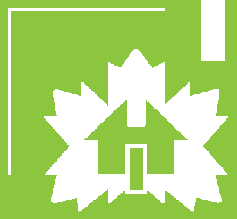
The CHBA Net Zero Home Labelling Program - v1

April 27, 2017



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Webinar Agenda

1. How the CHBA is supporting industry innovation - and why
2. How to become a CHBA Net Zero Qualified Builder/Renovator, Energy Advisor, Trainer or Service Organization (+ the registration process)
3. How a home becomes Qualified and receives a label (+ the registration process)
4. What information do we have for consumers and where can you find it?

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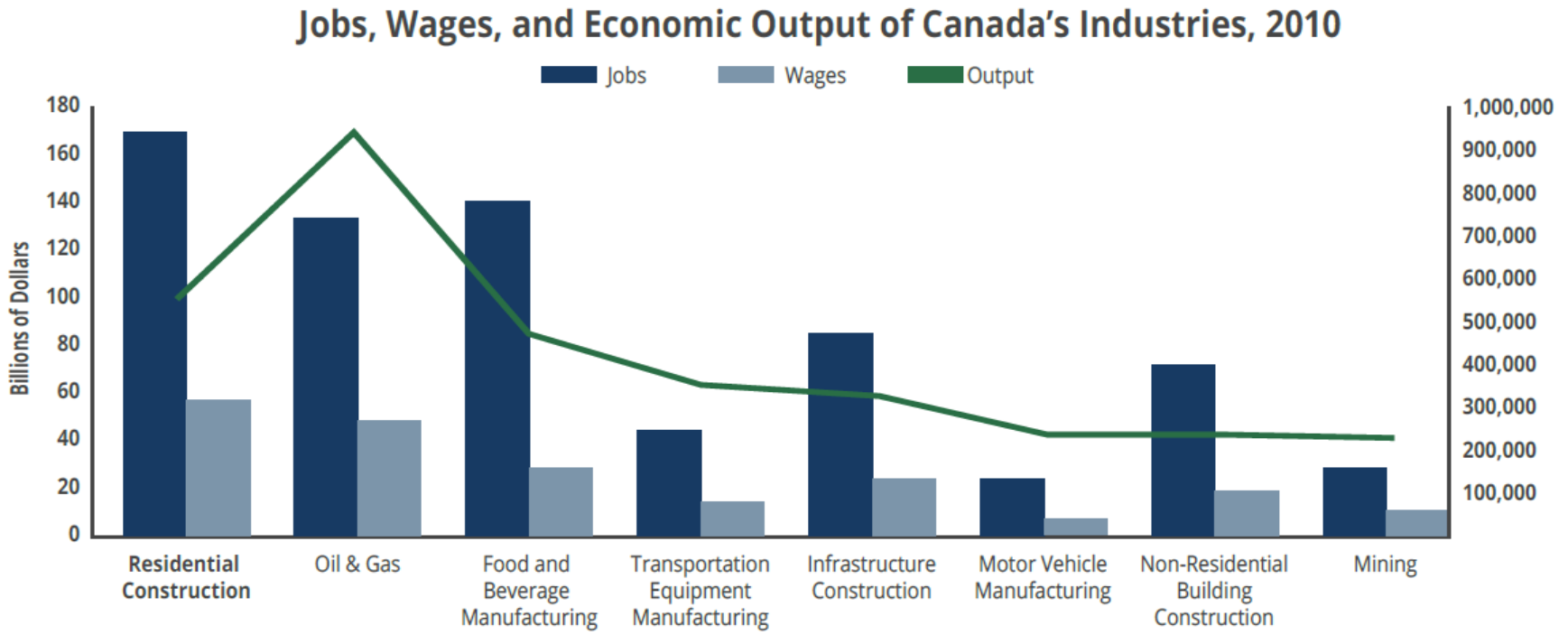
About the CHBA

- Founded in 1943, the Canadian Home Builders' Association (CHBA) is **the voice of Canada's residential construction industry**.
- Representing **more than 8,500 companies across Canada**.
- The residential construction industry is a vital part of Canada's economy in every community across the country:
  - Directly and indirectly supports **1,008,872 jobs**
  - Pays **$58.5 Billion in wages**
  - Generates **$128.7 Billion in economic activity** annually

Residential Construction – Largest Industry in Canada

Residential Construction is the largest industry in Canada, representing **more jobs and economic impact** than any other.



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How the CHBA is Supporting Industry Innovation

- A **Net Zero Energy Housing Council** was established in 2014 to guide CHBA's efforts in high-performance housing.
- 50+ **volunteer members** sit on the Council from various industry organizations across Canada, including NRCan, NRC and CMHC.
- The mandate of this self-funding Council is to **deliver services that will support members' voluntary adoption** of Net Zero Homes.
- Supporting the CHBA Strategic Priority to advance innovation in our industry, the goal is **TO CREATE A MARKET ADVANTAGE** for CHBA members.

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Barriers to Net Zero Homes

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)

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Council Key Priorities (Tools & Solutions!)

The remove the barriers to adoption our efforts will focus on:

- **A Labelling Program** to distinguish and recognize Net Zero and Net Zero Ready Homes and the builders/renovators.
- **Marketing & Communications initiatives** to develop the Net Zero brand, build awareness and understanding of the value of Net Zero homes, and stimulate market demand.
- **Educational initiatives** to bridge the knowledge gap and accelerate the industry's capacity to capitalize on Net Zero.
- **Financing initiatives** to address the initial cost of Net Zero Homes and implement innovative and effective financing mechanisms.

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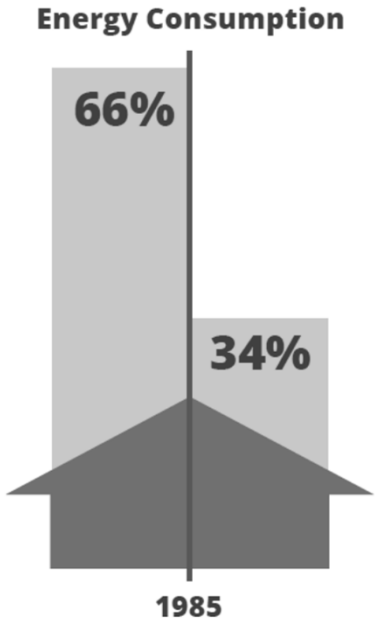
Future Program Development

- Net Zero **Renovations**
- Net Zero **Communities**
- Net Zero **MURBs** (incl. high rise)



The only way to meet climate change goals in housing is through **aggressively tackling retrofits**, where every $1 invested yields 4 to 7 times more than $1 spent upgrading a new home. The half of the housing stock built prior to 1985 uses twice as much energy as the other half of the stock built since then.

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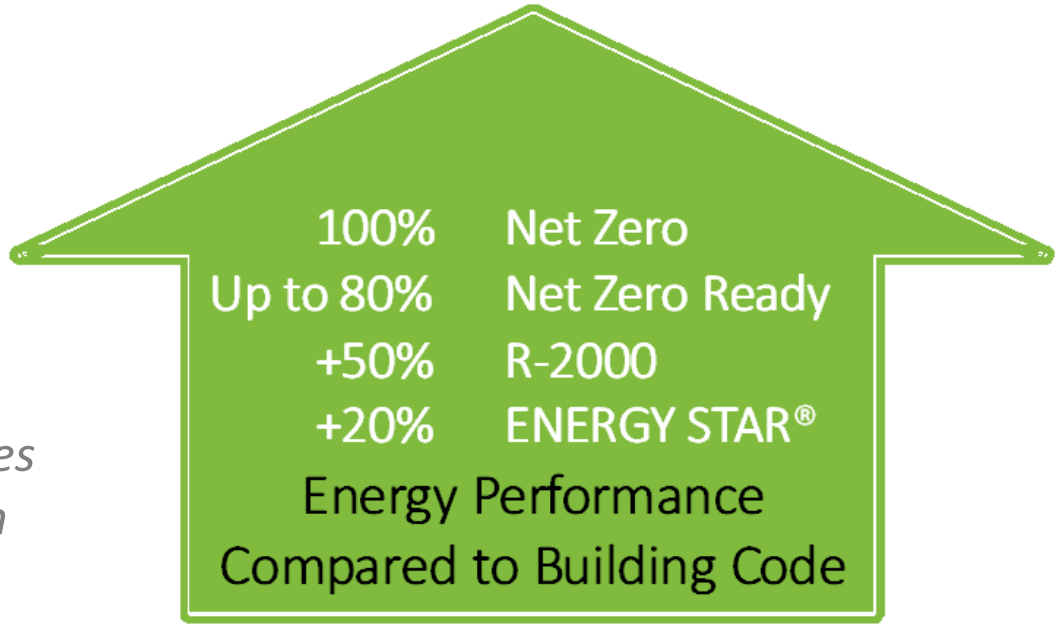
Reviewed Existing Programs

A Full Spectrum of Market Offerings

Over 1 million homes in Canada have an EnerGuide label!



