



The Acceleration of Net Zero: How the Canadian Home Builders' Association (CHBA) is Supporting Industry Innovation

Sonja Winkelmann, Director, Net Zero Energy Housing, CHBA

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NZE Housing Council (NZC) Background

- Oct 2013** CHBA Board struck a Working Group *to assess feasibility* of a NZE Council
- Apr 2014** CHBA Board approved the development of a self-funding NZE Council
- May 2014** Sonja came on board as the Director of NZE Housing
- Jul 2014** NZE Housing Council (NZC) Management Committee was appointed
- Sep 2014** First meeting of the NZC Management Committee
- Dec 2014** **Founding Members of the NZC were announced (45 + 11)**
- Mar 2015** 1st meeting of the Council – Year 1 Key Priorities were agreed upon
- May 2015** 2nd meeting of the Council
- Sep 2015** **Launch of the NZ Labelling Program PILOT**
- Oct 2015** 3rd meeting of the Council
- Mar 2016** 4th meeting of the Council (*Start of 2nd Year of the 2-Year Term*)



Net Zero Energy Housing Council (NZC)

The Council supports the CHBA Strategic Priority to **Advance Innovation** in our industry, with the goal of creating a **market advantage** for CHBA builder and renovator members who choose to pursue it.

This will not only help to meet the housing aspirations of Canadians, but renew Canadian world leadership in high performance housing.

The mandate of this self-funding Council is **to deliver services that will support members' voluntary adoption of NZE.**



Barriers to NZE (in “Buckets”)

Marketing and Promotion

- Poor branding, understanding, awareness, and demand
- Difficult to articulate value proposition (sales & marketing)

Competency & Capacity

- Limited education/accreditation and training/skills development

Technical Standards, QA & Tools

- Lack of standards and support tools

Cost Reduction

- High cost to build or retrofit (capital & labour)

Financing & Real Estate

- Lack of appropriate financing mechanisms and/or incentives

Policy

- Limited enabling policy (e.g. net metering, codes and regulations)



NZC Key Priorities for Year 1 & 2

- **A NZE Labelling Program** to distinguish and recognize NZE homes and the builders/renovators
- **Marketing & Communications initiatives** to develop the NZE brand, build awareness and understanding of the value of NZE homes, and stimulate market demand
- **Educational initiatives** to bridge the knowledge gap for early adopters and accelerate builder capacity to capitalize on NZE
- **Financing initiatives** to address the initial cost of NZE homes through innovative and effective financing mechanisms



2015 CHBA Home Buyer Preference Study

Study Facts



- CHBA report produced in partnership with Avid Ratings Canada
- The first nationwide market preference study for the home building industry
- Results released March 2015
- 1,581 new homeowners across six provinces of Canada (BC, AB, SK, MB, ON, NB)
- A significant 13% response rate (average response rates in other countries for similar studies are around 5%, such as the NAHB preference study in the U.S.)
- It provides in-depth insight into what homes buyers are looking for – and **demonstrates the importance of energy efficiency to today's home buyers.**

Buy the full survey results online at chba.ca/buyersurvey



2015 CHBA Home Buyer Preference Study

Top 10 “Must Have” Home Features

1. Walk-in closets
2. *Energy efficient appliances*
3. *Overall energy efficient home*
4. *High-efficiency windows*
5. Kitchen islands
6. Linen closets
7. Open concept kitchens
8. Large windows
9. 2-car garage
10. Walk-in pantry



Buy the full survey results online at chba.ca/buyersurvey



2015 CHBA Home Buyer Preference Study

Energy-Efficient Appliances

- The highest-ranking kitchen feature is **energy-efficient appliances**:
 - 68.4% of respondents rated this feature as a **must have** items
 - an additional 21.5% considered them **really want** items
- For builders who include appliances or offer appliance packages as options, it is important to home buyers that these appliances are energy-efficient, **regardless of age group**.

Buy the full survey results online at chba.ca/buyersurvey



2015 CHBA Home Buyer Preference Study

Overall Energy-Efficient Home

- 3rd highest ranked “must have” item is an **overall energy-efficient home**:
 - 63.7% of respondents rated this feature as a **must have** item
 - an additional 25.5% considered them **really want** items
- An overall energy-efficient home ranks as **important to all age groups** of home buyers.
- An analysis by product types indicates that it is most important to those seeking a single detached bungalow, while somewhat less important to buyers shopping in the high-rise market.

