St Mary's University Twickenham London

Guidance on developing strategy for decarbonising Catholic diocesan building stocks

Report prepared by the Guardians of Creation project for the Catholic Church in the UK

Laudato Si' Research Institute

Diocese of Salford

Guardians of Creation

This is the first in a series of guidance issued as part of the Guardians of Creation project. The project will produce a generalisable framework for sustainability transition in the Catholic Church, which is implementable at the diocesan level.

During the lifetime of this project, guidance will be issued relating to practical elements of sustainable change, like carbon accounting and environmental management within a diocese, as well as social and theological aspects of sustainability in the Catholic Church.

The Guardians of Creation project has been developed collaboratively with the Diocese of Salford as a pilot study for England and Wales. The principal participating institutions are the Diocese of Salford, St Mary's University, and the Laudato Si' Research Institute at Campion Hall, University of Oxford.

Guidance on developing strategy for decarbonising Catholic diocesan building stocks
Report version 1 | June 2021

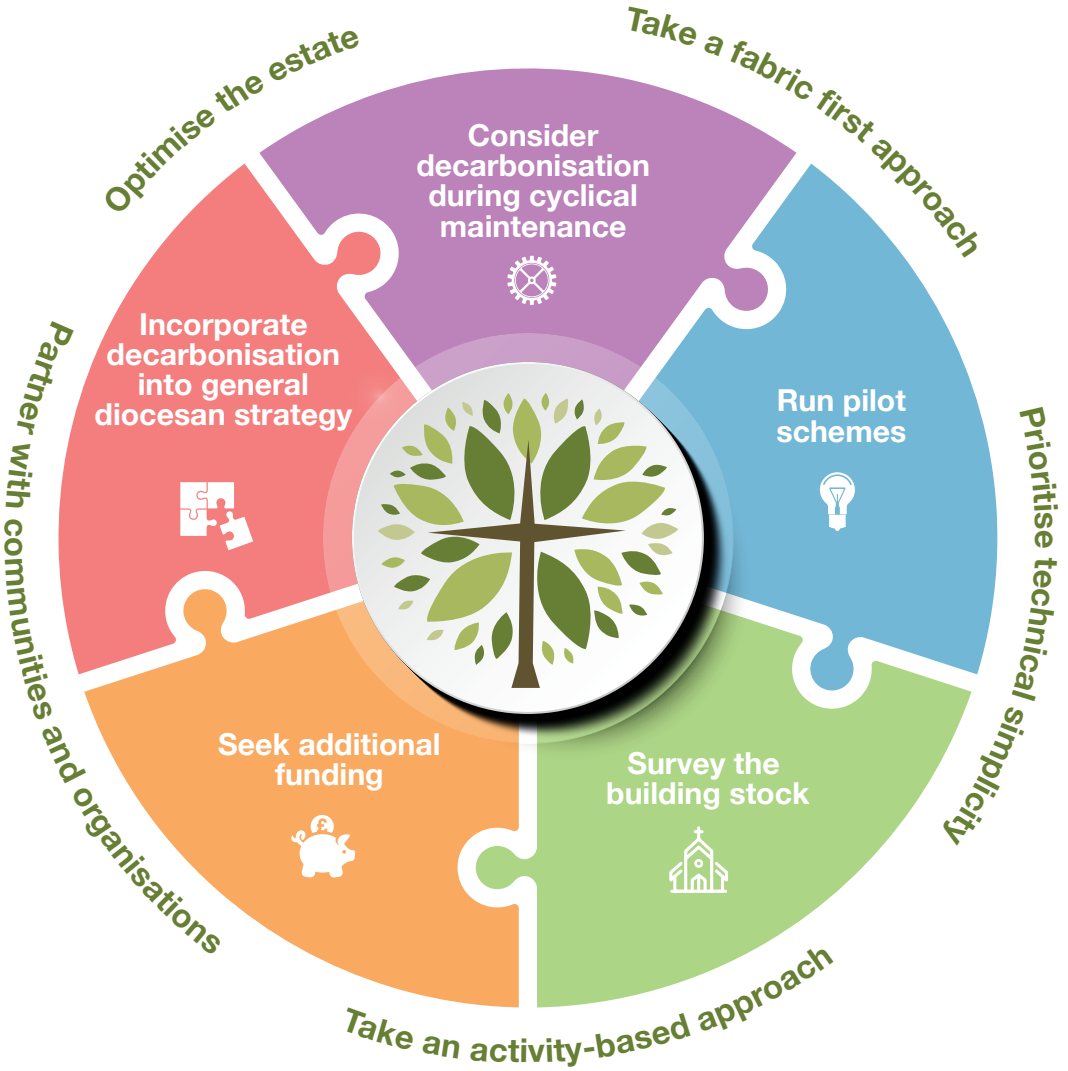
Contents

1. Introduction

1.1 Executive summary

In April 2021, the UK government set a legally binding target to reduce national carbon emissions 78% by 2035.[1] Ofgem, and the Climate Change Committee predict that achieving this target will require near complete decarbonisation of the built environment nationally.[2] Between this growing regulatory urgency, and the extensive positive case for decarbonisation set out in *Laudato Si'*,[3] the need for the Catholic Church in the UK to formulate and implement a decarbonisation strategy has never been greater.

It is common for a Catholic diocese in England and Wales to have in the order of 1,000 buildings in its building stock, comprised mostly of churches, clubs, schools and presbyteries. Because of the size, condition, and use of diocesan estates, the operational energy use of the diocesan building stock has a significant carbon footprint. To illustrate, we estimate that operational energy use in parish managed buildings within the Diocese of Salford is responsible for around 5,700 tons of carbon emissions annually, enough carbon dioxide to fill three hot air balloons every day. This figure does not include schools, which increases the total several times over. Because of the volume of diocesan carbon emissions associated with operational energy use in its buildings, any ambition to decarbonise a diocese is heavily contingent how a diocese manages its buildings. From our consultations with diocesan mangers and expert participants from industry and academia, there is a clear consensus that for a diocese to decarbonise, it must begin by developing a strategy for reducing the operational emissions of the diocesan building stock. This report offers guidance on the development of that strategy.



1 UK Government (2021), Press release: UK enshrines new target in law to slash emissions by 78% by 2035
2 Climate Change Committee (2019), Net Zero – the UK's contribution to stopping global warming and Ofgem (2020), Decarbonisation action plan
3 Pope Francis (2015), Laudato Si'

The substance of this report is a strategy framework for developing a decarbonisation strategy for a diocesan building stock anywhere in the UK. By strategy framework, we mean a set of concepts which can help analyse the task of decarbonising the building stock into comprehensible, manageable elements. These concepts offer a methodical process for formulating and implementing a decarbonisation strategy, which any diocese can follow. Our framework is divided into two sections: the first introduces the processes that a diocese can follow to develop a decarbonisation strategy, the second general principles that a diocese can apply whilst doing so. Each section has five sub sections: the section on processes details five activities associated with diocesan decarbonisation, the section on principles details five different principles to embed within the process.

In the figure above we summarise the substance of this report in a visual model, which articulates the understanding of how to formulate and implement a diocesan decarbonisation strategy that we developed during our investigation. The five diocesan activities that we recommend are depicted inside the circle, occurring as a cyclical, iterative process. The five principles that we identified for decarbonising the diocese are depicted on the outside of the circle, influencing, and providing the context for the diocesan activity within.

1.2 Scope of the report

This report has been prepared for the Catholic Church in the UK by the Guardians of Creation project (GoC) with the support of the Diocese of Salford. GoC is an interdisciplinary, multi-institutional project investigating sustainability transition and ecological conversion in the Catholic Church. This is the first report published by GoC, concentrating entirely on guidance for developing decarbonisation strategy for the management of the diocesan built environment. This guidance will be most useful when used in conjunction with other GoC resources, in particular the forthcoming *Guidance on Catholic diocesan carbon accounting*, and forthcoming detailed guidance on energy surveying diocesan buildings.

The report is not designed to give firm prescriptions in every area related to decarbonisation and built environment. Rather, it is designed to offer a process that dioceses can follow to develop their own strategies for decarbonising their own building stock. Although the report is broadly non-technical and written for both technical and non-technical audiences, we refer to technical resources throughout the report. The report will be of interest to diocesan managers involved in property, finance, fundraising and environmental management. It will also be of interest to bishops and trustees of dioceses. Because many of the activities described occur at the parish level, it will also be of interest to parish priests and parish committees. This guidance was designed to be applicable to any Catholic diocese in the UK, however, diocesan managers elsewhere in the world may also benefit from applying the general processes and principles of the framework, although should note that some particulars of the guidance refer to the UK context.

In the preparation of this guidance GoC convened a group of 15 experts from industry, academia, and the Catholic Church to discuss decarbonising the diocesan estate. GoC also conducted a consultation comprising of interviews and focus groups with a further 20 diocesan managers within the Diocese of Salford and other dioceses. The report's structure and content follow from a systematic analysis of qualitative data derived from these events. Where appropriate, this report also draws on industry guidance and UK government policy. This guidance has been prepared in a methodologically rigorous way, using data collection and analysis techniques designed for exploratory organisational case study research. The recommendations that the guidance makes should be treated as our systematic analysis and reporting of the advice and information shared with us by our diocesan, academic and industry participants.

The context for this guidance is rapidly changing. New technology is being developed, the economics of existing technology is changing, and new government policy is being created.[4] It is intended that this guidance will be updated in the future to reflect further findings from the GoC project, and changes in the technical and institutional context.

This guidance is concerned primarily with developing diocesan level strategy for operational carbon emissions in the diocesan building stock (in more technical language, generally 'scope 1' and 'scope 2' carbon emissions).[5] The substance of the report, therefore, is concerned principally with heating and electricity used in the operation of buildings. Carbon emissions associated with construction, or embodied carbon in building materials and systems are broadly outside the scope of this guidance. Although these topics are not in scope, reference to several resources dealing with these issues have been included.[6]

1.3 'Decarbonisation'

During our diocesan consultation, we found that the terminology associated with reducing carbon emissions can be perceived as complex, and possibly even as a barrier to action. In this report we strive to use accessible terminology.

