

Christ Church  
Energy Assessment Report  
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Site Visit: July 19, 2008

*"The earth is the Lord's and the fullness thereof." Psalm 24:1*

**I Summary**

Thank you so much for taking the time to consider how your congregation can be a good steward of god's creation and to protect our neighbors. This report is designed to help your congregation create an action plan to reduce your environmental impact. Please share and discuss this report with all involved stakeholders. It includes technical information and strategies for changing behavior.

*Behavior Changes*

1. Turn off lights when you leave the room
2. Turn off hallway lights when building is unoccupied
3. Put up signs to remind people to turn off lights
4. Hold educational sessions to explain the "how to" of good energy behavior
5. Evaluate refrigerator needs and remove excess ones.
6. Implement close out procedures for building.
7. Train leadership in how to use programmable thermostats.
8. Implement a recycling program
9. Use reusable dishes for coffee hour

*Free changes*

1. Place all electronics (microwaves/ TVs/ radios) on power strips and turn off the strips when not in use/ unplug them when not in use
2. Program thermostats with heating/ cooling temperatures

*Short term Changes (the next two years)*

1. Replace all incandescent lights with CFLs
2. Use high content recycled paper
3. Install 7 day programmable thermostats
4. Shrink wrap windows

*Longer-term changes*

1. Replace florescent fixtures with T8 bulbs and electric ballasts.
2. Solar hot water heating

**Vision/ Goals**

Decreased money spent on utilities

Avoid waste

Care for the environment

Educate the community

Give them the experience of environmental responsibility

Have people understand the building and how it operates

Involve more staff and volunteers in the building

**About the Congregation and Buildings.**

The rectory was built in 1838, the main Parish Hall building was built in 1950, the sanctuary was built in 1828, the outreach center was built in 1960 and the Smith building was acquired in 2001. There are about 500 members.

The old rectory has a steam boiler and feeds in to the church. There are air handlers for each zone of the church. There is one zone for the old rectory. The parish center has a 5 zone system and a gas furnace. The offices are gas and have central air conditioners. Outreach center has a gas furnace and two heat pumps.

**II Recommended Change**

The following is a detailed explanation of actions your congregation should take. Where available, cost and payback information is included when possible.

*Scheduling and shutdown procedure*

When scheduling meetings and program space coordinate where groups meetings, so they are in similar parts of the building and let the group leaders know who else is meeting in their space.

The building is shut down by the building engineers

Additionally of the group leaders should be given a check list, so they can make sure their section of the building is closed down before they leave. Items to include are: turn off the lights, turn off air conditioner units, turn off computers, turn down thermostats, unplug devices with phantom charges.

*Renters*

Include energy efficiency practices into the renter agreements.

*Climate Control*

Install seven day programmable thermostats and program them to when various spaces are utilized.

*Recommended Change:* Aube Programmable 30V Thermostat TH141-HC-28 # 5000.59 @ \$49.50

This is a main way to ensure that the rooms will be warm enough when occupied and allow you to save money and energy when not used. They can save up to 20% on heating and cooling cost per year, and will pay for themselves in about one year. Most will allow temporary overrides of the program by simply pressing one button.

The following are temperature guidelines for your thermostats. Each degree you are able to raise or lower the thermostat, you will save 3–5% on heating/ cooling costs

Winter	Summer
When a room is in use: 65-68	When a room is in use 68-72
When a room is not in use: 55-60	When a room is not in use 77- 82

All of the committee/ program leaders and staff should be trained how to program the thermostats, so they can be empowered to make changes if they encounter a thermostats not operating properly. For example, if it is too cold in one room, a committee leader should be able to make changes to the thermostat to help you save energy and money.

## Outreach center

This space is used by renters from 7am until 3pm by the Meals on Wheels group. Once a month on Monday evenings.

1. Install two seven day programmable thermostats and program it to room utilization.
2. 2 60 watt bulbs

Recommend Change: 14 Watt Spring Lamp # IK.015 @ \$2.42

Total cost: 4.84

Changes would cause reductions over lifetime of products

KWH: 920

Pounds of CO2: 1,262

Save: \$92

Payback: .2 years

3. 11 fluorescent fixtures 3 bulbs each

Upgrading to T8 bulbs and electronic ballasts should save you at least 20-25% on your electric bills. This upgrade should pay for themselves in 2-3.5 years. This information is the same for all T8 upgrades listed in the rest of the report

*Recommended change* T8 bulbs and electronic ballasts

Cost: per Ballasts- \$19.35 model # Advance Centium 4x32w Ballast

ICN4P32SC (each ballasts controls 4 bulbs)

per T8 florescent bulb – @2.70- model # Philips 32w T8 Fluorescent

F32T8/TL730/ALTO .