Buy the full survey results online at chba.ca/buyersurvey



2015 CHBA Home Buyer Preference Study

High-Efficiency Windows

- The Interior Features section indicates large windows are an important feature and, needless to say, today's energy-conscious consumers are expecting these **windows to be efficient**.
 - 63.4% of respondents rated this feature as a **must have** item
 - an additional 25.2% considered them **really want** items
- This feature shows **very little variance by age group (important to all)** and ranks as most important in the single-family detached bungalow product and slightly less important in the multi-family attached 2-storey.

Buy the full survey results online at chba.ca/buyersurvey



2015 CHBA Home Buyer Preference Study

Certification

- When asked to rate the level of importance of home energy certification by a designated program (e.g. ENERGY STAR, EnerGuide, Built Green, etc.):
 - 48.7% of respondents consider this a **must have** feature
 - an additional 28.8% rate it as a **really want** item
 - Only 6.0% of respondents feel this is **not important**

Buy the full survey results online at chba.ca/buyersurvey



2015 CHBA Home Buyer Preference Study

Power Generation

- Overall, alternative power generation systems rank low on the preference list for today's home buyers.
- **Solar electric (PV) is the highest-ranking**, but are still only a **must have** feature to 9.1% of respondents.
 - **46.5% of respondents indicate that solar power might be nice if affordable.**
- The **lowest ranking power generation system** is the small-scale wind turbine, with 48.0% of respondents rating it as **not important**.

Buy the full survey results online at chba.ca/buyersurvey



2015 CHBA Home Buyer Preference Study

Back-Up Power Generation

- As Mother Nature's storms continue to make headline news across the globe, **the preference for an emergency whole-home generator** will also be an interesting feature to monitor.
 - The study finds this is **not important** to 33.5% of respondents
 - **However, 41.7% indicate it might be nice if affordable**

Buy the full survey results online at chba.ca/buyersurvey



NZE Labelling Program

Objectives

- Distinguish/recognize NZE builders *and* homes
- Achieve a technical standard (2 tiers: NZE and NZE Ready)
- Track/measure success (ie increase in # of labels)
- Leverage the name recognition and cachet of “net zero energy”
- Develop a program that has technical rigor and simplified administration



Existing Programs



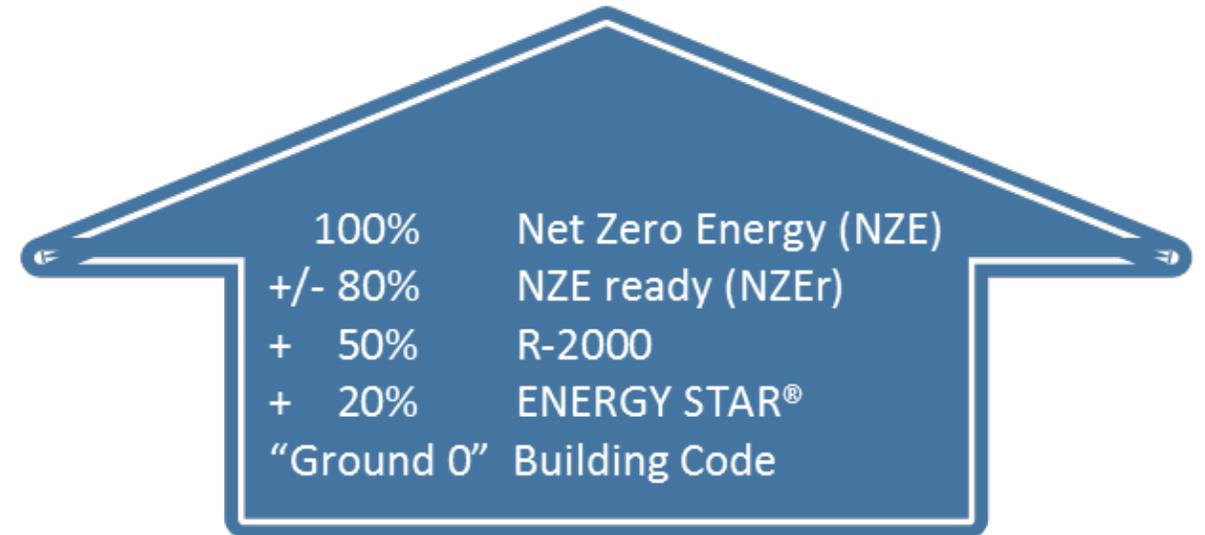


A Full Spectrum of Market Offerings

The CHBA supports a full spectrum of voluntary energy performance levels to provide Canadians with higher performing homes.