In this report, ***decarbonisation*** describes the process of reducing carbon dioxide and other greenhouse gas emissions that occur as a consequence of using energy. Decarbonising the diocesan building stock, therefore, means reducing the greenhouse gas emissions associated with the diocese's buildings. We recommend the term ***decarbonisation*** when communicating diocesan policy and strategy on operational greenhouse gas

4 See UK Government (2021), Industrial decarbonisation strategy for an overview of forthcoming policy actions and government reports
5 See Greenhouse Gas Protocol (2015), Corporate Standard for a thorough explanation of what is meant by 'scope'
6 See in particular resources produced by the Green Building Council and the London Energy Transformation Initiative (2020), Climate Emergency Design Guide for design approaches, and Greenhouse Gas Protocol (2021), Life Cycle Databases for extensive information on embodied carbon

emissions reduction. We feel that it is a relatively simple term to understand, and connects to a wider programme of activity in the energy sector and society more broadly, including the guidance of the Intergovernmental Panel on Climate Change.[7] Using the term *decarbonisation* does not normally entail a commitment to a particular emissions target as such, nor a method for reaching it. It does not entail concepts like *net-zero, carbon neutrality*, or *absolute zero* carbon emissions. These terms are typically held to indicate specific emissions targets along with implied methods for reaching them.

In our consultation, it was found that diocesan teams may sometimes prefer to avoid technical connotations altogether when communicating their strategy for reducing greenhouse gas emissions. In these cases, participants preferred the idea of communicating their strategy as a carbon reduction strategy. Perhaps more important than the terminology itself is that dioceses find a vocabulary with which they become comfortable, and which helps them to reduce their energy use and use renewable systems. The terminology itself should remain secondary to the objectives that the terminology describes.

1.4 Structure of the guidance

The substance of this guidance is a framework for developing decarbonisation strategy in the diocese, particularly in the context of the diocesan building stock. By 'framework', we mean a conceptual and analytical approach for developing a strategy through which a diocese understands and undertakes the tasks of decarbonisation. Anyone from any diocese reading this guidance should be able to consider their own diocese's particular situation through the prism of some general, empirically informed categories which we present below. The framework is presented in two sections. The first offers an analysis of the *activities* that a diocese will need to undertake to decarbonise. The second offers a range of *principles* that a diocese can adopt to help it understand and approach the activities of decarbonisation. Each section contains five sub sections, so the total framework presents five activities and five principles.

Each activity or principle that we introduce below is supported by one or more rationales for why GoC suggests this activity. These rationales were derived from the input of our expert participants, and are an important element of the framework. The rationales provide a diocese with the justification for why those activities might be appropriate, and further detail on what implementing an activity or principle might look like in the context of a diocese. For example, the first activity that we introduce, **consider decarbonisation during cyclical maintenance**, is supported by three rationales. We make the case that this activity **staggers cost, creates economies of scope** and **avoids locking in emissions**.

7 IPCC, (2018): Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels

2. Decarbonisation activities

This section details five major categories of activity that a diocese will need to undertake as part of a decarbonisation process. We consider this to be a relatively exhaustive typology of activities. Our analysis suggests that a decarbonisation strategy which does not trace a path through all five of these activities will be difficult to implement successfully.

The first recommendation of this report is to **consider decarbonisation as part of cyclical maintenance (1)**. Thinking in terms of cyclical maintenance may represent a relatively low, and efficient level of financial investment in decarbonisation, that simultaneously protects the diocese from some future costs and regulatory risk. Once the most urgent buildings have been identified, a diocese will need to start to **run pilot schemes (2)**. Running pilots begins to equip the diocese with an understanding that can go on to form the basis of a more systematic decarbonisation strategy as momentum builds. To implement the pilot schemes, and in some cases to prepare the diocese for funding or investment, the diocese will need to **survey the building stock (3)**. In many cases, the diocese will not be able to, or wish to fund such projects without additional income, in which case the diocese will have to **seek additional funding (4)**. Finally, on the completion of the process, to consolidate the organisational learning, and to connect the decarbonisation activity to the wider activity of the diocese, the diocesan management would normally **incorporate decarbonisation into general diocesan strategy (5)**.

We present the five activities in the order in which a diocese may wish to begin considering them. However, these activities would not normally occur in a linear way. In reality, many of these activities will be occurring simultaneously. Moreover, a diocese will need undertake these activities in a cyclical or recursive process, perhaps revisiting each activity at a larger scale as levels of understanding, organisational momentum, and popular support grow. For example, a diocese that has limited experience with decarbonisation may wish to target one or two parish halls due for cyclical heating system replacement (1), with insulation and a simple renewable alternative as a pilot scheme (2). For example, this might be the installation of a solar photovoltaic (PV) panel, or split system air source heat pump. This would require an energy survey report or retrofit assessment of those buildings only (3), and could be achieved with existing diocesan or parish funds or a small grant from an external fund (4). The organisational learning from this process could then be formalised as a case study or policy or that might offer governance or direction on how to apply the approach in other parishes (5).

As a diocese develops momentum it may be able to follow the same broad sequence of activities but at a greater scale. To continue the example above, the diocese could now begin rolling out the PV solution that it had developed previously, but at scale, installing PV every time appropriate buildings were due for relevant maintenance (1). The diocese could begin to iterate on this solution, perhaps experimenting with the installation of battery storage, or another complementary technology in a handful of sites (2). Because it would be occurring at scale, this approach would require that retrofit assessments be systematically included as part of the cyclical maintenance process (3). This would naturally require

more money, and so the diocese could turn to more sophisticated funding models like community energy schemes or other forms of investment for return (4). Again, at the completion of this process the organisational learning could be formally incorporated into diocesan policy (5).

2.1 Consider decarbonisation during cyclical maintenance

A way of embedding decarbonisation into diocesan activity proposed by both our diocesan and industry expert participants was that it would be desirable to embed the decarbonisation process within the existing programme of cyclical maintenance, or scheduled major projects in the diocese. This would mean that buildings due for related work would also be the buildings that would be prioritised for decarbonisation interventions. Diocesan property departments monitor when buildings in the diocese are due for building fabric maintenance or heating system replacement, often through quinquennial inspections in the case of churches. Our expert participants identified three main reasons why interventions could be prioritised according to existing cyclical maintenance or scheduled major projects, all three of which can convey cost saving implications.

2.1.1 Avoids locking in emissions

A boiler replacement cycle represents an approximately 15-year period of guaranteed carbon emissions if a gas boiler is replaced with like-for-like. Currently, gas is slightly less carbon intensive per kWh consumed than electricity from the grid, all other things being equal.[8] However, given the rate of grid decarbonisation required to meet the UK government target of 78% emissions reduction by 2035,[9] if a boiler were to be installed now not only would its lifespan vastly exceed the time it will take for the UK grid to become less carbon intensive than natural gas, it may well exceed the time it will take to decarbonise the UK grid entirely.[10] For this reason, our expert participants stressed that wherever possible, gas systems should not be replaced with like-for-like systems.

In many buildings it will be appropriate replace gas boilers at the end of their lifespan with heat pumps. The running costs of the heat pumps will typically already be lower, and the efficiency greater than a new like-for-like natural gas boiler, or hydrogen boiler.[11] This will be a desirable approach in many schools, presbyteries, religious houses, and some church halls. Installing heat pumps in these sites will be a quick and effective way to begin decarbonising the diocesan building stock, insofar as the optimal intervention will often be much clearer than in the case of churches. Given that gas heating is the principal driver of operational carbon emissions in a diocese (responsible for around six times the carbon emissions of electricity use in the Diocese of Salford for example), the installation of heat pumps in appropriate buildings also represents an opportunity for addressing a very significant proportion of the diocesan carbon footprint.

In contrast to the diocesan schools and domestic buildings, when church heating systems are due for replacement dioceses may face more complicated decisions. We suspect that churches with small congregations may benefit from local heating, and optimal systems for full churches are yet to be determined.

> **“We know that out of everything we need to do to reduce our carbon emissions, the number one priority is to move away from fossil fuels. So, avoiding replacing an existing gas system with a new gas system is absolutely key.”**
>
> **Thomas Lefevre, Director, Etude Sustainability**

Even if staggered according to heating system replacement cycles, taken in isolation, replacing gas heating systems with renewable systems will appear to be more expensive than replacing like-for-like in the short term. Like-for-like system replacement may only require the replacement of an appliance, often only incurring costs for the replacement appliance and its installation. By contrast, the installation of a new renewable system may include infrastructural changes to the building such that the building is able to support the new heating system.

We suggest that for these reasons, installations of renewable systems should be perceived by the diocese as long-term, necessary, infrastructure upgrades to buildings. In the long run, it is quite possible that the installation of renewable heating systems will become a legal requirement for many diocesan buildings. The UK Climate Change Committee and Ofgem estimate that 100% of domestic buildings and 90% of non-domestic buildings will need to be heated by renewable systems before the government’s legally binding deadline for net-zero carbon neutrality, if the UK is to achieve its target.[12] The International Energy Agency, which is often associated with a moderate position, has recommended the banning of all new natural gas boiler sales by 2025.[13] UK policy decisions designed to disincentivise the installation of new fossil fuel heating systems are now virtually inevitable in the foreseeable future. This means that for the diocese some infrastructural costs of changing heating systems in its buildings are inevitable. The decision that dioceses, parishes and schools need to make over the coming years is not whether to transition to renewable heating systems, but when the most appropriate time for doing so will be. We therefore recommend heating system replacement cycles as a cost-effective way of doing this that adopts a cautious approach to UK policy change.[14]

8 UK Government (2020), Greenhouse gas reporting: 2020 conversion factors
9 Climate Change Committee (2021), Sixth Carbon Budget
10 National Grid (2020), Future Energy Scenarios
11 London Energy Transformation Initiative (2021), Hydrogen: a decarbonisation route for heat in buildings?
12 Climate Change Committee (2019), Net Zero – the UK’s contribution to stopping global warming and Ofgem (2020), Decarbonisation action plan
13 International Energy Agency (2021), Net Zero by 2050
14 See also Green Building Council (2021), Renewable Energy Procurement & Carbon Offsetting Guidance for Net Zero Carbon Buildings

"Something we can start to do today is to make sure that we're not going to put anything in that we have to deal with in a few years' time."

