

Moving Faithfully Towards Energy Efficiency

St. Thomas the Apostle Anglican Church, Ottawa

ENERGY EFFICIENCY IN FAITH COMMUNITIES

While faith communities focus on spiritual needs, they must also worry about “bricks and mortar”, that is, the operation and management of their buildings, many of which are old and energy-inefficient. Conscious of their ecological footprint and rising energy costs, faith communities have increasingly turned their attention to improving energy efficiency. And they are doing it with help from Natural Resources Canada’s (NRCan’s) Office of Energy Efficiency (OEE).

In the fall of 2003, the Anglican parish of St. Thomas the Apostle on Alta Vista Drive, Ottawa, ON obtained an energy audit for its building which includes the church, an educational wing, and a link area. The audit’s recommendations, broader than expected, posed a financial and organizational challenge to the faith community. The parish turned for help to the OEE’s retrofit incentive program for existing buildings, known at the time as the Energy Innovators Initiative (EII) and, in 2006, extended, expanded and renamed EnerGuide for Existing Buildings (EEB). So began a journey toward a comprehensive energy management strategy.

A number of faith communities have joined the OEE’s EnerGuide for Existing Buildings (EEB). EEB provides members with a number of benefits that include information via a Web site and publications, workshops, tools and financial assistance through the retrofit incentive for planning activities [EEB (Planning)] and the retrofit incentive for project implementation [EEB (Implementation)].

St. Thomas the Apostle was one of the first faith communities to apply for EEB (Implementation) which, at that time, was known as Energy Retrofit Assistance [ERA(3)].

Ted Dunstan stands beside side door and windows in need of caulking and weatherstripping.



St. Thomas church entrance (south-facing).

“We embarked on a program that aims to reduce natural gas and electricity consumption by 45-50 percent, representing operating cost savings of about \$8000 a year at today’s energy prices for a capital cost of about \$150,000,” explains Church Warden, Ted Dunstan. “While the estimated payback period of close to 17 years may seem long, we concluded it was a worthwhile investment. Much of the work was necessary anyway and there are many benefits.”

Some of these benefits include:

- reduced energy consumption and related operating costs
- a healthier and more comfortable environment for the many users of parish space,
- increased energy use awareness and responsibility for conservation amongst parishioners and users of church premises, at home as well as at the church and
- a valuable contribution towards Canada’s Kyoto commitment.

Mr. Dunstan adds, “This will also help us be better stewards of God’s Creation, which, as a Christian community we should always be striving for.”

EVALUATING NEEDS

In the fall of 2003, as part of a five-year building refurbishment program funded by its Building on Faith (BOF) program, the parish decided to address some maintenance and energy issues. Earlier in the year the parish had already upgraded one boiler and improved insulation to R20 during replacement of the chapel roof, but more was needed.

In October 2003, the parish obtained an energy audit, which recommended a program of changes more sweeping than expected. Recommendations included significant upgrades to the building envelope, lighting and heating system. Total energy savings from the retrofits were expected to be over

\$8000 annually, but the capital cost was projected to be \$105,000. As time would tell, the eventual cost would add up to over \$40,000 more than this initial estimate, in large part due to the greater than expected cost of window replacements.

Faced with this challenge, St. Thomas the Apostle sought solutions. Through an event sponsored by NRCan partner KAIROS - Canadian Ecumenical Justice Initiatives, the parish learned about EEB. The church realized that through EEB (Implementation) it could qualify to receive up to 25% of the cost of the retrofit work not yet undertaken, based on energy savings in gigajoules (GJ). (Each GJ is equivalent to 277.8 kilowatt hours (KWH) of energy).

After joining EEB, the church group examined the EEB retrofit incentive program and discovered it qualified for \$6000 of assistance, based on a calculation of \$7.50/GJ for annual savings of 772 GJ. Although the financial assistance was more modest than hoped, the parish also saw value in the process of applying for the funding. It helped them to identify and analyze all the contributors to energy use, provided access to useful information and assistance, and required careful management and attention to detail.

“In other words,” Ted Dunstan comments, “it forced us into managing the program efficiently, keeping good records and being organized — often not easy to do in a volunteer organization such as a church.”

ORGANIZATIONAL CHALLENGES

Most religious organizations are complex voluntary institutions with many demands and priorities vying for precedence. There are usually several levels of authority, accountability and decision-making for large projects, which include any expenditure over \$1,000. It takes persistence and a good plan to navigate the channels and it can take extra time to get large projects off the ground. It is most important to identify a champion of the idea who can follow the course through to the end and who commands the overall respect and support of the whole group.

It also takes a good committee of volunteers who are willing to back the project and to devote considerable personal time and talent to see it to fruition, with regular monitoring and tracking throughout. Ultimately the long-term success depends on the ongoing participation of the whole community.



Sealing the south door and stained glass in rear church wall reduces heat loss.



Stained glass windows — beautiful, but a special energy-efficiency challenge. Caulking, weather-stripping and exterior mylar protective shields cut down heat loss without affecting light.

For this project, Churchwarden Ted Dunstan initiated the program. Once it was under way, he passed the coordinating role to Ferdy Doreleyers, Joint Chair, Property Management Committee. To manage the program, a new committee was formed, the Energy Retrofit Implementation Team (ERIT).

