

ADUR & WORTHING COUNCILS

CARBON MANAGEMENT PLAN

FEBRUARY 2024



Background

Following the joint declaration of a Climate Emergency in 2019, Adur & Worthing Councils published their [Carbon Neutral Plan: Working towards the 2030 target](#). This was a science- and evidence-based Plan that identified key actions and intervention measures required to set the councils on the path to net zero carbon emissions.

The *Carbon Neutral Plan* aligned to the Councils' previous vision *Platforms for our Places*. This update The *Carbon Management Plan* now supports [Our Plan](#), specifically the *Thriving Environment* ambition, which lists as a mission: *Action now achieves a fair transition to Net Zero Carbon by 2045*.

Whilst the councils' emissions only make up a fraction of one percent of the emissions from the area as a whole, achieving the Carbon Neutral target by 2030, the councils will be a model for all residents, organisations and businesses in Adur & Worthing, enabling us to lead the area towards net zero by 2045 through learning and shared infrastructure.

This refresh of the *Carbon Neutral Plan* comes four years after the previous plan was adopted and three years following the appointment of the carbon reduction team, which has, in partnership with colleagues from across both councils and external organisations, secured in excess of £10m of external funding and delivered a number of key interventions. Many of these are explained throughout the document.

Emissions Progress

As noted in the *Carbon Neutral Plan*, the scope for the councils' reductions was defined as being Scope 1 and 2 only. These are defined in Table 1, as follows:

| Category | Description | Data used in this analysis |
|----------|--|---|
| Scope 1 | Direct emissions from sources owned or controlled by the councils | Metered gas data (or bills) Litres of fuel purchased for council-owned vehicle fleet Pool car mileage |
| Scope 2 | Indirect emissions from the generation of energy (electricity) purchased by the councils | Metered electricity data (or bills) |

Table 1

As per the *Carbon Neutral Plan*, scope 3 emissions¹ are not included within this analysis and will form a key part of the councils' work to deliver on its 2045 target.

¹ Scope 3 emissions are indirect emissions that result from other activities that occur in the value chain of the reporting organisation, either upstream or downstream.

Since the publication of the original plan, annual reports have been presented to the councils' Joint Strategic Committee that have set out year-on-year progress regarding the targets. These have also identified where further data (i.e. new metering and billing) has become available to the councils that allows for the direct comparison between the original baseline year (2019/20) and now (table 2).

| tCOe2 | 2019/20 | 2022/23 | % decrease |
|---------------------|--------------|--------------|--------------|
| Electricity | 856 | 638 | 25.5 |
| Gas | 979 | 821 | 16.2 |
| Fleet and pool cars | 1,197 | 1,092 | 8.8 |
| Total | 3,062 | 2,553 | 16.6% |

Table 2

This shows that the councils have reduced their emissions by over 500 tonnes, or 16.6% in the previous four years. Whilst this is good progress, it is evident that more needs to be done in order to ensure the 2030 target is reached.

This 2023 *Carbon Management Plan* updates the 2019 *Carbon Neutral Plan* by focusing on:

- Delivered projects and work
- Emissions reduction measures - only relying on offsetting where a reduction in emissions is infeasible, as defined by the UN
- Recommendations for further work to continue to deliver our progression to our 2030 target

Scope 1: Gas

The *Carbon Neutral Plan* identified the need to reduce heating demands and phase out natural gas usage across the councils' estate. This work has been split into two areas: gas for space heating and hot water; and gas consumption at the crematorium.

Heating

WHAT WE'VE DONE ALREADY: SHELTERED HOUSING

The communal boilers at Shadwells Court and Tollbridge House have been fully decommissioned and replaced with ground source heat pumps

FUNDING: Public Sector Decarbonisation Scheme plus Adur Homes match funding



As of 2023, emissions from heating are derived from thirteen sites across both Adur Homes and corporate sites. The council has developed heat decarbonisation plans for the majority of these sites. Where heat pumps are installed or heat network connections made, emissions will continue to reduce as emissions associated with electricity production decrease (see section XX).

