

Energy across the authority 2024

Case study examples of how local authorities are engaging in the energy and climate change 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 130 pioneering local authorities working collaboratively to influence and support the delivery of green energy and energy efficiency to promote economic growth and combat fuel poverty.

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1. Foreword

Five years on since local authorities across the UK began to declare climate emergencies, the ambitious net zero targets set at the time are quickly approaching. Many local authorities are making great progress towards their goals, whilst others are just beginning their journeys and it is clear that the energy and climate change agenda will remain a top priority for local authorities for many years to come.

Globally, 2023 became the hottest year on record, with the planet's temperature reaching 1.48C hotter than pre-industrial levels. This figure is dangerously close to the Paris Agreement's target of limiting temperature increases to 1.5C. With the occurrence of extreme weather events becoming more frequent and the need for action becoming increasingly urgent, it is easy to be overwhelmed by the scale of the challenge ahead. However, it is important to remember that alongside the negative headlines, significant progress is being made, for example record numbers of heat pumps were installed in Wales in 2023, installations of EV chargepoints continue to soar across the UK and more and more local authorities are directly benefitting from renewable energy installations such as solar, with these benefits being felt both financially and in terms of carbon emission reductions.

Whether it is through online events, webinars, in-person events, energy forums or individual discussions, publications such as 'Energy Across the Authority', newsletters or through our regular briefing notes, APSE Energy aims to support local authorities by sharing knowledge and best practice. If you are inspired by any of the case studies within this document and would like to find out how APSE Energy could support the development or delivery of your project, feel free to get in touch and we would be happy to help.

The case studies included in this document demonstrate a range of different ways in which local authorities are engaging with the energy and climate change agenda, a selection of 'shorts' have also been included in this year's edition of Energy Across the Authority, with the aim of providing as much inspiration as possible for schemes of all scales. We hope that local authorities can take inspiration from these case studies to develop new and innovative approaches to reducing carbon emissions.

This is the fifth edition of 'Energy across the authority' and the case studies from all five versions remain informative as examples for Councils to follow.

Cllr Jacqui Burnett
APSE National Chair 2023-24

2. Executive summary

This is the 5th 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 climate change and 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.

In addition to the 7 case studies outlined below, we have also included a number of case study 'shorts' towards the end of this publication.

Oxfordshire County Council – Project LEO and the development of an energy mapping tool:

In September 2023, Oxfordshire County Council won 'Best Climate Change or Decarbonisation initiative' at APSE's prestigious Service Awards in Belfast for its role in Project LEO and the delivery of an energy mapping tool which has demonstrated the crucial role that local authorities can play in the transition to a low carbon energy system. The project succeeded in providing a blueprint for the energy system of the future; a greener, more flexible, and fair electricity system where everyone benefits.

Durham County Council – Creating a low carbon depot at Morrison Busty:

Durham County Council has set the target of reaching net zero by 2030, in order to achieve this, the decarbonisation of high emission council sites such as the Morrison Busty Depot will be vital. The project aimed to facilitate a dramatic reduction in carbon emissions through a holistic approach to future proofing the depot. This was achieved through the provision of EV chargepoints for the fleet based at the site, fabric upgrades to the depot's buildings and the removal of gas boilers, with air source heat pumps installed. These upgrades are powered by a 3MW solar farm which is connected to the depot via direct wire.

Mid and East Antrim Borough Council – Hydrogen Training Academy:

Mid and East Antrim Borough Council identified the potential for CleanTech and the hydrogen sector to offer significant opportunities for growth and a need to train and upskill existing industry staff and new trainees to the recognised professional competence standards required for this growing sector. In order to address this issue, the Hydrogen Training Academy was created. The training academy is a skills development project led by Mid and East Antrim Borough Council, in collaboration with academia and industry partners. The project supports development of the hydrogen economy, through delivering essential hydrogen training for industries, utilising bespoke practical training labs.

Neath Port Talbot Council – The Bay Technology Centre:

Neath Port Talbot Council developed the Bay Technology Centre and, in the process, created the first commercial energy positive building in Wales. The building's energy positive status means that it generates more power than it uses, something which closely aligns with Neath Port Talbot Council's Decarbonisation and Renewable Energy Strategy. The technology centre which opened in June 2023 has a tenancy focus of supporting organisations which are involved in net zero and carbon reduction.

Wigan Council – Youth Climate Summit:

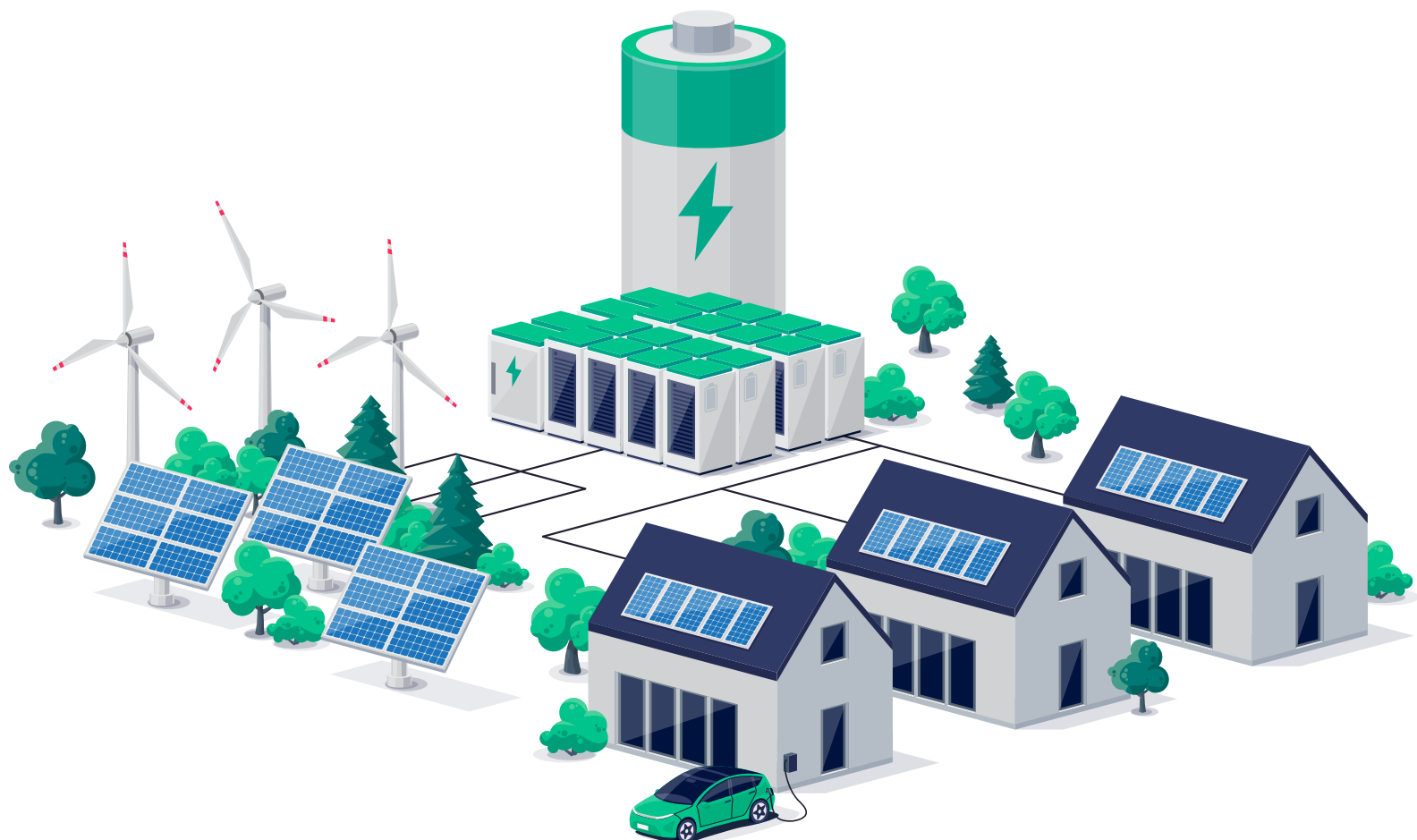
Wigan is the 9th largest metropolitan borough in England and is home to around 47,000 children of school age. In the Council's climate strategy, it was acknowledged that youth-led climate action would be key to achieving its goals. This commitment to engagement with young people across the borough led to Wigan Council designing and delivering the first ever Wigan Youth Climate Summit in September 2022. The event saw over 120 young people from across Wigan and Leigh, come together to hear inspiring stories from schools and colleges, listen to poems and performances on climate justice, spend time exploring an 'Eco Marketplace' and a Green Careers fair, and also the opportunity to take part in climate change workshops.

