice of any disruptions. Most of this disruptive work was scheduled to take place overnight and into the early morning therefore minimising the impact for members and the visiting public.

The complexity of the scheme led to energy consultants referring to it as a 'Rubik's Cube' due to the amount of problem solving required to overcome certain challenges, however despite these challenges the project was completed to a high standard, demonstrating a big step forward towards the Council's ambition of being carbon neutral by 2030.

Main learning points:

- Appoint good specialists to bridge knowledge gaps
- Make sure modelling is robust and always err on the side of caution
- Engage early with the DNO. The grid can be somewhat of a dark art. The DNO can make or break a project.
- Building solar on landfill sites comes with its challenges. Early engagement with the EA is essential. Don't underestimate the work involved and prep needed.
- Internal governance: 12-month delivery windows are challenging. Proper internal governance is important but consider way to speed it up through delegated decision making.
- Stakeholder engagement is key. Buy-in needed by all parties, internal (in our case leisure centre team) and external. A robust project team is essential with clear responsibilities and a shared vision
- Don't give up. With all complex projects there will be hurdles and unexpected obstacles along the way.

You may need to reshape things. Creativity and a good problem-solving ability is needed, but solutions are often there waiting to be found.

Future goals:

In regard to the Salt Ayre decarbonisation project and future ambitions, Councillor Kevin Frea deputy leader and cabinet member with responsibility for climate action said: "We know that we have a huge challenge ahead of us to achieve our ambition of becoming net-zero carbon by 2030 but this project, along with many others in the pipeline, will make a significant contribution."

Following the completion of the Salt Ayre decarbonisation, the Council has invested a further £1million of PSDS funding into improving the energy efficiency of other council buildings. This has included roof-mounted solar, the instillation of over 3,500 LED lights across 10 sites, BMS upgrades, insulation and secondary glazing at six sites.

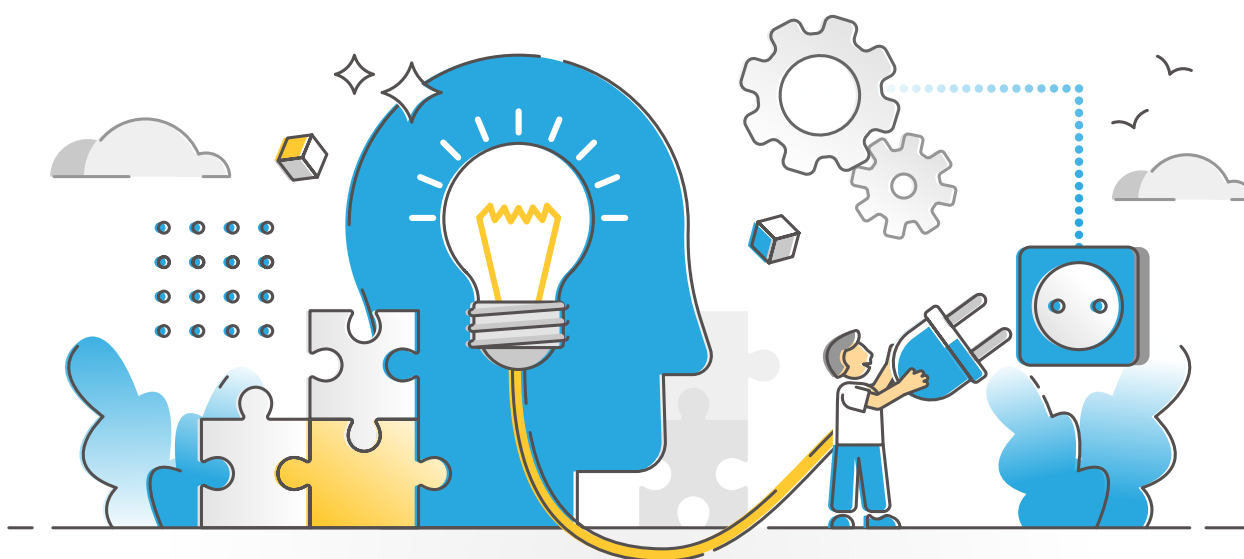
Lancaster City Council also plans to further future proof the Salt Ayre leisure centre scheme by extending the solar farm from 1.3MWp to 3MWp when local grid restrictions are lifted. This will enable the Council to increase solar energy production and supply even more renewable energy directly to Salt Ayre Leisure Centre, whilst also enabling the Council to explore other commercial options for the renewable energy.

Funding received through the Low Carbon Skills Fund enabled the Council to commission a Building Energy Decarbonisation Plan, which has since been adopted. This provides an overview of costs, solutions and a timeline to achieve the Council's net zero 2030 ambition.

Additional renewable energy schemes are being explored for low-value land and on commercial buildings within the Council's portfolio. This could lead to an additional 6MW of additional solar PV, further supporting the Council's transition towards renewable energy.

The Council has also received funding from BEIS Heat Network Delivery Unit to carry out techno-economic feasibility into district heat networks across the Lancaster District, which will focus on decarbonised heating solutions.

The Council has also committed itself to decarbonising its vehicle fleet and over the next four years plans to replace 52 vehicles with electric alternatives, with the aim of having a fully decarbonised fleet by 2030.



5.2 Swansea Council - Homes as Power Stations

In recent years, Swansea has been affected by the early impacts of climate change, the city has seen extreme storms, flooding and wildfires. It is expected that as these events get more common and severe, there will be significant local impacts particularly for the most vulnerable in Swansea.

As a result of the projected local and global impacts of climate change, Swansea Council declared a climate emergency in 2019. The declaration was soon followed by a climate change action plan which included a plan to reduce the Council's organisational emissions and a policy review designed to make sure that climate change mitigation is at the heart of all aspects of council work. The action plan also included two key emission reduction targets which are:

1. An organisational target of a net-zero council by 2030.
2. A wider city-wide target of a net-zero Swansea by 2050.

Swansea Council believe that setting a good example is extremely important, as by doing their bit, they are also supporting and encouraging others to take action. Therefore, in addition to the action plan, the Council also signed the Swansea Charter on Climate Change in early 2020. The charter underlines the importance of citizens, businesses, community, voluntary and partner organisations coming together in the fight against climate change and encourages members of the different groups to sign up to the charter and make their own carbon neutral pledges as part of the carbon neutral by 2050 agenda.