Dr Emma Gardner, Head of Environment, Salford Diocese

Using cyclical maintenance to prevent locking in future carbon emissions may be particularly pertinent in the case of heating systems and other operational carbon emissions. However, this approach can also apply to reducing the carbon emissions embodied in the materials used in other building maintenance. During our consultation with diocesan property departments, diocesan managers expressed a need for access to an authoritative source on embodied carbon and ecological impacts associated with potential building materials. The Greenhouse Gas Protocol keep an up-to-date list of these life cycle assessment databases,[15] including, for example, the Building Research Establishment's Impact database. One of our expert participants cautioned that these databases are not always at a satisfactory level of granularity, however they remain a useful heuristic that can help property departments feel comfortable about the broad implications of the materials that they are using.

2.1.2 Staggers costs

Our expert participants cited multiple examples of working with organisations including universities and local authorities that intended to decarbonise but were financially unable to implement an estate-wide decarbonisation programme that retrofitted the entire estate simultaneously. For these organisations, the cost of retrofitting the entire building stock simultaneously was simply not affordable, even though there was a significant return on investment associated with doing so. On top of this, our expert participants warned us that presenting an organisation with an unachievable cost estimate at the start of the decarbonisation process can make decarbonisation appear to be an insurmountable task. It was argued that the psychological effect of doing so can itself become a barrier to action, as it makes the task appear hopeless.

Catholic dioceses, with relatively large property portfolios but relatively small turnovers, may be examples organisations that would also struggle to implement a simultaneous, estate wide decarbonisation programme. Many dioceses may simply lack the liquidity to implement a programme of that kind without significant outside investment. Whilst larger scale impact investment in diocesan decarbonisation is certainly possible, not least given the potential for financial returns associated with some decarbonisation technologies, dioceses cannot count on such investment. In normal circumstances therefore, we recommend incorporating decarbonisation strategy into the existing building maintenance cycle, rather than planning an independent programme of decarbonisation projects. In contrast to the disempowering experience of contemplating an unaffordable but immediate estate-wide transformation, our expert participants described a virtuous cycle of momentum and hope associated with achieving demonstrable, albeit incremental progress towards a decarbonised estate.

"If you add those costs across every building, it's almost paralyzing. Whereas, if you take one building at a time there is the hope that bit by bit, we'll find a way to get the money. Maybe the parishioners can help on this one, maybe the local authority could help on this other one. There's the hope that we'll find solution along the way, if we get going step by step."

Thomas Lefevre, Director, Etude Sustainability

2.1.3 Creates economies of scope

Our expert participants highlighted that there are also economies of scope associated with incorporating decarbonisation interventions into the maintenance cycle. Sustainable capital projects and planned maintenance work may share a need for a particular fixed cost that would otherwise have to be expended twice if the projects were to be done separately. Using heating system replacement cycles as a prompt to review the kind of heating system that a building is using ensures that every building in the diocesan estate will have its heating system evaluated from a decarbonisation perspective, and that the evaluation comes at a time when work and expense was already anticipated. Erecting scaffolding is another example of this nature. Scaffolding is often a significant fixed cost for diocesan capital projects and required for many kinds of building fabric maintenance. However, it is also required for some retrofit energy efficiency or energy generation installations.

The economies of scope generated by considering decarbonisation as part of cyclical maintenance do not only apply to financial economies. Diocesan property teams also have limited time, and large property portfolios to manage. Considering decarbonisation during cyclical maintenance may also be a more efficient way of managing the limited time and attention available to diocesan property teams. By the same rationale, this approach should also limit the disturbance to each site and its users.

2.2 Run pilot schemes

There was a clear consensus among our expert participants from industry and academia, as well as the diocesan managers who we interviewed, that dioceses should be running pilot projects implementing decarbonisation technologies as soon as possible. This was perceived to be a necessary step before any diocesan decarbonisation strategy could be scaled up either within a diocese, or across other dioceses.

Pilot schemes were argued by our participants to be a driver of both technical understanding and social engagement. Our understanding in this guidance of the role and nature of pilot schemes, therefore, extends beyond the narrow definition of a pilot as an investigation into the technical feasibility of a technology. Many of the technologies that dioceses are considering are already proven in many of the settings that they are considering implementing them. However, running 'pilots' remain critical because the exploration of these technologies in the diocesan context also performs a social function, insofar as they generate understanding, momentum and enthusiasm in the diocese.

15 Greenhouse Gas Protocol (2021), Life Cycle Databases

"Strike some momentum, act where you've got some momentum going already, and get some schemes on some buildings."

Dr Richard Fitton, Reader in Energy Performance of Buildings, University of Salford

Given the relatively low levels of organisational learning around renewable energy and sustainable technology in most dioceses, dioceses may wish to pilot a range of technologies. Some of these pilots should be relatively simple. This could include PV systems, radiant heaters, destratification fans, smart heating controls, participation in a district heating network, zoning, installing temperature controls in buildings, and other proven technologies. We also note that given the heavy emphasis placed on energy efficiency and the invitation to **take a fabric first approach** by our expert participants, dioceses may perhaps prefer to focus on insulation and other fabric interventions before, or at the same time as investigating renewable systems interventions. Dioceses may also wish to undertake more complicated pilots, particularly in the cases of churches, where optimal renewable heating solutions have yet to be determined. For example, photovoltaic thermal hybrid solar collectors (PV-T) have seen relatively little general application in the UK, partly because of limitations on their potential to heat buildings to higher temperatures.[16] However, one of the research team has noted that in the specific case of churches, which typically have lower temperature setpoints than other buildings, PV-T may be a particularly useful technology.

Church Marketplace is a procurement organisation that supports the Catholic Church in the UK. Amongst other activities, it helps negotiate better prices on products and services than an individual diocese might achieve if purchasing by itself. Church Marketplace is currently investigating how to make sustainable technologies available at scale for the Catholic Church and is running a consultation with dioceses in spring/summer 2021 to understand what technologies dioceses might be interested in implementing. The findings from Church Marketplace's consultation will inform the framework agreement of suppliers and prices that it develops for suppling the Church at scale in the long run. Because of the potential impacts of Church Marketplace's consultation programme for the development of a favourable favourable purchasing framework agreement, and the consequent impacts on the costs of long-term decarbonisation in the Church, we highly recommend working with Church Marketplace to procure technologies that you may be interested in piloting or implementing.

2.2.1 Helps the diocese understand decarbonisation technologies

The first rationale provided by our participants for running pilot schemes was technical. Running a pilot scheme for a particular intervention helps the diocese to understand whether, and how to implement that intervention more widely. Any diocese will probably need to run several exploratory projects to develop an understanding of which technologies and approaches might be suitable in the context of that diocese. These pilots will vary in complexity. In many cases, dioceses will not have any experience in relatively simple decarbonisation technologies, like roof mounted PV and radiant heaters. We encourage dioceses to familiarise themselves with cheap and accessible technologies of this kind as a priority. For more complex pilots that may rely on specialist understanding or monitoring techniques that do not exist within the diocese, our expert participants recommend partnering with science and engineering departments at local universities. We have found that local universities are often very willing to support decarbonisation initiatives and may wish to work with their local diocese.

2.2.2 Communicates the diocesan commitment to integral ecology

The second rationale provided by our participants was social. Pilot projects also act as demonstration projects, articulating the diocese's engagement in decarbonisation to various audiences, including the organisation itself. Such projects also inform wider audiences, for example indicating to parishioners what might be possible in their own lives. This social function emerged as a particularly salient theme during the diocesan consultation in the context of Catholic social teaching, and Laudato Si' in particular. Diocesan managers and trustees felt that it was important for dioceses to be articulating a visible commitment to ecology and 'our common home', and undertaking visible projects represented a way of doing this. Because some pilots are not necessarily expensive (implementing a simple PV system may only cost several thousand pounds for example), visible pilot projects were also felt to be an impactful way of articulating diocesan commitment to ecology even before dioceses develop into a financial position from which to implement a large-scale decarbonisation strategy.

2.3 Survey the building stock

"The best way to do this exercise is to start with a full appreciation of stock and condition. Then you try and match the characteristics of the building to what you're going to put in them."

Dr Richard Fitton, Reader in Energy Performance of Buildings, University of Salford

Our expert participants made the case that when feasible, a diocese should look to begin a systematic energy survey process of its building stock. Ideally, this would eventually cover the entire diocesan estate. Surveys will be a necessary component of any decarbonisation process, and so a diocese will certainly already be conducting some surveys opportunistically by the time it begins thinking about an estate-wide approach. A systematic energy survey process in the diocese was considered to be a crucial step in scaling the decarbonisation strategy because it forms the basis for more advanced decision making. It will be necessary for understanding what interventions might be possible in the context of the surveyed buildings, but also for informing potential funding decisions made by external grant funding bodies and investors.

16 BEIS (2015), Evidence Gathering – Hybrid Solar Photovoltaic Thermal Panels

Currently, there are two common audit processes for determining the energy efficiency of a non-domestic building: Energy Performance Certificate (EPC) and Display Energy Certificate (DEC). An EPC constructs a simplified model of the building to assess the energy performance and provide recommendations for improvements. It is also possible to use the model to assess the energy and carbon benefits of any proposed actions. DECs assess how well the building is being operated and allow comparison of this from year to year by adjusting to different weather patterns each year. The key benefit of DECs over EPCs is that they deal with reality rather than a model. The key downside of DECs is that they do not provide a clear indication of the benefits of particular action before taking that action or without using a model to estimate the benefit. We expect that when future funding opportunities require an energy survey as part of a retrofit assessment, it will typically be an EPC. However, DECs may also be sufficient, and both will provide a document that can be independently audited by an accreditation scheme.

