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What is Net Zero?

A home that uses as much energy on an annual basis as it produces. Generally grid tied. A net meter keeps track of production and use. The bulk of production happens in the spring, summer and fall. The meter "banks" these kWh for use in the winter where production is low and use is generally higher. Net Zero homes typically use 15-20% of the energy they use as it is produced. The rest of the energy is exported to the grid and is consumed by neighboring homes.

How do you design a Net Zero Home?

A typical 2000 ft2 home generally has room for a 10 kWh array so that means that the house can't use more energy than what the 10 kWh array can produce annually. Depending on orientation and snow loads, annual production should be in the 8+ to 11,000 kWh area.

Siting – Maxime passive and active solar gains. Orient the bulk of the living space and the roof for the solar array 15 degrees west of due south.

Reducing Energy Loads beyond Typical Code Construction

Heat Superinsulation. R-7, R-25, R-30, R-40, R-60 Walls. No thermal bridges. Air tight building (.6 ACH50)
Passive Solar Gain

Mechanicals

Mechanical Ventilation with Heat Recovery.

Heating – Air Source Heat Pumps – Ducted and Ductless Minisplits.

Domestic Hot water Solar Domestic Hot Water (SDHW) or Heat Pump Hot Water (HPHW)

Plug Loads Measure regular energy usage with a glass front analogue meter or a web-based digital meter like EMonitor.
Induction burner stoves
LED lighting

Things to Think About

Resilience In the North Country a wood stove or alternate heat source is a good idea for super cold nights and power outages.

Beyond Net Zero

Bi-Modal Storage with batteries.
Storage of thermal energy.