Owner's Manual

St James of Jerusalem Episcopal Church

Long Beach, NY

Work in progress as of 5/1/2026

Contents

Introduction

A tool for creation care, and more

The owner's manual is a tool for creation care. The Emissions Project was the first time in recent years that our buildings were the topic of major change. The project caused us to gain a deeper understanding of the impact our buildings have on global warming and climate injustice.

The project also required us to gain a deeper understanding of how the systems our buildings work. Major contractors were required to present, as part of the job, documentation of how the systems worked, and how they should be operated and maintained. The Owner's Manual's aim is to pass on the awareness.

Working Document, Awareness tool

This Owners' Manual is an awareness tool. The goal is to provide our leaders (Vicar, Bishops Committee, Verger, B&G Sub- Committee) and parishioners with the information we need to make best use of our buildings and grounds to help care for them in perpetuity.

The Owner's Manual is designed to be a working document that serves several purposes, including:

- A description of the important components of our facilities, and how they are designed to serve us. Their purpose is described in a way that helps us appreciate them and their value to the parish.
- How the systems are supposed to be operated, so we can get the most effective and efficient use from them,
- How the systems are supposed to be maintained.
- The Owner's Manual will serve as record of what has been done to our buildings and grounds over time.

Credibility, attribution

The Owner's Manual was created in a way that encourages a documented history of our buildings and ground, giving credit to sources of information upon which our knowledge has been accumulated.

Record of Changes

Each Chapter has a record of changes, including the date of the latest update and the occasion prompting the change. This way, the reader is aware of the latest insights and information that have been considered. Plus, the Owner's Manual will serve as record of what has been done to our buildings over time.

References for the Introduction:

St. James of Jerusalem: Zeroing our buildings' carbon footprint. 2025. Goldstein, Wendy and Coty Keller. Published in the November 2025 edition of Dioceses of Long Island Creation Care Newsletter. See Page 4. This Op-ed documented the history of our emissions project. https://drive.google.com/file/d/15ZGekKSCENJdLI7Ou4-jbhWJ_kVUQyL0/view?pli=1

This Fragile Earth, our Island Home, a series of six weekly webinars began in February 2021. Our purpose was to help people learn about the climate crisis – its causes, solutions, and actions to take. Program videso, presentations, references and quizzes are available at https://ecopapak.org/FragileEarthIslandHome/InfoPage.htm

Chapter 1. Principles, Prerequisites

This chapter includes important underlying principles for caring for God's Creation and managing our buildings and grounds. There are three sections to this chapter:

a. A Livable World
b. Space Heating and Cooling – Building Envelopes
c. Conservation of Energy

Latest update: date 5/1/2026

Record of changes

Date	Occasions for update, who authored change.
Created 1/6/2026	In the summer of 2026, an Ad-hoc committee (Vicar, Fr. Michael; Emisisons Project Manager Coty Keller, Verger Donald Fraser, BC member and expert on HVAC controls Debora Smith) created the content of this chapter, and then edited them, in a series of meetings. Important sources of information are the 2021 Energy Audit, completion reports of three (3) jobs by Econo-Therm. Conversation Louis Eisenberg, President Econo-Therm. Author: Coty Keller
Addition 5/1/2026	The section on A Livable World was added to provide perspective, insight and guidance for the grounds- the landscape and gardens. Extensive references include our 2021 series, This Fragile Earth, our Island Home, classic guides by Eric Toensmeier and Dough Tollamy, Project Drawdown, Project Drawdown, and more. Authors: Wendy Goldstein, Coty Keller

A Livable World

Care for God's creation by striving for a livable world is a mission at St. James. In this section of Principles and Prerequisites we review the concept of taking carbon from the atmosphere and how that is related to the use of our grounds- our landscape and gardens.

Plants act as nature's air purifier by absorbing carbon dioxide and releasing oxygen through photosynthesis, helping maintain the balance of gases in the atmosphere. Beyond this, many plants can filter harmful pollutants like benzene and formaldehyde from the air, improving overall air quality. Their leaves and roots work together with soil microbes to break down toxins, making the surrounding environment cleaner and healthier.

In addition, plants are essential to the food chain because they form its foundation as primary producers. Through photosynthesis, they convert sunlight into energy, creating

nutrients that sustain insects and birds and, in turn, the carnivores that feed on them. Without plants, this flow of energy would collapse, leaving no source of nourishment for most living organisms. From tiny grasses to towering trees, plants support entire ecosystems by fueling life at every level of the food chain.

Context- What needs to happen for a livable world

During session 3 of This Fragile Earth Our Island Home, we described the two paths to achieve a stable climate: 1. Reducing/eliminating the emission of heat trapping gases and 2. Sequestration – removing carbon already in the atmosphere. This concept is shown in the up/down illustration in the figure below.

Figure 1-What Needs to Happen- the up/down illustration

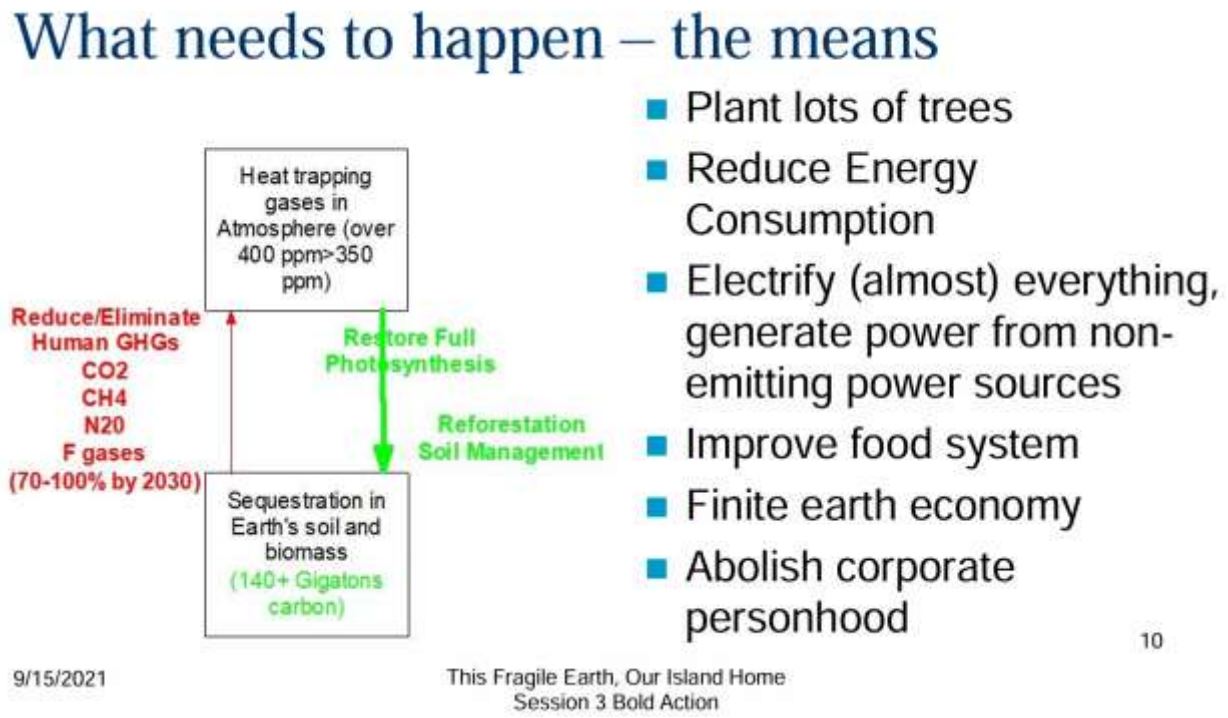

Image from slide show for Session 3, This Fragile Earth Our Island Home
Credit for the Up/Down concept: Urgency & Action: Drawdown to Reverse Global Warming from Florida Veterans for Common Sense.

The climate crisis is driven by an imbalance in the natural carbon cycle- we have too much heat trapping gas in the atmosphere as the result of human activity. One of the two direct solutions is to stop the emissions shown in red on the left side of the illustration. At St. James we are doing our part by:

1. **Reducing our energy consumption.** "Conservation of Energy" is the topic of the second section of this chapter, Principles and Prerequisites. Plus in Chapter 2 (Electrical Systems), we explain how we measure and monitor our power use to assure we are indeed conserving enerty.

2. We have **electrified all** our building systems. In Chapter 3, we explain how we converted from the use of gas heat to all electric, high efficiency heat pumps. In Charter 4 we describe how our hot water systems are no longer fueled by gas.
3. In Chapter 2, Electrical Systems, we explain how we monitor and manage the use of electricity from a solar farm (a **non-emitting power source**).

On the right side of the up/down illustration, is the other direct solution: Taking carbon from the atmosphere by the process of photosynthesis. We want to **plant trees and plants** that maximize the storage ("sequestering") of carbon in the earth's soil and in the mass of trees, shrubs and plants. Plus, our vegetable garden provides an opportunity to, in our own small – but significant way – **improve the food syste.** We can do this by providing nourishing, healthy produce while at the same time doing the photosynthesis thing in a way that improves the soil and its ability to contribute to a livable world. More on this later.

The other means for the Bold Action needed for a livable world (moving to a Finite Earth Economy and Abolishing Corporate Personhood) are beyond the subject boundaries of the Owner's Manual. To learn about these two important means of action for a livable world, you can tune into the video and slide shows at the webpage for *This Fragile Earth Our Island Home*. Go to https://ecopapak.org/FragileEarthIslandHome/InfoPage.htm for a catalogue of the recordings, as well as links to get the slide shows, references and homework (quizzes) from each session.

Regenerative Agriculture

Our vegetable garden is a good part of a food system that too often causes disease and produces "food" that is not nourishing and often contains toxins. The garden is our way of moving away from harmful "conventional" chemical-intensive practices and toward non-petrochemical, non-toxic methods such as Regenerative Agriculture. *Regenerative agriculture is an alternative to conventional farming practices that serves to embrace a naturalistic approach to farming and grazing. This form of agriculture retains a heavy focus on improving organic soil matter and increasing biodiversity to combat environmental degradation that results from conventional farming techniques and factory farming.* (Kilduff).

According to the Natural Resources Defense Council, regenerative agriculture principles and practices include:

- **Prioritize soil health.** While the techniques for caring for the soil vary with the context of each farm, generally, regenerative growers limit mechanical soil disturbance. Instead, they feed and preserve the biological structures that bacteria, fungi, and other soil microbes build underground—which provide above-ground benefits in return.
- **Reduce reliance on synthetic inputs.** Regenerative farmers and ranchers make every effort to reduce their reliance on synthetic inputs, such as herbicides,

pesticides, and chemical fertilizers. In the process of prioritizing soil health, many growers naturally use fewer chemical inputs. Instead, as beneficial insects and wildlife return and diverse crop and livestock rotations disrupt weed cycles, the ecosystem becomes more resilient. And with fewer toxic chemicals, there are reduced human health risks as well as increased financial independence from avoiding the recurring costs of synthetic inputs.

- **Cover cropping:** The practice of planting crops in soil that would normally otherwise be bare after a cash crop is grown and harvested. By keeping living roots in the soil, cover crops reduce soil erosion, increase water retention, improve soil health, increase biodiversity, and more. They can be planted during harvest time or in between rows of permanent crops.
- **No-till farming**: A technique that leaves the soil intact when planting rather than disturbing the soil through plowing.
- **Composting:** The natural process of turning waste (from manure or food) into fertilizer.
- **Reduced or no fossil fuel–based inputs, including pesticides**: Building soil health and leveraging other natural systems to help manage pests and reduce the reliance on pesticides or other chemicals, regardless of whether a farmer decides to pursue organic certification.

Putting Regenerative agriculture to work

The Carbon Farming Solution by Eric Toensmeier is a comprehensive guide and toolkit for using regenerative agriculture and perennial crops to combat climate change and improve food security. It details how farming can shift from being a major source of greenhouse gases to a net carbon sink by sequestering carbon in soil and biomass through practices like agroforestry and the cultivation of diverse perennial species (staples, proteins, oils). **Key aspects of the book:**

- **A practical toolkit:**

It provides a collection of climate-friendly crops and regenerative practices suitable for various climates and needs.

- **Focus on perennials:**

It emphasizes perennial crops (grains, staples, etc.) and agroforestry systems as key to maximizing carbon sequestration, alongside improved annual systems.