Background:

One of the ways in which Swansea Council has begun to make steps towards carbon neutrality is through the Homes as Power Stations (HAPS) scheme. All HAPS are built to the 'Swansea Standard', this is a fabric-first approach which achieves a 25% efficiency improvement on current building regulations, meaning that homes that achieve the Swansea Standard produce significantly fewer carbon emissions. The fabric-first approach to build truly sustainable homes relies on the following 5 factors to ensure minimum energy consumption and maximise energy production:

1. High-quality insulation;
2. Increased air-tightness;
3. Prevent thermal bridging;
4. Maximising solar gain;
5. Ensuring natural ventilation.



HAPS is an innovative initiative designed by Swansea Council to help reduce the emissions from social housing, reduce the impact of fuel poverty and work towards achieving the Council's goal of becoming net zero by 2030. The initiative aims to use renewable technologies to produce homes that are able to both generate and store their own power.

Through combining ground source heat pumps, PV solar roofs, Tesla battery storage and mechanical ventilation heat recovery systems, the homes are able to produce and store their own energy, whilst also using energy in a sustainable manner. HAPS homes are built in a way which maximises solar gain through orientation, the homes incorporate high performance triple glazed windows, high levels of mass insulation, no thermal bridging, and extremely high levels of airtightness with a target of 4 air changes per minute, meaning that they are able to reach the 5 key factors of a fabric-first home.

This low carbon technology has been funded through the Welsh Government's Innovative Housing Programme (IHP), and the Council has secured funding in all 4 rounds so far.

Swansea Council believe that the HAPS schemes have delivered sustainable, highly energy efficient homes and achieved a good use of space, as well as creating jobs and local investment. The Council promotes well-designed communities, which play an important role in supporting health and wellbeing, and key place making principles of providing green infrastructure, cycle routes and local facilities/services, never more relevant in terms of a post-Covid future.

Outcomes:

The first two HAPS schemes comprised of a total of 34 homes, with a further 6 bungalows being retrofitted to the same standard. The first of these schemes involved 18 new homes in Swansea, consisting of apartments and 2-, 3- and 4-bedroom family homes. These homes were built in one of the most deprived areas in Swansea and include innovative technologies to help keep energy bills as low as possible, meaning that Swansea Council can combat fuel poverty whilst also cutting carbon emissions.

The most recent phase of the scheme has seen the completion of a regeneration project in Clase which includes 25 x 3 Bed Houses; a new Welsh school and an enhanced playground area adjacent to the new estate.

There is high demand for social housing across Swansea with a particular shortage of large family homes. The mix of housing was carefully chosen by analysing the needs register and the local housing market assessment.

Swansea has some of the highest deprivation indicators in Wales and is committed to reducing fuel poverty for tenants whilst delivering low carbon new builds.

The EPC rating of the properties is A, with average daily energy consumption at 18.1kWh; of which 10.6kWh is imported from the grid. The remaining energy is provided from the PV panels directly and from the battery. The energy consumed by the Swansea Standard homes is 62% lower and imported energy (paid) is 78% lower when compared to an average UK house of a similar size. Therefore, on average the occupants in the Swansea Standard houses will pay approximately 20% of the energy bills that an occupant in an average Welsh house would pay.

In addition to the completed projects, the Council is also due to complete work on the West Cross Site; which will see 6 x 2 Bed bungalow properties being built. They have followed the HAPS and fabric first approach and the allocation of them will focus on more elderly tenants with mobility issues. They have been designed to Lifetime Homes Standard and will be part of the monitoring that the Welsh School of Architecture (WSA) are doing across of all the developments that received IHP funding. The bungalows are of particular interest as there will be an opportunity to measure the direct comparison with the 6 retrofit bungalows that were upgraded in an off-grid site previously.

Monitoring and evaluation:

The performance of each home will be monitored in partnership with the WSA. The evaluation will focus on the performance of the buildings, and tenant feedback on what the property is like to live in as a home. The aim is to deliver high quality, low carbon, high energy efficient housing at scale and pace. The user feedback to assess how comfortable the homes are to live in, as well as monitoring and evaluation of the buildings performance is critical to appraise how this technology works in the social housing sector.

Through this partnership, WSA have installed remote monitoring kit to collect temperature and energy use without inconveniencing the households. This information will be used to ensure that tenants get the maximum benefit and reduce fuel poverty. The tenants have access to the Tesla App giving real time data at their fingertips; showing what solar energy is being generated; how much is stored in the battery and how much energy they are drawing from the grid. The App helps to promote engagement and enables the tenant to make informed decisions on how and when they use energy.

Swansea Council has a strong commitment to low carbon or zero carbon homes and eliminating fuel poverty is a key driver for new housing developments. This project gives an opportunity as a test bed site for the Swansea Standard and the next generation of Council Homes as Power Stations.

This project is a key pathfinder of the City Deal Homes as Power Stations project. This technical innovation looks at how the region can grow the supply chain and the market for innovative low carbon homes, to make Wales a leader in low or zero carbon housing construction. The project will provide learning and evaluation, to support this technology and keep testing standards as active solar and storage technology improves.

Achievements:

As well as working towards the Council's net-zero ambitions, the scheme has also involved boosting skills and employment in Swansea. The homes have all been designed in house and the Council's own Building Services team has managed the project with its own staff carrying out the construction work, with the local supply chain being used wherever possible. This has led to upskilling of Council staff who had previously not been experienced in renewable technology.

Additionally, there have been permanent, full time trades people employed through the project, who have also benefitted from being able to learn about the low carbon technology used in this scheme. 12 apprentices have had the chance to work on site for a total of 8.5 weeks each, enabling them to gain new and unique skills in the field of construction and renewable technology.

The Council has already received very positive feedback from tenants who have occupied these new homes and - at a time when almost all of us are worried about the soaring cost of energy - they have less to be concerned about than most.

Overcoming challenges:

As the project took place during the COVID-19 pandemic, the Council faced a number of challenges due to the impact of lockdowns which had a significant impact on the construction process, staff shortages caused by social distancing requirements and staff members having to self-isolate also had a knock-on effect on the project. However, despite the unique challenges of the pandemic, the Council was impressed with the progress made on the first two HAPS schemes between April 2020 and their handover in April 2021, describing the 'remarkable' transformation of the site during this time.

Additionally, the Council had to convince officers of the benefits of the HAPS initiative. During the project, acceptance and buy-in of the HAPS concept, has grown throughout the Council. Careful balance of project risks and informing officers of how the homes will help the Council to achieve their aspirations of pushing the innovation and low carbon build agenda has helped to convince those who were sceptical about the project. During the project there were concerns that the controls to operate the house would be too complex for the tenants to get maximum benefits from their homes. However, these concerns have been addressed by

installing very simple controls, and ensuring that there is ongoing tenant engagement. Additionally, the house layouts have been designed to accommodate the equipment without compromising storage space. Training sessions for staff and tenants are also carried out, and this is refreshed at visits or on request, meaning that residents are well informed of how to make the most of their HAPS.

