

GENERAL SYNOD

Rising to the Challenge: reaching Net Zero by 2030

A Background Paper from the Environment Working Group

1. The purpose of this paper is to update Synod members on progress since the February motion on climate change, and strongly encourage Synod members to work with colleagues across their diocese, TEIs, and Religious Communities to address the call of the February Synod motion, and contribute directly to our common commitment to work towards net zero as a whole Church.
2. Recognising the global climate emergency, General Synod in February 2020 passed a motion calling on all parts of the Church of England to draw up a plan of action to cut carbon emissions year-on-year, reaching net zero emissions by 2030. The full wording of the motion can be found [here](#).
3. The first step towards this target is to be clear about the scope of it. Those emissions in scope are those the Church is able to take responsibility for; aiming to radically reduce them and offset any residual emissions from 2030. Scope is therefore a technical but also a strategic question. Clarity is essential if what is seen as a public commitment by the whole Church is to be acted on in a realistic and timely manner.

Definition and Scope of Net Zero

4. The definition can be found in full in the two pages of Appendix 1. This definition for the Church of England of what it means to achieve 'net zero emissions by 2030' has been agreed by the Environmental Working Group on behalf of the whole Church, following extensive consultation. The focus is primarily on our "scope 1" and "scope 2" emissions as defined by standard Green-house Gas (GHG) protocol; electricity, gas and oil used in our buildings, work related travel, and those elements where we either *directly control* the emissions or where we have *significant influence over them*.
5. A range of wider things have been ruled as out of scope of the target for 2030. However, it is still within our mission to *influence* these. Items that fall within this category are, for example, the personal GHG emissions of parishioners.
6. The definition will be reviewed in 2022, particularly in relation to major building projects and land, in line with the requirement for the EWG to report back on progress to General Synod.
7. In order to arrive at this definition, the EWG consulted with Dioceses, Cathedrals and other key stakeholders. Despite the pressures of dealing with a global pandemic, there was an extremely good response to the consultation. 35 dioceses and 23 cathedrals responded. 81% of consultees agreed fully with the definition as now agreed (or with minor variations). Of those that did not agree, approximately half expressed a desire that it should go further, and half considered that it was a stretch too far.

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Concerns raised

8. A few replies to the consultation raised much wider concerns about the net zero target that General Synod set. They wonder if it is viable, and where required time and money will come from. There is some concern that a drive towards net zero may cause expensive maladaptation, and the appropriateness of adaptations to our beautiful, listed buildings. The vast majority, however, were committed to the direction of travel and recognised the need for action.

Progress since February

9. Work has continued on reducing our carbon footprint both within the NCIs and across the Dioceses. Despite the pandemic, many have been developing their action plans and are beginning work on measuring their current carbon footprint. Appendix 2 summarises what we know about our carbon footprint. A list of dioceses who have passed climate crisis motions can be found in Appendix 4
10. Staff at Church House, in addition to the consultation on defining what is in and out of scope, have provided support to the wider Church through: an Energy Footprint Tool which has been used by 4500 churches; analysing and sharing the findings of the energy audit programme; guidance on energy efficiency and heating principles; drawing up the “Practical Path to Net Zero” (see Appendix 3) and creating a Net Zero Carbon webinar programme.
11. Within the wider environment programme the national Lent campaign was launched, and the Season of Creation, Climate Sunday, Letters for Creation, and Eco Church have been supported. Influential work continues by the NIBs on engagement and divestment. We are part of ecumenical work in advance of the international COP Climate talks next year.



Next steps

12. Many Dioceses, Cathedral Chapters and others have already started work on action plans, and all parts of the Church of England will need to follow suit. More work is required to cascade the ‘net zero carbon definition’ to deaneries, parishes, and schools and to encourage the journey towards net zero as well as the use of the many resources available to support this. Synod members can play a significant part in this through their many spheres of influence.
13. Nationally, a ten year action plan will be developed, along with a suite of further guidance. A clearer theology, linking emissions and care for creation, will be written, alongside engagement programmes which seek to support action by our church and school communities.

