Church Building Support

THE CHURCH OF ENGLAND
DIOCESE OF DURHAM

Achieving Net Zero Carbon in your Church Building

Martin Howard – Buildings for Mission Secretary: Diocese of Durham

martin.howard@durham.anglican.org

07586 090996

Content of the session

- Quick Wins – Things that you can do now
- Next Steps – Things that you can do over the next couple of years
- Getting to Net Zero – Things that will need more planning to implement
- Resources
  - Church of England Routemap to Net Zero Carbon
  - Practical Path to Net Zero
  - Webinars
- Support

Quick Wins

Some things that you can do for zero or low cost

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Quick Wins

The Building

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.
- If you have large keyholes you can cover the inside with a fridge magnet.
- The supply of water actually generates a lot of carbon so reducing water reduces carbon. (However this isn't included in the EFT)

Quick Wins

Heating & Lighting

Heating and lighting:

- Switch to 100% renewable electricity and “green” gas.
- 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.
- Check boiler flow temperatures.
- Review your frostat setting If you have radiators, add a glycol based “anti-freeze” to your radiator system.
- Check when water heaters are actually heating the water.
- Clean behind radiators and filters of fan assisted radiators
- Replace lightbulbs with LEDs, where simple replacement is possible.
- If you have internet connection, install a SMART heating controller, to better control heating.
- If your current appliances fail, then replace with A+++ appliances.

Quick Wins

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Quick Wins

People & Policies

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.
- Arrange meetings so that they follow other activities to avoid heating the building from cold for each activity
- Consider moving some smaller meetings elsewhere during cold months, rather than running the church heating.

Next Steps

These actions have a cost but the payback is generally fairly quick.

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Next Steps

The Building

The building itself

- If you have an uninsulated, easy-to-access roof void, consider insulating the loft.
- If it is feasible consider insulating under the floor, however it is important that ventilation is maintained to avoid damp issues.
- 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.
- If you have smaller rooms available consider electrical heating for these spaces.
- Consider creating one or more smaller (separately heatable) spaces for smaller events.

Next Steps

Heating & Lighting

Heating and lighting:

- Learn how your building heats/cools 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 heat the people.
- Radiant panels are especially good for specific spaces like chapels and transepts, which you might want warm separately to the whole church.
- 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.
- 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.
- Review who has control of the heating systems.
- Liaise with regular users of the building to ensure that they understand what you are trying to do.

Next Steps

People & Policies

Getting to Net Zero

Some things that you can do for zero or low cost

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Insulation

- 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 changing the floor, consider insulating the floor.
- Reinstate ceilings, and insulate above.
- 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.

Getting to Net Zero

The Building

Getting to Net Zero

Lighting & PV

Lighting

- Install a new LED lighting system, including all harder-to-reach lights, new fittings & controls.
- Consider including different levels of lighting dependent on usage of some spaces.

Solar PV Panels

- Install solar PV, if you have an appropriate roof.
- Consider how much electricity you can actually use when it being generated. You get the best benefit by using what you use rather than selling to the grid. Consider batteries.

EV Charging points

- 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.

Heating – Heat Pumps

If your church is a well-used church throughout the week and reasonably well insulated, then consider a heat pump.

There are three main types of heat pump

- Ground Source Heat Pump
- Air source heat pump
- Air to air heat pump, although these have limited applications.

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.

Heat pumps run at a lower temperature than gas boilers and need radiators suitable for this temperature. They work well with underfloor heating systems.

Getting to Net Zero

Heating – Heat Pumps

Heating – Infrared

Infrared heating works by heating people and objects rather than the air.

They come in a range of formats such as wall panels, strip heaters and chandeliers.

They can be suited to a wide range of installations and can be used to heat just part of a large open space such as side chapel.

Getting to Net Zero

Heating – Infrared

Heating – Electric

Electric radiators – these work in the same way as a traditional radiator but are powered by electricity and can be controlled independently.

Pew Heaters – These are fitted under the pews and provide heat directly where people are sitting and therefore less heat is wasted.