A new government-approved standard for reducing energy demand from non-domestic buildings, Publicly Available Specification 2038: Retrofitting non-domestic buildings for improved energy efficiency – specification (PAS 2038), is in development. The PAS 2038 standard advises a specific process for manging retrofit assessments. PAS 2038 specifies that the building energy improvement process will be managed by a retrofit coordinator, who will provide oversight and direction for retrofit assessors, who are the qualified energy assessors who actually conduct the site surveys. It is probable that the UK Government will make PAS 2038 a requirement for future funding initiatives, and other funding bodies may follow suit. A draft of the standard has undergone public consultation and is due to be published by the British Standards Institute on 5th July 2021.[17] Our expert participants, one of whom has worked on the development of this standard, informed us that this is likely to be the most suitable building energy demand improvement process for a diocese to follow when assessing its non-domestic buildings, both intrinsically, and because it may become an institutional requirement in some scenarios. Dioceses may find that existing staff in the property team are able to achieve PAS 2038 retrofit coordinator certification. Alternatively, if no staff are available or suitable, dioceses may find that they need to acquire this capacity through partnership or recruitment. Because of the utility of the PAS 2038 process for diocesan energy efficiency improvement, and the central role it is likely to play in the governance of retrofit activity in the UK, any forthcoming guidance from GoC is likely to follow PAS 2038 closely.

One of our expert participants noted that in the case of presbyteries and other smaller diocesan buildings, the related Publicly Available Specification 2035: Retrofitting dwellings for improved energy efficiency (PAS 2035), may offer a more suitable process than that outlined in PAS 2038. PAS 2035 is already available, and dioceses could begin working to it immediately if desired. As with PAS 2038, when a diocese decides to begin implementing PAS 2035 processes, we anticipate that it is of particular importance that the diocese does so having established a close and transparent relationship with the retrofit coordinator. Both PAS 2038 and PAS 2035 processes should be managed in a technology-neutral way that understands the wider context and objectives of the diocese, and dioceses can influence this through how they resource their retrofit coordinator requirement.

Site surveys across a diocese should normally only be pursued if funds have been identified for delivering the actions suggested by the survey reports. Thus, the cost of surveys should be viewed as the point of entry to a wider integral ecology improvement process, and not an end in themselves. When a diocese has identified some funds for interventions but is not in a position to survey the entire stock, we suggest using the following heuristics for assigning priority to buildings for the surveys that a diocese can afford.

1. Cyclical maintenance or planned major work to a building will often represent the most urgent need in terms of long-term cost and emissions saving. Changes in heating system and other scheduled infrastructural changes will typically require a survey, so as the dioceses begins to **consider decarbonisation during cyclical maintenance**, it may be appropriate to prioritise these buildings for retrofit energy surveys.
2. In some cases, buildings in a diocese will be reliant on particularity carbon intensive heating systems. Where a building uses oil or coal as a heat source or is understood to be particularly inefficient via quinquennial inspections or other means, it may be appropriate to prioritise it for an energy survey.
3. Where building users are already expressing higher levels of enthusiasm to take environmental action it may be appropriate to prioritise those buildings. Buildings with users who are enthusiastic about decarbonisation may also be particularly suitable if a diocese wishes to **run pilot schemes** that are more complex or experimental.
4. As part of a diocesan decarbonisation strategy, dioceses may be monitoring energy use data. We actively recommend that dioceses do so, and will set out a methodology in our forthcoming ***Guidance on Catholic diocesan carbon accounting*** to this end. Once a diocese is collecting this data, the diocese may wish to prioritise sites that the data analysis suggests have a higher carbon footprint.

2.3.1 Characterises the building stock for appropriate interventions

There are churches, schools, clubs, presbyteries, and other buildings in the diocesan building stock. Some of these buildings are listed, many are not. Different kinds of diocesan building will have very different use patterns, will be in different condition, and will be amenable to different kinds of intervention. Conducting audits is therefore a necessary step in understanding how decarbonisation technologies can be applied to the building stock of a diocese, precisely because of the range of different buildings held within the building stock.

Our expert participants cautioned that although it may be tempting to look for one or two interventions that might have apparently universal applicability in the diocese, and then aim to roll them out across the entire building stock, this is high risk approach given the diversity of diocesan building stocks. They warned that a scaled approach like this should be avoided until the building stock has been properly understood, and reminded us that the cost of surveys is low in comparison to the cost of interventions.

17 British Standards Institute (2021), PAS 2038 – Retrofitting non-domestic buildings for improved energy efficiency – specification

"The starting point should be about characterization. The buildings are so unique, and I think there are very individual problems in each building."

Dr Richard Fitton, Reader in Energy Performance of Buildings, University of Salford

2.3.2 Facilitates larger scale financing

Energy surveys of the building stock can be an important feature of securing funding for further interventions. To seek public funding applicants may need a body of evidence explaining what interventions are possible in the building stock, as well as a technical justification for making those interventions. Equally, impact or community investment will often require an assessment of the sustainability of investments made into decarbonisation.

"The main thing is you need to understand what you've got. If you don't understand what you've got and where you're going, you can't be ready when these funding calls come out."

Jon Kent, Director, Zeco Energy

2.4 Seek additional funding

There are a variety of different ways to fund decarbonisation in a diocese. In this section we give some consideration to grant funding and investment models. Despite the range of potential funding mechanisms, however, our expert participants made the case that preparing the diocese for most kinds of decarbonisation funding or financing actually begins from a relatively similar process. Specifically, attracting funding requires developing a project plan that encompasses: a comprehensive understanding of the needs of the existing building stock; a plan and rationale for the dioceses proposed interventions; an understanding of the cost of the proposed interventions; projections for the benefits of those interventions; and a way of monitoring the benefits of the interventions.

There was also a strong consensus among our expert participants that in many cases, these project plans will need to be fully costed, or even 'shovel ready', before the diocese begins considering which fund to apply for. This may seem counter intuitive, however, for both private and public funding, taking such an approach follows a compelling rationale. Our participants argued that in the case of attracting investment, the need for developing fully costed project plans reflected the necessity of high-quality decision information required by investors before approval. In the case of public funding, their advice reflected what they perceived to be the extremely fast-moving and competitive nature of the decarbonisation grant funding landscape.

"The public sector decarbonisation fund was a billion pounds this year. I know from projects that we're working on that a large proportion of that was awarded before the end of 2020. Bids were still going in up until the fourth of January, but a vast proportion of that money was already spent prior to December. The reason being, people have projects ready to go."

Jon Kent, Director, Zeco Energy

The particular example of the Public Sector Decarbonisation Scheme (sometimes referred to as the 'Salix fund') being allocated early was corroborated by our consultation within the dioceses. We learned that dioceses which had applied for the fund nearer the start of the application window had been awarded funding, whereas dioceses which had applied nearer the deadline had not.

"With Salix funding being so oversubscribed, and almost allocated before it is even announced, we should be building up that plan and have a complete estate strategy before we can chase after the money, which can be identified on the back of that. The order needs to be right."

Rob Tozer, Director, 1stPlanner

Depending on how a diocese manages its approach to fundraising, the emphasis placed on 'shovel ready' projects may entail some shift in thinking. Under this model, rather than bid managers working to identify public funds and build applications around those requirements, bid managers will need to begin by identifying potential opportunities for developing attractive, hypothetical projects based on the assets of the diocese. We note that it is possible to see this change in emphasis as an aspect of embedding decarbonisation in wider diocesan strategy, which we discuss in the section **incorporate decarbonisation into general diocesan strategy**.

Although our expert participants were pessimistic about a diocese's ability to achieve decarbonisation entirely, or even principally through grant funding, on other aspects of the financial viability of decarbonisation they were quite optimistic. A common observation made by the expert participants was that, due to the increasingly favourable economics of renewable energy generation and energy efficiency in general, organisations are learning to perceive decarbonisation as a source of revenue rather than a cost. They encouraged dioceses to take a similar perspective. As such, and particularly in the case of renewable energy generation, even if dioceses require external support to set up sustainable capital projects, in the long run such projects can be designed in a way that they actively generate income for dioceses. We return to this theme in more detail in the section **partner with communities and organisations**.

"Look at the portfolio, and start thinking about renewable energy as a revenue generator, as opposed to a cost."

Jon Kent, Director, Zeco Energy

"I think renewables can be seen as more of an investment with a long-term revenue stream as opposed to a cost."

Dr Chris Jones, Technology Transfer Fellow, Tyndall Centre for Climate Change Research, University of Manchester

The rationale for seeking additional funding for decarbonisation is self-evident. Instead of providing rationales, in this box, we outline four broad routes to funding decarbonisation that might be appropriate for a diocese. We introduce these routes in what we perceive to be approximate order of increasing complexity: **grant funding, investment portfolio rebalancing, community investment, and impact investment.**

2.4.1 Grant funding

Having designed and costed some ready-to-go projects, dioceses can work with their bid-writers to identify grant funding that has been made available for organisations and communities seeking to decarbonise. We offer a non-exhaustive list of avenues for exploration below. It is extremely unlikely that dioceses will be able to achieve their decarbonisation objectives through grant funding alone, however, grants may represent a good first step.

Renewable heat incentive scheme
Although the renewable heat incentive (RHI) scheme for non-domestic buildings is now closed to new applicants, the fund for domestic buildings will remain open until March 2022.[18] Using a mechanism called 'assignment of rights'[19] it is possible to have the costs of the equipment, and even the installation financed up-front entirely by the installer, who then become the recipients of the RHI payments rather than the diocese. Although not suitable for churches, schools, clubs, or any other non-domestic building, this fund may be appropriate for presbyteries or other diocesan domestic buildings. We strongly recommend that dioceses look to take advantage of this scheme as quickly as possible. There is currently no clear indication of whether a similar scheme will follow, and the scheme has the potential to fund a significant proportion of the heat pumps that dioceses will need to install.

