

# Multifamily New Construction & Major Rehabilitation Program

Efficiency Vermont, Burlington Electric and Vermont Gas want to work with all multifamily projects as early as possible. If a project is ultimately unable to meet all elements of the High-Performance Track described below, expect some reduction to the per unit incentive. The Efficiency Vermont, Burlington Electric and Vermont Gas representative assigned to your project are your best resources for technical assistance and figuring out how changes will affect your incentive.

## MINIMUM PROGRAM REQUIREMENTS<sup>1</sup>

Category		Planned	High-Performance Track		
Heating System	Air Source Heat Pump/ Cold Climate Heat Pump (ASHP/CCHP) <sup>2</sup>	<input type="checkbox"/>	Heat pumps must meet criteria for CEE Highest Tier of efficiency for Northern climate listed under "Air Source Heat Pumps (North)" searchable list at <a href="#">CEE Directory   AHRI</a> (ahrinet.org); Units maintain greater heating capacity at lower temps and meet IRA criteria for tax benefits for Vermont.		
	Water Sourced Heat Pump (WSHP)	<input type="checkbox"/>	Water source heat pumps must be ENERGYSTAR Certified. If Ground Source Heat Pump (GSHP) or Air to Water Heat Pump (A2WHP) system is utilized, it is important for the developer to contact the local electric utility early on for possible Tier 3 incentives, which would come from the electric utility.		
	Packaged Terminal Heat Pump ("Heat pump PTAC")	<input type="checkbox"/>	Cold climate PTACs suitable for studio apartments must meet Northeast Energy Efficiency Partnership criteria and produce heat in heat pump mode down to -5°F. Qualifying units available from IceAir and Ephoca. Please confirm model with Energy Consultant before ordering. Other units will be considered as they become available.		
	Ground Source Heat Pump systems (GSHP) <sup>3</sup>	<input type="checkbox"/>	Tier 3 incentives may be available from electric utilities for GSHP systems, IRA tax credits are available for new GSHP systems.		
	Cold Climate Heat Pump with integrated energy recovery ventilation	<input type="checkbox"/>	A current example of this technology includes the Ephoca All in One (AIO) unit. Other units will be considered as they become available.		
	Hydronic Boiler	<input type="checkbox"/>	Gas	95% AFUE/Thermal Efficiency	
			Pellet <sup>4</sup>	85% AFUE	
	Boiler Control Features	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Must modulate boiler water temperature based on outdoor temp (Outdoor Reset Control) with a maximum space heating temperature of 140°F</li> <li>Turn boiler off if outdoor temp is above 55°F (Warm Weather Shut Down – WWSD)</li> </ul>		
	Low Temperature Hydronic Distribution Space Heating Loop - Circulator Pump & Balancing Valves <sup>5</sup>	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Low temperature hydronic radiators with a maximum 140°F design temp required</li> <li>Variable speed, high performance "smart" electrically commutated motor (ECM) circulator pump(s)</li> <li>Pumps shall be set to proportional pressure mode and balanced accordingly. Efficiency Vermont will verify balance procedure and pump optimization.</li> <li>Install combination air and magnetic or coalescing dirt separator on supply side of circulation loop</li> </ul>		
Hot Water Pipe Insulation (Pex and Copper) – Follow CBES requirements	<input type="checkbox"/>	Fluid Operating Temp Range	Nominal Pipe or Tube Diameter		
		105° -140° F	< 1"	1" to 1.5"	1.5" to 4"
			1.0"	1.0"	1.5"
Central Domestic Hot Water	Wood Pellet	<input type="checkbox"/>	Advanced Wood Heat System: Use indirect-fired storage tank.		
	Natural Gas or Propane	<input type="checkbox"/>	Natural Gas or Propane: Use ENERGY STAR® labeled, condensing, sealed combustion stand-alone water heater with minimum thermal efficiency of 95%. This allows shut off of space-heating boilers outside of heating season.		
	Electric	<input type="checkbox"/>	All electric central DHW option: Air-to-water heat pump water heater(s) paired with optional electric resistance storage tanks if domestic hot water distribution involves recirculation.		
	All Recirculation Systems	<input type="checkbox"/>	DHW recirculation loop system design consultation must happen in design phase and resulting design must be approved by Efficiency VT/BED/Vermont Gas: <ul style="list-style-type: none"> <li>» Design shall utilize mixing valve(s) capable of operating at no more than 1.35 gpm.</li> <li>» The recirculation pump shall have an electrically commutated motor (ECM) and be equipped with "smart" controls (proportional pressure). The in-mechanical room recirculation system piping must comply with the (mixing) valve manufacturers recommended piping schematic.</li> <li>» Utilize non-powered thermostatic balancing valves (Circuit solver or equal) at the end of each DHW branch where a recirc water connection is made. Every effort should be made to limit the number of recirc water connections made to no more than 3 per central water heating plant.</li> <li>» GC to schedule site visit by EVT/BED/VGS staff to assist/verify DHW setup</li> </ul>		
	Pipe Insulation	<input type="checkbox"/>	See table for hot water pipe insulation under Heating System.		
	Drain Water Heat Recovery <sup>6</sup>	<input type="checkbox"/>	\$500/unit additional incentive for each unit served by drain water heat recovery unit.		
	Water Conservation	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Specify WaterSense toilets, fixtures</li> <li>Aerators = 1.5 gpm; Showerheads = 2.0 gpm; Toilets = 1.28 gpf</li> </ul>		