These programs present a complete market offering that is applicable to custom and production homes, renovations and low-rise MURBs.

The CHBA NZE Labelling Program has been designed so that a home could still qualify for NZEr, R-2000, or ENERGY STAR® if NZE isn't achievable for one reason or another.





NZE Labelling Program

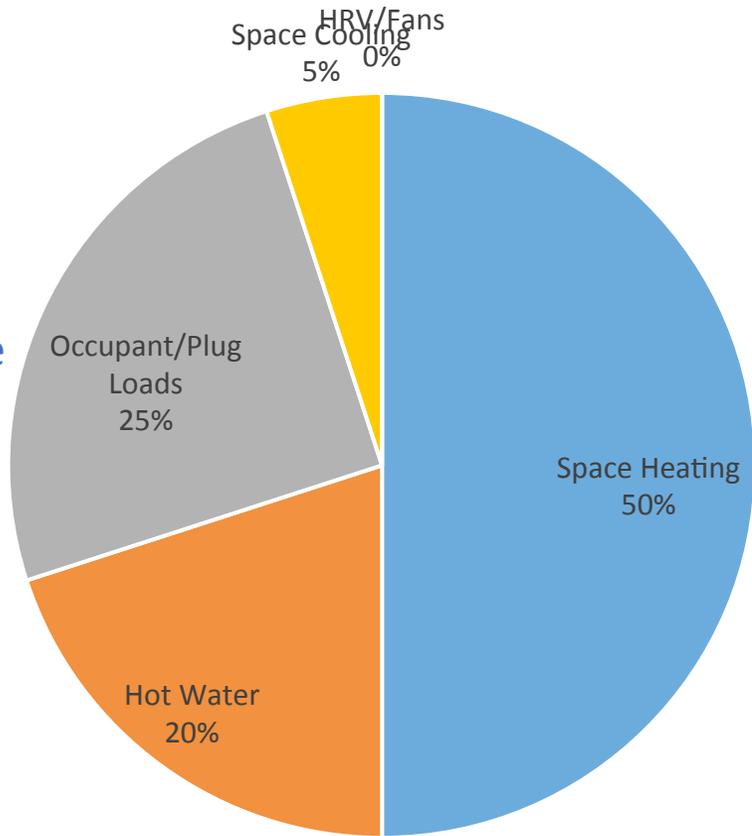
Definition: A NZE home is one that is *designed, modelled and constructed* to produce as much energy as it consumes on an annual basis.

- **NOT NZE “as operated”** – but uses assumptions for occupant consumption (Plug/ occupant loads in NZE homes are between $\frac{1}{2}$ to $\frac{2}{3}$ of total energy use)
- The energy produced is a) generated on-site and b) renewable.
- NZE can be achieved via net-metering AND/OR on-site generation and storage.
- It includes all forms of energy (ie passive and thermal) including acknowledgment of gas and electrical base loads.
- **NZE Ready = A NZE home that has not yet installed the renewables.**

