

# Net Zero Action Plan v1.0

November 2023

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## 1. Introduction

In February 2020, a motion was passed by General Synod that recognised the current global climate emergency, and called on all parts of the Church of England to reach net zero carbon by 2030. [1]

In July 2022, a further General Synod motion endorsed a national document entitled ‘Routemap to Net Zero Carbon’ [2] (herein referred to as ‘the Routemap’), which would guide dioceses to achieve net zero carbon by 2030. It sets out key milestones for all aspects of the diocese, and accordingly this Action Plan is based largely on the Routemap.

In May 2021, Durham Diocesan Synod acknowledged the climate crisis and committed to register as an Eco-Diocese [3]. In November 2022, Durham Diocesan Synod agreed the following motion “*...this Synod welcomes the Routemap to Net Zero Carbon by 2030 and commits to bringing to Diocesan Synod in 2023 a Diocesan Routemap with a view to achieving that goal locally.*”

## 2. Purpose

This Action Plan is Durham’s response to the call to reach net zero carbon by 2030. It sets out an estimate of Durham’s own baseline emissions and looks at where carbon emissions can be reduced. Estimated costs of reducing emissions have been projected, and our proposed actions based on the Routemap have been set out.

It is hoped that this document will raise awareness of the growing climate emergency, and provide reassurance that that Durham diocese are taking bold and clear steps to reach the 2030 target. The Action Plan will encourage those in churches, schools and other diocesan entities to also take this goal seriously and join with us in taking whatever actions we can.

This document is data driven, and as such will be under constant review in order to keep it relevant and maintain sensible targets. We have convened a net zero working group, who will regularly meet together to discuss the targets set out, as they have done to produce this document. This Action Plan will also be reviewed at Diocesan Synod annually, in line with the Routemap.

The document is a first step towards net zero by 2030. It highlights the need for further work to develop practical approaches to reducing carbon emissions, and gives an indication of the scale of funding required to achieve this, whilst recognising the challenges involved in finding this funding.

## 3. Theological Principles

It is clear from the devastating effects of climate change that global warming is harming God’s earth and God’s people. Safeguarding (caring) for creation is expressed very clearly in the fifth mark of mission, and each of the other four marks of mission have clear implications for how we regard the environment around us.

In May 2021, the Diocese introduced Caring for God’s Creation as one of our 4 Diocesan priorities [3]. It arises directly from our core Christian theology of God’s work in creation and salvation, and the mission of the Church. The priority has cultivated a shared Christian vision for God’s creation and our responsibilities and call as his people to steward, nurture, protect and champion it, in Jesus’ name, for the good of all people everywhere. A paper on this topic was produced by Archdeacon Rick Simpson at the time. [4]

## 4. Scope

The scope for this action plan is based on the scope outlined in the Routemap to Net Zero.

### In scope

- Energy use (gas, oil, other fuel, electricity) in buildings owned by the diocese or for which the diocese has a significant degree of influence:
  - Churches and church halls
  - Cathedral
  - Voluntary aided schools and schools within a Diocesan Academy Trust<sup>1</sup>
  - Clergy housing
  - Diocesan offices and land
  - Theological education institutions (TEIs)
- Generation emissions for electricity that powers our buildings
- Business Travel

### Out of scope (but aim to missionally influence)

- Commuting to and from work
- Congregation Travel
- Clergy, Staff, Family and church member lifestyles
- Emissions from school buildings which the Church has little influence over – For Durham Diocese, this means voluntary controlled schools and academy trusts.

### In scope after 2030

- Purchasing
- Waste
- Water
- Contractors
- IT
- Air Conditioning Gases

We hope that implementing this action plan will raise awareness of where Durham Diocese currently stands. It is also hoped that it will influence some of the out-of-scope items through a change in attitudes and behaviours across the diocese.

The definition of Net Zero is shown below. It can be defined as the gross carbon footprint of the in-scope emissions described above, minus electricity from renewable sources to reach the net carbon footprint. To achieve net zero carbon, any remaining emissions should be offset by valid schemes or by exporting excess energy to the grid from renewable generation (e.g. Solar Panels).



Figure 1 - Definition of Net Zero, taken from the Routemap to Net Zero by 2030 [2]

It is important to note that offsetting is to be used as a last resort – we hope to get our net carbon footprint as close to net zero as possible before we consider offsetting, however we recognise that there are some buildings where offsetting in conjunction with other measures may be required to achieve net zero.

<sup>1</sup> The Diocese does not have their own Diocesan Academy Trust, so our Voluntary Aided (VA) schools are those in scope.

As previously mentioned, this Action plan will be under review and the emissions in scope after 2030 will be considered at a later date.

It is important to recognise that every aspect of the diocese and every building is different. There is no blanket approach to reaching net zero, which is why it is important for every church, school and other diocesan organisation to consider their own approach to net zero based on the information provided in this Action Plan.

## 5. Durham’s Baseline emissions (2021)

We have used the Church of England Environment Programme’s “Carbon Emissions Report 2021” [5] to gather background data and have adjusted it to remove schools that are not in scope (See Footnote 1). We have also removed the TEIs from the ‘Other Buildings’ section, as Durham’s are not fully in scope (See Section 6.6). The table below shows the resulting data. The original data can be found in Appendix 1.

	2021 Carbon Footprints (tCO <sub>2</sub> e)	Percentage contribution to carbon footprint
Churches	2500	55 %
Schools	418	9 %
Housing	1300	30 %
Other Buildings (Cathedral, TEIs, Offices)	227	5 %
Travel	20	1 %
<b>Total</b>	<b>4465</b>	<b>100%</b>

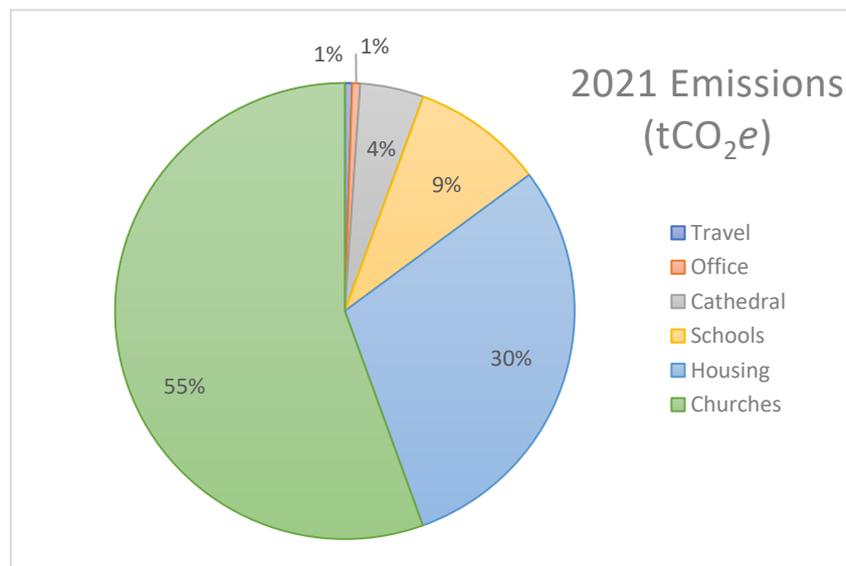


Figure 2 – A breakdown of the Diocese of Durham's baseline carbon emissions

The Carbon Emission Report uses data from the Energy Footprint Tool [6]. Where data has not been entered by the church, school, cathedral or diocese, the CofE Research and Statistics team estimate values.