Corporate Sites

Figure 1 shows emissions from corporate buildings, plus projected emissions from these buildings following interventions. This reduces emissions from heating corporate buildings from 267 tonnes to 133 tonnes.

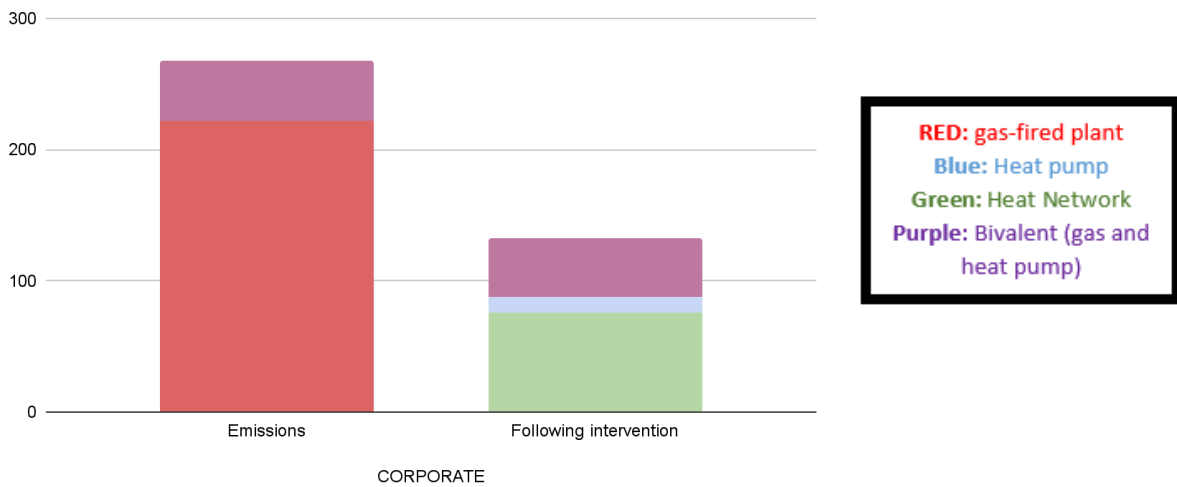



Figure 1

WHAT WE'RE DOING: WORTHING HEAT NETWORK

The Worthing Heat Network will provide low carbon heat to residents and businesses of the town centre.

Utilising large Air Source Heat Pumps located at the High Street Car Park, heat will initially be provided to Borough Council buildings and Worthing Hospital, with significant opportunities to grow the network over time.

CARBON SAVING: 150 tonnes (Town Hall and Portland House only)
3000 tonnes (Whole Phase 1)



FUNDING: Heat Network Delivery Unit, Heat Network Investment Project, Greater SE Net Zero Hub, Public Sector Decarbonisation Scheme, Worthing Borough Council

Adur Homes

Figure 2 shows emissions from Adur Homes, plus projected emissions from these buildings following interventions. This reduces emissions from heating Adur Homes buildings from 194 tonnes to 149 tonnes. Two sites have not had heat decarbonisation plans developed at present, one of which is the new communal gas-fired heating system due to be commissioned at Albion Street.