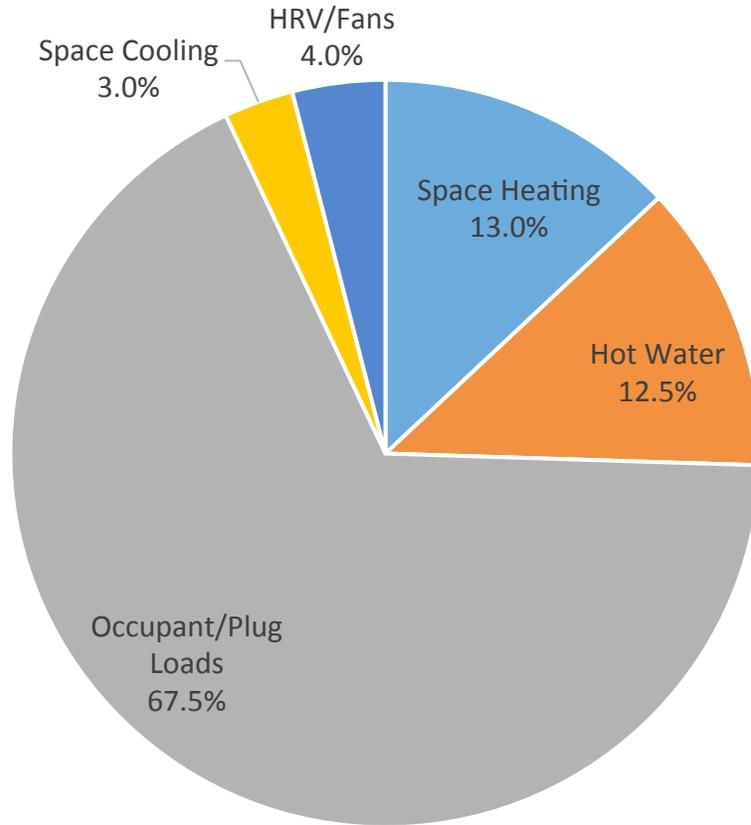


Occupant Behaviour – Biggest Loads!

Standard NBC 9.36 Home



A NZE Home



2011 Average Energy Use
Canadian Households
110-120 GJ/year
Source: [StatsCan](http://www.statscan.ca)

Average Energy Use
NZE Home
36-40 GJ/year

Roof space is prime real estate for PV panels!!!



NZE Labelling Program

A few thoughts about the PILOT

- NZE today is NOT NZE 5 years from now:
 - Developing technologies
 - Efficiency of Renewables in increasing aggressively
 - Balance our aspirational END GAME with a series of balanced steps forward
- What we cannot compromise:
 - Exceptional COMFORT (envelope & passive measures)
 - Enhanced IAQ /IEQ (Control & Conditioning)
 - Durability
 - Minimum maintenance and complexity
 - Affordability