- **Climate change mitigation:**

It positions carbon farming as a central part of climate solutions, working alongside renewable energy to reduce atmospheric CO2.

- **Global scope:**

It includes information on hundreds of perennial species and practices for different regions, from the tropics to colder climates.

- **Beyond sequestration:**

It also covers the environmental and socioeconomic benefits, such as increased resilience to extreme weather, biodiversity protection, and farmer empowerment.

Why Native Plants

Bringing Nature Home by Douglas W. Tallamy is a foundational book that explains the critical link between native plants and local wildlife, arguing that using native species in home gardens is essential for supporting biodiversity. Tallamy, an entomologist, reveals that most native insects can only eat native plants, so when non-native plants dominate landscapes, insect populations decline, which in turn devastates the food source for birds and other animals. The book provides practical advice for homeowners to create habitats that sustain wildlife, sparking a national movement to restore local ecosystems through gardening. Key themes and arguments in Bringing Nature Home include:

- **Unbreakable link:**

  There is a direct, unbreakable connection between native plants and native wildlife.
- **Insect crisis:**

  Native insects cannot or will not eat most non-native (alien) plants, leading to food scarcity as native plants disappear.
- **Biodiversity:**

  By planting native species, individuals can make a significant contribution to sustaining biodiversity, even in small yards.
- **Practical solutions:**
  The book offers actionable recommendations for creating wildlife-friendly landscapes, moving beyond simple conservation to ecological restoration.

Tallamy explains that the steep decline in wildlife populations in the U.S. is largely due to overdevelopment and the widespread use of non-native, ornamental plant species. As wild spaces become fragmented and scarce, suburban yards, like our grounds at St. James

represent one of the last great opportunities to rebuild habitat and food sources for insects, birds, and other wildlife. (Book Review: Bringing Nature Home by Douglas Tallamy)

How to put Native Plants to work.

Doug Tallamy's core mission, often called the Homegrown National Park initiative, urges homeowners to restore biodiversity by shrinking lawns, removing invasive species, and planting native species that support local insects and birds. His strategy involves practical, actionable steps:

- **Shrink the Lawn:** Reduce your lawn area by half to lessen water, fertilizer, and pesticide use, replacing grass with native plants that sustain animal life.
- **Plant Native Keystone Species:** Focus on native plants, especially keystone species like oaks, cherries, birches, hickories, and willows that support a high diversity of insects.
- **Remove Invasive Plants:** Identify and remove non-native invasive species, which crowd out indigenous flora.
- **Create "No-Mow" Zones & Landscaping for Life:** Establish "no-mow" areas under trees to accommodate insects that fall to the ground, and plant native ground covers instead of using lawn to the base of trees.
- **Reduce Insect Declines:** Protect nocturnal insects by replacing white outdoor bulbs with yellow light bulbs.
- **Fight Pests Responsibly:** Instead of broad-spectrum mosquito spraying, which kills all insects, use targeted methods such as Mosquito Dunks (Bacillus thuringiensis) in standing water, which kill larvae without harming other species.
- **Join the Movement:** Map your efforts on the Homegrown National Park map to contribute to a national, ecological network.

Another set of tools- i-Tree

The Carbon Farming Solution by Eric Toensmeier and Bringing Nature Home by Douglas W. Tallamy are valuable resources. Another terrific tool is i-Tree. Trees provide more than shade and beauty. They remove hazardous pollutants from the air we breathe, absorb carbon from the air to store in wood, and control stormwater by intercepting and absorbing stormwater.

i-Tree has tools for assessing individual trees and tree canopies. It also has tools to assist with planting trees. For example, My Tree is an online tool that is useful for comparing the benefits of individual trees. You tell the program about your tree, and they estimate

the **carbon dioxide** and **air pollution** it removes plus **stormwater** impacts. Check it out at https://mytree.itreetools.org/#/.

Conclusions – Using our landscape and gardens for A Livable World

Just as we were able to halt the use of fossil fuels, and stop our **buildings** from putting carbon into the atmosphere, we can use the concepts and tools of regenerative agriculture and native plants to have our **grounds** put the natural process of photosynthesis to work and take carbon from the atmosphere. We can compare the benefits of specific trees before purchasing and planting them. We can assess the benefits of a group of trees to estimate how much carbon they will take from the atmosphere.

References for A Livable World

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Hawken, Paul editor. 2017. Drawdown: the most comprehensive plan ever proposed to reverse global warming. Penguin Books. https://www.drawdown.org/ . Links to specific solutions:

- Protect Forests: https://drawdown.org/explorer/protect-forests
- Restore Forests: https://drawdown.org/explorer/restore-forests
- Reduce food waste: https://drawdown.org/explorer/reduce-food-loss-waste
- Improve diets: https://drawdown.org/explorer/improve-diets
- Silvopasture: https://drawdown.org/explorer/deploy-silvopasture
- Improve Annual Cropping : https://drawdown.org/explorer/improve-annual-cropping
- Composting: https://drawdown.org/explorer/increase-centralized-composting and https://drawdown.org/explorer/increase-decentralized-composting
- Fertilizers/nutrient management: https://drawdown.org/explorer/improve-nutrient-management
- Improved rice cultivation: https://drawdown.org/explorer/improve-rice-production

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Space heating (and cooling), building envelopes.

Critical to reducing the energy needed to maintain comfortable buildings is reducing the rate of heat loss. Heat loss takes place from the container that is being heated. That container, the Church and the Rectory, is known as the building envelope. The building envelope is the boundary between the heated (or cooled) space and the unheated (or uncooled) space. Defining this boundary is very important to establishing efficient heated (or cooled) portions of the buildings that are not unnecessary heated or cooled and if included do not contribute unnecessary to the rate of heat loss. This is particularly

important for a facility like our Church where different portions of the Church are operated for relatively brief periods on different schedules.

We have established 4 envelopes in the Church and one in the Rectory.

Table 1-Church Envelopes

Four Church Envelopes
1. Sacristy 2. Church office (Overcroft) 3. Sanctuary 4. Church basement (Undercroft) – includes meeting room, kitchen, bathrooms, stairway and hall outside Sacristy

Table 2-Rectory Envelope

The boundaries of the Rectory envelope are the exterior walls, the basement ceiling and the attic floor. The attic and basement are outside the envelope.

Importance of air sealing and insulation

Building heating and cooling losses occur when heat escapes a building in the winter (heat loss) or enters a building in the summer (heat gain), leading to **increased energy consumption for maintaining desired indoor temperatures.** These losses primarily happen through convection and conduction, although radiation could also be a factor. Radiation will not be considered here as it is often misinterpreted and has led to ineffective approaches to building envelopes (2021 Energy Audit)

As pointed out in our 2021 Energy Audit, convection is the most important heat loss and comes from convection- air movement (leakage/infiltration) through the building envelope. Heat transfer is at its most efficient with flowing air and flowing air usually means the transfer of that conditioned air (heated or cooled to desired temperature) out of the building envelope and replacing it with unconditioned air. This is why it is so important **to keep doors and windows closed** when we have heat or A/C on, and to **be alert to holes** in the building envelope such as gaps remaining when doors ad windows are closed, holes where electric wires, pipes or ducts run through the walls, floors and ceilings. The **fireplace** is an important part of the Rectory envelope. The fireplace flue should be kept closed to preserve the building envelope.

The church uses vestibules at the main entrances to the Sanctuary and the Undercroft. Vestibules, with doors on both sides, reduce heat loss or infiltration with the opening and closing of the doors. It is important, when we have heat or AC on, that **both vestibule doors are not opened at the same time,** which allows conditioned air to flow out of the envelope without barriers.

It is important that we maintain the best possible seal on the doors that correspond with the building envelope:

- the inside doors to the Sanctuary vestibule,
- the inside door to the Undercroft vestibule,
- The side door to the Church
- 1st floor hall doors to the
    - Sanctuary
    - Overcroft (Office)
    - Sacristy
- the Rectory Front door,
- The kitchen door to the Rectory basement

Equally important, we want to be mindful to keep the boundary doors closed when the heat or AC is on inside that envelope. (2021 Energy Audit, p14).

Conduction is less effective than conduction as heat loss but is also very important. Conduction is the process where heat moves through a material from a warmer area to a cooler area by molecular vibration. In buildings, this means heat flows from the warmer inside to the colder outside (or vice versa) through materials that make up the building's envelope (walls, roof, windows, insulation, etc.).

Before our emission elimination project, St. James was remarkable in its lack of insulation. The 2021 Energy Audit noted that only the ceilings of the Rectory and Church office (Overcroft) had any insulation. There have been significant improvements since then. Currently, our insulation situation is as shown in the table on the next page.

Table 3-Insulation Schedule

Space	Existing Insulation	Available Cavity	Notes
Church Roof	None	None	
Church Walls (except Sacristy utility area)	None	3.5”	Limited access due Fire stops, cannot access from outside
Sacristy utility area	R-24 slopes, R-15 walls of storag area. Room above is insulated R-19.		Insulated and tyek roof slope, outside wall and lower slope
Overcroft (office) Ceiling	R-19	5.5”	8/2024 Closed blower door hole R-60
Undercroft Walls	Earth		
Undercroft Ceiling and Rim Joists	R-48		Dense Pack L-77 Fiberglass
Rectory Ceiling	R-60		R-30 batt with blown on top @ 16”
Rectory Walls	R-15		Blown dense pack
Rectory Basement Ceiling and Rim Joists	R-19, R-40		Kraft Faced R-19 in basement. Dense pack garage ceiling under living space R-40. Rim joist insulated and sealed
Rectory Basement Walls	Earth		Outside boundary of the heating/cooling envelope
Sources: 2021 Energy Audit, completion report 3 jobs by Econo-Therm. July 2025 conversation Louis Eisenberg, President Econo-Therm.			

Impact on operations-

Be mindful of the envelope during events when heat or AC is being used

- Envelope doors and windows should be closed except when people are coming and going

-The fireplace flue should be kept closed to preserve the building envelope (put this in Envelope chapter too)

- If heat or AC is needed, schedule large group events in the best insulated envelope (Undercroft as opposed to Sanctuary) for example. The Sacristy and Overcroft are good for Small group (remember to keep the boundary door closed when heat or QC is on).

-Keep an eye on the seal of the doors that correspond to the building envelope. If defective, take action to get it fixed.

Help people understand this mindfulness is in the interest of God's creation (our goal is zero emissions) and the parish mission. We prefer to spend our limited budget on worship and other mission essential activities rather than utility bills.

References for Principles, Prerequisites

2021. EMS Environmental, ASHRAE Level 1 Energy Audit Report. Oct. 4
https://ecopapak.org/CreationCare/EMSAuditReport.pdf

Conservation of Energy

Context

St. James parish is committed to a mission of caring for God's creation. More specifically, we committed to a goal of zero emissions. This target comes from knowing that to have hope for a livable world, we (humans) must act to restore the natural balance to the carbon cycle. This means getting the atmosphere below 350 ppm of greenhouse gases. The scientific consensus is to achieve this we must stop using fossil fuels by:

- reducing energy consumption (hence energy conservation is the topic of this chapter), and
- electrifying (almost[1]) everything and generating electricity from non-emitting poser sources.

Our emissions elimination project at St. James has, in theory, achieved the means to the latter- electrifying everything and generating electricity from non-emitting poser sources- by replacing our boilers and hot water heaters with high efficiency electric heat pumps and purchasing our electricity from a solar farm.

What remains to be accomplished is to match theory to reality by reducing our energy consumption to a level that can be provided by (1) the capacity of the solar farm (and perhaps in the future our own rooftop solar, and (2) (1) our budget.

Competing interests and the balancing act

The parish has other interests that must be respected including health, comfort and convenience. Especially in the Rectory, which is occupied 24/7, we want the indoor air to be clean. We have installed an Energy Recovery Ventilator (ERV) to provide fresh air when

[1] A notable exception to using electricity for everything is to heat water directly from the sun. While this is not a feasible option on Long Island where solar water contractor are scarce, it should be noted for consideration in other regions.

the windows are closed, and the heat/AC is on. We also prefer to keep parishioners and meeting room tenants, like our AA groups, warm in the winter and cool in the summer. Insofar as possible, we also strive to manage the indoor environment with some degree of convenience, insofar as possible, by operating the heating/cooling system remotely or by pre-set programming. It's a balancing act that needs mindfulness and attention. On the one hand, we our goal is to use less energy than the solar producer makes. This means striving more minimum electrical consumption. On the other hand, we try to accommodate the health, comfort and convenience needs of the parish and the community. It's a delicate balancing act. What we hope to achieve are outcomes that are the result of well-thought-out decisions on how the HVAC systems are employed and maintained. This document is designed to inform those decisions.

