Towards Cost-Effective Net Zero Energy Ready Residential Renovations 2022-2026

Canadian Home Builders' Association

Natural Resources Canada | Ressources naturelles Canada

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BUILDING KNOWLEDGE CANADA INC.

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Towards Net Zero Roadmap with Volta SNAP: Bringing Building Science into Business Models

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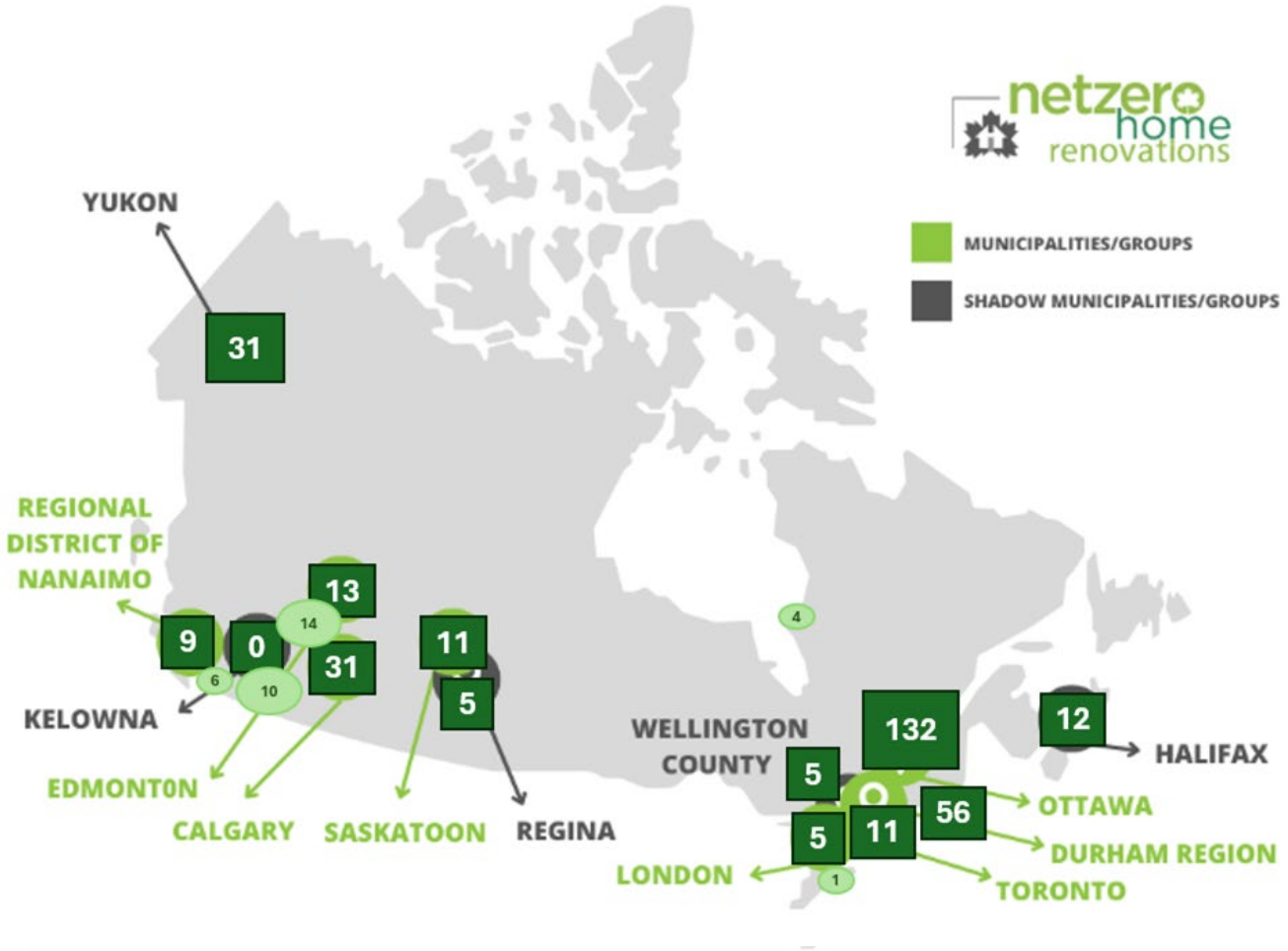
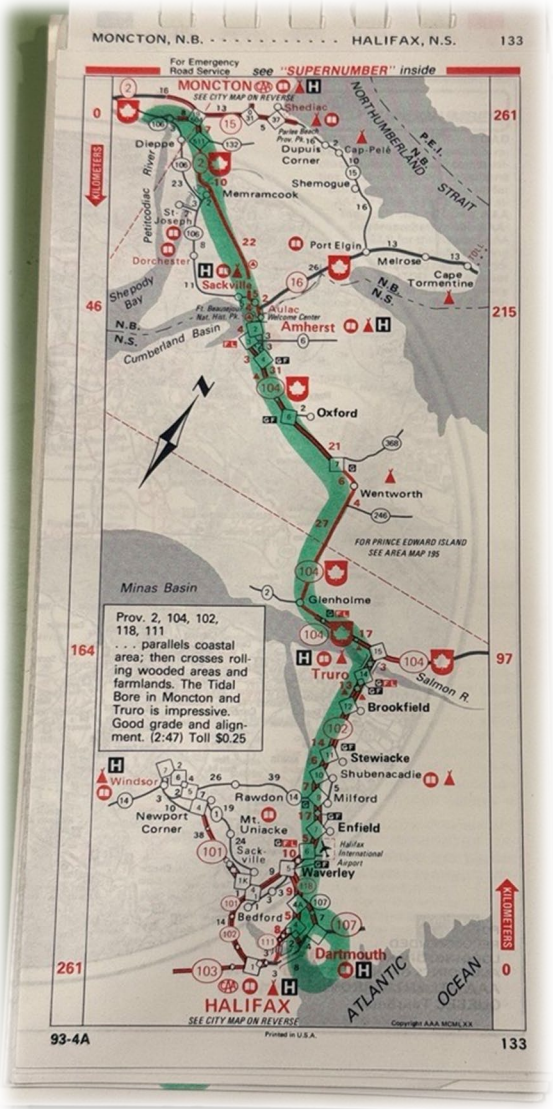


