Appendix 1

Decarbonisation Team Annual Report

November 2023

Introduction

In June 2019 Caerphilly County Borough Council (CCBC) declared a Climate Emergency and committed to 'making Caerphilly County Borough Council a net zero carbon local authority by 2030'. A Decarbonisation Strategy and accompanying Action Plan, containing 122 actions was approved in November 2020. A Decarbonisation Team was appointed in 2022.

This report highlights the work of the Decarbonisation Team in 2023. The Team works in partnership with multiple teams and service areas internally including Procurement, Land & Property Services, Fleet, Housing, Regeneration & Planning, Sustainable Communities for Learning, Social Services, Highways, Countryside, Community & Leisure and Parks.

Aligned with the structure of the Decarbonisation Strategy and Action Plan, the work of the Team is divided under the following five headings:

(i) Corporate and Cross-Cutting Actions
(ii) Reduce
(iii) Produce
(iv) Offset
(v) Buy

This Annual Report is structured to reflect these areas of work.

Corporate and Cross-Cutting Actions

To achieve Net Zero Carbon by 2030 it is fundamentally important that the organisation is able to measure its carbon emissions. Without measuring emissions and ascertaining the effect of targeted actions, the commitment to Net Zero Carbon is unachievable.

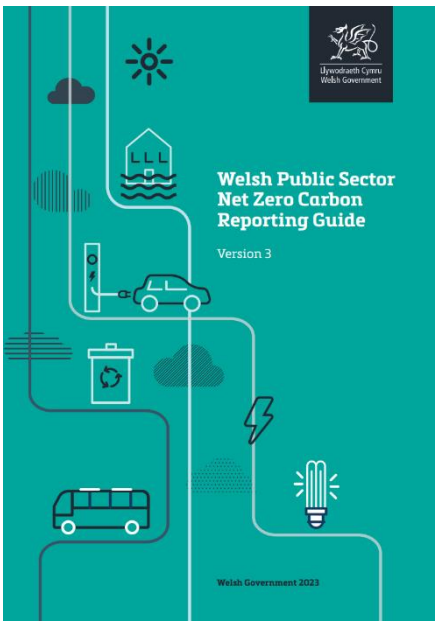
The Corporate and Cross-Cutting section of the Decarbonisation Action Plan focuses firstly on measuring and understanding organisational emissions so that actions for emissions reductions are targeted and measurable. Secondly, there is a need for dissemination of this information and knowledge. A program of awareness raising, and skills development is key to ensuring that decarbonisation is embedded into the organisation's ways of working.

The Decarbonisation Team reviewed the previous Action Plan, revised and agreed the Corporate and Cross-Cutting section into 11 actions (See Appendix 2).

Of these actions:

- 1 is completed
- 4 are going well with good progress
- 3 have had reasonable progress
- 3 are not yet started

Emissions Reporting



For the reporting year 2021/22 Caerphilly CBC reported an emissions total of 101,677,791 kg CO2e (22,560,205 kg CO2e operational emissions plus 79,117,586 kgCO2e supply emissions). This was offset by -7,420,489 kgCO2e through our land use, giving a submitted carbon emissions figure of 94,257,302 kgCO2e (or 94,257tCO2e).

For the reporting year 2022/23 Caerphilly CBC reported an emissions total of 103,308,185 kgCO2e (22,110,491 kgCO2e operational emissions plus 81,197,694 kgCO2e supply chain emissions). This was offset by -7,413,691 kgCO2e through our land use, giving a submitted carbon emissions figure of 95,894,494 kgCO2e (or 95,894 tCO2e).

The reported emissions for 2022/23 were an increase of 1,637,192 kgCO2e or 1.74%. Changes to reporting methodologies which have brought in additional areas,

and better data mean that direct comparison of year on year trends is not possible at this stage.

The overall increase was in part driven by an increase in third party spend of £31.1 million which resulted in an increase in supply chain emissions of 2,080,108 kgCO2e or 2.63%. Operational emissions actually decreased by 449,714 kgCO2e or 2%. Despite emissions from business travel (grey fleet) and commuting increasing and the introduction of reporting on F-gases, the reduction in emissions from streetlighting, buildings and waste led to the 2% reduction operationally.

Emissions Source	**2021/22**	**2022/23**	**Difference**	**% Change**
Buildings	14,461,974	13,154,526	-1,307,448	-9.04%
Streetlighting	976,579	797,619	-178,960	-18.33%
Fleet and equipment	4,107,401	3,988,849	-118,552	-2.89%
F-Gases		9,187	n/a	n/a
Agriculture	49,972	49,355	-617	-1.23%
Business travel	298,704	637,343	338,639	113.37%
Commuting	1,299,784	2,124,885	825,101	63.48%
Homeworking	886,897	912,032	25,135	2.83%
Municipal waste	478,894	436,695	-42,199	-8.81%
Total Operational Emissions	22,560,205	22,110,491	-449,714	-1.99%
Total Land Use emissions	-7,420,489	-7,413,691	6,798	-0.09%
Supply chain - Tier 1	79,117,586	81,197,694	2,080,108	2.63%
Total Emissions	**94,257,302**	**95,894,494**	1,637,192	1.74%

Table 1, Breakdown of Organisational Carbon Emissions 2021/22 – 2022/23

Following deeper analysis of the reported emissions from 2021/22 it was anticipated that emissions would rise in 2022/23 as data collection and analysis improves year on year. This results in emissions that were previously unable to be collected and reported on being included in the organisational report, giving a more accurate representation of Caerphilly CBC emissions.

The increase in emissions from Business Travel and Commuting are due to improved data collection for the most recent reporting year. Previous year's emissions omitted HART mileage from Business Travel and Schools from Commuting.

There were a number of changes to emissions factors from 2021/22 to 2022/23, most noticeably in the supply chain. The grid electricity emissions factor now includes a proportion of emissions outside of scope, so whilst consumption has increased, associated emissions have decreased.

The increase in supply chain emissions highlights once again the need for improvement in methodology for calculating these emissions; spend went up and so emissions went up – despite the emissions factors being re-calculated so that many fell. Also, with the ability to analyse the spend more closely, emissions that previously would have been classified just as construction or food were able to be more accurately classified to the specific SIC code relating to the product. This in some cases placed more spend in categories with slightly higher emissions factors leading to higher emissions.