The graph below has been produced using the Carbon Emission Report data, and this time includes all church schools, not just those in scope. It gives a holistic picture of how we have progressed as a diocese over two years from 2020 to 2021. There is a slight decrease in church and school emissions, but it isn't possible to say with much confidence what has caused this. We believe that other building and staff travel emissions are likely to have increased due to the bounce back from the COVID-19 lockdown and staff attending the office and travelling for work more regularly.

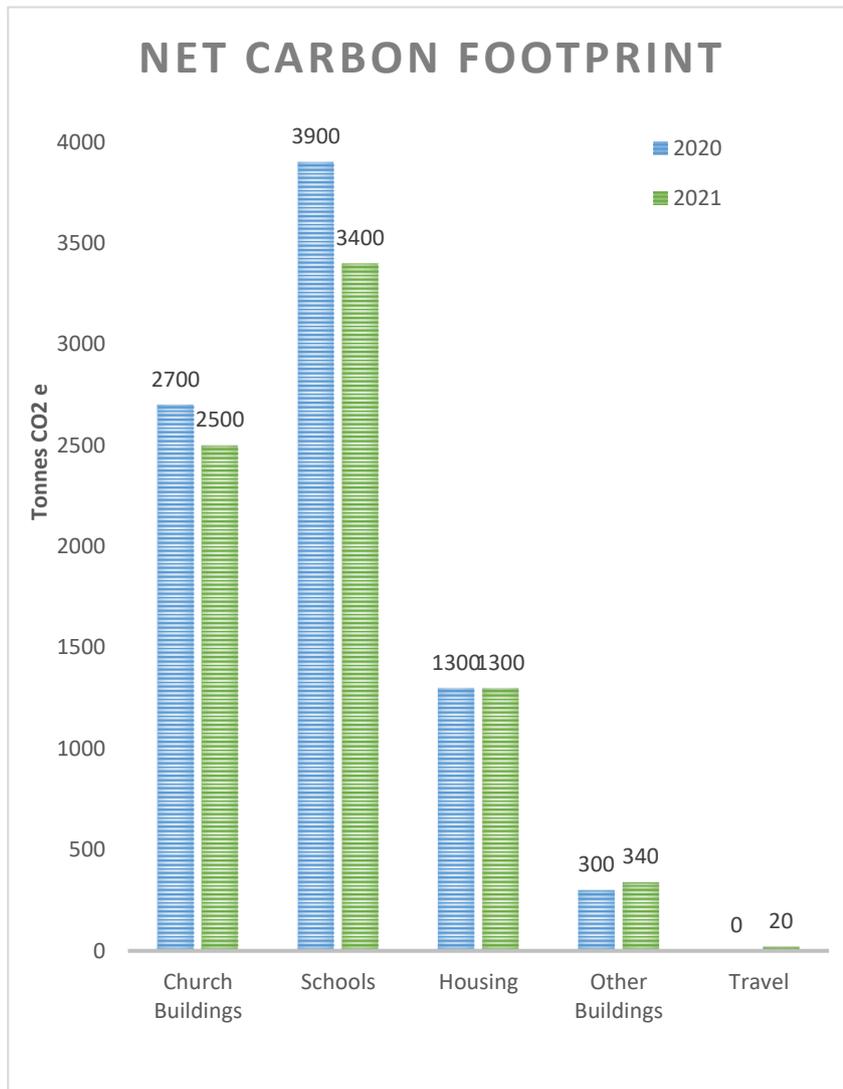


Figure 3 - Comparisons of 2020 and 2021 data for the diocese

## 6. Action Plan

### 6.1 Churches

#### Background

The diocese currently has 261 church buildings that are open for worship. Of those churches 62% are listed buildings (15% Grade I, 39% Grade II, 8% Grade II\*). The majority (76%) of our churches were built in the 19<sup>th</sup> Century or later, but at least 15% of those are known to have replaced older churches on the same site.

Churches vary in size and in there are currently 32 Large Churches (>650sqm), 180 Medium Churches (250-650sqm) and 49 Small Churches (<250sqm).

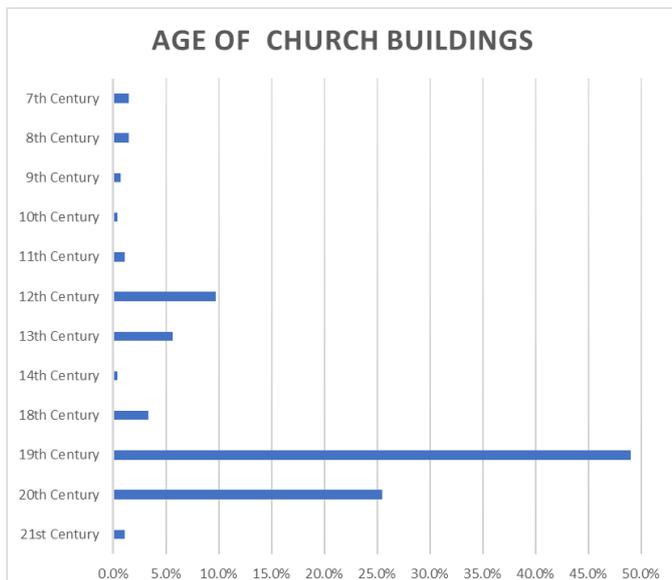


Figure 4 - Ages of Durham's Church Buildings

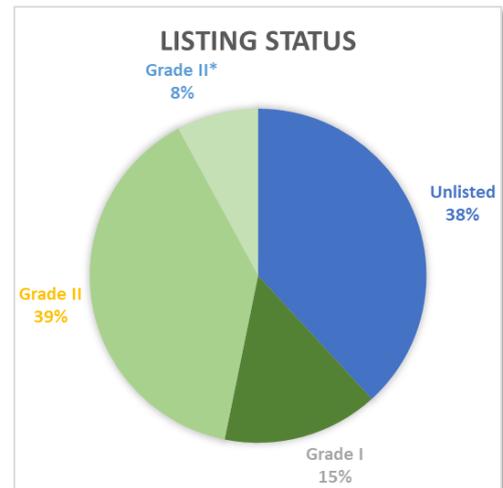


Figure 4 - Listed Status of Durham's Church buildings

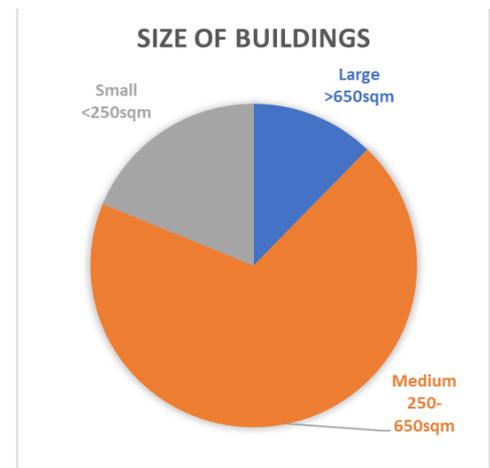


Figure 5 - Durham's Church buildings by size

The background data suggests that our churches produce a carbon footprint of 2500 tCO<sub>2</sub>e annually. We have produced some more detailed current carbon emissions data using our own knowledge in addition to data submitted by churches using the Energy Footprint Tool (EFT) [6].

The 2021 EFT had a 43% response rate, which rose to 60% in 2022. Where there were gaps in the data, we have interpolated using known building properties such as size and energy type.

The overall carbon output for our church buildings in 2021 & 2022 in tonnes of CO<sub>2</sub>e is shown in the table below.

