

The Efficiency Argument

How builders can make their new homes more affordable **BY GORD COOKE**

There continues to be strong interest in energy efficiency and all things green in the building industry. The progression of code changes since 2006 that leads up to a performance-based energy efficiency standard in 2012 may be seen by some as a burden on the new home industry, especially in these tougher economic times. This view is strengthened by the knowledge that new homes are already much more efficient than older homes (as seen in the accompanying graphic) and more significant savings in energy would come from improving existing stock. Of course, this is being done through popular programs such as the ECO Energy Retrofit Incentive program that many renovators and trade contractors have helped owners of existing homes access to improve their homes.

However, for new home builders it is important to recognize that implementing energy efficiency improvements specifically and green elements generally is just so much easier and cost-effective when building new than in trying to upgrade older homes. So while some builders may see energy efficiency changes in the code as a "Oh no, now what?", there are energy efficiency improvements that can make new homes more

affordable and thus present great opportunities for builders who are inclined to think "OK, what's next?"

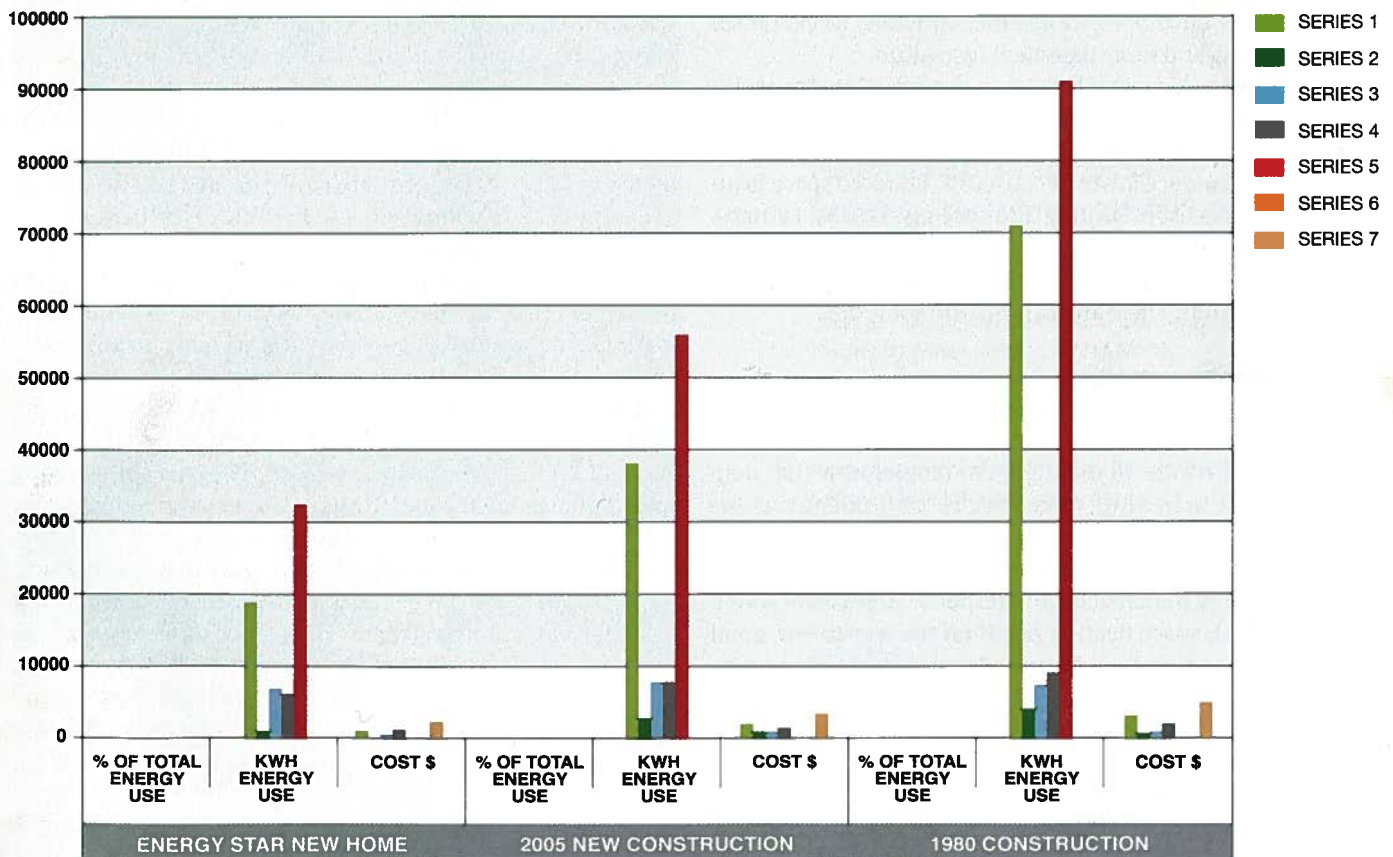
The table shows the energy consumption for a 2,300-square-foot home built to three different construction standards but with exactly the same occupant activity or lifestyle. The only changes in water heating, lights and appliances are the introduction of more efficient lights and appliances in the Energy Star house. This table then shows a couple of important trends:

1. Space heating needs on a per square foot basis are going down. Of course, we have been building bigger and bigger houses. This is a trend that is showing signs of coming to an end with a premium being put on optimizing the use of space by architects and discriminating older buyers.