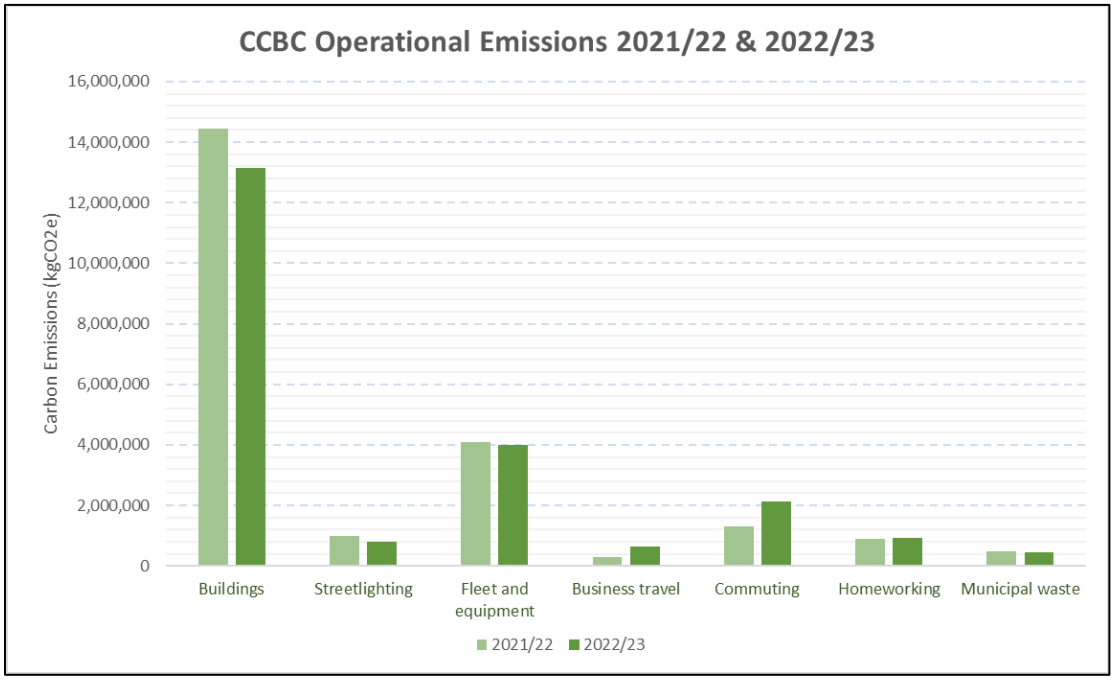


Figure 1, CCBC Operational Emissions 2021/22 & 2022/23

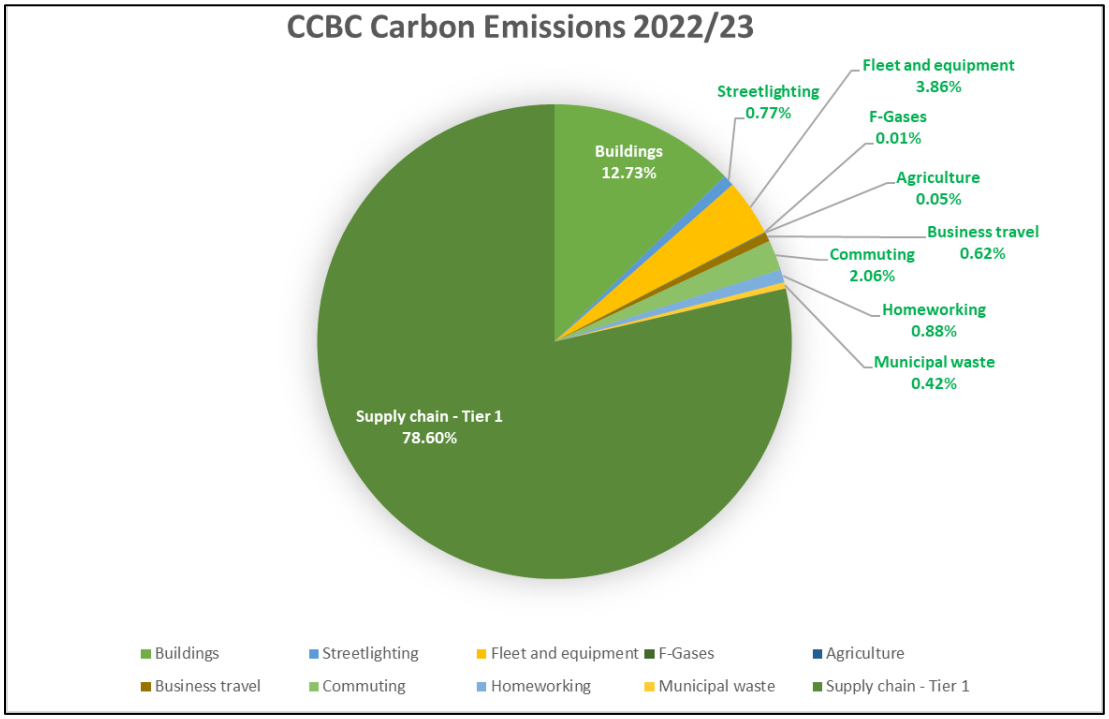


Figure 2, CCBC Organisation Carbon Emissions 2022/23

Service Area Baselines

In June 2023 a Cabinet recommendation was approved (Recommendation 2), that **"each Directorate and Service Area is given a copy of their carbon baseline, and that during 2023/24 financial year work is done to support them to fully understand and analyse those emissions and to identify priority areas for reduction."**

The Decarbonisation Team has produced emissions baselines and footprints for each Directorate and Service Area, aligned with Welsh Government Net Zero Carbon Reporting for 2021/22 and 2022/23. The data is contained in spreadsheets and visualised using Power BI reports. To enable understanding of these emissions presentations have been developed with delivery and timeline to be agreed.

Following the presentation of baselines to services, further analysis of these emissions in partnership with services can begin. This will enable budgets to be set for carbon emissions from 2024/25 as approved in June 2023 by Cabinet (Recommendation 3).

A calculation of residual operational emissions will help to inform this work and is being completed as part of an offsetting project detailed below.

Carbon Literacy Training

Aligned to Recommendation 6 approved by Cabinet in June 2023, there are three actions in the Corporate and Cross-Cutting section of the Decarbonisation Action Plan focused on carbon literacy training and developing a carbon literate organisation. This is because achieving Net Zero Carbon will require the efforts of every member of Team Caerphilly. Every person has an impact on the carbon emissions produced by the organisation and will have agency within their role to consider these impacts and ways that they can reduce them. To enable this, each person should understand what Net Zero Carbon is, why we are working towards it and how they can make a positive difference.

The first action is to raise awareness of Carbon Literacy. Healthy Schools have organised and funded 12 schools to attend Carbon Literacy for Educators training via Keep Wales Tidy, and a further 3 schools were funded by Keep Wales Tidy.

Additionally, an initial cohort of 22 officers have completed Carbon Literacy training accredited by the Carbon Literacy Project and delivered by Cynnal Cymru.

The initial cohort comprised of officers from the Decarbonisation Strategy Working Groups, the wider Transformation Team and colleagues who had completed the Infuse Program with a focus on Accelerating Decarbonisation.

Feedback was collected from the attendees and from those that responded:

- 100% would recommend the training to a friend/colleague, of which 57% are extremely likely to recommend.
- 100% found the training relevant to their role, of which 57% finding it extremely relevant.
- 100% found the information present to be clear, of which 71% found the information to be extremely clear.
- 85% found the course to contain about the right amount of information with 15% finding there to be too much information.
- 100% of attendees are clear on the takeaways from the training and 100% are confident that they will be able to achieve their pledges.
- 71% would consider undertaking 'Train the Trainer' training to deliver an in-house course to others within their service area.

All attendees are required to commit to two pledges in the workplace, one personal and one group. Examples of these pledges have been uploaded to the Decarbonisation intranet pages to provide insight for those who will be undertaking the training in future to understand what is required for accreditation.

One attendee commented,

> *"I believe this was an excellent introduction to the topic and could be delivered in house with the suitable Carbon Literacy Trust accreditation… We all have a part to play and whilst very much focused on the workplace from a pledge perspective, will undoubtedly impact on the home as well."*

This demonstrates the value of delivering the training and the potential impact of a wider rollout of training on the organisation and our commitment to achieving Net Zero Carbon.

Two further actions are aspirations to become accredited as a Carbon Literate Organisation. There are tiers of accreditation beginning with Bronze, running through Silver and Gold and ending with Platinum.

As an organisation the requirements for the Bronze award have been satisfied and an application to the Carbon Literacy Project to receive this award will now be submitted. The Team anticipates achieving Silver accreditation by March 2025.

Becoming accredited signifies our commitment to achieving Net Zero Carbon and acting upon the declaration of the climate emergency in 2019.

Two further actions centre on developing a skilled workforce. Carbon literacy is the first step of this process, but it is not enough to do this training once. In delivery of these actions, we propose integration of decarbonisation skills into existing people management processes. This will ensure the understanding, knowledge, skills and behaviours are embedded into our culture. It is also important to gauge what skills already exist, and which skills are needed for each role within the organisation. Through the Infuse programme, research has been undertaken to understand what the skills requirements are and how we can assess the skills that currently exist. The next stage of this experiment is to prototype the skills assessment with teams to develop an internal mechanism for decarbonisation specific training needs. This will in turn inform the development of training programmes to upskill the workforce.

Cultural & Behavioural Change

The shift to working in ways compatible with achieving Net Zero Carbon requires a cultural and behavioural change throughout the organisation. Carbon literacy training and other skills development will provide the knowledge and understanding, whilst other strategic policies will determine the application of these skills and guide Team Caerphilly to embedding low carbon considerations.

One of the Five Corporate Commitments approved by Cabinet in June 2023 (Recommendation 5) was that **"Net Zero Carbon considerations should be included in all major decisions as part of the Integrated Impact Assessment process**". The Team has drafted an addition to the organisation's Integrated Impact Assessment. This will require officers to consider the impacts that projects will have on each of the four pillars of the Decarbonisation Strategy. Resources to help with these considerations will be uploaded to the Decarbonisation section of the new CCBC Intranet. Carbon Literacy training will support the implementation of these considerations as officers develop the understanding and knowledge to enable them to ascertain how major decisions can impact upon the Net Zero Carbon status of the organisation.

Corporate Energy Usage Patterns

Identifying energy usage patterns of non-domestic buildings is key to assessing sites and the opportunities for actions under the Reduce or Produce pillars. Electricity that is consumed by Caerphilly CBC in any non-domestic building from the grid carries a carbon footprint. As detailed above, energy consumptions accounts for 13% of all emissions. Those emissions come from natural gas usage as well as electricity but as we reduce the use of fossil fuels in our heating systems, electricity consumption will increase. The focus therefore is to reduce electricity consumption as much as possible, whilst also generating renewable energy which will reduce the carbon emissions for the consumption which is unavoidable.

A data science MSc student from the Data Science Academy based at Cardiff University collaborated as part of their summer dissertation project to create visualisations of energy consumption and headroom at 28 sites across the estate

where half-hourly electricity consumption data was available. The headroom at each site is the difference between the energy being consumed and the supply's maximum demand (the total amount of energy that can be imported during each half hour period) over each half hour period. Using minimum headroom, we can make assumptions on the available energy which can be utilised at each site without having to increase the supply's maximum demand.

Corporate Case Study – Data Science Academy Data Student

Through participation in the Infuse Programme, an opportunity to offer a summer placement of a Data Science MSc student was offered by Y Lab and the Cardiff University Data Science Academy. The purpose of this collaboration was to provide a MSc student with a topic for their dissertation whilst also providing a practical application of data science skills that would benefit the student as well as the organisation they were working with.

The Decarbonisation Team had set a Corporate and Cross-cutting Action to "Establish energy usage patterns across corporate buildings" and as such agreed that this would a fantastic opportunity to complete this work and benefit from the skills of a data scientist.

An application for 3 students was submitted with the proposed project outcomes:

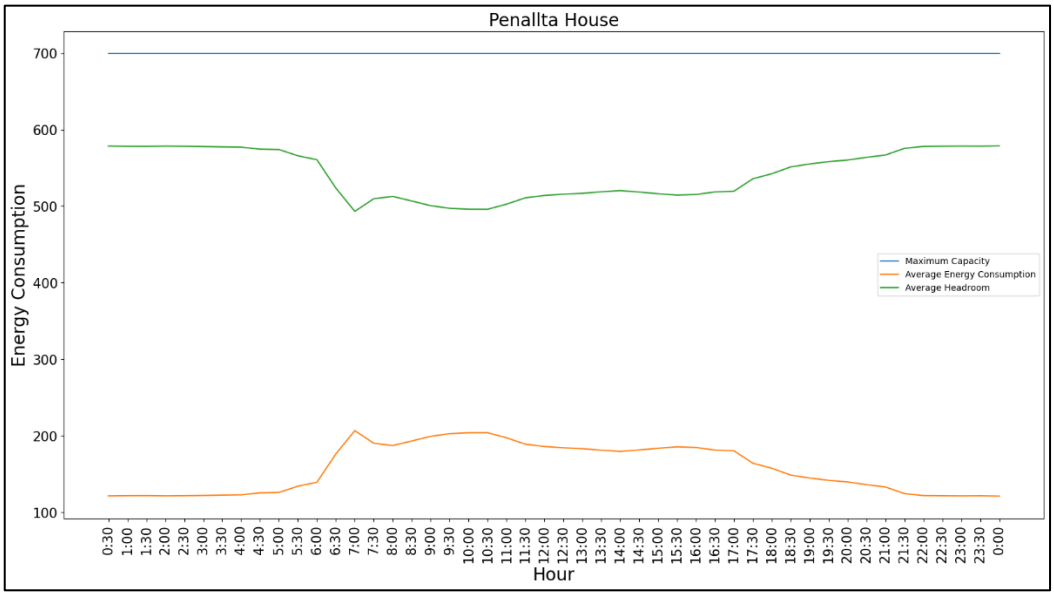
(i) Establish energy usage patterns for corporate buildings where half-hourly data is available;
(ii) Map this usage against current maximum demand for electricity supply;
(iii) Use existing site headroom to determine number and size of potential EV chargers;
(iv) Use sub-station headroom data to show opportunities for export/import of additional energy;
(v) Additional supply from renewable energy projects to be modelled with existing gid capacity and energy demand to determine where additional supply would be best utilised.

