Reducing carbon emissions in the property estate

Report to Environment, Economic Growth and Transport Scrutiny Committee

April 2023

Appendix A

Contents

1. Energy Strategy

1.1 Electricity and gas

The procurement strategy for the supply period 2020-2024 is a flexible purchase in advance contract with electricity and gas being bought in clips throughout the contract period. This strategy mitigates some risk of rising prices by avoiding the need to enter a fixed term contract on one specific date.

The contracts, which were procured via LASER Energy (a public sector energy specialist framework provider, owned by Kent County Council) allows Renewable Energy Guarantees of Origin to be purchased for the electricity to service the corporate and street lighting portfolios. Whilst the overarching aim is to reduce electricity consumption Under Greenhouse Gas (GHG) Protocol for scope 2 certified Renewable Energy Guarantees of Origin, electricity used can be reported as zero carbon under market-based methodology for electricity emissions. The carbon savings attributed to this by contract year would be:

	Consumption (kWh)	**Carbon emissions (Tonnes CO2)**
October 2020 to September 2021	16,428,003	3,546
October 2021 to September 2022	15,444,678	3,042
October 2022 to February 2023	7,515,232	1,437

Renewable Gas Guarantees of Origin (RGGOs) can also be purchased as a green gas option. Unlike REGOs however these are not widely accepted as reportable under Greenhouse Gas Protocol so would not reduce scope 1 emissions. The cost of buying these allowances is considerably higher than the electricity equivalent and at the time the contract was agreed would have added a premium of approximately 50% to the wholesale cost of the gas.

Further benefits from the LASER Energy framework are increased reporting on carbon performance of existing contract and access to Net Zero services.
The flexible framework opens various routes to assist customers in achieving Net Zero ambitions via energy supply agreements. Some of the key options include offering power purchase agreements to organisations who can sell electricity to the grid, sleeving facilitation that enables the energy from any power purchase agreements entered into by the council to be supplied through the framework to the council portfolio of sites, green basket options whereby energy may be purchased directly from renewable generators, and REGO certificates. The contract for the 2024-2028 is currently in procurement with the provision for REGOs being maintained.

The energy supply strategy 2024-28 is currently in procurement and a report is included at Appendix 'B' for consideration in Part 2 of the agenda.

1.2 Water

Following the de-regulation of the water services market in April 2017 commercial users were allowed to change their water retailer. LCC entered the market relatively early and moved corporate and school supplies to Wave (the trading name for Anglian Water Business (National) Limited). As water still must be bought from the same wholesaler (United Utilities) the benefits of moving supplier are through the added value of the contracts. Wave have a commitment to help the authority reduce its water use with enhanced reporting and highlighting increased usage.

As an addition to the water supply contract with Wave, arranged via North East Procurement Organisation (NEPO) for the period 2022-2026 (3+1year contract), the council included the provision of automatic meter reading devices for water meters at all corporate sites. Whilst installation work associated with this project is still ongoing significant savings have already been realised.

The devices give an early warning for excess water use. As a method to quantify savings in a standard way when calculating savings, it is assumed that a leak would run for one month (as this is the frequency of manual meter readings). The financial savings made so far this year equate to £42,000. The carbon savings associated with this would be 16 tonnes. This calculation assumes the lost water to be cold so has no adjustment for the carbon or cost associated with heating the water.

2. Carbon Descent Plan development

The council is working with LASER Energy to undertake a base line carbon assessment to understand of its 'in house' activities prior to developing a plan to reduce emissions: a 'Descent Plan'.

LASER Energy will undertake a data quality assessment for each data source dependent upon their significance and reliability. As well as highlighting any risks to data integrity, this exercise will provide focus and recommendations for the council to improve data quality and collection processes going forwards. Once all applicable data has been collated, LASER Energy will carry out analysis and convert them into equivalent quantities of emissions, broken down by:

- Emissions scope (as defined by the GHG Protocol)
- Emissions source (each individual contributor)
- Sector (buildings etc.)
- Any additional analysis deemed beneficial

This will provide insight into emissions and identify which operations and emissions sources are most significant. It will allow comparisons to be drawn across operations, sectors, scopes, and individual emissions sources. The data will be processed and analysed at a site level. The appraisal will include an emissions intensity assessment alongside a benchmarking exercise to determine the performance of each site against both apposite industry benchmarks and other sites in the council's portfolio. This exercise will identify the best and worst performing

sites in the portfolio and help to inform the next stages of the project. This will then allow forecasting to be made of reductions under business as usual due to changes in electricity generation for example and highlight how the carbon footprint could be comprised in the longer term and which emissions sources might prove more difficult to abate over that period.

