

Christians and Creation

Energy Efficiency Upgrades at St. Luke's (Part 3)

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The ability of humanity to alter earth's ecosystems on a global scale became possible in the last century. The discovery of oil has provided immense freedom from the natural world, but at the same time has led us to believe that we are separate from it. The most easily accessible energy sources are gone and experts warn that we are past the halfway point on reserves. So, while there is still oil, the remaining fields will produce less net energy as it takes more energy to extract the oil. On top of this, energy use is steadily increasing worldwide. Increasing demand and reducing net yields mean that we are facing a serious future energy crisis, and probably increasing the chances of conflicts over resources unless we change how we do things.

We must move to a less energy intensive society, but not necessarily a poorer one. The first place to begin is energy efficiency and energy use patterns. Previously I looked at space heating and electrical use, this month we start by addressing water.

Water Use

In 2006 we replaced the old toilets in the Hall with four new low flush toilets. The CRD gives a \$75 rebate for each toilet (cost is about \$400 per toilet plus installation). Our water use is down 7% last year compared to 2006 (figure 2). The payback for replacing standard toilets with low flush toilets is 11 years. The main reason for replacing the toilets was that they had cracked tanks, and one had already broken and caused water damage.

Although toilets use a great deal of water, water use in both the Church and Hall is mainly due to summer garden use. By plotting water use by season we realized that our main use is in the garden. The high water use in 2003 and 2004 was due to the hot weather we had in those summers (Figure 2). The conclusion is to target summer water use first.

Micro-drip irrigation on a timer is inexpensive, convenient and really reduces water use because it targets each plant. However, this does not work for lawns that require a lot of water over a large area. Letting most lawns go dormant in summer has resulted in significant water savings compared to 2004 and 2003 (Figure 2). Timed watering in the cooler morning helps to reduce evaporation.

Some General Considerations

- It is a good idea to obtain energy use for the past five years before completing upgrades. Record any upgrades and the monthly energy used after each.
- Plot use by month or season to get some idea about peak use and what might be the cause. By recording total energy use and then calculating the load of the suspected highest users, you can figure out what proportion of total use is due to which device.
- When considering upgrades, target the highest energy users first.
- Remember to buy the most energy efficient appliances, and beware of phantom loads (standby mode) where the device still draws power when not in use.
- When upgrading building walls or basements consider adding insulation and/or vapour barriers during construction. As pointed out previously, gap sealing alone can yield quite large paybacks.

Conclusion

God foresaw a period in the future when our appetite for resources would outstrip what the earth could support; hence it is no surprise that the last book in the Bible states that those that would hurt the earth will be accountable (Rev. 11:18). As Christians we should be taking a lead in the effort for sustainable stewardship. As a biologist and Christian, I believe we were intended to use but care for the earth. Energy supply is the key to this because it determines how much, what kind, and how fast we use resources, and therefore what impact we will have.

We hope that our efforts will spark action in other Churches. The return on investment is quite high and gives stable returns because the cost of energy is sure to rise. In fact, the return is higher than typical mutual funds and as high as or higher than some stocks except with almost no risk (5-40% annually) for many upgrades. The Church just has to be able to afford the initial financial outlay and payback period. After this the savings accumulate every year and reduce the impact of price increases. If you have the savings, then consider investing in energy efficiency, especially if volunteers can do some of the work. .

The road to lower energy systems that are more sustainable is vital. Those who wish to start down this path can start solving both this problem and wider environmental concerns. Those that need help to get started can contact me through St. Luke's for advice. The process is actually quite interesting but does require some learning and change of habits.

Further Readings

Heinberg, R. 2003. *The Party's Over: Oil war and the fate of industrial societies*. New Society Publishers. Gabriola Is. [A great discussion for those that doubt that energy is becoming scarce].

Heinberg, R. 2004. *Power Down: options and actions for a post-carbon world*. New Society Publishers. Gabriola Is. [Future conflict or not is related to energy]

Homer-Dixon, T. 2001. *The Ingenuity Gap: can we solve the problems of the future?* Vintage Canada, Toronto. [The first economist I have read that really understands the connection between the environment and economics and our inability to understand this.]

Homer-Dixon, T. 2007. *The Upside of Down: catastrophe, creativity, and the renewal of civilization*. Vintage Canada, Toronto. [A positive message for our future if we start making some changes, again connecting the environment with our current society]

Stoyke, G. 2007. *The Carbon Buster's Home Energy Handbook*. New Society Publishers. Gabriola Is. [For those who wish to see a short but well written account of energy saving options and paybacks]

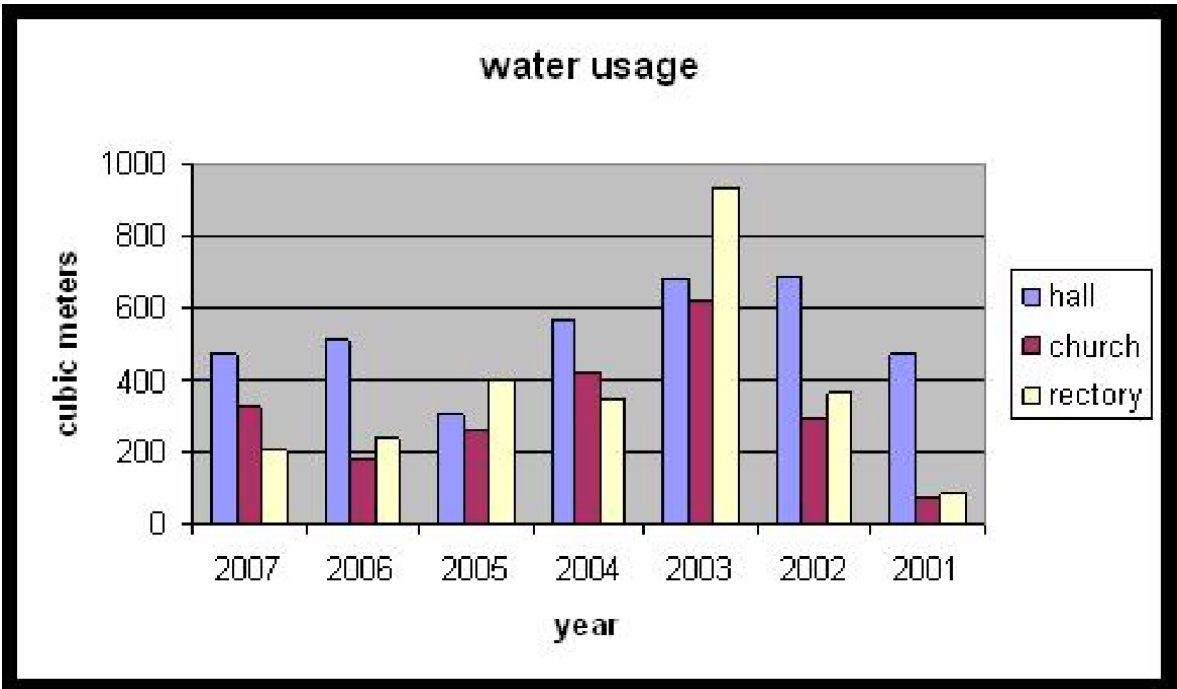


Figure 2. Water use in the Church Hall, Church and Rectory