The application was accepted in April 2023. The Team learned at the end of May 2023 that we had been successful and had been allocated 1 student for the project.

As part of the project, we asked for a collaboration agreement to be signed to protect the information that was going to be shared with the student. Once the agreement had been checked by the Legal and Information Governance teams, it was signed and returned to the Data Science Academy. An initial kick off meeting with the data student was then organised for the 20th of June 2023. At this meeting we agreed frequency of future meetings and how data would be shared.

An external sharepoint folder was arranged for the Decarbonisation Team so that large data files could be shared securely with the student. Half-hourly electricity consumption data for 28 sites were shared with the student alongside maximum demand values (the maximum amount of energy that can be imported from the grid at a time), generation headroom (substation level) and demand headroom (substation level) for each site.

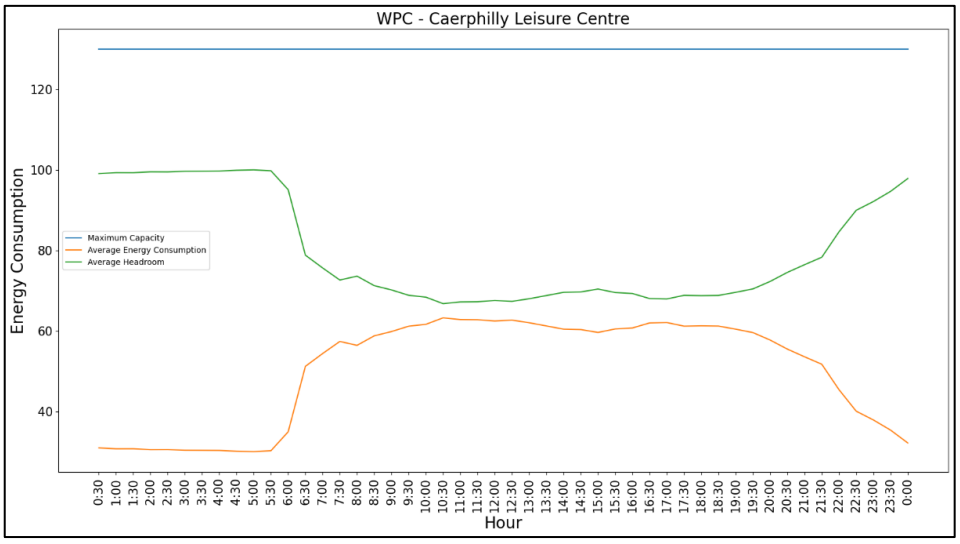
From this data the student was able to generate code to visualise energy usage patterns for each site looking at usage daily, weekly, monthly and seasonally. Maximum demand information was then added to each pattern to demonstrate the existing electricity headroom at each site. The student used the minimum headroom data to estimate the number of chargers which could be situated at each site without the need for additional supply.

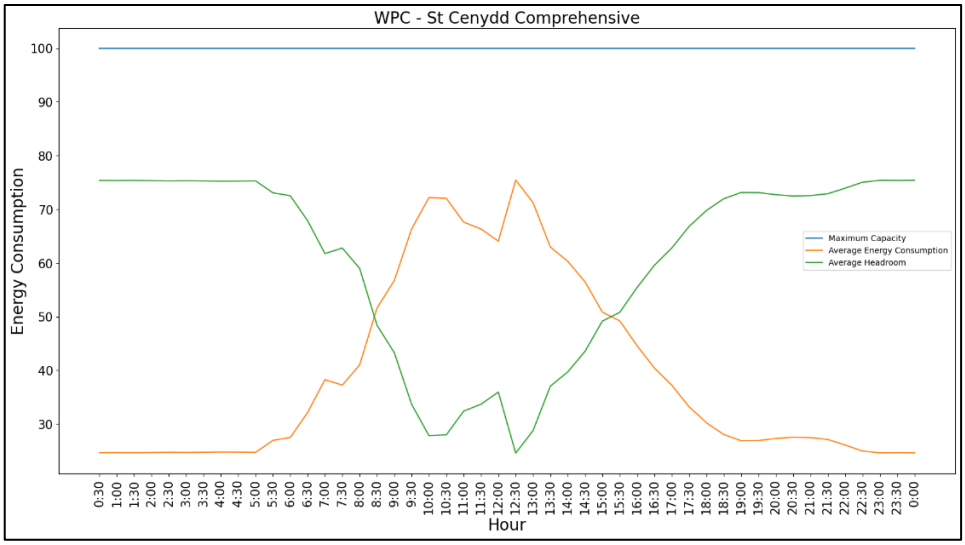


Unfortunately energy modelling from the Cwm Ifor Solar Farm project was not available in time for the student to complete output (v) listed above.

A full folder of the modelling, coding and outputs has been shared with the Team and will be invaluable in assessing sites as part of future energy projects. The coding can then be replicated to reflect energy consumption data from year to year.

Opportunities to collaborate with a data science MSc student from the Data Science Academy arise every Spring and the connections made with the Academy and others at Cardiff University will enable academic support with ongoing decarbonisation projects.





Fossil Fuel Divestment

The Wales Pension Partnership (WPP) has now implemented a decarbonisation overlay on all of its equity sub-funds. For the Greater Gwent Fund, this means that there is a 25% reduction in carbon exposure relative to the respective benchmark on £1.13bn of its assets (which equates to c. 30% of total assets).

The WPP launched its Active Sustainable Equity (ASE) sub-fund in June 2023 and the Greater Gwent Fund invested £150m in this product. Collectively this sub-fund equates to £1.3bn of assets across Wales (c. 8% of total WPP assets) and this is expected to increase over time as the product develops.

The WPP is working closely with its advisors in preparing an "All Wales Climate Report" which is intended to highlight the collective exposure of investments and to demonstrate decarbonisation progress over many years. The report will also offer insight into forward looking objectives and various milestones that will need to be achieved if the WPP (and its underlying investor funds) are to achieve net zero by 2050 or sooner where possible.

The Greater Gwent Fund has continued to selectively invest in renewable energy infrastructure throughout the UK (with some investment now specifically in Wales) and this has increased to £130m (up from £70m quoted in last year's update). The Fund continues to work with specialist investment managers and explore further opportunities that are consistent with its fiduciary duty. The Fund is actively considering its approach to "levelling up" or local impact investment opportunities (local defined as UK wide) in light of Government policy and its encouragement of the LGPS to invest in this area. As a result and alongside the investment strategy review we are preparing a high level policy covering the proposed approach which will likely be available in early 2024 for publication.

Reduce

Through delivery of services the authority will emit carbon. Whilst emitting some carbon is unavoidable, reducing the quantity of carbon emitted as much as possible is vital to achieving Net Zero Carbon.

The Decarbonisation Strategy recognised that reducing operational emissions through reducing energy consumption is imperative. The identified targeted areas for action are:

- Existing Buildings – Corporate and Domestic
- New Developments – Corporate and Domestic
- Streetlighting
- Travel & Transport
- Waste Management

The nature of this work has meant that the Reduce section of the Decarbonisation Action Plan is the largest, crossing many services and existing work streams.

The Reduce working group and other stakeholders have reviewed the previous Action Plan, revised and agreed the Reduce section into 30 actions (See Appendix 2).

Of these actions:

- 4 are completed
- 13 are going well with good progress
- 11 have had reasonable progress
- 2 are not yet started

Corporate Buildings

Reducing energy consumption of buildings is mostly achieved by improving the fabric of the buildings, improving the regulation of energy consumption, and reducing the emissions of the energy used through generating or using renewable energy. Caerphilly CBC is responsible for 778 non-domestic sites with a combined gross internal area of 475,534 m². The building condition on the sites varies depending on the nature of the site (see figure 3).