Further challenges were caused by adverse weather conditions, which saw very wet conditions followed by sub-zero temperatures causing complications with the groundworks on site.

Future goals:

Swansea Council intends to continue building new homes using the Homes as Power Stations model and will monitor the properties over the coming years to inform future projects. As the project has been funded by the Welsh Government's IHP, the progress of the project and any monitoring and learning will be shared across Wales with other local authorities. The evaluation, which will be for 3 years post-occupancy will compare these properties to other homes built to current building regulations, and energy efficiency and whether the projected savings for tenants in terms of energy use are realised.

The HAPS scheme has been awarded funding in Innovative Housing Programme 2. By the end of the IHP project, Swansea Council will have delivered 94 homes through this Innovative Housing Programme, 18 passivhaus homes and 76 highly energy efficient Homes as Power Stations.

The Council has an ambitious target to develop 1,000 affordable homes, and is looking at building capacity to be able to deliver this work as quickly as possible to meet the huge demand for good quality affordable housing in Swansea. Additionally, plans are in place for Homes as Power Stations to facilitate the take up of renewable technologies in at least 10,300 properties (7,000 retrofit, 3,300 new build) within five years to increase affordable warmth and reduce fuel poverty, which will have a knock-on effect on improving the health and well-being of residents, reducing the burden on health and social services.



5.3 East Lothian Council - On Street Residential Bollard-style EV Chargers

Background:

In August 2019, East Lothian Council's elected members unanimously agreed to declare a climate emergency, in which the Council resolved to make all council services net zero carbon as soon as practically possible, and by 2045 at the very latest. East Lothian Council's 'Climate Change Strategy 2020–2025', reiterates this commitment to net zero and focusses on preparing communities, businesses and the council for the adverse impacts of climate change.

The Strategy embeds the principles of climate justice into East Lothian Council's climate emergency response, to ensure that those most vulnerable in society, including those who are already at a socio-economic disadvantage, will not be disproportionately adversely affected by the effects of climate change. These principles guided the development of the initiative in the below case study.

Overview:

East Lothian Council's Climate Change Strategy includes an ambitious target of stimulating and supporting a 15% switch to electric vehicle (EV) uptake by 2023. This is something that the council was already committed to, and by 2022, East Lothian already has the highest number of chargers per head of population in mainland Scotland and was ranked 12th in the UK, demonstrating the council's commitment to achieving the goal of encouraging large numbers of residents to switch to using an EV.

It is well recognised, that chargers are easily installed for homes with driveways, and therefore homeowners and private tenants are often readily able to charge their vehicles off road, in a safe manner. In East Lothian, 70% of households have driveways, however, for the 30% that don't have driveways, public chargepoints are required.

One way in which the council is encouraging EV uptake is by installing chargers where they are needed most, particularly for those who do not have access to private off-street parking. The council hopes that 'On-Street Residential Bollard-style Chargers' will soon make up the majority of chargers in the authority area and by the end of 2023, the council wants to ensure that all residents live within a short walk of at least one public charging site, and preferably a choice of several, including town centre Journey chargers and Destination chargers in council car parks. By ensuring that car chargers are accessible for all residents, the council is able to work towards their goal of climate justice, as no matter the socio-economic situation or location of a resident, they will be able to access charging infrastructure with few barriers.

The bollard-style chargers are up to 7kW and are designed for routine charging, in convenient areas which are close to where the driver would usually park. The 7kW chargers are also cheaper to use than faster, more expensive options, which once again makes this initiative more accessible for a wider group of residents.

Overcoming challenges:

As parking in residential areas is often in short supply, the council was faced with the difficult decision of whether to make the use of parking spaces adjacent to On-Street bollard style chargers restricted to EV drivers only. It was decided that restricting use would be inconvenient for many residents and therefore no restrictions are in place. Although this means that EV chargepoint access may sometimes be blocked by non-electric vehicles, the council has been able to monitor this issue by deploying parking sensors at a range of sites. This system enables registered drivers to see whether the charger is in use, and not just whether there is a space to park. This technology means that drivers are able to avoid situations where they arrive at their preferred On-Street bollard style site only to find it is blocked by a non-electric vehicle.

The parking sensors also allow the council to highlight the high availability of alternative nearby Destination chargers (whose bays are restricted to plugged-in vehicles only) and detect any abuse of these bays, giving drivers confidence that there will always be somewhere close by to park and charge.

Outcomes:

To date, East Lothian Council has successfully installed 141 council-owned chargers, including 39 7-22kW on street chargers, with a further 50 in progress. This means that East Lothian has one of the highest numbers of car charging devices per head of population in the UK. All council-owned chargepoints have been entirely financed via funding secured from Transport Scotland and the Office for Zero Emission Vehicles (OZEV) On-street Residential Chargepoint schemes.

When it comes to proximity to public chargers, East Lothian ranks in the top 5 local authorities outside of London for local authorities whose residents live within a 400 metres / 5 minute walk of a public charger. Based on the latest figures, 43% of households in East Lothian fall within this category.

Additionally, the council has ensured that chargers are accessible to as many people as possible, through installing bays that are easily accessible for people with disabilities, and has also installed longer charging bays up to 12m in length in some locations to cater for electric vans and eHGVs.

Future goals:

Thus far, the funding for the expansion of vehicle charging infrastructure by East Lothian Council has been secured from central government funding schemes, however the council is currently in the process of moving away from solely relying on grant funding and exploring options of working alongside commercial partners to fund, operate, and maintain the council's growing charging network. By diversifying the funding for infrastructure, the council hopes that it will be able to expand the ecosystem in East Lothian in a more sustainable manner.

Cllr John McMillan, East Lothian Council's Cabinet Member for Environment, Economic Development and Tourism said: "East Lothian Council is continuing to look forward and is now working with partners to investigate future funding models to ensure that the charging network remains fit for purpose for years to come."

The council is also hosting an e-bike hire scheme and improving cycle links for their use, providing bookable charging infrastructure for electric buses, coaches and other commercial Heavy Duty Vehicles and is looking to trial queue management solutions for busy Journey charging sites.

In terms of wider climate change mitigation ambitions, the council will continue working towards the seven key outcomes that are set out in its 2020-2025 Climate Change Strategy.