Nottingham City Council – Vehicle to Grid Charging (CleanMobilEnergy Project):

Nottingham City Council is making excellent progress in transitioning away from traditional internal combustion engine vehicles, with EVs now making up over 50% of the Council's fleet. The CleanMobilEnergy Project involved the use of an interoperable energy management system to improve the balance of energy demand with supply, enabling the Council to export unused energy from EV batteries back to the grid at times of high demand, whilst charging the batteries using energy from solar PV or from the grid at times of low demand. Through the project, the Council has also been able to expand its fleet with 46 electric vehicles.

City of Lincoln Council & YES Energy – Home Energy Upgrade Scheme:

In the East Midlands 14.2% of the population are experiencing fuel poverty, a figure which is higher than England's average. It was for this reason that the Home Energy Upgrade Scheme was launched by a consortium of local authorities, led by City of Lincoln Council. All councils in the consortium have declared climate emergencies, and with 15% of carbon emissions originating from home energy use, the scheme has gone a long way to tackling this issue. Through the Home Energy Upgrade Scheme, a £6 million fund was allocated for the installation of low carbon technologies and insulation works for private tenure properties.



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 energy crisis and its impact upon fuel poverty has highlighted the importance that 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.

APSE Energy supports councils who wish to embark on initiatives such as setting up their own solar farms or decarbonising leisure centres. Whilst APSE does not provide investment advice it can support the development of appraisal processes and policy development which seek to maximise local outcomes such as the provision of affordable, clean energy, which is attractive to consumers, whilst addressing fuel poverty, green jobs and skills, and playing a vital role in combating climate change. Some councils for example may look to sell renewable energy at an affordable rate to local businesses which 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?

Although there are no statutory net zero targets for local authorities, the vast majority have declared climate emergencies and are working towards net zero targets that are much more ambitious than the UK Government's 2050 target.

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 heat pumps 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 installation of solar panels to council house roofs, in solar carports or in council-owned solar farms, alongside 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. Clean Air Zones and Low Emission Zones have been introduced in cities across the UK with the aim of improving air quality whilst encouraging drivers to adopt low emission vehicles.

As the take up of electric vehicles gains pace, local authorities will play a vital role in the delivery of public chargepoints, with funding available through streams such as the Local Electric Vehicle Infrastructure Fund and the On-street Residential Chargepoint Scheme.

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 DESNZ. Funding is available through schemes such as the Public Sector Decarbonisation Scheme, with the Home Upgrade Grant, ECO4 and the Great British Insulation Scheme providing funding for upgrades to the energy efficiency of social housing and low-income households.

Across the UK, more and more local authorities are putting together Local Area Energy Plans, whilst in Scotland all 32 local authorities have now produced a Local Heat and Energy Efficiency Strategy. Pursuing an LAEP or an LHEES supports local authorities to map out the necessary steps required for a local areas energy system to reach net zero.

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.

ECO4 and the Great British Insulation Scheme: A guide for local authorities

Our latest publication provides guidance to local authorities looking to learn more about ECO4 and the Great British Insulation Scheme. This guide will be useful for local authorities looking to get involved in ECO4 regardless of whether you are new to the scheme, or have been familiar with its previous phases.

Using design in planning to address climate change

The securing of good design through the planning system is a perennial challenge that is becoming increasingly important in addressing climate change, securing positive outcomes for the community as well as health and wellbeing. Good design is more than a discussion around the merits of architectural style and extends beyond aesthetics and subjective concepts of beauty.

This document provides an important guide for local councils who want to secure better design through planning policy, better defensible decisions and need to provide a good grounding for officers and Members.

EV Infrastructure Survey Report

The 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.

A full list of APSE Energy publications can be found on our [webpage](#).

5. Case studies

5.1 Oxfordshire County Council – Project LEO and the development of an energy mapping tool

Background

In 2019, Oxfordshire County Council collaborated with local partners from the commercial sector, academia, and their local communities to develop a body of work known as Project LEO (Local Energy Oxfordshire). Project LEO is a multimillion-pound initiative that sought to gather the evidence required to support the policy changes and investment needed to create the technological, financial, and social conditions for successful systemic change towards a decarbonised electricity system.

Project LEO ran for four years, before coming to a close in 2023, with Oxfordshire County Council playing a key role in the development of an energy mapping tool. The tool provides a spatial picture of how and where energy is used across Oxfordshire and informs where changes are needed to enable the transition to net-zero.

In September 2023, Oxfordshire County Council won ‘Best Climate Change or Decarbonisation initiative’ at APSE’s prestigious Service Awards in Belfast, for its work on the development of the energy mapping tool.

Overview

The climate emergency is the biggest challenge the planet faces, and Oxfordshire County Council has not only committed to reaching its own target of becoming a net-zero council by 2030, but also to enabling the county to reach net-zero well ahead of 2050. To meet this wider target, the Council understands the need to act collectively and at pace with partners across the County.

With the UK’s commitment to decarbonising the electricity system by 2035, there is a clear need to transition our energy system to accommodate; a switch to cleaner energy; the predicted rise in demand for electricity which is predicted to treble by 2050 as a result of the switch to greener technologies such as heat pumps and electric vehicles; and the need to introduce flexibility in the local electricity network to make best use of existing capacity and avoid the need for costly network upgrades.

Oxfordshire County Council recognised the key role local authorities could play in this transition, due to the assets they hold, their participation in local infrastructure planning and the interface with residents and community groups. With its well-established partnerships in energy innovation, the Council felt that Oxfordshire was ideally placed to delve into the unknown to develop and trial the tools, processes, and partnerships that could deliver the low carbon energy system we all want to see. This led to the inception of Project LEO.

The 40-million-pound project was part funded through £15m from UK Research and Innovation’s Strategy Challenge fund, with the remainder of the funding coming from private sector project partners.

The overall project objectives can be broken down into three main parts:

- Testing new market and flexibility models – exploring products and services that create new opportunities to benefit from the way we generate, store, and use energy in our homes, organisations, and communities.
- Advancing the capabilities of networks to manage smart, renewable and storage technologies – learning what needs to happen to our electricity networks to make them ready for a change to a local energy system.
- Facilitating local participation in the energy system – ensuring that individuals, households, and organisations are part of the energy transition.

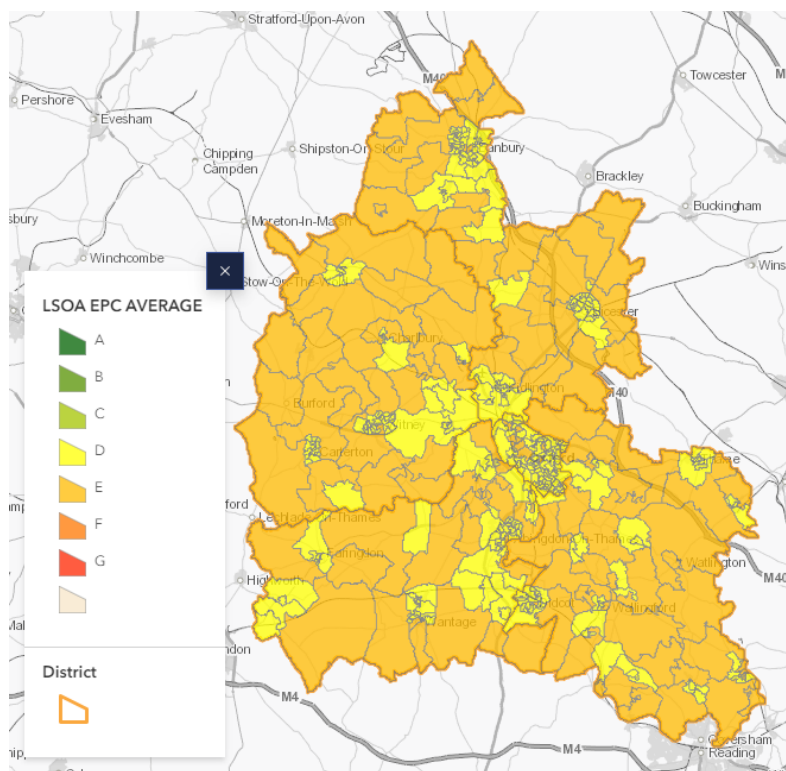
The cross-sector collaboration included Oxfordshire County Council, Scottish and Southern Electricity Networks, Low Carbon Hub, Equiwatt, Oxford Brookes University, Oxford City Council, Oxford University, Nuvve and Piclo.

Roles and responsibilities of each of the stakeholders were clearly defined at the project outset. Oxfordshire County Council led the development of a Strategic Energy Mapping Platform to support local area energy planning and provided assets to participate in the flexibility trials.

