

ENBRIDGE GAS PROVINCIAL ADVANCED BUILDING SCIENCE SERIES

In Partnership with: Enbridge Gas and Building Knowledge Canada

CRITICAL CANADIAN HOME BUILDING SCIENCE PART 10:

Historical Homes & Deep Energy Retrofit (NZ Reno) Challenges

December 1, 2022 1:00-2:30 PM (EST)



Andy Oding
Building Knowledge Canada



Trevor Trainor
Bawating Building Science

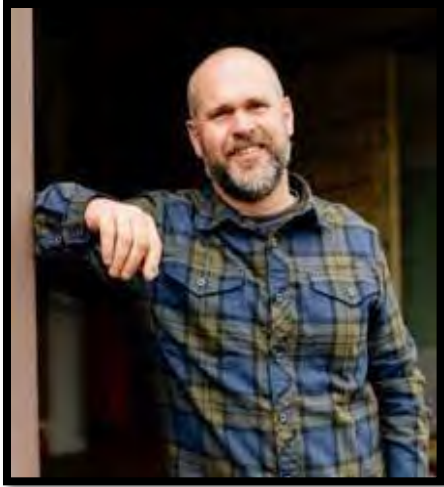
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Guest Speaker



Trevor Trainor– President and a Building Science Specialist at Bawating Building Science

- He specializes in the hygrothermal performance of wall and roof systems in extreme, cold climates and has extensive experience in monitoring moisture and heat flow in enclosure systems, developing hygrothermal and energy models and performing forensic investigations on buildings with moisture-related issues.
- This experience in field research, modeling and forensic investigations gives him a unique perspective in the development of high-performance building enclosure designs.





Host



Andrew Oding REA NZQEA LEED AP BSSO
Vice President | Director of Building Science

- Member, NBC SCEEHB Standing Committee Energy Efficiency in Houses & Buildings 2019 - present
- Chair, NBC Task Group “Unintended Consequences “ SCEEHB Standing Committee Energy Efficiency in Houses & Buildings 2019 – present
- Voting Member, ASHRAE 90.2 EE Standard for low Rise Buildings and homes
- Member, CSA TC424 Energy systems in buildings
- Member CSA A440
- Chair-Past, CHBA Technical Research Committee
- Chair-Past, CHBA Net Zero Council
- Chair-Past, NRCan Energy Star for New homes TAC
- Chair-Past, CaGBC LEED for Homes TAC

Agenda

1 -1:10 Intro

1:10-1:20 Deep Energy Renovations-Why now?

1:20 – 2:00 Trevor Trainor –Expert Reflections on best practice Historical Retrofits

2:00-2:30 Q&A

Housekeeping – Rules of Engagement

- Questions? Please place **ONLY** in **Q&A**.
- Be considerate, thoughtful and respectful in the CHAT.
- The BKC Admin team is ready to help with tech concerns or general inquiries.
- Please complete SURVEY MONKEY following presentation!
- Links, presentation materials - all will be sent out to attendees following the webinar.
- NEW FEATURE: Closed Captioning is enabled if you require a live transcript while the hosts are speaking. It's between Record and Reactions at the bottom of most screens.



POLLS!!

Where are you joining us from?

What keeps you busy day-to-day?

Deep Energy Retro-fit: Residential

Greener Homes is great...But we need to **MOVE FARTHER & SMARTER** towards “net zero energy/emissions and carbon(operational and embodied)

Unintended consequences of “Tunnel-Vision” Deep energy retrofits...

- Destroys the durability of the home
- Causes Indoor air quality issues and possibly life safety issues (back-drafting, humidity and IAQ issues)
- Results in negative comfort impact on occupant (e.g. short-cycling, imbalanced htg/clg,)
- INCREASES operational cost of home or residence (Elec vs gas - Prioritizing HVAC “fixes” over Enclosure solutions)
- INCREASES overall carbon emissions (e.g. embodied vs operational) Seriously?....

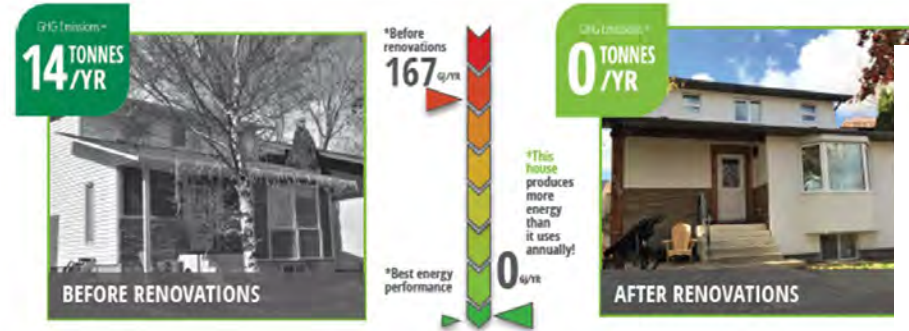


Deep Energy Retro-fit: Residential

A thoughtful, Science based approach IS the ONLY way forward.