	2021	2022	% Difference
<b>Churches</b>	2648	2432	-8%
<b>Church Halls</b>	346	409	+18%
<b>Church Buildings</b>	2995	2841	-5%

The data would suggest that whilst churches are potentially using less carbon in 2022, church halls emitted more carbon. This could be as a result of church hall-based activities restarting after the COVID-19 pandemic. In any case, exact comparisons are difficult between 2021 and 2022 due to both the incomplete data and the COVID-19 lockdown affecting early 2021.

The table below shows how church size and fuel type affect their emissions. It suggests that oil-heated churches produce less emissions than gas. This may be due to frequency of usage, with most oil-heated churches being used less during the week than gas-heated churches.

#### 2022 – Average CO<sub>2</sub>e Emissions for church size and heating fuel type

CO <sub>2</sub> e Tonnes (Av)	Gas	Oil	Electricity	Other
Large Churches	18.34	14.08		
Medium Churches	10.34	6.75	3.28	5.83
Small Churches	4.2	3.56	0.91	
All Churches	10.68	6.62	1.19	5.83
Church Halls	8.49		1.46	

#### 2022 – Proportion of heating fuel types in the diocese

% of Buildings	Gas	Oil	Electricity	Other	None
Large Churches	96%	4%			
Medium Churches	85%	10%	5%	1%	
Small Churches	48%	6%	42%		3%
All Churches	80%	9%	10%	1.0%	
Church Halls	85%		15%		

#### *Actions already taken*

We have one church with a Ground Source Heat Pump, one church with a Biomass Boiler and 3 churches with photovoltaic (PV) panels. We have actively encouraged churches to consider the “quick wins” for reaching net zero and many have installed LED lighting as a result.

The Diocesan Advisory Committee (DAC) have implemented an environment policy to ensure church building proposals consider towards net zero approaches where appropriate.

The Diocese is committed to reaching a bronze Eco-Diocese award, and as such we have been encouraging churches to sign up for the A Rocha Eco-Church award scheme [7]. We currently have 34 Churches with awards and a further 44 signed up. This is expanded in the table below.

Level of Eco Church Engagement	Number of Churches	Percentage of 261 churches (%)
<b>Bronze</b>	28	11
Silver	5	2
<b>Gold</b>	1	0.5
<b>Signed up</b>	44	17
<b>Not yet engaged</b>	183	70

### Proposed Actions

We recognize that it will be a difficult task to assist all 261 churches in getting to net zero carbon. In line with the Routemap, we have begun to produce a list of the top 20% emitting churches in our diocese using data from the 2022 EFT combined with interpolated data. The 2022 data suggests that the emissions from these churches make up over 52% of total church emissions in the diocese. The Routemap advises a strong focus on these churches, and we will be contacting these churches shortly to work with them in reducing emissions – but we acknowledge the need for work with churches outside the top 20% if we intend to reach net zero by 2030. That said, it is likely that emissions from some church buildings will fall within the 10% most difficult to eliminate and will therefore be eligible to be offset. This is particularly likely to include older buildings which are used infrequently, which have listed status. Further work will be undertaken to develop the strategy in this area.

The Routemap suggests that the top 20% emitting churches need to produce an action plan, but we would like to encourage all churches to develop their own plans. As work on action plans progresses, the net zero working group will develop and promote resources that assist all PCCs in developing their plans.

We intend to develop our communication and collaboration networks, to make our net zero target more widely known amongst local church members. The diocesan team will celebrate and share the success of our churches, provide tools and encouragement and facilitate collaboration to decarbonize buildings. We currently have a small, but growing Environment Champions network, and we aim to find at least one champion in each deanery. These champions will assist all churches, offering advice on their net zero plans. We hope that promoting the Eco-Church scheme will encourage all churches to take actions towards caring for God’s creation in whatever ways they can.

Actions	Date
<b>Continue encouraging churches to consider the “quick wins” that have minimal cost and relatively high impact.</b>	2023+
<b>Continue encouraging churches to consider alternative forms of heating. Initially focus on the highest emitters (Large &amp; Medium churches using gas or oil).</b>	2023+
<b>Achieve an 80% completion rate for the 2023 EFT</b>	2024
<b>Achieve a Bronze Eco-Diocese award</b>	2024
<b>Establish a network of Net Zero Champions representing every deanery to assist in getting the word out</b>	2024
<b>All churches to switch to green electricity and gas tariffs at point of contract renewal.</b>	2024-2025
<b>Achieve a 90% completion rate for the 2024 EFT</b>	2025
<b>No new oil boilers to be installed in churches after this date. Heating resilience guidance and support information to be sent out to churches before this date.</b>	2025
<b>Work with top 20% energy consuming churches to produce their own action plans.</b>	2024-2025
<b>Work with all other churches to produce their own action plans</b>	2026
<b>30% of Churches to have achieved an Eco-Church award and Diocese to reach silver Eco-Diocese award.</b>	2026
<b>All churches to have written and begun implementing their own Net Zero action plan, including a heating resilience plan.</b>	2027
<b>Diocese to reach Gold Eco-Diocese award.</b>	2029

## Costs and Funding

Due to the diverse portfolio of our church buildings and the resulting differing energy use, it is very difficult at this stage to produce a detailed costing to reach Net Zero Carbon in our church buildings.

However, using estimates for various interventions that have been provided by the national church and analysis of the types and sizes of buildings within the diocese, it has been possible to estimate the costs for the various stages of the Practical Path to Net Zero [8].

The table below shows costs based on the four stages of the Practical Path to Net Zero document [8]. Stage A involves quick wins, Stage B involves larger improvement works, Stage C are for bigger, complex works that require DAC permissions, and Stage D are very large scale works that are only appropriate in specific circumstances. Greater detail of these actions and assumptions made for costings is shown in Appendices 3 and 4. It is worth noting that not all churches will require works from every stage listed below. The estimates are based on early 2023 prices.<sup>2</sup>

	Cost for a small church (<250m2) used c. Once a week or less)	Cost for a medium size church (250-650m2) used 1-2 times per week	Cost for a large church (650m2+) used 3-4 times week	Cost for a large or very large church (650m2+) used 6-7 days per week	Total
<b>Number of Churches</b>	<b>49</b>	<b>180</b>	<b>30</b>	<b>2</b>	<b>261</b>
<b>Stage A</b>	£212,000	£1,400,000	£361,000	£35,000	£1,996,000
<b>Stage B</b>	£630,000	£2,669,000	£455,000	£115,000	£3,868,000
<b>Stage C</b>	£294,000	£3,240,000	£1,080,000	£111,000	£4,725,000
<b>Stage D</b>	£1,079,000	£5,252,000	£5,364,000	£683,000	£12,377,000
<b>Other</b>	£183,000	£588,000	£158,000	£16,000	£945,000
<b>Total</b>	<b>£2,398,000</b>	<b>£13,149,000</b>	<b>£7,418,000</b>	<b>£960,000</b>	<b>£23,911,000</b>
<b>Approx cost per Church</b>	<b>£49,000</b>	<b>£73,000</b>	<b>£247,000</b>	<b>£480,000</b>	

This table does not include the cost of getting church halls and ancillary buildings to net zero carbon. Given the size of most of our church halls, we are assuming that they would have similar decarbonizing costs to those of a small church. This gives a rough estimate of the total cost of £2,700,000 to get all church halls to net zero. Further work will be needed to develop more detailed figures, which will require some surveying of church halls within the diocese.

<sup>2</sup> A detailed document containing cost breakdown and assumptions made is available upon request.