ENERGUIDE RATING SYSTEM

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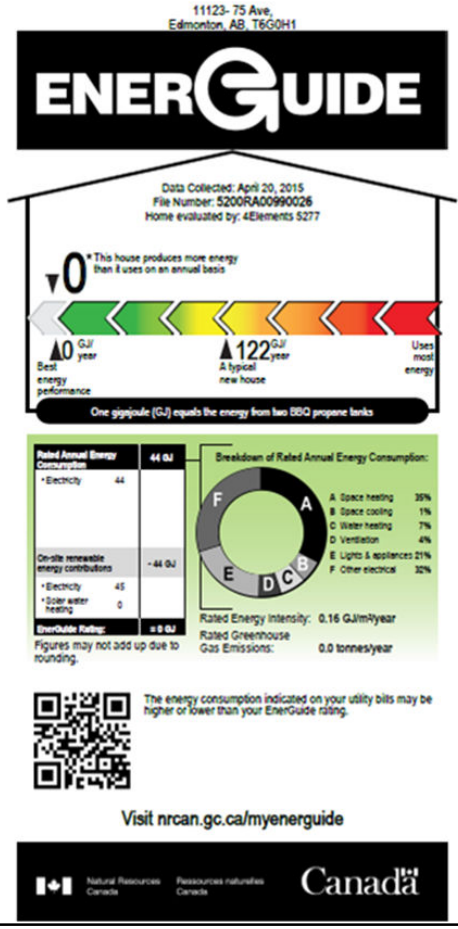
EnerGuide Rating System (ERS v15)



First 0 GJ Label in Canada

Issued by NRCan

to Habitat Studio in Edmonton, AB

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Net Zero Home Labelling Program PILOT

28 homes from 11 builders were Qualified under the Pilot

▪ Reid's Heritage Homes	Guelph, ON	5 Net Zero Homes
▪ Lucchetta Homes	Welland, ON	1 Net Zero **Ready** Home
▪ Doug Tarry Homes	St. Thomas, ON	1 Net Zero Home
▪ Construction Voyer	Laval, QC	6 Net Zero Homes (Stacked MF Units)
▪ Mattamy Homes	Calgary, AB	5 Net Zero Homes
▪ Minto Communities	Kanata, ON	5 Net Zero Homes (4 townhomes)
▪ Effect Homes	Edmonton, AB	1 Net Zero Home
▪ K&P Contracting	Flatrock, NL	1 Net Zero **Ready** Home
▪ Habitat Studio	Edmonton, AB	1 Net Zero Home
▪ Sifton Properties	London, ON	1 Net Zero Home
▪ Sloot Construction	Guelph, ON	1 Net Zero Home

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Initial Costs

EQuilibrium Program

- $120-160,000

Now (NRCan initiatives)

- Net Zero $60-80,000 (15-20% of standard construction costs)
- Net Zero Ready $30-40,000

Some Targets?

- Net Zero $40,000
- Net Zero Ready $15,000

Financial data will be collected on actual costs as well as utility reductions for all home in the program.

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Net Zero Home Labelling Program v1

Program Requirements

1. **Administrative Requirements** for Program participants (Service Organizations, Energy Advisors, Trainers, Builders/Renovators)
   - Agreements (incl. attestations, signed annually with registration)
   - Participant Benefits and Annual Fees

2. **Technical Requirements** for the homes (incl. modelling procedures & guidelines)
   - Space Cooling Information Sheet
   - Building Envelope/Space Cooling (BE/SC) Evaluation Tool (xls)
   - PV System Commissioning Report - for Net Zero Homes
   - PV Ready Checklist - for Net Zero Ready Homes *(NRCan PV Ready Guidelines and Checklist available in May)*
   - Net Zero/Ready Home Labels

Participant Benefits

Participation in this program offers **recognition as an industry leader** for those delivering the next generation of high performance housing to discerning Canadian home buyers.

The CHBA offers the following benefits to qualified program participants:

- **PROMOTION** as an industry leader and program participant on the CHBA website.
- **BRAND LEADERSHIP** of a desirable performance target with a label for each home. (Plaques and other Net Zero Home promotional items will soon be available for purchase online.)
- **KNOWLEDGE** sharing via the Net Zero News and other industry publications.
- **ELIGIBILITY** for CHBA's Net Zero Home Award for homes labelled in the program.
- **ACCESS** to the Net Zero Home sales & marketing tool kit – which will continue to grow.

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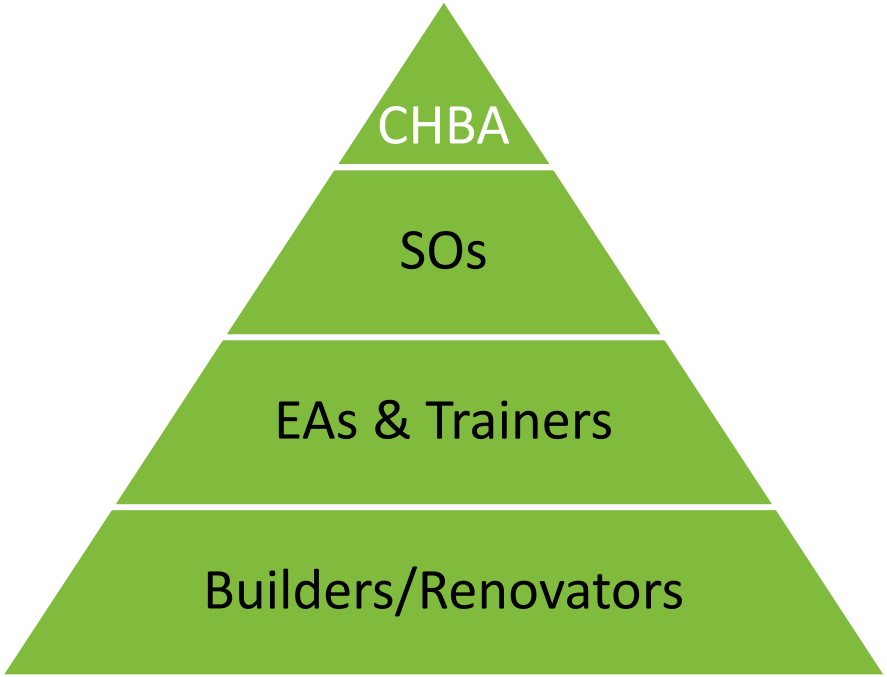
Participant Benefits

- **UPDATES** to the Program requirements and educational offerings based on industry guidance. (Includes training courses, webinars, Boot Camp and networking/exchange events.)
- **COMMUNICATION** of program results to key stakeholders such as utilities, government and media, providing program and policy direction.
- **RESEARCH** focused on advancing the voluntary adoption of affordable Net Zero Homes.
- **CONSUMER LITERACY** development through delivery of content, to drive demand for Net Zero Homes. (Including project profiles, and homeowner e-manual – under development.)
- **COORDINATION** of efforts nationally through a network of qualified professionals and online registration/data collection system.


