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A Chat with a “LEED” R

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A HOME 60% MORE EFFICIENT

There is some confusion today with all the different energy rating programs that are advertised for homes. Eco-Energy, EnergyStar, GreenBuild and R2000 to name just a few of these programs. These programs are mostly designed to rate the energy efficiency of the home. There is one program however that goes far beyond that to look at the home as a system and its environmental responsibility. About 15 years ago the United States Green Building Council was formed and they developed what is known as “The Leadership in Energy and Environmental Design Green Building Rating System” or LEED for



short. The program began with a rating system for commercial buildings. In 2002 this system was introduced in Canada by the Canadian Partner of the USGBC.

What makes a green home?
It should be resource efficient,

healthy, durable and environmentally responsible. A LEED certified home takes all of this to another level, greatly reducing your energy and water bills. Water is basically ignored in all the other programs. Reduced green house gas emissions; LEED promotes near zero and net zero homes. Extensive testing for air quality conditions, cost efficiency and lastly a concern for a sustainable community including best assembly practices available today. The LEED for homes program is new; it was for-

mally introduced by the CaGBC on April 9th 2009 in Vancouver.

I sat down with Jeremy Neven from Tackaberry Heating & Refrigeration Supplies recently to talk about the LEED program for Homes. Jeremy is a LEED Rater for Homes. Jeremy has been involved with evaluating homes for some time and is involved in the EnergyStar rating program. I asked Jeremy what he thought the future held in the LEED Program. He stated that the consumer awareness for energy efficient homes has seen considerable interest in the past couple of years. It represents a lifestyle change for many people, one we must make he remarked. He noted that the LEED rating system can make a home over 60% more efficient than a standard Home built to the Ontario Code. He went to note that while the up front costs are higher, you start to save on energy costs from the first day and over a lifetime this cost is recovered many times over. Even adding this additional cost to a mortgage will be recovered in a reasonable time frame.

Jeremy went on to describe just how different the LEED for Homes Rating System is. It is made up of 8 sections, each one rating a specific portion of the home. Each of the sections accumulates points; the total of these points gives a home it rating. A silver Rating requires 60 points, Gold, 75 points and Platinum requires 90 points out of a possible 136 points. The First Section is innovation and design. The builder or project manager must integrate the trades and plan for the most durable home with specific attention to solar design, both passive

IT IS MADE UP OF 8 SECTIONS

and mechanical. Second Two is on location, a socially responsible site must be chosen. In Section Three called Sustainable Sites, attention to the impact of the actual construction is rated. Section Four is specifically related to water conservation, both from the building exterior and its occupancy use. Section Five has the largest number of points for any section, 38. In this section the builder must assemble a well insulated and tight building envelope with efficient heating and cooling systems. Section Six is called Materials and Resources, its objective is to reduce waste and utilize as many green certified products as possible. The third largest section for points is number Seven, Indoor Environmental Quality. The builder must integrate ventilation systems to improve air quality, even the installation of EnergyStar appliances. The last section is the smallest in points but I agreed with Jeremy that this one is very important. Section Eight covers awareness and education. The builder must complete a manual for the homeowner so they fully understand their LEED home.

Jeremy's last comment was striking "We don't inherit from our ancestors-we borrow Mother Earth from our children", well said. Jeremy currently has three homes that are just starting the LEED process, in future columns we will visit one of **these homes. I would like to express a special "Thanks" to Jeremy and Tackaberry's for me allowing me to take the time out of his workday for this column.**

The LEED for homes program must become the standard for new homes. More and more builders are joining CaGBC. I proudly belong. It is however the consumer who must request these homes and encourage the builders that construction of energy and resource efficient homes that are healthy to live in are the homes of the future.

GATHERING THE "LEED" POINTS

The Leadership in Energy and Environmental Design or LEED as it is known has set a standard that will become the measurement for environmentally responsible homes in the future. Right now the Canadian Green Building Council (CaGBC) who oversees the LEED program is teaching builders and consumers about LEED and its many advantages. I chuckle when I see ads for some new homes advertising a list of energy efficiencies. In fact most of these will become code required when the new minimum building codes come out next year. R 2000, Energy Star and EcoEnergy are recognized systems for measuring how energy efficient a home is. While this is an important improvement it is far from the level of environmental values we must **reach. The eight points in the "LEED for Homes" program addresses all of the environmental impact every new home built has on our world. The CaGBC recognizes that explaining the LEED program and how the points system works is part of the development process.**

Fortunately I am involved in a "LEED for Homes" building right now. I am going to walk you thru the system of collecting points to attain the recognized levels of certification. There are four levels, certified, silver, gold and platinum. Other than locations each area of certification has prerequisites built into the section. If you do not attain them, you cannot certify your home. By creating the levels, it will make easier for a homebuyer to quickly recognize the overall performance of this particular home. A study done in Western USA where the LEED program is more advanced than in Canada it was found that a LEED home sold for nearly 15% more than a conventionally assembled home that included the energy improvements package.