Total cost: \$ 212.85

Alternatively you can convert to 34 watt T12 as apposed to the standard 40 watts. Cost per bulb- \$1.76 model # Philips F34 T12 Rapid.

Total cost: \$ 58.08

## Kitchen

1. 7 fluorescent fixtures 4 bulbs each

Upgrading to T8 bulbs and electronic ballasts

Per T8 fluorescent bulb – @2.70- model # Philips 32w T8 Fluorescent

F32T8/TL730/ALTO

per Ballasts- \$19.35 model # Advance Centium 4x32w Ballast ICN4P32SC

(each ballasts controls 4 bulbs)

Total cost: \$ 135.45

Alternatively you can reduce you energy use by just 15% by putting in a 34 watt T12 as apposed to the standard 40 watts. Cost per bulb- \$1.76 model # Philips F34 T12 Rapid.

Total cost: \$ 75.60

2. Place microwave on a power strip and turn the power strip off when not in use. This will prevent phantom charges and help to save \$2 per year.

3. Outside the door

4 candelabra bulbs candelabra base

Recommended Change: TCP 5w Candelabra-Base Flame Tip 8TFC05LV # 1100.020 @ \$ 13.28

Total Cost: \$ 53.12

Changes would cause reeducations over lifetime of products

KWH 1700

Pounds of CO2 2332

Save \$ 170

Payback 0.9 years

## Youth room

1. 4 florescent fixtures which each hold 4 bulbs  
Cost: per Ballasts- \$19.35 model # Advance Centium 4x32w Ballast ICN4P32SC (each ballasts controls 4 bulbs)  
per T8 Florescent bulb – @\$2.70- model # Philips 32w T8 Fluorescent F32T8/TL730/ALTO  
Total cost: \$120.60  
Alternatively you can put in a 34 watt T12 as apposed to the standard 40 watts.  
Cost per bulb- \$1.76 model # Philips F34 T12 Rapid.  
Total cost: \$28.16
2. 1 60 watt light bulb  
Recommended Change: TCP 14w ESB Spiral 4-Pack UB144 product # IK.015 @ \$2.25  
Changes would cause reeducations over lifetime of products  

KWH	460
Pounds of CO2	631
Save	\$46.00
Payback	.2 years
3. Program the thermostat to room utilization
4. Remove the lava lamp

## Main sanctuary

This space is used once a month from 6:30 until 730 pm and every Sunday from 6:30am until 12 noon. Once it is done being used, it is locked up.

1. Program thermostat to room utilization
2. 56 candelabra bulbs candelabra base  
Recommended Change: TCP 5w Candelabra-Base Flame Tip 8TFC05LV # 1100.020 @ \$ 13.28  
Total Cost: \$ 743.68  
Changes would cause reeducations over lifetime of products  

KWH	23800
Pounds of CO2	32654
Save	\$ 2380
Payback	0.9 years
3. 27 spots 65 watt dimmable floods  
Recommended Change: GE R-30 Dimmable Flood # 1160.607 @ \$12.15  
Total costs: \$ 328.05  
Changes would cause reeducations over lifetime of products  

KWH	11016
Pounds of CO2	15114
Save	\$ 1102
Payback	1.1 years

## Choir loft

Use on Saturdays for practice and Sundays

1. 7 75 watt bulbs  
*Recommend Change:* 20w ESB Spiral 4 Pack # IK.019 @ \$2.91  
Total Cost: \$ 15.33  
Changes would cause reeducations over lifetime of products

KWH	6650
Pounds of CO2	9124
Save	\$ 665
Payback	.3 years

2. Replace the two thermostats with seven day programmable thermostats and program them to room utilization.

**Choir room**

1. 3 60 watt light bulbs  
 Recommended Change: TCP 14w ESB Spiral 4-Pack UB144 product # IK.015 @ \$2.25  
 Total cost: 6.75

Changes would cause reeducations over lifetime of products

KWH	1380
Pounds of CO2	1839
Save	\$138

1. Payback .2 years

2. Shirk wrap 4 winnows: Put shrink wrap over the window. You can find this cheep product in any hardware store. It isn't the most attractive thing, but can work really well especially on windows that you never open. It can help you save up to 10% on heating and cooling.