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Category		Planned	High-Performance Track
Air Conditioning <sup>6</sup> (Cooling only)	Air Source Heat Pump Single Packaged	<input type="checkbox"/>	Minimum 16.0 SEER2, 9.0 EER2 (These are CEEs Tier 2 efficiencies).
	Air Source Heat Pump Split System	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Minimum 15.2 SEER2, 10 EER2 for ducted systems</li> <li>Minimum 16.0 SEER2, 9.0 EER2 for non-ducted systems</li> </ul>
	Chiller, Air Cooled	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>&lt;150 tons; 11.5 EER, 15 IPLV @ AHRI</li> <li>&gt;150 tons; 15 EER; 18 NPLV @55F chilled water</li> </ul>
Thermal Shell <sup>7</sup>	Ceiling	<input type="checkbox"/>	R-60 attic and/or R-49 Slope. Attic sheetrock plane air sealed.
	Flat Roof	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>R-45 continuous above roof deck</li> <li>Sealed roof sheathing joints and connect roof sheathing to wall sheathing at perimeter</li> </ul>
	Wood Framed Wall <sup>8</sup>	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>R-12 continuous exterior insulation (CBES or RBES)</li> <li>R-21 cavity minimum</li> <li>Sheathing joints taped/sealed.</li> <li>See Footnote 8 for guidance for steel framed</li> </ul>
	Exposed Floor <sup>9</sup>	<input type="checkbox"/>	R-38 cavity with minimum R-6 continuous exterior insulation.
	Below Grade Wall	<input type="checkbox"/>	R-20 Continuous .
	Slab Edge (on grade)	<input type="checkbox"/>	R-20 for 48" below.
	Windows	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>NFRC U value 0.27 or less (ENERGYSTAR qualified for Cold Climate)</li> <li>Storefront: U-0.33 or less</li> </ul>
	Elevator & Stairwell Vestibules	<input type="checkbox"/>	For buildings with parking garages under living space. Required at parking level, recommended in corridors.
Air Leakage <sup>10</sup>	Maximum Allowed	<input type="checkbox"/>	0.075 cfm50/ft2 (0.10 cfm75/ft2) of total thermal boundary surface area (6 sides include above grade walls, below grade walls and slab) <sup>10</sup> . Must be verified by blower door test. If blower door test indicates higher air leakage, expect reduction of per unit incentive. Building envelope commissioning incentives of 50% (up to \$5,000) available to achieve this air tightness target.
Lighting	In-unit <sup>11</sup> and Common area fixtures	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>ENERGY STAR or Design Lights Consortium qualified LED fixtures</li> <li>If screw-based fixtures are installed, must install ENERGY STAR qualified LED lamps.</li> </ul>
	Interior common area controls	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Occupancy controls included in all hallways, stairways, laundry rooms, etc.</li> <li>Day lighting control included in common areas with glazing.</li> </ul>
	Parking lot / Site	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>LED fixtures listed on Design Lights Consortium qualified products list.</li> <li>Lighting Power Density (LPD) 20% better than CBES:                             <ul style="list-style-type: none"> <li>» No more than 0.10 watts/sq. ft for interior parking garage</li> <li>» No more than 0.016 watt/sq. ft for parking lots</li> </ul> </li> </ul>
Appliances (Common Area or In-Unit)	Common area washing machines	<input type="checkbox"/>	ENERGY STAR certified.
	In-unit	<input type="checkbox"/>	ENERGY STAR Refrigerator, Dishwasher, Clothes Washer and Clothes Dryers.
	In-unit "all in one" clothes washer/heat pump clothes dryer	<input type="checkbox"/>	Additional incentives for ENERGY STAR combination washer/dryer units: <ul style="list-style-type: none"> <li>ENERGY STAR "most efficient" = \$400 per unit</li> <li>ENERGY STAR = \$200 per unit</li> </ul>
	In-unit Electric Dryers	<input type="checkbox"/>	Additional incentives for ENERGY STAR "most efficient" category: <ul style="list-style-type: none"> <li>Heat pump = \$400 per unit</li> <li>Hybrid heat pump = \$200 per unit</li> </ul>
Ventilation	Mechanical Ventilation serving residential units & common areas	<input type="checkbox"/>	2023 RBES/CBES requires Balanced Heat or Energy Recovery Ventilation and can be either a central system or individual systems each serving a living unit. Systems must have a Minimum Sensible Recovery Efficiency (SRE) of 70%. Supply ductwork will deliver fresh air into bedrooms with appropriate registers that spread airflow for occupant comfort. Make sure to include a return/pickup from the kitchen area to meet requirements for the 45L tax credit. Test and Balance report must be provided to Efficiency VT. Ducting must be rigid, smooth-walled pipe.
Incentives	Base	<input type="checkbox"/>	\$3700 per apartment (includes VGS portion when in VGS territory) up to 75 units. Incentives for projects above 75 units determined on a custom basis. Incentives may be affected by available budgets.