Renovator Peter Darlington, Solar Homes Inc. **Service Organization** Enervision
Energy Advisor Cooper Lee, 4 Elements Integrated Design LTD. **Net Zero Pilot Home** Calgary, AB (Climate Zone 6)



NET ZERO RENOVATIONS PILOT HOME POST-RENOVATION DETAILS

<p>BUILDING ENCLOSURE</p> <p>Windows: Lux Windows & Glass, Triple Glazed Low-E</p> <p>Walls: R16 EPS, R12 Batt</p> <p>Celling: R60 Blown</p> <p>Foundation: R20 Batt</p> <p>Envelope: 35% better than NRCan reference house</p> <p>Airtightness (ACH @ 50 Pa): Pre-reno 4.55 → Post-Reno 1.27</p>	<p>MECHANICALS</p> <p>Fuel Source: All-Electric</p> <p>Heating & Cooling: Mitsubishi ASHP & Electric Furnace</p> <p>Water Heating: Electric heat pump</p> <p>Ventilation: Nu-Air HRV</p>
<p>RENEWABLE ENERGY</p> <p>PV System: 15.6 kW Hanwha & CanSolar array</p> <p>Energy Monitor: Neurio</p>	

Want to learn more? Visit www.netzerorenos.com for updates.

Find the 6 pilot project profiles at www.NetZeroRenos.com

Testimonial

"I started planning a fairly typical renovation and stumbled across an article that was talking about net zero. It was like a lightbulb went off; I realized... I could generate all my own energy for the rest of my life. Not only is it cost-effective, but the home is more comfortable: year-round spring fresh air, consistent temperatures everywhere, no bugs, no outside noises, and virtually no energy bills for the home and [electric] car!"

***(Estimated) \$2,500 /YR SAVED**
On energy bills!

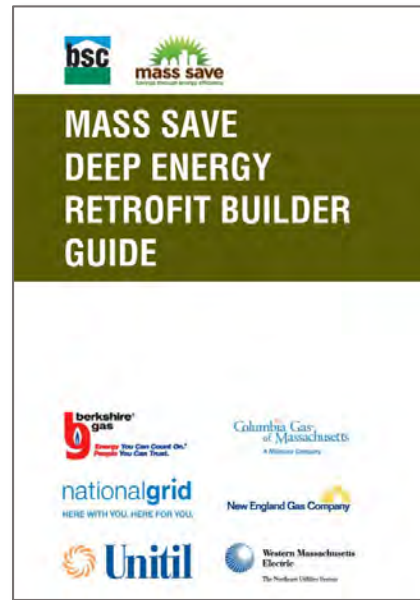
*Utility cost savings based on energy profiles and assumes the following utility rates: Natural Gas: \$4.89/GJ plus carbon price: \$1.05/GJ \$40/month admin. Electricity: \$1.11/kWh electricity plus \$25/month admin.

Deep Energy Retro-fit: Residential

A few good references to get started



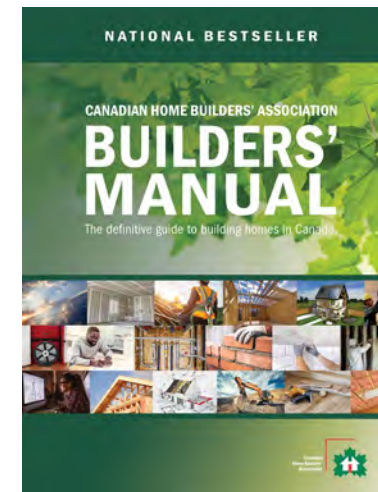
www.bchousing.org/research-centre/library/residential-design-construction



www.buildingscience.com/



www.chba.ca/CHBA/Publications/Renovators-Manual.aspx



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ENBRIDGE GAS PROVINCIAL ADVANCED BUILDING SCIENCE SERIES

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CRITICAL CANADIAN HOME BUILDING SCIENCE PART 11:

The Growing Barriers NZ Builders and Communities Face With Renewables, PV, Energy Management and More

December 15, 2022 1:00–2:30 PM (EST)



Andy Oding
Building Knowledge Canada







Wil Beardmore
Bluewater Energy



Thank you for attending!

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THE HOME THAT SCIENCE BUILT