Storage heaters – These work by storing heat when electricity is cheaper typically overnight and releasing it when you need it.

Pew Cushions – These can be mains or battery powered and provide heat where people are sitting.

Fan assisted heaters – These are basically wall mounted fan heaters. They are not overly efficient but send the heat further into the room.

Getting to Net Zero

Electric Heating

Hybrid Heating Systems

Getting to Net Zero Carbon with your heating system doesn't have to be an all or nothing process.

The move from gas / oil to a low carbon electric system can be done over a number of phases.

For example you may want to continue to use the oil/gas boiler to heat the church for large events but you could install pew heaters or infrared heaters to heat the regular small congregation.

This could then be expanded over a number of years as the boiler reaches the end of its life.

If there is not realistic option to replace a gas boiler then install the most efficient one that you can and keep it's use to a minimum.

Getting to Net Zero

Hybrid Systems

Activity

In small groups you will look at a sample church.

For the church you are looking at please identify …

- Quick wins
- Next Steps that you could take
- How you could reach Net Zero Carbon

Church A

- Medium church building of approx. 600sqm. Unlisted.
- Urban area with lots of tall trees to south side of the church.
- Flat ceiling with void above.
- Used for activities at 5+ days a week.
- Congregation of 150+
- Several small rooms including a church office which is staffed Mon-Fri.
- Currently pews on pew platforms but church are considering replacing pews with chairs.
- Lighting is mainly via halogen spot lights with fluorescent tubes in ancillary rooms.
- Currently heated by gas boiler linked to large bore cast iron pipes and a mixture of radiators.

Church B

- Small rural church building of approx. 175sqm. Grade II Listed.
- Seating capacity of 90 and a regular congregation of 15.
- Used for one service on a Sunday and fortnightly midweek communion
- Only main church and vestry.
- Single roof across Nave and Chancel and in a traditional east-west orientation.
- Lighting is recently upgraded to LED throughout.
- Currently heated by oil boiler linked to large bore cast iron pipes running around the perimeter of the church.
- No toilet or kitchen facilities.
- Oak pews on a stone floor.

Resources

The Church of England Website has lots of resources to support you in identifying what will work for you.

