

Diocesan Carbon Emissions Reporting for 2019

Summary

The estimated 'net' carbon emission for the Diocese for 2019 has been revised to 10,750 tonnes CO₂e. The gross carbon emissions was 12,270 tonnes CO₂e. Renewable electricity and carbon offset gas purchased by approximately a third of churches and the Diocesan offices offset this figure by 1,540 tonnes CO₂e.

Almost half the emissions come from church energy use, a quarter from the Diocesan VA schools and a quarter from the clergy property.

The scope of the emission included has been based on the national definition of "net zero carbon" for the Church of England (Scope 1 and 2 emissions).

Data from the new Energy Footprinting Tool (EFT), part of the online Parish Returns, has been deployed for the first time to improve the accuracy of the 2019 carbon emissions for churches. This includes Non-Church Parochial Buildings (NCPBs). Additional data from the Green Journey scheme had been used to build a fuller picture.

Comparable data for other Dioceses' emissions is only available for the EFT data for churches and NCPBs. For example Leeds 8,300; London 12,200; Oxford 7,300; and York 5,500 tonnes CO₂.

This report revisits the 2019 carbon emissions due to a lag time for data to be available from the Energy Footprinting Tool.

For 2019 there were significant data gaps in assessing the carbon emission of the Diocese. No data is available for staff travel or glebe land. The data set is, however, a considerable improvement on the previous reports and continues to establish Leeds Diocese as one of the national leads in carbon accounting.