Public sector decarbonisation scheme
The public sector decarbonisation scheme may return in 2022.[20] This fund may be suitable for decarbonising diocesan schools, however, as intimated above dioceses may need to begin preparing project plans for applications soon to compete for this funding when the request for proposals opens.

"We know from working with Salix, who manage the funds, that the next round will be distributed next year. But there's no point thinking about that in August or September. You need to be thinking about it now. You need to be looking at projects now so that you can build up a fully worked return on investment and calculate your costs."

Jon Kent, Director, Zeco Energy

Section 106 funding and the Community Infrastructure Levy
Funding set aside by local government for community infrastructure investment may also be a viable source of funds for dioceses, as explained to us by one of our expert participants. There may be some restrictions on how the diocese can access these funds, and this may require working with a consultant.

"We've run a pilot in the Archdiocese of Westminster over the last six months or so. Across five local authorities we identified about 2.6 billion pounds of potential funding when you look at look at education Section 106 funds, and housing Section 106 funds."

Rob Tozer, Director, 1stPlanner

Ofgem and District Network Operators
Under instruction by Ofgem, District Network Operators (DNOs) have been trialling a community energy support scheme which may extend to include schools and dioceses. It may be worthwhile getting in contact with your DNO to explore whether they may be able to support your diocese with capital costs related to decarbonisation.

Ofgem have also made funds volunteered by companies in lieu of fines for breaches of licence conditions available to communities. These funds are distributed through the Energy Saving Trust.[21]

Local Enterprise Partnerships
Some funds have been made available for community energy projects by Local Enterprise Partnerships (LEPs). The BEIS Local Energy Team works with LEPs to create regional funds that can also be applied to.[22] You may wish to contact your regional LEP to find out if those funds are currently supporting community energy projects for which a diocese might be eligible.

2.4.2 Investment portfolio rebalancing

A technically straightforward, albeit potentially organisationally complex topic worthy of acknowledgment is the reallocation of diocesan financial investments into capital projects for decarbonising the building stock. Many dioceses are currently undergoing some form of ethical review process for their investments. It is conceivable that as dioceses divest financial assets that they determine to be unethical, they may elect to use the cash released by divestment to invest in return yielding

18 UK Government (2020), Changes to the domestic RHI regulations
19 Ofgem (2018), Essential Guide to Assignment of Rights
20 UK Government (2021), Public Sector Decarbonisation Scheme
21 Ofgem (2020), Voluntary Redress Fund
22 Association for Public Service Excellence (2021), BEIS Local Energy Team

renewable capital projects in the diocese. Renewable energy generation in the diocese can be an attractive investment proposition, as we outline in the cases of community energy and impact investment below. We note here that if renewable energy generation and associated business models are a viable investment for community schemes or impact investors, then it is feasible that the diocese could itself be the investor.

2.4.3 Community investment

Dioceses may wish to consider community investment as a way of financing decarbonisation. Community benefit societies and cooperatives are often used as a legal and financial vehicle for coordinating community investment in renewable energy generation projects that will yield a return. These entities are created specifically for the benefit of the investing communities and are typically designed with governance structures that protect the community that is investing. They can generate a return by providing energy to the communities that they serve (at rates that benefit the community), selling surplus energy back to the grid through the Smart Export Guarantee,[23] and depending on the technology used by the scheme, providing other energy services like helping to balance the grid. Dioceses can engage with existing regional or national community benefit societies and cooperatives, or they can develop their own. If a diocese does elect to develop their own, the model affords a high degree of control to the Church through the design of a scheme's governance. For example, the boundaries of the communities participating in a Church led community energy scheme can be defined by the scheme. A scheme could be designed to be local to a parish, a diocese, or even Church-wide. The opportunity to invest could be made available to specific groups within a geography like the parishioners of certain parishes or dioceses only, or to a wider community of all faiths and none. The Church can also set a maximum size of investment that an individual may invest in the scheme to protect individuals from risk, and community energy schemes are often designed in a way that supports the fuel poor with the provision of energy.[24] As one of our expert participants pointed out, given the generally low interest rates available to the public in the current UK economic context, the rates of return that community investors in solar projects can expect are relatively compelling.

"With return on investment to the investors and the general public of around four to four and a half percent, I think we're going to see a growing wave of community led projects."

Dr John Hindley, Director, Twelvetrees Consulting

Facilitating community investment through these vehicles may be a particularity suitable route to funding decarbonisation in some dioceses for two reasons. Firstly, the rationale of community investment is already somewhat aligned to the financial dynamic that exists between dioceses and their congregations. Offertory typically represents the majority income of a diocese under normal conditions, and dioceses may find that relatively large numbers of parishioners contributing relatively small investments into ecological transformation in the church at scale is ethically and financially agreeable to both dioceses and congregations. Secondly, unlike grant funding, community investment vehicles can be scaled indefinitely.

2.4.4 Impact investment

A complex topic, but worthy of acknowledgment in this guidance is the possibility of developing commercially attractive investment propositions for impact investors who are aligned to the Church's mission.

"In the Catholic community there are a lot of entrepreneurs and investment managers who would be potentially quite happy to engage into such a process."

Stephen Brenninkmeijer, Founder of Willows Investments, Chair of the European Climate Foundation

Unlike community investment above, impact investment might tend toward larger scale investments in dioceses. Larger scale investments in renewable energy generation, when correctly organised and financed, can generate noteworthy return on investment as one expert participant noted in the quote below.

"We've seen that larger organisations are able to take advantage of power purchase agreements and other financial vehicles for renewables. The economics have become increasingly favourable, particularly if you have tax status that can sand some of the edges off it as well."

Dr Chris Jones, Technology Transfer Fellow, Tindall Centre for Climate Change Research, University of Manchester

Because of their scale, such investments might require a comprehensive programme of investment grade building audits, robust calculations exploring the return on investment, and the creation of a fund for coordinating the investments. We suggest that the complexity of orchestrating impact investment in diocesan decarbonisation renders it a longer-term goal, relative to some of the other funding options above.

"For every investment you need to look at the return. We have done lots of work with corporations. Because the PV has a payback period of less than 10 years, they naturally go for it. For bigger investment, like infrastructure investment, you can look at the internal rate of return to look for good financial investment. And on top of that, it'll be good to identify social value."

Dr Mei Ren, Director, Buro Happold

23 Ofgem (2020), About the Smart Export Guarantee
24 Green Alliance (2019), Community Energy 2.0

2.5 Incorporate decarbonisation into general diocesan strategy

Our expert participants reflected that for a diocesan decarbonisation strategy to be more successful, it needs to be incorporated into central planning and strategy making in the diocese. From our consultation with the Diocese of Salford and other dioceses, we understand that currently, decarbonisation does not necessarily feature in more general diocesan decision making about the building stock. Our expert participants identified three areas of diocesan strategy making to which decarbonisation might be particularly relevant: reorganisation, estate development, and land management.

2.5.1 Connects decarbonisation to other aspects of property strategy

During our diocesan consultation, we came to understand that property departments may not necessarily have a sustainability policy or sustainable design guide informing how they approach their capital projects. Property departments may instead be relying primarily on Building Regulations for project governance. We note that with the implementation of the UK Government's forthcoming Future Buildings Standard, relying primarily on Building Regulations for project governance will begin to incorporate some aspects of decarbonisation by default by 2024 (with interim uplifts to part F and part L of Building Regulations, dealing with fuel, power, and ventilation, anticipated in mid-2022).[25]

However, despite often relying on Building Regulations for project governance, we have observed that some members of diocesan property departments have expressed a desire to develop departmental policy that extends beyond Building Regulations, and takes a more proactive, and diocesan centric approach to project governance in relation to decarbonisation. In the short term, resources like the London Energy Transformation Initiative Climate Emergency Design Guide,[26] which offers some policy making and design guidance, may be useful for developing diocesan property strategy. In the longer term, dioceses may wish to collaborate to develop a standard that can be shared throughout the Church. As an alternative, or in addition to developing diocesan governance on decarbonisation, dioceses can either hire, or partner closely with a retrofit coordinator and retrofit assessors, whose expertise can perform a similar function to a departmental policy or design guide.

Regardless of how it is achieved, UK government policy developments over the coming years will necessitate that decarbonisation will have to be more profoundly incorporated into the activities and governance of property departments. With the imminent implementation of the Future Buildings Standard, and the publication of the forthcoming Heat and Buildings strategy, our expert participants reflected that not incorporating decarbonisation into estate development strategy may have the potential to become a regulatory risk for the diocese in the long run. Our recommendation is that property departments act in anticipation of these changes, as well as according to the proactive motivation that we identified during our diocesan consultation, and incorporate decarbonisation into departmental governance before it is imposed on them by Building Regulations.

> **"It is essential that the energy efficiency strategy is built into the estate development strategy. I don't think the two things can sit in isolation. When we're doing the scoping and development planning for the projects, that energy efficiency has to be factored in. Otherwise, you're doing it as a retrofit."**
>
> **Rob Tozer, Director, 1stPlanner**

As decarbonisation becomes a more prominent theme in the property strategy the question of how it will be resourced will need to be addressed. Dioceses may find that many aspects of decarbonisation can be subsumed within the roles of existing staff. However, the distinct and specialised competencies of retrofit coordination and assessment bear specific consideration. Retrofit assessment will typically require qualified energy assessors. Currently, energy assessors are often engaged via Church Marketplace, and so this may remain the best way of resourcing the energy assessment requirements of a diocese. However, PAS 2038 and PAS 2035, which are likely to become the institutionalised governance for energy demand improvement processes, also require a retrofit coordinator. A retrofit coordinator is responsible for project managing the whole process of reducing energy consumption on a site. Dioceses might want to consider training existing staff into the role of retrofit coordinator according to the PAS 2038 standard. Where the diocese has a well-staffed property team, this may be entirely possible. Where this is not possible, the diocese may need to consider either hiring a new member of staff who can perform the role of retrofit coordinator among other functions, or partner with an organisation that can. We also note that many parishioners may have the competencies required of retrofit assessors and coordinators. When PAS 2038 is published in July 2021 the individual competencies required of the retrofit coordinator will be made clear.[27] The diocese will then be able to begin planning its resourcing strategy.