Net Zero?
Show Canadians the beauty of it. The CHBA National Awards for Housing Excellence competition now has a Net Zero category.
Canadian Home Builders' Association
NATIONAL AWARDS for HOUSING EXCELLENCE
NET ZERO HOME AWARD FINALISTS (Award Gala May 12th in NL)
Construction Voyer, Laval, QC
Doug Tarry Limited, St. Thomas, ON
Minto Communities, Ottawa, ON
Reid's Heritage Homes, Guelph, ON
Sloot Construction, Guelph, ON
chba.ca/housingawards

Roles & Responsibilities

The CHBA develops and updates the requirements for the Program as well as supporting tools such as the branding/messaging and educational courses.



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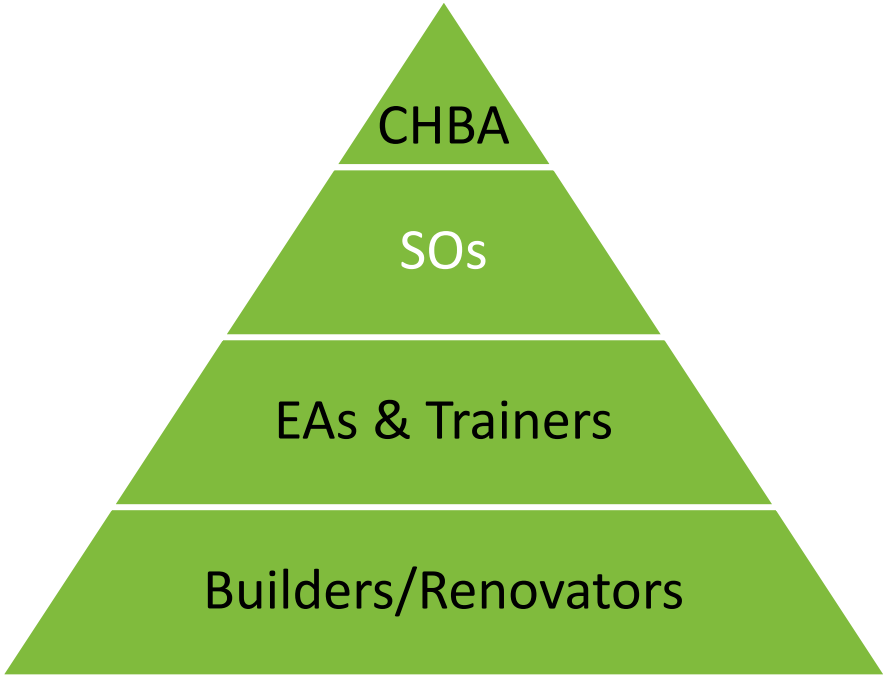
Roles & Responsibilities

SOs are responsible for complying with the SO Agreement and meeting all program requirements.

They verify that the Homes, Builders/Renovators, EAs and Trainers have met program requirements, and provide attestation documentation to CHBA to that effect.



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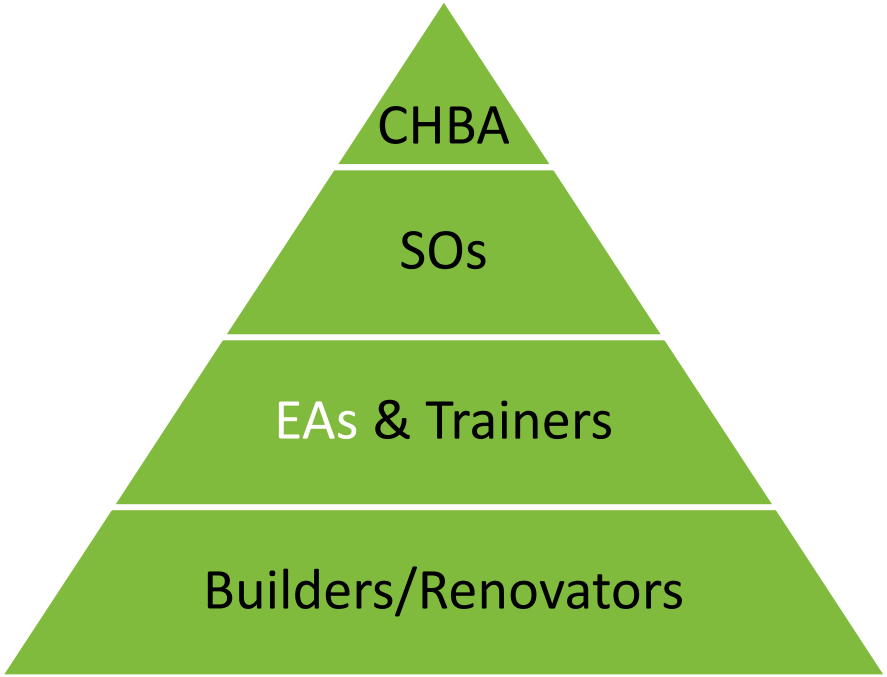
Roles & Responsibilities

EAs are responsible for complying with the EA Agreement and meeting all program requirements.

They work with builders/renovators to evaluate, model and test homes per the Technical Requirements. EAs must submit the house files to the SO as per the Home Labelling and Registration Process. EAs must provide attestation to CHBA that all program requirements have been met.



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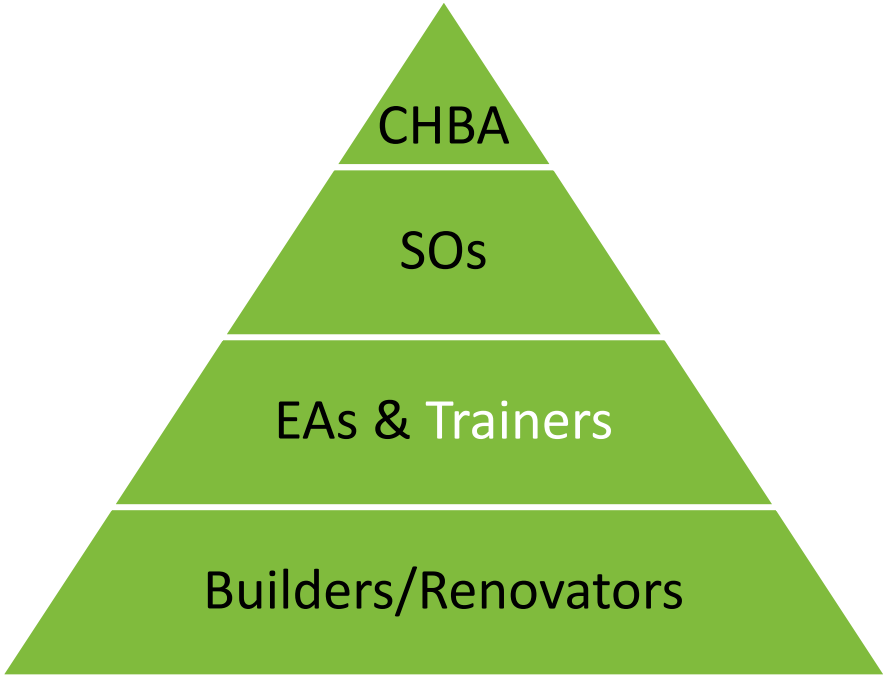
Roles & Responsibilities

Trainers are responsible for complying with the Trainer Agreement and meeting all program requirements.

They deliver Net Zero course content as per the instructor manuals, documenting attendance, administering and marking the exams, collecting participant feedback and reporting all results to their SO within a week of course completion.