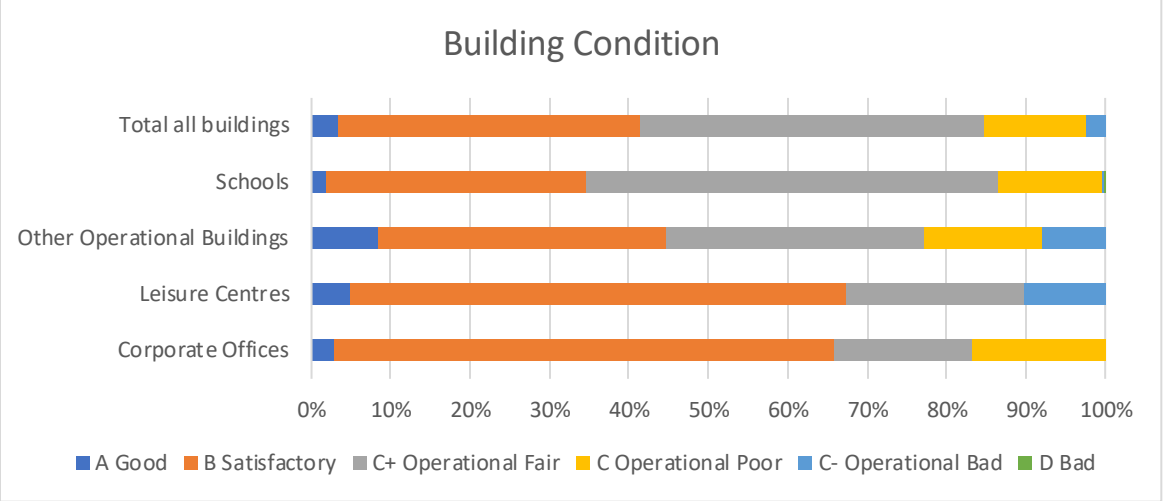


Figure 3, Building condition, type of site (non-domestic)

The condition of the sites detailed above is also reflected in the current cost of the backlog maintenance of the sites (see table 2). Improving the fabric of the building will improve energy efficiency but is a large programme of work requiring detailed analysis of each building and its requirements.

Category	**Priority 1 (Urgent)**	**Priority 2 (Essential)**	**Priority 3 (Desirable)**	**Total**
Corporate Offices	£30,000	£902,000	£1,518,000	£2,450,000
Leisure Centres	£73,000	£1,220,000	£2,230,000	£3,523,000
Other Operational Buildings	£638,000	£5,003,000	£5,999,000	£11,640,000
Schools	£440,000	£14,113,000	£20,661,000	£35,214,000
Total for all sites	£1,181,000	£21,238,000	£30,408,000	£52,827,000

Table 2, Site Category, backlog maintenance costs by priority

There is a rolling maintenance programme in place with refurbishment schemes undertaken. This means that condition survey ratings and backlog maintenance costs are not always reflective of current condition or the level of required repairs. These existing costs will affect the work to decarbonise the authority portfolio by assisting with the prioritisation of works for sites.

The Energy Team have reviewed the existing backlog maintenance requirements for non-domestic buildings alongside Energy Performance and required upgrades for improved energy efficiency. From this exercise, priority sites for upgrades have been identified to form the initial phase of a full programme of works to improve the energy efficiency of non-domestic buildings. High-level costings of technologies to reduce carbon emissions of buildings have been provided which can be extrapolated based on internal floor area. These numbers will be improved as we move through the programme of works. From these high-level costings, a framework for contractors will be produced through the works can be procured.

Funding opportunities for these works are continually being explored to include the Salix Invest to Save Scheme as well as Welsh Government Low Carbon Heat Grants.

Asset rationalisation

An asset rationalisation mechanism has been reviewing corporate buildings to identify and assess options for continued use and ownership of the assets. Service Asset Management Plans (SAMPs) have been reviewed by the Asset Management Working Group and a list of identified properties that will be targeted in the short, medium and long term for vacating by services has been produced. As part of this options appraisal, the number of sites, running costs, backlog maintenance costs, lease costs, potential rental revenue and potential capital receipts are considered alongside the needs of the Service. Consultation with Service area/s to fully understand needs and requirements is key. By understanding what elements of the service can be relocated to a central location and what (if anything) need to remain in current location/s, we can make informed and data enabled decisions which benefit Services, Service Users and the authority.

This process has the potential to reduce number of Corporate Office sites, to streamline the estate and achieve improved efficiencies at remaining sites.

Corporate Landlord Model

Through Mobilising Team Caerphilly, the Decarbonisation Team, worked as part of the 'Assets Efficiency' workstream. A key project proposal from this was the recommendation that the authority adopt a 'Corporate Landlord Model' to control assets. The Corporate Landlord model centralises property management and associated budgets and removes the demands of managing property from individual service areas, freeing them up to deliver the services our residents, businesses, and visitors expect.

The Corporate Landlord model will deliver a better strategic understanding of our asset base, and the costs of investing in them over time, as well as the day-to-day costs of managing and maintaining them. Managed strategically, our assets can address the challenges of saving money, and at the same time help us align with partners to achieve more effective use of assets to deliver common objectives.

At present, responsibilities for these assets rests largely with the individual service areas. The current approach does not allow for the maximising of efficiencies or optimum value for money and is inefficient in the allocation of resources. A move to a Corporate Landlord model proposed would see a change in responsibility for management, maintenance and investment in relation to the council's non HRA buildings and assets.

In short, the Corporate Landlord model seeks to ensure better governance and value for money, enhanced customer service (particularly when considering our customers internally) and a greater consistency of approach across all buildings and assets. It would ensure better quality of decisions being taken based on a sound evidence base, helping to ensure best value for money, and more efficient procurement of works and allocation of resource, across all of the council's non HRA estate.

Community Asset Transfer

A Community Asset Transfer (CAT) happens when a Public Sector Body transfers the management and/or ownership of a property asset to a community council or Third Sector/ Community Group. This will sometimes include the delivery of any associated services. Through Mobilising Team Caerphilly, the question of whether the authority should use CAT to contribute to savings was raised and discussed.

There may be services that are currently being delivered by the authority that might be better suited being delivered by the communities of the borough. There are things to consider as potential issues to transfer for example backlog maintenance considerations, covenants, restrictions on title e.g., charitable trusts etc, interest from management committees or groups. Through the Asset Efficiency workstream it was established that we would consider asset transfer of any asset in the portfolio in its current condition but also in an improved condition. By improving the fabric of the asset and decarbonising the site, the authority could ensure that an asset is being transferred rather than a liability.

Existing Housing

Welsh Housing Quality Standards (WHQS) has driven improvements to existing housing stock within the borough. The energy consumption of existing housing stock does not contribute to the authority's organisational carbon footprint reported annually through Public Sector Net Zero Carbon Reporting. However, reducing energy consumption through more efficient homes will reduce carbon emissions and contribute to the All Wales Net Zero Carbon by 2050 ambition set by Welsh Government, as well as easing cost of living pressures on residents by reducing energy bills.

WHQS23 has recently been agreed and will focus on further improvements to council owned housing stock. Target Energy Pathways will be undertaken for each CCBC owned property to formulate a whole stock assessment. Energy Performance Certificate (EPC) assessments will be completed for each home to establish their energy rating and identify the least energy efficient stock for prioritisation. The energy efficiency of domestic properties will be improved through the UPVC triple glazing window replacement programme that will introduce high specification energy

efficient glazing. This glazing is being manufactured by the authority and there is an install programme of 84 properties in this financial year.

Energy efficiency is also being improved in council owned sheltered housing schemes and measures are being delivered to two schemes – Maesteg and Oaklands – through the Optimised Retrofit Programme. A fabric first approach is being taken to address issues tenants were experiencing, aligned to PAS2035. Measures being taken include External Wall Insulation, Photo-voltaic installation, Mechanical Ventilation with Heat Recovery and low energy windows and doors. This will directly impact the operational carbon emissions of the authority, as the energy consumption within sheltered housing schemes is within scope for Public Sector Net Zero Carbon reporting. Surveying has started for the properties that will be included in next year's decarbonisation programme.

Fleet

As of 30th September 2023, a total of 544 vehicles made up our fleet. This number represents a decrease of nearly 80 vehicles since the requirements of COVID-19 resulted in significant increases in our fleet numbers, reaching highs of over 620 in the summer of 2020. There has also been a change in the breakdown of the fleet with an increase in hired vehicles to replace those leased from Specialist Fleet Services (SFS) as that agreement comes to an end.

The 544 vehicles are made up of 94 vehicles that we own, ~170 vehicles on hire and 278 vehicles on long term lease (generally 5 years) with SFS. We now have 12 fully electric vehicles in the fleet.

Figure 4 below shows the total number of vehicles in our fleet since August 2019, and how this breaks down between owned, leased and hired.

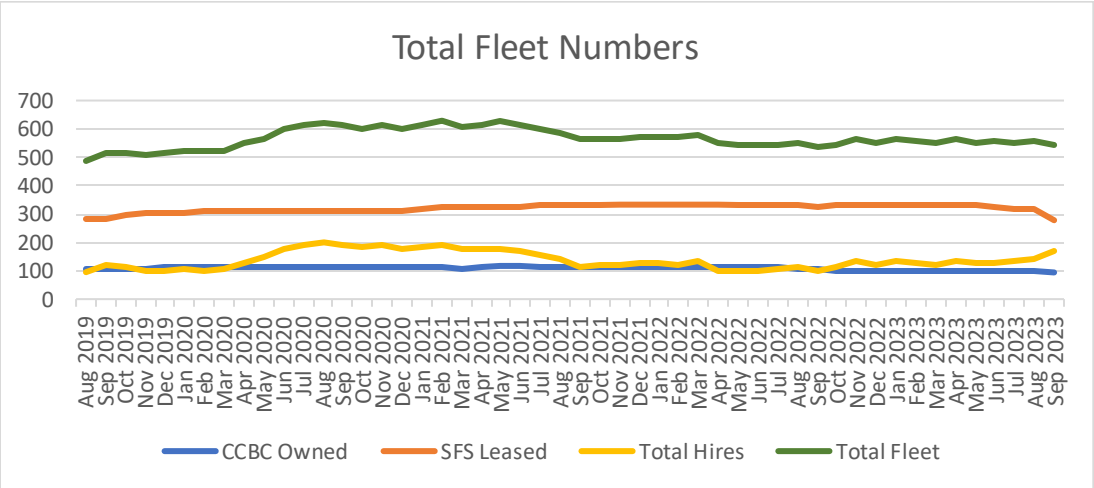


Figure 4, Breakdown of fleet vehicles by ownership, lease and hire 2019 – 2023

With the SFS contract ceasing at the end of January 2024, hired vehicles are replacing leased ones as the lease contracts come to an end. The cost of hired vehicles is about the same as SFS leased ones but have the added advantage that the arrangement can be terminated at any time. This means that we can easily remove them from our fleet if we find we no longer have a need for them or swap them for EV alternatives as service areas become ready to make the transition.