Developing the energy mapping platform and challenges faced

Accessing granular data, understanding the current energy demand profile and the ability to collaborate with other stakeholders involved in local area energy planning, had been identified as a significant challenge for local authorities generally, including Oxfordshire County Council. The need for a strategic mapping tool was identified to host geospatial data and support teams across Oxfordshire working to decarbonise.

Drawing on expertise in the wider partnership (and beyond), the Council commissioned Advanced Infrastructure to build a new spatial mapping tool to support energy systems planning. The resulting LEO Strategic Energy Mapping Platform draws together over 150 layers of data (publicly available, held or commissioned by the Council or other LEO partners, or provided by the Energy Systems Catapult) into a single space, to give an accessible overview of land use (including environmental and landscape designations, agricultural grade, flood risk zones, planned housing and employment growth) and energy assets in Oxfordshire. New data identifies areas across the whole County which may be suitable for installation of additional renewables and estimates the potential generation capacity for each suitable area. Further datasets identify opportunities for household renewable generation (roof top solar and/or ground source heat pumps) and help identify neighbourhood and community areas where energy efficiency programmes may be best targeted. Together, these datasets will help the Council and key stakeholders across the County to plan for the scale up of renewable generation, roll out of low carbon technologies and improvements in energy efficiency, needed to meet emission reduction targets.



Data sharing

One of the challenges faced by the Council was accessing and sharing data amongst the diverse partnership, including commercial organisations. However, this was largely resolved via a clear Data Sharing Agreement acceptable to all partners. The complexities of data protection, and dealing with personal data, were addressed through rigorous risk and impact assessments. Spatial data is shared through the Public Sector Digital Agreement and under licence as appropriate to project partners.

A fit for purpose tool

Developing a mapping tool that provides suitable data and functionality for a wide range of users presented numerous challenges. To ensure the tool was fit for purpose:

- User testing was prioritised during the development stage; the Council engaged with colleagues from across Oxfordshire's 6 local authorities to identify data, trial functionality and test outputs. The feedback

was used to refine the system. This has resulted in the platform being well-received and generating interest outside of Oxfordshire.

- Worked closely with Energy Systems Catapult who played key role in providing robust data. This successful collaboration has provided valuable insights into developing the platform and populating it with data that can be made available nationally.

The resulting energy mapping tool has been well received by stakeholders and is already supporting decarbonisation projects across the County:

- Identifying properties suitable for our 'Home Upgrade Grant' retrofit scheme;
- Supporting the City Council EV team in the roll out of EV charging points;
- The development of local area energy planning.

Outcomes

Project LEO has succeeded in providing a blueprint for the energy system of the future, a greener, more flexible, and fair electricity system where everyone benefits. The project findings have been disseminated widely by the project partners. The team were delighted to be invited to Westminster in February 2023, by Chris Skidmore MP, Chair of the Net Zero Review, to discuss the learnings from the initiative. Demonstrating that Project LEO is considered one of the UK's most ambitious, wide-ranging, and innovative energy trials.

The key project findings:

- Local Area Energy Plans (LAEPs) should be mandatory, convened by local authorities whose central role is supported by appropriate resourcing, and dedicated to a 'whole systems' approach that will adopt the best solutions for each area, informed by the priorities of the local community.
- Aggregators, in the widest sense, are essential to develop flexibility markets, offering the skills and expertise that can open up participation in flexibility markets to whoever wishes to engage; this will be core to delivering a fair transition.
- The regulatory framework must support network operators' ability to invest in electricity infrastructure, data and digital for the long term and in anticipation of new demand, to ensure our net zero targets are reached.

Future plans

Decarbonising the Oxfordshire economy and society remains a priority. Oxfordshire County Council is committed to work in partnership to develop a Local Area Energy Plan that makes this priority tangible and manageable. The Council has engaged local stakeholders and are establishing a working group to take this forward. The LEO energy mapping tool will play a key role in developing this plan.

The Energy Mapping platform will continue to be developed, for example through the 'Digital Local Area Energy Planning' project led by Advanced Infrastructure, with OCC, SSEN, Dundee City and Perth and Kinross Councils, funded through the Net Zero Living, Pathfinder Places Programme.



5.2 Durham County Council – Creating a low carbon depot at Morrison Busty

Background:

Between the 1920s and 1970s, Morrison Busty was the site of a large colliery in north-west County Durham. At its peak, the colliery employed over 1,500 people and was extracting 1,450 tonnes of coal per day. When the colliery closed in 1973, the site became an operational depot for Derwentside Council, before becoming one of Durham County Council's strategic depots servicing the northern part of the county. The Morrison Busty Depot is one of the Council's largest strategic depots, serving around 350 square miles of the north and west of County Durham. The depot provides equipment storage, a base for fleet vehicles, a household waste recycling centre, a horticultural nursery and offices, which when combined was contributing 1,150 tonnes of carbon dioxide per year, or 2.5% of the Council's total emissions.

Through its Climate Emergency Response Plan, Durham County Council has set the target of reaching net zero carbon by 2030. One of the ways in which the Council has been able to work towards this ambition is through its work to transform the Morrison Busty Depot to be low carbon.

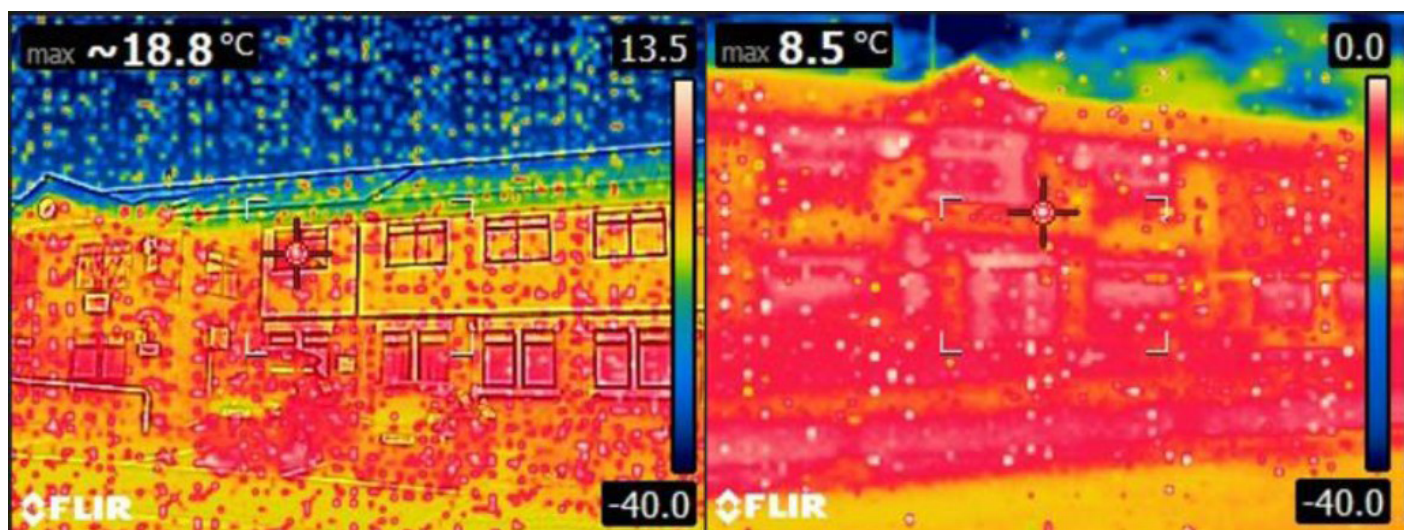
Project overview:

The project aimed to facilitate a dramatic reduction in carbon emissions through a holistic, whole place approach to future proof the depot, upgrade services and provide a path to net zero for the site. This was done by providing electric vehicle charging for the fleet based at the site, upgrading the fabric of the buildings and removing natural gas boilers and replacing them with air source heat pumps. The depot's buildings and EV chargepoints are powered by a 3 MW solar farm which is connected to the depot via a direct wire, and supported by 2 MWh battery storage. The £8.3 million project was funded through £5 million from the European Regional Development Fund, with the remaining £3.3 million coming from Durham County Council.

The two office buildings on the site were thermally inefficient and required upgrades before the installation of heat pumps. The fabric improvements included new windows, a thermal wrap, mixing external and internal wall insulation, as well as insulating roof spaces. Alongside this, mechanical ventilation with heat recovery will ensure that fresh air is provided to the spaces without significant heat loss.

The project is tackling the three major challenges in reducing emissions for local authorities in decarbonising transport, heat, and electricity. The holistic approach provides a strategy for decarbonisation that will be replicated across other council sites and used as a national demonstrator project.

