Building Code and Voluntary Programs Make Ontario New Home Builders Leaders in Energy Efficiency

New homes being built in Ontario are now among the most energy efficient in North America. This is due both to recent improvements to the Ontario Building Code, as well as a range of voluntary and challenge programs. This article will explore how we got here, the close relationship between voluntary programs and mandatory requirements in the building code, and where we need to go next.

It all started with a thorough understanding of the intricacies of building science, and this works has created an industry of building science research in Ontario. Early leaders in this area include researchers at Canada's National Research Council in the '50s and '60s. In the late' 70s, professor John Timusk led the work of a group of recent graduates at the University of Toronto, who remain leaders in this field; they include Michael Lio (co-founder and first chair of EnerQuality Corporation), Dr. Joseph Lstiburek (founder of Building Science Corporation), Paul Duffy (now with Icynene), and Kim Pressnail and Dr. Ted Kesik (University of Toronto), and Professor Hitesh Doshi (at Ryerson University). In 1982, Eric Burnett (University of Waterloo) and Vlad Stritesky (President of Trow Global, now called exp), held the first Canadian Conference on Building Science and Technology. This conference continues to be organized by the National Building Envelop Council. Other leaders in building science now include Professors John Straube of the University of Waterloo and Russell Richman of Ryerson University.

Nominator: Peter Love, Research Fellow at Ryerson University and President of Love Energy Consulting. *Peter Love was Ontairo's first Chief Energy Conservation Officer of Ontario and the President of EnerQuality Corp from 1996-2005.*

Name of the Project: The Ontario Building Code and Voluntary Home Energy Efficiency Programs
Key Contributors: homebuilder, governments and building scientists of Ontario
Physical Details: Since 1975 the Ontario Building Code has specified energy-performance minimums.
Claim to Fame: Top Building Code in North America in terms of energy efficiency.

Ontario's first building code, issued in 1975, included minimum energy-efficiency requirements. After relatively modest updates in 1983 and 1986, major improvements were made by Bob Rae's NDP government in 1990, which included full-height basement insulation. The subsequent election of Mike Harris' Conservative government in 1995 brought about many changes, one of which was a discussion paper called Back to Basics, which called for a major roll back of the minimum energy- efficiency requirements in the building code. A coalition of manufacturers, financial institutions, energy companies, and consumer and environmental groups, led by the Canadian Energy Efficiency Alliance, was able to pressure the government to at least retain most of the previous improvements to the code.

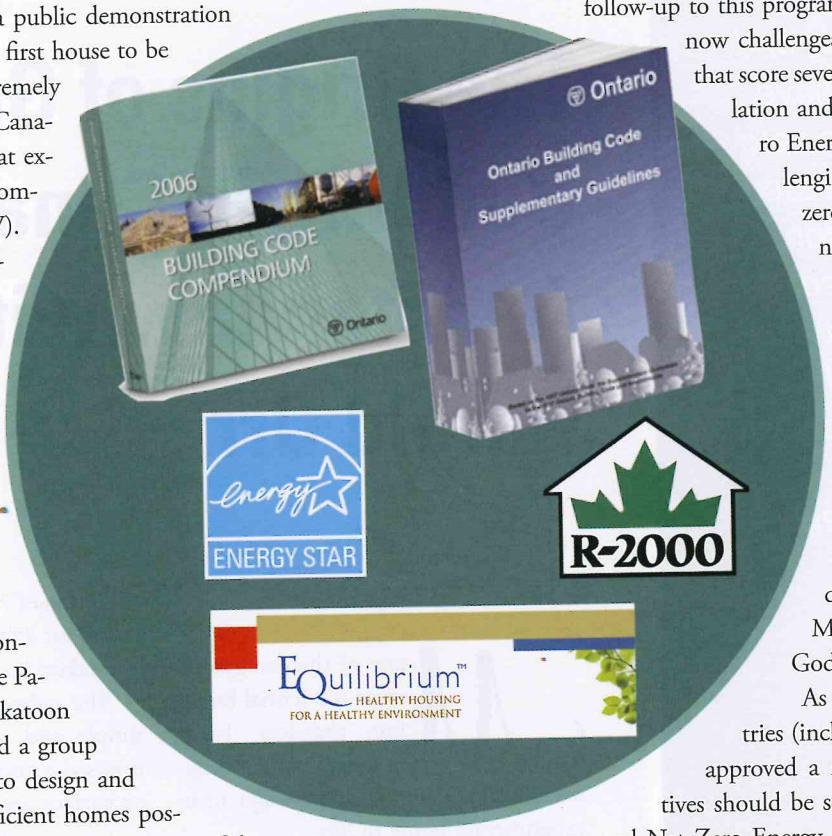
In 2006, three years after the formation of a new Liberal government by Dalton McGuinty, changes to the code made its energy-efficiency requirements the highest in Canada and among the highest in North America. With its final improvements coming into effect January 2012, new homes will be 35 per cent more energy efficient than those built in 2006, and new commercial buildings will be 25 per cent more energy efficient. Using the NRCan EnerGuide for Houses (EGH) rating system, average homes have gone to a rating of 80 or equivalent, up from a rating of about 73. Using the more useful and internationally recognized scale, this is equivalent to a HERS rating of 63, where a rating of 100 is defined as the current building code minimum requirement.