Appendix 1 : National definition of the scope of net zero carbon for the Church of England

The table below summarises whether all the main activities of the Church of England are in-scope of the ‘net zero carbon by 2030’ target set by General Synod in February 2020 or not. Those items in green are in-scope by 2030. Those in amber are in-scope but not until *after* 2030. Those in red are out of scope.

This definition will next be reviewed in 2022, by the national Environmental Working Group.

In scope?	Buildings / activities
<p>✓ 2030 NET ZERO</p> <p>These are in scope of our “net zero by 2030” target.</p> <p>We will aim to measure and report these as soon as possible, as a first step towards making real and sustained reductions</p> <p>The national EWG will review, and potentially expand this scope, every three years, from 2022 onwards, in line with reporting to General Synod.</p>	<ol style="list-style-type: none"> The energy use of our buildings; <ul style="list-style-type: none"> Gas, oil, or other fuel use Electricity purchased (no matter the source it is purchased from – renewable electricity purchased is accounted for later) For the following buildings; <ul style="list-style-type: none"> Churches, including church halls and ancillary buildings. (This includes non-parochial churches, BMOs and others if they have their own utility supplies.) Cathedrals (all buildings within the green line forming part of the precinct) Schools where the DBE has a significant degree of influence (generally Voluntary Aided & Diocesan Academy Trusts) including halls/other buildings Clergy housing, bishop’s housing, and other staff accommodation wholly owned by the Church (based on EPC grades and <u>average</u> reasonable use, not actual usage) Church bodies’ offices including Church House Westminster, diocesan offices, and bishops’ offices Peculiars, only if they come under faculty jurisdiction Other diocesan property, including common parts of tenanted properties Theological Education Institutions which are part of the Church of England For all the above, tenants’ energy use and mobile phone masts should be excluded if possible, e.g. if on their own sub-meters. Floodlights managed and paid for by the local council should also be excluded if possible. Including the “well to tank” and “transmission and distribution” factors involved in getting energy to the building. Note: Electricity used to charge EV vehicles will be included within the above. All work-related travel (eg the petrol / diesel used by archdeacons on visitations, CBC / DAC members on visits to discuss projects, reimbursable clergy and ordinand travel, reimbursable staff and volunteer travel, reimbursable train journeys, staff and clergy making reimbursable flights for work or ministry, coaches hired for school trips etc). <p><i>In standard Greenhouse Gas reporting definitions, these are our “Scope 1” and “Scope 2” emissions and some small elements of Scope 3 which are operationally simpler to include.</i></p> <ol style="list-style-type: none"> From this, and on the understanding that real reductions in energy use have been made, the following can be removed: <ul style="list-style-type: none"> Excess energy generated on site (e.g. from solar PV) and exported to the grid 100% renewable electricity purchased either from the Green Energy Basket or agreed companies, reviewed annually, having regard to the criteria used by the Big Church Switch Green gas [certification approach still t.b.d.] Other reliable offsetting schemes, meeting national criteria to be developed.