Strategies for maximum conservation

1. When the heat or AC is on, in the Church and/or Rectory, **be mindful of the building envelopes.** For example, be mindful of
    a. Vestibules
    b. Other boundary doors (Rectory front, kitchn to basement; Church 1st floor hall to outside, Sacristy, Overcroft and Sancuary)

    As explained it the Building envelope chapter, convection-air movement- is the most important cause of heating and cooling loss

2. Whenever possible, **let nature in and keep the HVAC off**. The Rectory and Sanctuary have ample windows to allow fresh air in. The best way to conserve energy is not to use any: open up and turn off the HVAC.

3. **Use ceiling fans**. A room will feel cooler with a ceiling fan due to the wind chill effect. The moving air from the fan helps evaporate sweat, making you feel more comfortable even without changing the actual air temperature. A ceiling fan can make an 80-degree room feel like 76 degrees. For maximum conservation, only use the fans in occupied rooms. [2]

    We can use the fans without the AC on. For example, if the Rectory or Sanctuary temperature is 80 degrees with the windows open, the fans can make it feel like 76 degrees - which is cooler than the DOE/Energy Star suggested 78 degrees for maximum efficiency.[3] If we have the AC on, we might set the thermostat in the

[2] Perfection Heating, AC and Refrigeration. How To Save Money by Adjusting Your Ceiling Fan. July 5, 2022. https://www.perfectionhvac.com/how-to-save-money-by-adjusting-your-ceiling-fan/

[3] DOE. Home Cooling Tips. https://www.energy.gov/energysaver/home-cooling-systems#:~:text=Set%20Your%20Thermostat%20Wisely:,Efficient%20Use%20of%20Exhaust%20Fans:

Rectory or Sanctuary to 80 degrees and with the fan on achieve the effect of 76 degrees.

4. **Not too hot, not too cool.** Set thermostats for most efficient temperatures. . The U.S. Department of Energy (DOE) recommends, maximizing energy savings while maintaining comfort, setting thermostats to around 68°F to 70°F when awake during winter and lowering the setting when asleep or away.

   During the summer, the DOE recommends setting the thermostat to around 78°F when home and awake, and increasing when away.

5. **When away from the Rectory, turning it off is the most efficient option.** If it is not feasible because of threat of freezing in winter or dampness or overheating in summer, turn it down (to just above freezing, 40 degrees- or up - to say 84 degrees. Plus set ERV to off when away. There is no need for the ERV exchanging air 5x/hour when not occupied.

6. **Every Degree Matters**. To have an idea of how much adjustment in heating/cooling degrees can matter, consider the 3 percent thumb rule. The DOE's Energy Savers website used to say, (before the new regime took it down) that you can generally save 3% on your heating bill for each degree that you turn your thermostat down during the winter. Ann Carrns, writing for Money Matters in the NY Times reports that raising your thermostat by just one degree in the summer will decrease your electric bill by 2 percent, according to the Edison Institute. She also reminds us that the Energy Department suggests setting the thermostat as high as comfortable when you are home — aim for 78 degrees — and several degrees higher when you're away.[4]
   Let's examine the impact of raising the Rectory AC setting from 74 degrees to 78, degrees. If the Edison institute's estimate played out for us, we would consume 4x2 (four degrees x 2% per degree)=8 % less energy.

   During the period June 3 to August 6th, 2025 the Rectory used almost 2,000 kWh of electricity. Let's assume that 85% of that was for HVAC (with hot water, lighting, laundry, and cooking using the other 15%). If we saved 8% of the 1,691-kWh used on HVAC, that would be 135 kWh. 135 kWh is a bit more than 2 day's allocation of solar electricity from Harvest Power (63 kWh/day is what we contracted for 2024-5). If all these assumptions proved correct, changing the Rectory thermostat from 74 to

[4] 2022 Carrns, Ann, *How to Lower Your Summer Electric Bill.* NY Times. July 22. https://www.nytimes.com/2022/07/22/business/air-conditioner-electricity-bill.html

78 degrees would earn a "free" day of HVAC operations each month. That's another day of slack each month – not nothing!

Savings in the winter would be different, and possibly more dramatic. We could save 3% per degree instead of 2%. Plus, HVACs works harder to heat than cool, as described earlier.

Every degree matters.

7. The **fireplace** flue should be kept closed to preserve the building envelope. Firewood releases heat trapping gases when burned, and its use should therefore be discouraged.

8. **It's not just HVAC.** The Rectory and Church have other uses for electricity that can also be conserved. For example:

    a. While the Rectory is not occupied for more than a day or so, the **hot water** heater can be set to the Vacation mode, saving us the energy to heat and store water we won't be using. [5]
    b. **Lights and fans** in the Rectory and the Church can be shut off when rooms are not occupied.

9. **Monitor, evaluate, share and react.** We will be monitoring our electrical consumption and assessing the results of our meter reading. We will know how we are doing with resspect to our allotment from the solar farm, and therefore if we are getting in trouble with God by using dirty power from the grid. We will also know how we are doing with the parish budget.

    After meters are read, results are assessed, we can **celebrate or throttle back** on our usage, **adjust the parish budget and tweak our contract with Harvest Power**.

Mindfulness into action

Understanding why it is so important that we conserve energy can help motivate us to be mindful of how conservation action can be used with St. James buildings. Unless we conserve, we will not be able to achieve zero emissions, and will not meet our commitment to care for God's creation, and our financial position will be at risk. It makes sense that we

[5] Separate but related issue- cold water supply might be shut off to avoid water damage- a requirement for some homeowner's insurance policies.

should make the 9 strategies known to the community and to implement them into our routine.

References for Conservation of Energy

DOE. Home Cooling Tips. https://www.energy.gov/energysaver/home-cooling-systems#:~:text=Set%20Your%20Thermostat%20Wisely:,Efficient%20Use%20of%20Exhaust%20Fans

2021. Interfaith Association of Greater Long Beach. Bold Action. 3rd in a series of 6 presentations in the series, This Fragile Earth, our Island Home. Presented by the. Feb 18. Video available at: https://ecopapak.org/FragileEarthIslandHome/Session3/video3.mp4 Slide Show is at https://ecopapak.org/FragileEarthIslandHome/Session3/Slides3.pdf

This session describes what it will take to achieve a stable climate.

2022. Perfection Heating, AC and Refrigeration. How To Save Money by Adjusting Your Ceiling Fan. July 5. https://www.perfectionhvac.com/how-to-save-money-by-adjusting-your-ceiling-fan/

Chapter 2- Electricals Systems

Latest update: January 18, 2026

Record of changes

Date	Occasions for update, who authored change.
1/18/2026	Original publishing of Owner's Manual. Includes major upgrade to the Electrical System as part of the emissions project. Author: Coty Keller, project manager.

Background and History

The electrical system can be thought of as the heart of St. James' buildings in that it provides the energy for all vital systems. It is also the key to the parish's commitment to care for God's creation in that it provides the means for emission free operations.

The electrical upgrade began in the summer of 2024 and completed in October 2025. There were three components to this job: (1) provide the power needed to switch to all electric appliances and support the ADA lift elevator, (2) elevate all electrical distribution components above design flood level, and (3) install sub metering so we can determine the amount of electrical power being used in the Rectory and Church as if they were two separate entities.

The scope of work is shown in the table below.

Table 4 Electrical Upgrade- Scope of Work

Scope of Work, Electrical Upgrade
1. Service upgrade from 200 amp to 400-amp service. The Church and Rectory are each provided with individual 200-amp service. 2. Additional loads to be accommodated include: a. For the Rectory i. Replacing the Rectory gas hot water heater with a high efficiency electric heat pump water heater. (240 V, 30 Amps according to Brookline.) which will be located in the Church Sacristy. ii. Addition of electric stove and dryer in the Rectory (the Dryer wiring and receptacle has already been installed). iii. Addition of an Electric Vehicle (EV)charger for the Rectory driveway. i. HVAC. The existing AC will be replaced by a 3 or 4 ton heat pump. The addition of an Energy Recovery Ventilator (ERV) in Rectory will require an additional 125v circuit requiring about 40 watts of electricity per hour.

b. For the Church, new loads include:
    i. Replacing the gas hot water heater in Church with three or four on demand, under sink, hot water heaters (sacristy, bathrooms, kitchen for dishwasher, sinks)
    ii. Addition of ADA lift elevator (30 AMP 120 v service)
    iii. Addition of electric stove in the church kitchen.

2. Provide two internal sub-meters to monitor the kWh use between the Rectory and Church.
3. System should be compatible with possible future installation of rooftop solar with batteries.
3. Design flood elevation (DFE) has been determined to be 2'8" above the first floor of the Rectory and 14" above the church's first floor. Any electrical distribution components that are not waterproof must be elevated above this level.

Source: Emissions Project approved by Dioceses Jun 2024. See Appendix C for the determination of DFE

Electric Meters

Why does it matter?

Knowing how much electricity we consume is important information for our Creation Care mission as well as our financial management. The only way to know for sure how much electricity we are using is to record consumption information from our meters.

Background information.

Electricity usage is measured in kilowatt hours (kWh). We measure the total amount of electricity coming to our buildings at the Long Island Power Authority (LIPA) meter in the back of the church. We also measure the power consumed by the Church at a sub meter in the Sacristy storage area and power consumed in the Rectory by a sub meter in the dining room. The Rectory meter became operational on March 10, 2025, Church meter was overhauled and became accurate Oct 10, 2025.

All three meters flash all sorts of data, more than we need, The only data we need is kWh. At the outside meter, kWh is displayed with the 001 Register, Inside, kWh is displayed with the 01 register.

Figure 2- What you see in the meter display

Outside meter	001 XXXXX kWh
Inside meters	01 XXXXXX.X kWh

The highlighted part of the display is what changes. These are the numbers you report. Note the inside meters report in tenths of kWh (there will be a number to the right of the decimal place).

Examples: on December 29th, 2025, outside read 00789, inside the Church read 0006558.3, and the rectory read 012516.9

To read the meter, the idea is to watch the flashing information and then when the proper register is displayed, to record the kWh data. The data may be recorded by camera, or by writing it down, or both. Either method is okay so long as the information is legible and accurate.

The three meters should be read within a few minutes of each other.

What days do we read?

We aim to read the meters weekly. The day of the week is not important. Plus, we want to read and record the meter readings on the 8th of each month, the day PSEG reads the meter for billing purposes.

Consumption

Knowing how much electricity we use (consume), and where it comes from, is important for three reasons:

1. We are billed on the amount of kWh the utility provides us. Knowing how much electricity we use, or plan to use, is essential for parish budgeting.
2. Electricity from PSEG's grid is "dirty" in that it is produced with fossil fuels, which means it creates heat trapping gases (emissions." Our goal is to use only electricity generated by zero emission energy, such as solar, and avoid the use of dirty grid electricity. Therefore, we need to know how much of the electricity we use is from the grid,
3. Conservation of energy is, as explained in Chapter 1, part of our mission for God's creation. Measuring our consumption is essential for knowing how well we are doing with our conservation goals. Every degree on the thermostat matters, every kWh matters.

Calculation of Consumption – How much power have we used?

It is important to know how much power we use for Creation Care, equipment management and our financial budget.

How do we make the calculations? We read our meters, collect the information, record the data into a spreadsheet, and interpret the results.

It's straightforward. If, for example, we record the Rectory meter reading on the first and the eighth of the month and the difference is 300 kWh, then the Rectory consumed 300 kWh that week or (300 kWh/7 days) 42.9 kWh per day on average. Same goes for the Church's consumption being directly measured on the Church meter.

One complication is the LIPA meter outside, which uses a multiple of 40. If the LIPA meter shows a difference of 15 kWh over a week's time, what it is telling us is that we consumed (15x40 kWh) 600 kWh in the Rectory and Church together during that time, or (600/7 kWh) 85.7 kWh per day on average.

