St Albans Diocesan Board of Finance

BOILER REPLACEMENT POLICY

Approved by:	Property Committee of the Diocesan Board of Finance
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Church boiler replacement requirements

Of the total net zero carbon emissions across diocesan activity, property represents around 20% (covering housing and glebe, not including churches and schools), and heating systems are a critical contributor.
The Property Committee is concerned that the boiler replacement policy for diocesan housing is consistent with national requirements for churches considering boiler replacement to avoid double standards.

The Faculty Jurisdiction Amendment Rules 2022 require churches to have due regard to the Church Building Council's guidance on net zero carbon and to explain how they have done this when formulating any proposal. Replacing a fossil fuel boiler (gas, oil, LPG) with another fossil fuel boiler now requires a full faculty application. Consideration is given to the adequacy of the explanation on how due regard was given to the net zero guidance.

The specific guidance that must be considered covers heating principles, a checklist for assessing heating matters, and guidance on appraising all heating options. The options appraisal covers: how well the option meets the identified needs; cost and ROI (both up-front and ongoing); carbon footprint (operational & embodied), and ease of maintenance.

Policy: The Property Team will adopt an options appraisal approach (with a checklist and template) to provide clear rationale for heating system replacement decisions.

Boiler failure

The DBF has several houses with end-of-life gas and oil boilers that are at risk of failure (either ceasing to function or with unacceptable repair costs that necessitate replacement). When this occurs during the heating season, occupants require an immediate heating solution, i.e. a like-for-like replacement, which rules out assessment of alternatives and commits the property to minimum 10-years of further carbon emissions, in conflict with the diocesan net zero carbon objective, and potentially leading to higher utility bills than alternatives.

One or more 'travelling' gas boilers could be used as temporary solutions to allow time for options appraisal for existing gas installation (this is not a solution for other fossil fuels such as oil boilers). Provided any backup hot water provision is operational, a travelling boiler may not need to be installed as a temporary measure outside of the heating season. A travelling boiler might become the permanent solution in some circumstances.

Policy: The Property Team will maintain one or more 'travelling' gas boilers that can be used as temporary replacement in the event of boiler failure, to allow time for options appraisal.

Appraising options

Each property will have a different set of characteristics to assess. For example, a rural property on an oil boiler may not have piped natural gas as an available option.

Modern gas boilers are not necessarily like-for-like replacements for old gas boilers. Consideration also needs to be given to existing heating and ventilation methods (e.g. radiator size and heating controls) to ensure occupants are not subject to increased bills (see appendix).

Air-source heat pumps (ASHPs) are better for the net zero carbon objective because they run on electricity rather than fossil fuels and may produce lower utility bills for occupiers. Installing an ASHP requires assessing the existing heating system and designing a new system, often with the additional cost of radiator and heating control upgrades and associated redecoration.

The Property Committee aims to move away from oil-based heating systems over the next ten years, in line with the net zero carbon objective. Oil systems are higher carbon than other heating methods and do not have a temporary replacement option. Modern oil systems and modern gas systems have reasonably similar energy efficiency.

All gas boilers installed since around 2004 have been condensing gas boilers to maximise their efficiency and reduce running costs and carbon emissions. They can only operate in this mode if the radiators are sized to allow flow temperatures of around 60C (compared to 80C for a traditional system). Conventionally a new boiler is installed with little consideration of the radiator sizes and whether they will enable the system to operate efficiently. A room-by-room heating design assessment is required to ensure that each radiator in the heating system is adequately sized to minimise the system's energy use, running costs and carbon emissions.

Properly comparing the options must include consideration of the total cost of system upgrades and other works required to support the heating method; the expected cost impact to the occupier and whether they would need to vacate for the works; and the carbon impact.

Building thermal envelope

A heating design assessment costs around £400-500 to determine: whether installing an ASHP is feasible and affordable, and what changes would be required to ensure a condensing fossil fuel boiler can operate at peak efficiency. However, a heating system cannot be sensibly designed without considering the thermal performance of the building envelope.

