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Net Zero Energy (NZE) Housing Workshop:

Building the Market for Net Zero Homes

Municipal Leaders Forum
November 8, 2016

Agenda

- Introduction
- Mapping the Road to Net Zero with VUCA
- Voluntary Programs & Incentives
- Innovative Financing Mechanisms
- Technology Pathways & Implementation
  - New Homes
  - Retrofit
- Home Buyer Trends
- Capacity Building

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EnerQuality

Canada's #1 certifier of energy efficient homes and the market leader in residential green building programs.

Residential Green Building Programs	
Certification	ENERGY STAR®, EnerGuide, Net Zero, R-2000, GreenHouse, LEED
Training	Builder Workshops & Housing Innovation Forum
Program Design/Delivery	LEEP, Savings By Design, Optimum Home, Home Reno Rebate, Green Streets Incubators

2016 ENERGY STAR HIGH EFFICIENCY HAUTE EFFICACITÉ
NEW HOMES / MAISONS NEUVES
Participant of the Year
Program Delivery

2016 ENERGY STAR HIGH EFFICIENCY HAUTE EFFICACITÉ
NEW HOMES / MAISONS NEUVES
Sustained Excellence

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2016 – 2030 Net Zero Homes Challenges & Opportunities

- Ontario Building Code Updates (OBC 2017-2030)
- New Energuide (ERS) Rating System 2017 Updates
- Ongoing ENERGY STAR for NEW HOMES 2017-2030 Updates
- Net Zero Homes with EV, Storage, and Distributed/Community Power Generation
- New Low Carbon/EE Technologies (Mainstream, Emergent, Undiscovered)
- New Provincial DSM/CDM Programs & Incentives
- New Federal Programs (e.g. New 2017 Federal Home Retrofit Incentives)
- Innovative Financing Mechanisms
- Inter-agency Provincial Coordination (IESO, MMAH, MOE, Green Bank, MOECC, Municipalities, LDCs, Gas Utilities)
- Evolving Economic Trends
- Evolving Home Buyer Trends
- Evolving Municipality Trends
- Capacity Building & Training for Builders and Consultants
- Downstream Capacity Building (Trades, Sub-contractors, Suppliers)

Proven Strategies to Address VUCA

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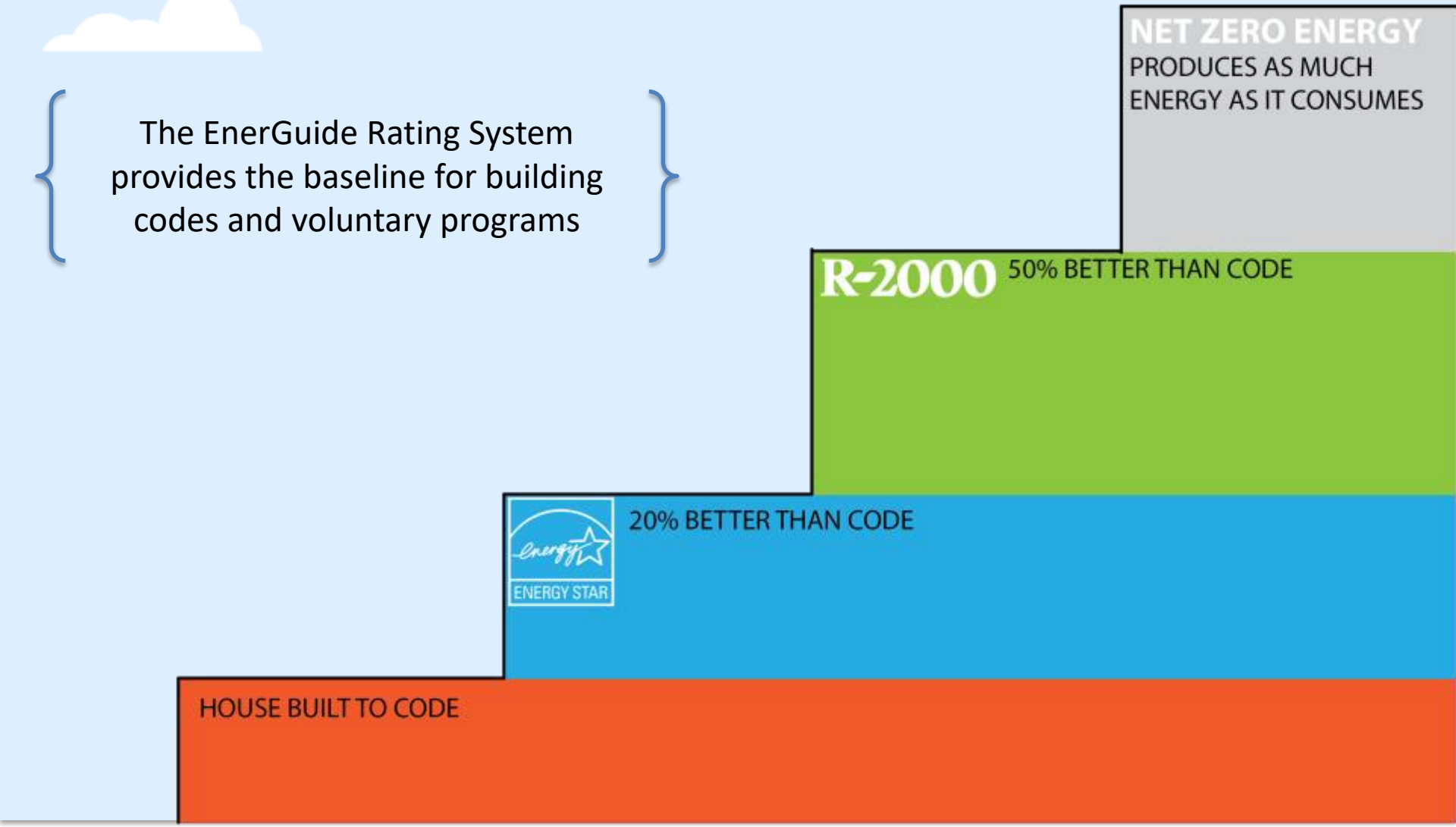
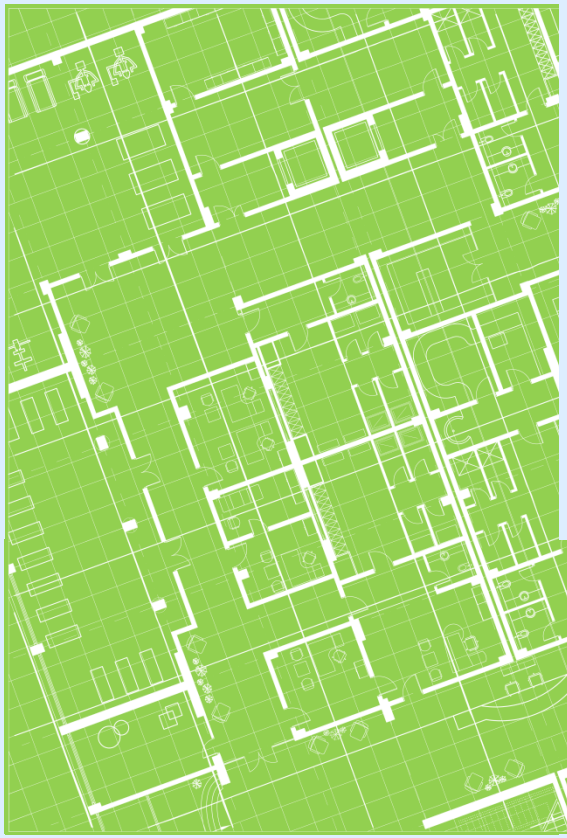
Voluntary Programs & Code