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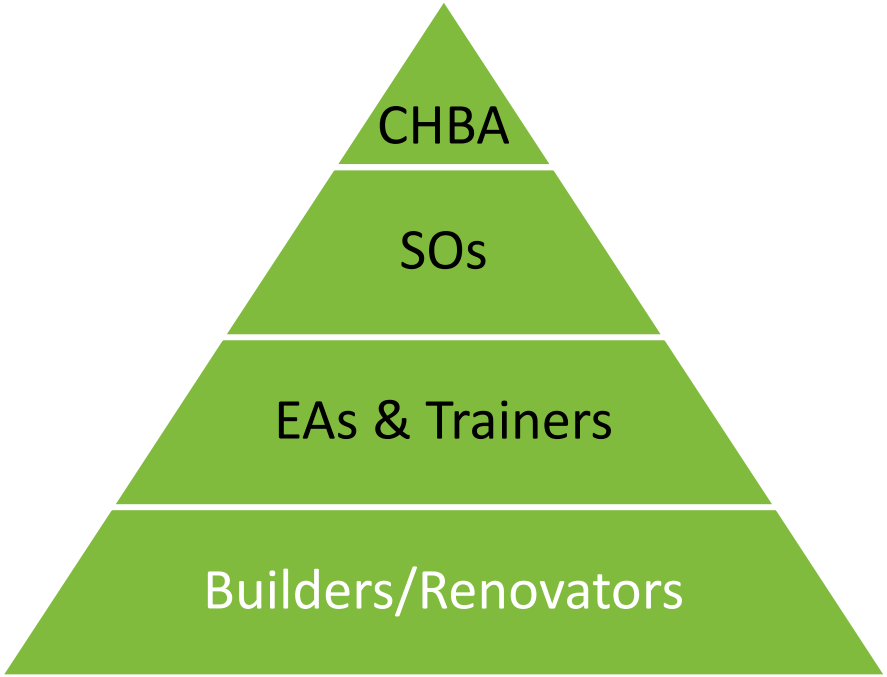
Roles & Responsibilities

Builders/Renovators are responsible for complying with the Builder/Renovator Agreement and meeting all program requirements.

They build/renovate the homes and are responsible for ensuring that their homes meet the Program Technical Requirements. They must provide attestation to CHBA that all program requirements have been met.



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CHBA Qualified Net Zero Service Organization

Service Organization Requirements

1. **Membership:** CHBA Member
2. **Licences:** EnerGuide + ENERGY STAR®/R-2000 Licensed SO
3. **EAs/Trainers:** Must use Qualified Net Zero EA/Trainers
4. **Labelling:** Obtain an ERS label through NRCan for every Net Zero/Ready Home & register all Qualified Net Zero/Ready Homes with the CHBA.

Once these requirements are met, the designation of **CHBA Qualified Net Zero Service Organization** is earned, and an agreement will be signed with the CHBA.

See Administrative Requirements document for more.

CHBA Qualified Net Zero Energy Advisor

Energy Advisor Requirements

1. **Licences:** EnerGuide + ENERGY STAR®/R-2000 Registered EA
2. **Training:** Net Zero Energy Advisor course & exam
3. **Consulting:** Two Net Zero Home files, mentored and reviewed by a Qualified Net Zero EA.
4. **Marketing & Communications:** Use sales & marketing "tool kit" per usage guidelines

Once these requirements are met, the designation of **CHBA Qualified Net Zero Energy Advisor** is earned, and an agreement will be signed with the CHBA.

See Administrative Requirements document for more.

CHBA Qualified Net Zero Trainer

Trainer Requirements (For BS & EA courses)

1. **Licences:** ENERGY STAR®/R-2000 Licenced Trainer by NRCan and/or approved BS/EA Trainer by SO
2. **Qualification:** Qualified Net Zero EA
3. **Mentoring:** First session must be mentored by a Qualified Net Zero Trainer
4. **Marketing & Communications:** Use sales & marketing "tool kit" per usage guidelines

Once these requirements are met, the designation of **CHBA Qualified Net Zero Trainer** is earned, and an agreement will be signed with the CHBA.

See Administrative Requirements document for more.

CHBA Qualified Net Zero Builder/Renovator

Builder/Renovator Requirements

1. **Membership:** CHBA Member
2. **Training:** Net Zero Building Science course & exam
3. **Licences:** EnerGuide Registered Builder
4. **Labels:** NRCan EnerGuide label and CHBA Net Zero/Ready label
5. **Marketing & Communications:** Use sales & marketing "tool kit" per usage guidelines

Once these requirements have been met and the first Net Zero/Ready Home is labelled, the designation of **CHBA Qualified Net Zero Builder/Renovator** is earned, and an agreement will be signed with the CHBA.

See Administrative Requirements document for more.

Legal Structure and Indemnity

1. The **CHBA Net Zero Home Labelling Program** (the Program) recognizes builders and service professionals who commit to meet its Program requirements, and recognizes houses that these builders and service professionals attest to meeting the Program's Technical Requirements.
2. The **Canadian Home Builders' Association** (the CHBA) is a national not-for-profit organization with voluntary membership comprising new home builders, renovators, developers, trades, manufacturers, suppliers, lenders and other professionals. CHBA is not a construction company, warranty organization, certification or standards body in any way. The CHBA provides this Program to help interested homebuyers identify net zero builders, renovators and homes, and to support its members who are looking to provide these homes to homebuyers and homeowners.

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Legal Structure and Indemnity

3. The **CHBA Net Zero Home Labelling Program Technical Requirements** (the Technical Requirements) use the standards developed by the Department of Natural Resources Canada (NRCan), of the Government of Canada, that can be used to build to net zero or net zero ready performance under the following programs:

Issuing Agency	Document	Reference
NRCan	EnerGuide Rating System (ERS) v15	ISBN 978-1-100-25693-1
NRCan	ENERGY STAR® for New Homes (ESNH) Standard v12	M144-237/2012-7E-PDF or ISBN 978-0-0660-05023-2
NRCan	2012 R-2000 Standard	M144-223/2012E-PDF

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Legal Structure and Indemnity

4. Net Zero/Ready Homes **shall comply with the applicable building codes and regulations,** in addition to the requirements of this Program. This Program is not a substitute for local, provincial, or territorial building codes; it is an additional set of requirements that are intentionally more stringent in the areas of energy efficiency and net energy consumption.

5. A **CHBA Qualified Net Zero Home and a CHBA Qualified Net Zero Ready Home** that is labelled under the Program is a home that is recognized by CHBA, on the basis of the attestations (by the builder/renovator, its Qualified Net Zero Service Organization and a Qualified Net Zero Energy Advisor) to have met the Technical Requirements, including the energy performance rating using NRCan's EnerGuide Rating System (ERS).

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Legal Structure and Indemnity

6. A **CHBA Qualified Net Zero Service Organization** (the Service Organization) must meet the ongoing requirements of the Program, including being licensed through NRCan to deliver EnerGuide, and ENERGY STAR® or R-2000. See above for more information on the Service Organization requirements for qualification under the Program.

7. A **CHBA Qualified Net Zero Energy Advisor** (the Energy Advisor) must meet the ongoing requirements of the Program, including being registered through NRCan to deliver EnerGuide and ENERGY STAR® or R-2000. See above for more information on the Energy Advisor requirements for qualification under the Program.

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Legal Structure and Indemnity

8. A **CHBA Qualified Net Zero Trainer** (the Trainer) must meet the ongoing requirements of the Program, including being licensed through NRCan to deliver training for ENERGY STAR® and/or R-2000. See above for more information on the Trainer requirements for qualification under the Program.

9. A **CHBA Qualified Net Zero Builder/Renovator** (the Builder/Renovator) must meet the ongoing requirements of the Program, including being an EnerGuide registered Builder through NRCan. See above for more information on the Builder requirements for qualification under Program.

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Legal Structure and Indemnity

10. **HOT2000** is an energy simulation and design tool for low-rise residential buildings developed and managed by the Office of Energy Efficiency at Natural Resources Canada. HOT2000 supports Natural Resources Canada's EnerGuide Rating System (ERS), ENERGY STAR for New Homes (ESNH) and R-2000 energy efficiency residential programs. The new v15 ERS scale gives a consumption-based rating measured in gigajoules (GJ) per year using version 11 of HOT2000, as compared to the 0-100 scale in the ESNH and R-2000 programs which still use version 10 of HOT2000.

11. The **energy performance rating** required for recognition under the Program means that the house has been rated to achieve a net zero energy consumption rating equal to or less than zero gigajoules (0 GJ) per year using version 11 of HOT2000, and other program requirements.

Legal Structure and Indemnity

12. **Service Professionals' Attestation:** The Energy Advisor and Service Organization review the home design and construction and attest that it meets the Program's Technical Requirements. Any digressions from the design, testing, construction and evaluation procedures for a given house are the exclusive responsibility of the Energy Advisor and the Service Organization. CHBA in no way warrants the work of the Service Professionals on any given house.