The below images show heat loss from one office building before and after the thermal efficiency upgrades:



Outcomes and benefits:

It is expected that as a result of the solar generation, thermal upgrades to buildings and the installation of air source heat pumps, the site's emissions will be reduced by 74%. The EV charging infrastructure installed on the site will support the electrification of the Council's fleet which is being undertaken gradually. Once 50% of fleet vehicles at the site are electrified, this emissions reduction is modelled to increase to 93% and upon full electrification of the Council's fleet, 107% of emissions will be reduced.

When the entire fleet based at the site has been fully electrified, it is predicted that demand for electricity at the site will be approximately 1.9 GWh per annum, whilst the solar farm is set to generate 2.2 GWh per annum, however electricity will be required via a grid connection during winter months and exported to the grid in summer months. A smart energy management system will optimise how and when energy is used at the site, maximising the use of the battery and minimising costs for the depot.

The project has been subject to an independent summative assessment that found that the project is expected to achieve:

- 862 tCO₂e annual reduction in Greenhouse Gas emissions, equivalent to £895,380 over 25 years;
- 1,065,846kWh reduction in annual energy consumption on site (including public buildings);
- Translating these energy consumption and Greenhouse Gas emission reductions into monetary savings and combining them with the estimated financial value of other, wider impacts arising from the project, the Council has estimated that the £8,342,698 project will have a net economic impact of £69,118,248, corresponding to a return on investment of £8.28 per £1 invested.

The multidisciplinary approach that was taken to design the project allowed the project to deliver a holistic and future-proof whole-place-based solution to multiple needs that the Council was previously facing (need to reduce its own carbon footprint, need to reduce its energy and site operations costs, need to improve working conditions for site-based staff etc). It has also allowed the project to create value and opportunities for new stakeholders. For example, the refurbished offices now provide high-quality meeting space that local community groups can hire.

Overcoming challenges:

The Council outlined a number of challenges that had to be overcome to ensure the successful completion of the project, including:

- Facing challenges such as the project design stage coinciding with the COVID-19 pandemic;
- Difficulties with sourcing specialist parts during the Brexit transition period;
- Surprising underground conditions at the site;
- Delays created by utility companies, meaning that site commissioning took place before the project end date.

Additionally, as the site included a large field which now hosts the 3 MW solar farm, it was vital that environmental impact assessments were carried out to prevent damage to wildlife in the area. The assessment found that wildlife including newts were present on the site, to avoid the solar farm having negative impacts on the wildlife, new habitats including wetlands were created to ensure they were not negatively impacted by displacement.

The grassland now hosting the solar farm will not be mown to allow wildflowers to bloom in the summer months and a local farmer has agreed to allow his sheep to graze on the field if the grass begins to shade the solar panels. This reduces fuel consumption on the site, as no lawn mowers are required, provides shaded areas for invertebrates, and supports wildflower meadows creation to sequester carbon.

Despite these challenges, the low carbon depot project was not only within budget, but extra work was also able to be conducted within the budget, such as the replacement of the natural gas heating of the on-site nursery with high-efficiency air source heat pumps.

Lessons learnt:

- Communicate to all teams that there is no such thing as free electricity, if they believe this it will ultimately lead to wastage.
- Developing an all-year-round culture of energy efficiency and lower electricity demand will pay dividends when the generation from solar PV is lower and battery storage has longer periods to self-power the site in the winter months.
- The later stages of commissioning should involve those who will be responsible for operating the system and to assist in the training & handover process.
- Early monitoring of the system to ensure performance is as per predictions.
- Despite having a web-based monitoring and logging system for solar PV performance and yield we would still recommend including simple non-resettable generation meters for an additional back-up and to assist with fault finding.
- When working with a DNO export limit (G100) it's essential to have a customer side tripping device which will trip before the DNO's device and which can be re-set and managed by the site team.
- Use temperature loggers in those areas where there are multiple users and differing opinions of whether room temperature is correct, particularly when going across to heat pumps which operate at lower flow temperatures and therefore radiators are not as hot to the touch.

Future goals:

Durham County Council hope that this project will act as a national demonstrator for further decarbonisation projects at council depots, whilst also supporting the Council to achieve its fleet decarbonisation ambitions.



5.3 Mid and East Antrim Borough Council – Hydrogen Training Academy

Background:

In 2018, Mid and East Antrim Borough Council identified CleanTech and the hydrogen sector as offering significant opportunities for growth and identified the need to train and upskill existing industry staff and new trainees to the recognised professional competence standards required for this growing sector.

In order to address this issue, the pilot Hydrogen Training Academy (HTA) was created. The training academy is a skills development project led by Mid and East Antrim Borough Council, in collaboration with academia and industry partners. The project supports development of the hydrogen economy, through delivering essential hydrogen training for industries, utilising bespoke practical training labs. The training academy is helping to address skills shortages, through developing workers to meet industry and market demand.

Overview:

In 2020, the Council developed a highly ambitious and innovative strategy to become the “CleanTech hub for NI” based on the significant strengths and assets the area has in this sector, including green energy players such as Wrightbus, the leading manufacturer of hydrogen buses, alongside green bus manufacturer Alexander Dennis, and the fact that the borough houses NI’s two power stations at Kilroot and Ballylumford. The area is home to Ryobi, Caterpillar, Cranswick Country Foods, and Moy Park, who are at the forefront of adapting business operations to more efficient green energy fuel sources.

The UK Hydrogen Strategy (2021) sets out the Government’s drive to deliver 5GW hydrogen production by 2030. With almost no low carbon production of hydrogen in the UK, meeting this 2030 ambition and delivering decarbonisation and economic benefits from hydrogen requires a rapid and significant scale up. The workforce of Northern Ireland and the UK in general does not currently have the necessary skillset to be able to respond to demand and opportunities in this sector, hence the need for the ambitious HTA.

The Hydrogen Training Academy (HTA) has been described as the first of its kind in the UK, and to create the academy, Mid and East Antrim Borough Council led a collaboration of organisations including, Northern Regional College, Belfast Metropolitan College, Queen’s University Belfast (QUB), Ulster University, University of Birmingham and industry partners, through the Council’s Manufacturing Task Force.

The HTA was funded through a successful application to the Community Renewal Fund, securing £511,130 for implementation, with additional funding from Government, private sector sponsorship and the Labour Market Partnership increasing the total to around £800k. The training academy was progressed through discussions with industry and stakeholders on skills requirements to develop and grow the hydrogen economy. This included local and national government, where discussions focused on alignment with the Department of Agriculture, Environment and Rural Affairs of Northern Ireland’s (DAERA) Green Growth initiative. Investment in skills and innovation was identified as key across all stakeholder and industry groups and the project concept was expanded and developed into the HTA Project.

Aims and objectives:

The aims and objectives of the HTA were to;

- Inform and develop new hydrogen course material and recruit trainees
- Educate stakeholders and industry representatives on opportunities within the hydrogen economy
- Develop two innovative and fully equipped training facilities, a H² Gas Safe Lab and a Hydrogen Fuel Cells Lab
- Deliver accredited hydrogen skills training to 180 people across private industry sectors and public sector stakeholders



Challenges overcome:

The Hydrogen Training Academy faced challenges in relation to financing, capacity/capability, consumer engagement/behavioural change, and policy/regulation throughout development. These were overcome by:

- Using innovative, creative and collaborative approaches to successfully manage the process to secure maximum funding
- Using specialist consultants for equipment design, with academia providing technical knowledge, and private sector stakeholders informing subject matter
- Launching a PR campaign communicating the project to stakeholders and informing and engaging consumers to help alleviate public concerns regarding safety. Pilots and demos of bespoke training labs helped to accelerate adoption
- MEABC leadership and pushing forward in the absence of policy and regulation being in place for hydrogen, with a campaign of lobbying supported by stakeholders, to help inform policy decisions. This included identifying the need to set up a Hydrogen Skills Training Taskforce.

The unique cross-sectoral collaborative approach has strong engagement between public and private sectors and training providers, utilising bespoke labs to support delivery.

Outcomes and achievements:

This HTA increased public awareness and early acceptance of hydrogen through extensive communication and dissemination activities, and it also addresses fuel poverty challenges. Power capacity shortages, combined with an economic crisis, created the worst fuel poverty situation that NI has experienced. Energy capacity concerns reinforce the fact that public sector must work together to harness hydrogen as an energy source, through the development and diversification of skill sets which support hydrogen integration across a range of sectors.

By March 2023 the HTA partnership had not only met but exceeded the agreed objectives set at project concept. A Learning Pathway for a range of hydrogen subjects from Level 2 Level 7 has been created supporting the development of the skills required to maximise opportunities in the hydrogen and CleanTech Sectors.