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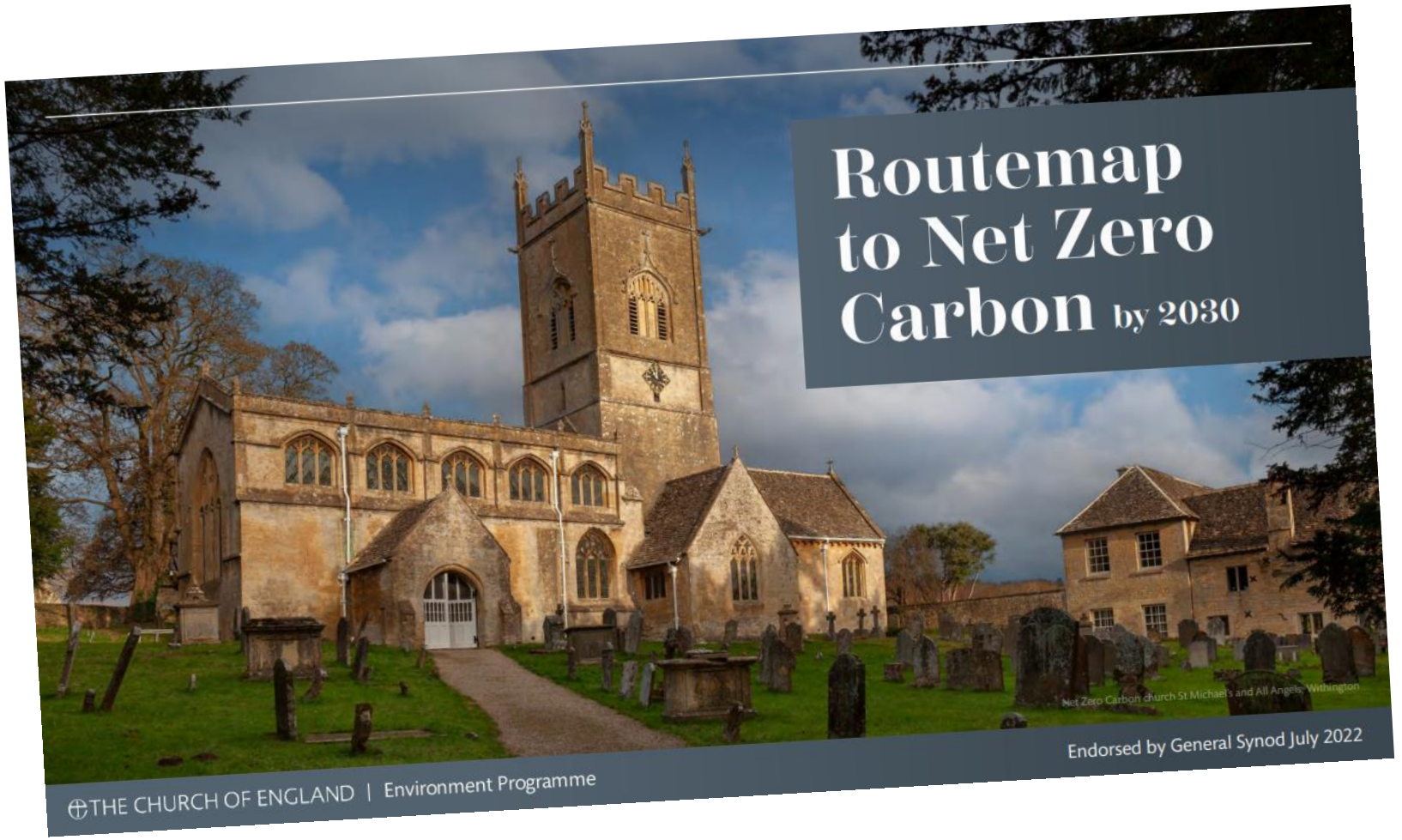


