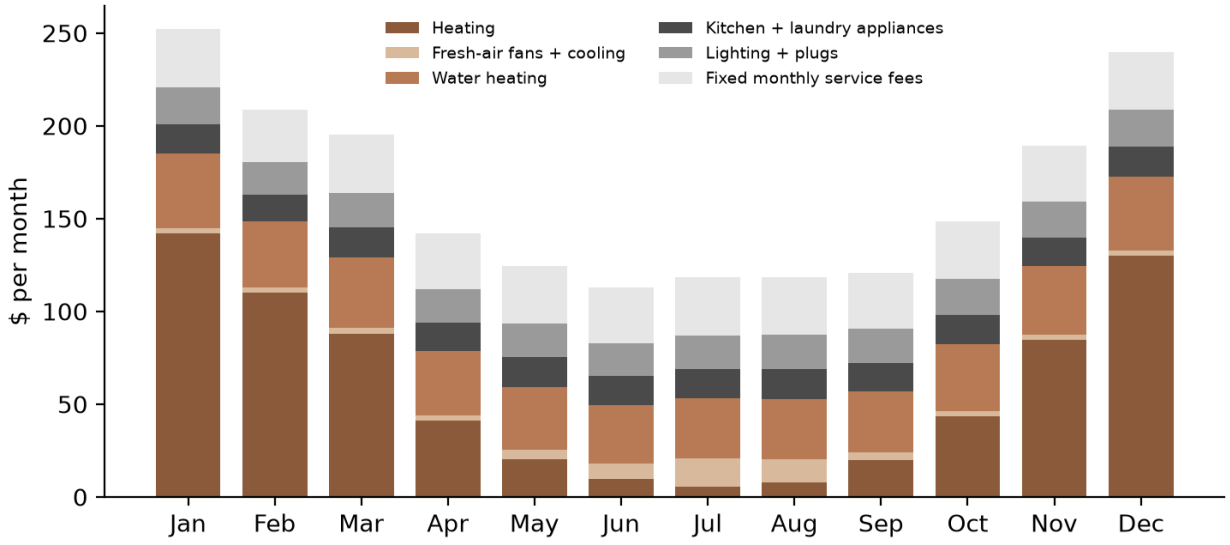
Luminare Homes - 2-Storey Garden Suite Utility Cost Estimate

Edmonton, Alberta. All-electric home: cold-climate ductless heat pump (mini-split) for heat, electric hot-water tank, electric range. Prepared Oct 31, 2026 from the 2-Storey Factory Guide (Rev A) and current EPCOR / Alberta Utilities Commission rates.

	Low	Typical	High
Average per month (all-in, incl. GST)	$105	$164	$224
Per year	$1,262	$1,971	$2,684
Electricity used per year (kWh)	5,645	7,906	10,751
Winter month (Jan)	$153	$252	$360
Summer month (Jul)	$77	$118	$162
Energy price used (cents/kWh, before delivery)	7.79 (retailer fixed)	12.01 (default rate)	13.21 (max 2027 default)
All-in per kWh incl. delivery + GST (cents)	15.9	20.3	21.5

Headline: a typical household should expect about **$164 a month** ($1,971 a year) for all electricity, including heating, hot water, cooking and the fixed monthly fees. Winter months run about $209-$252; summer months about $113-$118. There is no natural gas bill: the home is all-electric. Water and sewer are billed separately and are not included.



Typical case, month by month (stacked by use, incl. GST).

1. What we used from the drawings

Item	Value used	Source
Two stacked boxes (A upper, B lower)	18'-9 1/2" x 14'-0" each; about 42 m2 (450 sq ft) of floor	Factory Guide p.3, p.97 (load calc)
Walls	2x6 at 16" OC, closed-cell spray foam full 5 1/2" depth, 8'-0" high	Factory Guide p.43
Floor (B, over open air) and roof (A)	2x10 at 16" OC, closed-cell foam full depth ("about R-55+", owner)	Factory Guide p.57; owner
Windows	All triple-glazed, black frames. W1-W7, W9, W10, W14 (10 units) + insulated steel entry door D1. No skylight is included in this estimate.	Factory Guide p.39; owner
Heating	Cold-climate ductless heat pump (mini-split), 12,000 BTU class: one indoor unit in the living room and one outdoor unit. It moves heat from the outside air, so each kWh of electricity gives about 2 to 4 kWh of heat. In the coldest weather, electric resistance heat tops it up.	Owner, Oct 31, 2026
Fresh air	ONE compact HRV (heat-recovery ventilator) serving both boxes	Owner, Oct 31, 2026
Hot water	ONE electric tank, 40 US gal, 240 V, 3 kW	Factory Guide p.97, p.124
Kitchen	Electric range 30" (240 V 40 A), 24" fridge, 24" dishwasher	Factory Guide p.97, p.126
Laundry	GE Profile PFQ97HSPVDS washer + ventless heat-pump dryer combo (120 V)	Factory Guide p.126
Cooling / heat trace	No built-in cooling system. No heat trace is specified.	Factory Guide