The EnerGuide Rating System provides the baseline for building codes and voluntary programs



R-2000/Net Zero Energy



R-2000 = 30+ years of research and innovation

R-2000 accounts for 22% of energy efficiency improvements in the market since 1980

14,800 of these leading edge homes certified

R-2000

EnerGuide Rating System

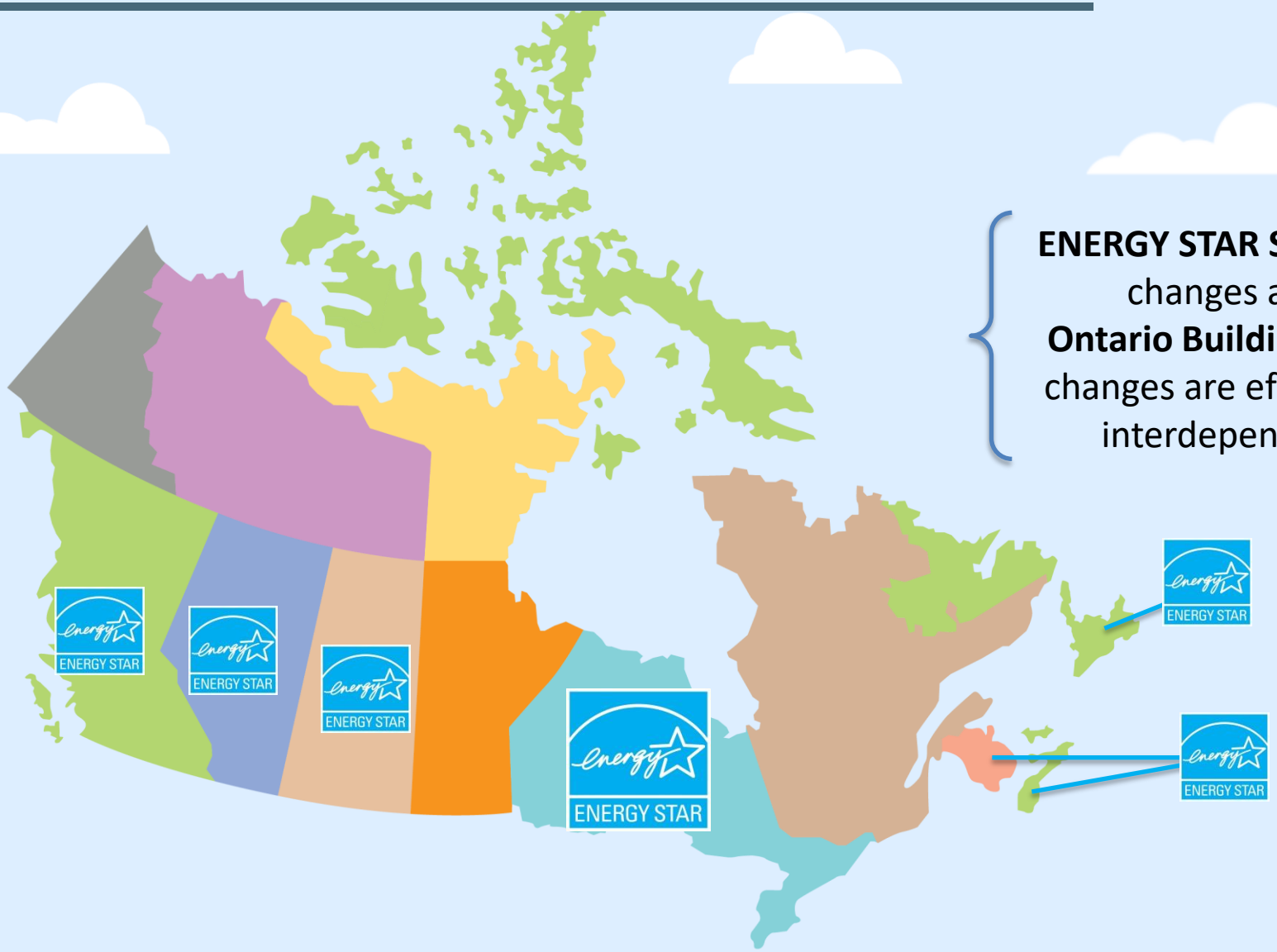
Ranked 3rd most useful energy efficiency tool by Canadians