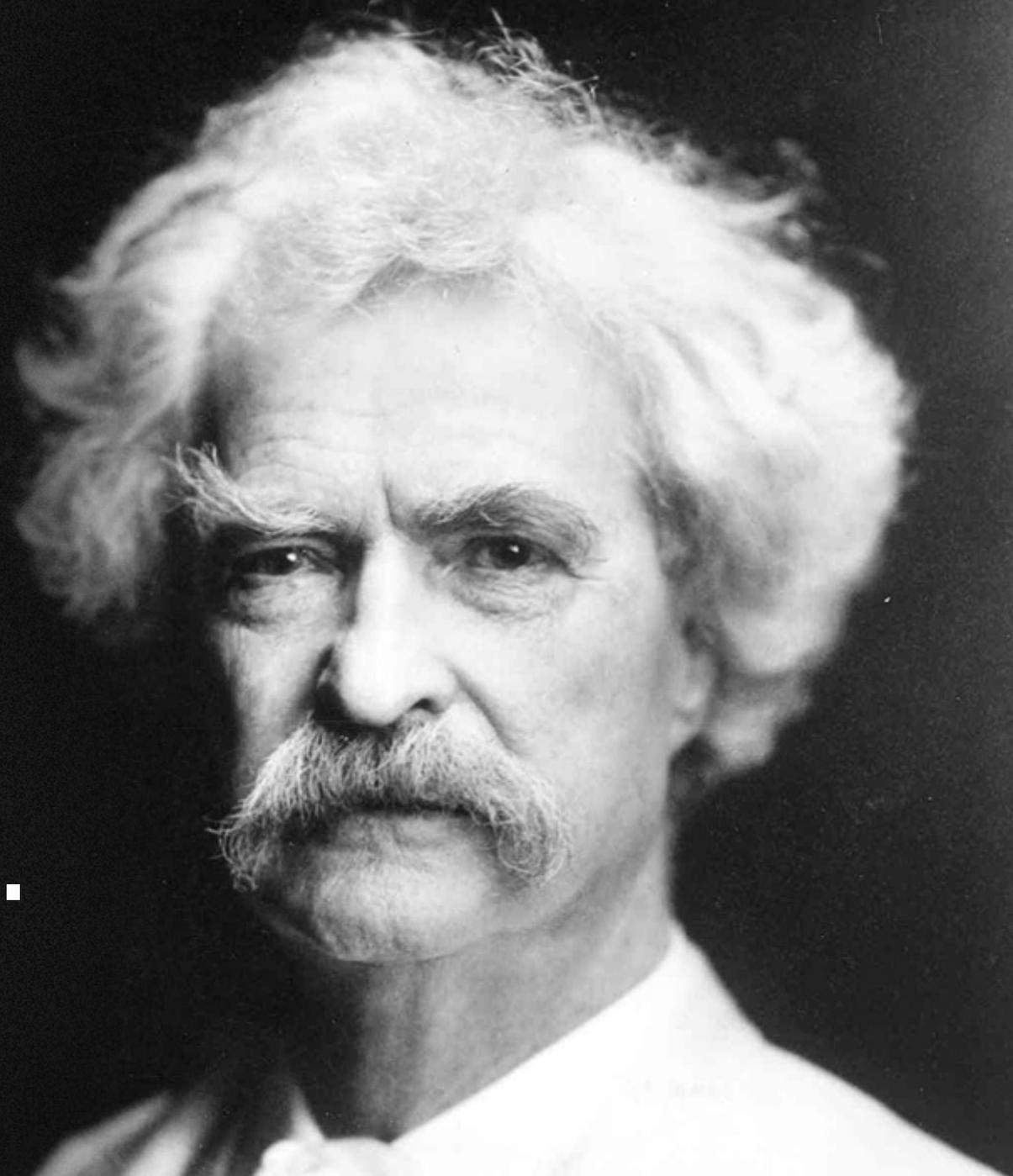


Program Designed for User Experience



Continuous
improvement
is better than
delayed perfection.