Additional financial support was secured in March 2023 via the Mid and East Antrim Labour Market Partnership to develop the Level 2 and Level 3 materials so they could be delivered online. Work on this online learning platform was completed in September 2023 with the courses due to be available from early 2024.

The project has been very well received across both public and private sectors and been recognised for its innovative approach, landing five prestigious awards in 2023. These included: Highly Commended in the Business Eye Sustainability Awards in February 2023; Winner of both the Regeneration Project of the Year and Council of the Year categories at the iESE Public Sector Transformation Awards in March 2023; Silver Award for Best Public/Private Sector Initiative at the APSE Service Awards in September 2023; and finally Silver Award at the All-Ireland Sustainability Awards for the Best Energy Initiative or Project of the Year in October 2023.

Short term benefits	Long term benefits
Improved qualifications	Unemployed/economically inactive residents secure employment
Improved employment prospects	Unemployed/economically inactive residents secure further training
Improved confidence, self-esteem, motivation	Improved flexibility and mobility of participants
Extended career pathways, earning potential	Reduced economic shock as traditional industries transition to net-zero

Lessons Learnt

- Need for collaborative approach to develop solutions - to ensure the success of this project MEABC established a consortium made up of: Private industry, public sector organisations, Government Departments, Academia, public corporations and lobby groups such as Hydrogen NI and the MTF to work together to provide a practical solution to an imminent future need and resource requirement.
- Significant leveraged funding and investment secured - the initial funding secured from UKCRF was £511k. Through successful promotion, engagement and networking, MEABC were able to secure and leverage an additional c£290k to make the total investment c£800k from a range of public and private sources, which will result in training being delivered to 200+ participants and investment of over £200,000 in bespoke training equipment. Investment of £50k from EPUKI, the owners of the two Power Stations in NI and members of the EPH Group reflects the relevance of the project to industry.
- Aligning Capital with Revenue Funding to maximise outcomes - The two bespoke mobile training labs are dedicated to providing practical, hand on training to accompany the online and classroom based training. The labs are unique and provide real added value to the HTA learning experience.
- Knowledge Sharing and Learning – there has been significant engagement and collaborative working between academic partners throughout the project to develop the desired pathway and ensure complementarity and alignment with other provision across the board.

In summary, the HTA:

- Created a coordinated learning hub with extensive expertise and industry engagement
- Utilised academia experience to design, develop and accredit content and structure of the course for technicians
- Brought together parallel education providers in a joined-up approach
- Created a hydrogen learning network to share knowledge and expertise, ensuring training based on industry need and advances in the sector
- Developed and delivered essential hydrogen skills training courses, accredited at OCN Level 3, across a range of public and private sector organisations

Future plans

Future plans include creating a physical hub to stimulate and support innovation in CleanTech and advanced manufacturing. The £24m Belfast Region City Deal i4C Innovation & CleanTech Centre will be established in Ballymena in 2027, to include a dedicated space for a fully scaled HTA base.

HTA is acting as a pre-cursor to the £15m HyTechNI project, which will see a series of hydrogen testbeds in the area on the themes of heating, transport, and skills training, alongside a hydrogen technology accelerator led by QUB. This is an important corner stone in both the positioning of the borough as a hydrogen hub and supporting significant innovation activities in CleanTech.

Development of the Hydrogen Training Academy continues in the interim period without significant financial support in place. Northern Regional College are mainstreaming the existing Level 3 courses into the curriculum at Northern Regional College. Mid and East Antrim Council continues to promote the HTA and the H2 Gas Safe training lab for training organisations and as a demonstration piece. All HTA Partners continue to explore opportunities for further investment in the project in order to build on the innovative work carried out to date and maximise the opportunity for green growth in Northern Ireland.

5.4 Neath Port Talbot Council – The Bay Technology Centre

Background:

Neath Port Talbot Council has developed the multi award winning Bay Technology Centre (BTC) with the aim of creating the first commercial energy positive building in Wales. The £8.5m scheme was funded through £3.75m in European Regional Development Funding (ERDF), alongside £3m in funding from the Swansea Bay City Deal, £500,000 from the Welsh Government's Economic Stimulus Fund and a further £1.25m from Neath Port Talbot Council. The building's energy positive status means that it generates more power than it uses, something which closely aligns with Neath Port Talbot Council's Decarbonisation and Renewable Energy Strategy.

The Bay Technology Centre provides high quality, flexible office and lab space for start-ups and indigenous business growth, with a focus on technology, innovation and R&D across various sectors looking to grow and flourish in South Wales. The BTC which opened in June 2023 has a tenancy focus of supporting organisations which are involved in net zero and carbon reduction, one of the first organisations to occupy space in the BTC was a renewable energy company which develops wind turbines for small-scale wind projects.

Overview:

The BTC is situated in the Baglan Bay redevelopment area, a large brownfield site on a former chemical plant. The 500-hectare site has been parcelled up with the Baglan Energy Park forming one of the parcels in the north of the site adjacent to the M4 which connects Port Talbot with Swansea to the west and Cardiff to the east. The Energy Park includes an existing Innovation Centre and University of South Wales and ERDF funded Hydrogen Centre, both sites support innovation among businesses.

The Bay Technology Centre was conceived as an extension space to the Innovation Centre, continuing the energy theme of the part and setting a standard for commercial property in the area through its energy positive status and state of the art design. The intention is that the surplus energy is used to supply the Hydrogen Centre to create hydrogen to power the council's commercial fleet of vehicles. To support the ambitions of the City Deal and Enterprise Zone, the Bay Technology Centre was designed to include a mix of laboratory and office space to support organisations involved in the commercialisation or production of scientific innovation and processes, allowing testing and development. The ambition was that this would attract growing and innovative businesses who would help diversify Neath Port Talbot's local economy where heavy industry and manufacturing (particularly from the Port Talbot Steelworks) dominates. Capturing spin out companies from the University of South Wales and Swansea would support this strategic goal.

Further to the site's energy positive credentials, an environmental management plan was also prepared as part of the development phase, protecting wildlife, minimising pollution and using materials based on their sustainable characteristics. Biodiversity conditions were met with early surveying enabling the establishment of a clear boundary line between the site and where habitat management was needed. Through paying close consideration to the local environment, the scheme managed to achieve a 486% net gain on area-based biodiversity through enhancing habitats.

The focus on environmental management and sustainability meant that through extensive pre-planning, the Council were able to design out waste, with the construction work producing just 2.4 tonnes of waste per 100m², which is considerably lower than the typical UK project average of 11 tonnes per 100m². Of the waste that was produced, 96% was diverted from landfill, with 59 tonnes of construction waste being recycled or recovered. Additionally, 92% of the building fabric can be recycled at the end of its life.

How did the building become energy positive?

The Council has predicted that the energy use intensity of the BTC will be 66.5 kWh/m²/a, whilst the renewable generation will be 69.1 kWh/m²/a, meaning that the building will produce more energy than it uses. This impressive achievement marks a 281% energy improvement over current building regulations.

Passive design principles were used when planning the installation of the building fabric, massively reducing the amount of energy that is required to heat the building. The building management system of the BTC has been set up to shut down any non-essential equipment when not in use, further enhancing the energy efficiency of the building.

The building is powered by renewable energy, generated on site. The external cladding of the south and west facing walls is made up of solar panels, whilst the roof is also covered in solar PV.



Challenges overcome:

As the design stage of the project took place during COVID-19 lockdowns, the Council's construction partner trialled a cloud based collaborative design approach to mitigate against the challenges of working from home. This was extremely successful, with the innovative application of this software also taking some of the lag out of the design process on collaborative schemes where recommendations could be made and shared in a virtual space where all parties could view the details. Being able to share the 3D +model also made it easier to explain challenges with the Council and for both parties to easily identify risks for the site team. Utilising this technology for augmented reality was also explored on this project but was less successful with the processes for this being explored in more detail by the construction partner.

Outcomes and future targets & goals:

The state-of-the-art Bay Technology Centre achieved an 'Excellent' Building Research Establishment Environmental Assessment Method (BREEAM) rating for its build reinforcing the sustainable credentials that were sought, this was one of the Council's key targets at the beginning of the project. The Council hopes that the technology centre will be a showcase for innovation, highlighting the possibility for local authorities to invest in energy positive buildings.

Future impacts will also be to raise the opportunities for high value jobs in Neath Port Talbot, help to diversify the local economy and encourage productivity improvements. The role of the Bay Technology Centre in supporting spin out organisations from local universities is already being pushed and this will help to drive commercialisation of innovation. Alongside the neighbouring Innovation Centre, the Technology Centre is supporting a growing hub at the Baglan Bay Energy Park and within the Waterfront Enterprise Zone which may catalyse further investment.