We acknowledge that the costs may look daunting at first glance. We are hopeful that churches will seek to make their church buildings as close to net zero as possible. Funding for this work is clearly going to be a challenge, and we hope that this will be achieved from a wide range of sources. These include grant funding from various charitable bodies that already support church building projects, assistance from the Church Commissioners and it is possible that national and/or local government may contribute before 2030, although this remains uncertain. We recognise that many of our PCCs are facing significant financial challenges and it is important to try to leverage as many sources of funding as possible to reduce the request made of parish finances. However, parishes are encouraged to promote fund-raising and submit grant applications to awarding bodies and the nationally-funded diocesan church buildings team will support parishes in doing so.

### *Difficulties and Challenges*

Obtaining complete energy data sets from all churches remains challenging. It is hoped that more churches will complete their EFT results on Parish Returns this coming year. More data will help us to predict the costs that churches will face to reach net zero.

Another challenge is the need for some churches to upgrade to a three-phase power supply in order to install electric heating, such as infrared systems and heat pumps. This has not been included in cost estimates as example data is not yet available.

## 6.2 Cathedral

### *Background*

The Cathedral precinct covers an area of 18.9 (acres) in the centre of Durham city. This includes the Cathedral itself, the cloistral buildings (including museum, gift shop and restaurant), the cathedral offices and workshops, 18 properties at The College, part of Durham Chorister school, and riverbank land along the River Wear. All of this inner precinct is in scope according to the Routemap to Net Zero.

The Cathedral itself is heated by older gas boilers. The restaurant, shop and museum are powered by a separate, more efficient gas system in the Energy Centre. There are no oil boilers on the site. The Cathedral is a World Heritage Site and is therefore a popular tourist destination, attracting around 290,000 visitors in 2022. Vehicle access to the cathedral is restricted, therefore EV charging points are not considered a priority.

We have collected electricity and gas consumption data from across the entire Cathedral precinct for January-September 2023. The results are outlined in the table below.

<b>Gas usage (Jan-Sept 23)</b>	<b>Electricity Usage (Jan-Sept 23)</b>	<b>Carbon Footprint (Jan-Sept 23)</b>	<b>Anticipated Carbon Footprint for 2023</b>
928,254 kWh	149,778 kWh	198.1 tCO <sub>2e</sub>	260.6 tCO <sub>2e</sub>

The anticipated Carbon Footprint of the cathedral in 2023 will be higher than the estimated baseline data in Section 5 suggests. The data explained below suggests that energy consumption has actually decreased since the baseline was estimated, therefore we believe that the 2021 baseline for the

cathedral was too low. Revisions to baseline data such as this are not unexpected as better data is collected.

### Recent Audit

The cathedral had an energy and sustainability audit completed in 2021-22. The table overleaf outlines the findings and actions that the cathedral has since taken to increase energy efficiency.

Key Audit findings	Actions taken
<b>Internal transept and triforium lighting are not LED or energy efficient bulbs.</b>	Replaced 50-60% of internal Cathedral lights to LED. It is difficult to do more than this as a brand-new system would be needed for the rest of the lighting.
<b>Workshop and office lighting not LED or energy efficient bulbs.</b>	Replaced most lights to LED in workshops and offices.
<b>Monitoring of energy use is poor. Smart meters or better monitoring is recommended.</b>	A Building Management System (BMS) is used which updates hourly with energy usage data.
<b>Main cathedral boilers only 80-85% efficient so some energy loss at considerable cost. Energy centre boilers 96% efficient so relatively little improvement required.</b>	Turned boiler temperature down by 1 degree in winter to save energy and costs. Electric boilers are being investigated.
<b>Heating ducts required better cleaning and maintenance to improve efficiency of heat flow.</b>	Underfloor heating ducts in the shop and café have been cleaned and are now cleaned regularly on a 6 monthly basis.
<b>Loss of heat in college properties due to poor insulation and single-glazing.</b>	Secondary glazing has been trialled on a few college properties – we believe it saves around 75% more heat than single-glazing.

Figure 6 shows how current electricity use from 2023 compares to electricity use before the audit (2019), and during the audit (2021).

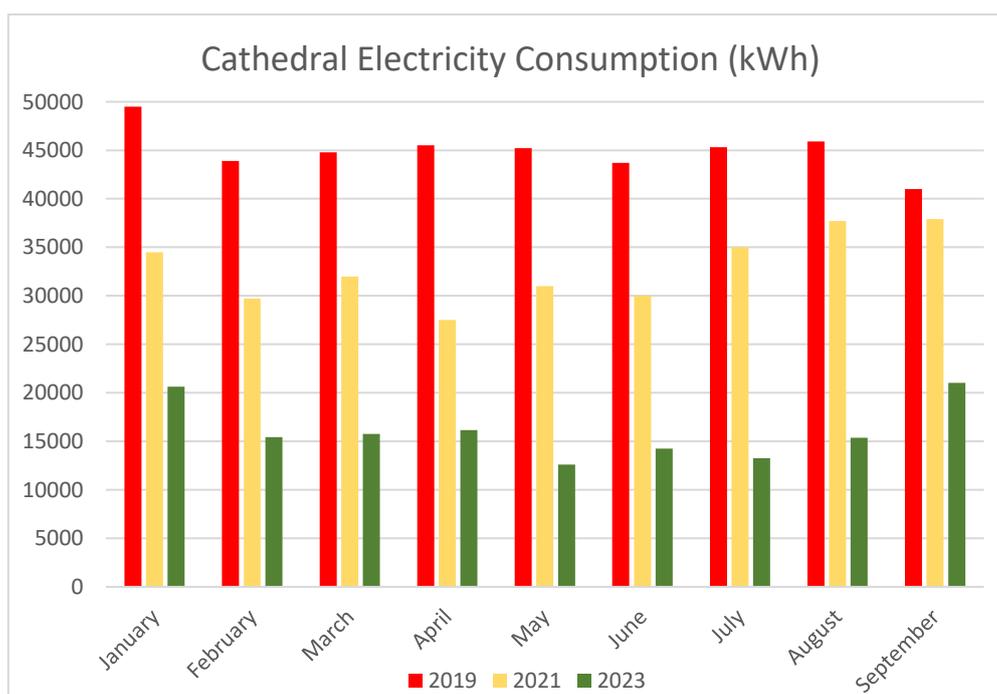


Figure 6 - Durham Cathedral Electricity Use 2019, 2021, 2023. Taken from energy audit report and current BMS data

The resulting data is extremely positive - it suggests that actions taken to replace lighting with LEDs and better monitoring of usage using the BMS has had significant effects.

Figure 7 below shows cathedral gas consumption data. The figure for 2023 includes known data to September, and the remaining months' usage has been estimated. 2020 and 2021 were affected by the COVID-19 pandemic and as such for large parts of the year the main cathedral building and the café and shop were not being heated. 2019 therefore shows the pre-pandemic baseline figure. It is encouraging then, that gas consumption for 2023 has decreased by more than 50% since both the audit and the pandemic. This suggests that actions to turn down the boiler and improve heating efficiency by cleaning the heating ducts has worked well.