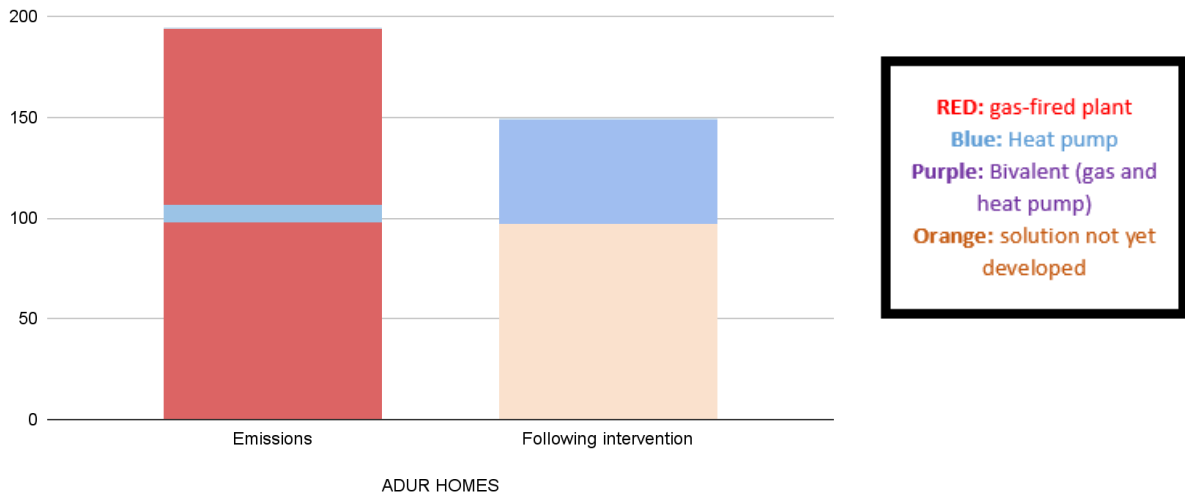


Figure 2

Recommendation: Develop Heat Decarbonisation Plans for the councils' remaining gas boilers

WHAT WE'VE DONE ALREADY: SHOREHAM CENTRE



The old, inefficient gas boilers which had no controls have been replaced by a new, bivalent system utilising large air source heat pumps.

New gas boilers were also installed to provide top-up heating during the coldest months. Further work to the distribution system and fabric will be required to fully decarbonise the site

FUNDING: Public Sector Decarbonisation Scheme plus Adur District Council match funding

CARBON SAVING: 25tonnes per annum

The Worthing Heat Network forms a key part of both the councils' plan to decarbonise its own estate, but is also the foundation of its ambition to decarbonise heat within Worthing by 2045.

It will initially connect five council-owned buildings plus Worthing Hospital, installing over 1.5km of insulated pipework between the hospital and the Civic Quarter. Low carbon heating will be produced by utilising large, centralised Air Source Heat Pumps located at the network's energy centre at the High Street Multi-storey car park. Planning Permission was granted in December 2023, with construction expected to start in 2024.

It is anticipated that once fully operational, Phase 1 of the heat network will save over 3,000 tonnes of carbon per year, increasing as new public and private sector connections are made.

The heat network will continue to expand organically across Worthing, utilising additional waste heat loads and making connections to new buildings over time. Other WBC owned and/or operated buildings as well as development sites will therefore be able to connect in due course.

WHAT WE'RE DOING: WORTHING CIVIC QUARTER

£2.5m of funding has been secured from the Public Sector Decarbonisation Scheme to complete additional energy efficiency works to Civic Quarter buildings, including connecting to the Worthing Heat Network.

These works include secondary glazing (pictured), loft insulation, draughtproofing, mechanical improvements to heating systems and improvements to BMS systems.

A previous £500k grant has allowed some works to already be completed at Worthing Town Hall and Portland House



FUNDING:

Public Sector Decarbonisation Scheme
Worthing Borough Council

CARBON SAVING: 125tonnes per annum (Town Hall and Portland House only)

Recommendation: Seek PSDS Funding for the remaining town centre buildings

Non-council controlled sites

The Councils are also responsible for maintaining a number of additional boilers under lease agreements with tenants (e.g. South Downs Leisure (SDL), Worthing Theatres and Museums and some community centres). These fall outside of the scope 1 definition used above, however they represent significant sources of carbon emissions.

WHAT WE'RE DOING: WORTHING CULTURAL BUILDINGS

All Worthing Theatres and Museums buildings are due to connect the Worthing Heat Network. This will fully de-gas the cultural property portfolio.

It is expected that this will assist WTAM in demonstrating their sustainability credentials for future funding bids

FUNDING: PSDS and Worthing BC match funding

CARBON SAVING: 129tonnes per annum



The council is continuing to support SDL on their own pathway to net zero by:

- Targeting a connection to the Worthing Heat Network for Splashpoint by 2027, reducing annual emissions by over 500 tonnes
- Developing Heat Decarbonisation Plans for all other SDL sites owned by Adur & Worthing Councils.