Units enrolled as of December 2024 deadline.

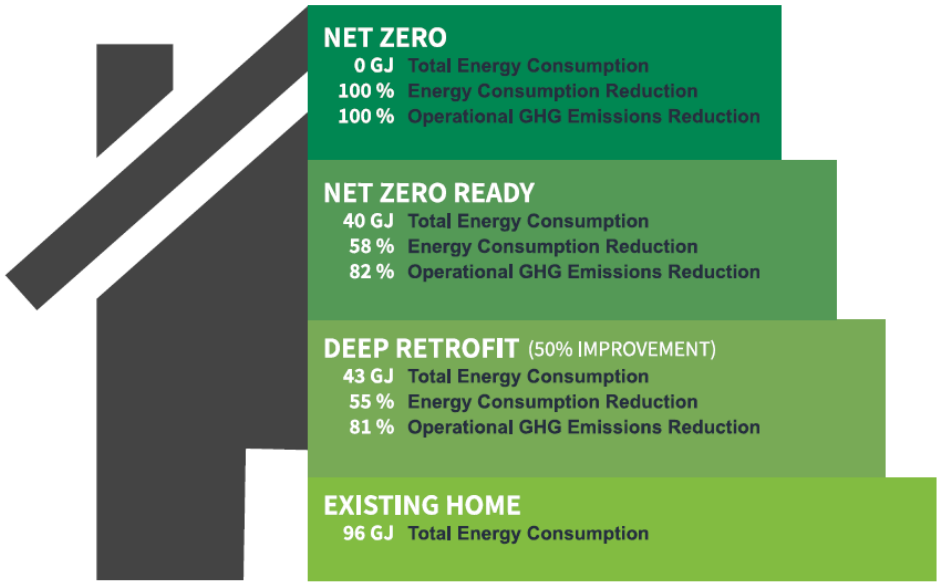
- 13 municipalities
- 140 projects
- **over 350 residential units**
  - 39% single family homes
  - 33% multi-unit residential
  - 29% semi-detached, row or townhomes
- **$20.3 M completed**
- **+ $32.5 M costed**

The Business Case for a Roadmap Process & Tools



- Meeting homeowners and existing homes **where they are** at and integrating their plans in terms of budget/conditions/goals
- Cost-effective **access** to Qualified Net Zero expertise
- Provide a **Towards Net Zero Roadmap** that maximizes benefits for home and homeowner
- Allow for **intentional phasing** of work with building science reviewed waypoints

Towards Net Zero Roadmap in volta SNAP



- **Reduce duplication** of inputs (Augment the ERS/CHBA NZ workflow)
- **Increase agility** for on-demand modifications to modelling
- **Get ahead** of decision trigger points
- **Avoid lock-ins** / stranded assets

Towards Net Zero Roadmap 2.0

- A **phased plan** for home improvement – an interactive report
- Stages based on **homeowner goals** and end-point (Net Zero) targets
- **Customized resources** for homeowner and renovator
- **Lifestyle impacts**, health and indoor air quality