The work will also show the scale of the reductions required to meet any commitments that have been made. An options appraisal workshop is proposed, facilitated by LASER Energy with council officers to better understand the organisation and objectives. The workshop will entail a discussion of completed, current and future projects, possible carbon reduction options and potential scale. As an example, options could include:

- Switching building heating to heat pumps and upgrading insulation
- Installation of LED lighting
- Installation of photovoltaic panels (PVs)
- Green electricity procurement options
- Estate rationalisation

A model will then be built, showing low and high impact scenarios to assess the impact of the agreed actions for the service, which would include an assessment of the impact on emissions as well as high level financial modelling. This work will complement the existing property strategy and help the move towards rationalising the estate.

In parallel to this a Sector Specific Carbon Reduction Options Appraisal will be developed to provide an appraisal of LCC's portfolio at a more detailed level, breaking down sites and opportunities to give sector specific recommendations for each of the different building uses within LCC's portfolio. This approach and the greater depth analysis, on a sector-by-sector basis, will provide a focus for budgetary discussions and explore financial, carbon and social aspects of numerous Carbon Reduction Options. The work will identify the worst performing properties and most energy intensive buildings and services within each of the different portfolio sectors and identify case studies to generate reports for each of the building types, identifying Carbon Reduction Opportunities along with potential costs, financial and carbon savings.

A draft report and recommendations will be available by the end of September 2023.

The carbon descent plan will build on the data in the carbon dashboard referred below.

3. Premises data and information

3.1 Carbon/condition Dashboard

The carbon/condition dashboard provides a league table of how buildings perform based on carbon emissions and identified priority 1 condition requirement costs per m2 of floor area. Using heat map grading, buildings are sorted into quartiles by carbon and cost aspects to come up with an overall order of performance.

Using data from the energy monitoring and targeting software the carbon/ condition dashboard shows emissions for all buildings based on emission factors published by central government (DEFRA). The dataset for the current dashboard is taken from billing for financial year 2021/22 and uses the gross internal area (GIA) for the floor area.

Of the 253 corporate buildings on the dashboard 203 have some form of fossil fuel heating. The remaining 50 use only electricity so the purchase of REGO backed electricity for these sites would confirm 100% of their energy consumption to be from renewable sources.

To aid this comparison electricity emissions are recorded using the appropriate grid conversion factor so high consumers can still be identified.

3.2 Display Energy Certificates

Display Energy Certificates (DECs) are designed to show the energy performance of public buildings. They use a scale that runs from ‘A’ to ‘G’ - ‘A’ being the most efficient and ‘G’ being the least. Public bodies must have a DEC for a building if it is at least partially occupied by a public authority, has a total floor area of over 250m2 and is frequently visited by the public.

All buildings that are within scope to require a DEC are also required to have an accompanying Recommendations Report to indicate priority works that will help reduce energy consumption.

Recommendations Reports are valid for 7 years for buildings over 1000m2 with 2023 marking a year when a significant amount are required to be renewed across the corporate portfolio. This work will be carried out by the council's in-house engineers who are accredited Low Carbon Energy Assessors and Low Carbon Consultants. To comply with accreditation body requirements the reports must follow a prescribed formulaic structure, and assessors will highlight key recommendations.

3.3 Energy surveys – fleet and depot sites

The current carbon dashboard indicates that the fleet and depot asset group are relatively poor performers on energy.

Energy efficiency surveys are currently being undertaken at 15 of these buildings to provide good housekeeping advice and identify practical measures to reduce energy use.

4. Interventions

4.1 Heating controls

Making use of heating controls is a simple way of reducing energy use in council buildings. Approaching the winter period, Facilities Management visited 173 retained buildings to gather information about heating set points and reduce (where appropriate) to a maximum of 21ºC. When the heating season ends (usually at the end of March) the buildings that are at 21ºC will be further adjusted to 20ºC. This gradual decrease will allow building occupants to better adjust to the reduced temperatures.

