



Integrated Design Sessions





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Key Contacts

Name	Company	Role	Email
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Project Background (Discovery)

Information Gathering Phase

The Client

Client is interested in retrofitting their home to as close to net zero as possible. Duplex home with 7 people (2 adults and 5 children) living in the home. There is an HRV in the basement, only. There is a 100amp service and there is concern with the high moisture level in the home.

Key Goals.

(goals that must be met, or the project will not move forward)

1. Budget – The project must stick to client budget
2. Ventilation – this is high priority with mould issues in some areas of the home
3. DHW – Replace propane tank with electric system
4. Heating – upgrade heating with Heat Pump – mini split system
5. Insulation – Upgrade attic insulation
6. Windows – Replace all windows and 2 doors

Secondary goals:

(goals that can have some flexibility, could be described as preferences rather than must haves)

1. Carbon Reductions – Mechanical system upgrades have largely accomplished this already.
2. Resiliency- setup for battery backup in future
3. Long term improvements and energy bill reduction – lower bills as home improves over time.



Charrette #1 Agenda

Date: 2025-05-08

Objectives: To understand the opportunities, challenges, and red flags for each LEEP10 home to attain 50% and Net Zero energy reduction targets

1. Is there enough power at each home to electrify?
 - 1.1. If not, is there a solution to avoid electrical system upgrades?
2. What are the recommended/possible Energy Conservation Measures for each home to attain 50% and NZ energy savings? Why and IDP
 - 2.1. HVAC
 - 2.2. Building Enclosure
3. What solar opportunity exists for the home to support 50% and NZ energy savings? Project Brief, design overview and status update

Meeting Notes:

- 7 children (5 living in the home and 2 back in the summer)
- 2 adults
- Propane

HVAC

- Mould issues in some closets
- Primary topic - how to provide heating and cooling
- Difficult getting ventilation to bedrooms
- Want stable temp throughout the house
- Heat pump heads in bedrooms not great - blowing on people's head
- house SO broken up
- Lots of little rooms
- Quiet mode provides air movement
- Smokey season
- Want house to run as it should - not at 70% of effectiveness

Energy

- Foundation worst problem re: energy
- Eliminate baseboard heating
- Get rid of baseboards (1,500watts) if heads going in
- Solar potential is Have \$60k to spend
- Ventilation
- Can't remove propane appliance - stones all around it
- Propane hot water - extraordinarily expensive
- Water heating is the second most expensive thing
- Maybe upsize HRV
- Putting in good quality electric hot water tank
- heat pump hot water too noisy
- What happens to bills if go from propane to elec
- Bills go down
- 1 tank in the house might not be enough for 7 people
- May need 2 tanks
- Back up tank - one feeds off the other



Charrette #2 Agenda

Date: 2025-06-11

Objective: Final mechanical and design questions

Meeting Notes:

Meredith / Paul / Nate / Mark / Oriol

To get to 50%:

- Get very hot and very cold with critical moisture issues
-
- Range hood is the ventilation
- Family of 7 - sometimes 9
- Net Zero isn't 50%
- Need to change windows
- Can't do anything much with basement
- Replace with 0.9 windows
- HRV will be Venmar 70% (ducting can handle it)
- Add ductless heat pump cold climate
- Going to keep propane fireplace ('stoned' in)
- Busbar rating 125 - minus baseboards adding heat pump and hot water tank = same amperage
- Eliminate baseboard heat in basement bedrooms
- Propane hot water has to go - replace with electric hot water
- (not Rheem - explodes and wont replace)
- Maybe cut size of baseboards so can avoid upgrading elec
- Adding attic insulation - adding 70% HRV & replacing windows
- How much power does Propane water tank take - 15AMPS /
- Electric is 30amps total
- Must remove baseboards wherever there is a head
- Could reduce size of 3 baseboards in basement to 500 each
- - refer to BEN GUIDICCI for analysis
- Any room not getting a heat pump head keep baseboards but
- reducing
- size to 500
- Needs F280
- Add 1kw post heater for HRV
- 80-gallon Hot water tank (efficiency may be better on x2
- 30gallon tank)
- - can it fit is next question



Charrette #3 Agenda

Date: 2025-05-26

Objectives: To understand the opportunities, challenges, and red flags for each LEEP10 home to attain 50% and Net Zero energy reduction targets