25 UK Government (2021), The Future Buildings Standard
26 London Energy Transformation Initiative (2020), Climate Emergency Design Guide
27 British Standards Institute (2021), PAS 2038 – Retrofitting non-domestic buildings for improved energy efficiency – specification

2.5.2 Connects decarbonisation to diocesan reorganisation

Many dioceses in England and Wales are undergoing reorganisations, which often feature a review of parish boundaries. Occasionally parishes are amalgamated. This kind of decision-making has implications for the diocesan building stock when the use, management, or ownership of diocesan buildings changes because of reorganisation. Our participants argued that decarbonisation needs to be thought about during these processes, as an important factor in deciding which buildings to keep, and how to use the ones that are being kept.

"It's about ensuring that when we're doing strategic reviews in our dioceses, which may be driven by mass numbers, number of clergy etc., that sustainability and decarbonisation are part of that conversation so that it's not dealt with as a separate topic."

Lyn Murray, Chair of the National Conference of Diocesan Financial Secretaries of England and Wales

2.5.3 Connects decarbonisation to land management

The final point our expert participants made about the need to incorporate decarbonisation into diocesan strategy more broadly, was that because of the particular nature of the diocesan building stock it may not be possible to achieve complete decarbonisation without taking opportunities for offsetting into account. Diocesan building stocks often include a significant proportion of heritage buildings, which in some cases are difficult to decarbonise entirely.[28] Carbon offsetting is the process by which an organisation funds a carbon negative activity to compensate for emissions that it deems to be inevitable. It is generally advised that this should be the last resort in the decarbonisation process, prioritised after both emissions reduction and renewable energy generation.[29] In part because of the heritage nature of some of the diocesan building stock,[30] dioceses may decide to participate in some degree of carbon offsetting in the long run. Because Dioceses also own land, they can consider developing their own offset schemes. In our diocesan consultation, the theme of making the best possible ecological use of the diocesan land was quite prevalent. By thinking about decarbonisation as part of the land management strategy, and vice versa, dioceses may be able to develop projects with ecological benefit that they would not have otherwise considered.

"Some of the older buildings are never ever, ever going to achieve net-zero. You can install as much insulation as you like, but the nature of their design and structure won't allow it. You want to incorporate ground source or air source heat pumps? The infrastructure won't allow you to do that. So, this is why you need to make the best use of the land in the estates, and natural capital."

Jon Kent, Director, Zeco Energy

28 Arup (2011), Low Carbon Heritage Buildings
29 Green Buildings Council (2020), Unlocking the Delivery of Net Zero Carbon Buildings
30 Arup (2011), Low Carbon Heritage Buildings

3. Decarbonisation principles

The previous section offered an empirically informed sequence of activities that a diocese may wish to engage in as it develops a decarbonisation strategy. In this section we offer a group of principles, also derived from our participants' input, which a diocese may wish to consider as it designs the content of these activities.

The first three of these principles are concerned to a great extent with how to prioritise interventions. They broadly mirror the approach advocated by the UK Green Building Council and others.[31] First, a decarbonisation strategy should contain within it some consideration of whether, and how to **optimise the building stock (1)**. Before considering intervention, this principle invites diocesan managers to consider whether it is even physically or financially possible to decarbonise the diocesan property portfolio in its current form. It invites the further question of whether decarbonisation objectives can be considered as part of the decision-making processes that determine use change, or property divestment decisions. The next principle we propose is to **take a fabric first approach (2)** to thinking about the buildings that the diocese does want to concentrate on. Our participants generally considered that prioritising intervention to the building fabric before systems interventions to be preferable from both decarbonisation and financial perspectives. However, they also noted that this principle should not be followed dogmatically, for example to the exclusion of obviously beneficial systems interventions or repairs. The third principle is to **prioritise technical simplicity (3)** in the systems interventions that the diocese does opt for. Dioceses are in an interesting position in that they have large building stocks, but the users and managers of those buildings are often relatively non-technical. Any novel technology that is introduced needs to be low risk and operator friendly for the benefit of the building users and managers. The fourth principle encourages dioceses to **take an activity-based approach (4)** to designing solutions. Thinking carefully about the kinds, and patterns of use in a building should help to design more applicable and efficient solutions across what, in the case of dioceses, is a very diverse building stock. Lastly, we identified that dioceses may want to think about how to **partner with communities and organisations (5)**. In the particular context of diocesan decarbonisation, our participants indicated a range of specific financial and social benefits associated with careful partnership.

These five principles can be considered in conjunction with the activities detailed in the previous section. When designing a programme of activities for decarbonisation, a diocese can view the programme of activities through the prism of the principles we detail below. For example, if a diocese is designing a pilot scheme and an associated funding application, it might ask itself the following questions based on the principles explained in this section. Does the proposed scheme prioritise the most relevant buildings (1)? Does it concentrate on fabric before systems – or have a strong rationale for not doing so if it does not (2)? Are the interventions designed to be usable by the least technical users of that building (3)? Are the interventions designed with the use patterns and user activity of the buildings in mind (4)? Does the intervention benefit other constituencies, and could it be supported by any partner organisations (5)? If a diocese decides that a programme of activity passes these 'tests', then it may find that the decarbonisation strategy as a whole becomes more effective.

3.1 Optimise the estate

As a principle, our expert participants proposed that before considering either fabric or systems intervention, dioceses should evaluate whether a building is truly valuable to the diocese and community in the long term, in its current form. We do not propose particular heuristics for determining which buildings may be more or less valuable to the diocese, as this will certainly be a motivated by a nuanced and contextually determined consideration of religious, financial, social and ecological value at both the level of the diocese and the parish. We also do not propose heuristics for determining whether buildings that are deemed to be less valuable to the diocese should be changed in their use, management or ownership. Our intention, and the intention of our participants with introducing this principle is to draw attention to the fact that if a diocese is operating with a maintenance deficit, decarbonisation will be practically impossible.

Although we do not propose specific criteria here, we do propose that a diocese develops its own criteria for evaluating whether its most energy inefficient buildings are possible candidates for change of use, management or ownership as part of a decarbonisation strategy. Given that the issue of property divestment is highly connected to other aspects of diocesan management, this principle might be particularly appropriate to consider as a diocese moves to **incorporate decarbonisation into general diocesan strategy**, as outlined in the previous section. As mentioned in the previous section, a diocese may find that Mass and clergy numbers motivate decisions of this kind, however dioceses may also wish to consider environmental risks associated with climate change, such as coastal flooding, in this decision-making process.

3.1.1 Saves or generates money while reducing carbon footprint

The rationale for selling, or otherwise removing some of the buildings from the building stock which are simultaneously of low importance to the diocese or parish, whilst being energy inefficient is relatively self-evident. Divesting of difficult to manage property will generate immediate decarbonisation benefits for the diocese, in that the diocese will no longer have to power or maintain buildings which, by virtue of their condition, are more likely to be energy inefficient. At the same time, the diocese will be able to generate short term income from their sale.

31 UK Green Building Council (2019), Net Zero Carbon Buildings: A Framework Definition

"We can talk about energy savings, and we definitely should, and we should definitely talk about carbon. But there clearly appears to be some kind of backlogging in maintenance, and maybe cyclical and preventative maintenance hasn't taken place. There comes a day when you have to address the fact that some of these buildings are too big, too old, and are maybe not designed for the church of now."

Dr Richard Fitton, Reader in Energy Performance of Buildings, University of Salford

Instead of selling energy inefficient buildings of low religious and community value, our participants noted that dioceses are full of opportunities to use the building stock to create social value, whilst also generating some income. The opportunity for developing social housing was a particularly common observation made by diocesan managers and trustees during our consultation. Participants argued that if problematic sites were redeveloped into carbon neutral social housing that made use of renewable technologies,[32] then the diocese would be able to meet several of its objectives at once.

"We're looking at some schemes where we're putting a grid connected battery storage unit in, which has been fed by a green, renewables contract, and then looking at building social and affordable housing on top. The battery can supply energy on a community interest company basis. So, it's not for profit, and it's a lot cheaper than buying it from the grid."

Jon Kent, Director, Zeco Energy

Some of our expert participants were already working on such a model in the Archdiocese of Westminster, which, amongst other financial benefits was unlocking access to Section 106 funds that the diocese may not have otherwise been able to access as it redeveloped the school estate.

"We're looking at the Catholic school estate across the Archdiocese of Westminster as being something that can actually start generating an income rather than becoming a cost. The school estate can also be something which provides housing and provides community facilities. The first thing we do is identify how much funding there is in the local authority."

Rob Tozer, Director, 1stPlanner

3.2 Take a fabric first approach

A fabric first approach to decarbonisation prioritises maximising the energy efficiency of the building by addressing the building fabric before turning to other elements of the building like heating systems. This approach is common recommendation in the sector, and coherent with the wider discourse on sustainability transition. The International Energy Agency, for example, model that 40% of global decarbonisation will need to be achieved through energy efficiency.[33] A large part of this will need to be delivered through the energy efficiency of building fabric interventions. Our expert participants made the case that a fabric first approach is a cautious and desirable approach to decarbonising the diocese for two reasons. Firstly, when executed in a way that does not exacerbate any existing issues with the building it protects the diocese's buildings from falling into disrepair as an indirect consequence of investment in other decarbonisation methods, or as a direct consequence of inappropriate systems interventions to the buildings themselves. Secondly, it is associated with cost saving benefits, especially into the long term.

3.2.1 Protects the diocese's buildings

A major motivation for taking a fabric first approach in the diocese is to preserve the integrity, and consequently value of the diocese's buildings. If the building fabric is allowed to deteriorate because a diocese has not attended to its fabric in favour of concentrating on systems interventions, then in the over time more fundamental issues with the building can emerge.

