

Home Sweet Home: Building for the Future

By Kerstin Muth

New building design and construction will be undergoing a revolution in the next decades. There are two primary motivations: environmental concerns (sustainability and climate change) and energy costs.

Currently, during the life time of an average building 20% of the energy is consumed in construction of the building and 80% of the energy is consumed when the building is in use, primarily for heating and cooling. The new design changes will reduce the energy required to operate a building, hence less greenhouse gases and lower energy costs.

The best way to improve building energy efficiency on a broad scale is through the building code. The 2006 code improved on the 1997 code by about 20%. The planned codes for 2012 will result in homes 35% more energy efficient than a home built in 1997. The additional capital costs of a home built in 2012 would be recovered within 6-8 years through reduced energy bills.

There is also consideration for new homes to be “solar ready”. Modifications in the initial building design will make it much easier to add solar technology such as solar hot water or photovoltaics at a later time. Requirements for “solar readiness” include a roof location of suitable size, pitch and orientation and extra plumbing valves and fittings on the water heater.

The energy efficiency in building codes will improve, albeit slowly. Many individuals and companies are taking bigger steps towards the ultimate goal, “net zero” buildings that supply their own electricity, heating/cooling and water requirements.

One might think net zero is possible in California or Florida but what about cold climates? There are numerous examples. The Riverdale Net Zero Project Duplex and the Mill Creek Net Zero Home are both in Edmonton, Alberta. The Nolulu Ecocentre, located just west of Thunder Bay, has moved beyond net zero status in terms of electricity and produces more than required on an annual basis.

One of the basic principles of “green” design is to make the building do the work, as passively as possible, to reduce the energy load of the building. This includes the amount of insulation, placement and type of windows and other aspects of building design. Then it is possible to downsize or even eliminate components of the energy system. L'École Vérendrye and the Sister Margaret Smith Centre are newer buildings in Thunder Bay which have incorporated this principle.

Each geographic region will have its own opportunities and challenges. Northwestern Ontario's cold winters require heating our homes for many months. Opportunities lie in increased insulation and utilizing solar energy or other renewable energies. Windows can catch the sun's

rays in winter, offer optimal shade in summer and natural daylight all year. Thunder Bay has a bountiful 2200 hours of sunshine annually.

Energy efficiency improvements for new buildings can be realized quite easily. However, the majority of buildings in our communities have already been built before 1997, with minimal energy efficiency requirements. In 2008 the Canadian Mortgage and Housing Corporation released a report on net zero retrofits. There are many benefits including local employment generation and reduced air pollution. Barriers include initial cost and insufficient knowledge and experience in the building industry. The “Now House” organisation is overcoming these barriers and has developed a process for retrofitting older houses into net zero energy homes. They launched their first house, a 60 year-old wartime house in Toronto, in 2008.

Government strategies to improve the energy efficiency of existing buildings could include: a broad building retrofit program, energy labeling requirements, a renovation building code, or a required energy upgrade with change of ownership. A key point of the proposed “Northern Growth Plan” is to “encourage development and use of green technologies and demonstrate leadership in green building, and water and energy conservation”. The role of producing green building products and creating green buildings, both new and existing, in the future economy of northern Ontario needs to be realised!

Once the gaps around doors and windows have been sealed, the next steps entail some time, planning and research. The rewards? Minimal (or even zero) energy operating costs and a much lighter footprint on the planet.

See www.environmentnorth.ca for green building links, including an upcoming “Near Net Zero Home” workshop on April 23 in Grand Marais.

Kerstin Muth is a member of Environment North and the Earthwise Energy Working Group.