Resources

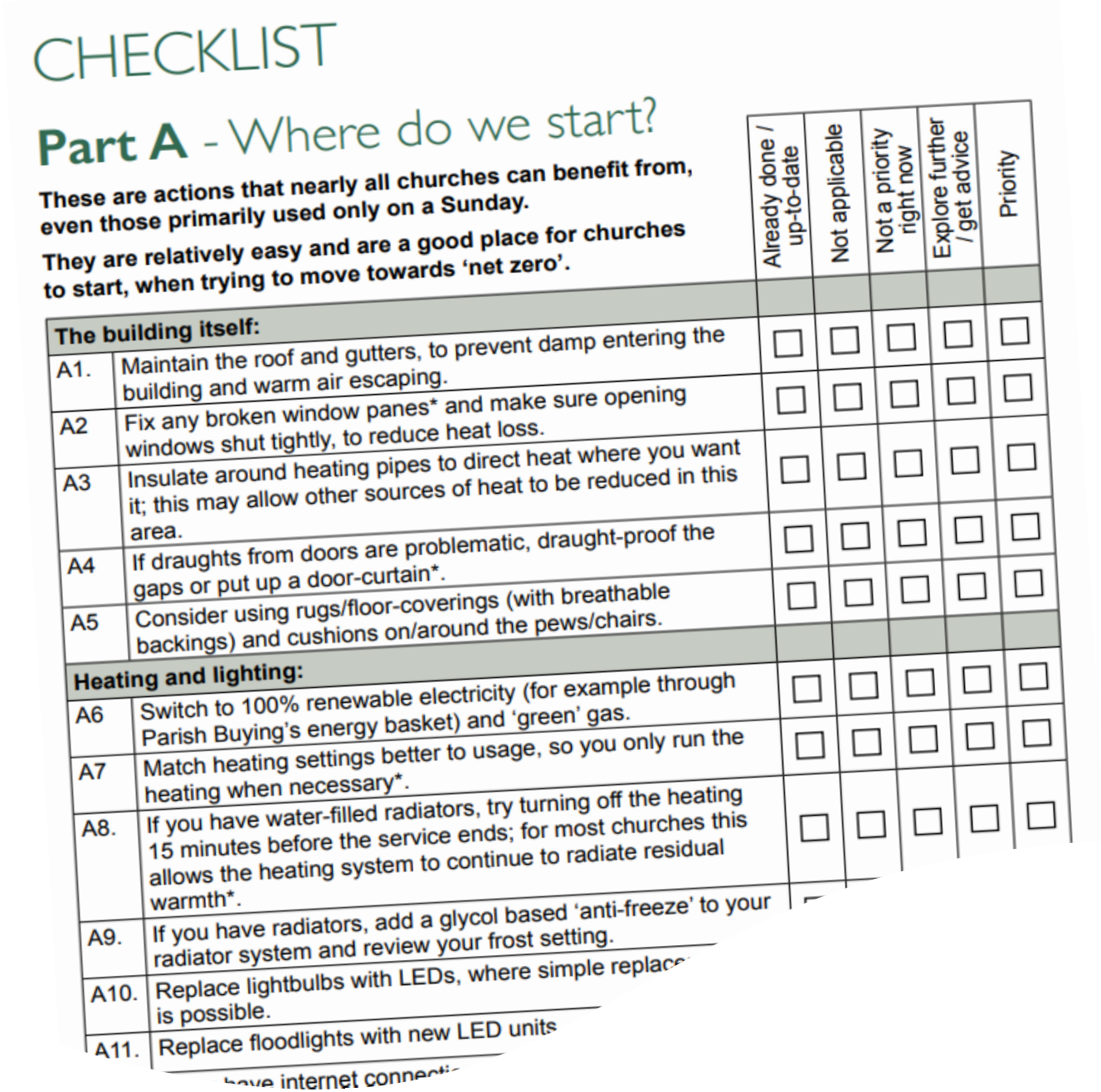
Routemap to Net Zero

The next slides give some of the key dates in the routemap.

RoutemapToNetZeroCarbonFinal.pdf (churchofengland.org)

	Milestone	Date
4.2.1.	National: Faculty rule changes were agreed by General Synod in 2022, for a range of changes to the rules to support net zero carbon. Clear guidance to be issued on agreed changes, and wide communication about the implications.	2022
4.2.2.	National: Promote the Practical Path to Net Zero checklist, Heating Options Appraisal guidance, and church energy audit programme to all those responsible for church buildings.	2022+
4.2.3.	National: Parish Buying rolls out and promotes new net zero carbon product offering, including solar panels, heating solutions, 'green' gas tariff and EV car charging.	2022+
4.2.4.	Cathedrals and Churches: Over the duration of a Quinquennium and from 2022, all cathedrals and the top 20% of energy-consuming churches to develop net zero carbon action plans for completion by no later than 2027. These should include, as a minimum, low-carbon heating options to replace fossil-fuel heating at end-of-life, such as heat pumps or far infra-red heating panels. The Action Plan should also contain a Heating Resilience Plan which should consider how to manage heat should the existing system fail, to avoid needing a quick like-for-like fossil-fuel replacement.	2022-2027
4.2.5.	Dioceses: Every diocese has a 90%+ completion rate for the Energy Footprint Tool, and 100% of cathedrals complete the Energy Footprint Tool.	2023+
4.2.6.	Cathedrals: All cathedrals to have sustainability reviews completed. The review should make reference to the Practical Path to Net Zero and actively consider implementation of 'quick wins', how to decarbonise heat and how to reduce energy consumption.	2023
4.2.7.	National: Pilot an investment scheme for projects with high enough Return on Investment (see also Section 5.4).	2023
4.2.8.	National: Proposal to change APCM rules to require reporting of carbon footprint results to come to General Synod.	2023