The first section is the Innovation and Design Process. Instead of one builder hiring the trades, taking a set of plans and building the home you must have an Integrated Project Team that is comprised of no less than 4 professionals with extensive building background and education. Durability planning and management is a requirement. You must agree to third party



NEW MINIMUM BUILDING CODES COME OUT NEXT YEAR.

verification and this is done by a LEED rater in the field who is working with the actual LEED program provider. The LEED rater returns to the site at specific times to check on the project to be sure its following the verification process. If you have innovative or regional design features you can ask for points in this section. This section is worth a maximum of 11 points.

The second section is designed to credit a LEED builder who utilizes existing infrastructure, proximity to transit or previously developed land. Attention to neighborhood development is stressed here; the section is worth 10 points.

Next on the list is Sustainable Sites. There are two prerequisites here, erosion control and no invasive plants during landscape work. Use of local plants and shrubs is preferred. Surface Water Management and density of the buildings helps considerably at reaching the 22 points available.

Water Efficiency is the fourth section, harvesting rain water and reusing it for toilets or in irrigation along with bathroom fixture conservation accumulates 15 points here. Energy and Atmosphere offer the highest level of points, 38. In this section the Energy Star rating system is used as the prerequisite for this section. One area that is not in the Energy Star rating is refrigerant testing and this is a prerequisite here. The higher the HVAC rating, the more points the builder can receive.

Materials and Resources rank number four with respect to the number of points at 16. One prerequisite is limiting the waste from wood framing the home. The preferred method is off site fabrication where controlled cutting is easier than on site. There must be a waste management plan in place and a minimum level of recycling is required. Any imported wood used must be FCS rated to ensure its environmentally acceptable flooring or trim for example. Use of bamboo flooring is one way to attain some points here.

Indoor Environmental Quality ranks number three for points, 21 are available here. The home must have combustion venting, outdoor air ventilation and exhaust. Proper air filters in furnaces and the HRV gains points here. One area 99% of builders never consider is reducing the contaminants during construction, mostly from foot traffic. At our project we have to lay down proper mats and supply shoe racks for the trades to remove their footwear. Garages are another ignored area. Reducing pollutants and adding an exhaust fan gain 3 points here.

The last section is one that is sore fully ignored, Awareness and Education. Well over 75% of all HRV units we see in residences are ignored. Filters are usually plugged and the interior of the cabinet is filthy. This LEED section awards 3 points for training the homeowner or the building manager in the case of a small apartment or townhouse complex. They are given an Operations Manual that lays our weekly, monthly and annual maintenance on the building. This is a prerequisite for LEED.

Builders can also gain points for public awareness. In the case of our project we will have a trailer on site that is open to the public. It describes how the Seniors Town Homes are being built and explains the LEED process, tours are available.

Once the residence is finished the LEED rater returns to complete his final report and accumulate the points. The project must meet the 18 mandatory measures and 16 points must be



**LEED for Home
Platinum Sample**

Insulation: Walls, R-21 dense-pack cellulose; ceilings, E-49 loose-fill cellulose
Heating system: Radiant floor and woodstove
Cooling system: None
Windows: Thermotech triple-glazed; U-factor 0.15
Green splurge: 2kw PV and solar hot water (\$30,000)

GREEN RATING	POINTS EARNED/AVAILABLE
Innovation and design	9/9
Location and linkages	3/10
Sustainable sites	15/21
Water efficiency	10/15
Energy and atmosphere	27/38
Materials and resources	14/14
Indoor environmental quality	15/20
Awareness and education	2/3
Total score	95/130

achieved in four categories. A Platinum home needs 90 out of a possible 136 points, a gold home requires 75 and a Silver home should have 60 points. These are base levels, they can be adjusted up or down by the size of building for example. By way of a third party confirmation the prospective buyer is assured the home has reached this level of

certification. While energy efficiency is a good step, this area represents just over a 1/3 of the points in a Platinum home. Modern Builders have a long way to go yet; at least the path is now defined for them to follow.