We have been made aware from demonstrator projects that insulation is a concern for our houses, and that a heating system designed assuming insulation is performing will not work when it is not. Therefore, we need to complete an EPC and insulation bore-scoping and determine feasibility of works to make thermal performance sufficient, before it makes sense to do a heating design assessment. In some cases, a thermographic survey may also be necessary.

Where insulation is not performing and cannot be easily replaced, or the total cost of proposed works for envelope upgrades and installing an appropriate heating system is prohibitively expensive, it may be more cost effective to sell a house and purchase a more energy-efficient alternative, rather than pursuing heating system replacement.

We currently have budget of £50k to complete EPC and insulation bore-scoping across the entire housing portfolio in 2026. Quotes for the work are being sought.

Policy: The Property Team will hold an in-date EPC and insulation bore-scoping report (and thermographic

survey if necessary) for a property and determine feasibility of improving thermal performance of the building envelope, before securing a heating design assessment.

When determining the heat source replacement costs, the following will be requested:

1. A boiler only replacement cost;
2. A boiler replacement with all necessary radiator/piping & control upgrades to ensure that the boiler can operate predominantly (more than 90%) of the time) in condensing mode, maximising efficiency and minimising the operational costs for the occupants;
3. An ASHP-based system with all necessary radiator, piping and control upgrades to achieve a design seasonal coefficient of performance (SCoP) of at least 4.0. This is to ensure that the running costs would be no more than for a condensing gas boiler operated efficiently.

Decisions on the appropriate solution will be made on a case-by-case basis. They will consider:

1. The running costs & affordability of the current system (which would be broadly replicated by a boiler-only replacement) in relation to a single stipend;
2. The anticipated running costs & affordability of an upgraded heating system;
3. The capital costs, net of any available grants, and level of occupant disruption that upgrading the heat emitters and related items would have;
4. The age of the existing heat emitters & pipework (if the majority of the heating system is more than 30 years old it could be considered as approaching end of life);
5. The current building fabric condition;
6. The likelihood of replacement of the property;
7. The carbon impact of the change;
8. The total impact on clergy wellbeing of installing multiple like-for-like replacements within the same budget;
9. Whether replacing the house with an alternative is more cost effective than the proposed works.

Prioritisation

Properties with non-gas fossil fuel boilers will still be at risk of like-for-like replacement in the case of emergency failure, as the travelling boiler will only apply to properties with gas boilers.

The Committee received a paper on fuel poverty risk for our occupiers (spending 10% or more of income excluding housing costs on energy) at the November meeting. Properties where the occupiers are at risk of fuel poverty are being prioritised for insulation bore-scoping.

Policy: The following properties will be prioritised for heating design assessment:

1. Non-gas fossil fuel boilers
2. Gas boilers at risk of failure (according to age)
3. Occupants with health conditions that require heating system improvements
4. Occupants at risk of fuel poverty (about 30% of stock)
5. Properties going into vacancy where the boiler is more than 15 years old (opportunity for works)
6. Gas boilers in order of age
7. A property may be exempted due to extenuating circumstances (e.g. intention to sell)

Adoption

Where changes are made to the heating system to reduce the flow temperatures, and particularly if the heat source is changed to a heat pump, the occupants should be trained to expect a longer warm up period than they may be used to, and on how to operate any new controls. This is to ensure that they can realise the efficiency savings that the new system would be capable of delivering. Simple operating instructions should be left for future occupants.

Policy: Training will be provided when significant changes are made to a heating system for existing occupants. New occupants arriving to air source heat pump systems will receive training. The Property Team will include operating instructions for new systems in welcome/house information packs.

Appendix: Radiator and heating control upgrades (extract from NZC paper at Sep 2025 Property Committee meeting)

The portfolio review has identified that a significant number of our boilers are at risk of failure, with the risk of lumpy associated replacement costs. The following matters are for the Committee's discussion regarding our approach to replacing end-of-life boilers.