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Legal Structure and Indemnity

13. It is the **Builder's responsibility** to ensure the house meets the Technical Requirements (including the energy performance rating using NRCan's ERS) on the basis of the work by the Service Professionals, and that the house meets any and all applicable local building codes and standards. The builder attests that the home has been built to meet the Program's Technical Requirements, and any digressions therefrom are the exclusive responsibility of the builder. ***The contract for the home's construction is exclusively between the builder and the Purchaser of the home or, in the case of a renovation, the homeowner.***

14. **Warranty: CHBA members are required to register all their homes with a warranty provider,** including their Net Zero/Ready Homes.

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Legal Structure and Indemnity

15. CHBA is not a warranty organization and as such **CHBA in no way warrants** construction of the house or its energy performance. The Net Zero/Ready Home label is in no way a warranty. CHBA does not conduct its own construction, renovation or evaluation, and does not take responsibility for the performance or accuracy thereof, or for any responsibilities (contractual or otherwise) to the Purchaser of the home or in the case of a renovation, the homeowner.

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Legal Structure and Indemnity

16. **Actual Energy Consumption** will vary according to occupant behaviour, actual fluctuating yearly climatic conditions, and other factors. As such, the rating is specifically not a prediction of net zero energy consumption or zero energy cost in any given year. It is instead a rating of the net annual energy use of the home, in an average climatic year, based on assumed standard occupancy, occupant energy loads, and operating conditions according to NRCan's ERS. Occupant factors, such as the number of occupants, occupant behaviour, and occupant selected and controlled appliances and electronics, as well as climatic conditions (e.g. temperature, solar radiance) will vary and affect the actual annual energy consumption and production of the home.

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Legal Structure and Indemnity

17. **Ongoing maintenance** to ensure optimum performance is solely the responsibility of the home owner(s).

18. **The rating is predicated** on the data and standards specifically at the time of the evaluation, and not at a later date.

19. Per all of the above, achieving **net zero energy consumption in any given year is not, and cannot be guaranteed** by the builder, Natural Resources Canada, the Service Organization, Energy Advisor, or CHBA. Under the varying conditions that will be experienced, the house may use more or less energy than the rating.

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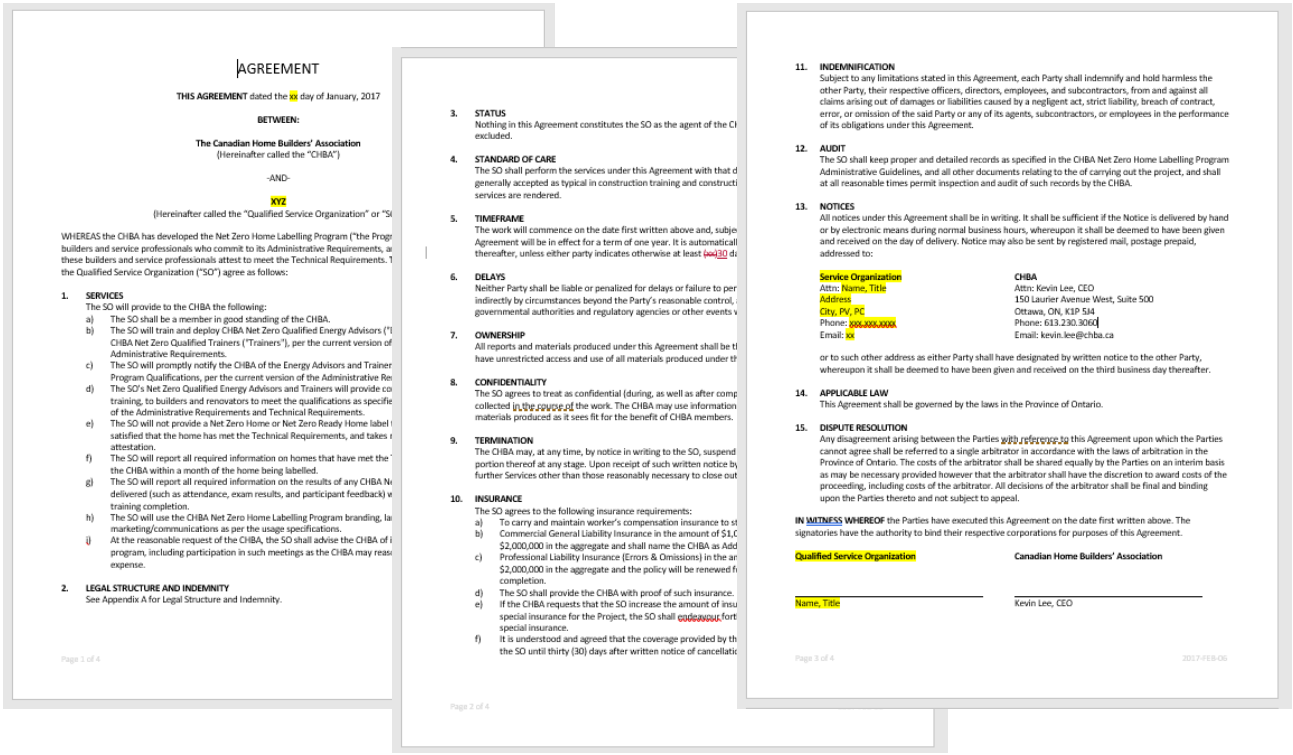
Agreements

Agreements for all Program participants (Service Organizations, Energy Advisors, Trainers, Builders/Renovators) include attestations, signed annually at time of registration.



AGREEMENT

THIS AGREEMENT dated the xx day of January, 2017

BETWEEN:

The Canadian Home Builders' Association
(Hereinafter called the "CHBA")

-AND-

XYZ
(Hereinafter called the "Qualified Service Organization" or "SO

WHEREAS the CHBA has developed the Net Zero Home Labelling Program ("the Progr
builders and service professionals who commit to its Administrative Requirements, a
these builders and service professionals attest to meet the Technical Requirements. T
the Qualified Service Organization ("SO") agree as follows:

1. **SERVICES**
The SO will provide to the CHBA the following:
a) The SO shall be a member in good standing of the CHBA.
b) The SO will train and deploy CHBA Net Zero Qualified Energy Advisors ("
CHBA Net Zero Qualified Trainers ("Trainers"), per the current version of
Administrative Requirements.
c) The SO will promptly notify the CHBA of the Energy Advisors and Trainer
Program Qualifications, per the current version of the Administrative Re
d) The SO's Net Zero Qualified Energy Advisors and Trainers will provide co
training, to builders and renovators to meet the qualifications as specifie
of the Administrative Requirements and Technical Requirements.
e) The SO will not provide a Net Zero Home or Net Zero Ready Home label
satisfied that the home has met the Technical Requirements, and takes
attestation.
f) The SO will report all required information on homes that have met the
the CHBA within a month of the home being labelled.
g) The SO will report all required information on the results of any CHBA N
delivered (such as attendance, exam results, and participant feedback) w
training completion.
h) The SO will use the CHBA Net Zero Home Labelling Program branding, la
marketing/communications as per the usage specifications.
i) At the reasonable request of the CHBA, the SO shall advise the CHBA of
program, including participation in such meetings as the CHBA may reas
expense.

2. **LEGAL STRUCTURE AND INDEMNITY**
See Appendix A for Legal Structure and Indemnity.

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3. **STATUS**
Nothing in this Agreement constitutes the SO as the agent of the C
excluded.

4. **STANDARD OF CARE**
The SO shall perform the services under this Agreement with that d
generally accepted as typical in construction training and constructi
services are rendered.

5. **TIMEFRAME**
The work will commence on the date first written above and, subje
Agreement will be in effect for a term of one year. It is automaticall
thereafter, unless either party indicates otherwise at least (xx)30 d

6. **DELAYS**
Neither Party shall be liable or penalized for delays or failure to per
indirectly by circumstances beyond the Party's reasonable control,
governmental authorities and regulatory agencies or other events

7. **OWNERSHIP**
All reports and materials produced under this Agreement shall be t
have unrestricted access and use of all materials produced under t

8. **CONFIDENTIALITY**
The SO agrees to treat as confidential (during, as well as after comp
collected in the course of the work. The CHBA may use information
materials produced as it sees fit for the benefit of CHBA members.