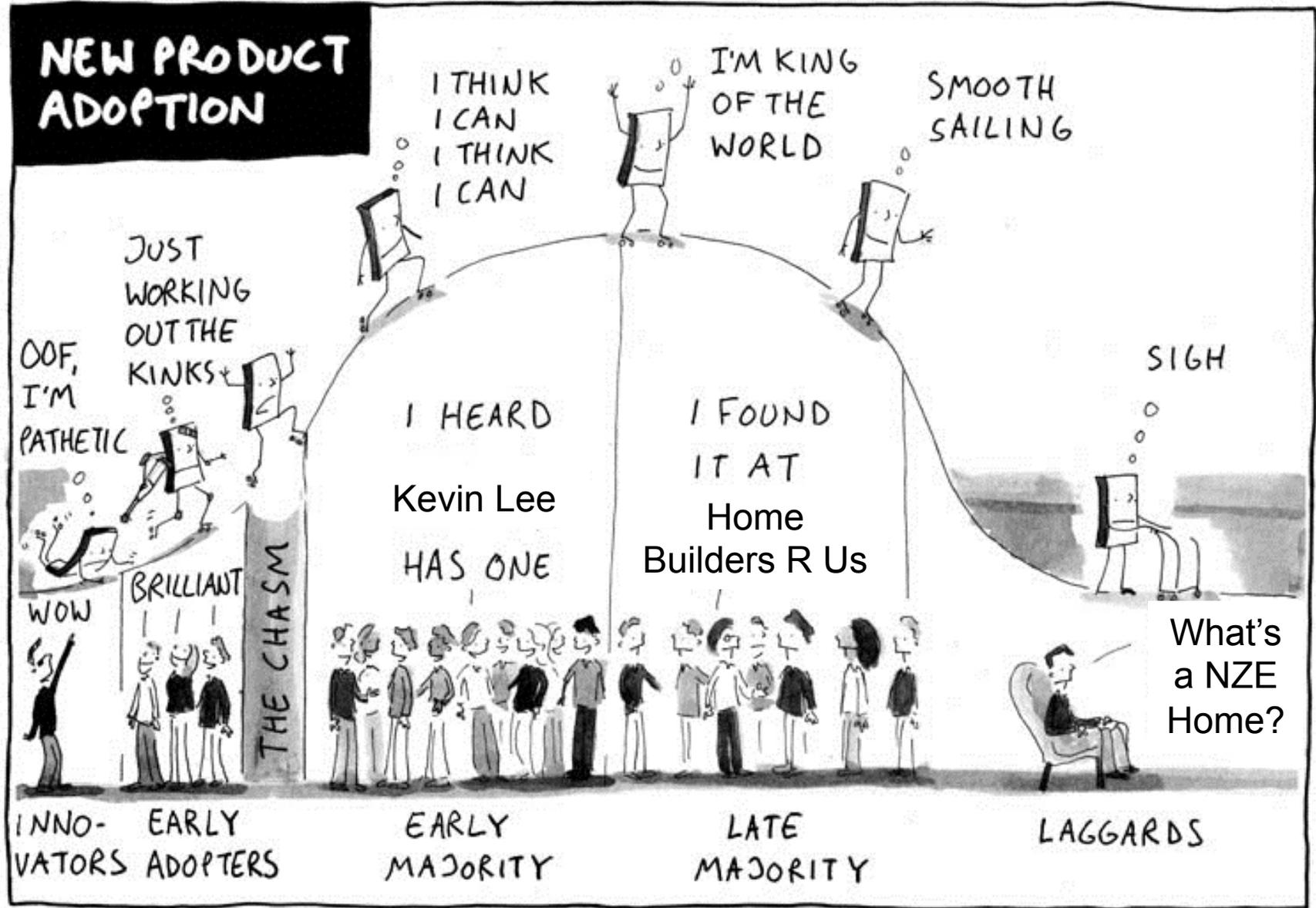
Mark Twain





BRAND CAMP

by Tom Fishburne



© 2007 Thanks to G. Moore

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NZE Labelling Program PILOT

PILOT Technical Specifications for a CHBA NZE Qualified Home

BASE: R-2000 v.12

- + **EnerGuide for Houses** - Net Annual Energy Use ≤ 0 GJ
- + **R-2000 NZE Pilot** requirements (incl. R-2000 v.14 draft)
- + **CHBA requirements:**
 - **NZE:** Renewable energy design evaluation & installation verification
 - **NZE_r:** “Renewable Ready” design evaluation & verification
 - **All:** Energy monitoring device with real time information for consumer
- + *ENERGY STAR[®] v.12 Performance Path min. requirements (OPTIONAL)*

NOTE: One document combining all of the requirements is under development!



NZE Labelling Program PILOT

What have we learned so far about how to get there?

- SIMPLE design – especially the mechanicals!!!
- Building envelope requirement (space heating): 33% more efficient than Building Code (R-2000 is 25%)
- Air Tightness target is 1.0 ACH50 or less (max. is 1.5 ACH50)
- Enclosure design:
 - ✓ Attic R60+ (at least 10" raised heel trusses)
 - ✓ Walls R35+
 - ✓ Below grade walls R25+
 - ✓ Below grade slab R10+
 - ✓ Windows R5+ (triples)
- 8/12 pitch is ideal for PV



NZE Labelling Program PILOT

Potential options to be explored post-pilot

- Daylighting Strategies – to help reduce loads
- Electric Vehicles – not to address transportation but as a storage/backup option
- Battery Storage – for backup and time-of-day \$ optimization

Future Program Development

- Fine tune NZE MURBs and NZE Renos
- NZE Communities (District/Micro Energy & CHP)
- The Water/Energy Nexus - water use affects NZE homes... but how & by how much?



NZE Labelling Program PILOT

Outcome of Pilot: A Voluntary Canadian Standard...

- that clearly defines NZE/NZEr homes for the general consumer.
- with built-in ability and mechanisms which adapts to emerging technologies and consumer expectations, guided principally by the builder industry in partnership with government support systems.
- which is administratively appropriate for all homebuilders including custom homes, renovations, large volume production, and low rise multifamily.
- that provides a ROADMAP to designing, constructing (and possibly operating) affordable, comfortable, healthy, durable and appealing homes for Canadians.



NZE Labelling Program PILOT

Become a CHBA NZE Qualified Builder/Renovator in 4 steps

1. **Membership:** CHBA Membership
2. **Training:** R-2000 and NZE Builder Training
3. **Licences:** EnerGuide and R-2000 licenses (ENERGY STAR® is optional)
4. **Labels & Certifications:** R-2000 v12 certification (includes EnerGuide v12 label) from NRCan (ENERGY STAR® label is optional) and NZE/NZEr label from CHBA

Once your first NZE/NZEr home is labelled you earn the designation of CHBA NZE Qualified Builder. Congratulations!