Carbon Emissions Breakdown

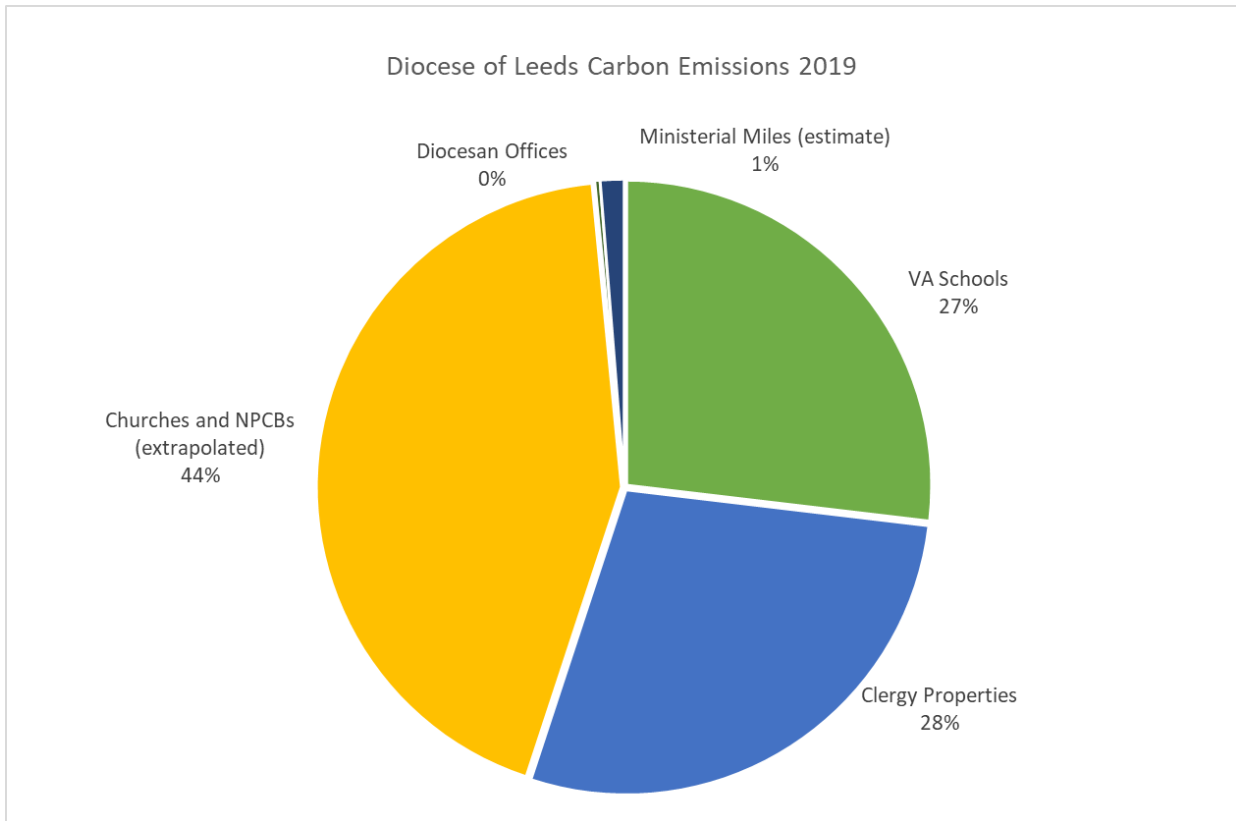


Figure 1: Diocese of Leeds Carbon Emissions 2019 (Tonnes CO₂e). Full data set in Appendix.

Nearly half of the emission from the Diocese come from the energy use of the 614 church buildings and Non-Church Parochial Buildings. The 456 clergy properties and 57 VA schools account for approximately a quarter of the remaining emissions.

Carbon Emissions (tCO₂) by Fuel Type

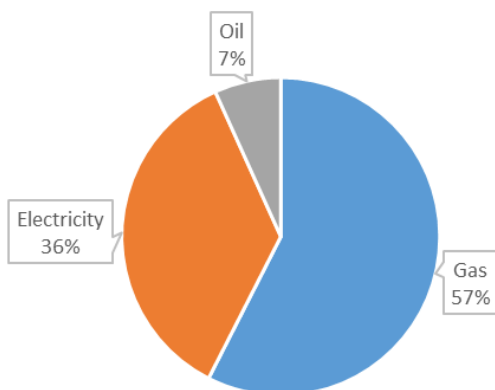


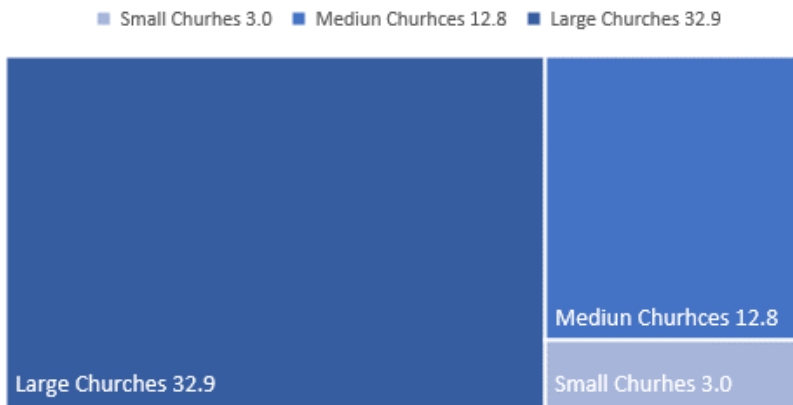
Figure 2 illustrates the proportion of emission from different energy sources in the Diocesan VA Schools, which is similar to that of churches.

Gas and oil heating systems contribute the bulk of the emissions. Emitting 0.339 kg of CO₂e per kWh, oil is a more carbon intensive form of fuel than gas at 0.208 kg of CO₂e, or electricity at 0.316 kg of CO₂e.

The 33.6 tonnes CO₂e emissions from diocesan offices are relatively small when compared to the more numerous other property holdings, but in themselves are not insignificant.

Figure 2: Carbon Emissions form Energy Use in Diocesan VA Schools.

Average Carbon Emissions (tCO₂e) by Size of Church



Data is not available for staff travel, however, a very approximate estimate has been given for “Ministerial miles” (clergy and volunteer travel) which illustrates that may be a less significant proportion of diocesan emissions that energy use in buildings.

The emission from churches vary considerable. Large

churches have a much greater carbon footprint that small churches.