9. **TERMINATION**
The CHBA may, at any time, by notice in writing to the SO, suspend
portion thereof at any stage. Upon receipt of such written notice by
further Services other than those reasonably necessary to close out

10. **INSURANCE**
The SO agrees to the following insurance requirements:
a) To carry and maintain worker's compensation insurance to st
b) Commercial General Liability Insurance in the amount of $1,0
$2,000,000 in the aggregate and shall name the CHBA as Add
c) Professional Liability Insurance (Errors & Omissions) in the an
$2,000,000 in the aggregate and the policy will be renewed f
completion.
d) The SO shall provide the CHBA with proof of such insurance.
e) If the CHBA requests that the SO increase the amount of insu
special insurance for the Project, the SO shall endeavour fort
special insurance.
f) It is understood and agreed that the coverage provided by th
the SO until thirty (30) days after written notice of cancellatio

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11. **INDEMNIFICATION**
Subject to any limitations stated in this Agreement, each Party shall indemnify and hold harmless the other Party, their respective officers, directors, employees, and subcontractors, from and against all claims arising out of damages or liabilities caused by a negligent act, strict liability, breach of contract, error, or omission of the said Party or any of its agents, subcontractors, or employees in the performance of its obligations under this Agreement.

12. **AUDIT**
The SO shall keep proper and detailed records as specified in the CHBA Net Zero Home Labelling Program Administrative Guidelines, and all other documents relating to the of carrying out the project, and shall at all reasonable times permit inspection and audit of such records by the CHBA.

13. **NOTICES**
All notices under this Agreement shall be in writing. It shall be sufficient if the Notice is delivered by hand or by electronic means during normal business hours, whereupon it shall be deemed to have been given and received on the day of delivery. Notice may also be sent by registered mail, postage prepaid, addressed to:

Service Organization	**CHBA**
Attn: Name, Title	Attn: Kevin Lee, CEO
Address	150 Laurier Avenue West, Suite 500
City, PV, PC	Ottawa, ON, K1P 5J4
Phone: xxx-xxx-xxxx	Phone: 613.230.3060
Email: xx	Email: kevin.lee@chba.ca

or to such other address as either Party shall have designated by written notice to the other Party, whereupon it shall be deemed to have been given and received on the third business day thereafter.

14. **APPLICABLE LAW**
This Agreement shall be governed by the laws in the Province of Ontario.

15. **DISPUTE RESOLUTION**
Any disagreement arising between the Parties with reference to this Agreement upon which the Parties cannot agree shall be referred to a single arbitrator in accordance with the laws of arbitration in the Province of Ontario. The costs of the arbitrator shall be shared equally by the Parties on an interim basis as may be necessary provided however that the arbitrator shall have the discretion to award costs of the proceeding, including costs of the arbitrator. All decisions of the arbitrator shall be final and binding upon the Parties thereto and not subject to appeal.

IN WITNESS WHEREOF the Parties have executed this Agreement on the date first written above. The signatories have the authority to bind their respective corporations for purposes of this Agreement.

Qualified Service Organization	**Canadian Home Builders' Association**
Name, Title	Kevin Lee, CEO

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Home Labelling and Registration Process

Modelling, Construction & Evaluation

- EA provides consulting to builder and models the proposed design.
- Builder follows regular ERS procedure to notify SO of coming file submission.
- Builder builds home to meet Technical Requirements.
- Builder schedules final evaluation with EA. *(NOTE: Builder will receive labels from SO within 3 weeks of final evaluation.)*
- EA evaluates home per ERS protocol and is responsible for verifying compliance with the Net Zero Home Labelling Program Technical Requirements.

File Submission, Labelling and Registration

IF EA FINDS THE HOME DEFICIENT:

- EA arranges to re-evaluate the home once all deficiencies are corrected.

IF EA FINDS THE HOME COMPLIANT:

- EA sends complete ERS files, BE/AC Evaluation and PV System Commissioning Report/PV Ready Checklist to SO.
- SO performs QA on the files then submits ERS file to NRCan for approval.
- Once approved by NRCan SO mails ERS and Net Zero/Ready labels to the builder.
- Builder affixes ERS and Net Zero/Ready labels to the homes' electrical panel, takes a photo and emails it to the SO.
- Once photo is received, SO registers final Net Zero/Ready file with CHBA.
- CHBA reviews the file then posts it on the website.

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v1 Technical Requirements (for the homes)

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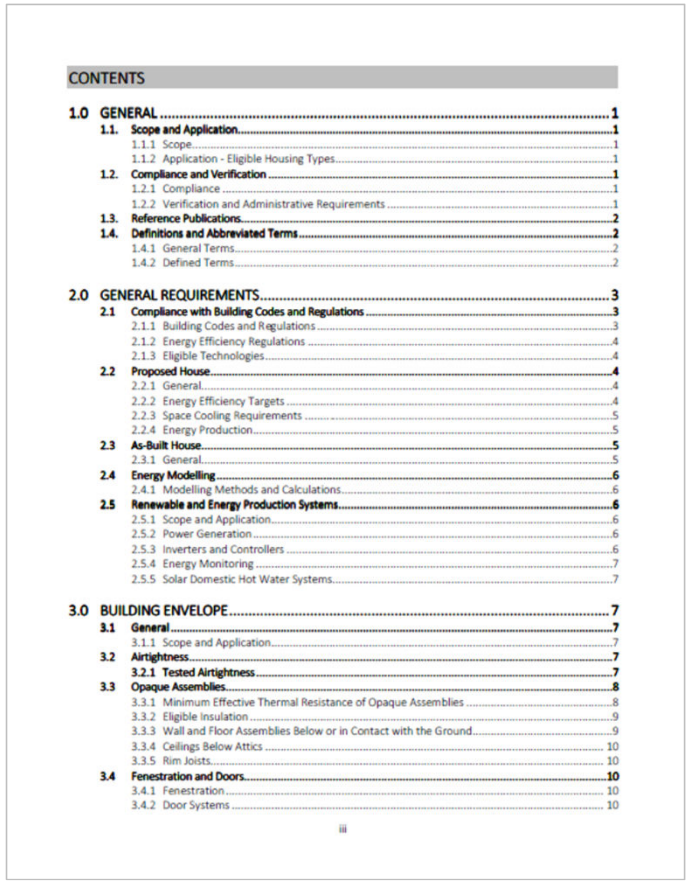
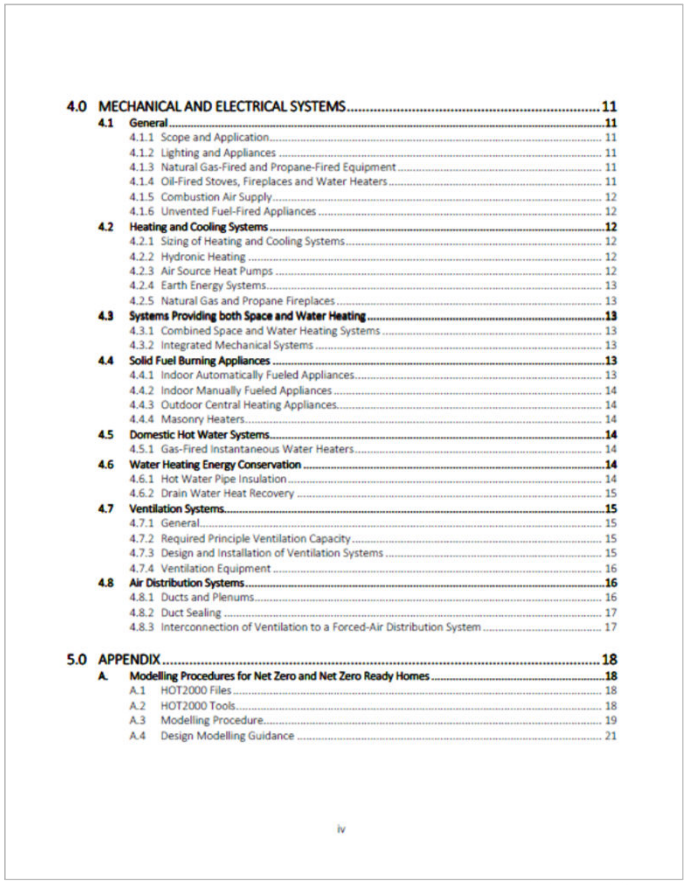
Canadian Home Builders' Association
Net Zero Home Labelling Program
Technical Requirements – Version 1