Using this example, we can write the formula for calculating our consumption for a period, in this case a week.

Table 5-Consumption Calculation Formula

Calculation of consumption for a week
Total kWh consumed/week = LIPA meter kWh x 40 = Rectory kWh + Church kWh Total kWh consumed/week=15x40=600= 300+300

A spreadsheet helps do the calculations and keep a record. The following table shows part of the consumption spreadsheet for the period December 8 to December 26 2025.

Table 6 -Electrical Consumption Spreadsheet Example

Date	LIPA meter kWh	LIPA kWh w/ multiple	kWh since last	days since last	Ave kWh per day	Church meter kWh	kWh since last	Ave Church kWh per day	Rectory meter kWh	kWh since last	Ave Rectory kWh/day
12/8/25	677	27080				4871.2			9723.3		
1/26/25	771	30840	3760	18	209	6229.9	1358.7	75.5	12125.7	2402.4	133.5

The spread sheet multiplies the observed LIPA meter reading by the multiple (40) to get the actual amount of electricity (in kWh) received by our buildings since the meter was installed in January of 2025). The spreadsheet then calculates the amount of electricity used during this 18-day period (3,060 kWh) and the average, per day usage (209 kwh)

The spreadsheet also uses the readings from the internal meters for Church and Rectory to calculate the amount of electricity the Church and Rectory used during the period.

Where the electricity comes from

Knowing where electricity comes from is important for a few reasons. Power from PSEG is "dirty" in that part of it is generated, in part, from fossil fuels. Power from solar power is essentially free of greenhouse gas emissions. PSEG power is also more expensive. Power from community solar is less costly.

Table 7-Electricity Sources past two decades

	2015-2020 Average	2021	2022	2023	2024	2025
Total Electric	11338	10440	11309	11204	11499	32056
Harvest Power	0	668	10871	11077	11499	27465
From PSEG Grid	11338	9772	438	127	0	4591

Sources: Total electric 2021 and before from historical data from utilities; 2022 and later from consumption by meter readings. Harvest Power from annual reports. PSEG grid is from the calculation of difference between total consumption and rescripts from Harvest Power.

Heat trapping gas emissions

Creation Care is one of our missions, and we measure our success by how close we get to the zero emissions goal.

Calculation of emissions

Emissions are measured in pounds of carbon dioxide (CO_2). We calculate emissions from the amount of fuel we use, and multiplying by internationally recognized factors, to some extent. The US Energy Information Agency publishes factors (coefficients) that allow us to calculate how much equivalent pounds of CO_2 we are responsible for, based on how much fuel we consume. For example, for every gallon of gasoline we use in our car, we emit about 19.6 pounds of CO_2). For natural gas, we used to count the amount consumed on our gas meter in a unit of measure called the "Therm." For every therm we burned, we emitted 11.7 pounds of CO_2 [6].

The table shows the amount of natural gas we've used over time, and the resultant annual emissions.

Table 8-Calculating Emissions from Natural Gas

Year	2015-2020 Average	2021	2022	2023	2024	2025

[6] The concept of a Therm is explained at https://en.wikipedia.org/wiki/Therm

Therms Nat Gas	2350	2452	1967	1747	1830	189
lb CO_2 from Natura Gas	27517	28715	23034	20456	21431	2213

This chapter is about electricity. Why are we talking about natural gas? Because our creation care strategy is to stop using natural gas and transition to 100% electricity. It is important that we know the costs and benefits of this move. That means having a knowledge of the costs of natural gas. It's also to understand that measuring the emissions of electricity is more complicated than natural gas.

When we use electricity to power things (heat and cool or buildings, heat our water, run our appliances), the resulting emissions depend on how the electricity is generated. Since our electricity is generated by several sources of fuels, The calculation is more complex than just multiplying the amount of kWh we use by a single factor. The table shows the different emissions from different sources of electricity.

Table 9-Emissions from different sources of electricity

Pounds of CO_2 Emitted for each kWh generated by	
Wind	0
Solar	0
Hydro	0
Biomass	0 - ha ha see discussion below.
Nuclear	0
Coal	2.21
Natural Gas	0.96
Oil	2.46
Source: USIA as of 1/14/2026	

These emissions are according to the US Government. It should be pointed out that you cannot believe everything the government says. **Biomass** is organic material that comes from plants and animals, and includes crops, waste wood, and trees. The U.S. Energy

Information Administration (EIA) points out that biomass is often mistakenly described as a greener alternative to coal and other fossil fuels.[7]

However, recent science shows that many forms of biomass—especially from forests—produce higher carbon emissions. The old idea behind biofuels — a type of biomass — is that they can offer a carbon-neutral fuel source because the emissions caused by burning them have already been offset by the carbon dioxide taken up in their creation.

The Union of Concerned Scientists notes, however, that the farming and machinery used to grow, harvest and take biofuel crops to market emit more heat-trapping gases than the biofuel crops take from the air. Ethanol and biodiesel harm the soil because the way corn and soybeans are farmed relies on heavy doses of pesticides, synthetic fertilizer and a monoculture farming practice that depletes microbes needed for healthy soil.

This leaves the soil susceptible to erosion. It also makes soil unsuitable for farming healthy produce and takes away its ability to capture and store heat-trapping gasses.

It is important to recognize that all forms of biomass emit heat-trapping gases when burned. Others, particularly biofuels, also degrade soil health. We (society) need to stop using them. Zero emissions, not renewability, is the important property for our energy sources. For now we are told by the government to calculate 0 emissions from biomass, but we should know that is not accurate.

In a perfect world, we would produce all our electricity from the sun and have no emissions. Wouldn't it be nice to contract with Harvest Power to provide us 100 percent of our electric needs from their solar farm? Or better yet, wouldn't it be cool to have a rooftop solar system producing all our electricity needs? Until then we need to rely on PSEG to provide some amount of our electricity.

Calculating the emissions from Grid electricity requires knowledge (or at least a reasonable estimate) of what sources of energy is being used, and in what proportions. Based on the most recent information from PSEG, in terms of the % of different fuels used to generate electricity, the table show the calculation of how much CO_2 is emitted for each kWh that PSEG provides on their "dirty" grid.

Table 10-PSEG grid emissions factor calculation

[7] If we want to reduce heat-trapping gases, we need to distinguish between beneficial and harmful 'renewable energy' The Invading Sea. January 2-22. https://www.theinvadingsea.com/2022/06/19/if-we-want-to-reduce-heat-trapping-gases-we-need-to-distinguish-between-beneficial-and-harmful-renewable-energy/

	lbs. CO2 per kwh	% PSEG power	Pounds CO2 per kWh	
Wind	0	0.00%	0.00	
Solar	0	1.38%	0.00	
Hydro	0	6.97%	0.00	
Biomass	0	7.84%	0.00	
Nuclear	0	28.02%	0.00	
Coal	2.21	0.00%	0.00	
Natural Gas	0.96	53.94%	0.52	
Oil	2.46	1.85%	0.05	
		100.00%	0.56	Total

Sources: Freedom of information request from PSEG regarding the sources of their electricity. USEIA for pounds of CO@ per kWh of electricity. https://www.eia.gov/tools/faqs/faq.php?id=74&t=11

We estimate that each kWh from PSEG emits about a half pound of CO2. (.056 pounds).

This table offers insight into where our state government needs to go in terms of zero emission sources of electricity. Zero contributions from wind, and 1% from solar are, for example, disappointing when you consider that NY state has a law (Climate Leadership and Community Protection Act- CLCCA) that is supposed to be eliminating emissions. This law to requires the state to produce regulations that reduce greenhouse gas emissions economy-wide by 40% by 2030 and 85% by 2050 from 1990 levels. According to Earth Justice, the state is stalled in any efforts to create the regulations to reduce pollution from oil and gas.

Members of the parish may wish to, in addition to working to eliminate their own emissions and helping St. James realize our goals, to urge our state office holders to get with the program allegedly mandated by the CLCCA,

Putting aside the state of NY, lets return to the display of St. James' progress with elimination of emissions.

The following table lays out the results of the calculation of our emissions for the past two decades.

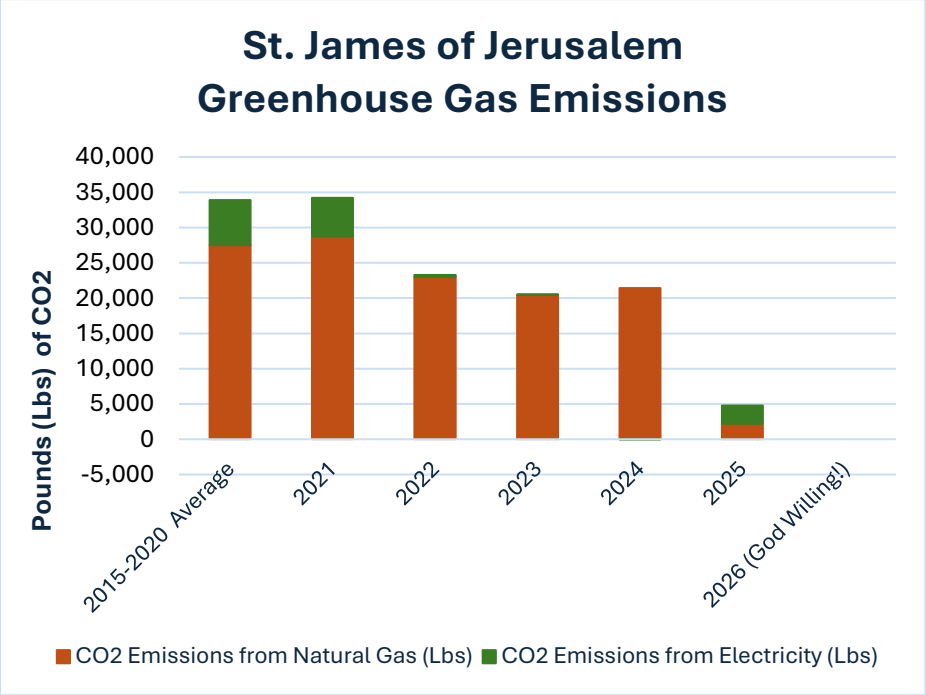
Notice that emissions from electricity counts power from PSEG's grid. Electricity from Harvest Power's solar farm, via the community solar program, is emissions free.

Table 11 -Emissions Data

	2015-2020 Average	2021	2022	2023	2024	2025	2026 (God Willing!)
CO2 Emissions from Natural Gas (Lbs)	27,517	28,715	23,034	20,456	21,431	2,213	0
CO2 Emissions from Electricity (Lbs)	6,387	5,505	247	72	0	2,587	0
Total CO2 Emissions (Lbs)	33,904	34,220	23,280	20,528	21,430	4,800	0
Calculations: Therms of Natural Gas (shown earlier) x factor of 11.71 pounds CO2 per Therm. kWh of PSEG grid electricity (shown earlier) x factor of .56 pounds CO2 per kWh							

We estimate that our buildings emitted 4,800 pounds, or 2.4 tons of carbon dioxide (CO_2) in 2025. This data is displayed on a bar graph in the following figure.

Figure 2-St. James Emissons History



This graphic captures the outcome of the emissions project as time goes by. Our operations, until the end of 2021, used natural gas and dirty grid electricity. Beginning at the end of 2021, we joined the community solar program and immediately dropped emissions by using zero emission solar electric from Harvest Power .in 2025 we took the major step of transitioning all heating of spaces and hot water to electricity, with much of that power coming from Harvest Power's solar farm.

Looking ahead

We have the capability of operating our buildings with zero emissions in the future, but it will not happen without careful management. This zero emission goal is dependent on conserving energy, as described in Chapter 1 AND providing what energy we need from solar. In the short term, that means contracting Harvest Power, or another community solar provider for enough energy to cover our electrical consumption.

In the long term, we should consider investing in rooftop solar to provide some, if not all of our solar power. It seems that our consumption may be too high, and our means (the area on the roofs and our building fund) too small to provide enough solar panels. This conclusion is based on a 2024 quote for a 10.9 kW rooftop system that would provide about 1,500 kWh annually for a cost of about $34,000[8]. Our present consumption, based on 2025 observations, is over 32,000 kWh, more than twice what a 10.9 kW system would provide. In the coming months and years, we should continue to gather information on our electrical consumption, developing rooftop solar technology, and the solar markets. For now, we can say that perhaps our roof and our budget may be too small for 100% rooftop solar capability, but time has a way of changing things.