"If you go and start to interfere with the ventilation and heating strategies of a building that's already on the edge it will become a very, very bad building at the end of it. So you may well have a carbon neutral building, but it may fall over."

Dr Richard Fitton, Reader in Energy Performance of Buildings, University of Salford

In thinking about building fabric before engaging with systems and technology, dioceses can make sure that the systems interventions they go on to design are appropriate for those buildings. In practice, this means that a diocese should conduct retrofit assessments of the building stock before designing technical interventions, in a way that thoroughly takes account of the condition of the building. Equally, it might be desirable to fold this principle into the strategy process as the diocese begins to **consider decarbonisation during cyclical maintenance**.

32 See for example https://www.passivhaustrust.org.uk
33 International Energy Agency (2020), Energy Efficiency

"What we're doing down at Westminster Archdiocese is looking at building condition. Because there's no point putting renewable, or more efficient technology in the building if the fabric of the building isn't going to be able to adapt to it."

Jon Kent, Director, Zeco Energy

A fabric first approach is likely to be appropriate for most categories of diocesan buildings. We feel that it is worth acknowledging a caveat to this principle for churches, however. Schools, presbyteries, and clubs may see sufficiently frequent use, be commonly heated to sufficiently high temperatures, considered to be of lower architectural merit, and easier to insulate such that they warrant the benefits of a fabric first approach. Churches, however, have use patterns and features which may, in some cases, make taking a fabric first approach less suitable, although worth investigating nevertheless. Given difficulties and cost in insulating many churches there may be merit in remedial air leakage sealing to reduce the escape of heat, but this will need to completed in line with other maintenance and heritage considerations.

3.2.2 Saves the diocese money while decarbonising

Ofgem reports that around 40% of the electricity used in the UK in the final quarter of 2020 was generated from non-fossil fuel sources.[34] Under some of the National Grid's more ambitious estimates, it is possible that the UK electricity sector will have entirely decarbonised by 2033.[35] Even if a later date is achieved, grid decarbonisation remains an inevitable step in achieving national net zero. An increasingly, and eventually entirely decarbonised grid means that in the long run a diocese may be able to decarbonise the operational energy use of its buildings entirely if it simply electrifies all its heating. For most buildings in the diocese's building stock including schools, some presbyteries, some church halls, some religious houses and other buildings, we can expect this to be through the installation of heat pumps which are already often more energy efficient that most alternatives.[36] Despite the gains in energy efficiency associated with heat pumps, the cost of electricity per kWh relative to gas can negatively impact on the economics of heat pumps. Consequently, dioceses may want to think about how they can mitigate current and future electric heating costs through energy efficiency as a priority, which will also have the desirable effect of reducing the diocese's carbon footprint in the short run.

"You don't want to have an all-electric building on a fully decarbonised grid that's really inefficient and becomes very expensive. I think soon, within the next few years when electricity is more decarbonized than gas, energy efficiency is going to come right back to the table."

Dr John Hindley, Director, Twelvetrees Consulting

3.2.3 Avoids the embodied costs of renewable technology

Although renewable technology facilities decarbonisation, paradoxically, it carries an embodied carbon, and sometimes embodied social cost. One of our expert participants has conducted extensive research on the topic of embodied carbon in renewable technologies,[37] and dioceses engaging seriously with the issue of embodied carbon as part of decarbonisation may wish to review this information. In addition to the carbon cost, like other technologies many renewable technologies require some material inputs that are often extracted or produced in weak governance zones and undemocratic regimes. Therefore, some renewable technology bears the risk of having incurred a social cost in its production or extraction.[38] We note that there are of course embodied costs associated with fabric interventions, which can also be reviewed by dioceses.[39] However, the technical complexity and resource intensity of renewable technology often entails that it can carry a heavy embodied cost. For this reason, finding ways to use less energy through simple fabric interventions like installing insultation will often carry a lesser embodied carbon cost. We also note that purchasing technology through Church Marketplace, which purchases according to Catholic social teaching, may help to address the issue of social cost in the supply chain.

3.3 Prioritise technical simplicity

A recurring theme that emerged during our diocesan consultation and our conversations with expert participants was the importance of concentrating on decarbonisation solutions that were not complex. We hope that this emphasis on simplicity runs through this entire framework. The first principle we introduced in this section invites the diocese to consider the simple question of 'is this building necessary?' The second principle asks the relatively fundamental question 'is this building structurally sound and efficient?' Only once those fundamental questions have been answered do we suggest moving to the question 'what technical approaches to decarbonisation can be implemented?'

"If I look at it from a diocesan perspective, the approach needs to be simple."

Lyn Murray, Chair of the National Conference of Diocesan Financial Secretaries of England and Wales

When the diocese does move to considering technical interventions, our expert participants typically recommended exploring technically simple, electrified solutions for decarbonising the diocese. For most buildings, this will start with insulation and heat pump heating. In the case of churches, in many dioceses this exploration may begin with installing PV on church hall rooves or car parks for on-site energy generation.

34 Ofgem (2021), Electricity generation mix by quarter and fuel source
35 National Grid (2020), Future Energy Scenarios
36 London Energy Transformation Initiative (2021), Hydrogen: a decarbonisation route for heat in buildings?
37 Finnegan, Jones and Sharples (2018), The embodied CO2 of sustainable energy technologies used in buildings: A review article
38 International Institute for Sustainable Development (2018), Green Conflict Minerals
39 See Greenhouse Gas Protocol (2021), Life Cycle Databases

"I think if we want to implement successful solutions to mitigate climate change, we have to favour the simple solutions and only make them more complex when it's required, or when there's a clear case. A simple PV system exporting the energy and using electricity directly for something like radiant heating when you can is often the best way forward. I think it's really healthy to start with a simple system, and then ask why would you spend more time, or money, or more complexity on something else?"

Thomas Lefevre, Director, Etude Sustainability

3.3.1 Reduces risk of user error

A feature of the diocesan building stock that is particularly pertinent to how a diocese might formulate a decarbonisation strategy is the experience of the building managers and operators. One can expect to see a high level of diversity in the levels of engagement, available time and technical ability in the various building users and managers throughout an entire diocese. The most obvious rationale for implementing simple solutions that can be understood widely is the lower risk of user error that might be associated with such a diverse group of users. Our expert participants cited several cases from their experience of other organisations where technical solutions were seriously undermined by the way in which the building was used. When designing interventions, we recommend thinking carefully about how users will interact with the solutions that are being designed. Where possible, solutions should be sufficiently simple as to require no additional training for the building users and managers.

"Having informed capable people is very important in making the transition. And in the parish I think it's pretty rare, perhaps, to have someone on the Finance Committee say, who really knows the building and is able to cope with it. And it's not something you can expect the parish priests to do."

Dr Sarah Darby, Associate Professor and Acting Leader, Energy Programme, Environmental Change Institute, Oxford University

However, there may be cases where at least some level of training is required. In those cases, dioceses need to think carefully about how that training will be administered, and who the recipients might be. One of our expert participants, speaking on her experience working with the Church of England, stressed the importance of taking the social elements of decarbonisation seriously in an organisation like the Church.

"The people power, the understanding of the issues, the mechanisms through which to facilitate it, the peer learning - that capacity building should not be underestimated."

Catherine Bottrill, Director, Pilio

We were also cautioned of the risks associated with taking agency away from the existing building users. One participant gave the example of an organisation where establishing a remote management system for the building's heating systems generated several adverse unintended consequences associated with both the efficiency of the building and the experience of the building users. From the perspective of users, therefore, better results can be achieved by solutions that do not deprive them of agency yet also appear as manageable and comprehensible to them. This approach is perhaps particularly important in the context of the Catholic Church, considering the subsidiarity principle of Catholic social teaching.

3.3.2 Improves opportunities for ecological education

A secondary benefit to installing technology that users understand is that those users will know how to communicate the benefit of that technology to others. This may be of particular importance to the Catholic Church, insofar as a diocese perceives educating the laity on issues of ecology to be an element of the Church's mission. The educational benefit of clearly understandable technical interventions is likely to apply both in schools and parish managed buildings. In schools the technology can be incorporated into the pupils' education. In parish managed buildings the technology offers an example to parishioners for what they might want to do with buildings that they are responsible for. One can consider this principle in conjunction with the social benefits that we noted may occur when the diocese begins to run pilot schemes. Simple and easy to articulate demonstration projects can be communicated more easily and reach a wider audience.

"Do we want to include this into the educational syllabus? Yes, we do. If we're going to put battery storage at a school, why not have it as a teaching aid?"

Jon Kent, Director, Zeco Energy

3.4 Take an activity-based approach

This guidance has already intimated that dioceses may benefit from adopting a range of approaches that reflect the diversity of buildings in the diocese, and ways in which those buildings are used. On this theme, a principle that emerged in discussion with our expert participants was the concept of designing optimal decarbonisation solutions by thinking about the activities occurring in the building that the solutions are being designed for.

"What's the sort of activity we need the energy services for? What's the nature of that demand? Churches and schools are both pretty specialized places in terms of what goes on in them, yet we tend to think of provision of heating and power in a very general sort of way and treat all buildings more similarly than we need to."

Dr Sarah Darby, Associate Professor and Acting Leader, Energy Programme, Environmental Change Institute, Oxford University

3.4.1 Supports more effective solutions

Presbyteries are typically used as domestic buildings, and so following normal decarbonisation guidance for domestic buildings will typically be appropriate.[40] Equally, schools have distinct patterns of use that make particular interventions more favourable. For example, the frequency and predictability with which both of these buildings types are used are likely to make them suitable candidates for air or ground source heat pumps. In the case of presbyteries, these heat pumps can probably be funded through the RHI until early 2022. Of all the diocesan buildings however, churches may have the most unusual patterns of use, and will benefit the most from carefully designed activity-based heating solutions. For churches, taking an activity-based approach principally means concentrating on heating the worshippers.

"In a church, we perhaps think too much about heating the space and not about warming the worshipers. So, we should perhaps be moving away from thinking that we've got to keep the whole space to a particular temperature."