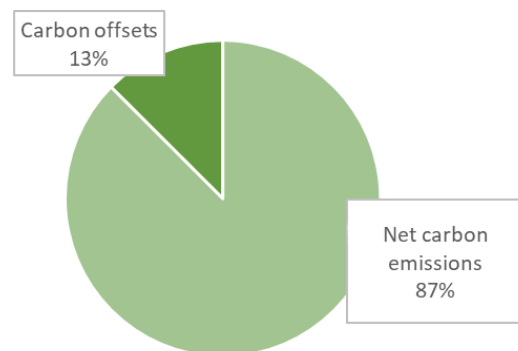
Figure 3: Average carbon emissions for Leeds Diocese churches of different sizes (Small = less than 250m², Large = above 650m²)

Carbon Emissions and Church Growth

With the church growth that the Diocese is seeking to achieve, some additional carbon emissions would be expected eg heating the church building for more hours, additional ministerial miles.

As the quality of the Energy Footprinting and schools data improves, comparisons for emission per person hour will be more comparable for congregations and schools across the Diocese.

Gross to Net Carbon Emissions



Carbon Offsetting

To reach a ‘net’ carbon emissions figure carbon offsets can be deducted.

1,540 tonnes CO₂e can be deducted due to the 1,350,600 kwh of renewably generated electricity and 4,111,400 kwh carbon offset gas purchased by over 100 churches in the Diocesan data set.

To offset the whole of the 2019 diocesan tonnes 10,750 CO₂e emissions would cost £215,000 at a standard rate of £20 a tonne of carbon.

Figure 3: Proportion of carbon emissions offset in 2019

The Energy Footprinting Tool

Participation in the new online Parish Returns Energy Footprinting Tool was extremely high, with 338 churches (53%) submitting energy usage data. Nationally participation ranged from 11-56% of churches with Leeds having the second highest (Sodor and Man achieved 56% participation).

Using only the EFT data, compared to other dioceses, Leeds has the second highest estimated carbon emission nationally, with London having the highest emissions, London 12,200; Leeds 8,300; Southwark 7,700; Oxford 7,300; Lichfield 7,300 tonnes CO₂.

Note that the Diocese of Leeds calculation of emission for Churches and NPCBs is lower than the extrapolated EFT data. This is due to additional data from the Green Journey being added for more accuracy and because the EFT did not recognise the energy tariffs offered by Diocese of Leeds Green Journey procurement scheme (SSE 100% renewable business and Crown carbon offset gas) as carbon neutral. This should be in place for 2020 data collection.

Comments

The 10,750 tonnes CO₂e emitted in 2019, should be serious matter of concern for the Diocese. To keep global average temperatures below 1.5°C, there is a small and dwindling remaining global carbon budget of approximately 60 tonnes CO₂e per person in perpetuity.

The size of the diocesan emissions, and their contribution to climate change, raise moral, ethical and spiritual questions that go beyond these carbon accounting figures.

This data set informs the Zero Carbon Diocese Strategy. Key action points are therefore:

- Switch to renewable electricity supplies as soon as possible
- Reduce energy loss from buildings wherever possible
- Put in place plans to decarbonise heating systems ie switch to an electric powered heating system
- Give particular support to larger churches to decarbonise
- Invest in the generation of renewable electricity where possible
- Reduce car and aviation miles where possible, move to active and public transport and when possible to electric vehicles

It is anticipated that data collection will continue to improve as the C of E Research and Statistics team extend the Energy Footprinting Tool to gather ministerial miles, schools data, clergy property data and Cathedral emissions.

While the emissions reported here are those that the Diocese is directly accountable, the potential influence on carbon emissions across thousands of members of congregations and school pupils to households, businesses and communities across the Diocese must not be underestimated.

Jemima Parker
Diocesan Environment Officer
19.4.21

APPENDIX

Carbon Emissions Full Account

	Carbon emissions tonnes CO2e						Carbon Offsets tonnes CO2e				
	Electricity	Gas	Oil	Other fuel (no data)	Travel (car)	Travel (air)	Total	Renewable Electricity Purchased	Renewable Electricity Generated (No Data)	Other offsets	Total Offsets
VA Schools	1177.4	1894.8	222.8				3295.0				
Clergy Properties							3454.0				
Churches and NPCBs (Extrapolated)	1097.9	4113.2	110.4				5321.5	513.1		994.2	1507.4
Diocesan Offices	27.8	5.8					33.6	27.8		5.8	33.6
Bishop's Offices	5.0	6.4					11.4				
Staff Travel (No data)											
Ministerial Miles (Estimate)					155.3		155.3				
Bishop's Travel					13.2	5.7	18.9				
Glebe Land (No data)											
Gross Carbon emissions (tonnes CO2e)							12289.7				
Net Carbon Emissions (tonnes CO2e)											10748.8

Figure 4: Breakdown of carbon emissions for the Diocese of Leeds 2019 (CO2e = Carbon dioxide equivalent).