Points of Contact

For information on the design of the electrical system, or warranties, contact Coty Keller, emissions project manager. To report on the need for corrective maintenance or repairs, contact the Vicar. The parish electrician is Bob Fink Electric Inc. bobfinkelectricinc@gmail.com. (516) 723-1099. For information on meter readings, consumption and/or emissions calculations, Contact Coty Keller.

[8] February 2024 Quote from Harvest Power rooftop division.

Chapter 3 -Heating, Air Conditioning and Ventilation (HVAC)

Latest update: October 31, 2025

Record of changes

Date	Occasions for update, who authored change.
10/31/2025	Baseline after emissions project and Ad-Hoc committee on HVAC operations reviewed principles of Conservation, Boundaries and insulation, building envelopes, and approved the heating and cooling protocol . Includes upgrade to control system 10/27/2025 which added two additional smart thermostats and grouped all mini splits in the Sanctuary into one zone, Author: Coty Keller
1/18/2026	

Description

The Church and Rectory are heated and cooled by high efficiency heat pumps. As the Department of Energy says heat pumps offer an energy-efficient alternative to furnaces and air conditioners for all climates. Like your refrigerator, heat pumps use electricity to transfer heat from a cool space to a warm space, making the cool space cooler and the warm space warmer. During the cooling season, heat pumps move heat from your house to the outdoors, and during the heating season, they move heat from the cool outdoors into your warm house. Because they transfer heat rather than generate heat, heat pumps can efficiently provide comfortable temperatures for your home.

Because of the way they are designed, we should use the heat pump in moderation or risk overworking them. Mr. Cool says, “Keep your heat pump’s temperature set to a moderate setting. Don’t set it higher during the winter than is necessary- between 66 and 70 degrees Fahrenheit — and avoid running it continuously. Make sure to use the heat mode rather than auto to reduce the amount of energy that’s needed during auto mode, which automatically switches between heating and cooling.[9] “

Similarly, Mr. Cool says in the summer, if the outside temperature reaches 100 or more, we should not set the thermostat in the Rectory or the Church below 80 degrees. A 20 degree differential is all the heat pump is designed to handle. If it’s 105 outside, set the Thermostat to 85.

[9] Can a Heat Pump work in cold and hot temperatures? Mr. Cool. https://www.mrcool.com/blog/can-a-heat-pump-work-in-cold-and-hot-temperatures

Church Heat Pumps

The Church heat pumps are **Ductless Air-Source Heat Pumps**, originally installed after Superstorm Sandy circa 2013. The Department of Energy says ductless air-source heat pumps offer an efficient and flexible solution for heating and cooling buildings without existing ductwork. These systems are ideal for zone heating (we have 4 separate building envelopes in the Church) and can significantly lower energy use compared to traditional heating methods.

Our units in the Undercroft are on the small size, as far as heating goes, and were just capable for that space at the time they were installed. But our super insulation added since then adds insurance that we can heat the meeting room.

The **location of the components**. The heat pumps have outside condenser units, and seven inside wall mounted units . The inside and outside units are connected by refrigerant lines and control wires.

The 7 inside units are as follows

a. Overcroft
b. Sacristy
c. Undercroft (2 Samsung mini splits)
d. Sanctuary Zone has 3 mini-splits:
    i. Sanctuary NE
    ii. Sanctuary SW
    iii. Sanctuary NW

The Church HVAC units are normally monitored and/or controlled with Cielo Breez smart thermostats on site and/or remotely by phone with the Cielo Home app. See the Operations section for details on the functions of the thermostat.

When the Church wi-fi is not available, the mini-spits must be controlled with the old handheld remotes located as follows:

a. Overcroft (on the office desk)
b. Sacristy- on the Sacristy desk
c. Undercroft (First draw on the left in the Kitchen)
d. Sanctuary Zone - on the Sacristy desk

Details of the **individual components** (model, serial number, capacities, etc.) are listed in the HVAC Inventory in the appendix.

Rectory Heat Pumps

The **Rectory** has **Ducted Air-Source Heat Pumps,** were **installed** in early 2025, and replaced the old AC unit and the gas furnace. The most common type of heat pump, the air-source heat pump, transfers heat between your house and the outside air.

As the Department of Energy says, air-source heat pumps have been used for many years in nearly all parts of the United States, but they've not always been used in areas that experience extended periods of subfreezing temperatures. However, advancements in air-source heat pump technology now offer a legitimate space heating alternative in colder regions. As with most property owners looking to replace a gas heating system with a heat pump, we "weatherized" the Rectory in 2024, 25 to ensure optimal energy conservation and comfort.

In the event of below zero weather, the Rectory system has an emergency backup heat feature to supplement the heat pump.

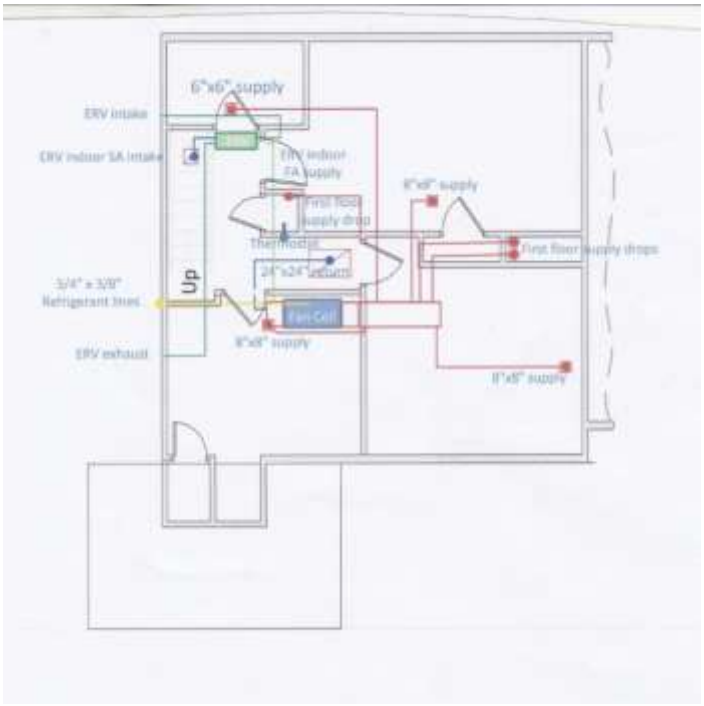
The Rectory also has an Energy Recovery Ventilator (ERV) working in consort with the heat pump. The ERV is a type of ventilation system that improves indoor air quality by replacing stale indoor air with fresh air. The ERV also pre-conditions incoming fresh air by transferring heat and/or moisture from the outgoing stale air, improving energy efficiency.

Details of the **individual components** (model, serial number, capacities, etc.) are listed in the HVAC inventory in the appendix.

The Rectory HVAC system components are shown in the System Drawings in Figures 3 and 4. Figure one shows the major equipment in the attic: the heat pump air handler (fan coil) and the ERV. The red lines show flow of the supply of conditioned air to ducts in the 2nd floor ceiling as well as drops to the 1st floor. You can also see the location of the thermostat and the 24"x24" return duct in the 2nd floor hall. The 24"x24" return duct is important as it holds the **filter which should be replaced every three months**.

The air handler is connected to the outside condenser (the heat pump) by refrigerant lines, shown (yellow) and control wires. The heat pump condenser is mounted on the east wall of the Rectory as shown in Figure 2. This figure also shows the three supply ducts on the first floor.

Figure 3- Rectory HVAC System Drawing 1



Source: The Cooling Company

Figure 4- Rectory HVAC System Drawing 2

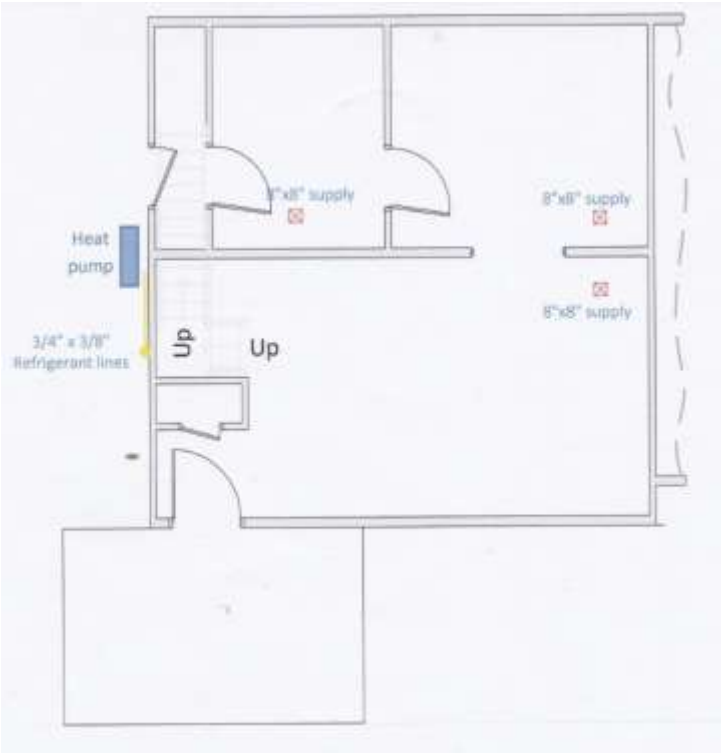


Image Source: The Cooling Company

The Rectory HVAC is controlled by the Honeywell thermostat located in the hall on the second floor. This thermostat can be monitored and/or controlled remotely by phone with the Resideo app. Please see the Operations section for more details on the thermostat.

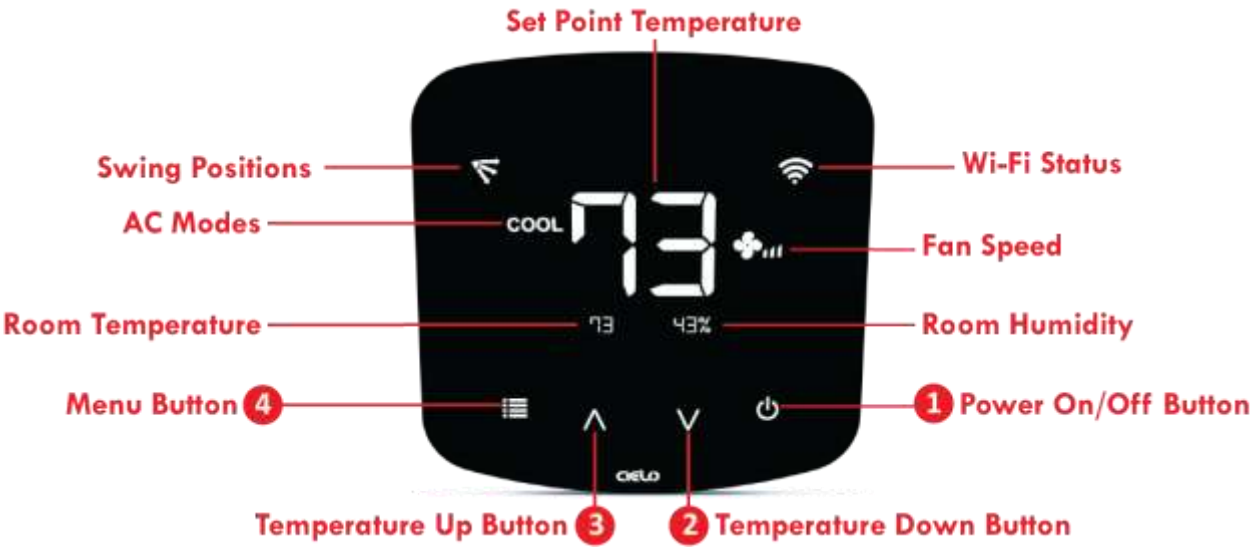
Operation

Church HVAC Operation

The **primary and preferred way** to monitor and operate the Church heat pumps is **from** the Cielo Home app, which works with the wall mounted, **smart thermostat** shown in the next two figures.

Please note that **Current Room Temperature is not prominent** in most of the Cielo units (the Breez Plus models) in the Scarcity, Undercroft and two of the Sanctuay units). Instead, Set Point Temperature is the big, prominent number in the middle of the display. **Current temperature is below that, in smaller numbers.**

Figure 5- Cielo Breez Plus Smart Thermostat



Source: Cielo Breez Plus Owner's Manual p. 14

Touch the Power on/off button to energize the display.

