YOUR DECARBONISATION REPORT

The Green Stationery Company

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European Union
European Regional Development Fund

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WEST OF ENGLAND Combined Authority

BACKGROUND

This free report has been produced by the West of England Combined Authority as part of the West of England Green Business Grant scheme, which is funded by the European Regional Development Fund (ERDF) and the West of England Recovery Fund. Following a survey of your business on 2nd March, this report estimates your current carbon emissions and identifies steps you could take to decarbonise.

We have used information gained during the survey, as part of your Organisation Application and any subsequent information requests to produce this report. If further investigation or historical information is required then this is highlighted as appropriate. The improvements that make the most impact are shown first; however, we do not recommend any particular options, nor do we guarantee that measures will achieve the savings calculated and stated in this report.

Carbon emissions are calculated using the UK Government greenhouse gas reporting conversion factors 2017 for CO_2 equivalent (CO_2e), and include both direct (scope 1 and 2) and indirect (scope 3) emissions relating to the production and consumption of energy in the UK. Energy costs are calculated using the UK Government energy and emissions projections 2018, using 2020 retail prices. This report does not set out the planning consent or building regulations that may be required for these works.

If you would like any further information or clarification please feel free to contact the West of England Combined Authority on 0117 332 1520 or email gbg@westofengland-ca.gov.uk.

Why are Decarbonisation, Energy Efficiency and Resource Efficiency Important?

The West of England Combined Authority declared a climate emergency in July 2019, alongside our local authority partners. We have committed to carbon neutrality by 2030, contributing towards maintaining global warming at less than 1.5°C above pre-industrial levels.

We are ambitious in supporting a green recovery from COVID-19, building on the positive behaviour changes brought about by the pandemic to help businesses to transition to low carbon approaches, as well as create new businesses and jobs.

Commercial electricity costs are forecast to increase by 14% over the next 15 years, therefore improving energy efficiency and investing in onsite renewable generation could reduce the impact of rising energy bills on your business overheads and bottom line.

The low carbon economy is predicted to grow by 11% per year up to 2030, creating around one million jobs nationally. This could represent 35,000 new jobs in the West of England by 2030, and 65,000 by 2050.

The water industry accounts for 1% of total UK greenhouse gas emissions. Using and wasting less hot and cold water through more efficient fittings can cut emissions, decarbonise the economy and support the creation of new technologies.

Approximately 80% of environmental impacts are determined at the design stage of a new product. By viewing waste as a design flaw and opting for circular practices we could significantly reduce waste and waste processing, and avoid the sourcing of unused, raw materials.

ABOUT YOUR BUSINESS

2 Cleveland Terrace, Bath BA1 5DF

Based in central Bath, your business is a retailer of environmentally friendly and ethical office supplies. With 80% of your business being online, your premises mainly consists of storage and packing space, as well as a small office.

Your building is a listed Georgian property and is within the Bath conservation area. You occupy the ground floor and basement. It is constructed of solid limestone with secondary glazed windows. The floor between the basement and ground floor has also been insulated between the floor joists. Heating is provided by portable direct electric heaters (fan and passive convection) with appliance thermostats. There is no hot water system, no cooling system and ventilation is natural by opening windows at the front and rear of the premises.

Lighting is a mixture of compact fluorescent bulbs and halogen spotlights. You have minimal other electrical equipment on site apart from basic IT equipment.

Water use and waste production are very low. You produce one bag of general waste every 2 weeks and reuse as much packaging as possible. Your main waste challenge is shrink wrap which you receive from suppliers and now return to them to process. You have one business delivery vehicle which is a self-charging hybrid and would like to install a charge point to allow you to switch to an electric vehicle. You also use electric bike delivery services for local orders as well. Staff commute to the business by walking.

Front of premises on Cleveland Terrace

Your Recent Decarbonisation Activities

- Your windows are secondary glazed and your ground floor has been insulated.
- You minimise waste production as much as possible, including returning difficult-to-recycle materials and reusing packing materials.