3. Evaluate refrigerator usage and consider removing  
 4. Install a seven day programmable thermostat and program it to room utilization.

**Bathroom**

2 florescent fixtures which each hold 2 bulbs  
 Cost: per Ballasts- \$16.00 model # Advance Centium 1x32w Ballast ICN1P32SC (each ballasts controls 2 bulbs)  
 per T8 florescent bulb – @2.70- model # Philips 32w T8 Fluorescent F32T8/TL730/ALTO

Total cost: \$42.08

Alternatively you can reduce you energy use by just 15% by putting in a 34 watt T12 as apposed to the standard 40 watts. Cost per bulb- \$1.76 model # Philips F34 T12 Rapid.  
 Total cost: \$7.04

Front doors

1. Seal large gap in front doors. Have people station outside to welcome attendees instead of having the doors opened.

2. 2 65 watt flood lights  
 GE R-30 Dimmable Flood # 1160.607 @ \$12.15

Total costs: \$ 24.30

Changes would cause reeducations over lifetime of products

KWH	816
Pounds of CO2	1120
Save	\$ 82

Payback 1.1 years

### Parish hall

The parish hall is opened by the sexton at 7:00am and is used until 12noon on Sundays.

1. Program the thermostats to room utilization.
2. Label the light switches, so users can only light up the area of the room they need.
3. 10 60 watt bulbs

Recommend Change: 14 Watt Spring Lamp # IK.015 @ \$2.42

Total cost: 24.20

Changes would cause reductions over lifetime of products

KWH:	4600
Pounds of CO2:	6311
Save:	\$ 460
Payback:	.2 years

### Chapel

The Chapel is opened from 7am until 5pm.

1. Install programmable thermostats and program them to room utilization

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2. 3 60 watt light bulbs

Recommended Change: TCP 14w ESB Spiral 4-Pack UB144 product # IK.015 @ \$2.25

Total cost: 6.75

Changes would cause reeducations over lifetime of products

KWH	1380
Pounds of CO2	1839
Save	\$138
Payback	.2 years

### Offices

The offices are used from 8:30am until 4:30 pm Monday through Friday and on Saturday and Sunday Mornings.

### Old Rectory

The space is used week days for group meetings and Thursdays for tea.

1. 8 candelabra bulbs candelabra base

Recommended Change: TCP 5w Candelabra-Base Flame Tip 8TFC05LV # 1100.020 @ \$ 13.28

Total Cost: \$ 106.24

Changes would cause reeducations over lifetime of products

KWH	3400
Pounds of CO2	4665
Save	\$ 340
Payback	0.9 years

2. Evaluate Refrigerator needs and see if it can be removed.
3. Senior youth- instead of using the hotplate for morning meals, use a microwave to warm up food.

### Thrift shop

1. 4 candelabra bulbs candelabra base

Recommended Change: TCP 5w Candelabra-Base Flame Tip 8TFC05LV # 1100.020 @ \$ 13.28

Total Cost: \$ 53.12

Changes would cause reeducations over lifetime of products

KWH	1700
Pounds of CO2	2332
Save	\$ 170

Payback 0.9 years

2. Install programmable thermostat and program to space utilization

3. Try line drying clothes. Dyers are the number one user of house hold electricity. Washer and dryer

4. 5 60 watt bulbs

TCP 14w ESB Spiral 4-Pack UB144 product # IK.015 @ \$2.42

Total Cost: \$ 12.10

Changes would cause reeducations over lifetime of products

KWH	2300
Pounds of CO2	3156
Save	\$ 230

Payback .2 years

### Conference room

1. 12 60 watt bulbs

*Recommend Change:* TCP 14w ESB Spiral 4-Pack UB144 product # IK.015 @ \$2.42

Total Cost: \$ 26.40

Changes would cause reeducations over lifetime of products

KWH	5520
Pounds of CO2	7573
Save	\$ 552
Payback	.2 years

2. Label light switches so you can use proper amount of light for your activity

3. This room has the thermostat for the offices. Make sure it is programmed to room utilization.

### Offices space

1. 5 60 watt bulbs

TCP 14w ESB Spiral 4-Pack UB144 product # IK.015 @ \$2.42

Total Cost: \$ 12.10

Changes would cause reeducations over lifetime of products

KWH	2300
Pounds of CO2	3156
Save	\$ 230

Payback .2 years

2. 1 radio: place the radio on a power strip and turn the power strip when not in use. This will prevent phantom charges and help to save \$4 per year.