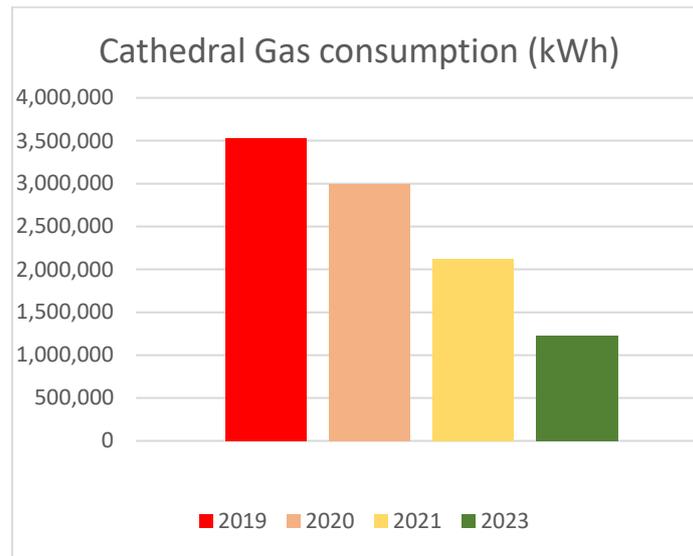


Figure 7 - Durham Cathedral Gas consumption in 2019, 2020, 2021 and 2023. Taken from energy audit report and current BMS data.

### Proposed Actions

Action	New Costs	Date
Continue monitoring BMS data and regular cleaning of heating systems		2023+
Complete Energy Footprint Tool		2024+
Switch to green electricity contract at the point of contract renewal	Difficult to estimate, but possibly a small increase to current tariff	2024
Switch to Green gas contract at the point of contract renewal	Difficult to estimate, but possibly a small increase to current tariff	2024
Sign up for Eco-Church and achieve a bronze award	£3,000 for projects	2024
Add secondary glazing to all college properties	£200,000	2024-25
Replace and rewire entire lighting system to be completely LED	£250,000	2025-26
Complete own action plan with heating resilience plan – no fossil fuel heating replacements after 2027. Consider options for electric boilers.		2026
Complete land management plan for cathedral-owned land		2026
Install approx. 157 solar panels on Monk's dormitory roof	£1,100,000	2026-27

### *Difficulties and Challenges*

Due to the World Heritage Status of the cathedral and precinct, it is difficult to plan large-scale projects that may alter the buildings or appearance of the area. For this reason, we have decided against pursuing ground-source heat pumps which would be very difficult to install in such an area. Consideration will also need to be given to the installation and specification of solar panels, and planning permissions will need to be sought. It is thought that the roof of the Monk's Dormitory that houses the Cathedral Museum will be a very good location for panels – it is south-east facing and angled inwards towards the cloister so the panels would not be visible from anywhere except the top of the cathedral tower.

The recent energy audit highlighted a need for a more efficient variable speed drive pump on the cathedral boilers. However, this would require expensive refurbishment of the whole pipework system – a system that may not be needed for future low-carbon interventions. Therefore, this refurbishment action is on hold until it is decided whether the cathedral can run wholly on electricity from renewable sources.

### *Costs and funding*

It is anticipated that the immediate costs will be relatively small, being routine cleaning of the heating systems and continued monitoring of energy data, as well as perhaps an increase in the cost of energy by switching to a green contract. The larger long-term projects are likely to total in excess of £1.5million.

There is currently no specific funding secured for these projects. Funding allocation and opportunities will be investigated by the Cathedral, including any funding available for World Heritage Sites.

## 6.3 Schools/DBE

### Background

The Diocesan Board of Education (DBE) for the Diocese of Durham is operated by the Joint Education Team (JET), which is shared with the Diocese of Newcastle. Durham has 30 schools within Academy Trusts, 17 Voluntary Controlled Schools, 1 Free School and 9 Voluntary Aided schools. As mentioned in Section 4 of this action plan, the Diocese of Durham does not have its own Diocesan academy trust. We are therefore directing focus towards our voluntary aided (VA) schools, over which the diocese has the most influence, and all 9 are in scope for net zero by 2030. We recognise that the DBE has some influence over our academies and VC schools, therefore we will continue to encourage action towards net zero where possible in these schools. A more detailed timescale for our schools' progress in later iterations of the action plan.

All of Durham's nine VA schools are primary – six are one-form entry, one is two-form entry, one is a one-form junior school, and one is a two-form junior school. We have collected their raw energy use data (gas and electric in all schools) for the school years 2021-2022 and 2022-2023 in order to work out an estimated carbon footprint for each school. Further work is needed to confirm which schools are on 'green' electricity tariffs, so at this stage, we have presumed that schools are not on such tariffs. Figure 9 shows that every school reduced their carbon output during these years. The average carbon footprint of our VA Schools in 2022-2023 was 42.5. which is consistent with the average carbon footprint for all primary schools in the Durham diocese of 43.5.

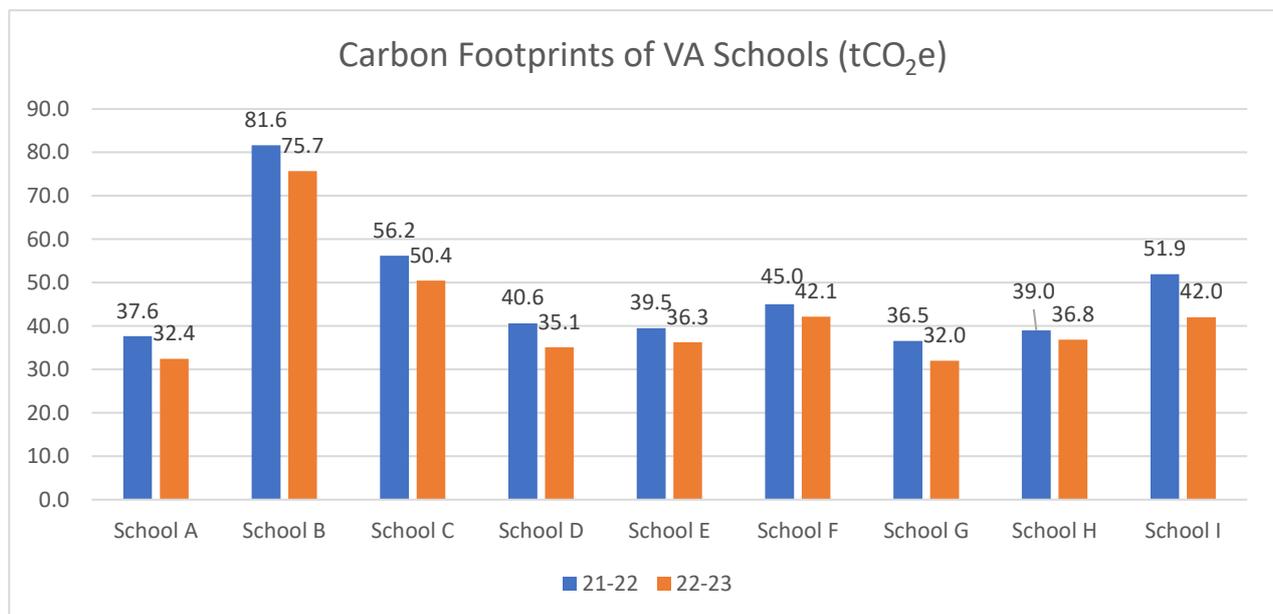


Figure 8 - Current Carbon footprints of all Voluntary Aided schools across Durham Diocese in academic years 21-22 and 22-23

### Actions already taken

We have already obtained a good set of recent usage data for all our VA schools, and for 69% of all our other schools. We have begun an exercise to find out more about the building fabric and energy supply in each school. A small number of schools have made use of the Energy Toolkit to submit energy data [9]. We have begun seeking guidance from schools' energy advisor DBE Services [10] on the sources of funding available.