To select **mode,** touch the menu button once. The AC modes will start blinking. Use the up or down button to select the mode (e.g. Cool, Heat, etc.) Use only Cool or heat or off. Never use Auto, because it can confuse the unit between heating and cooling modes and cause it to freeze up.

Once Cool or Heat mode is set, **select the temperature by using the up and down buttons on the bottom of the thermostat.** The set point at the center of the display will show the selected temperature.

Fan speed should always be "Auto." If not set to Auto, **touch** the menu button twice. The fan speed icon will start blinking. Use the up or down button to change the fan speed to Auto, and the Auto the fan speed is set.

In **two of the smart thermostats**, the ones in the Overcroft and Sanctury NE, Current **Room Temperature is the big number in the center of the display,** as show in this figure: the set point temperature is show in smaller numbers below that.

Figure 6- Cielo Breez Max smart thermostat

Source: Cielo Breeze Max Owner's Manual

The Cielo Home App is used to monitor and/or control room temperature, while on site or away. The app presents a little different from the local thermostat.

Big picture on the home screen:

- Are all units online? Green Circles
- Temperature in each "zone:" Overcroft, Sacristy, Undercroft and Sanctuary
- Is power on or off to the units in each zone?

St James of Jerusalem Owner's Manual

- Humidity in each

Controlling the heating or cooling in each Church zone

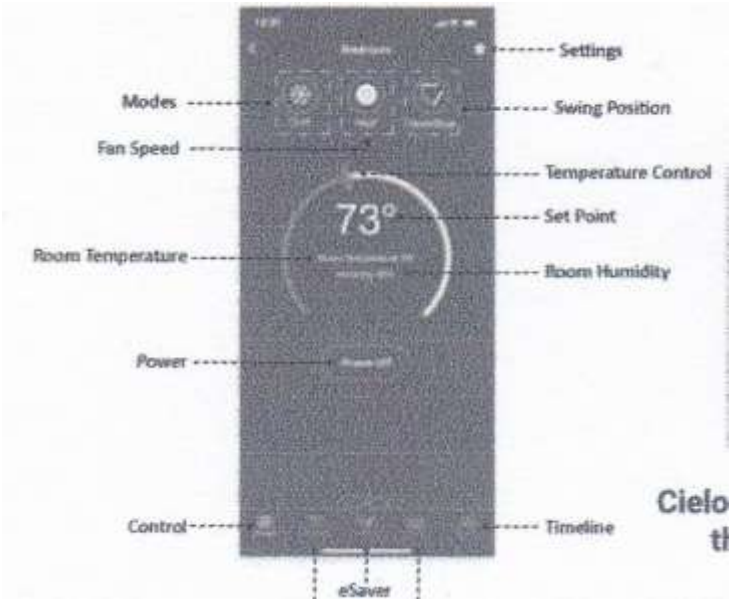
For the Sanctuary, use the group control feature. From the Home Screen, select Sanctuary Zone, then press "All On" or "All Off." All three units (SW, NW and NE) will respond as set. See individual unit control below.

For the **Sacristy, Undercroft and Overcroft zones**, select the device (Sacristy, Undercroft or Overcroft) and press "Power On" or "Power Off."

Individual unit control

Without power on to the unit, we can set a schedule and check the filter status. Power must be turned on to operate the unit – select mode (heat, cool) and fan mode, set temperature and observe room temperature. As shown in the figure, the prominent number in the display is the Set Point Temperature.

Figure 7- Church Phone App Control



Source: Cielo Breez Owner's Manual p. 13

To select **mode,** touch the menu button once. The AC modes will start blinking. Use the up or down button to select the mode (e.g. Cool, Heat, etc.) **Use only Cool or Heat. Never use Auto,** because it can confuse the unit between heating and cooling modes and cause it to freeze up.

Once Cool or Heat mode is set, **select the temperature by using the temperature control circle on the app, or the up and down buttons on the bottom of the thermostat.** The set point at the center of the display will show the selected temperature.

Fan speed should always be "Auto" for most efficient results. If not set to Auto, tap on the fan icon and select "auto" from the app. Or on the thermostat, **touch** the menu button twice. The fan speed icon will start blinking. Use the up or down button to change the fan speed to Auto, and the Auto the fan speed is set.

No Touch Feature – the electronic thermostat "Cage"

To prevent users from making any changes to the smart thermostat settings from the device itself, we disable the display on the Breez Plus or Max device. To disable the touch buttons on the smart thermostat,

- Open the Cielo Home App
- Tap on the device you want to disable the buttons for
- Go to Settings (upper right) and tap on "Touch"
- Toggle it to the left and tap "Apply"

Church HVAC Protocol

Responsibility: The Vicar, as the full-time leader of our parish, and on site at the Rectory, is responsible overall for monitoring and operation of the Church HVAC systems. If not in the vicinity, the Vicar can remain observant of Church HVAC operations by the Cielo home app. If using the remote app is not feasible the Vicar can designate one of the qualified lay people to oversee the Church HVAC systems. (i.e Verger Donald Fraser, Bishop's Committee member Deborah Smith).

Tenants, (AA, Arts Group, Dancing, etc.) are not allowed to operate the Church HVAC. The reasons for the "no touch the thermostats' policy will be explained to each group and included in the Building Responsibility letters.

Spring and Fall, when no heating or cooling is needed:

- Open church windows for fresh air
- Set all units **Off**

Heating Season:

- Be **mindful of the outside temperature**, whether Church is occupied or not. We must be aware if threat of freezing exists. As back up to the Vicar, BC member Deborah Smith will keep an eye on outside temperatures as well as temperatures inside the church with use of remote temperature sensor or in person if necessary.

- **Honor the building envelope**: Windows closed, vestibule doors, side door to Church and doors from hall to Sacristy, Overcroft and Sanctuary should be closed.
- **Occupied:**
    - Set units to **Heat mode. Fan Auto**
    - Thermostat set for 68 degrees or lower during the day. If occupants must have higher temperatures, this target can be raised a few degrees at a time until a satisfactory temperature is reached. Recall from the Conservation chapter that **every degree matters.**
- **Unoccupied:**
    - **No threat of freezing:**
        - Set units to **Off.**
        - Windows opened for fresh air.
        - Ceiling Fans Off.
    - **Threat of freezing for Undercroft and Sacristy** (the only two building envelopes where we have water in pipes)
        - set up Comfy feature with the following rules: Rule 1: If the room temperature falls below 40°F, turn on Heat mode. Rule 2: If the room temperature rises above 45°F, switch the unit to off. [10]
        - Be alert and mindful of situations- monitoring outside temperature, inside temperature in Undercroft and Security, and unit status. Human attention is needed to make sure heat comes on when/if room temperature goes below 40 degrees, and that units are not on above 45 degrees. Every degree counts.

Cooling Season:

- **Honor the building envelope**: Windows closed, vestibule doors, side door to Church and doors from hall to Sacristy, Overcroft and Sanctuary closed
- **Occupied:**
    - Set system **mode: Cool, Fan: Auto**
    - Set temperature to 78 degrees or higher. If occupants must have a lower temperature, this target can be raised a few degrees at a time until a satisfactory temperature is reached.
    - Recall from the Conservation chapter that **every degree matters. Use of ceiling fans in Sanctuary can make it feel 3 or 4 degrees cooler.**

[10] Email Jordan Green. Manager Technical Support, Cielo WiGle Inc. 11/14/2024

    - When the temperature outside approaches 100 degrees, set the thermostat to 80 degrees. A 20-degree differential is all the heat pump is designed to handle. If it's 105 outside, set the Thermostat to 85.
- **Unoccupied:**
    - Set system Mode to **Off**
    - Fans off

Rectory HVAC operation

Heating and cooling in the Rectory are controlled by either thermostat located in the 2nd floor hallway (Operations are described in the Thermostat User's Guide) or remotely by phone using the Residio Smart Home app.

Access to the Residio Home Smart app is shown in the table below.

Table 12- Rectory HVAC Residio Home Smart app

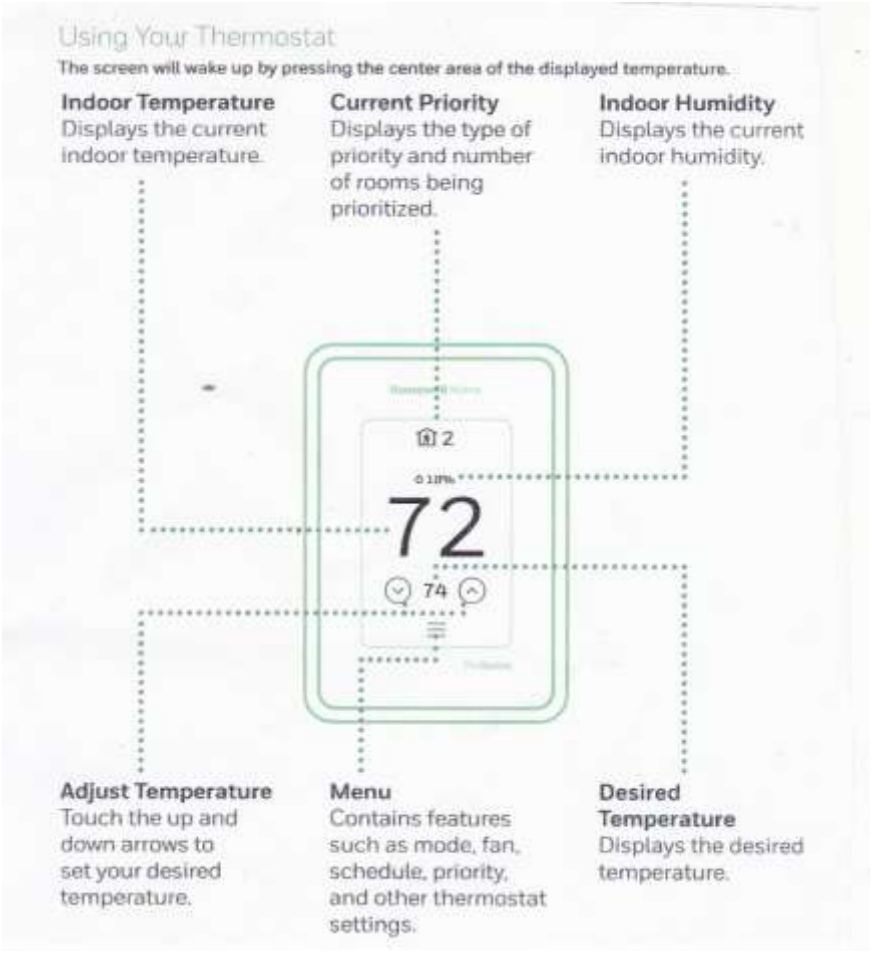
 Access to the Residio Smart Home is gained using the Vicar's email: vicar@stjameslb.org. Password: Contact the Vicar or the Emissions project manager The security passcode is 3863.

On the thermostat, current temperature is shown up front and center on the thermostat as shown in the figure. Desired (set) temperature is below that, in smaller numbers.

Use the menu button to select mode (Off, Heat, Cool) Fan is also accessed via the Menu button. **Fan mode should be "auto**." We want to make sure the fan runs when the heating or cooling system is actively operating, and to ensure fresh air from the ERV is being circulated.

It is important to know that having the fan mode in "auto" allows the ERV to function and have it "fresh air" benefit even when the heat pump is not heating or cooling. **When windows are open, allowing fresh air in naturally, the ERV should be turned off at the breaker panel** to conserve energy and reduce filter maintenance.

Figure 8- Rectory Thermostat



Source: T10 Thermostat User's Guide p 4.

When using the phone app, the display is a bit different. For example, as shown in the figure on the next page, the System Mode (OFF, Heat, Cool) and Fan are directly accessible. Fan mode should always be "Auto." We want to make sure the fan runs when the heating or cooling system is actively operating, and to ensure fresh air from the ERV is being circulated. .

