

Project Profile / Case Study Submission

Description: Net Zero Retrofit with out Demo!: 2010 house retrofitted to net zero energy with Aerobarrier, geo exchange and solar. No demolition.

Building Profile

A	Address	2 Windhaven Gardens SW		
	Year Built	2010	Type of building	single detached
	Square Footage	1600 sq ft above garde	Structure Type and Foundation	Wood structure, cast in palce foundations
	Climate Zone	7A		

Project Goals

Comments

B	Reduce Energy Consumption	100%
	Increase Thermal Comfort	negligeable
	Improve Indoor Air Quality	better due to better controls and air movuement
	Reduce GHG reliance (Net-Zero Readiness)	100%
	Improve Home Value	to be determined
	Other Typical Renovation Goals	none

Stakeholder Profile

C	DER Manager		Builder	
	Building Sciences Advisor	Amelie Caron	Builder Website	none
	Energy Advisor	Chelsah Thomas	Funding Agency	SSRIA (collaboration and scheduling)
	Architect	none	Utilities Provider	Fortis

Retrofit Checklist

Retrofit Type	Initial Assessment	Retrofit Improvement
Envelope		
1	Airtightness - Penetration Sealing	4.5 ACH50 Aerobarrier 1.2 ACH50/ currently around 1.9 ACH50
	Wall Insulation	R20 batt no change
	Ceiling Insulation	R40 cellulose no change
	Foundation Insulation	R12 batt no change
	Window Replacement	Double pane, air, insulated spacers, vinyl frame no change
	Door Replacement	Steel EPS core no change
	Other	
Mechanical and Electrical Systems		
2	Heating	92% NG furnace Geo exchange-no secondary heating
	Cooling	none Geo exchange
	Hot Water	Nat Gas power vented 40 gal Desuperheater with 40 gal Electric tank

Electrical Service Amperage	100 amp	125 amp-due to EV-not due to geoexchange
Other		surge protection device, DCC for EV charging

Energy Performance			
	Initial	Goal	
3	Energy Use Intensity (kWh/m2/a)	181	86
	Annual Heating Demand (kWh)	22380 kWh	21525 kWh
	Annual Cooling Demand (kWh)	0	504 kWh
	Air Leakage Rate (ACH50)	4.5	1.9
	Other		

Lessons Learned	
	<p>Lots of coordination upfront as we purchased the house for the project. Needed to know we could reach our target PRIOR to lifting conditions</p> <p>The idea of drilling an existing property is easy, but many unknowns came up. For example: 40 ft water geysers throwing rocks at all our neighbours houses</p> <p>Drilling ridgs are HUGE! Not every lot has the room to have one on their property</p>
4	<p>Treching through lime stone is a ton of work for a mini excavator and a jack hammer (60ft trench)</p> <p>no heating available for a few days while the heat pump gets installed and the gas one gets disconnected- not ideal in winter conditions</p> <p>Cities do not know what permits to require for these projects-multiple electrical permits pulled- a lot of confusion at Fortis and the City</p> <p>Up electrical cable from the house to meter to the electrical panel (no panel upgrade) due to EV 40 amp breaker.</p> <p>All in, the project started in April 2022, and is now 100% completed in August 2022, very little disruption to our living space and life style.</p>