Table 3 below provides a breakdown of the end date of individual vehicle leases from SFS.

Month lease ends	No. Vehicles
End January 2024	236
Rest 2024	53
2025	6
2026	12
2027	8
2028	9

Table 3, Number of vehicles on lease from SFS with lease end date

This provides both a significant opportunity and challenge as theoretically these vehicles could be replaced with ULEV alternatives. This will require significant investment in and installation of infrastructure and resource to overcome the logistical challenge of the transition.

EV Infrastructure

Installation and commissioning of EV charging infrastructure to date provides the charging capacity for around 100 fleet EVs. The breakdown is as follows:

- Ty Penallta charging hub – 15 double 7kW chargers.
- Tir y Berth charging hub (old Meals on Wheels site) 7 double 7kW chargers.
- We now have a total of 53 charge points on the CCBC charging network
- This work includes the setting up of the back office system to manage the charging network, monitoring of charge sessions (including electricity use and CO2 savings) and, where necessary, internal recharging.
- Total value of works let to date £437,000

Alongside this we have introduced staff/visitor personal vehicle charging with a system that allows those individuals who choose to charge their vehicles at a CCBC site to pay for the electricity used. The tariff covers

the electricity and admin costs only. This work included the provision of all relevant policies, notices, instructions and compliance practices.

Optrak Consortium Project

CCBC secured funding from the Cardiff Capital Region Challenge Fund to run an innovation project looking at ways to effectively transition to electric vehicles and manage an electric fleet. This includes rationalising the fleet to gain the greatest advantages from a move to EV, managing vehicle charging requirements and providing suitable charging infrastructure.

A lot of work has been done scoping out our requirements from the project which including a 10-week initial investigation exercise using actual fleet data from the Quartix tracking system. This provided an initial assessment of the task in hand, a valuable insight to the working of our fleet and has been vital in identifying the specific outcomes we are looking for from the project.
Those outcomes include:

- Fleet Analytics Solution
- EV Charger Siting Tool
- Service Area Support (e.g. Housing Maintenance)
- Support with Vehicle Pooling Solution

There are other possibilities that the information gained from the analysis of the data could help with that are being investigated. It is important to underline the fact that all of these outcomes depend upon continued access to the vehicle tracking data.

New Development – Housing & Non-Domestic Buildings

Whilst the energy consumption of authority owned housing doesn't not sit in scope for Public Sector Net Zero Carbon reporting, the development and construction of housing is accounted for under scope 3 supply chain emissions. Currently, every £ spent on construction and materials will be translated into $kgCO_2e$ by multiplying the £amount by an emissions factor determined by The Department for Energy Security and Net Zero (formerly The Department for Business, Energy and Industrial Strategy or BEIS). The methodology constraints and issues of this process are discussed further in the "Buy" section of this report. Pertinent to reducing the carbon emissions relating to developments, is the adoption of lower carbon construction methods and measuring the impact of these.

Low carbon construction methods consider the carbon emissions at every stage of a construction project – cradle to grave. There is embodied carbon in the materials used to construct buildings, but there are considerations to be had in the transportation of materials to sites, the equipment and machinery used, and the waste created through the project. Cradle to grave then calculates the expected energy consumption and required maintenance of the building to estimate the carbon emissions of the building through its life cycle. Finally, the end of life of the building is considered – how will this building end its life and what will happen to the materials? These considerations and calculations are significant to all building and construction projects – housing and non-domestic buildings.

Housing

Cabinet have approved a Development and Governance Strategy that sets out a policy framework which now applies to all Caerphilly Homes developments. The strategy is to build all new homes using Modern Methods of Construction (MMC) fabric first principles and build to Building Regulations 2025 as a minimum thereby concentrating on thermal efficiency and ventilation. The strategy sets out an ambition to build to net zero carbon but recognises that reductions in embodied carbon are harder to deliver than operational reductions.

Caerphilly Homes have received planning approval for a 45 home, later living scheme at Ty Darran, Risca and 92 homes at the former Oakdale School site. All new homes built on both sites will be built with energy efficiency and lower costs for customers in mind. A report has been provided by Wilmott Dixon which discusses the ethical sourcing of the materials contained in photovoltaics and batteries together with the recycling options. At this time, Caerphilly Homes do not require the inclusion of renewables although that may change in the future. New homes in Oakdale and Risca do not require the introduction of renewables as they are designed to be super efficient using fabric first construction materials and methods.

The partnership with local steel frame manufacturer, Caledan – a company based in Ystrad Mynach – continues, however, Caerphilly Homes will shortly be bringing

forward a number of smaller sites and will seek to introduce a timber frame offer to the development programme. Caerphilly Homes is part of the All-Wales Net Zero Timber Frame group and will be offering a site to include in an all Wales project shortly.

United Welsh Housing Association (UWHA) have opened a new Modern Methods of Construction (MMC) factory in the borough with ambitions to increase the number of homes they build using MMC techniques. MMC projects use off-site manufacturing to build homes faster and with less waste. Timber frame for the Cwm Ifor developments (R25) were built in UWHA's MMC factory. UWHA has provided a presentation on the use of the MMC factory to the Affordable Homes Partnership and are in discussions with other community landlords about using the factory to build timber frames for their new developments.

Welsh Government now incentivises the use of MMC in new developments through the Social Housing Grant programme and, as a result, the Council expects to see an increase in the number of new homes developed using MMC.

Non-Domestic Buildings

Sustainable Communities for Learning Programme ensures all new capital investment for schools support net zero commitments and meet required standards for decarbonisation in the choice of materials, transport and construction techniques. Welsh Government have specific requirements and standards for net zero schools – this is currently focused on net zero operation, however embodied carbon is being considered.

Schemes identified for the programme:

- A new replacement Ysgol Gymraeg Cwm Gwyddon on the former Cwmcarn High School site
- An extension of Trinity Fields School and Resource Centre
- The amalgamation of Llancaeach Junior School and Llanfabon Infants School to create a new Primary School provision
- A new replacement Plasyfelin Primary School on the existing site
- The establishment of a Centre for Vulnerable Pupils (Pupil Referral Unit) on the former Pontllanfraith Comprehensive site

Streetlighting

A programme to convert all the county borough's street lanterns to LED was completed in January 2021. Concurrently, the authority has implemented part night lighting, between the hours of midnight and 5.30am, to all lighting, except at junctions and in major town centres. Cabinet approved the continuation of reduction in streetlight operating hours in November 2022.

The reduction in operating hours of streetlighting has multiple benefits for the authority. Reducing energy consumption at a time when the unit cost price of electricity is increasing will reduce the cost to the authority of providing lighting. Reducing energy consumption will also reduce operational carbon emissions and contribute to achieving net zero.

Table 4 below shows the achievements of these measures. There is a noticeable change from the conversion to LED bulbs and as the authority continues with part lighting and the grid decarbonises, the carbon emissions from the operation of streetlighting will continue to fall.

Year	kWh	%Change	$kgCO_2e$	%Change
2019/20	8,579,794		2,711,043	
2020/21	5,565,418	-35.13%	1,603,564	-40.85%
2021/22	3,352,484	-39.76%	976,579	-39.10%
2022/23	3,049,585	-9.04%	797,619	-18.33%

Table 4, Streetlighting energy consumption and carbon emissions with % change year on year

Waste

Carbon emissions from all waste collected or created by the authority is reported to Welsh Government through the Public Sector Net Zero Carbon reporting. Currently, municipal waste is reported alongside commercial and industrial waste collected by council vehicles. There is the opportunity to report on Organisational and Project waste. However, currently this data is not available for reporting.

The trend in waste emissions reported is detailed in table 5.

Waste Type	2021/22	2022/23	%Change
Mixed Recycling	374,930	343,397	-8.41%
WEEEE	5,782	4,990	-13.69%
Landfill	4,064	3,680	-9.45%
Combustion	39,630	36,581	-7.69%
Composting	28,008	23,920	-14.59%
Anaerobic Digester	26,481	24,125	-8.90%
Total	**478,895**	**436,695**	**-8.81%**

Table 5, Waste Emissions by Waste Disposal Method, 2021/22 – 2022/23

Actions for Waste align with the waste hierarchy – Prevent, Reduce, Re-Use, Recycle, Recover, Dispose. Actions to reduce carbon emissions from waste straddle the two distinct targets for Net Zero Carbon in Wales:

(i) Net Zero Carbon Public Sector in Wales by 2030
(ii) Net Zero Carbon Wales by 2050

The first of these targets is generally focused internally on organisational emissions, whilst the second is focused on the wider borough including residents and businesses. As we collect, handle and transport waste on behalf of our residents, we are responsible for reporting on the carbon emissions from this waste. Unlike most of the other actions aimed at the 2030 target, reducing emissions from waste will require higher levels of engagement with and action from our residents.

The Authority has signed up to the Public Sector Waste Minimisation Campaign and to this end provides infrastructure to facilitate recycling for its workforce. It has also recently signed up to the national WARPIT initiative (led by Procurement and FM) which reduces waste by redistributing office furniture and assets to increase the life-cycle of products and stop usable items from entering waste streams.

A Waste Strategy is in the process of being developed to enhance the sustainable management of municipal waste arising and in turn attain the statutory targets set by Welsh Government. There is a campaign in place to incentivise participation in the food waste recycling collection service which supplies feedstock for a local anaerobic digestion facility which is providing electricity for 2000 homes.