Figure 9-Rectory HVAC Phone App Control

Source: T10 Thermostat User's Guide p 5

Rectory HVAC protocol

Responsibility: The Vicar, as the occupant and overall leader of our parish, is responsible for operation of the HVAC in the Rectory. In his absence, the Vicar can remain in control by using the remote app. If using the remote app is not feasible. The Vicar can designate one of the qualified lay people to oversee the Rectory. (i.e Bishop's Committee member Deborah Smith)

Spring and Fall, when no heating or cooling is needed:

- Open windows for fresh air, as ERV will not be providing fresh air (breaker to off)
- Set system status to **Off**

Heating Season:

- Be **mindful of the outside temperature**, whether Rectory is occupied or not. Must be aware if threat of freezing exists. As back up to the Vicar, BC member Deborah Smith will keep an eye on outside temperatures as well as temperatures inside Rectory with use of remote temperature sensor or in person if necessary.

- **Honor the building envelope**: Windows closed, front door, kitchen door closed, fireplace flue closed.
- **Occupied:**
  - Set system status to **Heat mode ON**
  - Thermostat set for 68 degrees or lower during the day. Reduce to 64 degrees or lower for sleeping. If occupants must have higher temperatures, these target can be raised a few degrees at a time until a satisfactory temperature is reached. Recall from the Conservation chapter that **every degree matters.**
- **Unoccupied:**
  - **No threat of freezing:** Set system status to **Off**
  - **Threat of freezing:** Set system status to **Heat mode ON.** Set temperature to 40 degrees to keep pipes from freezing while consuming minimal energy. Shut off the ERV breaker at the electric panel in the dining room.
- Pending – instructions for sub-freezing weather (back up heat)

Cooling Season:

- **Honor the building envelope**: Windows closed, front door, kitchen door closed, fireplace flue closed.
- **Occupied:**
  - Set system status to **Cool mode ON**
  - Set temperature to 78 degrees or higher. If occupants must have a lower temperatures, this target can be raised a few degrees at a time until a satisfactory temperature is reached.
  - Recall from the Conservation chapter that **every degree matters.** Use of ceiling fans can make it feel 3 or 4 degrees cooler.
  - When the temperature outside approaches 100 degrees, set the thermostat to 80 degrees. A 20 degree differential is all the heat pump is designed to handle. If its 105 outside, set the Thermostat to 85.
- **Unoccupied:**
  - Set system status to **Off**
  - If there is a threat of damage from humidity, from prolonged absence, set system status to Cool, and set temperature to 82 degrees, and shut off the ERV breaker at the electric panel in the dining room.

Maintenance

Building and Grounds sub-committee is responsible for organizing and recording the maintenance on the HVAC systems.

The inside units hold the filters which should be cleaned every 250 hours of operation according to the smart thermostat reminder feature.

Recurring, “preventive” maintenance is essential to keep the HVAC systems in good working order and minimize the chance of system failure. This list of preventive maintenance items has been created from the equipment owner’s manual and the collective experience of our installer and the project manager.

The Buildings and Grounds Committee is responsible for overseeing the maintenance and reporting ate least quarterly to the Bishops Committee what recurring maintenance has been accomplished and what has been deferred.

Preventive Maintenance Church HVAC

Annual system “tune up.” Includes testing and evaluation of all system components. Done under contract with installer.

Mini-split filters are to be cleaned every 250 hours of operation. Done by Church people, under direction of Building and Grounds Committee. Records are kept as shown in the appendix.

A handy tool to keep on top of the mini-split filter cleaning is the Air Filer feature on the Cielo Home app. As of this writing, the app is set to remind of cleaning due every 250 hours.

There is no substitute for regularly putting eyeballs on the filters to make sure they are free of dirt and debris.

Preventive Maintenance Rectory HVAC

Annual system “tune up.” Includes testing and evaluation of all system components.

Filters are cleaned/replaced as follows:

- Return filter – 24x24x1 MERV 13- located in the ceiling of the hall on the 2nd floor. To be replaced every 3 months by Church Personnel under the direction of the Building and Grounds Committee.
- ERV has two filters to be serviced by installer every 3 months:
    - RA filter to be cleaned
    - OA filter – to be replaced with MERV 13 (FVFL1310VE1) .
- Records are kept as shown in the appendix.

Service life Church HVAC

The Church HVAC system is a blessing and a curse. We do not have a record of the decision-making process when it was installed after Superstorm Sandy, but we can imagine there were not many thoughts of using the mini splits to heat as well as cool the Church. It was not until we began our Creation Care problem solving process, with the energy audit, that we realized the opportunity these old HVAC units provided: the ability to heat the church with electricity from the sun and eliminate the use of fossil fuels with that transition.

The curse is the Church HVAC design process in 2012 & 13 did not assure sufficient heating capacity for the Church building for the worst case (really cold days). We have inherited a limited electric heat pump heating system, a “chilly” one., but a “free” one. It did not cost us more than thousand dollars in an updated control system, and we are able to experience near zero emission heating as a result.

When the Church heat pumps reach the end of their service life, we can replace them with units of higher capacity. A well-designed replacement heat pump/mini-split upgrade would do us well, when the time comes. Until then we live with the free, chilly ones.

We can plan on upgrading our existing Church heat pumps with more capable units when the existing units reach the end of their service life. Our HVAC company estimates this could be in the coming year or 2, or as long as 5 more years. It’s uncertain.

An estimate would be in the tens of thousands of dollars, based on 2-year-old information from contractors. We can plan on this capital expense from our building fund.

Once the units are upgraded, we will have quicker heating response, and there will be no fear of being too chilly in the Church.

Points of Contact

Internally, Coty Keller, project manager for the emissions project, is a starting point for information on our HVAC systems, , their maintenance and warrantees. For maintenance contracts, the Treasurer is responsible for issuing and paying for recurring maintenance. Externally, The Cooling Company installed the Rectory system and has had the initial preventive maintenance contract on it and the Church System/. Chris Sansone is the company president. coolco@optonline.net. 631-563-7196.

Chapter 4 - Plumbing Systems

Latest update: January 27, 2026

Record of changes

Date	Occasions for update, who authored change.
2/11/2026	Upgrade of the hot water systems as part of the Emissions Reduction Project, which included removal of the gas how water heaters in the Rectory and Church and replacement with an all-electric hot water systems in 2025. Also re-location of the water meter/gauges in 2025 Author: Coty Keller, Emissions Project Manager

Supply plumbing and meter, distribution

The Rectory and the Church buildings are serviced by the same water line.

The service line from the City of Long Beach enters the Church underground by the side entrance. The first stop for incoming water is the meters, located in the nook under the stairs to the Undercroft, which is accessible from the right side of the closest north of Men's room.

We have two meters: one for the irrigation system and another for the cold-water supply to to the Rectory and Church.

Remote reading gauges are located outside near the steps to the Rectory porch.

Hot Water

We have two separate water hot water heating systems – one for the Rectory and another for the Church

Rectory Hybrid, High Efficiency Water Heater

The Department of Energy explains that heat pump water heaters use electricity to move heat from one place to another instead of generating heat directly. Therefore, they can be two to three times more energy efficient than conventional electric resistance water heaters. To move the heat, heat pumps work like a refrigerator in reverse.

Figure 10- Heat Pump Water Heater

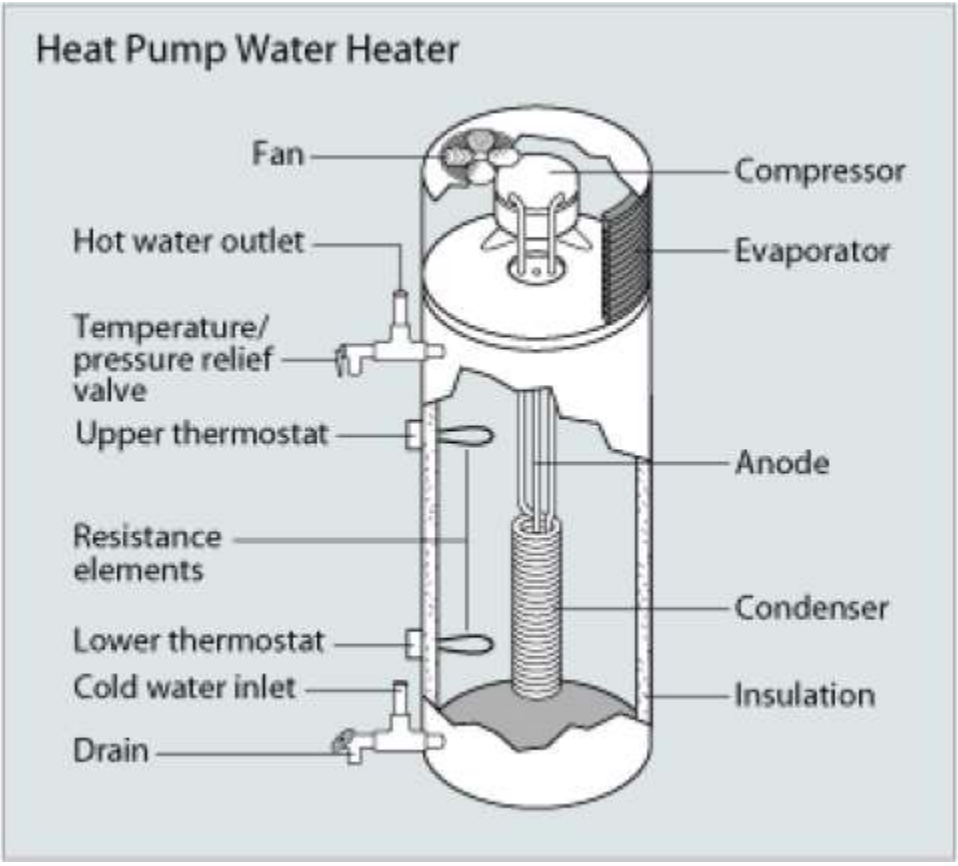


Image from How Heat Pump Water Heaters Work, DOE

While a refrigerator pulls heat from inside a box and sends it into the surrounding room, a stand-alone *air-source heat pump* water heater pulls heat from the surrounding air and transfers it -- at a higher temperature -- to heat water in a storage tank.

The Rectory hot water heater is located in the Church building, in the Sacristy storage area. The reason the unit is not located in the Rectory is we did not think there was a reasonable place to put it. The heater should be above design flood level, which as explained in Appendix C, which is 2'8" above the Rectory first floor. Since the heaer could not go in the Rectory basement, to place the heater elsewhere in the Rectory would be to sacrifice too much living area.

Use and Maintenance

Guidelines for the use and maintenance are contained in the Use and Care Manual for Rheem Pro PH50-T2-RH375-30. To get hot water at any faucet in the Rectory is a matter of opening the faucet, and waiting for hot water.

Waiting for hot water is an issue for the kitchen and bath sinks. We thing the reason the sinks take so long to get hot water is their faucets' low flow feature. The faucets are designed to conserve water by a low flow rate. This restricts the flow rate of the water coming from the Sacristy storage area, all the way to the other side of the Rectory to the sinks.

There is fast hot water to the bath tub (and presumably to the basement deep sink in the basement) , which do not have flow limitations.

An option to solve the long wait for hot water in the bathroom sind, is to run the hot water in the tub until it's hot, which would get hot water close to the bath sink. Shut off the tub and have hot water in the sink quickly.

Another solution to the sink hot water wait is a to install a recirculating pump system. An example is the $300 Chilipepper. I have experience installing this pump system and have had good performance from them. The features of the Chilipepper design are shown in the table.

Table 13- Features of Chilipepper CPBT1010

• Small, Pump that Eliminates the need to run the faucet for several minutes to get Hot water to the sinks • Once installed, the Chilipepper can usually supply hot water to other fixtures along the supply line prior to the point of installation. (We might be able to install one pump in the bathroom that might bring hot water to the kitchen sink also) • The Chilipepper easily installs under a sink with everything included for a normal Installation. The installation is straightforward and simple with the Do-It-Yourselfer in mind.

If the Bishop's committee will consider investing $300, I will conduct further investigation and, if selected, provide the labor.