Bringing high skilled individuals into the Bay Technology Centre will also create opportunities for improving the local labour market, as learning is shared. With the focus of tenant organisations on research and development, there is also likely to be an emphasis on training and development of staff to remain abreast of developments in respective sectors. The current tenants and prospective pipeline were well regarded by stakeholders as appropriate to the ambitions of the Bay Technology Centre for a mixed-use research and development space. It was recognised that the businesses needed to meet a broad definition of research and development to ensure the widest economic opportunity. This included securing organisations who have the potential to grow and secure high value employment locally across a range of sectors, especially where this linked to the low carbon and net zero agenda. It is reassuring that there is demand for the space given some of the risks raised by COVID-19 and expectations are that the property will be fully let.

5.5 Wigan Council - Youth Climate Summit

Executive Summary:

In July 2019, Wigan Council declared a climate emergency, before committing to the target of reaching net zero council emissions by 2038, with a further aim of reducing the borough's emissions at the same time.

Wigan is the 9th largest metropolitan borough in England and is home to around 47,000 children of school age. In the Council's climate strategy, it was acknowledged that youth-led climate action would be key, with the Council committing to ensuring that all young people within the borough would have the opportunity to live in a clean, green borough where a sustainable future is safeguarded.

This commitment to engagement with young people across the borough led to Wigan Council designing and delivering the first ever Wigan Youth Climate Summit in September 2022. The event saw over 120 young people from across Wigan and Leigh, come together to hear inspiring stories from schools and colleges, listen to poems and performances on climate justice, spend time exploring an 'Eco Marketplace' and a Green Careers fair, and also the opportunity to take part in climate change workshops.

Overview:

Wigan Council has long had strong links with local schools and colleges through its Eco Schools programme and the Climate Response Team now lead on all aspects of climate education and engagement within local schools. This team works closely with the Wigan & Leigh Youth Cabinet, who had outlined tackling climate change through enhancing the voice of young people as one of their top priorities. This focus on youth voice led to the decision to hold a youth-led borough wide event focussed on climate change, this event would become known as the Wigan Youth Climate Summit (WYCS).

The Council identified a number of key objectives that it wanted the Summit to achieve, including: Identifying what climate change means to young people and giving them a platform for their voices to be heard;

- Showcasing to students and local businesses and organisations, that there is a wide range of socioeconomic and over all wellbeing related co-benefits which arise from tackling climate change;
- Providing information through themed and age-appropriate workshops to help young people to develop skills and take practical action within their schools, homes and local communities;
- Providing a green careers event which would promote working in the green sector and promote initiative by local businesses.

As well as developing Council objectives for the Summit, Wigan Council also worked with the Wigan & Leigh Youth Cabinet to determine exactly what they would like the outcomes of the WYCS to be, these included to:

- "Identify what I can do to tackle the climate crisis – in my school, in my community and across Wigan Borough";
- "Identify what I need to help enact change";
- "Provide me with a voice to let you know what I think is missing to enable a sustainable and fair future for my and future generations";
- "To enable me to see a future possible career in enabling action to respond positively to climate change".

The event:

The inaugural Wigan Youth Climate Summit was held on the 28th September 2022, the event attracted over 120 students from local schools and colleges. The event was fully hosted by the Wigan & Leigh Youth Cabinet, to ensure that the event had a youth-led voice, with the Council's Climate Response Team project managing the event. Despite the Council playing a key role in planning the WYCS, a number of decisions were taken to the Youth Cabinet for sign off, to ensure that the decision-making process involved input from young people.

The event was sponsored by three businesses – Kraft Heinz, Murphy Group and FCC Environment, who all have a strong commitment to net zero and environmental practices, and all held stalls in the Green Careers

Fair to showcase careers within their sectors.

The WYCS was opened by the Youth Cabinet, followed by Aneeshwar Kunchala, a 7-year-old conservationist and Britain's Got Talent finalist, who provided an inspiring poem and Q&A session for attendees. The morning session continued with presentations from several schools and colleges who outlined their own climate action.

The event also involved age-appropriate workshops from groups such as the Lancashire Wildlife Trust, Transport for Greater Manchester and the Royal Horticultural Society, these workshops aimed to get attendees practically involved in climate action, in suitable and engaging ways. A green careers fair was also set up to showcase local and regional businesses and organisations who are combatting climate change or working towards achieving strong environmental and net zero targets.

Finally, around 14 local organisations set up stalls at the WYCS's Eco-Marketplace, these organisations ranged from CICs representing human rights, and animals, to local businesses and education services. The young people attending the summit had a lot of time to visit the stalls and learn about the varied connections that they had to different aspects of climate change.



Sustainability:

When planning the WYCS it was important to ensure that the events impact on climate change would be minimal, therefore it was decided that the WYCS would mark the Council's first event with sustainability at the heart of event management. This focus on sustainability included:

- **Venue selection:** the Council worked with local event space, The Edge, which is located in the centre of Wigan. The venue was selected as a result of its green credentials, with the space operating on 100% green electricity, alongside extensive recycling facilities;
- **Transport:** The Edge's location in the centre of Wigan meant that the venue had strong transport links, with the venue close to bus and railway stations. For attendees and stallholders who weren't able to travel on public transport, more sustainable transport such as active travel or car sharing was encouraged;
- **Catering:** the Council's in house catering team provided a fully plant-based lunch, including hot and cold options;
- **Advertising:** all event PR was undertaken online via Eventbrite free ticket distribution. Additionally, all event material such as banners, signage and bunting were produced without a date, so that the materials can be used year on year;
- **Paper usage:** all event stall holders and those running workshops were asked not to bring and distribute leaflets or paper materials;
- **Plastic:** no single use plastic was allowed onsite, with all beverages provided in fully biodegradable cups.

Outcomes and benefits:

Through leading on the delivery of the Wigan Youth Climate Summit, the Council has created momentum surrounding improved access for youth voices in climate action and policy within Wigan borough. The Summit closed with the Youth Cabinet declaring that they would be creating a Youth Climate Strategy which will be designed and consulted by the Youth Cabinet and delivered by Wigan Council.

The Council received 'incredibly positive' feedback on the Summit, 79 young people provided feedback and answered questions on what they had learnt from the Summit, all respondents agreed that they would like the WYCS to become an annual event.

The Summit brought together a wide range of businesses, community groups and other organisations from across the Wigan borough, with the event fostering relationships that are continuing now and into the future. Eight of the stall holders from the WYCS including small and large businesses, and human rights groups are now part of the Council's Wigan Climate Coalition, a group of 26 organisations and businesses from across the borough who are coming together to tackle the climate emergency together. As a result of the Summit, over 30 primary and secondary schools have requested lessons and assemblies both from the Council and other organisations to raise awareness on various climate topics.

Future plans:

Following on from the Summit, the Council are now working to review its event management process to understand how it can begin incorporating sustainability into all event management and decision-making processes in the future.

The 2nd WYCS was a further success, with the attendees doubling in size to over 250+ staff and students from local schools and colleges. After the feedback from the first Summit, the young people of Wigan & Leigh asked for more information surrounding waste and recycling, which became the theme for the 2nd WYCS on 27th September 2023. The Climate Response Team worked with local community groups and volunteers to create a new feature for the Summit – 2 themed workshop rooms were introduced including the 'Second Chance Saloon' highlighting the importance of reuse prior to recycle, and 'Save the Waves' to raise awareness surrounding plastic pollution in our rivers and oceans. A future target for the Council is to ensure that the 3rd WYCS is fully carbon neutral, with a plan to collaborate with the Lancashire Wildlife Trust to offset any emissions that come from the event through tree planting, species rich grassland creation and wetland restoration.

The Council also plan to create a Youth Climate Summit toolkit to share with other local authorities as it believes that the approach is easily replicable and could promote a stronger youth voice in local climate action and decision making across the country.



5.6 Nottingham City Council – Vehicle to Grid charging (CleanMobilEnergyProject)

Background:

Nottingham has a target to become the first carbon neutral city in the UK by 2028. To achieve this target, Nottingham City Council has set out a 250+ point Carbon Neutral Action Plan, one key aspect of this plan is decarbonising transport and moving energy generation to renewable sources and away from fossil fuels.

Nottingham City Council is making excellent progress in transitioning away from traditional internal combustion engine vehicles, with electric vehicles (EVs) now making up over 50% of the Council's fleet. European cities are increasingly investing in renewable energy production and EV charging infrastructure, but there are challenges due to a mismatch in renewable energy production and consumption peaks.