<p>~ NET ZERO AFTER 2030</p> <p>These will be in our next phase of work.</p> <p>Some dioceses may opt to include these in their diocesan 2030 targets.</p>	<ol style="list-style-type: none"> 4. All the emissions from major building projects (new builds and extensions, major re-orderings, solar panel installations, major new heating or lighting systems) * 5. Emissions generated from the farming / management of Church land (including church yards, unless fully controlled by local councils, and glebe land) less emissions sequestered through the farming / management of Church land (such as tree planting, soil improvement, and other nature-based solutions) * 6. All the emissions (including upstream process & transport) from the procurement of any items we buy (e.g. pews for churches, paper & printing for offices, new cars for bishops, catering for events) 7. Upstream and downstream emissions from water and drainage 8. Downstream emissions from waste disposal 9. Emissions from building contractors, plumbers, electricians and the like 10. Carbon generated from use of emails and the internet in work-based contexts 11. Diocesan investments, if they are a material amount 12. Air-conditioning gasses <p><i>In standard Greenhouse Gas definitions, these are those parts of our “Scope 3” emissions which are within our influence to a significant degree.</i></p> <p><i>* To be specifically reviewed in 2022, with the potential to bring them into scope of the 2030 target, only after consultation, and if feasible methodologies have been developed</i></p>
<p>✕ NOT INCLUDED IN TARGET</p> <p>Out of scope of our target (but still within our mission to influence)</p>	<ol style="list-style-type: none"> 13. Travel of staff and clergy to and from their usual place of work or ministry 14. The travel of the public to and from church, school, and church events. 15. Clergy family’s & residents’ GHG emissions (consumer goods, travel, holidays). The energy used to heat and light the housing, if over the average reasonable use above. 16. Personal GHG emissions from the lives of worshippers attending church, other church users (such as people attending a choir or playgroup), and overseas visitors 17. Schools over which we have very limited influence (generally Voluntary Controlled Schools which are fully controlled by Local Authorities) <p><i>In standard Greenhouse Gas definitions, see below, these are either out of our scope or are scope 3 but largely outside our influence.</i></p>

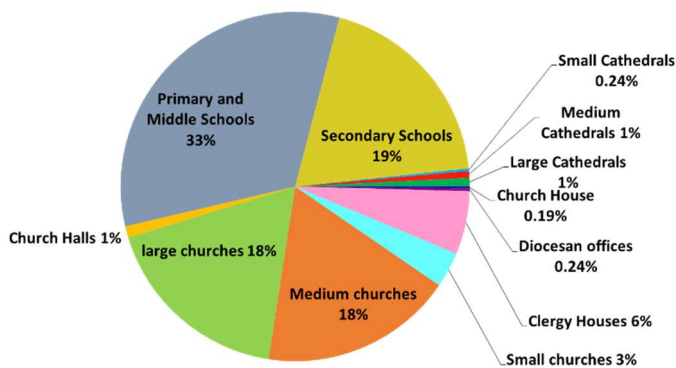
APPENDIX 2: Our current carbon footprint

The Church of England has a very significant carbon footprint; 600k-1000k tCO₂e in 2012.

- The last baseline study was in 2012, and at that time the energy used by the Church created between 600,000-1,000,000 tonnes of 'carbon dioxide equivalent'; the standard measure of greenhouse gas emissions.
- This was just for **energy** (electricity, oil, gas). It did not include transport, water, waste, or the things we buy.

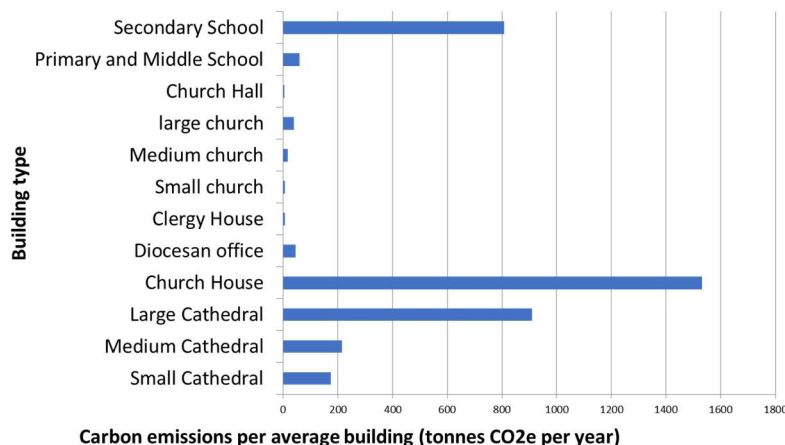
We know the majority of our emissions come from our schools and larger churches.