1 million+ labels on homes across Canada

50+ programs and regulations use system

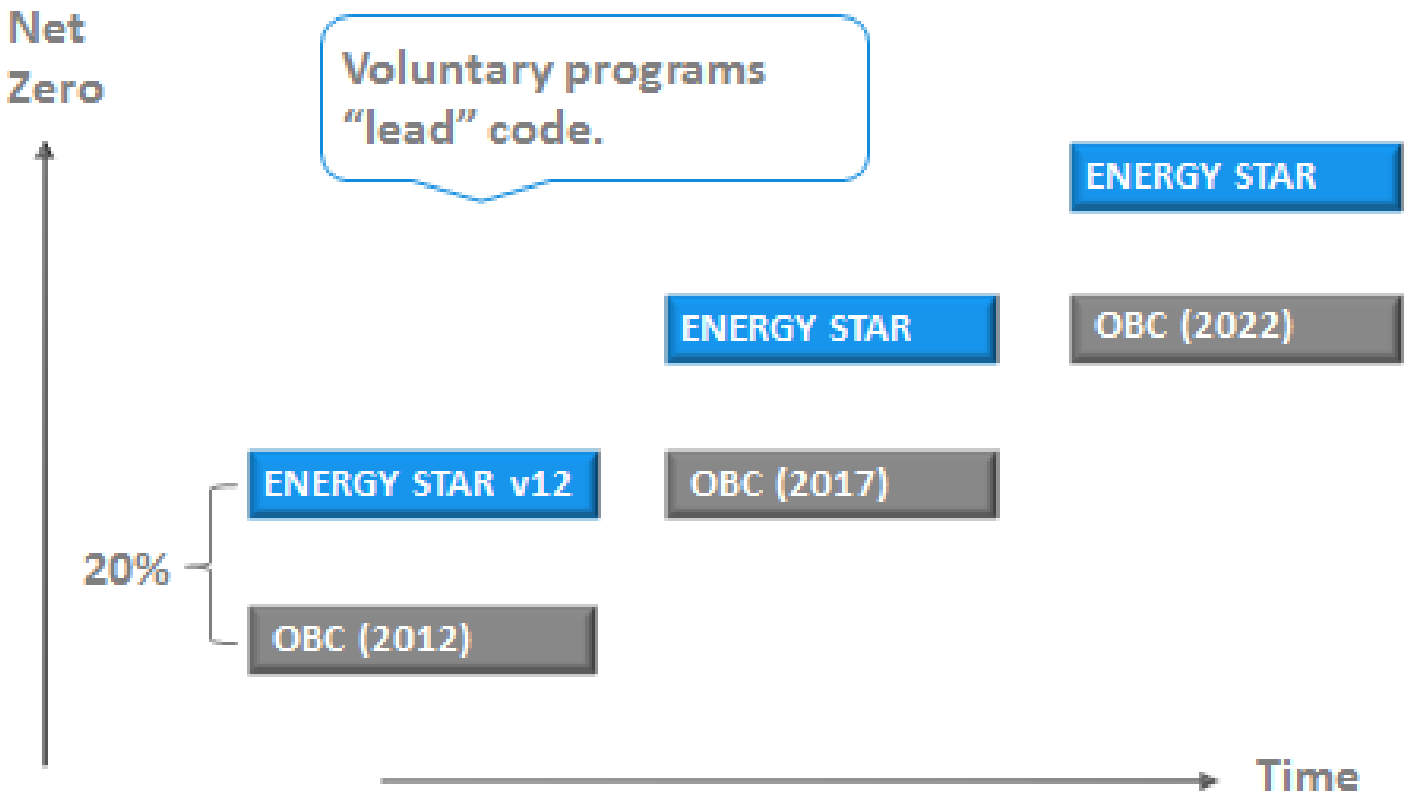
ENERGUIDE RATING SYSTEM

ENERGY STAR for New Homes



ENERGY STAR Standard changes and **Ontario Building Code** changes are effectively interdependent

New OBC Coming Jan 1, 2017



Relevant Programs & Incentives

New Construction Incentives

- MOECC/Green Bank Homebuyer Incentives
- EGD Savings By Design Program
- IESO Residential New Construction Incentives
- CMHC Rebates
- Net Metering Rates
- Low Income Programs
- Equipment Incentives
- Municipal Programs/Bonuses?
  - Water Conservation Incentives
  - Storm Water Management Incentives

Retrofit Incentives

- Federal Retrofit Incentives
- HERD
- UG Home Reno Rebate
- EGD Home Energy Conservation Program
- IESO Whole Home Retrofit Incentives
- Net Metering Rates
- Low Income Programs
- Equipment Incentives
- Municipal Programs?
  - Water Conservation Incentives
  - Storm Water Management Incentives

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LIC Overview

- **LIC** financing **used:** sewers, sidewalks, buried utilities
- Ontario Ministry of Municipal Affairs and Housing **LIC regulatory change** in 2012: also: private **energy**, **water efficiency**
- LIC program design: **all admin costs (marketing, interest, admin) recovered**.
- **LICs** implemented for **retrofits** to **existing homes** in **7 municipalities:**
  - **City of Toronto:** energy/water
  - **City of Halifax, N.S.:** solar thermal, water
  - **Town of Berwick, N.S.:** air source heat pumps
  - **Four Municipalities**, **N.S.:** energy efficiency retrofits

LIC Benefits

- **LIC removes financing barriers to energy efficiency:**
  - **Financing is up-front**.
  - Longer-term **fixed-rate** financing**:** e.g. **10, 15, 20-year terms**.
  - Makes energy/water efficiency affordable: annual **savings match** annual **payments** due to **longer terms.**
  - **New owner continues payments on LIC balance** on sale**.**

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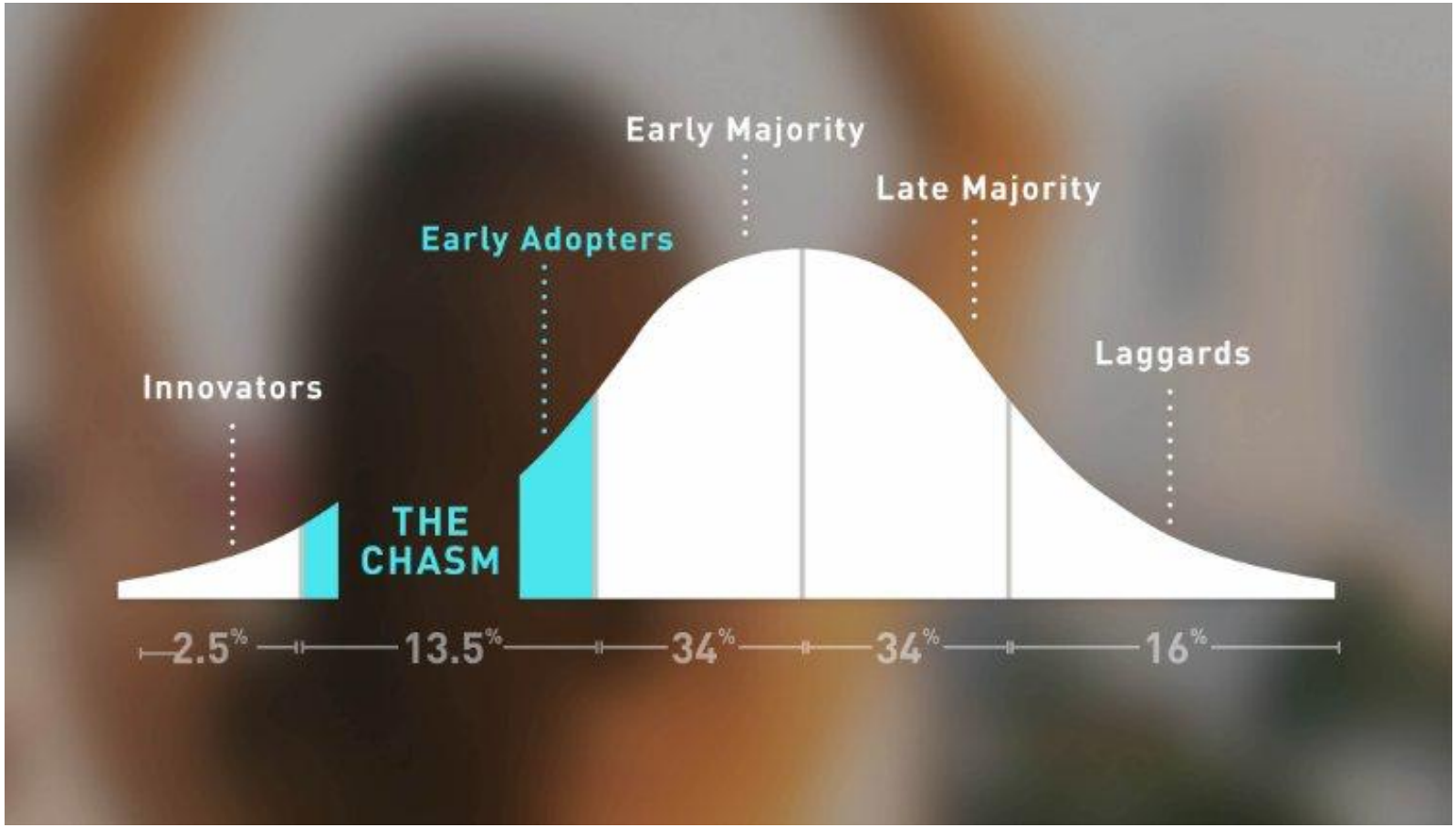
Moving Forward into the Mainstream