Effective: April 1, 2017
Last Updated: March 31, 2017



CONTENTS



Definitions

A CHBA Qualified Net Zero Home

A CHBA Qualified Net Zero Home that is labelled under the Program is a home that is recognized by CHBA, on the basis of the attestations by the builder/renovator, its Qualified Net Zero Service Organization and a Qualified Net Zero Energy Advisor to have met the Technical Requirements, including the energy performance rating using NRCan's EnerGuide Rating System (ERS) **to be designed, modelled and constructed to produce as much energy (from on-site renewable energy sources) as it consumes on an annual basis.**

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Definitions

A CHBA Qualified Net Zero Ready Home

A CHBA Qualified Net Zero Ready Home that is labelled under the Program is a home that is recognized by CHBA, on the basis of the attestations by the builder/renovator, its Qualified Net Zero Service Organization and a Qualified Net Zero Energy Advisor to have met the Technical Requirements, including the energy performance rating using NRCan's EnerGuide Rating System (ERS) **to be a Net Zero Home that has a renewable energy system designed for it that will allow it to achieve Net Zero Home performance, but the renewable energy system is not yet installed.**

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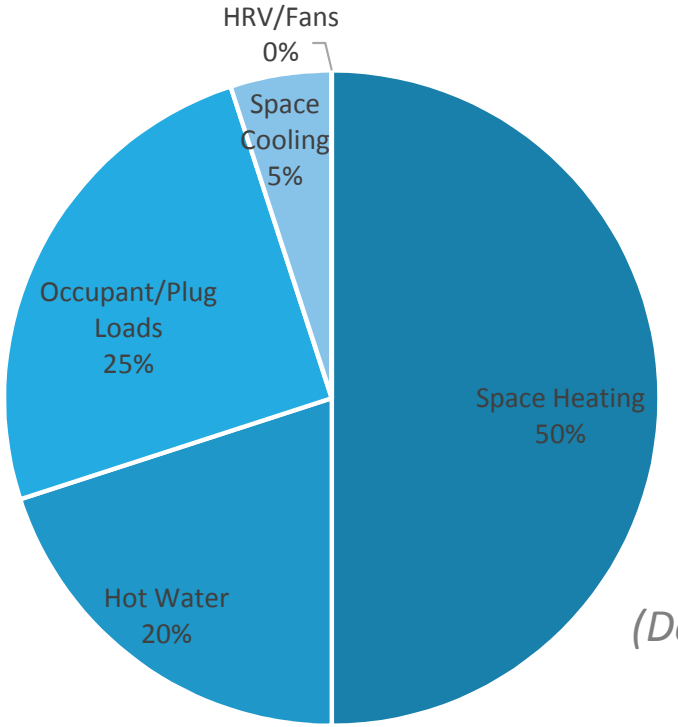
Occupant Behaviour – Now The Biggest Load!

Average Canadian household uses

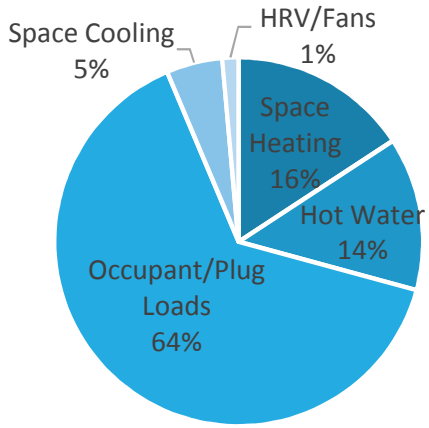
105 GJ/year

Source: NRCan and StatsCan

Standard NBC 9.36 Home



Net Zero Ready Home



Average Net Zero Ready Home uses

36 GJ/year

(Range of 34-44 GJ for attached, detached & MURBs combined)

Roof space is prime real estate for PV panels. (Design & aesthetics matter!)

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v1 Technical Requirements (for the homes)

- A 0 GJ rating shall be achieved using modelling methods and calculations in conformance with the EnerGuide Rating System v15, using HOT2000 v11.
- Annual space heating energy consumption (MJ) that is at least 33% lower than the corresponding reference house.
- An energy monitoring system shall be installed that provides electricity production and consumption data both in real time and aggregated over daily, weekly, and monthly time periods.
- Homes of any age are eligible as long as they meet all program requirements, including having an ERS 0 GJ label using the current version of HOT2000 specified by the Technical Requirements, using results from a Blower Door Test performed within 2 years of application.

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v1 Technical Requirements (for the homes)

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CHBA Net Zero Home Labelling Program – Space Cooling Information Sheet

Homes built to the Technical Requirements of the CHBA Net Zero Home Labelling Program are built with extremely high levels of insulation and airtightness. This keeps the heat in and the cold out during the winter, dramatically reducing energy bills. In the summer, it helps keep the house cool, unless heat gains inside the house occur, at which time the house will keep the heat in. Net Zero Homes are built to avoid excessive heat gains, but under certain conditions, heat gains can occur.

Heat gains include solar gains through windows and skylights, as well as internal heat gains, which include heat generated by occupants and equipment inside the building like refrigerators, dryers, cooking equipment, lighting, and other devices which generate heat as part of their operation.

To avoid overheating and to ensure occupant comfort, every Net Zero Home is required to undergo an assessment of whether it surpasses a threshold for space cooling. **If the cooling load exceeds the threshold, it is highly recommended that a space cooling system be installed in the home.**

However, installing and using a space cooling system is a homeowner choice. Homeowners can rely on other methods for cooling the house if they find it too warm, such as opening windows and using fans. They may also not be concerned with above average temperatures in the home from time to time. Accordingly, **cooling systems are not mandatory in Net Zero Homes, but builders must offer such systems to the homebuyers as an option, though homebuyers can opt out of such systems if they prefer not to have them installed.**

Learn more about energy efficient housing from Natural Resources Canada at http://www.nrcan.gc.ca/energy/publications/17756

- Every home is required to undergo an assessment of whether the house surpasses a threshold (2 MJ/m^3) for space cooling. If the cooling load exceeds the threshold, it is highly recommended that a space cooling system be installed in the home. (See Space Cooling Information Sheet and BE/SC Tool.)
- To learn more take the Net Zero Building Science and Energy Advisor courses.

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PV Forms

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Photovoltaic (PV) Ready Checklist

CHBA Net Zero Homes are all required to meet 0 GJ as modelled with a Photovoltaic (PV) system. To prepare a home for PV installation, each of the following specifications must be completed by the builder as detailed in NRCan's Solar Ready Guidelines:

NOTE: Builders may wish to consult with local building code authorities for guidance on issues associated with installing PV systems on roof structures.

1. On the roof	Completed
Roof orientation and angle are designed to accommodate sufficient PV to achieve net zero energy	☐
Enough unobstructed/unshaded roof space is available to achieve net zero energy	☐
Roof structure as designed will support additional loads associated with the PV system, if beyond code	☐
Ice breaks and access paths included where recommended *(See NRCan PV Ready Guidelines pending release in Mar/Apr 2017.)*	☐

2. Conduit

Minimum one PV conduit sized 2.5 cm/1" run to designated inverter location ☐
(Any conduit with bends/elbows >45 degrees has a nylon pull-rope installed for future convenience)

3. Termination of Conduit

Mechanical room workspace, conduit end capped *(account for pull-rope if present)* ☐
Check one of: Attic termination workspace, conduit capped and sealed *(account for pull-rope if present)* ☐
Or Roof termination, conduit capped, sealed and flashed *(account for pull-rope if present)* ☐

4. Space / Electrical

Designated wall space provided for PV inverter ☐

5. Code Compliance

ESA and Building Code inspections Passed ☐

6. Identification of Components

PV Ready components identified in drawings and labelled on-site ☐

7. Declaration, Name & Signature

I hereby confirm that the PV Ready upgrades have been installed in this house according to Section II of NRCan's Solar Ready Guidelines.