The Authority has committed to introducing a complete digital solution for waste. This will include back office and front-line functionality and capabilities that will allow for more efficient and paperless methods of working. Procurement is to conclude w/c 6th November and the implementation date is from February 2024. With the help of the successful supplier, we hope to be fully digital within 12 to 24 months.

Work is on-going as part of the Waste Route Map and Strategy to model the performance benefits and outputs of changing the recycling service to something more blueprint compliant. Collecting already separately presented items will result in a better quality of materials being collected. This will mean that there will be less dependence on a Material Recovery Facility to sort materials to transfer to market for sale and recycling. The Authority will have access direct to markets which will benefit carbon emissions and generate income.

Produce

The Decarbonisation Strategy acknowledged the importance of generating our own "green" electricity and heat. This will reduce carbon emissions, give greater energy security, insulate us against volatile price fluctuations and will bring the added benefit of offsetting grid demand whilst reducing system losses associated with grid supplied electricity if it is produced at the point of demand.

The Produce Working Group has been established with members from Decarbonisation, Transformation, Property, Housing, Planning and Infrastructure. The Team, which also receives external support from the Welsh Government Energy Service, meets monthly.

The first piece of work undertaken by the group was to review the Produce actions contained within the original Decarbonisation Action Plan under the Produce Pillar. The agreed new Produce Action Plan contains 12 actions (see Appendix 2).
Of these actions:

- 2 have been completed
- 6 are going well with good progress
- 3 have had reasonable progress
- 1 is not yet started

Land mapping and evaluation

The authority has significant land holdings. The review of land assets, in collaboration with the Welsh Government Energy Service with a view to identifying opportunities for renewable energy technology, is an ongoing process. The first round of reviews identified several sites which were progress to the next stage and were examined in greater detail to consider issues such as grid connection, planning, etc. This work identified potential opportunities for solar, on shore wind and hydroelectricity generation. Some examples of these projects are outlined below. The review process continues with further sites being assessed based on our energy needs.

Solar

The authority has already installed Photovoltaic (PV's) panels on roofs of its buildings. In some instances, these are small demonstration arrays on schools, but the authority has also installed larger arrays to good effect and is currently investigating its collective non-domestic roof space for medium sized PV arrays.

Produce Case Study 1 – Cwm Ifor Solar Farm

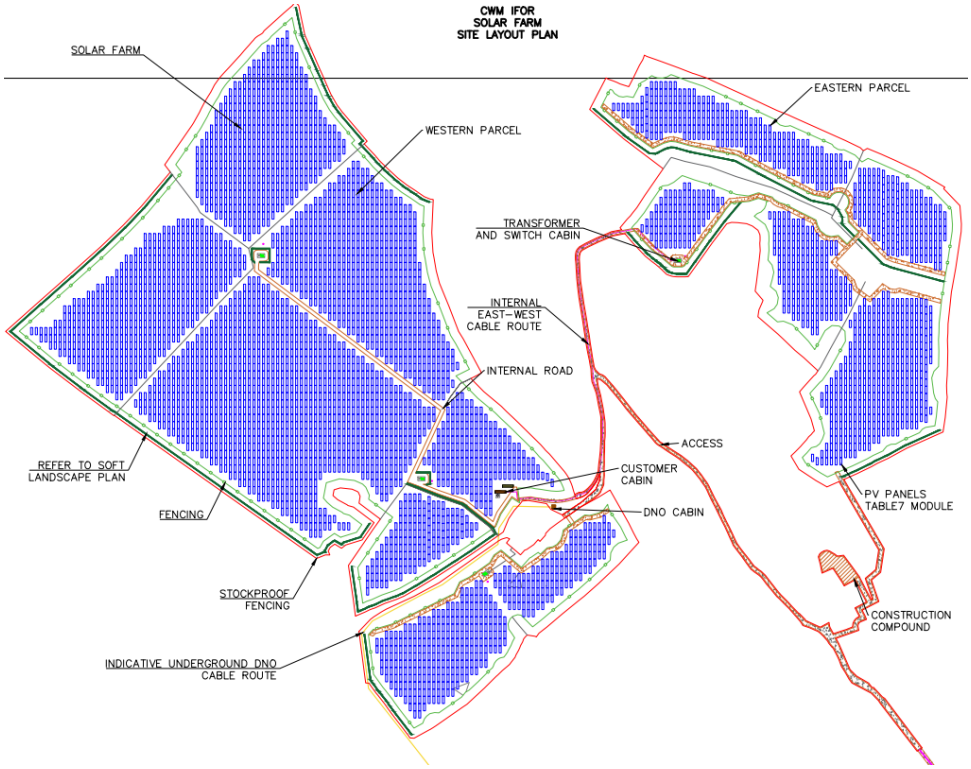
Background

Cwm Ifor is a privately-owned farm at Penyrhoel, just north of the town of Caerphilly. The land is low-grade and currently used for agricultural purposes. However, it is on a hill side with steep south, southeast and southwest facing slopes, which is suitable for solar arrays.

The project and grid connection were novated to the Council in April 2020 after the developer decided not to progress the project due to existing covenants on the land and potential access issues.

The Project

The project will develop a 20MW solar farm covering 36 hectares, which will potentially be the largest publicly owned solar farm in Wales. Grid connection is secured, and outline designs have been completed along with energy yield assessments so that financial modelling can be completed.



It is anticipated that when operational the solar farm would generate 23.5GWhrs of electricity per year, or enough to power around 6,000 homes. At current energy prices it will create income of between £669,000 and £892,000 per year over the 35-year life of the project.

As the solar farm is over 10MW in size it is deemed to be a development of national significance (DNS), and therefore the planning application will be determined by Planning and Environmental Decisions Wales (PEDW). The planning application was submitted in January 2023 with a decision anticipated early in 2024. As well as a generating significant amount of electricity the solar farm will also enhance biodiversity of the land, with the use of native plant species and the protection of bats and an owl nesting locally. The boundary will be protected by stock proof fencing to protect the solar farm from the farm animals.

The project has been a real team effort with internal representatives from Regeneration, Procurement, Communications, Transformation, Property Services and Finance. As well as external support from planning, landscape and visual and technical consultants, Welsh Government Energy Service, Local Partnerships and the Carbon Trust.

Consultees have included; the Local Planning Authority, Council Ecologist, Council Landscape Architect, Environmental Health, Highways, CADW, NRW, GGAT and the Fire Service. Ward Members, Community Councils and Cabinet have also been consulted along with communities local to the solar farm.

Life-time CO2 savings are estimated at 55,300tCO2e, or approximately 1,580 tCO2e per year which will contribute to decarbonising the electricity grid and will have a positive impact on air quality.

There will also be a community benefit fund made available to groups within the area as part of the solar project. This will support community decarbonisation projects as well as wider support for the community. Not only will the project improve air quality and wellbeing it will also bring in a revenue to support council services for the most vulnerable. Community benefits clauses will also be included in the contract for the solar farm build.

Wind

As part of the land asset review, sites have been considered for wind turbine projects. The initial reviews have not identified significant opportunities. CCBC has been approached by developers to invest in wind developments in the county borough and this is the subject of ongoing discussions and evaluation.

Hydro-electric

The authority has undertaken a review of its capacity to generate hydroelectricity from rivers and streams on Council owned land. To date there is limited opportunity to progress projects although Cwmcarn Forest has been identified as offering some opportunity to generate electricity for onsite use at the visitor centre. An initial feasibility study for a scheme at Cwmcarn was undertaken in 2012 but a lack of clarity over ownership of the stream bed meant that this wasn't pursued. The current proposed design for the scheme overcomes this risk as the stream bed will not be utilised.
A reassessment of the feasibility study has been commissioned with Wallingford Hydro Solutions and Heidra to determine updated costs and potential payback for the scheme. It is estimated that a 27kW turbine could be installed onsite, which would produce at least half of the visitor's centre annual electricity requirements. The peak load of the site (maximum energy imported at one time) is 30kW and the base load is 14kW (typically what is being imported overnight). With a 27kW turbine, during times of base load, the excess electricity could either be exported to the grid or utilised onsite by charging electric vehicles. The group exploring this opportunity took a site visit to Margam Park to see their hydro-electric scheme and how it is

adding value to the site as an additional tourism attraction. Should the result of the study be positive, the Group are committed to ensuring that there is an educational aspect to the scheme which demonstrates not only the technology being used but also the carbon emissions being saved.

Green Hydrogen

Significant work is being undertaken to develop partnerships and to secure funding to investigate the contribution that green hydrogen might play in delivering the authority's commitment to be net zero carbon by 2030 and its wider contribution to regeneration and decarbonisation in the county borough.

Produce Case Study 2 - Green Hydrogen Project

Background

Hydrogen is generated by splitting water (H_2O) into its constituent parts, hydrogen and oxygen by electrolysis - passing an electrical current through the water. The term green hydrogen is used when the electricity used in the electrolysis is generated from renewable sources such as wind or solar.

The Green Hydrogen project has included a review of Council owned land to identify suitable sites. Two potential locations have been identified and are the subject of more detailed feasibility studies. The project also incorporates an ethical water source rather than mains drinking water, with the use of water from the Council owned reed bed facility in Nelson.

Green hydrogen production will potentially support the decarbonisation of the larger fleet vehicles owned by CCBC and the other 10 councils within the region.

The Project

The green hydrogen project will see a 10MW electrolyser sited at one of two locations and will use water from the reed bed facility at Coed Top. 15MW of green energy will be needed for the project. This will be a mix of solar and wind. Ideally the green energy generation will be co-located with the electrolyser however if this is not possible then PPA arrangements for energy through the grid will be made.

Our estimated annual diesel use by our larger fleet vehicles is 69,000 gallons (315,000 litres) per year, at a cost of around £600,000 per year. The use of hydrogen has the potential to save around £60,000 per year, with an additional opportunity to sell hydrogen to the wider region.