4.2 LED lighting installation

There are certain challenges with retro-fitting LEDs and without a full lighting design and replacement programme the full benefits will not be realised. A simple like for like replacement could result in areas that are under/over lit and without adequate controls the full energy saving potential may not be achieved.
A full lighting replacement scheme requires assessment of the fixed wiring and often testing/ removal of asbestos is needed. These associated items can add considerable costs to any scheme.
Facilities management are currently assessing fittings when carrying out re-modelling in areas and will replace lighting with LEDs wherever appropriate.

4.3 Photovoltaic (PV) Arrays

The price of PV installations has fallen in recent years but prior to this the payback of the technology was longer than for other technologies. Falling prices and significant progresses in the efficiency of the technology when considered with the increasing price of electricity now make PV arrays a viable option. However, it should be noted that retro-fitting PV arrays or solar panels to existing roofs requires intrusive surveys and load testing to be carried out to determine the structural integrity of a roof before viability of a project can be assessed. When applying a 'fabric first' approach to decarbonisation, this can require the replacement of a roof to be commissioned sooner than might otherwise be planned which can add significant cost to the works and impact the viability of the project.

The Energy Team are currently working with our framework provider to carry out a scoping exercise at 10 corporate sites to provide a forecast of the renewable generation potential through PV. As with all renewable technologies it is imperative to reduce consumption through wastage prior to commencing a project. In doing this both running costs and project costs will be reduced. PV-Coal Clough, Leyland and Garstang Libraries all benefited from PV array installations in 2022. The three systems have a combined peak generation capacity of 19kW and are projected to produce 17,982kWh per year.

5. Capital programme

5.1 Condition-led programme

The council has a varied portfolio of operational premises with a wide range of construction types and age profiles. Each require a bespoke approach to maintenance and decarbonisation. Some will not be suitable for a low carbon heating options without significant enabling works and consideration will need to be given to the operational requirements of each building. The greatest impact can be gained through 'retrofit' installations that enhance the thermal efficiency of a building through a 'fabric first' approach, followed by reducing use of fossil fuel-based heating systems. By upgrading building fabric or replacing heating systems to meet current building regulations, such works can have a beneficial impact on the level of emissions.

Previous rounds of the council's operational buildings condition-led programmes were based predominantly on the condition of the building structure, fabric, and services; with the highest priorities being ranked according to risk of building closure or Health and Safety risks. These condition priorities continue to form the basis of the programme; however, this now incorporates a focus on carbon reduction, taking a more holistic approach to the building and its operational use.

As part of the strategy to reduce carbon emissions, all relevant projects will be supported by a low carbon consultant who will formulate a bespoke plan to help identify and minimise energy consumption. As well as providing guidance on good energy management to reduce waste, each property will be issued with a recommendations report to highlight areas for future improvement. By taking a long-term view, improvement works can be phased to ensure carbon reductions are achieved without placing an unmanageable burden of increased operating costs on the premises budget that can be associated with the change from gas to electricity.

To note, retrofitting low carbon technologies in older buildings presents a significant challenge. Part L of the Building Regulations makes provision for the conservation of fuel and power, and this is considered when commissioning and designing schemes. All buildings constructed today must meet the strict requirements imposed in the regulations and these will ensure low carbon heating solutions can satisfy the heating requirements.

The consequential improvements required on older buildings to enable zero carbon heating solutions are extensive with new roof coverings, insulation for walls and new windows/doors indicated as a minimum. Larger radiator sizes are also required for heat pump applications as the heat supplied is of a lower temperature.

An innovative approach building services are taking to these challenges is to utilise a hybrid design. This consists of an air source heat pump installation which is supported by a lower capacity gas boiler. The heat pump and boiler will operate in a changeover configuration with the gas boiler being primary heat source when the weather is colder or for the morning boost then the heat pump replacing it as the heat demand in the property falls. As fabric improvements are made to the building the need to utilise the gas boiler will reduce so the initial carbon savings will increase over time. This phased approach would make the decarbonisation of heat a viable option at buildings that would previously have not been suitable for a heat pump

solution. Further benefits of the hybrid approach are that it provides resilience in the system should there be any plant failures and expensive infrastructure upgrades to the electricity network can be reduced.