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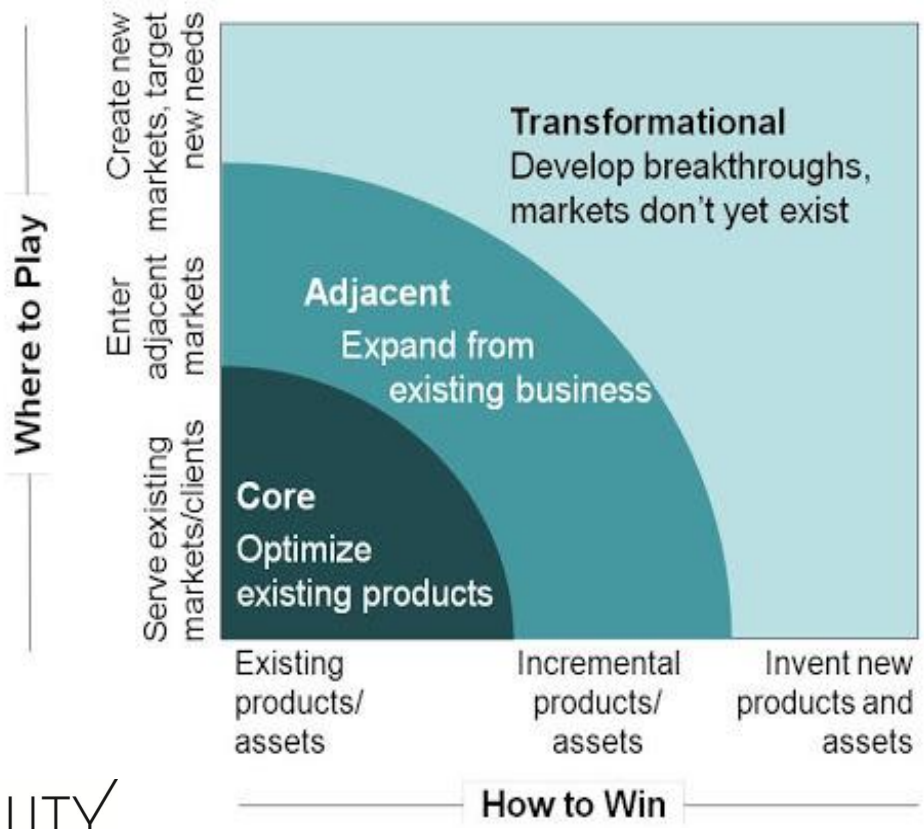
Technology Adoption H Standards

Innovation Ambition Matrix



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Emergent / Imminent Technology Enhancements

- **Core Innovation Changes**
  - Envelope
  - Water Heater Efficiencies
  - Furnace Efficiencies
  - Window Values

- **Adjacent Innovation Changes**
  - Water Conservation
  - Stormwater Management
  - Low Solar gain Windows
  - Zoning
  - Sealed Ducts
  - Adaptive Thermostats
  - Solar Ready

- **Transformational Innovation Changes**
  - Occupant Behavior
  - Plug loads
  - Distributed Renewables
  - Community Renewables
  - EV Charging
  - Energy Storage
  - Thermal Storage

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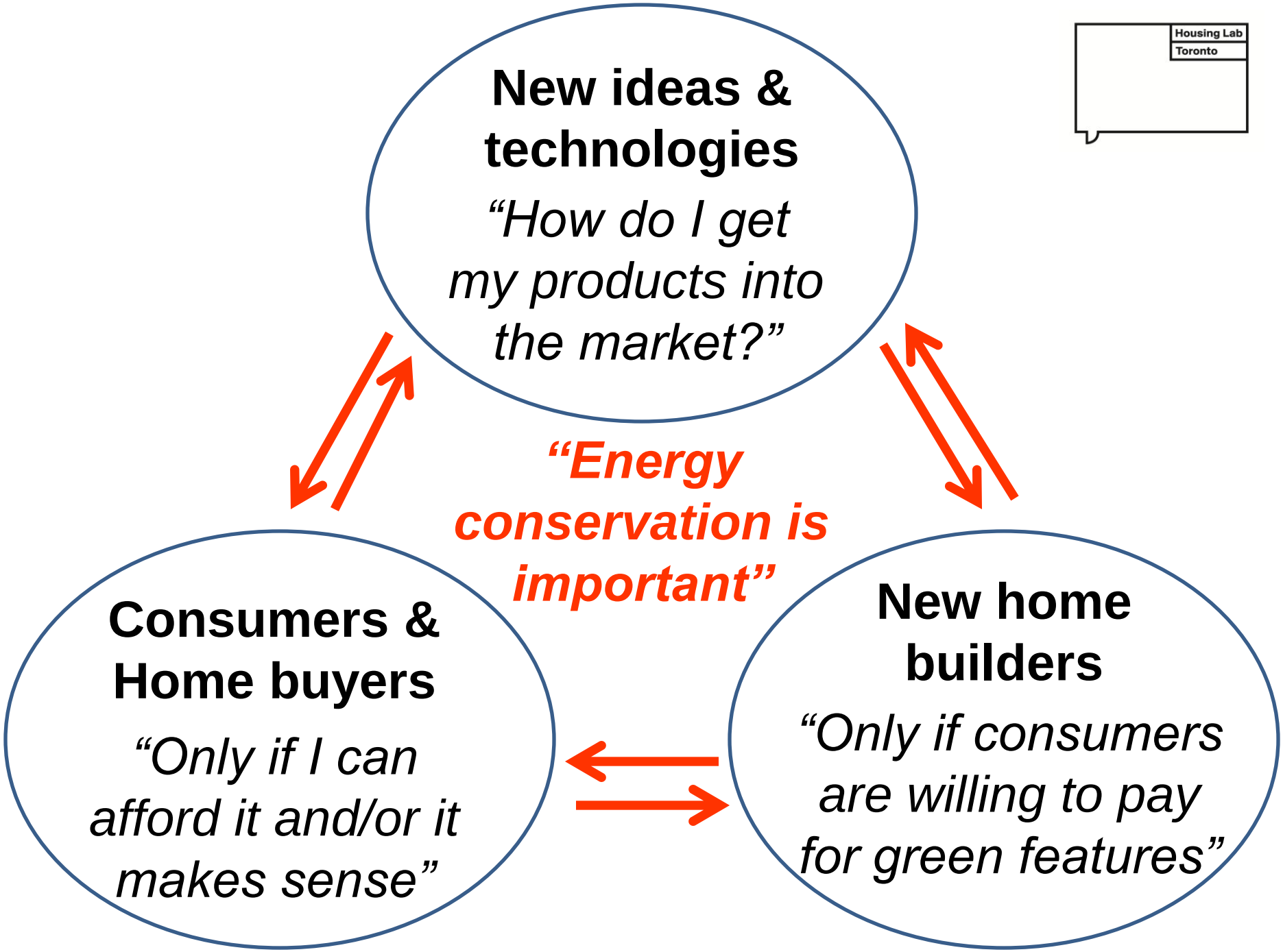