More information on East Lothian Council's Climate Change Strategy can be found here:

https://www.eastlothian.gov.uk/downloads/file/29179/climate_change_strategy_2020-2025



5.4 Oxfordshire County Council - Community Action Groups

In 2019, Oxfordshire County Council declared a climate emergency and soon after published their Climate Action Framework which sets out how the Council will reduce operational emissions to net-zero by 2030 and create a thriving, zero-carbon Oxfordshire by 2050. The Council believes that in order to achieve this ambitious goal, grass roots climate action by community groups will play a key role and will be a cornerstone of the strategy.

Background:

Community Action Groups Project Oxfordshire (CAG) supports a network of almost 100 local community-led groups, making it the largest network of its kind in the UK. The community groups work in a range of areas including: transport, energy, biodiversity, food and waste at a range of scales, from running repair cafes to developing community-owned solar farms. The network members are brought together by a shared vision of resilient and empowered Oxfordshire communities working together so that people and the planet can thrive within ecological limits.

The CAG Project receives its core funding from Oxfordshire County Council and the two have been engaged in a long-term partnership since 2001. The CAG team work with new community groups to help them get up and running, whilst supporting existing groups to develop and thrive. Some examples of support provided by the CAG team include:

- Advising on group structure;
- Developing funding bids;
- Providing skills training and access to resources;
- Advising on health and safety;
- Facilitating networking between groups in different areas of the county;
- Monitoring and reporting of the impact of the groups.

Achievements:

During 2021, the community action groups ran over 7,000 events, attended by over 43,500 residents and contributing over 65,000 volunteer hours to the county, demonstrating the impact that grassroots groups can have when part of a supportive network. With almost 100 member groups, CAG is a network of likeminded groups who are able to share skills and experience with each other, so that all members have the opportunity to work together to achieve common goals.

A survey of CAG members in December 2020 showed:

- 85% of groups said they had been more effective in achieving their aims thanks to being in the CAG network;
- 70% of groups had been in contact with other CAG members to share information, knowledge or skills, or work on a collaborative project;
- 75% of groups work with a local authority to deliver better environmental and social outcomes in the county.

Examples of CAG Oxfordshire in action

Collaborate Groups:

One exciting way that CAG Oxfordshire offers unique opportunities to members is through 'Collaborate Groups'. These groups give members working on similar themes an opportunity to meet up, share ideas and find ways of collaborating with each other.

The meetings are open to members of the CAG network, as well as other associated, like-minded groups and organisations. Collaborate groups are currently open for those interested in plastics, trees, waste, energy, climate action with children, growing, surplus food, biodiversity and rewilding, and Oxfordshire markets.

The Collaborate Groups meetings are a great opportunity for CAGs to:

- Learn about the activities and achievements of other groups;
- Share knowledge and skills;
- Explore opportunities for collaborative projects and funding bids;
- Gain advice and support from the CAG Oxfordshire staff;
- Network and socialise with other members.

Replenish Oxfordshire:

Replenish Oxfordshire is a project managed by CAG Oxfordshire and funded by Oxfordshire County Council. The project's network of volunteer ambassadors attend events, set up projects and work with local community groups to grow and cook zero-waste meals.

So far, the project has been able to work with community groups to:

- Run home composting and 'Love Food Hate Waste' workshops;
- Deliver food growing and home composting kits to people experiencing financial insecurity;
- Run cookery workshops and demos;
- Deliver 'Love Food Hate Waste' packs to people receiving food parcels from community fridges and food banks;
- Deliver waste reduction workshops in schools.

Challenges overcome:

The COVID-19 pandemic and subsequent lockdowns brought the majority of in-person community action to a halt around the country; therefore, it was necessary for CAG to come up with innovative ideas to continue making an impact in new ways. Despite the pandemic, CAG continued to grow, adding 13 new member groups in 2020.

One way in which CAG continued to support communities' work towards climate goals was by providing bikes to key workers. 3 member groups collaborated to donate a total of 315 bikes, enabling key-workers to travel safely, whilst also reducing carbon emissions.

Data collected by CAG in 2020 demonstrated that the community groups found ways to work around COVID restrictions to deliver for their communities. The data showed that:

- Over 5,000 events and activities were run by member groups;
- There were 38,284 attendees of these activities (compared to over 80,000/year pre-COVID);
- Community groups amassed 57,300 volunteer hours.

Future goals:

CAG Oxfordshire and Oxfordshire County Council have ambitious goals for expanding their efforts as they strive towards the goal of becoming net zero. The network of community groups aims to quadruple its reach by 2030, and both CAG Oxfordshire and the Council have set the following targets to build on the impact that they currently have:

- Increasing the reach and diversity of the CAG network;
- Further developing the peer-to-peer support model;
- Developing more partnership with non-environmental third sector groups to help them to embed climate action within their purpose and activities;
- Further strengthening relationships between community groups and local authorities.

More on Oxfordshire's Community Action Groups - <https://www.cagoxfordshire.org.uk/>

5.5 Dundee City Council - Engaging the Public in Climate Change and Sustainability (Sustainable Dundee)

Since declaring a climate emergency in 2019, Dundee City Council has led the implementation of the Dundee Climate Action Plan split across 4 key action areas of energy, transport, waste and resilience, a key element of the plan is to demonstrate local action and solutions to the climate crisis. A critical part of this work is public engagement to inspire, encourage and empower the public to take climate action and equip them with the knowledge, tools, and skills to face this world-wide and local challenge.

The Climate Action Plan is driven by international agreements such as the Paris Agreement, statutory requirements including Scotland's Climate Change Act and organisational commitments that have an impact on the wider community. As with the agreements that it was inspired by, the Climate Action Plan sets necessary carbon reduction targets, to mitigate the worst impacts of climate change, including a 40% reduction in greenhouse gas emissions by 2030 and then to achieve net-zero greenhouse gas emissions by 2045 or sooner.

Overview:

During COP 26 in 2021, Dundee City Council engaged the public in a six-week city-wide in person and online programme to encourage climate action. Under the banner of 'Sustainable Dundee', the programme aimed to reach the widest possible audience with events designed to reach those who may be overwhelmed by the thought of engaging in climate action. Through a wide range of events and activities, the project aimed to address the following 8 priorities: energy efficiency, active travel, low carbon transport, air quality, biodiversity, waste and recycling, food growing and resilience. The 8 key priorities are all vital in achieving the 4 key action areas of the Dundee Climate Action Plan.

