



Who's Afraid of the Big Bad Furnace?

By Greg Labbe

There are simple lessons in folk tales and traditional stories that are retold and reinterpreted time and again. I want to try a modern building-design read on the tale of the Three Little Pigs.

If you read carefully, you will see there was never much debate about straw-bale versus wood-framed versus full-brick construction. The focus was, rather, about durability, quality, and resiliency of the building envelope.

As for the wolf, I think he represents a depleted environment and our concerns about energy security personified in the big, bad utilities cutting you off, because you can't pay your bills.

The moral I take from the story is that you should invest in a quality building envelope, one that keeps the energy wolf at bay. Customers will always say they can't afford this or that upgrade, especially when it's for something as unspectacular as the building envelope. But, I have always looked to OBC codes for what they are: bare minimums for comfort and envelope performance. That is my starting point and then I look at where my maximums could be and find a realistic spot somewhere in between.

My belief in the importance of the building envelope was reinforced recently as I was insulating a home on a bitterly cold January

day. I've been in the insulation business for more than 12 years. I've worked with old and new houses, some had insulation, some didn't; but what they all had in common was at least one large heating system chugging away come winter time.

I was working on a major retrofit of an older home. These homeowners did their research and they didn't blow their budget on granite counter tops, but, instead, they wanted to perfect the home's thermal envelope. They had the rather impressive goal of retrofitting a 1950s house to the Passive House standard.

Naturally, I poured a lot of insulation into the second-storey roofline, so much so that, while it was -10°C outside, it was more than 15°C inside, with only a 1,500W plug-in electrical heater (not much better than a glorified hair dryer) running in the basement. The question I had, since there was no conventional heating system chugging away to keep the place warm, was: "Why do we even need one?"

This was an unfinished shell, with only a third of the insulation installed in the walls, yet the place was just as warm as some of the rooms in my own 1920s, double-brick house in Toronto.

I have been looking into the Passive House concept along with a colleague, who studied the standard while going to school in Germany. And, I admit it takes a bit of time for the enormity of the concept of no conventional heating system to sink in. But in that little retrofit on a cold January day, I began to really understand what it meant. In

the same way I now fully understand the story the Three Little Pigs.

Though variations in the tale exist, I will sum them all up to say that the two pigs who built simply to code minimums, hoping their oversized HVAC system would save them, ended up taking refuge in the third pig's house. So, I would not be surprised if, one day, this Passive House retrofit homeowner could have a house full of unexpected guests, including those who thought they had renovated sufficiently by getting a high-efficiency furnace. I'm specifically thinking of the way folks got to know their warmest neighbours after the infamous 1998 ice storm in Quebec.

I also want to talk about the classic drawings of the various pigs' houses, because there is a lesson there, too. They were only as big as they needed to be and of a thermally simple design. That may be a result of the fact that heat loss is a function of a home's surface area, not its volume. The surface area of a home is increased by adding dormers, overhangs, and extensions, which results in added thermal bridging. Insulation is vital, but design is also key to keeping the wolf at bay.

The trends in the United States are showing that more new home buyers are opting for smaller houses and are happier as a result¹. This is something Sarah Susanka has been reinforcing in her book series *The Not So Big House*. Susanka essentially says build small. And what you save in materials and labour, plough it back into a great design with personalized features - something that speaks volumes about you and how you want to live your life.

I have long been a fan of traditional wisdom. I think there is a lot to learn from the past, even the recent past, like the 1970s, if you know where to look. With a small footprint and basic design, R60 attic, R44 walls, R60 basement walls, and R30 insulation under the

basement floor, the 1977 Saskatchewan Conservation House needed no conventional heating system. And, it was built in Regina, which has a designed degree day rating of 5661! Seems we forgot about that one, and, to a certain extent, we gave up on the quest for radically energy-efficient housing when cheap energy prices returned in the 1980s.

More than a decade later the Germans and Swedes refined the concepts used in the Saskatchewan Conservation House by creating the Passive House standard. Their approach was simple: instead of trying to figure out which heating system will compensate for a poorly insulated, leaky envelope, they wondered what kind of building envelope was needed to minimize the heating system. This was their new take on an old familiar tale. With regard to the building shell, the base-line heat-load assumption in the Passive House standard is 15 kWh/m²/year, and the building shell is tight down to 0.6 ACH @ -50 Pa. The average Ontario house has about 10 times the air leakage and consumes 10 times more energy - or 170kWh/m²/year.²

I like to think the third Little Pig knew that HVAC systems last 10 to 15 years, but home envelopes last 100 or more. So, I urge you to take another look at your building envelope and consider the lessons of the Three Little Pigs: build a well-insulated shell of simple design, with minimal thermal bridging and air leakage, and the Big Bad Wolf will never be at your door.

Greg Labbe is the Director of Green Consulting and New Home Rating at GreenSaver, a not-for-profit company dedicated to improving the built environment. He was the head of GreenSaver's home insulation division, until opening the consulting and rating division in 2011. www.greensaver.org

Enbridge Ranks as a World Leader in Green

By Lenard Hart

Enbridge is currently ranked as the top Canadian company in the World's Top 100 Sustainable Businesses.*

It's hard to say whether it's better to be No. 16 in the world or No. 1 in your own country, but Enbridge is both.

For the past decade, Enbridge has supported many green activities in Ontario and in other parts of Canada. But, it was a surprise to me they are so far along the path to becoming a sustainable business.

In the past, I've had the pleasure of working with Enbridge on the R2000, EnerGuide for Houses, ENERGY STAR for Homes, low-income housing, drain water heat recovery, the, and the High Performance New Construction programs, as well as the Green Building Festival, at least a dozen integrated design charrettes, and a solar hot water, measurement program and, now, as a sponsor of this magazine. Such international recognition is rare for any Canadian company, and we at Sustainable Builder Magazine wish to congratulate Enbridge and all eight of the Canadian companies that made this prestigious list.

Top Canadian Companies	Rank	CO2 Productivity Sales (\$) divided by CO ² (tonnes)	Leadership Diversity % of Women on the Board of Directors	% Tax Obligation Paid in Cash	Country
Enbridge Inc	16	\$3,782	15%	62%	Canada
Encana Corp.	25	\$2,819	20%	64%	Canada
Sun Life Financial Inc	50	\$397,663	25%	100%	Canada
Nexen Inc	59	\$1,953	8%	70%	Canada
Transcanada Corp.	65	\$630	15%	84%	Canada
Toronto-Dominion Bank	68	\$244,577	25%	100%	Canada
Royal Bank Of Canada	71	\$255,324	20%	100%	Canada
Telus Corp.	88	\$28,012	8%	0%	Canada

* Analysis for the Global 100 was based on the work of a group of sustainability research providers. The top 10 per cent of sustainability and financial performers from a global universe of 3,500 stocks were identified, and these were then ranked by a set of Key Performance Indicators (KPIs) calculated using environmental, social, governance (ESG), and financial data collected by Corporate Knights Research Group and verified with The BLOOMBERG PROFESSIONAL® service.