To maintain this designation, participate in on-going NZE education (TBC during the Program Pilot) and build at least one NZEr home every 3 years.



NZE Labelling Program PILOT

CHBA NZE Qualified Service Organizations (SO)

Our primary avenue for delivering the NZE Labelling Program will be to utilize the existing expertise and infrastructure of the R-2000 Licensed Service Organizations.

CHBA NZE Qualified SOs provide the following services for the CHBA NZE Labelling Program:

- Supporting the builder/renovator to ensure they meet all program requirements, including acquiring NRCan licenses and successfully completing the required Builder Training.
- Delivering CHBA NZE Builder Training, including administering the exam by a CHBA NZE Qualified Trainer.
- Ensuring the home meets all program requirements, including performing Modelling, Testing and Inspections/Verification by a CHBA NZE Qualified Energy Advisor.



NZE Labelling Program PILOT

Current CHBA NZE Qualified Service Organizations (SO)

1. CHBA British Columbia
2. CHBA New Brunswick
3. CHBA Newfoundland and Labrador
4. EnerQuality Corporation, ON
5. Enertest Corporation, ON
6. EnerVision Healthy Housing Choices, AB
7. EnviroCentre, ON
8. HAWK-EYE Technical Solutions, NS
9. Homesol Building Solutions, ON
10. Mindscape Innovations, ON
11. Sun Ridge Residential, SK
12. Sustainable Housing, NS



NZE Labelling Program PILOT

Who can be a NZE Qualified Energy Advisor (EA) or Trainer?

A CHBA NZE Qualified EA must:

- Be an R-2000 Licenced EA
- Have consulted on a successful R-2000 NZE Project (if not, must complete one under mentorship of an EA who has)

A CHBA NZE Qualified Trainer must:

- Be an R-2000 Builder Training Trainer
- Be a CHBA NZE Qualified EA
- Have participated in a review of the NZE Builder Training content with a CHBA NZE Qualified Trainer



NZE Labelling Program PILOT

What happens after the Pilot?

We must first evaluate the results of:

- The NRCan R-2000 NZE Pilot (12 builders invited to participate)
- The ecoEII Owens Corning NZE Communities initiative (5 builders, 5 homes each)
- Our Pilot

***Also:** The Consumer Marketing & Communications initiatives must be complete so we can have the NZE brand, along with key messaging for the various target audiences. This will build awareness and understanding of the value of NZE homes, and stimulate market demand.*



NZE Labelling Program PILOT

Educational initiatives are being developed to bridge the knowledge gap for early adopters and accelerate builder capacity to capitalize on NZE:

- **NZE Networking & Exchange** - For NZC Members only
- **CHBA NZE Builder Training** - EnerQuality is held first session in October and is holding another session in Ottawa Nov 25 & 26 and on Feb 2-3 in Toronto)
- **NZE Webinars** - This webinar is the official launch. More to be announced soon!
- **NZE Builder Boot Camp** - May 2, 2016 in Kelowna in conjunction with the CHBA Annual Conference

The NZC Education Working Group is conducting a needs assessment and gap analysis - and will work with key stakeholders to develop more educational opportunities



NZE BUILDER BOOT CAMP

May 2, 2016 in Kelowna, BC

8:30-5:00 NZE Builder Boot Camp

5:00-6:30 NZE “Business-Building” Networking Reception

In this 1-day intensive Net Zero Energy (NZE) Builder Boot Camp, you’ll hear from experienced builders and Energy Advisors a variety of techniques for how to take a home to NZE performance. Lessons learned in past projects, and the next steps along the “road” to NZE will be highlighted.

This unique event will **dramatically reduce the learning curve of participants**, as well as offer access to experts in four main areas: Design, Envelope, Mechanicals, and Renewable Energy.

Registration now open at www.chba.ca/conference! Early Bird rates end Feb 19!



Contact / More Info

Sonja Winkelmann

Director, Net Zero Energy Housing

Canadian Home Builders' Association

Office: 613.230.3060 x235

Email: winkelmann@chba.ca

Website: chba.ca/NZE

Twitter: [@NZEhomes](https://twitter.com/NZEhomes)



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