The councils will continue to work with SDL in order to develop business cases and secure funding to assist in the delivery of further decarbonisation measures.

Recommendation: Work with South Downs Leisure to deliver decarbonisation measures across their sites

Community Centres owned by the councils vary in the ultimate responsibility for heating system repair and replacement. Where the council is responsible, Heat Decarbonisation Plans have been developed for these sites and business cases, funding and intervention points will be considered going forward to assist tenants to decarbonise their heating supplies at an appropriate time

Recommendation: Work with individual Community Centres to deliver decarbonisation measures across their locations

Crematorium

Worthing crematorium is the single largest consumer of gas within this Plan. In 2022/23 it emitted over 400 tonnes of carbon during its operations, a slight reduction on 2021/22. Historic reductions have been due to changes in usage figures that are not necessarily permanent.

In 2021 a feasibility study, completed using Salix Low Carbon Skills Funding, explored the possibility of electrifying the crematorium. It noted that a number of constraints (specifically its location in mature woodland and surrounded by landscaped grounds; the electrical supply available; and space constraints within the building) make it difficult – albeit not impossible – to electrify. As a result, alternative options are being explored.

WHAT WE'RE DOING: HYCREM

The world's first pilot of using green hydrogen in a crematorium is scheduled at Worthing Crematorium in 2024.

The council are partners in HyCrem, alongside organisations from the higher education, net zero, cremation, hydrogen and gas distribution industries. HyCrem will see one of the three cremators at Worthing Crematorium utilise 100% green hydrogen for the cremation process for up to one month. Air quality testing and performance monitoring will be conducted alongside the trial.



CARBON SAVING: ~5tonnes (pilot only)

FUNDING: Industrial Fuel Switching/Net Zero Innovation Portfolio

Recommendation: Following HyCrem, determine and progress a decarbonisation option for the Crematorium

Scope 1: Emissions from vehicles

The remainder of the council's scope 1 emissions comes from operating its fleet of vehicles. This is easily split into four categories: light vehicles; larger trucks not used for refuse collection; the refuse fleet; and pool cars. Given the emissions inherent in continued diesel and petrol use, a transition away from fossil-fuels is required in order to meet the Carbon Neutral 2030 target.

WHAT WE'VE DONE: FLEET STRATEGY

The council has commissioned Ricardo to prepare a fleet strategy, setting out viable pathways to decarbonise its fleet, including by 2030. The recommendations included here are based on the output of that strategy

CARBON SAVING: up to 695 tonnes

FUNDING: Adur & Worthing Councils



As noted above, the council sees a potential role for the use of green hydrogen in its operations, however both the initial outlay and ongoing running costs will be significantly less economical than transitioning to a full battery-electric fleet.

The fleet strategy mentioned above forms the basis for the following sections of this report. A full strategy will be presented for adoption in summer 2024 and future users of this report should refer to the fleet strategy for the councils' most up to date approach.

Light Vehicles

The councils currently operate 70 light commercial vehicles (LCVs) and 12 larger vehicles between 3.5 and 12 tonnes in weight. These range from vans to support services including, Housing, Parks, Dog Wardens to road sweepers and the numbers will likely increase when food waste collections commence (subject to approval).

Despite making up two thirds of the fleet, these Light Vehicles contribute only about 30% of the fleet's emissions.

The technology for the decarbonisation of light vehicles is well established and the ranges required by the existing fleet mean that this is already a viable technology option.

WHAT WE'RE DOING: LIGHT VEHICLES

The council already operates 5 fully electric vehicles, charged at the Commerce Way depot.

A further 5 electric vehicles are on order with additional chargepoints to be installed at the same time

CARBON SAVING: 10tonnes (current and planned vehicles)



FUNDING: Adur & Worthing Councils

RECOMMENDATION: Continue replacing Light Vehicles with electric options as part of the ongoing fleet replacement cycle

RECOMMENDATION: As part of food waste collection options, explore low carbon options from the outset.