Heating degree-days: Environment Canada 1991-2020 normal for Edmonton (Airport) is 5,697 degree-days below 18 C, used for the typical case. The National Building Code value for Edmonton is 5,120 (used for the low case).

2. Heat-loss calculation (typical case)

Steady-state method: total heat loss rate UA (watts per degree) x yearly heating degree-days x 24 hours gives the heat the home needs. The heat pump makes that heat using less electricity than the heat it delivers (see section 3). Heating degree-days are used with the standard 18 C base, which already assumes some free heat from people and appliances; solar gain is ignored, so the estimate leans cautious.

Part	Area (m2)	U (W/m2K)	R-value*	UA (W/K)
Walls, net of openings	80.2	0.30	R-19	24.1
Windows (triple, rough-opening area)	21.5	1.00	R-5.7	21.5
Entry door	1.9	1.20	R-4.7	2.3
Roof (2x10, foam)	24.4	0.131	R-43	3.2
Floor over open air (2x10, foam)	24.4	0.131	R-43	3.2
Conduction subtotal				54.2
Air leakage (1.5 air changes/h at 50 Pa, 110 m3)				2.7
Fresh air through HRV (20 L/s, 70% heat recovered)				7.2
Total heat loss rate				64.2

*R-value in imperial units (ft2.h.F/Btu), rounded. Windows are about 21% of the wall area (21.5 m2 of 103.6 m2 gross wall), which is why they cause about 40% of the conduction loss.

- **Wall U 0.30**: 5.5" of closed-cell foam at R-6.0/inch (NRCan long-term design value) is R-33 in the cavity. The 2x6 studs (about 25% of the wall with headers, plates and corners) and the floor-edge framing drop the whole-wall value to about R-19. No outside continuous insulation is shown in the drawings.
- **Roof / floor U 0.131**: 9 1/4" of foam is about R-55 in the cavity; joists at 16" OC (about 12%) bring the assembly to about R-43. Ties to the owner's "R-55+" note. Roof joist size must still be set by the engineer for snow load (Factory Guide TC-50).
- **Windows**: no U-value is given in the guide. Typical triple-glazed, low-E, argon units land at 0.8-1.2 W/m2K (ENERGY STAR Canada limit 1.22). 1.00 is used, with 0.85 (low) and 1.20 (high) in the other cases.

- **Air leakage**: factory-built, foam-sealed shell; 1.5 ACH at 50 Pa assumed (low 1.0, high 2.0), converted to natural leakage at about ACH50 / 20.
- **HRV**: 20 L/s continuous (about 42 cfm); 70% heat recovery over the heating season (low 78%, high 65%). One compact unit at about 20 W continuous (175 kWh/yr).

3. Heating energy

Heat needed = 64.2 W/K x 5,697 degree-days x 24 h = **8,773 kWh** of heat per year. The heat pump delivers that heat using about **3,460 kWh** of electricity per year (about 82.8 kWh per m2 of floor): an average of **2.5 kWh of heat for every kWh of electricity** over the year. Heating is the largest single use in the home.

How the heat pump is modelled

Each month is split into many hours of outdoor temperature (cold and mild days, with a day-to-night swing of about 4 C), matched to the Edmonton degree-days. For each hour the home needs a certain amount of heat, and the heat pump supplies it at the efficiency (COP, heat out per electricity in) for that outdoor temperature:

Outdoor temperature	+10 C	+5 C	0 C	-5 C	-10 C	-15 C	-20 C	-25 C
Heat pump COP (heat per electricity)	4.0	3.6	3.2	2.8	2.4	2.1	1.8	1.5

- **In plain words**: on a mild day the heat pump gives about 4 units of heat for each unit of electricity; at -15 C about 2 units; at -25 C about 1.5 units. These are typical figures for a cold-climate unit of this size, including its defrost cycles, not the data sheet of a specific model.
- **Backup heat**: below -25 C the heat pump shuts off and electric resistance heat does all the work (1 unit of heat per unit of electricity). The heat pump can deliver about 3.5 kW down to -15 C, easing to 2.5 kW at -25 C; if the home needs more than that in a very cold hour, resistance heat supplies the difference. Over a typical year the heat pump supplies about 99% of the heat.
- **By season**: the average COP is about 2.1 in January, 3.3 in April and 3.9 in July (typical case); about 2.5 over the whole year (low case 2.7, high case 2.3).
- Hot water, appliances, lights, fans and the fixed fees are calculated as set out in sections 4 and 5. Cooling is left at the same small allowance and is not reduced for the heat pump, which is slightly cautious.