There is potential to save 845,000 kg of CO2 emissions in the borough, equivalent to that emitted by 313 houses or 503 cars. This will also impact positively on local air quality.

Opportunities to inject hydrogen into the gas grid are also being investigated along with opportunities for heat networks and oxygen offtake, as well as selling hydrogen to businesses.

Funding for feasibility studies has been secured from two funding sources to date. Firstly, UK Government Funding of £72,496 from Innovate UK, for feasibility studies to examine the non-technical barriers to the project, for which CCBC is the lead partner. Secondly, £43,768.02 HyBRID funding from Welsh Government for feasibility studies investigating the technical barriers to the project, which is being led by the University of South Wales. Phase 2 HyBRID funding will also be sought as well as DESNZ, Cardiff Capital Region and Welsh Government funding. The Welsh Government Energy Service are also undertaking feasibility work around green energy and Wales and West Utilities around transport hubs.

The team developing the project includes External support from South Wales university, Cardiff University, Energy Systems Catapult, Wales and West Utilities, Welsh Government Energy Service, Jen Baxter Consulting and Prosona. A number of internal conversations have taken place with colleagues from Regeneration, Procurement, Communications, Transformation, Property Services, Planning, Highways, Parks and Countryside, Environmental Health and Finance.

Anaerobic Digester

The original Decarbonisation Strategy identified that the Council has local arrangements in place at Bryn Quarry where Council collected food waste is converted into green energy via an Anaerobic Digester. The linked Energy Prospectus highlighted the opportunity to take electricity directly from this site and utilise it at the Tredomen Campus. Anaerobic Digesters (AD) break down feeder fuels such as food waste to generate a biogas which is used to generate electricity. By utilising a locally generated electricity supply it will reduce the transmission system losses (wasted electricity) and free up additional capacity on the local grid.

Discussions have begun with the Bryn Group to identify opportunities, with an initial study being initiated to review options and to develop an outline business case. This has included assessing the best route for any hardwire, to identify any land studies or further ecological studies that may be required. As part of understanding the viability of the project, negotiations have

begun on Heads of Terms and the principles of any potential power purchase agreements.

Mine Water Heat

The mine water heat network scheme is in the early stages; however, we are one of the first to engage with the coal authority and WG in this area we are already ahead of others and the mine water scheme at Pontlottyn is progressing through feasibility. CCBC will be in a good position for full funding for the project from WG. The coal authority has nearly completed the feasibility. There is a further report due from the coal authority on the best areas for mine water heat networks and CCBC is expected to be a potential hot spot for these networks from work undertaken so far.

Total amount of renewable energy generated 594,863 kWhrs from 63 installed Solar PV schemes.

Offset

It is inevitable that through delivering its services the authority will emit carbon. Therefore, in order to achieve net zero carbon these emissions will need to be offset. There are two principal ways that this can be done, carbon sequestration (capturing carbon usually by planting trees or by habitat management) or by purchasing carbon units/offsetting credits.

The Decarbonisation Strategy acknowledged that carbon dioxide removal through tree planting will play a major role in CCBC achieving its net zero target, and that it is imperative that the Council effectively manages its current land holdings to ensure that its woodland remains healthy. The purchasing of carbon credits is seen as the last resort and therefore the authority will seek to offset its carbon at this stage by the management, maintenance and creation of new greenspaces, woodlands and wetlands.

The Offset Working Group has been established with members from Decarbonisation, Countryside, Rural Development, Housing, Planning and Infrastructure. The group meets monthly.

The first piece of work undertaken by the group was to review the Offset actions contained within the original Decarbonisation Action Plan under the Offset Pillar. The agreed new Offset Action Plan contains 14 actions (see Appendix 2).
Of these actions:

- 4 have been completed
- 5 are going well with good progress
- 4 have had reasonable progress
- 1 not yet started

Land mapping and evaluation

In June 2023 a Cabinet recommendation was approved (Recommendation 8), that **"detailed land mapping and evaluation is undertaken to protect existing habitats and identify land for tree planting. Further work undertaken to assess the feasibility of a potential Caerphilly Forest programme and the potential for growing our own trees".**

This mapping has been undertaken. Table 6 below sets out the total areas of land owned by the authority under the headings required in the Welsh Government reporting tool. The table also summarises the kg$C0_2$e, sequestered, and therefore offset by the land use types.

The 1,143 hectares of forest land owned by the authority offset 8,306,886 kgCO_2e in 2022/23

Land Use Type	Land Area (Hectares)	Carbon Emissions ($kgCO_2e$)
Forest Land	1,143	-8,306,886
Cropland	48	880,361
Grassland	825	12,835
Wetlands	20	n/a
Settlements	1,398	n/a
Other	2	n/a
Total	**3,436.55**	**-7,413,691**

Table 6, Land use type, land area and $kgCO_2e$ offset.

Following the mapping of all CCBC land, a review of this land is being undertaken to identify areas that should be maintained and protected, and areas where there are opportunities for new tree planting. An internal mechanism has been developed by the Offset Working Group to identify land for future planting projects. The Team have created a form, which is uploaded to the Decarbonisation section of the CCBC Intranet, which services wishing to complete planting projects can complete. This will begin a process of assessing the land's suitability for planting. An initial desktop exercise utilising GIS makes a first assessment of suitability. A legal check for deeds, covenants, rights of way etc is then completed. If the land is still deemed suitable, an ecological assessment will be carried out and designs for the planting will be completed. This will ensure a cohesive approach to tree planting and enable the Team to track the location and number of trees planted so that we can create a database which monitors progress towards our agreed targets. Through this process, land has been identified for tree planting projects for both the 2023/24 and 2024/25 planting seasons. It is integral to our legal biodiversity obligations that we plant the right tree in the right place. Establishing this mechanism fulfils that obligation.

Tree planting programmes

Planting has been agreed on Countryside land for the 23/24 planting season. Designs and plans have been produced and agree for sites at Ynys Hywel and Parc Cwm Darran. Approximately 15,000 trees will be planted at those sites, with around 3,000 being planted by volunteers.

Initial sites on Housing and Infrastructure land for planting during the 2024/25 planting season has begun, with ecological surveys and initial feasibility work being undertaken.

Offset Case Study 1 – Ynys Hywel Covid Memorial Woodland 2023

Background

Ynys Hywel, a traditional working hill farm, forms part of the Sirhowy Valley Country Park, which is a popular location with people walking or cycling through the woodlands that rise from the riverbank and extend up the valley sides. Route 47 (the Celtic Trail) of the National Cycle Network runs the length of the park and beyond.

The Council owned farm was selected as the location for one of three covid memorial woodlands in Wales, to remember all those who have died during the pandemic. Funding of £499,000 was awarded from the Welsh Government to design, construct and maintain the memorial woodland for 5 years.

The Project

The new memorial park, covering an area of 7 hectares, was designed and implemented by Caerphilly Council's Landscape Architects. The design seeks to complement the existing country park, and importantly retaining key views across the valley and the overall rural character of the site. This includes both hard landscaping in the form of paths, where possible following the lie of the land to improve access, new timber access gates, benches, drystone walling entrances and natural water features, along with extensive native woodland planting. These enhancements will allow visitors to enjoy more of the picturesque scenery, whilst being able to walk, relax, contemplate and reflect.

The new woodland also respects the environmental quality of the site, with a landscape lead approach, including both improving and retaining biodiversity with retention of the species rich acid grassland meadows, mature trees and hedgerows and the overall landscape qualities.

The recent woodland planting contains a broad mix of native deciduous species to provide a robust mix that it is hoped will be able to withstand the challenges faced by climate change. Shrubs and trees species, including climax trees, have been planted throughout. A small percentage of native evergreens, Holly, Yes and Pine, are complimented by standard trees species including native Beech, Oak and Hornbeam. An extensive area of meadow has also been planted with Welsh daffodil and bluebell bulbs.

A total of 36,500 native trees and shrubs were panted in 2022/23, with 3,700 planted by volunteer groups. Further volunteer planting will be continue for the next 5 years. It's intended that the site will be maintained during the 5-year establishment period, using part of the grant funding.

The Team collaborated with external partners GAVO, Groundwork Wales and Keep Wales Tidy to co-ordinate the volunteer planting. Over 100 volunteers from various organisations and the local community took part in planting the trees over between 20th and 24th March 2023.

The Team organised facilities and refreshments for volunteers on site which were kindly donated by GAP and Castell Howell.

Minister for Climate Change, Julie James MS visited the site on the 23rd to mark the third anniversary of the first Covid lockdown and join volunteers in planting a tree.

Total number of trees planted

A Cabinet commitment was given to **"set a target of planting 300,000 trees by 2030, where land availability allows",** as part of the Decarbonisation Strategy work.

To date a total of 81,000 trees have been planted since the Decarbonisation Strategy was approved.

Carbon Credits

The purchasing of carbon credits for offsetting is a complex and evolving area. Offsetting and carbon trading schemes exist across the UK to purchase carbon credits, allowing organisations, businesses and individuals to offset their carbon emissions. Carbon credits can only be used once - you can sell them to a third party

to compensate for their emissions or you can use them yourself against your own emissions. Each Carbon credit purchased is equivalent to 1 tCO2e. The UK Emissions Trading Scheme is currently trading 1 tCO_2e at £38/tonne.

Should CCBC have been required to be carbon neutral for the financial year 2021/22 we would have needed to purchase carbon credits to offset the 94,257 tonnes of CO_2e. The market cost in that year of £78/tCO_2 would have cost the authority £7,352,046. Should CCBC have been required to be carbon neutral for the financial year 2022/23 we would have needed to purchase carbon credits to offset 95,894 tonnes of CO_2e. The current market cost of £38.11/tCO_2 would have cost the authority £3,654,539.17. This highlights firstly, the turbulent nature of carbon markets, but secondly and more importantly, the potential ongoing costs of millions of pounds should the authority fail to meets its Net Zero Carbon commitments.