% of total carbon emissions by building type



- The 2012 study indicated where the majority of the carbon footprint of the Church of England came from.
- We have nearly 3 times as many churches as schools, and yet more than half our carbon footprint comes from our schools. This is because the heating and lighting is on for the majority of the week, at a temperature suitable for children.
- The majority of the remainder comes from churches and clergy housing.

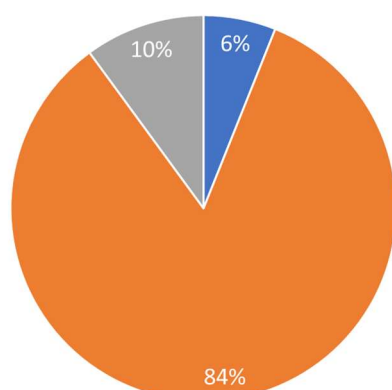
We know the focus needs to be on schools, cathedrals, offices, and larger churches.



- The 2012 study indicated we need to focus strategically on the highest energy-use buildings; cathedrals, schools, offices and large churches.
- Our smaller churches, often used only a few hours a week, already have a very low carbon footprint.
- The “**Practical Path to Net Zero**” guidance (appendix 3) reflects this, offering tailored suggestions.

For churches, the majority of energy use goes on heating. Reducing these emissions whilst keeping buildings comfortable and well used is perhaps the biggest challenge we face.

(sample = 126 churches and halls)
■ Lighting ■ Heating ■ Other

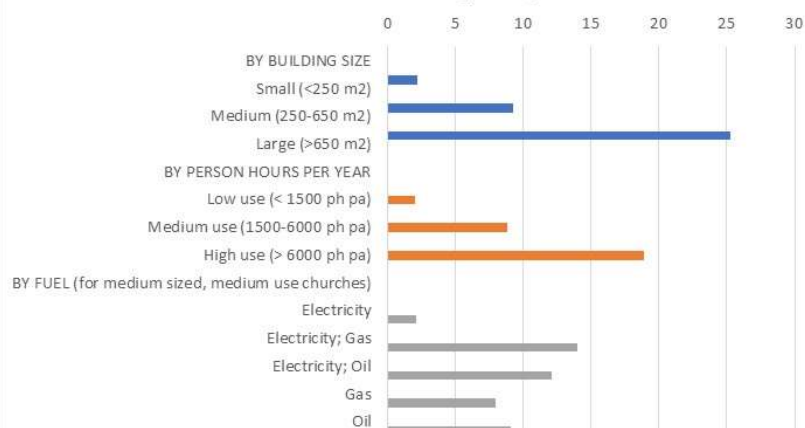


- The recent church energy audit analysis shows that heating makes up over 80% of church energy use.
- This requires us to **reduce heat loss** (e.g. draught-proofing, insulation, and basis maintenance such as broken windows and roofs), **make heating systems more efficient** (e.g. better controls, zoning, and matching heating to usage), and starting to **replace gas/oil heating with lower carbon solutions** (e.g. pew heaters and heat pumps).

Most churches already have low energy use, and carbon footprint from this. We need to help larger churches make energy savings, and find alternatives to fossil-fuel based heating.

Net carbon footprint from energy use, per church, tCO₂e

[Source: over 2,600 churches' Energy Footprint Tool results]



- The new church Energy Footprint Tool shows how the net carbon footprint caused by energy use varies with **size**, **usage**, and with the **heat source**.
- Churches using fossil fuels for their heating (gas and oil) on average have higher net carbon footprints than those on purely electric heating.
- Electric heating also allows an easy switch to 100% renewable electricity on a 'green tariff', perhaps through Parish Buying, further reducing the net carbon footprint of the church.

We know change is possible, as these examples of 'net zero carbon' churches show.