In Part L of the current Building Regulations the boiler and radiators are required to have a maximum design flow temperature of 55C. This is to ensure that when the heating system is running, if correctly controlled, the boiler will operate in condensing mode and therefore at close to its design efficiency. The minimum efficiency allowable for a newly installed gas boiler is 92%, with additional requirements for combi boilers in relation to their controls (weather or load compensation, or a smart thermostat with automation & optimisation) and flue arrangements to maximise efficiency.

One of the significant cost differentials that we are finding with heat pump quotes is driven by the large proportion of radiators that need to be replaced to enable the heat pump to operate efficiently (and therefore affordably). This is resulting in the cost difference between installing an ASHP and a replacement boiler being greater than the £7,500 available from the boiler upgrade scheme. As a recent comparator, a new gas boiler alone was £5.3k and a new ASHP system would have been £12.9k after the BUS grant.

This also means our incumbents are likely spending more on energy (with commensurately higher carbon emissions) than would be necessary if the radiators were increased in size to enable the existing (or a replacement) boiler to operate with a flow temperature low enough to enable the boiler to operate in condensing mode. This is likely to be in the range of 15-25% more energy consumed than necessary to heat the building. OFGEM assume the average 4+ bedroom home will consume around 17,000kWh of gas annually with a fuel cost of c£1050. This would suggest that if we don't upgrade radiators and controls when we replace gas boilers there are potential additional costs of around £200/year to the occupants.

When a boiler fails, our options are as follows:

Option	DBF Costs		Occupier cost	NZC
	Current	Future		
Gas boiler replacement, no changes to controls or radiators	£	££££	£££ Highest bills from inefficient radiators	★
Gas boiler replacement, upgrade control and radiators to enable 55C flow temperature or lower (meets current new build regs)	££	£££	££ More efficient system short term, but less efficient long term.	★★
Gas boiler replacement with upgraded controls and radiators to enable 45C flow temp or lower (minimise future heat pump installation costs)	£££	££	£ Maximising system efficiency	★★
Low carbon alternative, e.g. air source heat pump with upgraded controls and radiators to enable 45C flow temp or lower	£££ with BUS, or slightly less	£	£ Maximising system efficiency	★★★★★

If we only compare the capital cost of a replacement boiler to the capital cost of a complete ASHP system, including heat pump, radiators and controls, this significantly disadvantages net-zero-friendly ASHP systems and does not compare like-for-like. Only a replacement boiler is required to ensure occupants have a working heating system, but most of our radiators are likely to be well past end of life too, so this would not be an efficient and affordable heating system and results in hidden running costs borne by occupants.

Where a boiler fails in a property that we do not intend to hold long-term, then it makes sense financially to only do a gas boiler replacement as the property will not contribute to our net zero carbon goals long-term. However, where we do intend to hold a property long-term:

1. Should we always get a quote for a low carbon alternative?
2. When considering the relative capital affordability of a low carbon heating system, should we compare it to a straightforward boiler replacement or to a like-for-like replacement with upgraded controls and radiators? To what extent should our net zero carbon priorities influence extra capital expenditure?
3. If we don't install a low-carbon alternative:
    a. Should we invest DBF capital in upgrading control and radiators to improve efficiency and reduce bills for occupiers?
    b. Should we invest extra capital in controls and radiators that would future-proof the heating system for low carbon alternatives in future?

It should be noted that anything other than a straightforward boiler replacement will result in:

a. increased upfront costs as there is a cost associated with calculating the correct radiator sizes needed for each room;
b. increased capital and installation costs as a result of additional materials and labour being required;
c. reduced long term capital costs due to not needing to improve heat emitters at the next boiler replacement (only if sized now to be heat pump compatible);

reduced running costs for clergy only if systems are configured and operated correctly.