Refuse Fleet

The 2019 *Carbon Neutral Plan* noted that ultra-low emission HGVs were not expected to become widely commercially available in the next decade and that the councils will need to “undertake a review when the existing fleet is due for renewal”. Fortunately, technology has developed more rapidly than anticipated and there are a number of low carbon options to consider.

RECOMMENDATION: Review Fleet Strategy options and confirm preferred low carbon summer 2024.

Pool Cars

The pool cars operated by the council contribute less than 0.5% of the councils' total emissions from its fleet. The vehicles are not owned by the councils, the service is provided through a contract with a third party supplier. All of these vehicles are currently petrol-electric hybrid.

It is anticipated that these vehicles will be switched to battery electric models once charging infrastructure at the sites these cars are stored at overnight becomes available.

WHAT WE'RE DOING: POOL CARS

The Worthing Integrated Care Centre Multi Storey Car Park will have charging infrastructure available to charge all the councils' pool car fleet, enabling the discontinuation of the hybrids currently in use.

CARBON SAVING: 6 tonnes

FUNDING: Lease arrangement

RECOMMENDATION: Work to deliver improved alternative transport options (e.g. cycling provision) for staff

Scope 2: Electricity

Many of the measures to remove scope 1 emissions will have a necessary increase in electricity demand due to the phase out of gas or vehicle fuels. As a result, emissions associated with electricity consumption will remain a persistent part of the councils' carbon footprint and may increase, particularly in the short-term, as demand increases (potentially significantly).

The decarbonisation of the UK power system is expected by 2035. Whilst this is slightly beyond the councils' net zero 2030 deadline, significant reductions will mean replacing direct fossil fuel consumption (scope 1 emissions) with electricity will have a positive impact on the councils' carbon emissions.

The *Carbon Neutral Plan* identified few opportunities for electricity demand reduction measures across the councils' estate, principally due to the relative lack of high demand systems (e.g. mechanical ventilation) currently in use by the council. It has been routine for lighting replacements to be LED for some considerable time, although the upgrade of external lighting in particular is an opportunity for development.

RECOMMENDATION: Continue exploring opportunities for electricity demand reduction projects across the councils' property portfolio



The council already operates a small portfolio of solar PV systems. Most of these were installed post-Feed-in-Tariff subsidy and, as a result, the only financial benefit council receives from these is through a reduction in power purchased from the national grid. For

larger systems, such as those at Commerce Way and Shadwells Court, battery storage may present an opportunity to reduce the energy spend for the council².

WHAT WE'VE DONE: SOLAR PV

11 council buildings currently have solar panels installed, generating zero carbon electricity for consumption on site, with more planned for new developments

Where PV is installed, we regularly have 0 consumption during the daytime



FUNDING: PSDS and Adur & Worthing Councils

CARBON SAVING: approximately 30 tonnes/year (AWC controlled sites only)

Additional opportunities for the deployment of further Solar PV are likely, subject to financial viability for the following sites:

- Community Centres
- Commercial Property Portfolio
- Leisure Sites
- Car Parks (as solar carports)

RECOMMENDATION: Explore further opportunities for rooftop and carport solar PV opportunities with partner organisations

Important though they are, the above demand reduction, microgeneration and grid decarbonisation factors are only likely to have a small impact on the councils' scope 2 emissions. In particular, the fact that electricity from the national grid will not be zero carbon by the time of the councils' 2030 target date, some residual scope 2 emissions are inevitable if grid electricity is continued to be purchased.

² It should be noted that using battery storage to reduce imported electricity from the grid would also reduce the councils' reported carbon emissions, it does not reduce the overall emissions from the UK as a whole

RENEWABLE ELECTRICITY PRINCIPLES

The council has historically purchased its electricity via a renewable electricity tariff. These tariffs ring-fence existing renewables capacity for the council, but do *not* contribute to the lowering of UK-wide carbon emissions. In other words, they just make everyone else's electricity less renewable.