ERIT determined priorities, established a plan of action, and managed the various stages of the project from start to finish, including the NRCan application process, negotiating contracts for work while keeping within the church’s budget and reporting back to the parish council.

ENERGY EFFICIENCY MEASURES

Despite hurdles such as unexpected cost increases, the project began in December 2004, with an expected completion date of August 2005.

Project	Implementation Date	Project Cost (\$)	Energy Consumption Savings (GJ)/yr	Cost Savings (\$)/yr
1. Upgrade lighting to efficient fluorescents and metal halide elements	2004-2005	2500	62	1361
2. Upgrade building envelope by replacing windows with EE units, installing insulation, and new weather stripping	2004	85,000	466	4385
3. Replace 2 inefficient existing boilers with 1 mid-efficiency gas boiler, install vent damper and setback thermostats when space unoccupied	2005	20,000	244	2290

Figure 1: Summary of practical energy efficiency measures conducted as part of ERA (3) project by St. Thomas the Apostle.



Exterior view of new windows installation.



Interior view of new windows installation.

BUILDING ENVELOPE

A large part of the building envelope is glass, and the energy audit identified that up to 43 percent of heat loss was through the single-pane windows. Windows and doors were fitted with double panes in metal frames and weather stripping and caulking were also applied to seven single doors. The remaining 33 windows were sealed closed. These upgrades contributed to more than half the annual energy savings from the retrofit or 466 GJ, for a cost saving to the church of over \$4300 every year.

LIGHTING

As energy consumption from lighting accounted for over one quarter of yearly electricity consumption, it was a priority to find reductions in this area. A compact fluorescent bulb pays for itself 4 times over with the savings generated within its lifetime. Replacing incandescent bulbs with compact fluorescents is an investment that will reduce energy consumption in these fixtures by about 75%.

At St. Thomas the Apostle, incandescent light bulbs were replaced with compact fluorescent bulbs, mercury vapor lights with metal halide lights and conventional exit signs with light-emitting diode (LED) fixtures. These measures reduced the lighting load by half, for annual savings of 62 GJ of energy or over \$1350 at current energy costs.

HEATING

Based on the recommendation of the Energy Audit, the plan included replacing two inefficient boilers with one mid-efficiency gas boiler, installing a vent damper and using zoned programmable thermostats to allow temperatures to be set back in unoccupied areas. The resulting energy savings of 244 GJ is projected to return almost \$2300 every year in reduced energy costs.

AWARENESS

Probably the most important factor in a successful and sustainable program is understanding “the people dimension”. Creating awareness and “keeping people in the loop” can be as important as practical measures.

St. Thomas the Apostle’s energy management plan includes good communications. The results of the program are shared with the congregation, those who use the facility, including the resident daycare facility, and the wider community. To spread the word and be an encouragement to others, ERIT also presented a report of their experience to the Diocesan Synod in the summer of 2004.

The intention to build an “energy-conscious faith community” involved a communications and awareness program that includes:

- Posters, bulletin notices, and announcements to promote energy conservation in the church community,



Complicated old boiler system.



New high energy efficient boiler.

- Awareness training about the KAIROS Ecological Initiative and our energy retrofit program for paid staff, parishioners, and leaders of church groups,
- Outreach talks on energy and conservation to Children and Youth groups and
- Promotion by ERIT and the Parish Executive Committee of available NRCan workshops and KAIROS programs to parish representatives, as well as periodical updates of information about energy efficiency from NRCan.

CONCLUSION

Through a comprehensive retrofit, St. Thomas the Apostle provided a more comfortable and healthier environment for its users and reduced energy consumption and costs. In fact, by cutting average gas consumption by 48 percent, and electricity use by 26 percent, the church reduced its overall energy costs from over \$19,000 to just over \$11,000 every year, while also using 772 fewer GJ annually. The parish community is also more aware of the true value of the Earth's energy resources, and the importance of using them carefully, and is spreading that word, as shown in the message for the parish 2005 Easter letter: "Behold I make all things new."

Changing energy management practices is a challenge for any organization. Faith communities, with limited budgets and dependence on the good will of their hard-working volunteers, face particular hurdles. Nevertheless, the Parish of St. Thomas the Apostle, and its dedicated committee, ERIT, remains convinced that energy efficiency retrofits are a good idea.

To quote the ERIT committee:

"Despite the high cost and considerable amount of work we're confident we made the right decision to go ahead with this program. If other churches in the diocese decide to follow such a program we'll be happy to offer our help."



Re-caulking of many windows and doors in the link area improved building envelope integrity.



Foundation wall cracks (North-facing windows reflect seniors' housing development on former church property).

Year	Baseline	Current	Target
Summary — Totals			
Area (m2)	1860	1860	1860
Total annual energy cost (\$)	19,142	19,142	11,106
Total annual energy consumption (GJ)	1720	1720	948
Electricity			
Annual electricity costs (\$)	5,236	5,236	3,875
Annual electricity consumption (GJ)	239	239	177
Natural Gas			
Annual natural gas costs (\$)	13,906	13,906	7,231
Annual gas consumption (GJ)	1481	1481	771

Figure 2: Current and projected energy consumption for St. Thomas the Apostle, Ottawa, ON.

LEARN MORE

Obtain more information on KAIROS, this project, or how your faith community can get help to improve energy efficiency from EEB:



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