Net Zero Home Address	City, Province, Postal Code
Name	Signature
Company Name	Date (yy-mm-dd)

Note: Builders should leave a copy of the final two pages of NRCan's Solar Ready Guidelines (Sections IV and V) with the homeowner. v1.2017-01-01

For Net Zero Ready

For Net Zero

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Photovoltaic (PV) System Commissioning Report

This commissioning report shall be completed by the installer of the PV system. A copy shall be provided to the customer as part of the system documentation.

Documentation

The system documentation should include, as a minimum, the following elements:
- As-built system drawings and specification sheets of all system components from suppliers/manufacturers
- Operations manuals and warranties of all system components from suppliers/manufacturers
- Verification of proper system installation, performance and operation (via tests & photos)
- Grid connection confirmation
- Training/orientation to owner on basic system operation, typically at pre-delivery inspection

PV System Details and Array Tests	
PV module make, nameplate ratings and number of PV modules - List of all major balance of system components (i.e. inverter) along with nameplate ratings. (Photos)	
Serial codes for all PV modules and other major components	
Horizontal tilt angle of PV system	
Azimuth (direction) of PV system	
System Peak DC Watts (as designed) – this is the product of the nameplate PV module rating and the total number of PV modules	
System Operational DC Voltage (as designed) – this is the input DC voltage rating of the inverter	
System Open Circuit DC Voltage (as designed) – this is the product of the nameplate PV module open circuit voltage rating and the number of PV modules connected	
System Short Circuit DC Current – this is the product of the nameplate PV module short circuit rating and the number of PV modules in the array	
Energy monitoring device make - Must have real time energy consumption and energy generation information available to occupants. (Photo)	
Shut off/disconnect switch is clearly marked and visible (Photo)	
Solar conditions at time of the array tests	
Measure the open circuit voltage of each PV string of PV modules connected in series before they are interconnected and record	
Measure the short circuit current of each PV string and record	
Measure the PV operating current of each PV string and record	
Record the array operating current (product of operating current of each PV string and number of strings in array)	
Verify the PV array's operating voltage when connected to the inverter and inverter on	
Verify the inverter power output with the PV array connected to the inverter.	

Declaration, Name & Signature

I hereby confirm that the PV system on this house has been installed and commissioned according to the details included in this report

Net Zero Home Address, City	Province, Postal Code
Name	Signature
Company Name	Date of Commissioning (yy-mm-dd)

v1.2017-01-01

Labels

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THIS LABEL IS FOR
THE FOLLOWING HOME:
123 Street Address
City, PR
1A1 A1A

BUILDER/RENOVATOR:

ENERGY ADVISOR:

SERVICE ORGANIZATION:

CHBANZH ID#:

DATE APPROVED:

This label indicates that this home is recognized by the Canadian Home Builders' Association (CHBA) based on the attestations by the builder, its Net Zero Qualified Service Organization and a Net Zero Qualified Energy Advisor, that the home has met CHBA's Net Zero Home Program Technical Requirements, including the energy performance rating according to the Government of Canada's EnerGuide Rating System. More information is available at www.NetZeroHome.com

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THIS LABEL IS FOR
THE FOLLOWING HOME:
123 Street Address
City, PR
1A1 A1A

BUILDER/RENOVATOR:

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Co-branding with ENERGY STAR® or R-2000

If an ENERGY STAR® label or R-2000 Certification is also desired for the home

- Submit the home using ESNH **Prescriptive Path** to reduce file administration and costs. (Performance Path can also be chosen, if desired.)
- If the home will also be receiving an ENERGY STAR® label or R-2000 certificate, enter ESNH or R2000 into Info Field 1 in the ERS file.
- It is the responsibility of the builder, EA and SO to ensure all ENERGY STAR® or R-2000 program requirements have been met. (If choosing ESNH prescriptive path, the SO must enter CHBANZH in the comments field of the ESNH Compliance Tool.)

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Consumer Webpage

www.NetZeroHome.com

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The “Elevator Pitch”

What is a Net Zero Home?

Net Zero Homes produce as much clean energy as they consume. They are up to 80% more energy efficient than typical new homes and use renewable energy systems to produce the remaining energy they need.

Every part of the house works together to provide consistent temperatures throughout, prevent drafts, and filter indoor air to reduce dust and allergens.

The result: exceptional energy performance and the ultimate in comfort – a home at the forefront of sustainability. It all adds up to a better living experience.

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Value Propositions / Key Benefits

Exceptional value

- A Net Zero Home produces as much energy as it consumes and is up to 80% more energy efficient than a home built to conventional standards.
- With a Net Zero Home, your utility bills will fall to an all-time low, and stay low all year round.
- A Net Zero Home protects you from future increases in energy prices. Over the years, that could be a very big deal.
- Built to higher standards with greater attention to detail than conventional new homes, a Net Zero Home is better insulated and more air tight, making it more comfortable and more durable.
- The performance and quality of a Net Zero Home make it an excellent investment, whether you plan to sell or stay forever.

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Value Propositions / Key Benefits

Greater comfort, healthier living

- A Net Zero Home delivers exceptional comfort all year round - Advanced construction methods and materials along with superior heating, cooling and ventilation equipment means even temperatures throughout the house.
- Exceptional indoor air quality for healthier living - A built-in filtered fresh air system reduces allergens and asthma triggers, such as dust, pollen and outdoor air pollution.
- Tightly built and well insulated, a Net Zero Home is quieter. Outside noise such as traffic, lawnmowers and barking dogs are virtually silenced.

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Value Propositions / Key Benefits

Environmentally responsible

- By purchasing a Net Zero Home, you're doing your part to protect against climate change and preserve natural resources for future generations.
- A Net Zero Home produces as much energy – clean, renewable energy – as it consumes.
- It's also equipped with water-saving fixtures and appliances.
- All of a Net Zero Home's features work together to significantly minimize your household's environmental footprint.

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Annual Fee

To receive these benefits, program participants must register with the CHBA annually to attest that they have met the program requirements by signing the program Agreement, as well as provide information on their Net Zero activities, and pay a Participant Fee – **billed directly by the CHBA annually**.

The annual fee is based on your estimated number of homes/training participants/courses you will have in the year. (Upon registration the following year, your numbers will be reconciled to your actual usage and any +/- will be applied to the next years' fee.)

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Annual Fee

Qualified Net Zero Service Organizations	$25/house + $30/training participant (min. 1 each/year)
Qualified Net Zero Energy Advisors	$25/house (min. 1/year)
Qualified Net Zero Trainers	$50/course (min. 1/year)
Qualified Net Zero Builders/Renovators	$25/house (min. 1/year)

The first 1-49 homes are at $25/home
The next 50-249 homes are at $20/home
The next 250+ homes are at $15/home

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Additional Promotion

OPTIONAL Home Opening Promo Package *(For first Qualified Net Zero or Net Zero Ready Home)* ▪ CHBA President/VP to speak at opening ▪ National Media Release & invitation to "green" media to attend ribbon cutting as well as coordination with local HBA for local media distribution and invitation ▪ Special lawn sign ▪ Profiled on CHBA website and Net Zero News	$4,995/house

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How to register

- Visit www.chba.ca/nze. Member login is required to access some information.
- Click on the **REGISTER** button, then provide your registration details, e-sign the agreement and pay the annual fee.
- **We'll start with registering the Service Organizations as early as next week.**
- **EAs, Trainers and Builders/Renovators:** Contact a Qualified SOs for more information and to register homes.

Contact / More Info

Sonja Winkelmann
Director, Net Zero Energy Housing
Canadian Home Builders' Association

P 613.230.3060 x235
E winkelmann@chba.ca
@NZEhomes

- **Net Zero Council** info www.chba.ca/nzc *(+ subscription link for Net Zero News)*
- **Industry** info www.chba.ca/nze
- **Consumer** info www.NetZeroHome.com

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