3. Remove mini fridge. Refrigerators are one of the largest house hold user of electricity. See if you can use another refrigerator

14 60 watt bulbs

*Recommend Change:* TCP 14w ESB Spiral 4-Pack UB144 product # IK.015 @ \$2.42

Total Cost: \$ 33.88

Changes would cause reeducations over lifetime of products

KWH 6440

Pounds of CO2 8836

Save \$ 644

Payback .2 years

### **Rector's office**

6 60 watt bulbs

*Recommend Change:* TCP 14w ESB Spiral 4-Pack UB144 product # IK.015 @ \$2.42

Total Cost: \$ 14.52

Changes would cause reeducations over lifetime of products

KWH 2760

Pounds of CO2 3787

Save \$276

Payback .2 years

### **Accountant's office**

This room has the thermostat for the offices. Make sure it is programmed to room utilization.

### **Computers**

You can save \$25 to \$75 per desktop PC annually by activating the power management. When computers are not in use, they should be completely turned off. The BITS Smart Strip Power Strip # 7005.145 @ \$29.50, allows you to plug your computer into the main outlet, and its peripherals into any of the other six. When you shut down your computer, all of the peripherals will also turn off. When you turn on your computer, the peripherals will all turn on.

There are 13 printers throughout the building. Make sure they are turned off when they are not in use.

### **Solar hot water:**

Solar hot water systems are a very efficient use of solar power. They can help you save 50-80% on your heating bills and will pay for themselves in 5-10 years. To read more about hot water systems please visit the Department of Energy's website at [http://www.eere.energy.gov/consumer/your\\_home/water\\_heating/index.cfm/mytopic=12850](http://www.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=12850). Additionally you can read about Resurrection Lutheran Church, IL the first congregation Chicago to install solar hot water at <http://www.faithinplace.org/testimonials.php>

### **Landfill Waste**

We produce 245 million tons of waste each year. It is important to remember that waste is an environmental justice issue. A landfill's most significant environmental impact is the fluid that drains off the garbage, called leachate. The EPA only requires landfill owners to check water quality and methane buildup for 30 years after a landfill closes, but that landfill will threaten air quality and groundwater for thousands of years, according to G. Fred Lee, whose environmental consulting firm specializes in landfills. According to Dr. Robert D. Bullard, race permeates everything, in terms of housing,

education, where people can live, land- use decisions, transportation and mobility, of where waste treatment facilities are located<sup>1</sup>.

The church has disposables but have reusable dishes. People sign up each week to host. To transition to use the reusable dishes consider who is going to wash the dishes: staff or volunteers? Can you make washing dishes a part of the duties for coffee hour? Can an environmental ministry offer to wash the cups, or offer to wash if the point person in charge does not feel like doing it?

### **Recycling:**

There is recycling in the offices and church for bullets, need more plastics. There needs to be more receptacles throughout the building.

Have a competition among the children to create clear signs for the recycling bins.

Using cardboard create lids for containers with shapes for various products

See fundraising section for more information on making your building a community space for recycling.

### **Cleaning Products**

Implement non toxic cleaning products into you cleaning supplies. Toxic cleaning products run off into the ground and contaminate aquifers and water supplies.

Additionally, they expose people – most significantly children and workers – to unhealthy levels of toxic chemicals which can cause long-term health damage. Use Green Seal Certified Products, [www.greenseal.org](http://www.greenseal.org), an independent, non-profit organization dedicated to safeguarding the environment and transforming the marketplace by promoting the manufacture, purchase and use of environmentally responsible products and services.

### **Grounds**

There are several ways to incorporate your grounds into your overall greening process. The first is to use native plant species in your landscaping. This will cut down on maintenance. Secondly installing rain barrels and rain gardens allow rain and snowmelt to seep naturally into the ground. This helps recharge our groundwater supply, and prevents a water quality problem called polluted runoff. For more information visit <http://www.montgomerycountymd.gov/Content/DEP/Rainscapes/barrels.htm>. The national wildlife federation has a certification program to make your grounds a wildlife habitat. To learn more, visit: <http://www.nwf.org/backyard/>.