The CleanMobilEnergy (CME) City Pilot is one way in which Nottingham City Council is overcoming the challenges faced by this difference between production and consumption of renewable energy. CME is an EU funded scheme, with Nottingham's participation part of an Interreg North-West Europe Consortium. The consortium focuses on reducing carbon emissions through the development and application of REMove, a new inoperable energy management system to better balance energy demand with supply. Nottingham City Council's pilot is using the EU funding, alongside a contribution from Innovate UK.

CME has enabled the Council to significantly expand its EV fleet and install innovative infrastructure to support charging, using locally generated renewable energy with groundbreaking energy management systems, at the same time significantly reducing the Council's fleet and building emissions, supporting Nottingham's carbon neutral ambitions.

Overview:

The project has taken place at Eastcroft Depot and will allow the Council to export unused energy stored in EV batteries back to the grid at times of high demand and re-charge EVs – either from energy generated locally from solar PV, stored in stationary batteries, or from the grid at times of low demand when energy costs are much cheaper.

The development and application of the REMove energy management system was a key aim of the CleanMobilEnergy City Pilot. Current energy managements systems are not able to predict, measure, or decide how resources are allocated. At present, CO2 reduction energy systems are demonstrated through small, single topic systems that address either mobility management or energy production. REMove introduces a system that integrates existing, but fragmented solutions, based on mobility and energy flows.

In Nottingham, the CME project aimed to integrate renewable energy sources, storage devices and optimisation of consumption through the REMove energy management system. Through the project, the Council was able to install:

- 138kWp of solar PV generation;
- A 600kW/720kWh lithium-ion battery system;
- 40 V2G bidirectional chargepoints.



The 40 V2G units allow electric vehicles to act as short-term storage for energy produced by the 138kWp solar array on site. The vehicles will be able to discharge to the onsite battery energy storage systems (BESS) or the grid during peak times. The 720kWh battery energy storage system is made up of second-life electric vehicle batteries. While these batteries are no longer sufficient for car journeys, they have plenty of life left in them for storing power. 40 V2G vehicles were also procured; these EVs, alongside the V2G infrastructure, will not only minimise CO2 emissions but also the high capital costs of an expanding EV fleet are turned into an opportunity, by capitalising on the EV storage capabilities, thereby avoiding expensive electricity grid reinforcement works.

To facilitate the project, the Council was required to install a new site incoming power supply on the high voltage network and upgrade the on-site low voltage network – which was a significant piece of work.

Outcomes:

Through the project, Nottingham City Council has enhanced its fleet with 46 electric vehicles, including 36 Nissan eNV200 vans, 4 Nissan Leaf electric cars and 6 electric refuse collection vehicles, with the vans and cars being V2G capable. The Council also future proofed its EV fleet expansion, through a new 11kV power supply, along with a much-needed upgrade to the low voltage network.

The installation and optimisation of solar PV generation and EV charging has enabled the Council to lower its emissions and work towards the target of Nottingham being a carbon neutral city by 2028.



Future plans:

The Council's future plans include:

- Continuing the optimisation of the overall system, using monitoring data, along with fleet operational requirements, and including simulations to improve future performance.
- Effective management of in-front and behind-the-meter energy flows, using energy storage.
- Data to be used to further develop the REMove EMS, to enable it to act as the command and control for the system.
- Investigation of the potential to obtain best value from energy contracts, using time of use and grid services procurement.

5.7 City of Lincoln Council & YES Energy Solutions - Home Energy Upgrade Scheme

Background:

In 2022, the energy crisis saw huge increases in the amount of money being spent on heating homes across the UK, with the largest burden falling on those experiencing fuel poverty, in energy inefficient homes. In the East Midlands 14.2% of the population are experiencing fuel poverty, a figure which is higher than England's average. It was for this reason that the Home Energy Upgrade Scheme was launched by a consortium of local authorities, led by City of Lincoln Council.

The consortium was made up of City of Lincoln Council, North Kesteven District Council, South Kesteven District Council and West Lindsey District Council. All councils in the consortium have declared climate emergencies, and with 15% of carbon emissions originating from home energy use, the scheme has gone a long way to tackling this issue. The scheme is part of the Lincoln 2030 Climate Action Plan, which contains a decarbonisation strategy and action plan.

Through the Home Energy Upgrade Scheme, a £6 million fund was allocated for the installation of low carbon technologies and insulation works for private tenure properties. The scheme which focussed on fuel poverty alleviation, was launched in spring 2022, just as the energy crisis began to bite.

Project overview:

The scheme fully funded energy efficient and low carbon measures for vulnerable fuel poor households throughout the catchment area, specifically targeting residents most at risk during the energy crisis.

The available funding was utilised to help as many fuel poor residents as possible. A multi-measure retrofit approach was adopted, with the council procuring project management company YES Energy Solutions to target the support where it was most needed. The expertise of YES Energy Solutions was used to cover the full customer journey from recruiting eligible residents to managing the installation process. To make the project a success, YES Energy Solutions' resources were applied to project design; mobilisation; CDM; building control and planning applications; eligibility validations; contractor management and; customer satisfaction.

The project followed a whole house approach throughout the process. Once qualified for funding, YES' retrofit assessors conducted a survey of each property to create a bespoke retrofit plan. The Councils' survey teams also produced new EPCs for every property to ensure the property qualified and to help reduce fraud. The project adopted a collaborative approach, pooling knowledge and resources as far as possible, and by March 2023, the project had improved 146 households.

The scheme was originally designed to reduce fuel poverty through improving the thermal efficiency of homes with EPC ratings of D, E, F or G. £5.2 million of funding was available to boost poor EPC ratings up to band C to allow vulnerable residents to live in greater comfort, whilst being able to manage their energy bills during a cost-of-living crisis.

Low-income homeowners from the most underprivileged communities, where fuel poverty is prevalent, were targeted in the scheme. This was to ensure the energy efficiency measures funded through the scheme will have a major impact on improving the thermal values of properties with low EPC ratings whilst also having an impact on reducing fuel bills, alleviating fuel poverty and improving the physical and mental wellbeing of vulnerable residents.

In-depth research informed an innovative marketing campaign for the Home Energy Upgrade Scheme. A direct approach was used to reach the most vulnerable households, with the councils distributing letters to targeted lists. To raise awareness of the scheme further, an advertising campaign took place, combining digital tools with outdoor advertising to ensure the scheme was in the minds of residents in the area.

As the scheme entered its final phase, bills were double what they were when the funding application was submitted by the consortium. In this context, the scheme was able to protect the most vulnerable communities from spiralling fuel poverty. All thanks to a targeted publicity campaign that supported those who needed help to reach out and receive it.

The home improvements made so far have achieved annual carbon savings of 242,794kg. These carbon savings will repeat each year adding up to 6,069,850kg over the lifespan of the installed measures.

Outcomes and benefits

As of March 2023, annual bill savings for residents taking part in the scheme had reached £96,688.

On average, participants found that their properties' EPC was improved by over one and a half bands, with 104 properties achieving an EPC of C or above. The focus on low-income households meant that 146 households with annual income of less than £31,000 received energy efficiency upgrades. Across the 146 households, a total of 246 measures were installed, including:

- 20 air source heat pumps;
- 14 cavity walls filled;
- 6 electric storage heater upgrades;
- 12 external wall insulation systems;
- 1 underfloor insulated;
- 22 internal walls insulated;
- 66 lofts insulated;
- 13 room in roofs insulated;
- 92 solar PV systems installed;
- 307 EPCs;
- 199 retrofit co-ordinations.

The consortium has reported that the measures will achieve annual carbon savings of 242,794kg, with the potential of an additional £70,664 in savings as a result of energy saving advice given during the scheme through aftercare energy saving packs.

Overcoming challenges:

One of the challenges which faced the scheme arose as a result of PAS2035 regulations which meant that external wall insulation was very difficult to install. There was a solution to this challenge that would provide a good final product for residents in certain circumstances. The issue concerned the lack of roofline to cover the top ridge of the external wall insulation, presenting a risk of water damage and damp issues.

