Sensible planning assumptions for the costs to decarbonise churches, linked to the Practical Path to Net Zero Carbon for Churches

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Notes: This schedule has been commissioned by the national Cathedral and Church Buildings Division, and prepared by an experienced church energy auditor who is a qualified Quantity Surveyor and a Diocesan Sustainability advisor.

It gives cost information linked to the "Practical Path to Net Zero Carbon for Churches" plus some additional actions.

The costs below are ***indicative averages*** ; i.e. they will be useful when dioceses are planning for multiple churches, **they will not be correct for any one individual church.**

They are based on significant, but well informed, assumptions on the typical size of heating system, number of lights etc. for small/medium/large/very large churches.

Whilst they are a useful starting point for budgeting and prioritisation, once the actions for any individual building are identified, the costs will need to be confirmed from suppliers and installers.

If interiors are of historic, architectural or artistic interest, churches should seek professional and DAC advice first. If there is evidence of bats or nesting birds, seek specialist advice before closing draughts or insulating lofts.

These costs include labour and materials when purchased direct from suppliers but **exclude** professional fees, planning application and other compliance costs, VAT and main contractors overheads and profits.

They also exclude exception items such as asbestos removal, archaeology and the like.

	Energy and carbon saving from this action: low (<1%) / medium (1-5%) / high (5-20%) / very high (20%+)	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	To what degree is this an 'extra over' cost (e.g. additional to good basic maintenance or otherwise required expenditure)?
Part A "Where do we start?" from the Practical Path to Net Zero Carbon for churches	**L / M / H / VH**	**£k**	**£k**	**£k**	**£k**	
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						
A1. Maintain the roof and gutters, to prevent damp entering the building and warm air escaping.	L	£500	£800	£1,200	£1,500	Basic Maintenance
A2. Fix any broken window panes* and make sure opening windows shut tightly, to reduce heat loss.	M	£500	£1,000	£1,500	£2,000	Basic Maintenance
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 (Note: Focus on heating pipework hidden-away in cupboards or boxings, not exposed within the worship space).	M	£450	£850	£1,200	£1,500	Extra Over
A4. If draughts from doors are problematic, draught-proof the gaps* or put up a door-curtain*.	M	£800	£1,500	£3,000	£5,000	Extra Over
A5. Consider using rugs/floor-coverings (with breathable backings) and cushions on/around the pews/chairs.	M	£1,000	£2,000	£3,000	£4,000	Extra Over
Heating and lighting						
A6. Switch to 100% renewable electricity, for example through Parish Buying's energy basket, ...	M	**	**	**	**	Extra Over
... and "green" gas.	H	**	**	**	**	Extra Over
A7. Match heating settings (times and temperatures) better to usage, so you only run the heating to each area when necessary*.	H	£0	£0	£0	£0	Basic Maintenance
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* (Note: See also B5 - learning how your building heats/cools).	M	£0	£0	£0	£0	Basic Maintenance
A9. If you have radiators, add a glycol based "anti-freeze" inhibitor designed for heating system to your radiator system and review your frost setting.	H	£800	£1,200	£1,500	£2,000	Extra Over
A10. Replace lightbulbs with LEDs, where simple replacement is possible.	H	£150	£300	£500	£1,500	Basic Maintenance
A11. Replace floodlights with new LED units.	H	£1,000	£1,500	£3,000	£5,000	Extra Over
A12. If you have internet connection, install a HIVE- or NEST-type heating controller, to better control heating.	M	£500	£500	£500	£500	Extra Over
A13. If your current appliances fail, then replace with A+++ energy rated appliances.	L	£300	£300	£500	£1,000	Extra Over
People and policies						
A14. Complete the Energy Footprint Tool each year, as part of your Parish Return, & communicate the results.	L	£0	£0	£0	£0	Basic Maintenance
A15. Create an Energy Champion who monitors bills and encourages people to turn things off when not needed.	M	£0	£0	£0	£0	Basic Maintenance
A16. Write an energy efficiency procurement policy; commit to renewable electricity & A-rated appliances.	L	£0	£0	£0	£0	Basic Maintenance
A17. Consider moving PCC meetings elsewhere during cold months, rather than running the church heating.	M	£0	£0	£0	£0	Basic Maintenance
Offset the rest						