The programme opened with an event that would highlight the different elements of climate action in a fun, engaging and interesting way. The Council wanted to move away from stall events that fail to engage with a wide audience, therefore the 'HubFest' activity day was created. HubFest included information stands, Segway, rewilding and upcycling sessions, the main event of the day was 'Storm' a giant sea goddess puppet, who toured the city, the puppet encouraged spectators to take better care of our oceans and seas. The event was very well received, no more than 200 people were anticipated, however the event attracted around 12,000 people in one day. The visit of the sea goddess Storm was shared live via social media for the audience at home to follow, resulting in hundreds more viewers. The opening event was hugely successful and contributed to raising awareness of the importance of climate action and of the wider 6-week programme.

Over the 6 weeks, the city saw architectural installations, lectures, tree planting, business-focussed events, an international electric vehicle conference, dance, theatre and talks, the variety of events demonstrating the Council's ambition of reaching as many people from different backgrounds as possible. An online 'EcoSchools' conference was also hosted, attended by 700 pupils from local schools, the event aimed to inspire future generations through interactive workshops and activities.

Overcoming challenges:

As the programme took place during the COVID pandemic, the Council faced initial barriers as a result of uncertainty about the nature of events that would be able to be held. The programme was the first public event since social distancing regulations were relaxed, therefore it was difficult to predict how the event would be perceived and attended by the public. The pandemic also meant that some events had to be held online. However, despite the impact and uncertainty of the pandemic, the feedback that the Council received from partners and the public was overwhelmingly positive, with well attended and sold-out events taking place across the six-week programme. Through hosting a mixture of online and in person events, the Council was able to ensure that as many people as possible were able to engage with the programme, in a way which they felt comfortable with.

Future goals:

Dundee City Council has demonstrated its commitment to the United Nations' 17 Sustainable Development Goals through the City Plan, Council Plan, and Climate Action Plan and have developed an interactive map of all of the Dundee sustainability initiatives that link directly with each of the Goals. This tool will be promoted in schools as an educational resource to help set the UN SDGs in a local context, as well as promoting these initiatives to residents and visitors.

The interactive map can be found here: <https://sustainable-dundee.blue2web.co.uk>

In relation to Goal 13 on 'Climate Action', the Council has set goals to:

- 'Publish a Strategic Energy and Climate Change Action Plan, designed to deliver sustained reduction in CO2 emissions, and undertake a Climate Change Risk and Vulnerability Assessment'
- 'Deliver a range of projects promoting low carbon fuels, including expanding the % of electric vehicles in the city'
- 'Implement the most appropriate option from the National Low Emission Framework to improve air quality'
- Following the 6-week programme, the Sustainable Dundee Network will continue to work to engage the city in climate action, promote events, share ongoing climate action work, and inspire the city on its journey to become net zero.

The Sustainable Dundee Network was established following a successful programme of partnership events in Dundee for COP26. The network coordinates and collaborates on public engagement, events and projects that are built on the city's Climate Action Plan. Together with the Dundee Climate Leadership Group, they form a golden thread under the collective Sustainable Dundee banner. The groups leverage expertise from across the city to engage and inspire collective action and have a shared commitment to tackling climate change. The Sustainable Dundee Network is delivering actions for 2022, with Earth Hour Week being the first collective public event in March. Clean Air Day, Climate Week, and the University of Dundee's Festival of the Future followed later in 2022.

The Sustainable Dundee Webpage (www.sustainabledundee.co.uk) was launched on the 27th of September 2022 as part of activities for Scotland's Climate Week. The website is a newly developed resource and an information hub to help empower organisations, schools, and residents on their journey to Net Zero. Featuring, case studies from Dundee City Council and community action groups, a portal for community group funding and actions people can take to live more sustainably.



5.6 London Borough of Waltham Forest - School Streets

In April 2019, Waltham Forest was one of the first local authorities in the UK to declare a Climate Emergency, however despite this and the Council managing to bring down the borough's carbon emissions in the decade to 2016, there is a need for future initiatives to go further for the Council to reach its net zero by 2030 target.

The COVID-19 pandemic has dramatically impacted public perception of how streets and public spaces are used, raising awareness of the importance of active travel in improving public health and reducing emissions. For this reason, one of the schemes that has been introduced by the Council to cut carbon emissions is the School Streets scheme. This initiative is at the heart of the Council's priorities in addressing the climate emergency.

School Streets involves turning the street(s) surrounding a school into pedestrian and cycle only zones during pick up and drop off times to reduce emissions and create a safe environment which encourages children to walk, cycle or scoot to school. The School Streets restrictions are enforced by legal traffic management orders meaning that any non-exempt vehicles that travel into the restricted zone will be issued with a Penalty Charge Notice (PCN). The cost of the PCN is £130, which is reduced to £65 if paid within 14 days.

School Streets are necessary as across London the school run makes up 25% of vehicles on the road every morning, therefore by encouraging parents to find greener ways of getting their children to school, carbon emissions can be greatly reduced.

Waltham Forest Council has introduced 18 School Street schemes so far, all schemes are subject to a trial period of 6 to 9 months and reviewed to assess their impact, if the scheme is deemed to be a success, the School Street will become permanent. To date, 10 School Streets have been made permanent following successful trials. A total of 75 roads are included in School Street zones in the borough, with over 14,500 pupils currently benefiting from the initiative.

School Streets involves close collaboration between various council teams and the senior leadership team of each school. Each school has different opening hours and is part of a different community, therefore every school involved with the scheme requires a unique approach. This collaborative approach allows for expertise from those with local knowledge to influence the scheme design.

Overcoming challenges:

Although other local authorities have adopted School Streets, many are less enforceable and rely entirely on volunteers and school staff to place temporary blocks such as cones and boulders on the road to stop vehicles from entering. In Waltham Forest, Automatic Number Plate Recognition (ANPR) cameras are used to enforce the School Streets in a way that ensures maximum impact and allows the Council to monitor the school run routine changes accurately for each school. Although in the short run using ANPR cameras is more expensive and resource intensive, their use helps to ensure the longevity of the schemes.

As each School Street scheme is unique, the consultation period prior to and during the scheme can be time and resource intensive. Prior to enforcement, the plan for each scheme is consulted on with the local community, with their input being used to finalise exactly where and when the scheme will be in operation, following this, the scheme is launched as a trial. Although this approach takes time, by encouraging feedback from local residents, businesses and the school communities, the Council is able to develop schemes that work for each school, helping to make sure that the schemes are well received and successful. Following the trial, further data is collected, allowing the Council to ensure that the scheme is meeting its objectives prior to being made permanent.