1. Starting with the Problem Homes First & see how far we get:
 - 1.1. [REDACTED]
 - 1.2. [REDACTED]
 - 1.3. [REDACTED]
 - 1.4. [REDACTED]
 - 1.5. [REDACTED]
2. Didn't Discuss:
 - 2.1. [REDACTED]
 - 2.2. [REDACTED]
 - 2.3. [REDACTED]
 - 2.4. [REDACTED]
3. Action List:
 - 3.1. [REDACTED] Revision
 - 3.2. Mark and Tom - Finalise F280's and ECMs - aim for 2nd/3rd next week
 - 3.3. The report will be a written history of the project
 - 3.4. Mark can include pricing if get costs from Paul & Meredith
 - 3.5. Mark can include pricing if get costs from Paul & Meredith
 - 3.6. Paul & Meredith - costings done by end of July
 - 3.7. Need Balance Point Calculations - so need F280's tabled out from Tom
 - 3.8. F280's
 - 3.9. ECMs
4. Next Steps Plan:
 - 4.1. Nates Revisions
 - 4.2. Revised F280's – Tom
 - 4.3. HVAC - *to electrical, to balance points, & everything goes back to Meredith for costing*
 - 4.4. Costing
 - 4.5. IDP Report



Meeting Notes:

ECMS calculated to understand what would take to get to

50% energy reduction: (Marks Calcs)

- Attic to R50
- Windows to be replaced
- HRV
- ASHP 10 Cold Climate
- Switch from propane to electric water heating
- General Discussion about heat pump heads:
- 1 head downstairs (wont need cooling in the basement)
- Leave 2 baseboards in the bedrooms
- 1 head for Kitchen living dining
- 3 heads
- Room F280s are with the 50% energy reduction upgrades
- (not on what's current)
- Don't want to see 2 heat pumps from an efficiency and cost perspective
- Heat gain comes from the occupant load - 7 people (9 in summer)
- Conversation with the H/O - can have 2 outdoor units and have heating and cooling in the basement
- OR - 1 outdoor unit and no cool
- Baseboards might be useful for shoulder seasons
- 1 head in basement - reduce size of baseboards
- 1 head main shared living area
- 1 headmaster bedroom
- Remove baseboard in the master
- Bluebeam Revu Drawing Package being used for drawings
- Upstairs 2 bedrooms reducing BB to smallest BB possible
- Master and living - eliminate BB add 1 head
- Basement - 1 head
- Heat Pump sizing

Appendix A

HEET Dashboard

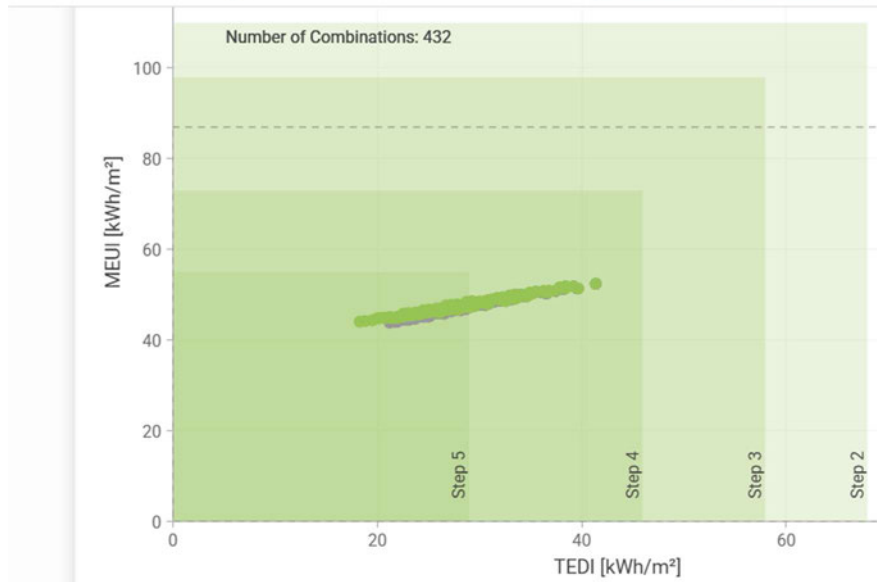


Options Modeled

961 Westridge Dr-NetZeroMins

House Info

Simulation Info



Selected Upgrades

Target	Energy Conservation Measures				
	Current	50% Reduction	Net Zero Mins Requirements	Net Zero Required Upgrades	
Air Leakage	2.2		1.5		
Attic Ceilings	R24.76	R50	R55.02		
Cathedral/Vault			R26.5		
Walls	R18.3		R18.3		R25
Exp Floor					
Foundation Wall	R12.66		R18.99	R30	R20
Slabs	R0		R0 (not required on Retrofit)		
Windows	U 2.97	U-0.91 Triple Pane	U 1.5 Double Pane		
Ventilation	55%HRV	70%HRV	55%HRV		
Heating/cooling	Direct Electric	ASHP HSPF 10 Cold Climate	ASHP HSPF 10 Cold Climate		
Generation (kWh)	0	18453	18214		
Other	Propane, Induced Draft	Electric Tank	Electric Tank		
% Heat Loss Reduction	-18	9	12	25	25
MEUI (kWh)	100	53	52	47.2	47.7



Appendix B

Solar Pannel Design and Layouts