Part B "Where do we go next?" from the Practical Path to Net Zero Carbon for churches								
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								
B1. If you have an uninsulated, easy-to-access roof void, consult with your QI about insulating the loft*.	M		£4,000	£7,000	£10,000	Extra Over	< the costs for doing the loft, not just consulting
B2. 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*.	M		£10,000	£15,000	£20,000	Extra Over	< the costs for doing the lobby, not just consulting
B3. Consider creating one or more smaller (separately heatable) spaces for smaller events.	M		£5,000	£10,000	£15,000	Extra Over	
B4. Consider fabric wall-hangings or panels, with an air gap behind, as a barrier between people and cold walls*.	M		£3,000	£5,000	£9,000	Extra Over	
Heating and lighting							
B5. Learn how your building heats/cools and the link to comfort, by using data loggers (data loggers can be hired, but consider seeking guidance on where to place them, comparing with outdoor temperatures and opportunities to measure other useful data such as humidity).	M		£300	£400	£500	Extra Over	< Costs here exclude professional support / guidance
B6. Improve your heating zones and controls, so you only warm the areas you are using***.	M		£900	£1,800	£4,500	Extra Over	
B7. Install TRVs on radiators in meeting rooms & offices, to allow you to control them individually***.	M		£300	£600	£1,200	Extra Over	
B8. Consider under-pew electric heaters	VH	£20,000	£30,000	£50,000	£70,000	Extra Over	
B8. ..... 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.	VH	£1,000	£1,500	£3,000	£6,000	Extra Over	
B9. If you have radiators, install a magnetic sediment "sludge" filter to extend the life of the system***.	L		£750	£1,000	£1,250	Extra Over	
B10. Consider thermal and/or motion sensors to automatically light the church when visitors come in, for security lights, and for kitchens and WCs.	L		£300	£800	£1,200	Extra Over	
B11. Install an energy-saving device such as Savawatt on your fridge or other commercial appliances.	L		£100	£200	£400	Basic Maintenance	
B12. Get your energy supplier to install a smart meter, to better measure the energy you use**.	L		£0	£0	£0	Basic Maintenance	
People and policies							
B13. Vary service times with the seasons, so in winter you meet early afternoon when the building is warmer.	M		£0	£0	£0	Basic Maintenance	
Part C "Getting to Zero" of the Practical Path to Net Zero Carbon for Churches							
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							
C1. Draught-proof windows*.	M			£2,000	£4,000	Basic Maintenance	
C2. If you have an open tower void, insulate or draught-proof the tower ceiling (NOTE: could also consider doors into the lower rooms) *.	M			£1,000	£1,000	Extra Over	
C3. Double-glaze or secondary-glaze suitable windows in well-used areas such offices, vestries and halls*.	M			£10,000	£15,000	Extra Over	
C4. Internally insulate walls in well-used areas such offices, vestries and halls*.	M			£15,000	£20,000	Extra Over	
C5. If you have pew platforms, consider insulating under the wooden platform with breathable materials*.	M			£7,500	£12,000	Extra Over	
C6. Reinstate ceilings, and insulate above*.	M			£25,000	£35,000	Extra Over	
Heating and lighting:							
C7. Install a new LED lighting system, including all harder-to-reach lights, new fittings & controls.	H	£10,000	£30,000	£45,000	£80,000	Extra Over	
C8. Install solar PV, if you have an appropriate roof and use sufficient daytime electricity in the summer.	M			£15,000	£60,000	Extra Over	<Note - Smart Export Tariff income is available for any electricity generated and exported (ie not used by the church)

Part D "Only if"… from the Practical Path to Net Zero Carbon for Churches								
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								
D1. If you are reroofing anyway, then insulate the roof, if appropriate for your roof*.	M	£8,000	£12,000	£16,000	£20,000	Extra Over	
D2. If you have an uninsulated wall with a cavity (typically build 1940 onwards), then insulate the cavity.	M	£4,000	£6,000	£10,000	£15,000	Extra Over	
D3. 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*.	M	£30,000	£40,000	£60,000	£90,000	Extra Over	
Heating and lighting								
D4. 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.	M	£16,000	£24,000	£40,000	£80,000	Extra Over	
D5a. If yours is a well-used church which you want to keep warm throughout the week, then consider an air source heat pump. Air source heat pumps are cheaper and less invasive than ground source (see below, 5b) but run less efficiently - particularly in during colder periods. (Note: Cost is for air-to-water heat pumps, NOT air-to-air heat pumps, which are below, under NEW2.)	H	N/A	N/A	£90,000	£180,000	Extra Over	< Government Boiler Upgrade Grant available as at Feb 23 and is subject to EPC conditions
D5b. If yours is a well-used church which you want to keep warm throughout the week, then consider a 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.	H	N/A	N/A	£160,000	£320,000	Extra Over	Grant available as at Feb 23 and is subject to EPC conditions
D6. 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).	M	N/A	N/A	£100,000	£250,000	Extra Over	
Church grounds								
D7. 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.	L	£2,500	£2,500	£2,500	£2,500	Extra Over	These can be leased, but can require substantial electrical wiring for connections.
Other								
These are new items, from more recent church energy audit, which were not originally included in the "Practical Path to Net Zero Carbon for Churches".								
NEW1. Add battery storage to a PV system (new or existing) where the church has a daily usage of electricity but not all that usage is during daylight hours (for example, evening lettings or floodlighting)	M	£5,000	£5,000	£10,000	£10,000	Extra Over	
NEW2. If yours is a church which has sporadic weekday usage (such as a few mid week services, weekly coffee mornings, several evening usage for choir or community groups) consider using an air to air source heat pump to provide heating for the church	H	N/A	£30,000	£60,000	N/A	Extra Over	
NEW3. If your church has chairs and is used by a relatively small number of people AND/OR you wish to provide supplemental thermal comfort to specific people (the clergy, choir, welcome team, congregation members with vulnerabilities etc) then consider heated chair cushions.	M	£2,000	£3,000	£4,000	£6,000	Extra Over	
* If interiors are of historic, architectural or artistic interest, seek professional and DAC advice first.								