St Michael's, Baddesley

- LED lights
- Pew heating
- 100% 'Green electricity'
- Offset travel with Climate Stewards



St Michael's and All Angels, Withington

- Reduced floodlighting operating hours & LED lights
- Biomass and then pew heating
- Solar PV panels generate more electricity than the churches uses, so act as an offset

For more, search for "net zero carbon case studies" on the main CofE website <https://www.churchofengland.org/>

We cannot currently measure all of our carbon footprint. Much more work is needed.

We only have measures for *some* of the in-scope elements of our carbon footprint:

- ✓ **Churches** – we have the Energy Footprint Tool for all CofE churches, plus 360Carbon as a next step.
- ✓ **Schools** – for most schools, we can access information from their DEC reports.
- ~ **Cathedrals and TElS** – planned for 2021. The EFT is planned to be extended to other buildings next year.
- ~ **Clergy Housing** – for *some* homes we have EPC reports which we can combine with sensible averages for energy use to estimate footprints. This needs to be extended and improved. A central tool would make calculations simpler, and this is planned for 2021.
- ~ **Transport** – for some travel, information exists on expenses systems, but generally data on work-related clergy travel is not gathered by the diocese. Again, a central tool would make this simpler, and is planned.

Beyond this, new measures are needed for the carbon emissions of Church **land** and for **major buildings projects**.

Support and guidance is available for dioceses, to help with their net zero carbon plans.

- Information and guidance: <https://www.churchofengland.org/more/policy-and-thinking/our-views/environment-and-climate-change>
- Webinars: <https://www.churchofengland.org/more/policy-and-thinking/our-views/environment-and-climate-change/webinars-getting-net-zero-carbon>
- Examples: <https://www.churchofengland.org/more/policy-and-thinking/our-views/environment-and-climate-change/our-stories>
- Diocesan Environment Officers: <https://www.churchofengland.org/more/policy-and-thinking/our-views/environment-and-climate-change/deo-map>
- Central staff: email jo.chamberlain@churchofengland.org and catherine.ross@churchofengland.org

A practical path to “net zero carbon” for our churches

These recommendations aim to help churches reduce their energy use and associated carbon emissions. They are based on the findings of our church energy audit programme and input from a range of professionals in the field.

NOTE: Many of the suggestions below require faculty; please seek input early on. If the church interior is of historic, artistic, architectural or artistic interest, seek professional & DAC advice first, before making changes; stabilising the environment for these interiors is important to minimise cycles of treatment, with their inherent carbon cost.

A. Where do we start?

These are actions that nearly all churches can benefit from, even low occupancy churches used only on a Sunday. They are relatively easy, with relatively fast pay back. They are a good place for churches to start, when trying to move towards ‘net zero’.

The building itself:

- Maintain the roof and gutters, to prevent damp entering the building and warm air escaping.
- Fix any broken window panes* and make sure opening windows shut tightly, to reduce heat loss.
- Insulate around heating pipes to direct heat where you want it; this may allow other sources of heat to be reduced in this area.
- If draughts from doors are problematic, draught-proof the gaps* or put up a door-curtain.
- Consider using rugs/floor-coverings (with breathable backings) and cushions on/around the pews/chairs.

Heating and lighting:

- Switch to 100% renewable electricity and “green” gas, for example through Parish Buying’s energy basket.
- Match heating settings better to usage, so you only run the heating when necessary*.
- If you have water-filled radiators, try turning-off the heating 15 minutes before the service ends; for most churches this allows the heating system to continue to radiate residual warmth*.
- If you have radiators, add a glycol based “anti-freeze” to your radiator system and review your frost setting.
- Replace lightbulbs with LEDs, where simple replacement is possible.
- Replace floodlights with new LED units.
- If you have internet connection, install a HIVE- or NEST-type heating controller, to better control heating.
- If your current appliances fail, then replace with A+++ appliances.