	Milestone	Date
4.2.9.	Churches: Eco Church registration	
	• All cathedrals registered for Eco Church and achieve bronze.	2023
	• 10% of local churches in every diocese registered; 5% of local churches awarded at least at bronze (= Bronze Eco Dioceses standard).	2023
	• 40% of local churches registered; 30% of local churches awarded, of which at least a third of these awards should be Silver or higher (= Silver Eco Dioceses standard).	2026
	• All dioceses reach Gold Eco Dioceses standard – targets are currently being amended by A Rocha.	2029
4.2.10.	Cathedrals and churches: At the point of contract renewal, switch to 100% green electricity tariff, encouraged through a major national switching campaign*. * Timing to be kept under review, depending on stabilisation of the energy markets.	2024
4.2.11.	Cathedrals and churches: Having reviewed options to replace fossil fuels, all churches and cathedrals that remain with gas heating, switch to a 'green' gas tariff at the point of contract renewal*, based on national advice about the criteria to apply. * Timing to be kept under review, depending on stabilisation of the energy markets.	2024
4.2.12.	Cathedrals and churches: No new oil boilers installed in churches and cathedrals after this date.* * contingent on government action to connect rural communities to the grid.	2025
4.2.13.	Churches: All churches to have energy efficient lighting installed throughout, with timers and light and motion sensors where appropriate.	2025
4.2.14.	Cathedrals and churches: All cathedrals, and at least the top 20% of energy-consuming churches, to deliver the actions in their Net Zero Carbon Action Plans.	2030



CHECKLIST

Part A - Where do we start?

These are actions that nearly all churches can benefit from, even those primarily used only on a Sunday.

They are relatively easy and are a good place for churches to start, when trying to move towards 'net zero'.

		Already done / up-to-date	Not applicable	Not a priority right now	Explore further / get advice	Priority
The building itself:						
A1.	Maintain the roof and gutters, to prevent damp entering the building and warm air escaping.	☐	☐	☐	☐	☐
A2	Fix any broken window panes* and make sure opening windows shut tightly, to reduce heat loss.	☐	☐	☐	☐	☐
A3	Insulate around heating pipes to direct heat where you want it; this may allow other sources of heat to be reduced in this area.	☐	☐	☐	☐	☐
A4	If draughts from doors are problematic, draught-proof the gaps or put up a door-curtain*.	☐	☐	☐	☐	☐
A5	Consider using rugs/floor-coverings (with breathable backings) and cushions on/around the pews/chairs.	☐	☐	☐	☐	☐
Heating and lighting:						
A6	Switch to 100% renewable electricity (for example through Parish Buying's energy basket) and 'green' gas.	☐	☐	☐	☐	☐
A7	Match heating settings better to usage, so you only run the heating when necessary*.	☐	☐	☐	☐	☐
A8.	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*.	☐	☐	☐	☐	☐
A9.	If you have radiators, add a glycol based 'anti-freeze' to your radiator system and review your frost setting.					
A10.	Replace lightbulbs with LEDs, where simple replace is possible.					
A11.	Replace floodlights with new LED units					

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Resources

Practical Path to Net Zero Carbon

PP2NZC_SelfGuidedChecklist_print_version.pdf (churchofengland.org)

Resources

Webinars

1. Heating part 1 : To replace or not replace?
2. Heating part 2 - Choosing the best heating solution for your church
3. Energy-saving quick wins
4. The Effective Management of Lighting Towards Net Zero
5. Church Solar panels
6. Electric car charging
7. The basics of heat pumps
8. Electric heating solutions - From pews and panels to chandeliers and cushions

Webinars on getting to net zero carbon | The Church of England

Support

What support is available?

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Support

- Contact myself or Bethan Still (Diocesan Environmental Officer)
- Ask DAC for informal advice.
- Attend sessions on producing a Net Zero Action Plan

Thursday 29th February	12.00pm	Zoom	Producing a Net Zero Carbon Action Plan	https://bit.ly/3Nxil68
Thursday 29th February	7.00pm	Cuthbert House		https://bit.ly/41COr6s

- Funding – various funding streams are coming on line in the near future. Please look out for emails etc. in the months ahead.
- Demonstrator Projects.

Support

What is available

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Questions???

Martin Howard– Buildings for Mission Secretary: Diocese of Durham

martin.howard@durham.anglican.org

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