Design check at -32 C outside / 21 C inside: peak heat loss is about **3.6 kW** (12,366 Btu/h) in the typical case, 3.1 kW in the low case and 4.2 kW in the high case. The 12,000 BTU class heat pump covers most of this, and the electric backup (built into the system or a few small wall heaters) covers the rest in the coldest hours. **Flag for the designer and HVAC contractor**: confirm the unit size and model, the backup heat, and how heat reaches the upstairs bedroom and the bath, since one indoor unit serves the living room.

Cooling: Edmonton has only 29 degree-days above 18 C per year. With large glass some cooling will be wanted on hot afternoons; 150 kWh/yr is assumed (low 50, high 300), spread over June to September. There is no built-in cooling, so this covers fans and a plug-in air conditioner. This is an assumption, not a calculation: orientation and shading are not set.

4. Hot water, appliances, lights and plugs (typical case)

Use	kWh/yr	Basis
Water heating (40 gal electric tank)	2,089	100 L of hot water per day (2 people, incl. dishwasher + washer share) heated from 4 C (Jan) to 14 C (Jul) up to 55 C at 93% efficiency. Assumption.
Electric range	450	NRCan average new electric range is 552 kWh/yr per household; 450 used for a 1-bedroom home (low 350, high 550). Assumption.
Fridge (24")	350	Typical ENERGY STAR 24" model, 350 kWh/yr (low 280). High case uses NRCan new-fridge average, 450-494. Model not chosen yet (Factory Guide: models TC).
Dishwasher, 2 loads per week	34	NRCan new-dishwasher rating 71 kWh/yr at about 215 standard cycles = 0.33 kWh per load x 104 loads. Hot water is counted under water heating.
Laundry, 1 wash + 1 dry per week	97	GE PFQ97HS EnerGuide: washer 136 + dryer 399 kWh/yr at standard use (about 295 wash and 283 dry loads) scaled to 52 loads each = 24 + 73 kWh.
Lighting (LED)	200	About 450 sq ft of LED lighting, heavier in winter. Assumption.
Plugs and electronics	900	TV, computer, router, microwave, small appliances, chargers, standby. Assumption.
Fresh-air fan (1 HRV)	175	20 W continuous.
Cooling	150	See section 3.
Heating	3,460	See section 3.
Total	7,906	

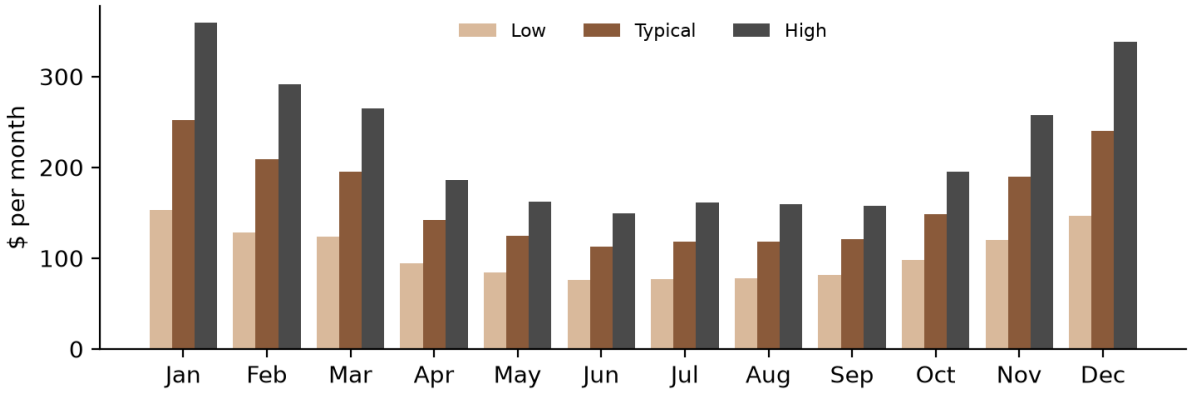
Owner assumptions for the typical case: dishwasher 2 loads per week; washer and dryer 1 load per week each. Heat trace: none is specified in the drawings, so none is included (a heat-trace cable would add a few dozen kWh per winter).

