



A solar model demonstrating energy efficiency, renewable energy and green building

Eco-Home Performance Comparison

Feature	MN Code Built	MN Energy Star	Eco-Home Duluth
Slab Insulation	R-10	R-10	R-20
Slab Perimeter Insulation	R-10	R-10	R-20
Walls	R-19	R-24	R-36
Rim	R-10	R-20	R-31
Attic	R-38	R-50	R-60
Windows Thermal Performance	U-Value = 0.35	U-Value = 0.33	U-Value = 0.19 - 0.21
Windows Solar Performance	None required	SHGC minimum 0.3	SHGC 0.4 – 0.6
Envelope Air Tightness	None required	0.2 cfm/sf @ 50 Pa	0.09 cfm/sf @ 50 Pa
Heat Recovery Ventilation Efficiency	None required	76%	90%
Peak Heating Load/sf	None required	None required	9.5 Btu/sf
Maximum Conditioned Space	None required	4000 square feet	1800 square feet
Annual Heating Energy Consumption	Estimated at 73.1 million Btus	51.2 million Btus 30% less than code	25.4 million Btus 65% less than code
Estimated Annual CO2 Emissions Related to Heating	8,772 lbs CO2	6,140 lbs CO2	3,048 lbs CO2

This table compares the Eco-Home with two recognized guidelines for construction: the MN Energy Code and the MN Energy Star Homes program. LEED for Homes criteria were studied relative to the Eco-Home, but an analysis of features relative to LEED did not easily translate to the features selected in this comparison. However, an independent look at the LEED for Homes Criteria suggests that the Eco-Home would rank as a LEED Gold or LEED Platinum certification.

It is rare that any set of building performance guidelines, “green” or otherwise, seeks to qualify and quantify either building energy consumption or associated greenhouse

gas emissions. One exception to this is the European Passivhaus standard. When defining a building as “green,” it is important to understand a few things relating to energy consumption, even if the selected “green criteria” do not require this:

1. What is the fuel source for heating and cooling?
2. What is the estimated fuel consumption for heating and cooling?
3. What is the estimated electrical energy consumption exclusive of heating and cooling?
4. What are the estimated CO2 emissions associated with the above information?