For comparison the average annual UK per capita carbon emissions is 5.3 tonnes carbon. In 2019, the Diocese of Leeds had a carbon footprint equivalent to 2,028 people's emissions.

Measuring the Diocese's Carbon Footprint

The data gathered to calculate the carbon emissions for the has come form a number of sources. The summary energy use and travel miles figures are shown in Figure 5. The details of how these figures were reached are below.

	Energy Use kwh				Travel miles		Total
	Electricity	Gas	Oil	Other fuel	Travel (car)	Travel (air)	
VA Schools	3725834.9	9090240.0	657356.5				13473431.4
Clergy Properties							
Churches and NPCBs (Extrapolated)	5960153.6	23248084.4	148366.2				29356604.2
Diocesan Offices	87841.0	27894.0					
Bishop's Offices	15942.0	30527.0					46469.0
Staff Travel (No data)							
Ministerial Miles (Estimate)					808,873		808,873
Bishop's Travel					71,553	37,859	109,412
Glebe Land (No data)							

Figure 5: Energy use and travel miles by sector for the Diocese of Leeds 2019

1. VA Schools

Energy data was gathered for each VA school from the Display Energy Certificate available on the Department of Education website. Three out of the 60 VA schools did not have a Display Energy Certificate available and they are omitted from the data. While many of the Display Energy Certificates are recent (in the past 2 years) small school are only required to have this assessment every 10 years, so some of the data dates from 2012. The full data set can be viewed in the accompanying spreadsheet.

2. Clergy Properties

456 of the 475 clergy properties have had energy audits conducted in the past three years. As part of this assessment, an estimate of carbon emissions is given. The 19 unassessed properties have been omitted. A monetary estimate of energy use is given, but not a kwh consumption figure, so this does not appear in Figure 5.

3. Churches

The data has been used from the 388 churches that completed the online Parish Return Energy Footprinting Tool for 2019 energy use. Energy use data for an additional 93 churches has been added from the Green journey data set. The shortfall of 133 churches has been extrapolated based on the existing data. Additionally, 74 churches entered EFT data for a Non Church Parochial Building (NCPB) and data for a further 40 Green Journey churches has been added.

4. Diocesan Offices

Energy bills have been collated. No data available for Bradford Office gas use or the solar export from Church House, Leeds.

5. Bishops' Offices

Energy bills have been collated for those offices for which the Diocese has responsibility.

6. Staff Travel

No data has been collated for 2019. From July 2020 car miles have collated from expenses claim forms and will be used for the 2020 report.

7. Ministerial Miles

A survey was conducted with only 9 clergy participating. The data is therefore an extrapolated estimate and only intended to give an indicative figure. It is hoped that the national C of E Research and Statistics department will be developing an addition to the Energy Footprinting Tool to gather ministerial miles.

8. Bishop's Travel

Expenses claims have been used to arrogate the miles travelled by car and by air.

9. Glebe land

No data is available to date.

Carbon Emissions Factors

Each kWh of energy and each mile travelled has be converted into a measure of greenhouse gases, CO₂e (carbon emissions equivalent), using standard conversion factors issued annually by the UK government. The following factors have been used:

- One kWh of electricity (incl. well to tank, transmission & distribution) = 0.316 kg of CO₂e
- One kWh of natural gas (non-renewable sources, including well to tank) = 0.208 kg of CO₂e
- One kWh of fuel oil (including well to tank) = 0.339 kg of CO₂e
- One kWh of LPG (including well to tank) = 0.259 kg of CO₂e
- One kWh of wood chips = 0.024 kg of CO₂e
- One kWh of pellets = 0.053 kg of CO₂e
- One km of car travel in a medium sized petrol car = 0.192 kg of CO₂e
- One km of air travel in economy, long haul = 0.150 kg of CO₂e