### Proposed actions

Action	Date
Continue data exercise to find out energy and building data from schools.	2024
Promote the energy toolkit and data reporting in all schools. Aim for a 60% response rate in 2024.	2024+
Communicate with schools to encourage “quick wins” – LED lights, reviewing boiler temperatures, turning off lights and electrical equipment.	2024
Encourage all schools to install a smart meter and begin monitoring use	2024+
Assist all VA schools in writing their own net zero action plan using energy performance data and including a heating resilience plan.	2024
Encourage all schools to develop a travel plan including green travel options and EV charging and promote it to their pupils.	2024
Seek public funding to conduct energy audits in all VA schools in order to assist with their own action plans and present a clear way forward for each school.	2024
Assist VA schools in writing a Climate Action Plan, including an execution plan with details on proposed funding, delivery method, programme etc.	2025
Support schools to work with their procurement providers to switch to green energy tariffs at point of contract renewal.	2025
Encourage VA schools to build a heat decarbonisation plan into their Climate Action Plan. revise to include Heat Decarbonisation Plan (HDP) by 2026.	2026
VA schools to deliver all actions in their plans by 2030, subject to funding.	2030

### Costs and Funding

It is anticipated that the total cost to decarbonise a one-form entry primary school will be approximately £850,000. Works to fully decarbonise a school may involve full scale roof insulation upgrades, cavity wall insulation, installation of LED lighting, installation of solar PV, the removal of oil or gas boilers (replaced by air or ground source heat pumps), and potential upgrade to the heating distribution system. We have estimated that a 2-form entry school will cost in excess of £1.2m for similar works. We therefore expect the total cost for all our VA Schools to decarbonise to be around £8m.

We are aware of the public sector decarbonisation scheme (PSDS) funding for these sorts of works; but at this stage we are exploring whether it would be possible to obtain the expertise and resources required to put together a successful bid. Other funding sources are also being researched, particularly for our VA schools, and we will take advantage of funding opportunities as they arise, given that government funding schemes for such works change frequently.

## 6.4 Offices

### *Background*

The diocesan office, Cuthbert House is owned by the Diocesan Board of Finance (DBF). The building is less than 10 years old and has around 30 desk spaces and additional meeting rooms that are regularly used for diocesan groups and activities. It is also used for lectures on two evenings a week by the Lindisfarne Theological College.

The Bishop's office is separate to the DBF office and is not owned by the diocese. The building is owned by the Auckland Project and houses the Bishop plus up to 5 members of staff. The Bishop's office is not in scope for this Action Plan, as the diocese does not have control or influence over the buildings themselves. This section of the action plan will focus on Cuthbert House as the larger capacity building that is owned by DBF.

The national church's background data aggregates Cuthbert House with the Cathedral and TEIs in the 'other buildings' category. We have collected Cuthbert House's electricity and gas consumption data for all of 2022 and inputted it into the Energy Footprint Tool, giving an updated carbon footprint for 2022 of 14.1 tCO<sub>2e</sub>. Cuthbert House now runs on "green tariffs", so assuming similar usage in 2023, the carbon footprint will decrease to 2.1 tCO<sub>2e</sub>.

### *Actions already taken*

Cuthbert House has achieved a bronze Eco Church Award. It is already double glazed, with mainly LED lighting and good insulation. Both electric and gas contracts are "green" tariffs, and there are two EV charging points and 5 bike racks in the car park. There are also plans in place to install an air source heat pump (ASHP) as the gas boiler is approaching the end of its useful life, and solar panels.

### *Proposed Actions*

Action	New Costs	Date
<b>Complete annual Energy Toolkit for Cuthbert House</b>		2024+
<b>Engage with landlord of Bishop's office and consider what changes can be made</b>		2024
<b>Install Air Source Heat Pump (ASHP) as a means of heating resilience</b>	£25,000	2025
<b>Install Solar panels (PV) on roof</b>	£68,000	2025
<b>Review the need and number of EV charging points</b>		2025
<b>Achieve silver Eco-Church award for Cuthbert House</b>		2026

### *Costs and Funding*

Overall costs for heating decarbonisation (ASHP and PV) should total in the region of £88,000. There may be additional costs in the long term, for example if it is decided that more EV charging points are required. Funding sources will be explored for these works.

## 6.5 Property and Land

### Background

The Durham Diocesan Board of Finance has 195 properties, primarily for housing clergy with private tenants occupying properties during clergy vacancies. The baseline data suggests a total carbon footprint of 1300 tCO<sub>2</sub>e for our properties. Since this data was collected, the diocese has put in place several measures to improve carbon efficiency of our housing stock.

Energy use data is difficult to collect as it is held by individual clergy or private tenants. Further work is needed to estimate the current carbon footprint and how much it has changed since the 2021 baseline. However, we do hold EPC certificates for all properties and as advised in the Routemap we have undertaken EPC+ surveys on a representative sample to assess the works involved in improving efficiency. Houses rated A are the most energy efficient, and Houses rated G are least efficient. We recognise that EPC ratings are by no means a perfect indicator of carbon footprint as they are an asset rating and do not consider energy usage or supplier.

The table and graph below show how our EPC ratings compare with domestic property EPC ratings for the whole of the UK. It suggests that whilst proportionally we have fewer A and B rated properties, we also have fewer E, F and G rated properties.

EPC	Diocese		National	
	No. of Properties	%	No. of Properties	%
<b>A</b>	0	0	59,927	0.2
<b>B</b>	7	3.6	2,944,853	11.7
<b>C</b>	70	35.9	7,514,406	29.9
<b>D</b>	99	50.8	9,538,029	37.9
<b>E</b>	14	7.2	3,837,002	15.2
<b>F</b>	5	2.6	976,590	3.9
<b>G</b>	0	0	300,929	1.2
	<b>195</b>		<b>25,171,736</b>	

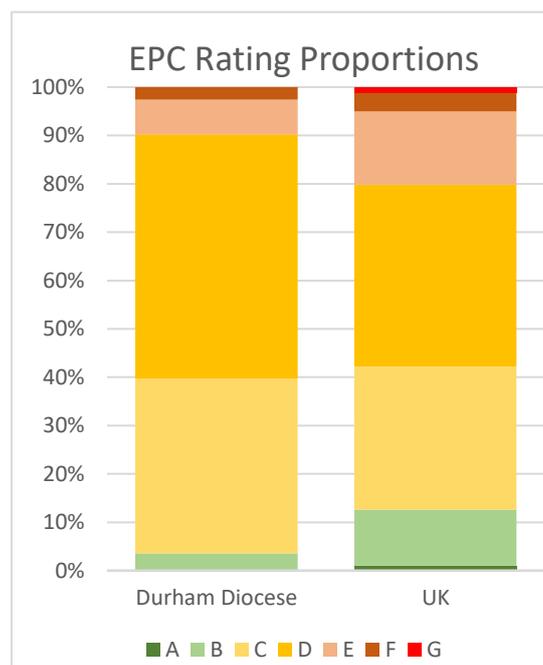


Figure 9 - Stacked bar graph showing how the Diocese of Durham's housing EPC ratings correspond to all housing EPCs nationally.

A survey by Savills [11] suggests that each EPC grade climbed represents around a 30–40% reduction in CO<sub>2</sub> emissions per year. They estimate that an average three-bedroom house with an EPC rating D emits 4 tonnes of CO<sub>2</sub>e per year. Using this as a guide, it would suggest that our current stock emits at least 723 tonnes of CO<sub>2</sub>e per year. Given that the majority of our stock are 4 bed vicarages with a study and a room suitable for a large meeting, it is likely that this figure is even higher, therefore more closely aligning with the baseline data (Appendix 2).