2. Lighting and appliance energy use is therefore a higher percentage of total household energy use. This is, of course, compounded by the knowledge, that although not reflected in this table, most households are using more appliances and lights.

3. Similarly, hot water use constitutes a higher percentage of energy consumption and again, there is evidence we are using more hot water per capita than ever before.

ENERGY CONSUMPTION FOR A 2,300-SQUARE-FOOT HOME



4. The cost of electrical energy is still quite a bit higher than natural gas, so although space heating still represents over 50 per cent of total energy use, the cost of that energy is currently less than the combined total of hot water, appliances and lights.

These energy trends alone present great opportunities for builders.

THE ENERGY EFFICIENCY TREND PRESENTS GREAT OPPORTUNITIES FOR NEW HOME BUILDERS...IMPROVEMENTS OF 25 TO 30 PER CENT ARE EASILY FUNDED BY THE SAVINGS IN ENERGY COSTS TO CONSUMERS.

Space heating

The \$700 per year in savings achieved by building Energy Star as compared to the 2005 Ontario Building Code levels, means monthly savings of almost \$60 for consumers. Because interest rates are at all-time lows, homebuyers can use that \$60 per month to afford \$10,000 more on their mortgage. This means that the upgrades to the building envelope and mechanical systems can easily be paid for by reduction in monthly energy costs.

The next 30 per cent reduction over Energy Star levels would result in another \$200 to \$250 per year or \$20 per month or approximately the equivalent of \$3,500 to \$4,000 in mortgage amounts. Many builders will recognize that this extra investment would pay for at least a few high performance features such as tighter envelopes, more efficient HRVs, thicker insulated sheathing and more basement insulation.

The most knowledgeable builders realize that significant cost trade-offs are available when implementing high performance features. Advanced framing optimizes wood use and improves thermal performance lower overall costs. Reduced space heating reduces the cost of heating and cooling systems. Perhaps, most importantly, the evidence is in that high performance homes dramatically reduce warranty claims and improve customer satisfaction. These are real win-win solutions.

Water heating opportunities

There are many new water heating technologies available to builders and their homebuyers. Tankless, condensing tanks, wall hung boilers are all mature technologies now that help meet the ever increasing expectations of homebuyers for quicker access to more hot water. These technologies offer at least a 30 per cent improvement in energy efficiency, while increasing the capacity and response time to hot water. Moreover, with space heating needs on the way down, good water heating systems can be turned into combination water and space heating appliances. This presents an opportunity to reduce capital cost of HVAC systems and increase overall energy performance.

Basing heating systems on hot water has another important advantage. Water is an ideal medium for storage and multiple energy source inputs. With time of use energy rates for electricity

at the ready and the availability of cost-effective solar hot water systems, heating hot water a variety of ways and then storing it for later use can provide significant savings to building owners. This will be of particular value in multi-family projects where water use is an even higher percentage of total energy use.

Lights and appliances

The relatively high cost of electricity coupled with ever increasing demand for appliances and electronics can be mitigated to some extent by more efficient lights and appliances. Clearly builders will find growing interest by consumers in Energy Star rated appliances. When they buy a new efficient home they will want to start with a clean slate of efficient appliances as well. This is a great opportunity for builders to show their commitment to energy efficiency at very little cost or risk – simply offer people options for better lighting and appliances.

Builders and consumers, however, are beginning to ask "What about solar, is it ready, is it cost-effective?" The Ontario Green Energy Act is certainly trying to make it so. At the time of writing this article, the Act, if passed would increase the feed in tariff for solar energy to over \$0.80 / kWh from \$0.42 / kWh. That is, consumers will be able to sell back solar energy to the grid for seven to eight times the normal billed rate. Builders need to be ready for this important trend. One simple idea was developed by a forward thinking builder in St. Thomas – Doug Tarry Homes. They make their homes "Solar Ready." Some simple preplanning, small modifications to roof design and placement of conduits and switching centres and for about \$300 per house, their clients feel satisfied that they will be able to take advantage of future solar advancements. This simple concept was so intriguing that Natural Resources Canada has developed a specification sheet and information brochures on it. Go to www.newhomes.nrcan.gc.ca for more information.

In summary, the energy efficiency trend presents great opportunities for new home builders. Efficiency improvements of 25 to 30 per cent are easily funded by the savings in energy costs to consumers and in some cases there are cost reductions that help mitigate material costs. The challenge is to get started, investigate what other builders are doing across North America, challenge trades to change techniques and materials, educate salespeople so they can educate homebuyers. In fact, the Department of Energy in the U.S. has issued a Builders Challenge to the industry. The goal is to help the industry offer "net zero energy" houses anywhere in America at no additional cost by the year 2030. They are approaching the challenge in steps, each step a 30 per cent reduction in energy use. This, in my opinion, is a great starting point. We should all challenge ourselves to find ways to improve housing performance by 30 per cent. If you fear consumers won't be interested, simply ask them "How much money would you like to be wasting on energy each month?" Then show them how the incremental costs for improving energy efficiency are immediately paid for by lower monthly energy bills – the best investment anyone could make. **OHB**

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