Dr Sarah Darby, Associate Professor and Acting Leader, Energy Programme, Environmental Change Institute, Oxford University

Although heating the worshipers should be a priority for designing heating solutions for churches, designing heating solutions for churches is complicated by a range of factors, not least heritage considerations. These complications mean that optimal technological solutions for many churches are still unclear, and further research is planned. We offer some speculative suggestions below, informed by our own expertise and input from our expert participants. Ultimately, the lack of certainty around optimal heating solutions for churches highlights how important it is that dioceses **survey the building stock** and **run pilot schemes** prior to implementing scaled interventions.

For churches, typically cathedrals, which are occupied throughout significant parts of every day by significant numbers of people, underfloor heating fed by a heat pump system may heat the people most efficiently. The heat pump might be ground source using boreholes or air source with the outdoor component on a neighbouring roof. For churches that are occupied less it may be appropriate to maintain the existing whole building heating system for as long as possible. If the church is heated by gas blower heaters or electric heaters it will be easy to replace these on an ad hoc basis. If the church is heated by a central system, however, and that system must be replaced, we speculate that a handful of technologies may be worth investigating.

Heat pump multi-split systems may be an efficient approach to heating churches in some cases. These heating, ventilation, and cooling systems have 'indoor units' delivering warm air into the building, and at least one 'outdoor unit' collecting heat. If enough are installed these may be able to deliver heating quickly and locally to worshipers, along with providing some level of destratification depending on how they are installed. However, we note that the noise and aesthetic implications of such an approach will need to be evaluated. Multi-split systems are relatively inexpensive, and so may be suited to churches where low capital cost and running costs override aesthetic and perhaps noise considerations.

Where a church is wide across the nave such 'forced-air' systems may struggle to deliver enough heat to the centre of the nave. Pew-heaters, effectively specialist electric fires fitted under pews, or inexpensive and widely available local electric underfloor heating systems may be suited if consideration of pews drying out and cracking is made. Rechargeable heated seat cushions or electric blankets may also be effective for warming worshippers. However, heated cushions and blankets may need to be managed by the congregation or pastoral associates, and so have practical drawbacks that other solutions may not.

There are also various types of radiant heater that are designed to heat surfaces (including people) rather than the air around people. These might also be effective in some circumstances. Radiant heaters powered by PV were deemed to be particularly worthy of further investigation by our expert participants. Radiant heating can leave feet cold however, which is important to the perception of warmth, so radiant heating may need to be supplemented by destratification fans or multi-split systems to warm feet.

Where there is a wet system. If a gas boiler has to be replaced and can't be repaired, then hybrid boilers may be worth consideration. Hybrid boilers are combination heating systems that include heat pumps, which deliver heat whenever possible. The system also contains a gas boiler, on particularly cold days the gas boiler can be used to increase the temperature of the hot water in the radiators to fully heat the space. Of the suggested avenues for exploration this may be the least activity-based, and so may bear combination with some kind of destratification or zoning approach to deliver more heat to the worshipers.

3.5 Partner with communities and organisations

The final principle that we advocate for dioceses developing decarbonisation strategies is to embrace the idea of partnership with other organisations and wider groups. Partnership, as such, is often considered an important part of managing for ecology, and the general arguments for partnering on issues of ecology and sustainability are well explored elsewhere.[41] In addition to the general mandate for working collaboratively associated with ecology, there are some specific community and financial benefits associated with forming specific kinds of partnership which we offer an overview of in this section.

We acknowledge that some aspects of the kinds of partnership that we outline below might appear to be novel or complex, but we also note that the Catholic Church is highly equipped to deal with complex organisational and social relationships. The organisational structure of the Church is itself a network of related but distinct organisations, often with complicated boundaries between them. The Church's tolerance for complex and diffuse organisational structure places dioceses in very good stead to apply their already nuanced approach to partnership to the issue of decarbonisation.

40 See https://energysavingtrust.org.uk for example

41 See for example United Nations (2020), Partnerships for the goals

3.5.1 Creates opportunities for financial sustainability

One of the main questions raised by diocesan managers regarding decarbonisation was how to finance it. In the previous section we outlined several ways through which a diocese could **seek additional funding**. Community and impact investment in particular, which we consider to be the most scalable and versatile ways that dioceses can fund decarbonisation, rely on developing some kind of partnership agreement with one or more groups of stakeholders.

"My concern is if we can't get funding from the government or the public sector the cost is going to fall on the diocese. And there's just no way that all of the dioceses across England and Wales could fund this type of activity. So, if there is the ability to generate some income, then I think that would be helpful."

Lyn Murray, Chair of the National Conference of Diocesan Financial Secretaries of England and Wales

We concentrate here on using partnership to generate returns for dioceses through the creation of 'business models.' We discussed above in the section on considering how to **optimise the estate** how the diocese might begin to think about the diocesan building stock as something capable of generating income. We note here that the business models through which returns are made possible are often reliant on partnering with other sectors. An example offered by and expert participant below included partnering with the local council to develop an energy demand management business model that would earn money by helping balance the national grid. Such a model might in part be possible using assets that a diocese would have invested in anyway as part of decarbonisation, but would also require partnership with a local authority because of the reduced cost of capital available to local authorities.

"There's a very lucrative market available for frequency response, which means you get paid to store energy when there's an excess, and the national grid buy it back off you when there is a shortage in supply. You can do it by forming a special purpose vehicle or a joint venture with a local authority. That will be a long-term revenue generating opportunity for both parties. Local authorities can borrow at 1%, so they are interested because they want to lend the money, and they might make a small percentage on the lending of the money."

Jon Kent, Director, Zeco Energy

A policy organisation supporting the UK government Department for Transport has recently argued that the UK charging infrastructure is vastly under equipped to support projected growth in electric vehicle (EV) use, and that to keep pace with demand the current rate of EV charging point installations will need to increase fivefold.[42] Not only is the demand for EV charging points growing, but EV charging points also have very short payback periods relative to many of the other technologies referred to in this guidance. If dioceses consider the installation of EV charging points in Church car parks for example, to be compatible with the Church's ethical mission, then EV charging may come to represent a highly lucrative business model for dioceses.

Our expert participants also highlighted opportunities to develop EV charging infrastructure-based business models, which might require partnering with a combination of public and private sector organisations. As noted by an expert participant below, the government's prioritisation of EV infrastructure may mean that the public sector will be able to support some of the infrastructural elements of an EV charging business model, whilst the private sector may be able to provide and manage the charging technology.

"Local authorities and DNOs will definitely have more money to spend for looking at how they implement EV charging infrastructure. So that's an area that has been untapped so far, but perhaps by working with corporates something could be done collectively and creatively to tap into that."

Dr Mei Ren, Director, Buro Happold

3.5.2 Creates community benefit

Partnering with other organisations and stakeholders does not just have the potential to create financially sustainable business models to ease the costs of decarbonisation, it also has the potential to create community and social value in areas that the Church wouldn't normally be able to reach. Issues like access to affordable housing or fuel poverty are issues that one might normally consider a concern for the Church but that fall partly outside its direct sphere of influence.

"A really critical issue here and is the availability of affordable energy. There's no point in us driving to net zero carbon emissions if parishioners don't have the resources and the funds to do it too, and it's actually driving more hardship. So, there's maybe some unintended consequences to think about."

Catherine Bottrill, Director, Pilio

It was observed by diocesan managers during our consultation that partnering to develop social housing, powered by on site renewable energy might be an effective way to practically respond to both the 'cry of the earth' and the 'cry or the poor' simultaneously within the diocese.[43] In the quote below an expert participant articulates one way of thinking about how a community oriented partnership and operating model for social, ecological and financial benefit might work.

42 Policy Exchange (2021), Charging up

"If the church is a part of a community, perhaps a low temperature heating network powered by ground and air source heat pump could be solution to serve the community. And together with PV and battery, could create a business model, like an energy services company, to bring social value back to the community."

Dr Mei Ren, Director, Buro Happold

4. Recognitions

4.1 Report authors

Dr Roland Daw
Senior Lecturer, St Mary's University

Dr Mark Charlesworth
Senior Lecturer, St Mary's University

4.2 Guardians of Creation core project team

We extend our thanks to Edward and Emma for their support and contribution in the development and delivery of this report. The core project team is:

Mark Charlesworth
St Mary's University

Roland Daw
St Mary's University

Edward de Quay
Laudato Si' Research Institute, Campion Hall, University of Oxford

Emma Gardner
Diocese of Salford

4.3 Expert participants

We extend our deepest thanks to the anonymous diocesan managers who participated in this research, as well as the following expert participants:

Catherine Bottrill
Director, Pilio

Stephen Brenninkmeijer
Founder of Willows Investments, Chair of the European Climate Foundation

Dr Sarah Darby
Associate Professor and Acting Leader, Energy Programme, Environmental Change Institute, Oxford University

Dr Stephen Finnegan
Director, Net Zero Carbon Institute, University of Liverpool

Dr Richard Fitton
Reader in Energy Performance of Buildings, University of Salford

Dr Emma Gardner
Head of Environment, Diocese of Salford

Dr John Hindley
Director, Twelvetrees Consulting

Jon Kent
Director, Zeco Energy

Dr Chris Jones
Technology Transfer Fellow, Tyndall Centre for Climate Change Research, University of Manchester

Thomas Lefevre
Director, Etude Sustainability

Alistair Lewis
Facilities Manager, CAFOD

Stuart McBain
Director, Stuart McBain Limited

Lyn Murray
Chair of the National Conference of Diocesan Financial Secretaries of England and Wales

Dr Mei Ren
Director, Buro Happold

Rob Tozer
Director, 1stPlanner

43 Pope Francis (2015), Laudato Si'

DIOCESE OF SALFORD

St Mary's University Twickenham London

Laudato Si' Research Institute

Guidance on developing strategy for decarbonising Catholic diocesan building stocks

Report version 1
June 2021

Guardians of Creation