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Short term

Long term

	HOUSE COMPONENTS	EXISTING HOME	PHASE 1:	DEEP RETROFIT *(50% Improvement)*	PHASE 2:	NET ZERO READY	NET ZERO
ENVELOPE	Ceiling with Attic Space	R51 Blown Cell.		R51 Blown Cell.		R70 Attic	R70 Attic
	Above Grade Walls / Garage Wall	R10 Batt		Gut main floor R19 Spray Foam + R5ci		Gut main floor R19 Spray Foam + R5ci	Gut main floor R19 Spray Foam + R5ci
	Foundation Wall						
	Under Basement Slab	R7		R7		R7	R7
	Windows & Sliding Glass Doors	Double-glazed		Double-glazed		U=1.2, SHGC=0.26	U=1.2, SHGC=0.26
	Airtightness	4.8 ACH		30% Reduction (3.4 ACH)		68% Reduction (1.5 ACH)	68% Reduction (1.5 ACH)
HVAC	Principle Ventilation	None		67% HRV		67% HRV	67% HRV
	Space Heating	95.5% AFUE Furnace		11 HSPF ASHP + 95% AFUE Furnace		11 HSPF ASHP + Elec. Furnace	11 HSPF ASHP + Elec. Furnace
	Cooling & Heat Pumps	10 SEER AC		19 SEER ASHP		19 SEER ASHP	19 SEER ASHP
DHW	Domestic Water Heater	0.63 EF Gas Tank		3.0 EF HPWH		3.0 EF HPWH	3.0 EF HPWH
OTHER	On-site Generation & Storage	None		None		None	9 kW Solar PV
	Lighting & Appliances	LEDs, ENERGY STAR®		LEDs, ENERGY STAR®		LEDs, ENERGY STAR®	LEDs, ENERGY STAR®

Roadmap Creation Process

1. **Pre-retrofit energy assessment:** EA creates initial roadmap with (flexible) checkpoints (50% savings, NZr, NZ)
2. **IDP / kitchen table meeting:** EA, homeowner, renovator evaluate options and make decisions, document next steps
3. **Post-IDP:** EA finalizes roadmap with homeowner-specific phases, completes building science tips/resources section
4. **Final Roadmap:** Signed by EA, delivered to homeowner & team (renovator, municipality, lender…)

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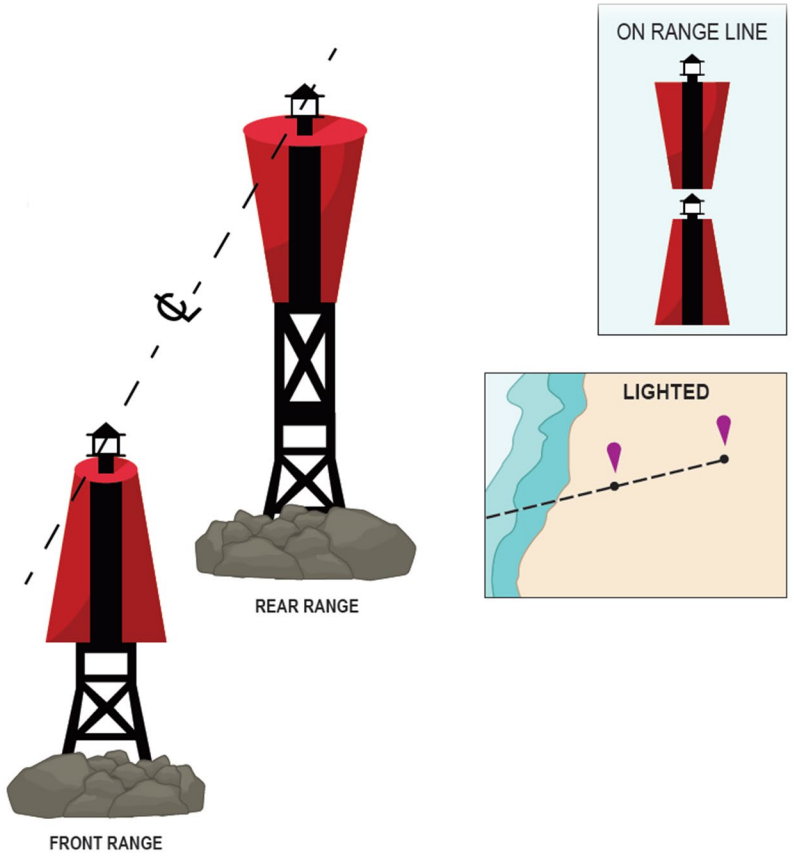
Alignment drives Business Case for DERs

- **Direct** towards a long-term **Net Zero or Deep Energy Retrofit** goal with an asset management lens
- **Empower** homeowner and team to make informed decisions
- **Plan** for maintenance and replacements cycles and seek opportunities for staged upgrades
- **Iterative alignment checks** with each phase of work



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