### *Actions already taken*

The diocese already has a property maintenance and improvement plan in place that aligns with the Routemap to Net Zero. The EPC+ surveys conducted have also established the potential EPC for each property. The graph below details the actual distribution of current EPC's compared to what it would be if all properties were improved to reach their best potential EPC.

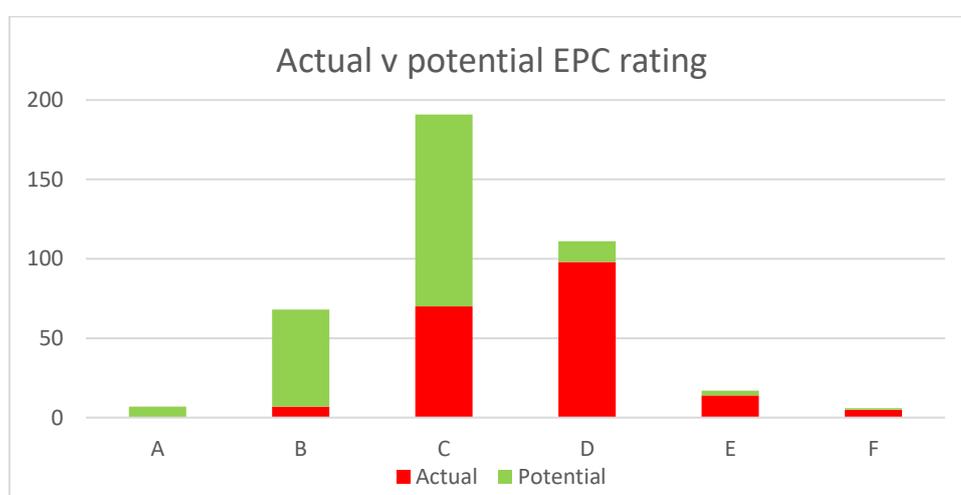


Figure 10 - Bar chart showing the actual and potential EPC distribution for Durham diocese.

We are currently undertaking a stock improvement project, which aims to get all Diocesan property to an EPC rating of at least a C, mainly by improving heat retention capability. Phase 1 of this project has started with all E and F rated properties, and is expected to be completed during 2024. The works to each property involve, where appropriate: installing insulation (loft, cavity wall, under floor, external and internal wall), draft proofing, full LED lighting re-fit and Double-glazing installation. Phase 2 of the projects focusses on getting D rated properties to a C or above. This will be completed once funding for this phase has been secured, although due to the intrusive nature of some works these are best carried out during clergy vacancies.

We have also secured funding and undertaken works to install photovoltaic (PV) panels on 10 properties. A further review of renewable potential will be undertaken in due course once we understand how the current PV panels have performed.

The property team at the diocese have sent out a “quick wins” document to all tenants and clergy informing them of the first steps that can be taken towards net zero.

### Proposed actions

Action	New Costs	Date
<b>Install smart meters at change of occupancy</b>		2024+
<b>Complete Phase 1 of the stock improvement project – bring all E and F rated properties up to a C</b>	£500k funded via DBF reserves from 2023 budget	2024
<b>Begin Phase 2 of the stock improvement project - bring all D rated properties up to a C</b>	£1.7 million	2024/2025
<b>Run a switching campaign to encourage occupiers to switch to a green electricity tariff.</b>		2024
<b>Review renewable potential across all properties.</b>		2025+
<b>Review housing stock again and decide what action needs to be taken to further improve property efficiency.</b>		2025
<b>Audit landholdings and create a land management plan</b>		2026

### Costs and Funding

It is anticipated that it will cost approximately £2.2million to bring the diocesan housing stock to an EPC rating of C or above. Some of this money has already been allocated from reserves and the works are being completed, but the remainder is awaiting details from the recent Church Commissioners' announcement.

We currently have very little data on how much it will cost to bring our glebe land portfolio to Net Zero. We will therefore be completing a land audit and management plan by 2026, and at this point we will have a better understanding of the costs.

### Difficulties/Challenges

The practical challenges around retrofitting large houses such that they achieve higher levels of EPC+ ratings are considerable, and there are currently few external sources of funding available. This may change subject to government policy, however this is difficult to predict.

The main difficulty for assessing our progress towards Net Zero in our housing stock is the lack of energy usage data to calculate carbon footprints. It is hoped that installing smart meters will enable occupiers to better monitor their energy usage, but the DBF does not have the rights to access this data, which belongs to clergy and tenants living in clergy housing.

The clergy and tenants within the houses are responsible for their own energy tariffs, therefore we have limited power to bring all our properties on to a 'green' energy tariff. It is hoped that a 'switching campaign' will encourage occupiers to consider switching to green tariffs.

Further work is required to collect data on our glebe land portfolio, and a net zero plan for this property will be developed in due course.

## 6.6 TEIs

### *Background*

There are two Theological Educational Institutions (TEIs) that sit within the Durham Diocese: Cranmer Hall and Lindisfarne College of Theology.

Cranmer Hall is residential and is part of St John's College, Durham University. Their premises are owned by the university, and they therefore fall under the University's target for net zero by 2035. We believe that St John's College are implementing their own action plan that will also cover Cranmer Hall.

Lindisfarne College shares premises with the diocesan offices for both Durham and Newcastle. The actions taking place in Durham are therefore covered under Section 6.4 of this Action plan.

### *Proposed Actions*

Both institutions already implement environmental teaching and learning within their courses, and discussions are ongoing to increase this wherever possible. Further work is needed to confirm whether the Eco Church award can be applied to Cranmer Hall as it sits within the university. Lindisfarne College has already achieved a Silver Eco-Church award. It is hoped that both colleges will increasingly promote sustainable methods of travel to their students.

## 6.7 Travel

### *Background*

The 2021 baseline data suggests that work-related travel makes up a very small amount of diocese-wide emissions. We anticipate that staff, archdeacon and curate travel will make up the majority of the diocese's travel emissions. Recent DBF Staff mileage data suggests that the carbon footprint of staff travel for the last financial year was 12.6 tCO<sub>2e</sub>. This estimate does not take into account the type of vehicle used for travel – it assumes everyone has driven in an average sized petrol car. It also does not account for additional trips using public transport, although this is minimal in our diocese as public transport links are poor - but it should still be considered in future calculations of our travel footprint.

The table below shows the aspects of travel that are in scope for 2030 according to the Routemap.

### *Scope*

<b>In Scope for 2030</b>	<b>Out of Scope</b>
DBF Staff Travel	DBF Staff commuting to and from work
Clergy travel	Parishioner travel to and from church
	Family travel to and from school

### *Actions already taken*

We have already taken several steps to encourage more sustainable travel in our diocese. We encourage DBF staff to car-share when going on site-visits by offering increased reimbursement for those miles car-shared. We also have EV charge points at the office and offer a salary-sacrifice EV lease scheme to members of staff. There are no pool cars owned by the DBF. The diocese also offers EV charge point installation in the homes of any clergy on request.