As such, the councils' approach when using renewable electricity to meet its future demands must meet the following tests for it to be legitimately 'offsetting' its scope 2 emissions:

- Renewable – in other words, solar, wind etc
- New – it must not already be contributing to the UK's zero carbon supply
- Additional – by becoming involved in the project, the council is unlocking its development

Trajectory to carbon neutral

The recommendations and interventions identified above will continue the councils' progress towards meeting its net zero 2030 target. Further to the gas information presented in Section above, the *total* emissions for the councils have been modelled in an effort to map a trajectory for the councils' emissions to net zero by 2030. This assumes that projects will prove financially viable and has only been possible to the extent that data has been available, so assumptions have necessarily been made around financial viability, technical deliverability and likely timeframes.

The indicative trajectory is presented at Figure 3.

Adur & Worthing Councils - Carbon Emissions 2019/20 - 29/30

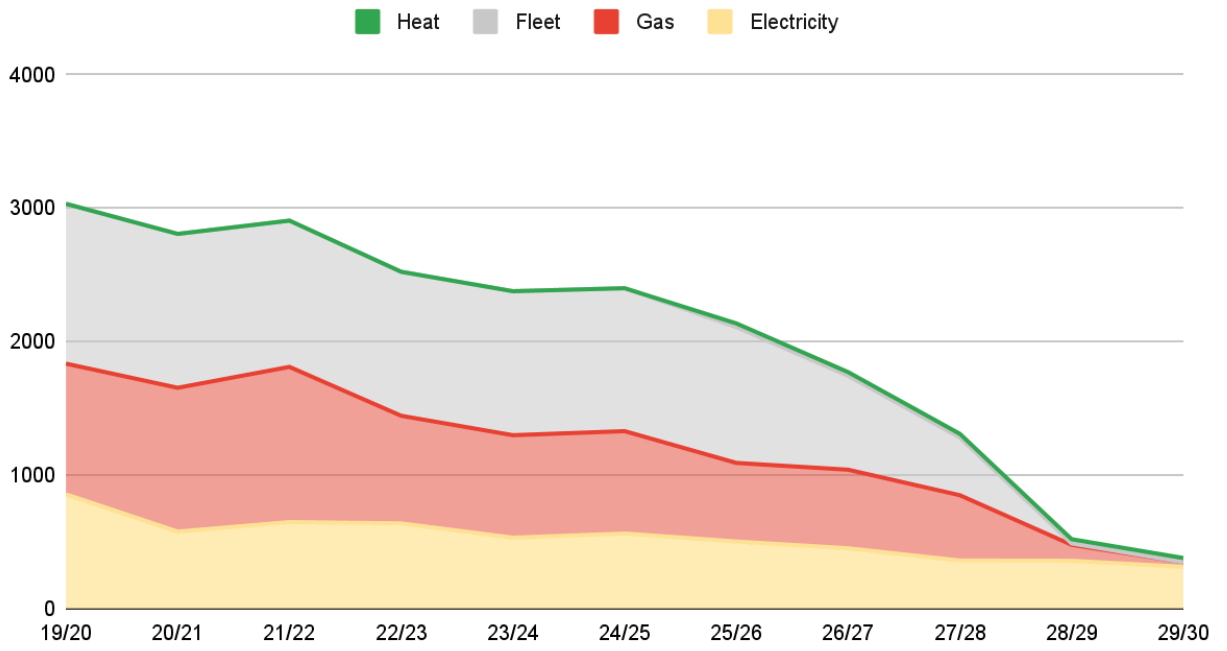


Figure 3

As this graph shows, emissions reductions are not due to be linear. Indeed annual increases are possible where the council increases its operational responsibility (e.g. food waste collections, new communal heating systems) or where external factors (crematorium use, increase in grid carbon intensity) play a part.

The biggest reductions come in the form of:

- The replacement of the refuse fleet with low carbon alternatives³ (500 tonnes)
- Connection to the Worthing Heat Network (200 tonnes)
- Decommissioning of sheltered housing gas boilers (190 tonnes)
- The gradual decarbonisation of the grid (190 tonnes)

It is important that these projects are prioritised in order for the largest emission reductions to be realised in order to minimise the cumulative impact of the councils' emissions.