Housing Lab
Toronto
New ideas & technologies
"How do I get my products into the market?"
"Energy conservation is important"
Consumers & Home buyers
"Only if I can afford it and/or it makes sense"
New home builders
"Only if consumers are willing to pay for green features"

Housing Lab
Toronto

Metrics
i.e. can be quantified & measured easily and conveniently

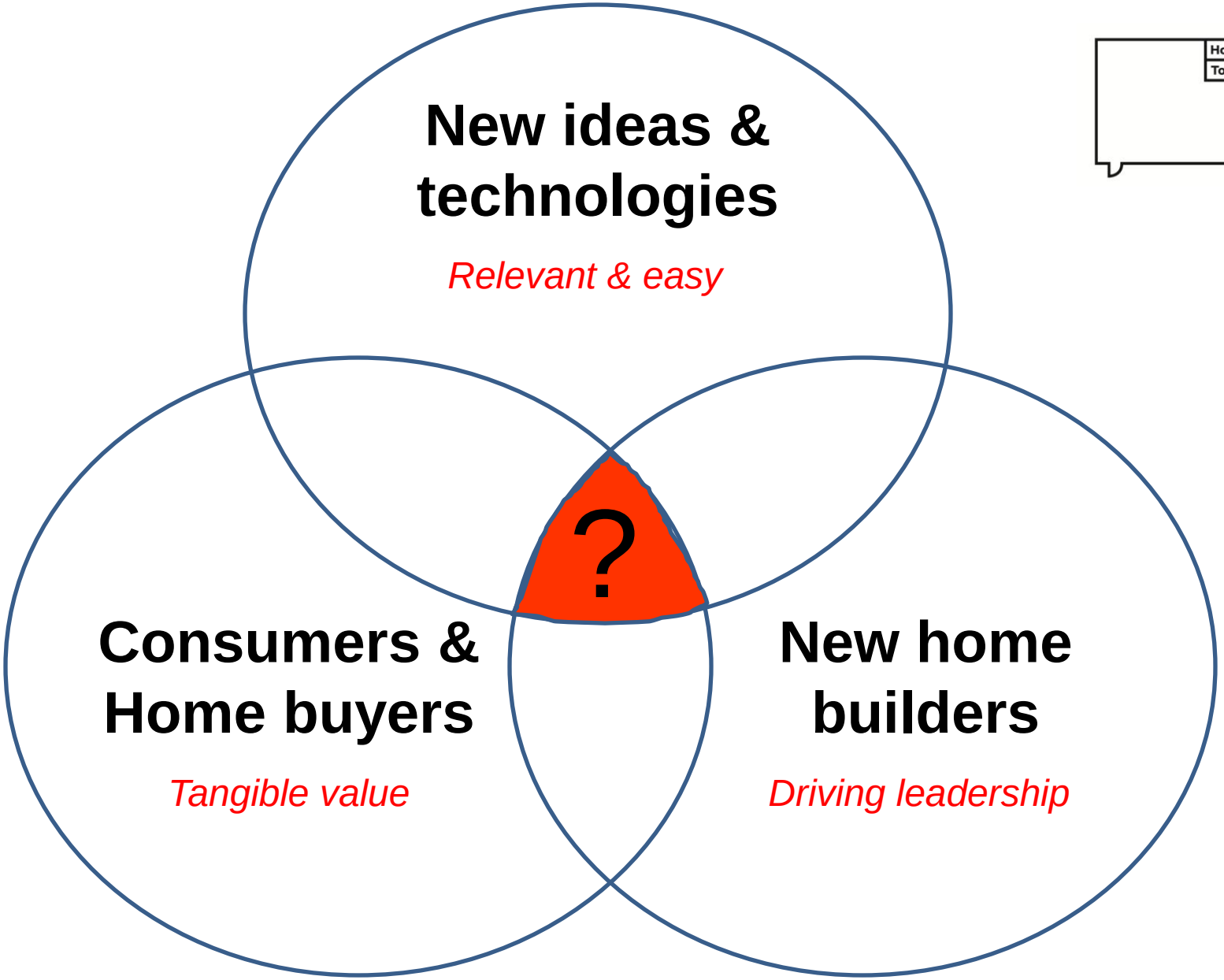
Value = rational benefit x emotional benefit / price