People and policies:

- Complete the Energy Footprint Tool each year, as part of your Parish Return, & communicate the results.
- Create an Energy Champion who monitors bills and encourages people to turn things off when not needed.
- Write an energy efficiency procurement policy; commit to renewable electricity & A+++ rated appliances.
- Consider moving PCC meetings elsewhere during cold months, rather than running the church heating.

Offset the rest:

- For most low usage “Sunday” churches, once they have taken steps like these, their remaining non-renewable energy use will be very small. For the majority, all they need to do now to be “net zero” is offset the small remaining amount of energy through [Climate Stewards](#) or other reputable schemes.
- Also, think about your church grounds. Is there an area where you could let vegetation or a tree grow?

B. Where do we go next?

These are actions with a reasonably fast pay back for a church with medium energy usage, used a few times a week. Perhaps half of churches should consider them.

Most actions cost more than the ones above, and/or require more time and thought. Some require some specialist advice and/or installers. They are often good next steps for those churches with the time and resources to move on further towards ‘net zero’.

The building itself:

- If you have an uninsulated, easy-to-access roof void, consult with your QI about insulating the loft*.
- If you have problematic draughts from your door, and a door curtain wouldn’t work, consult with your QI about installing a glazed door within your porch, or even a draught-lobby*.
- Consider creating one or more smaller (separately heatable) spaces for smaller events.
- Consider fabric wall-hangings or panels, with an air gap behind, as a barrier between people and cold walls.

Heating and lighting:

- Learn how your building heats/cool and the link to comfort, by using data loggers (with good guidance).

- Improve your heating zones and controls, so you only warm the areas you are using.
- Install TRVs on radiators in meeting rooms & offices, to allow you to control them individually.
- Consider under-pew electric heaters and/or infra-red radiant panel heaters*, which keep people warm without trying to heat the whole church space. Radiant panels are especially good for specific spaces like chapels and transepts, which you might want warm when you don't need the whole church to be warm.
- If you have radiators, install a magnetic sediment "sludge" filter to extend the life of the system.
- Consider thermal and/or motion sensors to automatically light the church when visitors come in, for security lights, and for kitchens and WCs.
- Install an energy-saving device such as Savawatt on your fridge or other commercial appliances.
- Get your energy supplier to install a smart meter, to better measure the energy you use.

People and policies:

- Vary service times with the seasons, so in winter you meet early afternoon when the building is warmer.

C. Getting to zero

These are bigger, more complex, projects, which only busy churches with high energy use are likely to consider. They could reduce energy use significantly, but require substantial work (which itself has a carbon cost) and have a longer payback. **They all require professional advice, including input from your DAC.**

The building itself:

- Draught-proof windows*.
- If you have an open tower void, insulate or draught-proof the tower ceiling*.
- Double-glaze or secondary-glaze suitable windows in well-used areas such offices, vestries and halls*.
- Internally insulate walls in well-used areas such offices, vestries and halls*.
- If you have pew platforms, consider insulating under the wooden platform with breathable materials*.
- Reinstate ceilings, and insulate above*.

Heating and lighting:

- Install a new LED lighting system, including all harder-to-reach lights, new fittings & controls.
- Install solar PV, if you have an appropriate roof and use sufficient daytime electricity in the summer.

D. "Only if...."

These are actions you would do at specific times (such as when reordering is happening) or in very specific circumstances. **Nearly all require professional advice, including input from your DAC.**

The building itself:

- If you are reroofing anyway, then insulate the roof, if appropriate for your roof*.
- If you have an uninsulated wall with a cavity (typically build 1940 onwards), then insulate the cavity.
- If the building is regularly used & suitable, such as a church hall, consider appropriate external insulation or render, appropriate for the age and nature of the building*.

Heating and lighting:

- If there's no alternative that does not run on fossil-fuels, then replace an old gas boiler or an oil boiler with a new efficient gas boiler.
- If yours is a well-used church which you want to keep warm throughout the week, then consider an air or ground source heat pump. Ground source heat pumps are more expensive and invasive to install than air source heat pumps, but run more efficiently once installed, depending on ground conditions.
- If you are doing a major reordering or lifting the floor anyway, and yours is a very regularly used church, then consider under-floor heating. This can work well in combination with a heat pump (above).