If we were to plant trees to offset this annual amount, we would need to plant an area around a third of the size of Caerphilly County Borough.

To better understand this area and to allow us to make informed decisions on this, the Offset Group has commissioned consultants to provide detailed advice. This includes an exploration of the business case for purchasing land for tree planting. This will compare the cost of acquiring land and planting, to the cost of purchasing alternative credits. This work will also identify the co-benefits of acquiring land such as delivering public access, employment and biodiversity.

Buy

The Buy Working Group has been established with core members from Decarbonisation and Procurement alongside nominated representatives from each Directorate. This group has reviewed the existing Decarbonisation Action Plan under the Buy Pillar and agreed an updated Action Plan with 10 actions (See Appendix 2).

Of these actions:

- 1 has been completed
- 5 are going well with good progress
- 2 have had reasonable progress
- 2 have not yet started

Supply Chain emissions comprise nearly 80% of organisational carbon emissions annually. Tackling these emissions is key to achieving Net Zero. However, the methodology used to ascertain these emissions is the least accurate used in the reporting. Currently, every £ spent is multiplied by an emissions factor to calculate the amount of carbon. If spend goes up, so does the carbon, even if this is for the same amount of the same product. Therefore, the main focus of the Buy group has been initially to understand these emissions better and improve the methodology for calculating them.

Analysis of 22/23 spend data from Spikes Cavell has been completed to identify priority areas for further investigation. Similar to other local authorities, a large proportion of spend sits with a small number of suppliers and so understanding these emissions and taking steps to reduce them will require engagement with a relatively small group of our suppliers. From engagement we can ascertain which suppliers are already measuring emissions and implement methodologies to more accurately record our proportion of these emissions. A breakdown of the percentages of spend and transactions related to numbers of suppliers is in Table 7 below.

	% Spend	No. Suppliers	% Suppliers	% Transactions
Top 50 Suppliers	44.8%	50	1.1%	27.1%
Top 100 Suppliers	59.7%	100	2.2%	36.5%
Total Spend with Supplier >£1mil	48.20%	59	1.30%	30.30%
Total Spend with Supplier >£500k	63.70%	119	2.60%	39.80%
Top 50% Spend (£135.8mil)	50.00%	64	1.40%	31.20%
Top 25% Spend (£67.9mil)	25.00%	17	0.37%	20.95%

Table 7, Percentages of spend, suppliers and transactions 2022/23

It was reported to Cabinet in June 2023 that the majority of emissions from supply chain in 2021/22 were from Social Care Services, Construction and Computing and Electronic Equipment. This has continued in the 2022/23 data.

The top 50% of spend is concentrated in just 5 UK Standard Industrial Classification codes (SIC codes):

- 87-88 – Social Care Services
- 41.2 – Buildings and building construction works
- 26 – Computer, electronic and optical products
- 78 – Employment services
- 49.3-5 – Land Transport Services

Tables 8, 9 and 10 below detail the changes in £spend, $kgCO_2e$ and UK emissions factors from 2021/22 to 2022/23.

UK SIC	Category	£Spend 2021/22	£Spend 2022/23	% £Change
87-88	Social Care Services	£73,642,254.16	£90,490,180.90	22.88%
41.2	Buildings and building construction works	£45,083,151.54	£24,630,747.13	-45.37%
26	Computer, electronic and optical products	£25,309,025.02	£23,283,039.79	-8.00%
78	Employment services	£19,936,622.19	£19,135,875.76	-4.02%
49.3-5	Land transport services	£12,302,298.88	£12,599,391.13	2.41%

Table 8, Top 5 spend categories with spend 2021/22 and 2022/23

UK SIC	Category	$kgCO_2e$ 2021/22	$kgCO_2e$ 2022/23	% $kgCO_2e$ Change
87-88	Social Care Services	21,356,253.71	11,854,213.70	-44.49%
41.2	Buildings and building construction works	16,680,766.07	5,911,379.31	-64.56%
26	Computer, electronic and optical products	10,376,700.26	10,896,462.62	5.01%
78	Employment services	2,791,127.11	2,545,071.48	-8.82%
49.3-5	Land transport services	9,595,793.13	6,526,484.61	-31.99%

Table 9, Top 5 spend categories with carbon emissions 2021/22 and 2022/23

The tables above highlight the issues with the current supply chain methodology. Although spend for social care has risen nearly 23%, emissions have fallen nearly 45%. This is due to a change in the emissions factor as detailed in the table below. Whilst some emissions factors decrease, others rise, meaning that year on year comparisons can be difficult and improvements hard to ascertain.

UK SIC	Category	2021/22 Emissions Factor	2022/23 Emissions Factor	Difference
87-88	Social Care Services	0.290	0.131	-0.159
41.2	Buildings and building construction works	0.374	0.240	-0.134
26	Computer, electronic and optical products	0.411	0.468	+0.057
78	Employment services	0.138	0.133	-0.005
49.3-5	Land transport services	0.776	0.518	-0.258

Table 10, Top 5 spend categories with changes in emissions factors 2021/22 to 2022/23

Analysis of 22/23 spend data from Spikes Cavell has been completed to align the spend with UK SIC codes used for carbon emissions reporting. The top 25% of spend with most carbon emissions has been identified for each service area as part of the work developing carbon baselines. The next step is to have discussions with services as part of carbon baseline presentations to understand the spend and what

is being procured. Some engagement with services has taken place through the working group meetings.

Procurement have identified a list of upcoming contracts which might be suitable for further consideration as part of this work e.g. Home to School Transport. Work is being done to understand the actual emissions associated with these contracts so that improved methodologies can be used for emissions reporting.

Various decarbonisation and carbon calculating toolkits have been reviewed by the working group to determine which toolkits best suit which services within the organisation. External partners from other local authorities and public sector organisations have been engaged with an eye to collaborate on a unified approach to emissions reduction, with an initial emphasis on gaining a better understanding of these emissions so that targeted actions can be measurable. It is agreed that working with partners in the region to provide consistency for suppliers is favourable and the core membership of the group are beginning initial discussions on how new tools and supplier engagement can be rolled out.

Social care services spend contributes the most carbon to supply chain emissions using current methodologies as it represents the largest spend. More detailed analysis of this spend and the constituent parts has been completed for 2021/22. And as such, social care has been identified as a priority area for trial of new carbon calculating toolkits and engagement with suppliers.

Key Priorities & Next Steps

2023 will have been the first full year with a dedicated Decarbonisation Team in place within the authority focused on achieving Net Zero Carbon.

Whilst there have been some achievements in delivering the Decarbonisation Strategy prior to this, now there are dedicated officers, there is the required drive to fulfil our objectives at scale and pace. This said, collaboration across all services and with external partners is key to delivery.

Service Area Engagement

Services need to understand their emissions and the role that they need to play in reducing them before meaningful action at the scale and pace required can take place. The Decarbonisation Team have developed baselines for each Service with a view to presenting this information and building understanding so that targeted actions can be agreed, and budgets set. This process will begin as soon as possible, with initial presentations are delivered to senior leaders within each Service, before cascading down through the structure. A plan to engage all levels of each Service will need to be agreed and rolled out as part of this process.

Audit Wales

In November 2022 Audit Wales published an Assurance and Risk Assessment Review for CCBC. This review considered the Decarbonisation Strategy and its delivery and made two recommendations:

R1: The Council should ensure its proposed actions to reach net zero by 2030 are:

- fully costed in terms of their carbon and financial impact to enable it to prioritise actions;
- fully reflected in its Medium Term Financial Plan and Capital Strategy: and
- integrated into Directorate Performance Assessments.

R2: The Council should develop a robust set of metrics to measure and report progress on its decarbonisation journey.

Costed Plan

Costing the Decarbonisation Action Plan requires data from many sources and cuts across multiple areas of work. From three pillars of the Decarbonisation Strategy, tools and studies are being developed to achieve this.

Reduce:

a) Local Partnerships in collaboration with the WLGA have developed a tool which will cost the decarbonisation of buildings based on internal floor area, current energy consumption etc. This tool, used in conjunction with the work already completed by the Energy Team will enable us to fully cost the programme of decarbonising non-domestic buildings.
b) Tools to cost the transition to EV for fleet vehicles are being explored through the Optrak project.

Produce:

a) The Local Area Energy Plan (LAEP) being developed by Carbon Trust, ARUP and Afallen in collaboration with the authority will identify key opportunities to decarbonise the energy system within Caerphilly and provide clarity on the costs of decarbonising homes and other low-regrets decarbonisation measures.

Offset:

a) The Offset Working Group has commissioned a study to be completed by City Science which will cost the offsetting required to achieve Net Zero Carbon in 2030 based on various scenarios of residual emissions. This will consider the cost to plant trees on land already owned by the authority and also the cost of purchasing land with the intention of planting trees on it.
b) NRW in collaboration with Data Map Wales have produced shapefile layers of the borough which detail which areas of the borough are best suited for tree planting. This can be used in conjunction with the City Science study/tool to determine the costs of offsetting projects.

A priority for the next year for the Decarbonisation Team is to compile the data from each of these tools and generate a costed version of the Decarbonisation Action Plan which can then be reflected in the authority's financial plans and strategies.

Metrics

The development of baselines for each Service will allow consistent gathering and reporting of data on carbon emissions for the authority. Targeted and measurable actions will be agreed with each Service, with the Outcome/Output recorded in the Decarbonisation Action Plan and reported annually by the Decarbonisation Team. Once Carbon Budgets have been set for each Service, these will be reported on through Directorate Performance Assessments as approved by Cabinet in June 2023.