## Proposed Actions

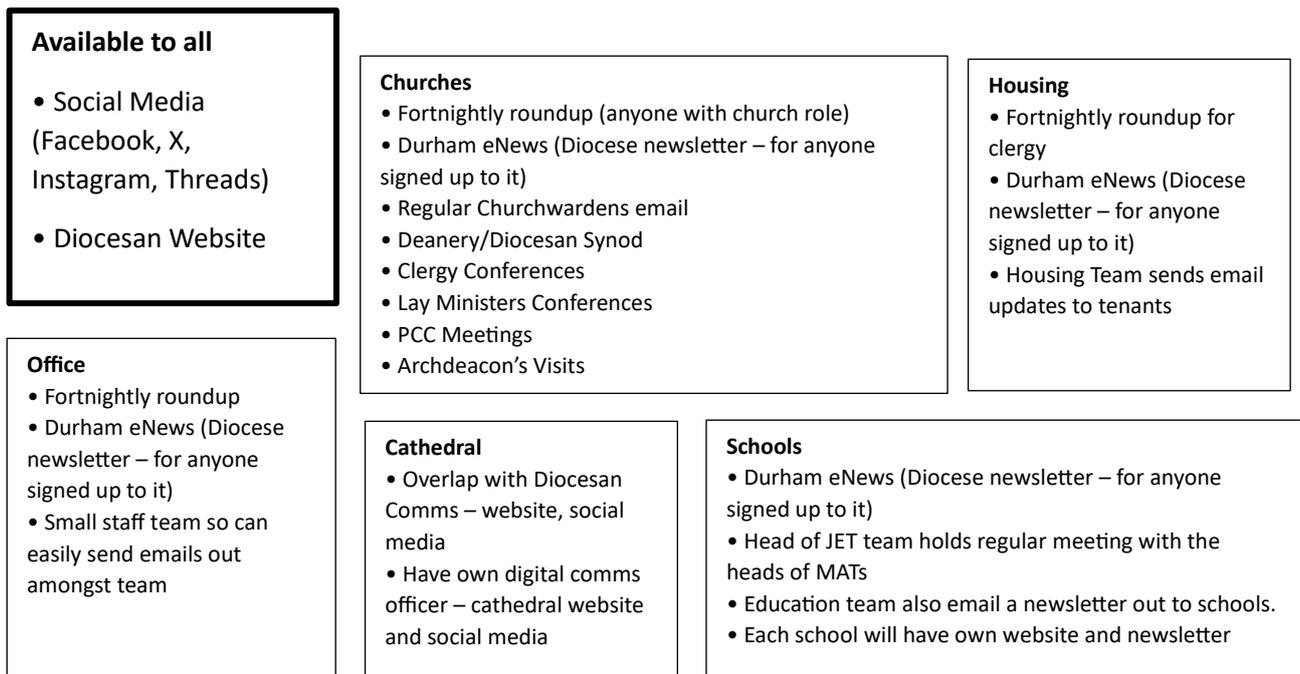
Our main action to help us reach net zero travel will be to create a Sustainable Travel Plan. This will begin in 2024 and will incorporate the sustainable travel hierarchy (Appendix 3). The travel plan will encourage DBF staff and clergy to hold meetings online where possible, and will consider how to incentivise staff who walk, cycle, use public transport and car-share. The travel plan will also consider similar incentives for clergy and encourage clergy to consider the action plan. We will also seek to influence the travel that is out of scope of 2030 by using appropriate diocesan communication channels to inform of the travel hierarchy and encourage sustainable lifestyles.

## 7. Communications Strategy

### Aims

We believe it is important that we consider a net zero carbon communications strategy for the diocese as a whole, to promote awareness of Durham's Net Zero Goals and targets. It is hoped that this will enable us to best communicate key messages regarding our journey to Net Zero to the different aspects of the diocese. We will evaluate the effectiveness and sustainability of each communication channel into the future. The net zero working group will define key messages that we hope to communicate, driven by milestones and progress along the route map.

### Channels of Communication



### Timescale

- 2023 – Raising initial awareness of NZ working Group, Action plan and goal for net zero by 2030 – Features in e-news, roundup and social media following presentation of action plan to Diocesan Synod
- 2024 – Once Bronze Eco-Diocese award is reached, publicise the award and case studies on social media, website and other channels.
- 2024 - Encourage Eco-Church signups to begin push for Silver Eco-Diocese award – regular updates and features in fortnightly roundup and social media.
- 2024 - The goal of net zero by 2030 to be communicated clearly to all clergy through Diocesan and Deanery Synod visits -DEO, Archdeacons
- 2024 – Aim for an 80% response rate to the EFT – increased reminders in the roundup, contacting churches individually via emails and phone calls.
- 2024 – Communicate the Net Zero by 2030 goal to all VA schools through JET team, encourage each VA school to then publicise this to students and parents
- 2025 – Encourage VA schools to publicise their action plans to students and parents
- 2025+ - Review communications and regularity of posts in line with progress and milestones

## 8. HR/Training Strategy

We recognise that achieving Net Zero Carbon requires excellent communication of the issues we face, goals we are putting and the strategy to achieve these goals. It is hoped that running training courses and updating staff induction documents will help to inform and influence behaviours. Whilst this section mainly focusses on training DBF staff, some training may be made available more widely in future years. Through better staff training we hope to encourage DBF staff to think about reducing their carbon footprint. Below is a timeline considering how we hope to raise awareness and gain support from staff to reach our net zero goals.

Action	Date
<b>DEO to complete Carbon Literacy and Train the Trainer Course</b>	2023
<b>All DBF Staff to complete Carbon literacy course led by DEO</b>	2024
<b>All DBF staff to be made aware of the Sustainable travel plan and encouraged to consider sustainable options</b>	2024
<b>Job descriptions to make reference to an eco-friendly office and carbon literacy training, if appropriate</b>	2024
<b>Train the trainer course to be completed by Environment Champions and CCO to supply carbon literacy training for clergy and parish staff, church leaders, diocesan staff &amp; schools</b>	2025

## 9. Acronyms

ASHP – Air Source Heat Pump	JET – Joint Education Team
BMS – Building Management System	LED – Light Emitting Diode
CCO – Creation Care Officer	MAT – Multi-Academy Trust
CO <sub>2</sub> – Carbon Dioxide	NZ – Net Zero
DAC – Diocesan Advisory Committee	PCC – Parochial Church Council
DBE – Diocesan Board of Education	PSDS – Public Sector Decarbonisation Scheme
DBF – Diocesan Board of Finance	PV - Photovoltaic
DEO – Diocesan Environmental Officer	TEI – Theological Training Institution
EFT – Energy Footprint Tool	UK – United Kingdom
EPC – Energy Performance Certificate	VA – Voluntary Aided
EV – Electric Vehicle	VC - Voluntary Controlled
IT – Information Technology	

## 10. References

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## 11. Appendix

### Appendix 1 – Baseline data from the 2020 and 2021 Emissions Reports

	2020 Data	2021 Data	2021 Data altered to fit scope	2021 altered data as percentage contribution to carbon footprint
<b>Churches</b>	2700	2500	2500	55 %
<b>Schools</b>	3900	3400	418	9 %
<b>Housing</b>	1300	1300	1300	30 %
<b>Other Buildings (Cathedral, TEIs, Offices)</b>	300	340	227	5 %
<b>Travel</b>	n/a	20	20	1 %
<b>Total</b>	8200	7600	4465	100%

### Appendix 2 – EPC rating for average 3 bed property, applied to current diocesan properties.

EPC Rating	Annual Emissions of average 3 bed property (tCO <sub>2e</sub> /yr)	Number of properties in Diocese	Total Annual Emissions (tCO <sub>2e</sub> )	
A	1.372	0	0	
B	1.96	7	14	
C	2.8	70	196	
D	4	98	392	
E	5.714286	14	80	
F	8.163265	5	41	
			Total Emissions (at least)	<b>722</b>

### Appendix 3 – The Sustainable Travel Hierarchy, produced by the Energy Saving Trust.

<https://energysavingtrust.org.uk/an-introduction-to-the-sustainable-travel-hierarchy/>