Church grounds:

- If you have car parking that is sufficiently used, EV charging points for electric cars can work out cost neutral or earn a small amount of income for the church. Note, they will *increase* the church's own energy use, but will support the uptake of electric cars. They could be good in combination with solar PV panels.

E. By exception

These actions are often mentioned in this context, but are generally not recommended, because of the risk of harm to the fabric, energy used, and/or the cost.

- × Standard secondary glazing on the main, historic windows (*this can be inefficient, expensive, & cause damage*).
- × Install solar thermal panels to generate hot water (*hot water use is generally not high enough to justify it*).
- × Background space heating at all times unless needed for stabilisation of historic interiors (*high energy use*).

* If interiors are of historic, architectural or artistic interest, seek professional & DAC advice first.

GS Misc October 2020 Appendix 4:

Diocesan Synod climate/net zero motions passed and Eco Diocese registrations

Diocese	DEO	Diocesan Synod net zero motion	Eco Diocese
Diocese of Bath & Wells	David Maggs	passed	planned
Diocese of Birmingham	Revd Patrick Gerard	passed	bronze
Diocese of Blackburn	Revd Canon Prof John Rodwell	planned	
Diocese of Bristol	Clare Fussell	passed	registered
Diocese of Canterbury	Teresa Bennett	passed	registered
Diocese of Carlisle	Richard Waller		
Diocese of Chelmsford	Revd James Gilder	passed	planned
Diocese of Chester	Debbie Dalby		
Diocese of Chichester	Revd Debbie Beer		registered
Diocese of Coventry	Godfrey Armitage	passed	bronze
Diocese of Derby	Vacant, contact Stella Collishaw for now		registered
Diocese of Durham	Revd Danie Lindley & Revd Catherine Walton		
Diocese of Ely	Vacant		
Diocese of Europe	Revd Elizabeth Bussman	passed	registered
Diocese of Exeter	Chris Keppie		registered
Diocese of Gloucester	Revd Arthur Champion	passed	registered
Diocese of Guildford	Alison Moulden	planned	bronze
Diocese of Hereford	Chrissie Pepler		registered
Diocese of Leeds	Jemima Parker	passed	bronze
Diocese of Leicester	Revd Andrew Quigley		registered
Diocese of Lichfield	Revd Richard Clarkson		registered
Diocese of Lincoln	Sarah Spencer	planned	registered
Diocese of Liverpool	Phil Leigh	passed	bronze
Diocese of London	Brian Cuthbertson	passed	registered
Diocese of Manchester	Vacant - Alison Peacock for now		registered
Diocese of Newcastle	Revd Mark Nash Williams		
Diocese of Norwich	Revd Canon Chris Copsey	passed	planned
Diocese of Oxford	Maranda St John Nicolle	passed	
Diocese of Peterborough	Dr Peter Brotherton		registered
Diocese of Portsmouth	Vacant, contact Rachel Houlberg for now	planned	registered
Diocese of Rochester	Vacant, contact Claire Boxall for now	passed	registered
Diocese of St Albans	Rachel Johnston	planned	planned
Diocese of St Eds & Ips	Revd Sandie Barton		bronze
Diocese of Salisbury	David Morgan		bronze
Diocese of Sheffield	Dr Cathy Rhodes	planned	planned
Diocese of Sodor and Man	Henry Uniacke	passed	
Diocese of Southwark	Sue Mallinson		registered
Diocese of Southwell	David McCoulough	planned	
Diocese of Truro	Luci Isaacson		
Diocese of Winchester	Vacant, contact David Morgan for now		bronze
Diocese of Worcester	Mark Wild		registered
Diocese of York	Revd Jan Nobel		

Correct according to information available as of 12 October 2020