The scheduled maintenance for the hot water heater is described in the section after the Church on demand heaters,

Church on Demand Hot Water Heaters

There are no hot water pipes in the Church. Instead, cold water supply lines take water to four, on-demand, under sink heaters where we need hot water:

- Bathrooms (2)
- Sacristy sink
- Kitchen cabinet area for the two sinks and dishwasher

Emax model SPEX3512, 120v on-demand units are installed for the bathroom and sacristy Sink. The Installation and Owner's guide is found at https://files.myrheem.com/webpartners/ProductDocuments/C031FEB5-2E4F-4AF5-9260-1D1E02E2602D.pdf

A Emax model SPEX95, 240v is installed in the kitchen to service the two sinks and dishwasher. The Installation and Owner's guide is found at https://files.myrheem.com/webpartners/ProductDocuments/191E390C-1F5D-4ED6-8A2E-BB5D473D904E.pdf

Operation of these heaters is as simple as opening the hot water fauce, or turning on the dishwasher. The heater senses the flow and energizes the heating element. You can hear a "click" to tell you it's on, and the water will be hot.

Maintenance Hot Water System

Preventive Maintenance of the Rectory Hot Water Heater, prescribed by the Use and Care Manual, is presented in the table below.

Table 14- Rectory's Rheem Hybrid Heat Pump Water Heater Maintenance

Every 4 months or 3 times annually a. clean filter on top of the tank b. relief valve and exercising, c. test anti leak valve, d. 5 gallons of water drained from tank to remove any built-up sediment, e. condensate drain and pump maintenance, and Source: Use and Care Manual for Rheem Pro PH50-T2-RH375-30.

Routine maintenance of the Church Hot Water system, as described in the owner's manuals, is presented in the table below.

Table 15 - Church On-Demand Hot Water Heater Maintenance

Every 4 months: clean aerators and filters on all the 4 Church on demand, Eemax under sink heaters. Source: Installation and Owners Manuals for SPEX95 and SPEX3512 heaters.

Points of Contact Hot Water Systems

Internally, Coty Keller, project manager for the emissions project, is a starting point for information on our hot water systems, their maintenance and warrantees. . For maintenance contracts, the Treasurer is responsible for issuing and paying for recurring maintenance. Externally, AWS Plumbing installed the system and has had the initial

preventive maintenance contract. Brian Single bsingle@awsmechanical.com. 516 889-1900.

Irrigation (Under Construction)

Description: Include location and model of the control panel

Operation

Maintenance includes start up in the spring and winterization in the fall.

Points of Contact

Drainage/Waste (Under Construction)

Description: includes where the pipes run, access to clean outs

Operation

Maintenance

Points of Contact

Chapter 5 - Roof and Gutters (under construction)

Latest update: date

Record of changes

Date	Occasions for update, who authored change.

Description including latest replacement, warrantees

Care and Maintenance

Points of Contact

Note: The 2021 Energy Audit offers thoughts and insights on the Church Roof and the insulation qualities and potential of the Sanctuary building envelope. Roof structure of Rectory and Church will be an issue if we pursue rooftop solar.

Chapter 7 - Lift Elevator (under construction)

Latest update: date

Record of changes

Date	Occasions for update, who authored change.

Description and purpose

Operation

Maintenance

Points of Contact

Chapter 8- Appliances (Under Construction)

Latest update: date

Record of changes

Date	Occasions for update, who authored change.

Stoves

Incorporate use, care and prescribed maintenance from owners' manuals

Clothes Drier

Incorporate use, care and prescribed maintenance from owners' manuals

Refrigerators

Incorporate use, care and prescribed maintenance from owners' manuals

Dehumidifiers

Incorporate use, care and prescribed maintenance from owners' manuals

Points of Contact

Chapter 9 - Columbarium (Under Construction)

Latest update: date

Record of changes

Date	Occasions for update, who authored change.

Description

Operations

Care and Maintenance

Points of Contact

Chapter 10 – Landscape and Gardens (Under Construction)

Latest update: date

Record of changes

Date	Occasions for update, who authored change.

Description

Care and Maintenance

Points of Contact

Include general housekeeping – mowing and blowing

Chapter 11- Organ (Under Construction)

Latest update: date

Record of changes

Date	Occasions for update, who authored change.

Description

Use and Care, Maintenance

Points of Contact

Chapter 12- Security Systems (Under Construction)

Latest update: date

Record of changes

Date	Occasions for update, who authored change.

Fire Alarm

Burglar Alarm

Points of Contact

Appendices

Latest update: date

Record of changes

Date	Occasions for update, who authored change.
1/18/2026	Publishing first edition of Owners' Manual. Author: Coty Keller

Appendix A- HVAC Inventory

The **individual components** of the all the heating, ventilation and air conditioning system are enumerated in the table.

Table 16- HVAC Inventory

Service Area	Service	Location of Unit	Brand/Date installed	Model #	Serial #	Cooling Capacity BTU/H)	Heating Capacity BTU/H)
Sanctuary #1	Cooling, heating	Inside NE	Fujitsu 2013	ASU30RLX	JPA008302	30,600	32,000
Sanctuary #1	Cooling, heating	Outside E	Fujitsu 2013	ASU30RLX	JPN008764	30,600	32,000
Sanctuary #2	Cooling, heating	Inside SW	Fujitsu 2013	ASU30RLX		30,600	32,000
Sanctuary #2	Cooling, heating	Outside SW	Fujitsu 2013	ASU30RLX		30,600	32,000
Sanctuary #3	Cooling, heating	Inside NW	Fujitsu 2013	ASU30RLX		30,600	32,000
Sanctuary #3	Cooling, heating	Outside SE	Fujitsu 2013	ASU30RLX		30,600	32,000
Sacristy	Cooling, heating	Inside	Fujitsu 2013	ASU7RLF	KPA019388	7,000	10,000
Undercroft	Cooling, heating	Inside	Fujitsu 2013	ASU9RLF	KQA039724	8,500	10,000
Sacristy & Office	Cooling, heating	Outside S	Fujitsu 2024	AOU18RLXFZ	87929	18,000	21,600
Meeting Room	Cooling, heating	Inside SW	Samsung 2013	MH052FNCA		18,000	19,000
Meeting Room	Cooling, heating	Inside NW	Samsung 2013	MH052FNCA		18,000	19,000
Meeting Room	Cooling, heating	Outside W	Samsung 2013	MH080FXCA4A		31,700	34,900

Rectory	Cooling, heating	Outside E	Friedrich	WFPU18Z363C		3 ton, 18 SEER	
Rectory	Cooling, heating	Attic	Friedrich	WFH36Z193C			
Rectory	Fresh Air (ERV)	Attic	Panasonic	FV-10VEC2	41017		

Appendix B- HVAC Filter Cleaning Records

In this appendix, we show examples of filter cleaning records for 2025. The Building and Grounds sub-committee is responsible for organizing and recording filter cleaning records in the future.

Church Heat Pump Filter Cleaning Record

The Cielo app reminder feature recommends cleaning filters based on 250 hours of use. (10 days of 24/7 operation). CC means the filters were cleaned by the Cooling Company. Otherwise, they were cleaned by Donald Frazer or Deborah Smith

Overcroft	**Sacristy**	**Sanctuary North (2)**	**Sanctuary South**	**Undercroft (2)**
11/13/2025 (CC)	2/23/2025	2/3/2025	2/23/2025	2/11/2025
	3/25/2025	2/26/2025	4/8/2025	2/26/2025
	4/15/2025	3/12/2025	4/15/2025	3/12/2025
	11/13/2025 (CC)	4/8/2025	5/16/2025	3/25/2025
		5/16/2025	9/7/2025	4/7/2025
		9/7/2025		4/21/2025
		11/13/2025 (CC)	11/13/2025 (CC)	6/16/2025
				7/22/2025
				11/13/2025 (CC)

Rectory HVAC Filter Cleaning & Replacement Record

Replace Quarterly

- Heat pump return filter- 2nd floor ceiling. 24x24x1 MERV 13
- ERV OA filter – optional MERV 13 (FVFL1310VE1). Need attic access

Clean Quarterly

- Clean ERV RA filter every 3 months– need attic access

Heat pump return filter	ERV OA filter	ERV RA filter
Installation 1/10/2025	Installation 1/10/2025	Installation 1/10/2025
Replaced 5/8/2025 Coty Overdue – filthy	Replaced 5/8/2025 Cooling Company dirty – it was due	Cleaned 5/8/2025 Cooling Company
Replace 8/12/2025 Fr. Michael – overdue. Let's shift to 2 months tickle 10/12/2025	Replaced 9/15/2025 Cooling Company	Cleaned 9/15/2025 Cooling Company
Replaced 10/20/2025. Fr. Michael	Replaced 11/13/2025 (CC)	Replaced 11/13/2025 (CC)
Replaced 11/13/2025 (CC)		

Appendix C- Elevation Records, Flooding Threats

Determination of Design Flood Elevation (DFE)

The Base Flood Elevation (BFE) in our area is 14 feet. BFE is the elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year. Design Flood Elevation (DFE) is the regulatory, locally adopted elevation at which a structure's lowest floor or critical equipment must be built to protect against flood damage. It is calculated as the Base Flood Elevation (BFE) plus additional "freeboard" (safety margin). The City of Long Beach uses 2 feet of freeboard and has established our DFE to be 16 feet.

The Dioceses commissioned a study in 2023 (see Master Plan for Efficiency Upgrade in the references below) that reported West Penn Street at our driveway is about 9 feet of elevation, and our building first floors are about 15'4' for the church and 13'10" for the Rectory. This tells us our first floors are below DFE (16'). Anything critical that is new to the buildings should be higher than that.

A discrepancy in elevation information in the Master Plan for Efficiency Upgrade was noted in 2024 as we were contracting for the Emissions Project. The project manager contacted Chris Schwarz, President at FPM to ask if they would be able to reconcile their observations with the unsophisticated, but seemingly reasonable measurements taken by us that indicate the differences in floor elevation in our buildings is closer to 12" instead of the 18" in their report. Chris replied that if we wanted more accurate information, we could hire a surveyor. In the interest of assuring that new equipment is installed at or above design flood elevation, we changed the scopes of work to compensate for the apparent discrepancy by adding to the minimum height above the first floor that would be called for by the Master Plan for Efficiency Upgrade.

DFE in Emissions Project Work

We established that DFE is 2‘8” above the first floor in the Rectory, and 14” above the first floor in the Church. All critical equipment installed for the emissions project was above that DFE. Any electrical lines below DFE were waterproof.

Basement Flood Threats

As pointed out in the Master Plan for Efficiency Upgrade, there are grade level entries to the basements of both buildings that raise the flood damage risk. The door to the side of the Rectory was turned on its hinges in 2025, so it opens outward, which will present more resistance to flood water than an inward opening door.

The access to the Church basement (the Undercroft) presents more of a flood hazard, as there is nothing stopping the water from running down the stairs to the Undercroft vestibule. The Bishop’s Committee Create has concluded that a temporary barrier to the flow of flood water down the front stairs to the Undercroft and purchase sandbags to keep in undercroft storage area is a solution The barrier should be created at the top of the stairs to the Undercroft. We should note that there are two other ways for water to get in besides flowing down the stairs:

1. At the bottom of the stairs is a drain which would be source of incoming water in a flood situation. 3
2. The ADA lift structure will provide a possible path for water to flow from ground level to the undercroft.

Value of an Elevation Certification

We do not have an Elevation Certificate (EC), a document that identifies the elevation of ones buildings in relation to the Flood Zone and the Base Flood Elevation. Completed by a licensed surveyor or engineer, this information is important to help determine the building’s flood risk and is used by flood insurers to determine the appropriate flood insurance rating.

References:

Engineering Report: Master Plan for Efficiency Upgrades, St James of Jerusalem. Prepared for The Trustees of the Estate Belonging to the Dioceses of Long Island by FPM Engineering and Geology, P.C. 20 September, 2022.

Discussions with Building Department, City of Long Beach

Appendix D- Blueprints and Drawings

Blueprints are located on the shelves in the Overcroft.

Square Footage.

Estimates of square footage, based on external measurements taken in June 2023 are:

Church- 4,550 Sq. Feet

Rectory – 2,417 Sq. Feet

Table 17- Square Footage

		ns	ew		
Church					
	Main structure	60	28	1680	
	Wing	24	15	360	
	Foyer	5	11	55	
					2095
	Basement				2095
	second floor	24	15	360	360
					4550
Rectory					
	Main structure	27	27	716	
	base 2nd floor	27	27	716	
	Dormer	10	11	110	
	Total 2nd floor			826	
	base Basement	27	27	716	
	Garage	10	16	160	
	Total basement			876	
					2417
					6967