A further challenge was caused by the need to balance the positive impact that the scheme has on young students with the needs of local residents and businesses who may need local access. In order, to balance these two competing issues, a number of road users are exempt from School Streets restrictions. Exempt stakeholders include:

- Businesses;
- Residents with a valid parking permit;
- School staff;
- Emergency services;
- Blue badge holders;
- Key council services;
- Any vehicle that is already parked in the zone when the restriction commences will be able to leave the zone without a penalty.

Through issuing exemptions, the Council is able to keep the local community happy and significantly minimise the impact that the School Street has on local businesses and those who need access to the closed roads.

Impact & outcomes:

All of the School Street schemes that have been implemented in Waltham Forest have led to increases in the number of students actively travelling to school and a decrease in the number of cars on the road in School Street zones. The Council has also received feedback from school communities that have experienced sustainable behaviour change as a result of the schemes.

Waltham Forest's Air Quality Team has installed air quality monitors at School Street locations to assess the impact of the schemes. Data collected before and after the implementation of the schemes has found that there has consistently been a significant reduction in nitrogen dioxide levels during the times that School Streets are in operation.

Monitoring has found that there has been a modal shift from car usage to active modes of travel such as walking and cycling as a result of School Streets. Data from one primary school in Waltham Forest found that there had been a 36% increase in the number of students travelling actively to school and a 70% decrease in the number of vehicles travelling on the roads affected by the scheme during operational hours. Data from a different school showed similar results with dramatic increases in the number of children actively travelling and notable decreases in the number of vehicles on the road. This data demonstrates the improved road safety on the roads during the operational hours of School Streets and the influence of School Streets on the behaviour of local people.

Future goals:

Waltham Forest Council intend to continue implementing further School Streets across the borough to keep tackling issues concerning congestion, poor air quality, road safety and low levels of physical activity.



5.7 Glasgow City Council - Dual Fuel Road Maintenance Fleet

Background:

Having hosted the United Nations Climate Change Conference (COP26) in 2021, Glasgow was at the centre of world's attention, with world leaders discussing how to best approach the ongoing climate emergency. In recent years, Glasgow City Council has taken a number of steps towards mitigating the impacts of climate change, in early 2019 the Council set up a Climate Emergency Working Group and soon after in May 2019, the Council declared a Climate Emergency.

The Climate Emergency Working Group produced an independent report in which 61 recommendations were made, the standout target of this report was the ambition to reach carbon neutrality by 2030. Following one of the recommendations from the report, the Fleet Strategy 2020-2030 was approved, the strategy establishes a framework for the Council to achieve a zero emissions fleet by 2030.

The following 5 points have been taken from the Fleet Strategy and represent the key targets to be achieved by 2030:

1. Facilitating the procurement and modification of high-quality vehicles that meet operational demands whilst maintaining best value.
2. Having processes in place which provide safe, efficient and reliable transport for the Council whilst optimising fleet availability.
3. Identifying and implementing a continuous improvement programme for increased efficiency through savings and income generation.
4. Having a highly trained and qualified workforce that are capable of meeting the challenges of innovative and emerging technologies.
5. Having alternative fuel solutions powering the fleet which support the operational objectives, whilst advancing the Council's drive towards net zero emissions.

Overview:

Glasgow City Council currently operates a fleet of around 1,200 vehicles and therefore the road towards achieving a zero emissions fleet is likely to be a long one. The fleet is vital in delivering frontline services to residents, businesses and visitors of Glasgow. The Council is responsible for maintaining over 1,900km of carriageway and 3,100km of footways and footpaths, therefore the vehicles that are responsible for their maintenance rack up a significant amount of carbon emissions.

The Council's current Road Maintenance fleet includes 20 dual fuel gritters (hydrogen and red diesel) which operate across 18 gritting routes within the city (2 spare). In October 2021, a new fleet of 11 hydrogen dual fuel gritters (hydrogen and red diesel) came into operation to replace the ageing diesel gritting fleet, a move which is helping the Council to reduce exhaust emissions. A beneficial aspect of the new dual fuel gritters is that the 11 new vehicles have interchangeable bodies, meaning that they can be used for road maintenance in both summer and winter.

Over the winter months, the vehicles will focus on gritting and winter maintenance and in the summer, they will be used for gully cleaning, road patching and as tipper vehicles. The operation to change the bodies takes just 30 minutes and therefore, the Council will be able to monitor weather forecasts to alter the role of the vehicle depending on the weather conditions.

Outcomes & impact:

The Council has found that the new gritters performed well, with performance indicator targets being met by gritting runs being completed on time. When compared with the previous ageing fleet, the new gritters were a significant improvement. This improvement was due to improved reliability and very few breakdowns which require a fitter to attend, meaning that the gritters could work much more efficiently.

Additionally, the fuel consumption of the Council was also reduced, vehicle emissions were considerably improved, both of these points mean that Glasgow City Council is making good progress towards maintaining its programme to achieve carbon neutrality by 2030, whilst also working towards the Fleet Strategy target of achieving a zero emissions fleet by 2030.

Glasgow City Council has aimed to raise awareness of the new vehicles and inform residents of the investment that is being made by adding a livery to the vehicles which states that they are dual fuel powered, with further information being detailed within the Council's Winter Maintenance Plan on the Council's website and through publicising the vehicles on social media.



Challenges overcome:

One of the key challenges for the Council was informing operatives of the benefits of adopting lower emissions vehicles and convincing them that the vehicles were safe and wouldn't make their jobs more difficult. The Council addressed this challenge by ensuring that operatives were involved and informed throughout the procurement process and by providing the necessary training. Communication between the Council and operatives was important as it enabled any issues or concerns to be raised by operatives and immediately addressed by the Council.

Further challenges were caused by delays to the construction of Glasgow's hydrogen refuelling centre, this meant that initially the new vehicles had to be fuelled entirely by diesel, however this issue was quickly addressed before the onset of winter when the gritters were in the highest demand.

Future goals:

Following the success of the 11 new gritters, there is now improved confidence that the low-carbon technology will lead to improvements in performance. This improved confidence has led to a new hydrogen fuelled multihog being procured by the Council which has been in service since December 2021 and has also vastly improved performance, whilst reducing emissions.

The City of Glasgow will be enforcing a new Low Emission Zone (LEZ) in the city centre from June 2023, the scheme will operate 24 hours per day, all year round. It is expected that the LEZ will significantly improve air quality, which will have knock on effects on improving public health and reducing emissions within the city. Glasgow City Council intends to continue striving towards achieving their goal of carbon neutrality by 2030 and plans to continue to introduce similar initiatives to improve the carbon emissions of road maintenance vehicles, which will lead to a zero emissions fleet by 2030.