5. Rates used (Edmonton, EPCOR; all checked Oct 31, 2026)

Charge	Rate	Source
Energy (Rate of Last Resort, default)	12.01 c/kWh, fixed to Dec 31, 2026	UCA default rates page; AUC Decision 29204-D01-2024
Retail fixed (low case)	7.79 c/kWh (Encor 2-year fixed, Aug 2026); 5-year fixed 10.25 c/kWh	EPCOR "Historical electricity rates", 2026 table
2027 default rate (high case)	Not yet filed. Cannot move more than 10% from 12.01: range 10.81-13.21 c/kWh	AUC Decision 29204-D02-2025
Retailer administration	$0.230 per day (default tariff, eff. Jul 1, 2026). Also assumed for the retail case.	EPCOR Regulated Rate Tariff, Jul 1, 2026
Distribution (EPCOR D&T;)	$0.72856 per day + 1.783 c/kWh (2026 interim)	EDTI Schedule DAS-R, eff. Jan 1, 2026
Transmission (system access)	4.050 c/kWh; Rider J -0.016; Rider K +0.103 (from Oct 1, 2026) = 4.137 c/kWh	EDTI SAS-R; Rider J; Disposition 31032-D01-2026
City of Edmonton local access (franchise) fee	1.388 c/kWh	AUC Disposition 30507-D01-2026
GST	5% on the whole bill	Federal
Result, typical	20.28 c/kWh all-in incl. GST, plus $367 per year fixed fees (incl. GST)	Calculated

Rates change: the default energy rate resets on Jan 1, 2027, and EPCOR distribution and transmission rates are interim for 2026. Each 1 c/kWh change in the all-in price moves the typical annual bill by about $83.

6. Low / typical / high



Setting	Low	Typical	High
Winter (heating degree-days)	5,120	5,697	6,267 (+10%)
Window U (W/m2K)	0.85	1.00	1.20
Wall / roof+floor U (W/m2K)	0.27 / 0.12	0.30 / 0.131	0.33 / 0.14
Air leakage (ACH at 50 Pa)	1.0	1.5	2.0
HRV heat recovery	78%	70%	65%
Heating efficiency (average COP over the year)	2.7	2.5	2.3
Hot water per day	75 L	100 L	130 L
Cooling kWh/yr	50	150	300
Range / fridge / dishwasher / laundry kWh	350 / 280 / 25 / 75	450 / 350 / 34 / 97	550 / 450 / 70 / 150
Lighting / plugs kWh	120 / 600	200 / 900	300 / 1,200
Energy price	7.79 c (retail)	12.01 c (default)	13.21 c (2027 cap)

7. Limits of this estimate

- Drawings are not yet stamped; sizes, windows and equipment may change. Window U-values, the heat pump size and model, appliance models and the HRV model are not selected yet. Heat pump efficiency (COP) figures are typical values, not the data of a specific maker.
- Steady-state, degree-day method: it is not an hour-by-hour energy model (HOT2000 / EnerGuide rating would be the formal check) and ignores solar gain, so it leans cautious.
- How people live matters most: thermostat setting, showers, and plug loads vary a lot from one household to the next.
- Not included: water and sewer, internet and phone, a car charger, a hot tub, or an extra portable heater.
- Energy figures for appliances come from NRCan / EnerGuide published ratings (laundry uses the rating of a ventless washer/dryer combo, GE Profile PFQ97HS, as the reference); hot-water use, lighting, plugs, cooling and cold-water temperature are our assumptions and are marked as such.

Sources (all opened Oct 31, 2026): Environment Canada 1991-2020 Climate Normals, Edmonton (Airport) - climate.weather.gc.ca; NRCan Keeping the Heat In, Section 3 (closed-cell foam RSI 1.06 per 25.4 mm); NRCan ENERGY STAR Canada windows specification (U 1.22) and Keeping the Heat In, Section 8; NRCan Residential Appliance UEC table (2021) and Searchable Product List entry for GE Profile PFQ97HS*V***; UCA default-rate page; AUC Decisions 29204-D01-2024, 29204-D02-2025, Disposition 30507-D01-2026, Disposition 31032-D01-2026; EPCOR DAS-R, SAS-R, Rider J, Regulated Rate Tariff (Jul 1, 2026) and Historical Electricity Rates pages.