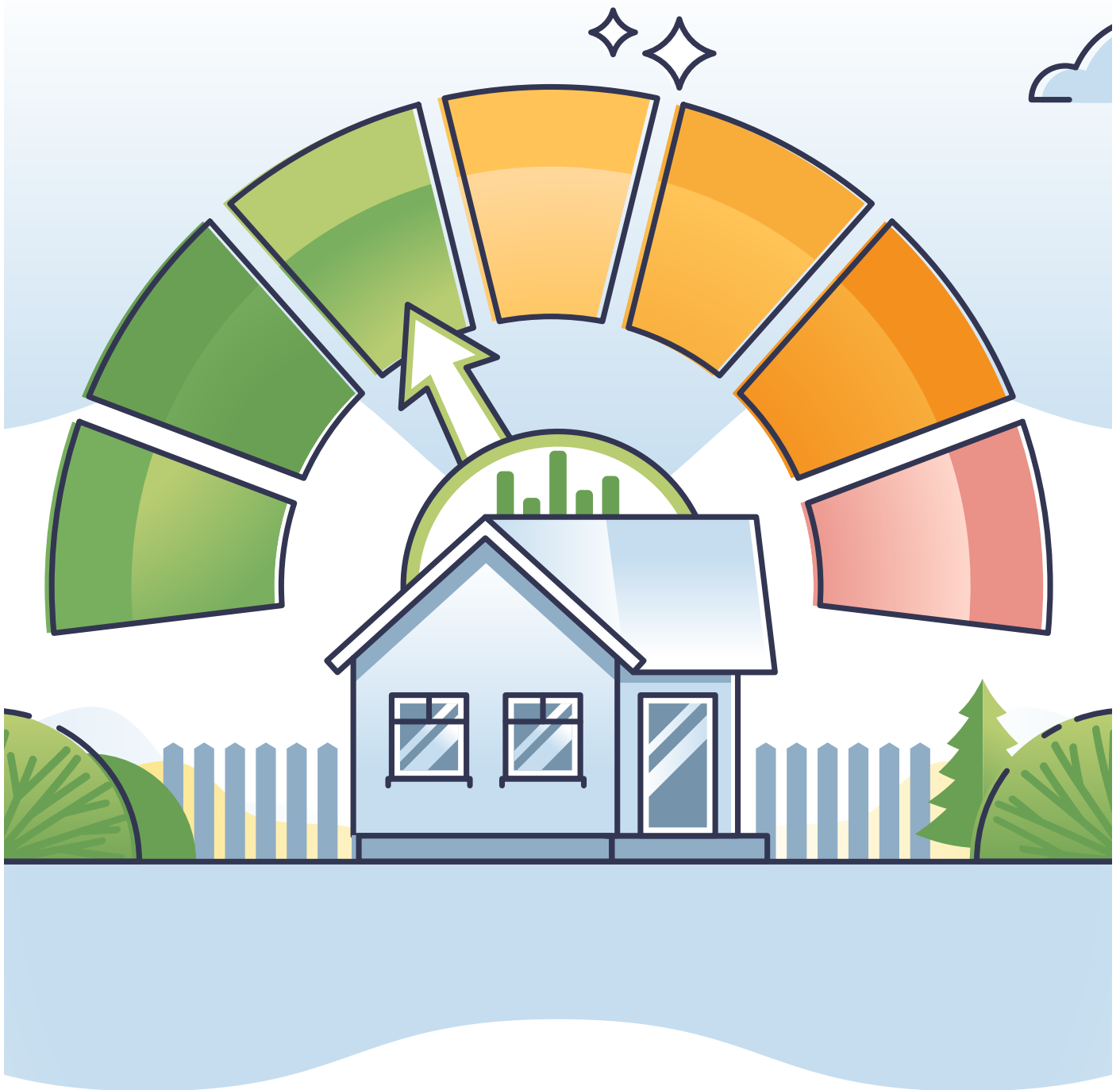
YES informed the consortium, and all councils agreed to promote internal wall insulation as an alternative solution. In addition, ancillary works were carried out at some properties to extend the roofline and allow the external wall insulation to go ahead. This did require the average costs in the scheme to be monitored closely due to the additional costs associated with the remedy. Lower cost measures were targeted in certain properties, the loft and cavity wall insulation balancing the costs of the expensive solid wall insulation to align with regulations in the schemes.

As is the case with funding through many Government schemes, unachievable timescales posed a challenge to the project. From the outset of the funding, the whole industry understood that it was unlikely that all funding from LAD and HUG would be spent to help households in fuel poverty – the timescale of one year was unachievable.

However, consistent lobbying from partners in the scheme, contributed to an extension to the funding to September 2023. Accurate reports of forecasts were used as evidence that an extension would bring substantial benefits to householders in fuel poverty.

Future goals:

Following on from the scheme's success, the consortium have secured over £10m to deliver HUG2 and are in the process of submitting retrofit measures on a range of off gas properties to the Midlands Net Zero Hub for approval.



6. Case study 'shorts'

Tewkesbury Borough Council – Solar carport

In the Summer of 2022, Tewkesbury Borough Council installed a 230 kWp Solar Canopy at its offices, which generates renewable electricity that can be used by both the council building and the leisure centre next door, whilst any surplus energy is fed back into the electricity grid. The solar canopy is made up of 570 panels and is supported by 13 columns, with the canopy roof angled to optimise energy captured from the sun.

The power generated is around 70% of the Council's electricity demand and by using less energy from the grid and less fossil fuels, the Council's greenhouse gas emissions will reduce by up to 76 tonnes a year, whilst the council see savings of around £45,000 a year in avoided energy costs.

In total, the project cost £627,000, with the Council successfully securing a grant of £284,000 from the Public Sector Decarbonisation Scheme.

Derby City Council – Urban Forest

In summer 2022, Derby City Council transformed the city's marketplace into an urban forest. The urban forest project was launched to combat climate change, whilst addressing the impact of urbanisation on the environment, biodiversity and the health and wellbeing of people living in the city. The project aimed to improve access to green space in urban areas and to improve quality of life for city residents.

The urban forest project involved transforming the marketplace into a vibrant green space by planting over 150 trees and 400 shrubs. The new trees provided shade, cooled the air and reduced the amount of heat absorbed by the pavement. This was particularly noticeable during the heat wave in 2022 where temperatures rose above 30°C.

Once the urban forest project came to a close, the trees and shrubs were re-homed in a city park to recapture the design, as part of the ongoing Queen's Green Canopy project. In 2023, Derby was given 'Champion City' status in recognition of the city's commitment to the Queen's Green Canopy project.

Lambeth Council – Electric cremator

In 2022 Lambeth Council's Bereavement Services implemented an innovative project, a new electric cremator at Lambeth Crematorium, replacing an end-of-life gas-powered unit. Operational staff were fully involved in the project from planning and training to installation.

In addition to using an electric cremator, the team has been making several changes across sites to reduce their environmental impact, including using electric vehicles and replacing all maintenance equipment with electric models where possible. They have applied a practical plan to the Council's Borough Plan, which promises to "Reduce carbon emissions, significantly cut waste and encourage re-use". The service continues to make more strides in this direction, with several more plans in the works for future years.

The Council has stated that a number of co-benefits of a more environmentally-friendly option are already apparent, with an average of three new funeral directors from across London making bookings each week. Service booking is up 27% from the last year on record before the installation was completed.

The cremator cuts out 30-35 cubic metres of natural gas pollution per cremation. This includes reducing carbon emissions by over 90% compared to gas cremators as well as reducing nitric oxide emissions to under 200mg - over 50% lower. Previous gas-powered models could release approximately 245kg of carbon per cremation, adding up to around 115,150 tonnes of carbon to the atmosphere each year. Making the change to electric makes an enormous difference to the effect cremations have on the environment.

Gedling Borough Council – Green Rewards

Green Rewards is an online platform using gamification to incentivise, encourage and inspire residents to undertake positive environmental behaviour change. Through inputting sustainable actions on the online platform, residents are able to input their sustainable actions and see the impact that they are having on tackling climate change. The actions focus on 6 themes:

- Travel;
- Waste and Recycling;
- Energy and Carbon;
- Get involved;
- Consumption;
- Biodiversity.

For each activity, Green Rewards members collect points which accumulate and give their household a ranking on the Green Rewards leaderboard. As well as individual households, there is also a team leader board. Teams are made up of the Wards the residents live in and residents are assigned into their Wards on registration to the platform. Each month, two winners are selected for each council, with the member with the most points and a raffle draw winner receiving a prize.

Green Rewards was created through a trailblazing partnership between seven Nottinghamshire District Councils, Nottinghamshire County Council, Nottingham City Council, both Nottingham University's and platform creator Jump, joined together to create the trailblazing partnership. Nottinghamshire is the first County in the country to see all its local authority and education partners collaborate on a climate change reduction project in this way.



7. 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.

We have 4 work strands, forming an overall objective of helping 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 DESNZ, 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.

Membership of APSE Energy means being part of a movement that looks for 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 understand our unique position within the sector and recognise us as a trusted supporter and a credible brand.

Whilst APSE Energy works across industry experts through our valued Associates we do not offer, and are not regulated to offer, investment advice in energy or indeed in construction and design services. Member local councils are encouraged to fully explore the benefits of renewable energy and energy saving measures across their authority and their locality to the benefit of the local environment and local citizens, however this should always take place with the secure knowledge and advice of their own council experts and appropriate professionals at every stage of development.

NEW MUNICIPALISM

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