5.8 Highland Council - Hydro Ness

The Highland Council declared a Climate and Ecological Emergency in 2019 and aspires to be net zero by 2025. One of the ways in which the Council is addressing the climate emergency and cutting carbon emissions is through the River Ness Hydro scheme which will help reduce the organisation's carbon footprint, and enhance the capability of the Council to generate and use renewable energy. The scheme utilises a 93kW hydroelectric power twin turbine to generate an estimated 550,000 kWh per year, this will supply the nearby Inverness Leisure Centre (ILC) with approximately 50% of its electricity use.

Background:

The Highlands is home to some of the most severely grid constrained areas in the UK, and on-site generation to minimise grid reliance is viewed as an important part of the mix of solutions going forward. Highland Council owns, operates and manages over 1,000 non-domestic buildings across the region - 33% of the land area of Scotland and 11.4% of Great Britain and covers 4,905 kilometres of coastline. This demonstrates the strong potential for the generation of renewable energy within the Highlands.

Hydro Ness, consisting of twin 46kw Archimedes screws, uses the natural flow of the River Ness to generate electricity and through a direct wire model, it is able to supply electricity to the nearby leisure centre. ILC, is one of the highest consuming buildings across the Highland Council estate, and is a hugely important and valued community asset. Due to the high footfall and the varied nature of services and functions offered at ILC (including two swimming pools, expansive gym and weights room, indoor multi-purpose gym hall space, catering and offices) electrical consumption is consistently high. The building design, and lack of directly adjacent space, drastically reduces available options to minimise the reliance of the leisure centre on grid supplied electricity, meaning that carbon emissions are high and the Council is subject to any cost increases related to energy prices.

Hydro Ness has been sized in such a way that the on-site consumption of the hydro generation is maximised within the leisure centre, providing maximum carbon savings, efficiency, and resiliency against future energy price rises. Supplying energy directly to ILC helps ensure a valued community asset continues to provide pivotal services to over 5,000 members, equating to over 800,000 individual visits annually.

Highland has long been a home for renewable generation, but the public, and in particular young students, cannot access many of these sites to understand the mechanics of good engineering in practice. A key priority for Highland Council, was to ensure that the site could provide a supporting narrative that clearly articulates the project's drivers and takes a holistic approach to tackling important issues in Climate Change and Environmental Management. The scheme is fully accessible to the public and allows visitors to see first-hand how renewable energy and old technology can help address a very modern problem.

The project:

Whilst this is a new scheme and direct wire arrangement, some of the infrastructure (the lade, weir, and smolt run), are from an older disused hydro scheme situated further along the river that powered a nearby mill. Utilising this historic infrastructure, this twin Archimedes screw project will generate and supply over 500,000 kWh of green electricity annually, offsetting the Council's reliance on grid supplied electricity and reducing the Council's spend carbon footprint.

The project will see vast improvement of the immediate surrounding area to create a destination through the introduction of interpretive landscaping. This intervention is a long-term investment for the Council and the asset itself will last well over 50 years. In addition, the site itself acts as a hub for STEM learning, inspiring the next generation of aspiring engineers and further demonstrating Highland Council's commitment to sustainability. Utilising a wide range of materials, ranging from static boards to QR codes, it is hoped that this will provide a unique and inclusive experience for all visitors – interactive elements will cover audio, visual and kinaesthetic. Furthermore, there will be some Gaelic presence on site including references to Highland specific content that pays respect to the unique nature and history of the region. The innovative structure

and supporting interactive content will help strengthen the river as an attraction and re-introduce it as a valued asset for renewable generation.

Challenges overcome:

The high-profile nature of the Hydro Ness project meant that clear and consistent communication/engagement were vitally important. The site includes varied environmental and ecological habitats - the river itself provides a vital ecosystem for four protected species, including the Atlantic salmon – therefore, it was essential that key stakeholders and the public were involved from project inception. The Council worked alongside organisations such as the Ness District Fishery Salmon Board and Inverness Angling Club to help shape and influence the project. For example, discussions with fishing interests, led the project team to opt to use an Archimedes screw for the hydro generation as it is fish friendly, whilst upgrading the fish pass and including an accompanying fish counter, providing more accurate monitoring of salmon numbers. This has enabled the environmental benefits of Hydro Ness to stretch beyond renewable electricity generation.

Working in a fast-flowing water environment is complex and challenging and due to the river ecology, the Scottish Environmental Protection Agency (SEPA) would only allow river works over a short period - July to October - reinforcing the need for specialist skills and extensive experience in delivery of hydro. 30% of the work was delivered by local contractors and whilst this is lower than usual, the specialist and unique nature of the project required extensive subject matter expertise including design and manufacturing of the turbines, design and manufacturing of the steel envelope and elements of the pre-cast concrete (these elements accumulate to around 50% of the total project cost). The SEPA restrictions created programming risk and tight windows, jeopardizing the Feed-in Tariff's (FIT) deadline of March 7th, 2022 (the scheme had to be fully commissioned by this date to receive a substantial Government incentive for renewable generation). All key milestones were completed in advance of all deadlines.

Key achievements:

Hydro Ness acts as the flagship project for Highland Council and the city – it acts as a prominent and visible reminder of the organisation's aspirations for the region to be Net Zero by 2025. The project is central to the long-term vision for the city, focused on delivering enhanced 'green zones' adjacent to the river, including the redevelopments of Castlehill, Northern Meeting Park and Bught Park.

This project reaffirms the Council's commitment to sustainability. Highland Council also recognises that for the region to prosper, good partnership working will be essential. The project benefited from the support of several valued partners such as the University of the Highlands and Islands (UHI). The project continues to work closely with UHI to align the initial and ongoing development of digital interactive content with the UHI Interactive Multimedia course. This will enable the content to be periodically updated and refreshed to reflect changing climate targets and attitudes towards climate change and sustainability. Additionally, this provides an opportunity for students to work with real life stakeholders, gain experience working on a local project and have works exhibited on-site.

The Hydro Ness site was a dilapidated parcel of land that has been severely neglected. This site was highly visible and yet offered very little to the public. The site had historical but damaged and neglected hydro infrastructure; this infrastructure has now been upgraded to allow for its reintroduction as a source of green energy generation.