An interesting but not well-known feature of Ontario's "Green Energy and Green Economy Act" of 2009 was the establishment of a Building Code Energy Advisory Committee. The mandate of this committee is to specifically advise the minister responsible for the building code on standards for energy conservation.

Voluntary programs promoting homes that are more energy efficient than the minimums required in the code have played a key role in making Canadian builders among the best in the world. They have also helped give governments the confidence to continually improve the minimum standards in the code. The minister responsible for making the last code change, the Hon. John Gerretsen, was certainly influenced by the fact that five builders in his home town of Kingston, Ont., were already building homes that exceeded EGH 80.

The energy crisis of the 1970s spurred other regions of Canada to demonstrate new methods and new energy technologies in an in-

tegrated way. Perhaps the "godfather" project that had a lasting national impact on Canadian housing was the Saskatchewan Conservation House, developed by Harold Orr. This home was built in Regina and opened as a public demonstration project in 1978. It was the first house to be super-insulated and extremely airtight, and the first in Canada to have an air-to-air heat exchanger installed (now commonly known as an HRV). The home was so energy efficient that it had no furnace. Dennis Rogoza, who led the project as the head of Saskatchewan's Office of Energy Conservation, has said that "this house was so energy efficient that if you struck a match you would break into a sweat."



The success of the Conservation House led to The Parade of Homes held in Saskatoon in 1980, which challenged a group of conventional builders to design and build the most energy-efficient homes possible for the commercial market. This successful project, in turn, led to the creation of the R-2000 Program by the federal government in 1982, which, interestingly enough, established EGH 80 as its minimum energy-performance requirement. Initially, such a target was only achievable by a few custom home builders, but two major Toronto area builders, Fram Building Group and Daniels, worked together and certified more than a thousand in a development in Mississauga, Ont. Although a few builders continue to certify their homes to this standard, others are using newer programs, such as ENERGY STAR for New Homes and LEED. Thanks to the leadership of Corey McBurney and others at EnerQuality, about 6,800 new low-rise homes in Ontario, or 20 per cent of all starts, were certified last year.

Technical competitions and challenges have also played an important role in improving building performance. In 1993, Natural Resources Canada launched the Advanced Homes competition and, more recently, CMHC launched the Equilibrium Program. In Ontario, John Godden launched the "Green Builders Challenge" which resulted in 50 builders achieving HERS scores of 50 or under. As a follow-up to this program, the "Envelop Challenge" now challenges builders to create a home that score seven lower through added insulation and air tightness. The Net Zero Energy Homes Coalition is challenging builders to build "net-zero" energy homes; there are now about 45 in Canada, including over.

Another important feature in the success of both mandatory requirements in the code, as well as in the voluntary programs, has been the excellent level of builder training. In Ontario, these programs have been delivered by Tex McLeod, Michael Lio, Al Schmidt, John Godden, and Gord Cooke.

As for the future, the G8 countries (including Canada) unanimously approved a recommendation that objectives should be set for Passive Energy Homes and Net Zero Energy Homes by 2020. The Architecture 2020 Challenge in the United States is calling for all new buildings to be carbon- neutral by 2030.

So, congratulations to the many building scientists, building-code developers/enforcers, produce manufacturers, voluntary program managers/ certifiers, trainers, architects, and designers, but, most importantly, to Ontario's builders, who are "doing it" every day.