DECARBONISATION STEPS TO SUCCESS

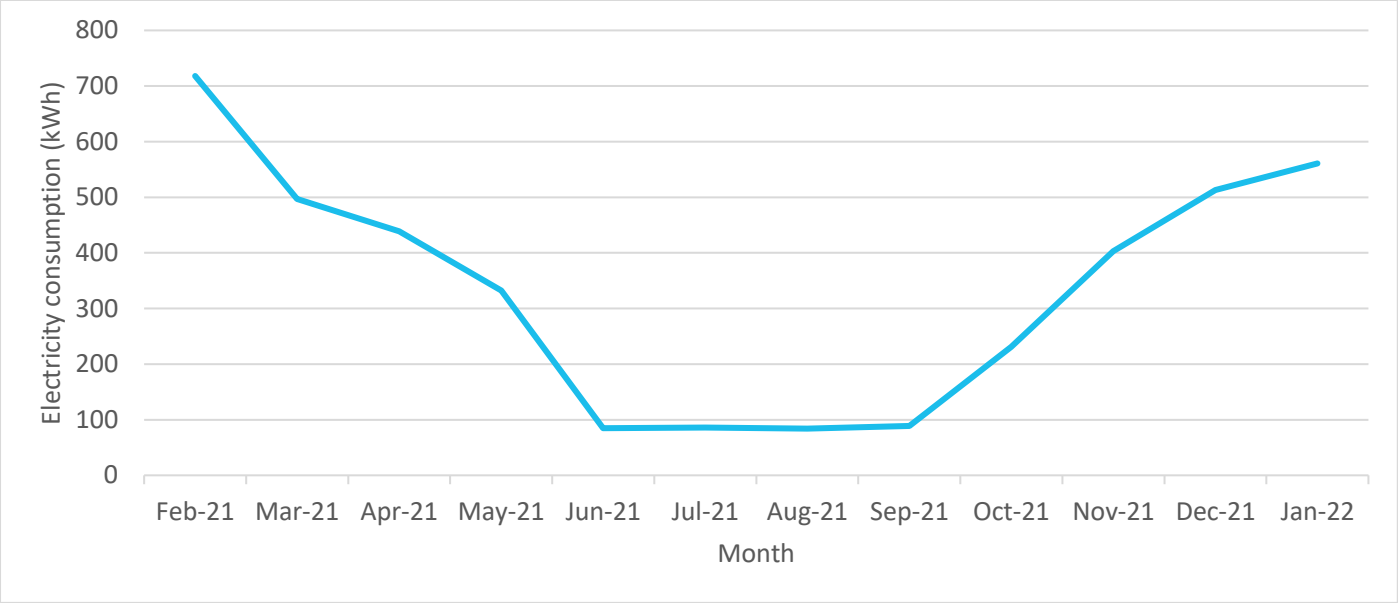
STEP 1 MONITOR	You can only manage what you measure, so keeping an eye on your utility bills is a good way to start your journey to decarbonisation. If you notice any increases or decreases in utility consumption or waste generation, take a moment to consider what might have caused it. It could be justified, or it could require further investigation and action.
STEP 2 REDUCE	Often the most cost-effective way of reducing carbon emissions is to cut down your consumption through energy and water efficiency improvements, reviewing business processes and manufacturing practices, and encouraging changes in staff behaviour.
STEP 3 REPLACE	If you can't do any more to reduce your consumption, you could identify where you can switch from unsustainable products to sustainable equivalents. This includes installing renewable energy generation on site, switching to sustainable transport options and sourcing recycled and more environmentally friendly materials.
STEP 4 OFFSET	If you believe you've exhausted all other avenues, you could offset your emissions through external means such as tree planting programmes. Some energy suppliers offer specific tariffs that include carbon emission offset costs.

YOUR ANNUAL CARBON EMISSIONS

The table below summarises your annual utility consumption and associated carbon emissions. This is based on information that you provided before the survey, which has been analysed to provide an estimate of annual consumption, carbon emissions and cost. The site is served by electricity only:

Utility	Annual Consumption	Annual CO_2e Emissions	Annual Cost
Electricity	4,038 kWh	1.8 tCO_2e	£561
Total	**4,038 kWh**	**1.8 tCO_2e**	**£561**

The graph below shows your monthly electricity consumption profile. Based on this, we believe that your electricity consumption is dominated by your use of heat in the colder months, with a base consumption of around 85kWh per month throughout the year for lighting and equipment. Therefore, reducing heating demand is likely to pose the greatest opportunity to reduce your carbon emissions in your premises.



Monthly electricity consumption

YOUR CARBON REDUCTION OPTIONS

Based on our survey and the information you have provided, we have identified the following potential ways in which you could save energy and carbon in your business, which are sorted in order of the greatest carbon impact:

Recommendation	Estimated Annual Consumption Saving	Estimated Annual CO_2e Saving	Estimated Annual Cost Saving
Radiant Heating	2,100 kWh (52%)	0.9 tCO_2e	£292
Air to Air Heat Pump	2,019 kWh (50%)	0.9 tCO_2e	£281
LED Lighting	654 kWh (16%)	0.2 tCO_2e	£91

Radiant Heating

Your building is currently heated by direct electric panel heaters, which can be expensive to run. While your electricity use appears to be dominated by your use of heating in the cooler months, your overall consumption is low, meaning investment in a fixed heating system like an air-to-air heat pump may take a long time to pay back. A lower-investment option could be to replace most of your panel heaters with radiant heaters.

Radiant heaters save energy because they heat objects such as people as opposed to the air (which is how standard electric heaters work). They can provide general heating to the space, but also spot heating can be implemented depending on how the space is used throughout the day.

Far infrared heaters, which look a bit like blank canvasses, would probably be the most appropriate technology as they are the most efficient type of radiant heating, don't emit any light, and provide a more comfortable heat over a longer period of time. They can be mounted on the wall or ceiling as well as portable versions being available.