Affordable
i.e. price is accessible for most

Makes me feel good
i.e. being green is good for environment

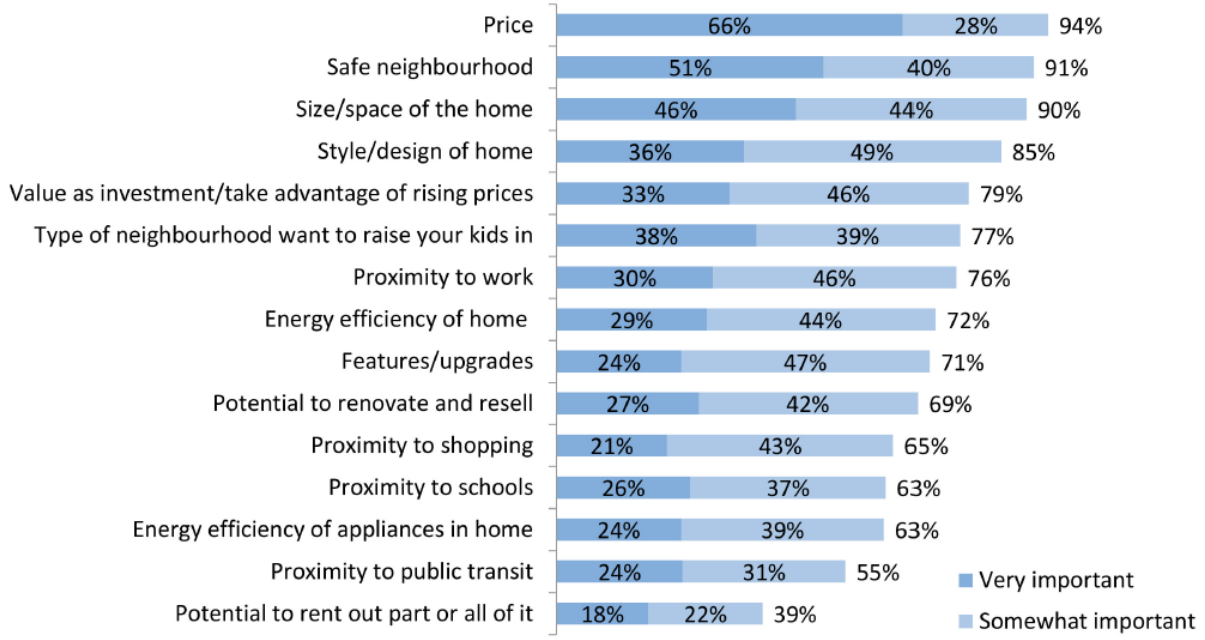
Consumers & Home Buyers are Key

Housing Lab
Toronto



How do we get there?

2015 Environics-Genworth First Time Buyer Survey



Q15. How important were each of the following as reasons for why you chose your current home?

ENVIRONICS RESEARCH

Genworth Canada

	Region							
	Total	Vancouver	BC	Calgary	Alberta	MB/SK	Toronto	Ontario
Condominium	17%	47%	16%	24%	13%	22%	39%	11%
Townhouse/row house	15%	24%	19%	20%	10%	7%	19%	22%
Duplex/Semi-detached	13%	3%	4%	7%	17%	6%	15%	16%
Fully Detached	55%	25%	59%	49%	59%	66%	28%	51%

2016 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. Linen closets *(#6 in 2015)*
6. Kitchen islands *(#5 in 2015)*
7. Open concept kitchens
8. 2-car garage *(#9 in 2015)*
9. Large windows *(#8 in 2015)*
10. **HRV/ERV** *(Bumped Walk-in Pantry from 2015's Top 10 List)*

Avid® Ratings Canada

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

CMHC EQuilibrium Homeowner Survey

EQuilibrium™
HEALTHY HOUSING
FOR A HEALTHY ENVIRONMENT

The experience of living in a sustainable home included:

- Better **comfort** and an improved lifestyle;
- Availability of ample natural light throughout the home;
- Superior insulation and **soundproofing** from home design, triple- and quadruple-pane windows;
- Ability to **control** the home's temperature using natural light and ventilation;
- **High-quality** floor, wall and ceiling insulation;
- Heating and ventilation systems that provide a **comfortable level of humidity** and prevent the growth of mold;
- Better indoor air quality with less dust and **fewer allergic reactions**;
- Durable and **low-maintenance construction**; and an efficient layout that maximizes usable living space and creates a spacious, esthetically pleasing environment.

New CHBA Net Zero Branding

netzero home

The ultimate standard for comfort and efficiency

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.

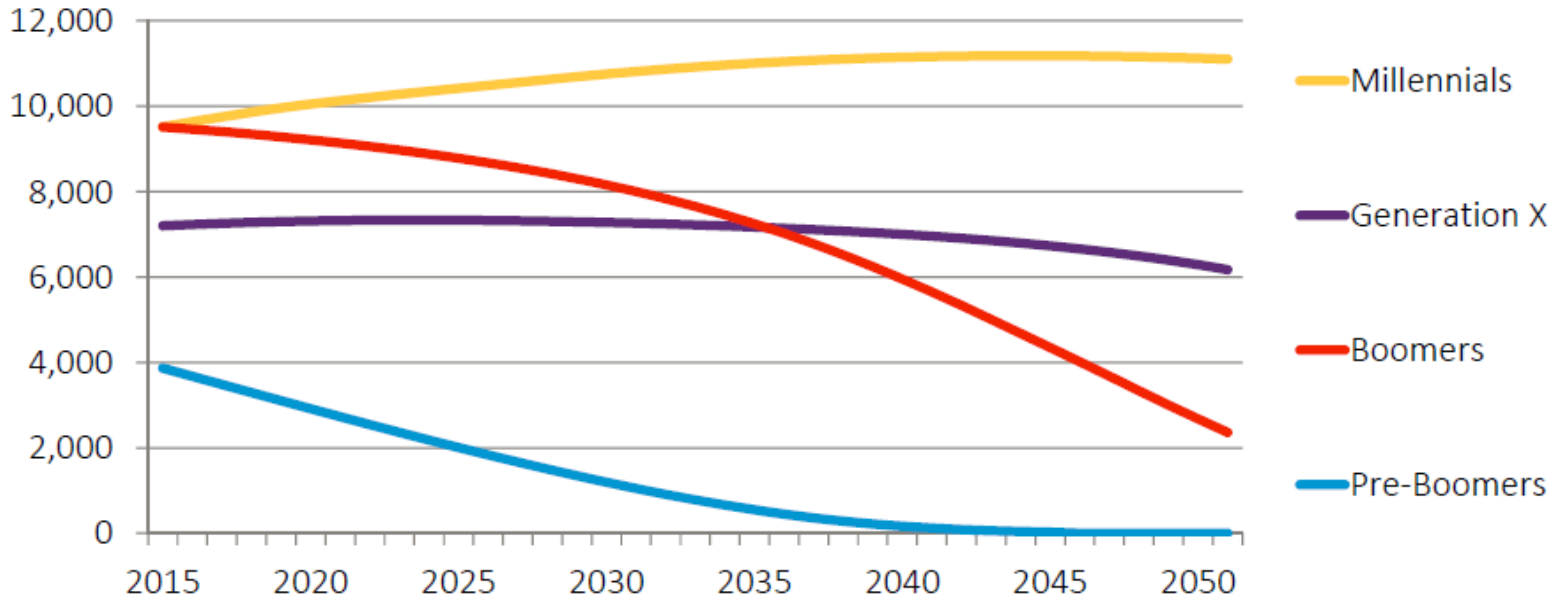
GENERATIONAL SIZE MATTERS

	Millennials	Generation X	Boomers	Pre-Boomers
Born	1981-2000	1966-1980	1946-1965	Before 1946
Age in 2015	15-34	35-49	50-69	70 and older
Population in 2015	9.5M	7.2M	9.5M	3.9M
% of Population	27%	20%	27%	11%
% of Labour Force	37%	31%	30%	1%
Households in 2015	2.8M	4.1M	5.6M	2.1M
% of Households	19%	28%	38%	15%

