

VerEco Home – ASHRAE TECHNOLOGY AWARD - Narrative

INTRODUCTION

The [VerEco Home](#), located at the Western Development Museum in Saskatoon, Saskatchewan and built by VerEco Homes Inc. and WSE Technologies, produces as much energy as it uses. The home is designed as a living, interactive exhibit to educate the community on home design techniques that help reduce environmental and economic impact. To meet the needs of Saskatchewan's cold climate, while creating a net-zero building, a team of local experts led by Dr. Rob Dumont of Dumont and Associates incorporated energy efficient products and technologies readily available to all home builders.

The VerEco Home is designed to be a Net Zero home which means it will produce as much energy as it uses on an annual basis. The home is also targeted for LEED certification demonstrating its environmental sustainability not only addresses energy but also innovation and design, site sustainability, water efficiency, materials and resources, indoor environmental quality, and awareness and education. The VerEco Home has a gross area of 1440 square feet with net living area of 1220 square feet.

TECHNOLOGY

The VerEco Home is unique in that it integrates readily available green building technologies in a very cost effective manner:

Energy Efficiency:

- Space heating
 - Compact design
 - Passive Solar Design
 - Super insulated building envelope
 - Double wall construction with R60 Cellulose insulation
 - R110 cellulose in the attic
 - High quality triple glaze, argon filled, low e coating windows
 - 10,000 pounds of thermal mass in special concrete floor tiles
 - Air tight construction
 - Heat recovery ventilation
 - Solar thermal collectors (flat panel and evacuated tube) for hydronic heating
- Photovoltaic (4400 watt system) for electric base board heaters
- Domestic hot water
 - Low flow fixtures
 - EnergyStar hot water heaters, dish washers and clothes washers
 - Drain water heat recovery
 - Solar thermal collectors for heating domestic hot water
 - Photovoltaic for electric back up heating
- Lights appliances and mechanical
 - CFL and LED lighting through out
 - Energy Star appliances
 - TED 5000 monitoring system
 - Phantom energy circuit
 - Photovoltaic

Indoor Air Quality:

- Heat Recovery Ventilation
- Sealed Ventilation ducts
- Anti contamination controls during construction
- Raised doorways to improve passive ventilation
- Low off gassing furniture
- Recycled furniture
- No VOC paints
- Passive Radon Ventilation
- MERV 13 filters

Innovation

- Compact design
 - Flex room
 - Utility closet
 - Walk up pantry
- Roof truss design
 - Dark sky compliant lighting built into eaves
 - 62 degree roof angle allows flush mounting of PV panels
 - low design reduces moving costs – less power lines to move
 - 26 inch eave eliminates requirement for awnings on south side
 - 42 inch hip provides ample room for 36 inches of blown in cellulose in attic
 - large flat roof area will capture ~800 gallons of water with a one inch rain
- Concrete floor tiles
 - Cost effective thermal mass
 - Durable flooring
 - Water resistant flooring

Operations and Maintenance:

- No furnace or air conditioning required
- Durable construction reduces maintenance
- Reduced operating costs
 - Zero energy costs
 - Water and waste water reduced by 66%

Cost Effectiveness

- Home available as RTM for \$125/foot (before alternative energy systems)
- Electrical costs reduced by \$4400/year at \$.11 per kWh. Assuming a 6.25% compound annual growth rate for energy, energy savings nearly \$1.5M in 50 years

Environmental impact

- Reduced GHG emissions of 33 tonnes per year or 1650 tonnes over 50 years
- Water consumption reduced by 800 liters per day (based on family of four). Total of 14.2M liters in 50 years.
- Built with recycled or sustainable materials wherever possible
 - Cellulose insulation
 - Bamboo, linoleum and concrete flooring
 - FSC lumber
 - Hardi panel siding
 - Metal roof
 - Concrete counter tops
- Recycled furniture