5.2 Government funding

5.2.1 Department for Education (DfE)

The DfE now includes low carbon criteria for applications to targeted capital pots. Some examples where the council has made an approach for these funds are set out below:

- **Youth Investment Fund (YIF)**

In developing an application to the Youth Investment Fund (YIF) to secure Department for Education investment in service and premises, detailed decarbonisation surveys were commissioned for premises at New Era, Accrington; Fleetwood Children and Families Wellbeing Milton Street; Blakiston Centre; and Leyland Youth Zone at West Paddock. The survey of the Youth Zone did not identify any works which would meet decarbonisation funding criteria. The council awaits the outcome of its application to the YIF fund.

- **Children's residential programme**

In January 2021, Cabinet agreed a series of 'Where Our Children Live' proposals, including the expansion of the in-house children's home service to include more 'complex' placements to help meet demand.

The Department for Education (DfE) has made the Children's Homes Capital Fund open to applications from local authorities and the council has been successful in its bid.

Premises at Croasdale Drive, Clitheroe were vacated in Spring 2022 following the service move to a new facility at Northcliffe, Great Harwood. The premises will be repurposed and retrofitted for the residential programme. A requirement of the Department for Education capital bid is that the project will meet the standard of BREEAM sustainability assessment method 'Very Good'. The design will reflect this requirement, and the estimate has included for such a specification.

- **New school projects**

The project to expand Ribblesdale School and provide 210 new primary places as a 'through school' is due to be completed in time for September 2023 intake. Whilst not part of the operational portfolio, the school is being designed and constructed in line with the DfE model design specification to achieve carbon net-zero status. Its modular construction is more energy-efficient and it will be installed with a ground source heat pump, supplying the school with a sustainable source of heat and hot water. Solar panels will also be installed on the roof, which will generate power for the school and car charging points will also be available for staff and visitors. Design

specifications for significant expansions of existing schools, and proposal for future new schools will follow a similar approach.

5.2.2 Department for Energy Security and New Zero

The Department for Energy Security and New Zero (formerly Business, Environment and Industrial Strategy BEIS) funds the Public Sector Decarbonisation Scheme (PSDS) and associated Low Carbon Skills Fund which are administered by Salix Finance and aim to reduce carbon emissions associated with heating buildings. The LCSF provides grant funding for detailed surveys and the wider Public Sector Decarbonisation Scheme provides capital match funding. Each fund is over-subscribed and requires detailed submissions to be formulated.

- **Libraries PSDS projects**

Following a successful bid for funding from the PSDS three libraries in Lancashire have been retrofitted with energy saving technologies.

Leyland Library, Coal Clough Library and Garstang Library all had extensive upgrades including air source heat pumps and LED lighting which were supported by photovoltaic arrays to provide a source of renewable energy. To improve the thermal efficiency of the building Coal Clough Library had replacement windows and a new roof covering. Leyland Library benefited from a new roof covering which helped reduce heat loss from the building. The project at Garstang Library completed first and is the only library that has been operational with the new heating system for a full 12-month period. Compared to the previous year the energy use at Garstang has fallen by 61% which represents a cost saving of over £11,000.

- **2023 funding round**

With another round of the PSDS due to open later this year, a further bid is currently being prepared for submission to the Low Carbon Skills Fund for funding to commission in depth de-carbonisation surveys at a further eight sites. Of these sites five are on the current capital programme for new heating systems and should be eligible for an application for funding from the PSDS.

6. Tree Management

At its meeting in March 2021, Cabinet agreed a new environment and climate programme for the county council. This committed the council to undertake a programme of urban tree planting on roadside verges, footways and in the small parcels of public and private land adjacent to the highway, and next to dwellings and business premises in urban areas with the aim of improving local amenity and air quality. To deliver against this aim, the council has been successful in securing grant monies from the Urban Tree Challenge Fund (UTCF) which is administered by the Forestry Commission and provides support for planting trees across England's Towns and Cities. Match funded by the council this will provide £500,000 for a five-year programme of planting and maintenance at locations around the county. 300 trees planted in the planting season for 2021-2022 and a further 300 in the 2022/23 planting season. A Tree strategy is being developed, due to be presented to Cabinet

towards the end of 2023, which will aim to provide a holistic approach to tree planting co-ordinated across the whole of the county council's portfolio of assets.