



March 31, 2010

REEP House for Sustainable Living
20 Mill St., Kitchener, ON

EnerGuide Rating and Energy Reductions

The REEP House renovations aim to raise our EnerGuide rating from 44 to 89 and achieve reductions of: 90% energy use, 63% CO₂ emissions, and 80% utilities cost.

Water Efficiency

Our water use reduction goal of 60% will be reached using grey water (with rain water as a back up) for flushing our 3L toilet, and by installing low flow fixtures. We will capture 80% of roof runoff in rain barrels fitted with ground moisture sensors, timers and pumps, demonstrating the technology and capacity to effortlessly water a large suburban lawn without City water. Our xeriscaping and permeable paving will ensure that no rain water falling on the property will be diverted into the City storm system, and includes 3 wells to monitor water quality under the paving.

Waste Reduction

Our process of applying for LEED Platinum certification is guiding our waste management system, which is diverting over 75% of construction waste from landfill. This is supported by the extensive re-use of existing structure, including the foundations, double brick walls, roof framing, sheathing, porch, and trim. Reclaimed materials are used throughout the home, for new framing, flooring, fixtures, and furniture. Preference is given to locally sourced materials with a high recycled content that are recyclable, following cradle to cradle principles, guided by advanced framing, detailed framing drawings, and waste factor reductions.

Transportation

REEP House is located in an established urban area, within walking distance of the downtown core, bus terminal, and all major amenities. A bicycle trail runs directly behind the property. We have advocated for a reduction to 3 parking spaces from the 10 originally required by municipal authorities, and will offer REEP House to a Bike Share program, and offer bike friendly parking and a charging station available for electric vehicles.

Technical Repeatability

REEP House is the opposite of rocket science. Our common sense choices deliberately demonstrate simple local solutions, carried out by local trades, suppliers and manufacturers. As a showroom and educational centre, our software will help homeowners choose the most effective energy reduction strategies with the best track record and quickest payback, and offer direct links to suppliers and contractors. In a nutshell: seal the envelope, insulate heavily, and install high performance heating.

Environmentally Preferable Building Materials

Materials selected are all run through a comprehensive decision making matrix, which prioritizes the following: Locally available; cradle to cradle manufacturing; durability; low to zero toxicity; sustainably / naturally sourced; low embodied energy; energy reduction enabling; carbon emission reduction; reasonable payback on investment; and extensive re-use. Whether through the use of exclusively FSC certified lumber, or the triple glazed, locally manufactured fiberglass windows, each choice is filtered to determine the best available solution to each component.

Affordability

REEP House set out initially to avoid becoming another “million dollar green home”. Our mandate is to provide a “one stop shopping” showroom, so although we have 3 heating systems, homeowners are encouraged to choose the simplest, most accessible and cost effective deep energy retrofit solutions for themselves. Our “20/50” package (\$20,000 for 50% energy use reduction), represents an average 5-12% home equity re-investment, with a payback of 4 years, and an annual return on investment of 5%.

Technical Innovation

The true technical innovation at REEP House is to keep things simple and use green decision making to achieve an intelligent design. For instance, because we chose high insulation and air sealing values, we only need a small wood burning appliance to heat REEP House, however, we will offer the most efficient model available in Canada. We are demonstrating solar pre-heat of hydronic condensing boilers, and heat pump technology. Our windows showcase world leading window and glazing, each window chosen for specific location based characteristics such as high solar gain or high winter U value, (up to R 8.5). All windows will enhance the heritage features of the Century home, and some will incorporate stained glass in triple or double glazed units. REEP House represents the most comprehensive energy retrofit of a hundred year old home in Canada, an early 20th century home with 21st century performance and lifespan.

Use of 3rd Party Labeling Programs

We are pursuing Platinum certification under the LEED for Homes Canada program, as a complete rehabilitation of an existing home. We are also following the EcoENERGY assessment program, using Hot2000 for energy modeling and analysis, and are providing NRCan and Energy Star data for products whenever available. Our energy performance monitoring will be reported to the Ontario Power Authority using International Performance Measuring and Verification Protocol standards laid out by the Efficiency Valuation Organization, and captured in a CMHC funded case study for their Equilibrium Communities research.

Builder's Commitment to "Green"

Ball Construction is a community based, nationally recognized builder with extensive experience in green building including several successful LEED certified projects. Specialized expertise includes advanced waste management, IAQ site management, and an extensive network of green suppliers and sub contractors.

Designer's Commitment to Green

Whiting Design is a sustainable design firm, working exclusively on projects which advance the practice of green building and achieve substantially improved energy and carbon reduction targets. Work radius is limited to 100km, with commuting and job site travel preferentially by foot, bicycle, bus or scooter. We offer a green benefit package to all employees, are Bullfrog powered, use 100% recycled paper, and all staff are LEED Accredited Professionals. House design was enhanced with the expertise of a Waterloo University based design team led by Professor John Straube.

Social Engagement

REEP House is in partnership with The City of Kitchener, The Region of Waterloo, the Trillium Foundation, the Kitchener and Waterloo Community Foundation, our three local Hydro Utilities, and the Ontario Power Authority. The house has been built with, and will continue to expand a growing community of local businesses and non-profit organizations. Our outreach program aims to draw 10's of thousands of people into tours of the house, and become the primary source for residents of Waterloo Region to find answers to their sustainability questions, and link up with local solutions.

Potential Impact on Market Transformation

REEP House is the first environmental show room in Canada to go beyond merely presenting information to the public. The tours of the house are fully integrated into a cutting edge set of software tools allowing residents to complete their own Sustainable Home Action Plan, which models the energy savings, investment potential, comfort and health benefits and payback of everything from adding a vacancy sensor light switch, to finishing a basement, to installing 2 kw of roof mounted solar PV. The software also provides direct links to local suppliers and contractors, and REEP's expertise developed performing over 10,000 home evaluations achieving 1,000's of tonnes of annual CO2 emission reductions. The purpose of REEP House is to stimulate more retrofits than the 2,000 per year we are currently involved with, and to increase their effectiveness from the 28% improvement we now average on older homes, to 50% and beyond.

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