A CHAT WITH THE “LEED FOR HOMES” COORDINATOR

I recently had the opportunity to chat with Chris Higgins in Vancouver. Chris is the “LEED Canada for Homes” Program Coordinator. There is considerable interest in the Canadian Green Building Council (CaGBC) and the “Leadership in Energy and Environmental Design” or LEED Program as it is known. It is rapidly becoming the accepted standard for commercial buildings and with the new “LEED for Homes” standards that was announced in March of this year the CaGBC is following their American counterparts in development of environmentally responsible residences.

Chris joined the CaGBC just under 2 years ago, arriving with a background from business and store planning, along with project management. Chris first gave me some background on the program. Initially the CaGBC put together a 12 man committee for a case study. This core committee contained well recognized representatives from the Home Builder Community and Government Organizations like CMHC. They compared the USA standards to our building methods and codes. Many things were

LEED FOR NEIGHBORHOODS

different, plumbing standards and evaluations for radon were two major issues. Changes in the LEED for Homes energy and atmosphere section with respect to air conditioning standards were one other area that had to be changed. Fortunately our EcoEnergy standards and the fact we use the Energy Star program made some parts quite compatible. Out of this committee **arose the beginning of "LEED Canada for Homes"**



My next question was directed at the actual facilitating of the program. Chris explained that they will continue with the Provider, Rater and Accredited Professional (AP) structure, not unlike the LEED Commercial Program. Anyone who is considering a LEED home will start with a Provider or an AP. The Provider is the company that registers the actual new home and is the direct line to the CaGBC. The Provider hires the actual raters who do the field work on site. They complete the applications, provide internal answers on a project and once the Green Rater Training Program is operational will actually take applications from anyone interested in becoming a rater. Right now a rater must be certified as an Auditor for R2000, EcoEnergy or EnergyStar. CaGBC recognized that in order to get the program up and running they would have to accept a recognized audit standard that is used in Canada.

The "LEED for Homes" Rater works as the liaison between the builder or a construction management company, whoever is building the LEED home. They are all presently certified in a Canadian recognized energy audit system. They help prepare the application that projects the level of certification, silver, gold or platinum, that the home will attain. They monitor the project and complete the necessary records to ensure that once the project is completed it complies with the level of registration projected. They also handle any questions that may be answered in the field or will require going to the Provider for confirmation. This portion of the "LEED for Homes" is currently in place with Providers and Raters available right across the country.

The Accredited Professional status (AP) is in full operation in the USA, its will be well into 2010 before it is fully in place in **Canada. The idea behind a "LEED for Homes AP" is to provide custom builders and homeowners who wish to build their own home access to a trained professional who is highly knowledgeable in green building and the installations available, the LEED program and preferably skilled in actual home construction. Large subdivision builders will likely have their own AP on staff. An AP will be able to initiate the application and work with the**

Rater in completing the actual building of the home. Construction Management Companies will likely be among the first on board here; my own company is for example.

I then asked Chris to describe their future plans. At the moment they have nearly 300 homes registered in the program. By 2012 they hope to have 15,000 homes a year going thru the LEED program. They fully recognize that the top 25% of the builders in Canada will move this program forward. It is the custom builders who recognize the market and social advantages to this program. In the USA the program has already gained recognition and some occupied homes are coming up for sale. In Seattle for example, a conventional home without the benefits vs. a similar LEED home is selling at a 15% premium and are on the market for a considerably shorter time before they are sold. They are working on pilot programs for smaller mid-rise buildings that are three stories high and they have a pilot on a six story condominium building. They are also working on a **"LEED for Neighborhoods" program which will set a criterion for sidewalks, lighting and communal energy and water systems rather than huge municipal infrastructure systems.**

Public recognition is also important and some municipalities and governments are recognizing the value of LEED homes. One city in Quebec is considering a one year tax break for anyone building a LEED home. In Cincinnati Ohio they offer a 10 year tax break in an attempt to induce more of these homes. I asked Chris why a city would do this and his answer was simple. A LEED home dramatically reduces the use of the city infrastructure for sewers, electricity and water supply. Maybe more cities should take a hard look at this idea.



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