RECOMMENDATION: Prioritise actions which make the largest carbon emissions reductions

Figure 3 shows that even with all of the interventions identified above, the council will still emit 380 tonnes of carbon annually, mostly through electricity consumption. This total must be offset for the councils to achieve carbon neutrality.

Offsetting: Renewable Generation

As per the *Carbon Neutral Plan*, the need to deliver and benefit from large renewables assets (or woodland⁴) must be met in order to be legitimately net zero carbon by 2030. Since the publication of the *Plan*, the UK market and legislation has developed considerably and there are now multiple routes to achieving a net zero electricity supply.

In order to meet the councils' residual electricity demand, it is likely the council will need in excess of 6MWp⁵ of solar capacity, or a smaller amount of wind capacity. Although Planning restrictions have eased slightly on the development of onshore wind in England, solar PV remains the more common and deliverable technology at this scale.

³ The graph assumes that battery electric vehicles are used but this is subject to confirmation in summer 2024. Alternative technologies are available and would result in a slightly different trajectory and residual emissions profile.

⁴ Or an alternative bio-sequestration method

⁵ MegaWatt peak – a measure of the maximum output of energy installations.

WHAT WE'VE DONE: LARGE SCALE SOLAR OPPORTUNITIES

The council has commissioned a study to explore the suitability of all of its assets for large-scale solar PV deployment. The potential for a modest solar farm has been identified and the council is actively seeking to progress its development, subject to financial viability

FUNDING: Adur & Worthing Councils

CARBON SAVING: up to 600 tonnes, depending on scale and grid carbon intensity

RECOMMENDATION: Seek to develop modest (3MW) solar farm on council-owned land

Due to the geographic constraints within Adur & Worthing (notably the sea, population centres and protected green spaces such as parks and the South Downs National Park), the council will not be able to deliver the required amount of renewable generation capacity within its boundaries. Opportunities outside Adur & Worthing will therefore need to be sought.

RECOMMENDATION: Seek to partner with Community, Public or Private sector partners to develop out-of-area renewable generation assets to provide electricity to council buildings

Offsetting: Sequestration

As mentioned above, carbon sequestration is an alternative to the deployment of large scale renewables assets in order to ensure genuine net zero emissions. The *Carbon Neutral Plan* suggested up to 575 hectares (5.75km²) would be required to offset residual emissions, however the carbon saving figure per hectare (3.56 tonnes) is at *maturity* of the woodland. Given the long timeframes in planting and growing woodland, tree planting will have a negligible impact on the councils' 2030 target.

Sequestration through alternative, more rapidly growing biomasses is also possible, although again it is felt that this will be difficult to make a meaningful contribution by 2030.

WHAT WE'RE DOING: OFFSETTING RESEARCH

As part of the Sussex Bay project (hosted by the councils), we are actively seeking research partners to assist in developing metrics and projects models to deliver 'blue offsetting', for example through the restoration of kelp forests.

FUNDING: Esmee Fairburn Foundation and others

CARBON SAVING: to be confirmed

Summary and Next Steps

Since the adoption of the *Carbon Neutral Plan* in 2019, Adur & Worthing Councils have made significant progress in reducing carbon reduction measures by over 16% and strengthening the identification of projects required for the councils to deliver on the commitment to be carbon neutral by 2030.

This revised *Carbon Management Plan* has demonstrated that significant progress can be made in reducing the councils' emissions from its day to day operations and that efforts to sustain progress already made around the decommissioning of gas boilers, decarbonisation of fleet vehicles and deployment of solar PV should be prioritised, particularly where external funding is available. Furthermore, projects that deliver greater savings should be prioritised for delivery in advance of those achieving more modest savings.

It also reinforces the point made in the *Carbon Neutral Plan*, that due to emissions taken to produce electricity, the council will continue to emit significant emissions even after all of these measures are completed. As such, offsetting measures - principally through the production of additional renewable electricity generation - should be developed at pace, in order to ensure the councils are able to meet their Carbon Neutral 2030 target.