Source: Statistics Canada (population) and Environics Analytics (households)

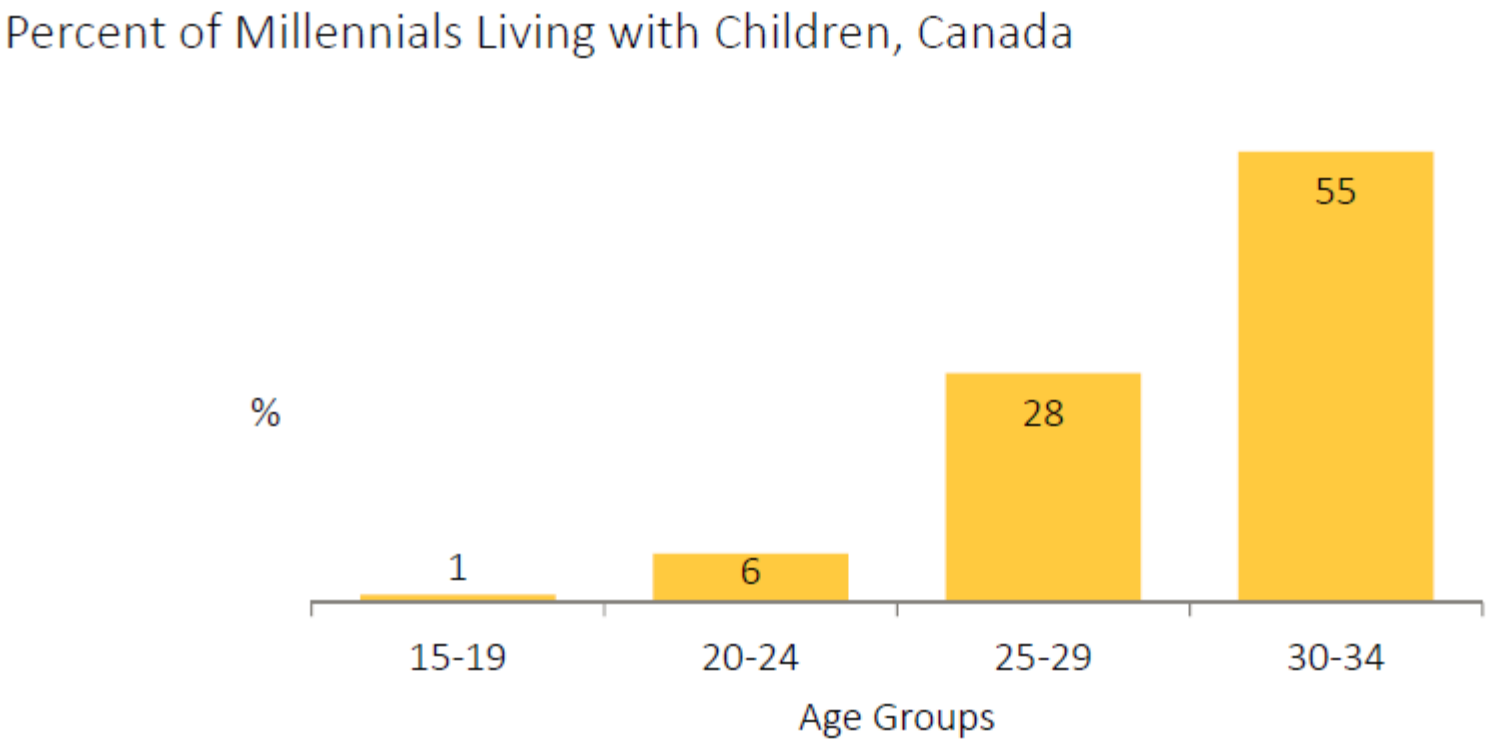
MILLENNIAL GENERATION WILL GROW AS BOOMERS DECLINE

Projected Population by Generation (thousands), Canada



Source: Statistics Canada, Medium Projection 2014

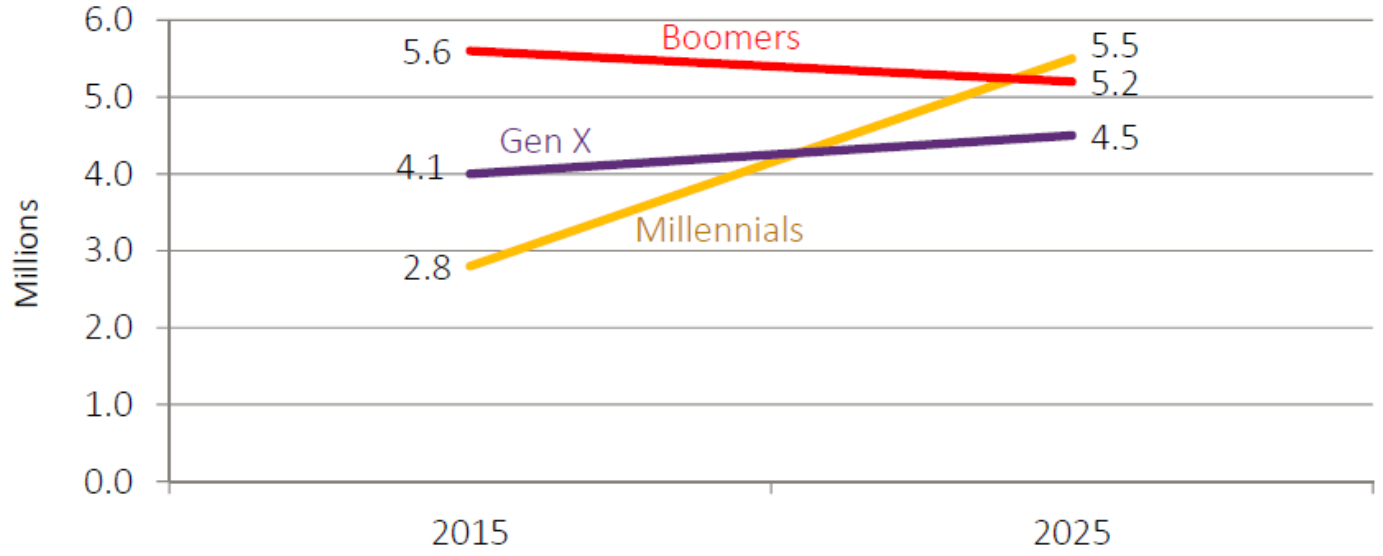
. . . AND ARE BUILDING A NEST



Source: Statistics Canada, General Social Survey

HIGH GROWTH IN MILLENNIAL HOUSEHOLDS PROJECTED OVER THE NEXT DECADE

10 Year Projections of Households



Source: Environics Analytics, 2015 DemoStats

Meet the Millennials

(2016 Environics)

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How will CHBA pass on the knowledge?