### **Activities**

#### *Workday(s)*

There are several tasks of maintaining energy efficiency of your building which can be done by volunteers. You might want to consider having a day once or twice a year for these task. These tasks include

- Convert to electronic ballasts and put in T8 bulbs
- Put radio/ microwaves/ computers on power strips
- Put signage throughout the building
- Install programmable thermostats

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<sup>1</sup> <http://www.coopamerica.org/pdf/CAQ73.pdf>

- Change light bulbs to CFLs
- Plant native plants
- Program thermostats
- Shrink wrap windows
- Label and place recycling receptacles throughout the building

### *Fundraising*

The following are great ways to raise money for your energy efficient changes to your building or to make a clean energy purchase.

- *shopIPL Bright Ideas*: Through this girl scout cookie type order process, members can order light bulbs and other energy efficiency projects for their homes. You make approximately \$1 off of each light bulb you sell. Some congregations have made a shopping list for the congregational building to go along with the sale.
- *Youth Grants*: The following organizations offer mini grants for youth lead environmental projects:
  - [http://www.dosomething.org/grant\\_list](http://www.dosomething.org/grant_list)
  - <http://payitforwardfoundation.org/educators/grant.html>
  - <http://www.captainplanetfdn.org/grants.html>
- *Reusable shopping bags*: These highly portable and colorful shopping bags can be customized with your congregation's logo or message about caring for creation. There is a good margin on sales and you are invoiced for your order. For more information visit: [www.chicobags.com](http://www.chicobags.com)

### *CFL's the Gift of Light to those in need*

Compact florescent light bulbs cost a little bit more money (about \$2) to buy than a standard light bulb, but can save a family over \$30.00 over their life time. This monetary savings in energy bills and replacement light bulbs can mean a great deal to a family that is choosing between food and medicine. Poor families spend a large percentage of their income on energy. Have families purchase CFL's for low income families and we can work with you to distribute them to families in need.

Your community's commitment to making these changes in your building is a great educational opportunity. It can inspire your members to take similar actions at home and in the community. To enable and foster this process, we have to engage and educate our community. There are several great ways about getting your message out:

1. Web: Create a space on your website which explains your commitment to stewardship of the planet, how you are already taking this on, and what steps you plan to take the future. For example check out these following websites:
  - <http://www.all-souls.org/socialjustice/7thprinciple/>
  - <http://www.chevyCHASEPC.org/MissionOutreach/EarthStewards/tabid/29431/Default.aspx>
2. Newsletter: This is your monthly opportunity to inform your members of your progress, ask for help for things like an energy efficiency work day, put in tips of steps they can take at home, highlight what members families are doing, and focuses remind them why this is an issue of their faith.
3. Worship: GWIPL has resources available to help incorporate these concepts into your worship serves, including sermon resources:
  - <http://www.gwipl.org/worship.asp>. As you make changes to your building, have blessing ceremonies.

4. Education: GWIPL offers formal education classes which can help with this process. For a full list of classes visit: <http://www.gwipl.org/speakers.asp>. There are also many text studies that you can lead yourselves at: [http://www.gwipl.org/text\\_studies.asp](http://www.gwipl.org/text_studies.asp). You should also have sessions with various groups of how to use your energy efficiency technology including programmable thermostats and lighting.
5. Conversations: Have one on one conversations with various key people in the congregation about why you care and why this is important.
6. Signage: There are many ways of physically have signs through out the building that you care for creation, some ideas include
  - a. Having the youth make signs to turn off the lights because you care about creation
  - b. Make bulletin boards about what various families are doing at home
  - c. Having photos of your grounds and nature in your building

Throughout all of these mediums, make the connection between your faith and the actions you are taking.

### III. Notes

1. These are just recommendation from a site check. Please look at lights before making any actually changes and double check to make sure that the recommended change will work. All prices were determined using our discounted online store and include our special 10% discount. Please use the code shopIPL to receive your discount. Products numbers are included for ease: [www.shopIPL.org](http://www.shopIPL.org).

2. The follow is a summery of incandescent and their compact fluorescent equivalents.

CFL	Incandescent
14 W	60 W
18 W	75 W
23 w	100 W
42 W	150W

3. When determining where to take action, consider how often the space is in use. Make changes in the most heavily used spaces first.

4. For some cases evaluate the light quality before changing all of the lights. Change some of them and ask various users if they are bothered by the change. If it looks okay, then change all of them.