# Multifamily New Construction & Major Rehabilitation Program

**Notes:**

1. Project will meet or exceed applicable Vermont Residential or Commercial Building Energy Codes. Less comprehensive Major Rehabilitation projects will be analyzed on a custom basis.
2. Qualifying cold climate heat pumps receive additional point-of-purchase midstream incentives from Vermont suppliers. Efficiency Vermont recommends developers specify that point-of-purchase midstream incentives be reflected in invoices to project to ensure cost savings are passed along to the project.
3. Ground Source Heat Pump incentives are included in the per unit incentive.
4. Low temperature hydronic distribution designed to operate at maximum 140°F temp allows condensing boilers to condense at all space heating distribution fluid temperatures. It also allows the use of heat pump technology utilizing hydronic distribution. Use of an automatic balancing valve either integrated with, or in addition to, a 2-way zone valve provides consistent heat delivery, improves occupant comfort, and saves energy when using variable speed pumps. It should also reduce the time and cost of system balancing.
5. Examples are drainwater heat recovery unit made by Powerpipe or Sharc. Sharc heat pump drainwater recovery units are appropriate for larger multifamily buildings.
6. Minimum efficiencies when air conditioning is proposed for project. This is not a requirement to add air conditioning.
7. A pre-drywall insulation inspection is required of insulation installed in cavities that will be closed. Air sealing in attics will be inspected prior to insulation being installed. R-value minimums are cavity + continuous and do not include structural or finished materials. Minimum requirements may be relaxed when historic building rehab prevents altering wall section.
8. For steel framed and for RBES or CBES buildings, the calculated U value of the assembly must be no more than 0.037 (U value - 1/R value)
  - Example: R25 exterior continuous insulation only or R20 exterior continuous and R13 cavity insulation
9. Exposed floors over unconditioned space. Basements are considered conditioned space.
10. Building Envelope Conditioning (BECx) financial support is available in support of achieving tightness level of High Performance Track - 50% of BECx cost up to \$5,000.
11. Efficient LED lighting shall be included in every room and exterior space.

Your Energy Consultant is: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

Don't have an Energy Consultant? Call us to have one assigned to your project.



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