Educational initiatives to accelerate builder capacity to capitalize on NZE:

- **NZE Building Science Training** - Nov 2-3 inaugural session (piloted with 200+)
- **NZE Energy Advisor Training** – Jan 2017
- **NZE Sales Training** - Jan/Feb 2017
- **NZE Builder Boot Camp** - May 2, 2016 (108 participants) *next in 2018*
- **NZE Networking & Exchange** - currently for Council Members only
- **NZE Webinars** - Jan, Feb, Apr, May 2017 (5 recordings from 2016 webinars)

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

Subscribe to ***NET ZERO NEWS*** to be notified of upcoming events/dates!

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Upcoming Training Courses

Know Your Code: A Primer on SB-12 2017
November 23, 2016 - Stratford
November 30, 2016 - Hamilton
Instructor Gord Cooke

Advanced Building Science
Dec 6, 2016
Toronto, Instructor Andy Oding

ENERGY STAR® 2017 Standard
Dec 7, 2016 - Toronto
Instructor Andy Oding

ENERGY STAR Green Streets Incubator Initiative & SB-12 Master Class
Instructors: Gord Cook, Kirk Johnson, and Ross Elliot
Nov 22, 2016 - Windsor
Nov 23, 2016 - Owens Sound
Dec 13, 2016 - Sudbury

Net Zero Builder Training Workshop – Version 1
Nov 14-15, 2016, Earth Rangers Centre, Toronto - Instructor Andy Oding
Nov 24 - 25, 2016, Best Western Kanata, Ottawa - Instructor Ross Elliott

Net Zero Low-Rise Forum at BILD
Dec 8, 2016 BILD – 8:30 AM–10AM

EQ Housing Innovation Forum and Awards
Feb 23, 2017, Toronto

Additional Workshops to be announced through March 31, 2017

Visit www.enerquality.ca/training for information or to register

About Us

EnerQuality, founded in 1998, designs and delivers **green building, certification, incentives, training, and market transformation programs** to the residential construction industry. EnerQuality's programs are voluntary and market-based. We partner with local homebuilders associations, governments, utilities, manufacturers, and consultants to bring our programs to market.

ENERGY STAR for NEW HOMES (ESNH) is celebrating the 11th anniversary of its launch in Canada. In 2005, EnerQuality developed and piloted ESNH in Canada – the most successful green building program - and remains the primary certifier of ESNH, R-2000, and ENERGUIDE homes with **80,000** homes certified to date under all three NRCan standards.

EnerQuality delivers utility energy efficiency incentive programs across Ontario for gas and electricity utilities. We host an annual **EQ Awards** Dinner celebrating the sustainability leaders in residential homes/condo construction industry. We also host the annual **EQ Housing Innovation Forum** where leading builders and subject matter experts showcase housing trends, technologies, builder best practices and lessons learned.

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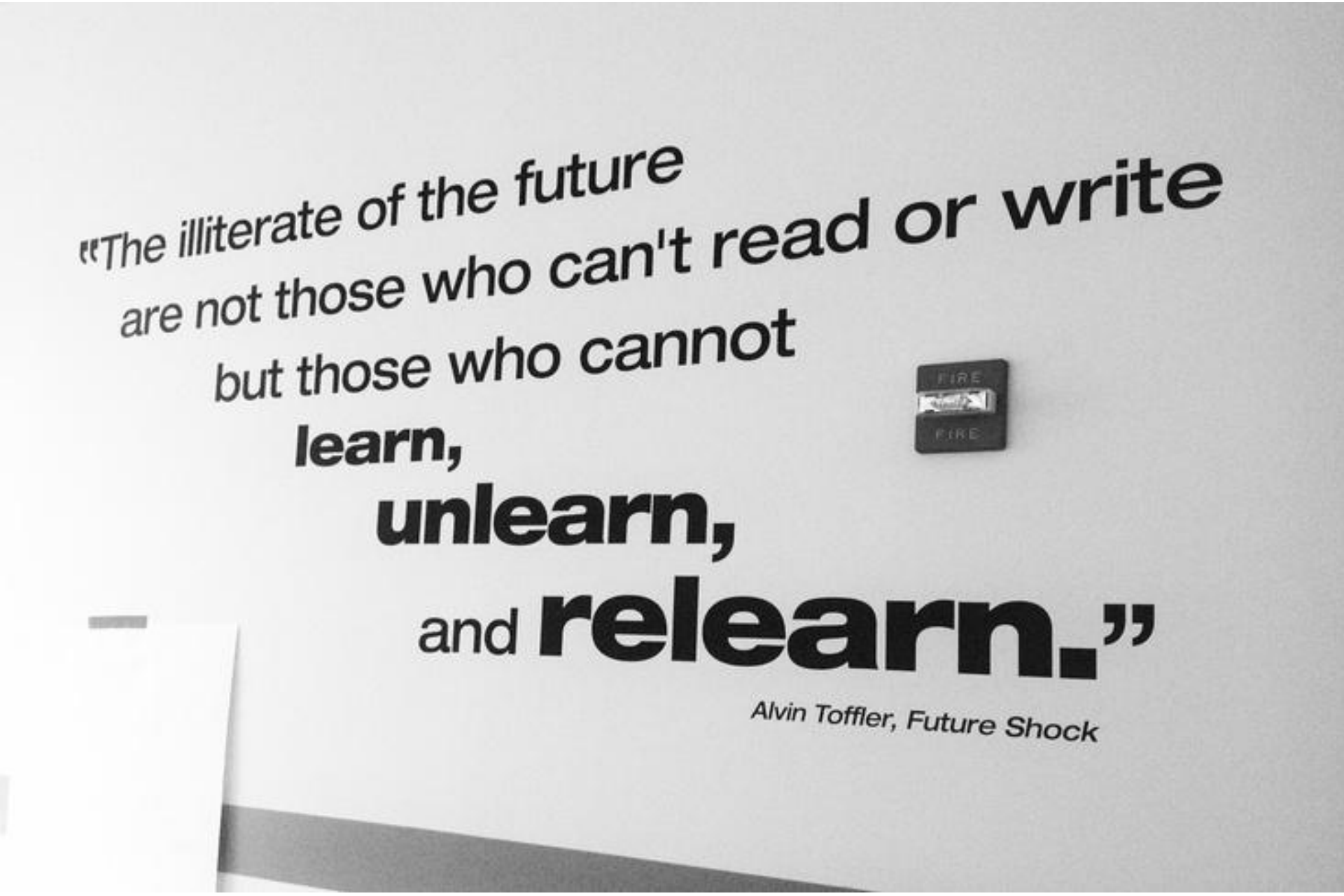
Thank You!

Kirk Johnson, Program Director, EnerQuality


"The illiterate of the future
are not those who can't read or write
but those who cannot
learn,
unlearn,
and relearn."
Alvin Toffler, Future Shock
FIRE
FIRE