The energy and carbon savings have been calculated based on replacing most of your electric heaters with radiant panel heaters, with an 80% reduction in energy use based on the Carbon Trust's guidance. You would need to speak to a radiant heating supplier if you want to understand what is possible and to obtain a quote for the works.

Air to Air Heat Pump

If you want to install a fixed heating system rather than use portable convection or radiant heaters, you could install a more efficient air to air heat pump to provide space heating.

An air-to-air heat pump is an air conditioning system that is able to operate in reverse to provide both heating and cooling to a space. They produce heat by extracting heat energy from the air outside and compressing it to a usable temperature. Heating and cooling are provided from fan-coil units that could be mounted on the wall, while the outdoor unit could be mounted on the ground or an external wall. An air-conditioning installer would be able to advise you on what is possible in your building and quote for the works.

Their efficiency varies throughout the year depending on the weather, however they can achieve heating efficiencies of up to 400% (1 unit of electricity produces 4 units of heat) because they are using freely available renewable heat energy from outside. Electric panel heaters provide heat at a maximum 100% efficiency.

The energy and carbon savings calculated are based on replacing your electric heaters with an air-to-air heat pump at an average 300% efficiency, taking into account the additional use of electricity for cooling in the summer.

LED Lighting

The lighting in your business is predominantly made up of compact fluorescent bulbs and halogen spotlights

Equivalent LED fittings are available that are likely to reduce your lighting energy consumption by between 50% and 90%. Furthermore, your maintenance and replacement costs are reduced as LED lights tend to last around 50,000 hours, compared to 1,000 hours for halogen and 15,000 hours for fluorescent.

The energy and carbon savings calculated are based on replacing 8 compact fluorescent bulbs and 4 halogen spots with equivalent LED fittings. You would need to arrange a survey with a lighting contractor to obtain a detailed quote for LED lighting appropriate to your business' needs.

For more information, take a look at the Energy Saving Trust's guide on lighting: The Right Light.

FURTHER RECOMMENDATIONS

The recommendations below have been identified, however energy and carbon savings have not been calculated because:

- they are a behavioural measure, so savings are difficult to quantify;
- it is not possible to calculate a saving without more detailed or specialist investigation; and/or
- the measure does not achieve a direct energy and carbon saving for the business.

Draught Proofing

To reduce heating energy consumption and improve comfort for staff you can ensure that all draughts such as from doors, windows and chimneys are blocked up where possible. Draughtproofing tape and brushes can be purchased at low cost from DIY stores and installed yourself. Pay particular attention to old wooden sash windows and wooden door frames, as these are the most common sources of draughts. If you are experiencing draughts from new UPVC doors and windows, these may be able to be adjusted by an installer to eliminate draughts.

FURTHER INFORMATION

For more information regarding the energy reduction measures mentioned in this report as well as further advice on energy efficiency, the below organisations can provide guidance as well as potential suppliers and installers.

Carbon Trust - Advice and guidance on energy efficiency and sustainability - https://www.carbontrust.com/

Chartered Institute of Building Services Engineers (CIBSE) - Knowledge and supplier directory of building services - https://www.cibse.org/

CIGA - Cavity Insulation Guarantee Agency including advice and installer directory - https://ciga.co.uk/

Energy Saving Trust - Advice and guidance on energy efficiency and sustainability - https://www.energysavingtrust.org.uk/

Energy Technology List – List of approved energy and water saving products that qualify for Enhanced Capital Allowances - https://www.gov.uk/guidance/energy-technology-list

FENSA - Approved installers of windows and doors - https://www.fensa.org.uk/

Gas Safe Register – Approved installers of gas appliances including boilers - https://www.gassaferegister.co.uk/

HETAS – Approved products and installers of solid fuel burners and boilers - https://www.hetas.co.uk/

Microgeneration Certification Scheme (MCS) - Approved products and installers of renewable energy - https://mcscertified.com/

Planning Portal – UK Government - https://www.planningportal.co.uk/

Smart Export Guarantee (Ofgem) – Scheme that pays small-scale low carbon generators such as Solar PV for electricity exported to the National Grid - https://www.ofgem.gov.uk/environmental-programmes/smart-export-guarantee-seg/about-smart-export-guarantee-seg

SWIGA - Solid Wall Insulation Guarantee Agency including advice and installer directory - http://www.swiga.co.uk/

Timber Standard for Heat and Electricity (UK Gov) – Quality and sustainability standards for wood fuel used in biomass technologies - https://www.gov.uk/government/publications/timber-standard-for-heat-electricity

Water Regulations Advisory Scheme (WRAS) - Approved plumbers and water products - https://www.wras.co.uk/

Western Power Distribution – Advice on connecting energy generation to the grid - https://www.westernpower.co.uk/connections-landing/connecting-generation-or-energy-storage

National and Local Sustainable Travel Grants –
https://travelwest.info/for-businesses/grants-funding
https://beta.bathnes.gov.uk/bath-clean-air-zone
https://www.goultralow.com/