The project team were able to involve local school children in the project through a naming competition across Highland schools. The response was overwhelming and over 100 pupils submitted posters and naming suggestions for the scheme (this is how 'River Ness Hydro' became 'Hydro Ness'). Feedback from teachers indicated this exercise stimulated real interest in sustainability and this approach – working in collaboration with young people to help inform future content – will surely form a strong foundation for future collaboration amongst likeminded organisations.

Due to the complex nature of the project, and to ensure stakeholders were fully aware of the proposal,

robust engagement has taken place and full consultation, in particular relating to the physical build and also environmental considerations as per mandated by SEPA, was undertaken with no challenge or objections. Furthermore, the Inverness Courier ran a public poll which finished with high public support from the project (>85%). Additionally, the project has received significant media attention and widespread praise.

Future targets and goals:

Whilst Hydro Ness has clear performance indicators (annual generation of 550,000 kWh, annual carbon savings of 140,000kg of CO₂e and the associated financial savings) the longer-term aspiration is to support and encourage an uptake and sustained interest in STEM subjects. Financial savings realised are reinvested into the Council's £17m Salix Recycling Fund, the largest in operation in the UK, to fund further energy efficiency interventions across the region.

A key objective of the content and messaging will be to demonstrate how nature and science work together to support positive change and promote sustainability. As a "live" STEM learning hub, the site will present a unique opportunity for Highland students to access and appreciate small scale 'run of the river' hydro, and learn how green, sustainable engineering can be applied in life. Interpretation will be presented in the form of high quality, robust and fully bespoke boarding's with further messaging being accessed via QR codes.

Visitors will be encouraged to access the QR content through a BYOD (Bring Your Own Device) approach, allowing a truly individual visitor experience. Furthermore, this allows content to be refreshed over time to reflect the changing landscapes around the key themes and presents an opportunity to articulate or highlight projects and interventions relating to Highland Council and their key partners.

Education:

It is hoped this site will educate and inspire people. The site will display unique Highland content and will focus on community – how people have shaped the Highlands, their role in renewable energy and their role in the transition to net zero. The information below sets out how each key message will embed community, environment, and economy:

Power of the River – In many ways the foundation of life in Highland, the importance of water across the region cannot be underestimated. Water has helped shape communities and continues to help shape the Highland economy; this is seen as a potential opportunity to appreciate water in a more holistic way, acknowledging its role in everyday life whilst being clear that climate change presents risk to water levels and rural communities, damaging the Highland economy.

Nature and Science – Hydro Ness uses simple, effective and proven science and engineering that works with nature, rather than against it to create renewable energy. By harnessing the natural power of the river to create energy the scheme won't negatively impact the natural environment, utilising Archimedes screw technology to ensure the salmon habitat is protected and they can navigate the river without risk of harm (this will be demonstrated through a connected fish counter). Moreover, improved planting and landscaping of the surrounding area will celebrate the unique nature of the Highlands and improve a neglected area of the river.

Renewable Energy and the Hydro Mechanics – The Highlands is a leading area for renewable energy generation and yet has the potential continue to grow and inspire and encourage sustainable change. There are many hydroelectric schemes across Highland, however, none are fully accessible. Hydro Ness will provide a truly unique opportunity for visitors to see renewable energy generation and innovation first hand through a fully accessible scheme designed to educate, inspire and celebrate; it is hoped this will encourage the next generation of engineers, or at the very least make visitors think about how their behaviours positively or negatively impact their surrounding environment.

Environment and Ecology - The Highlands environment is diverse and beautiful, and the River Ness is celebrated for providing habitats to a wide range of biodiversity. The scheme will celebrate the unique

environments in Highland which supports a wide variety of plant, animals and other species. The content on site will explore the species native to Highland and celebrate the community projects ongoing across Highland to boost the region's biodiversity and inspire people to get involved.

Climate Change and Sustainability - The climate and ecological emergency is a global issue. There are many ways that people can be more sustainable and help reduce human impact on the planet and reverse the effects of climate change. However, many people still do not know the basics of climate change and the site will help communicate key information regarding the climate and ecological emergency – making people more aware of what is happening in Highland. Highland communities need to feel empowered to take action to mitigate and adapt to the effects of climate change and transition to a more sustainable lifestyle.



6. APSE Energy Services

APSE Energy is a collaboration of over 130 local authorities who are working towards the vision of the municipalisation of energy. Councils having a greater role in energy management within their locality might be something as simple as advertising cheaper energy tariffs that residents can sign up to. It can also involve more in-depth measures such as installing large scale solar farms or establishing a local behaviour change or education programme.

APSE Energy has 4 work strands, which together form an overall objective of helping its members remain up to date with developments in energy and climate change.

Advocacy

We undertake an advocacy role to highlight energy related issues impacting local authorities to a wide variety of sectors, such as government, the wider local authority and public sector, professional bodies and industry organisations. We promote the vision of greater municipalisation of energy and showcase the projects that councils are involved in to meet that vision. We have links to government departments such as BEIS, to promote the aims of the energy collaboration and raise matters with key influencers. We also represent our members in terms of key policy and legislative developments.

Knowledge

APSE Energy enhances our members' knowledge by providing a range of briefings and technical notes, which keep officers and councillors up to date with developments in the sector. A monthly newsletter highlights current sectoral publications, services and projects and provides information relevant to the local authority energy agenda. We produce comprehensive research publications on a regular basis, addressing topics such as the electricity market, ECO regulations, solar PV projects, biomass projects, EV charging infrastructure and a variety of other topics.

Learning

We run a series of seminars, meetings, webinars and practical workshops focussed on specific themes with expert speakers and industry specialists. Partners host events to ensure members keep up to date with technology, new services and business models from the commercial sector. The Big Energy Summit is an annual 2-day conference with government department representatives, industry leaders and experienced local government officers as speakers. All conference costs, meals and accommodation are covered for 2 representatives per APSE Energy member authority. We hold summits in England and Scotland once a year. Our events provide opportunities for learning, networking and sharing understanding across the sector.

Consultancy

APSE Energy offers a consultancy service with energy sector experts as associates. Our associates specialise in local government work, and understand how the councillor-officer relationship works, the wider role of energy and how it fits with the delivery of council services. They have experience of working with a range of different technologies, across a variety of local authority contexts, on strategic issues and practical schemes.

Part of being in membership of APSE Energy means being within a movement that is looking towards alternatives to the big energy suppliers, making the most of council assets, addressing energy security, fuel poverty, emissions and cost issues, as well as promoting the council as a local leader in the energy and climate change agenda and recognising it has a role to play in place shaping in general.

Those who know APSE will understand our unique position within the local government sector and recognise us as a trusted supporter and a credible brand.

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