In accordance with the Department of Labor and Industry's statute 326.0981, Subd. 11,

"This educational offering is recognized by the Minnesota Department of Labor and Industry as satisfying **1.5 hours** of credit toward **Building Officials and Residential Contractors code/ energy** continuing education requirements."

For additional continuing education approvals, please see your credit tracking card.

St. Croix Valley Habitat for Humanity®

Andersen CORPORATION

When Sustainability and Affordability Meet

THE BIG IDEA

Jim Cooper

Associate Director

St. Croix Valley Habitat for Humanity

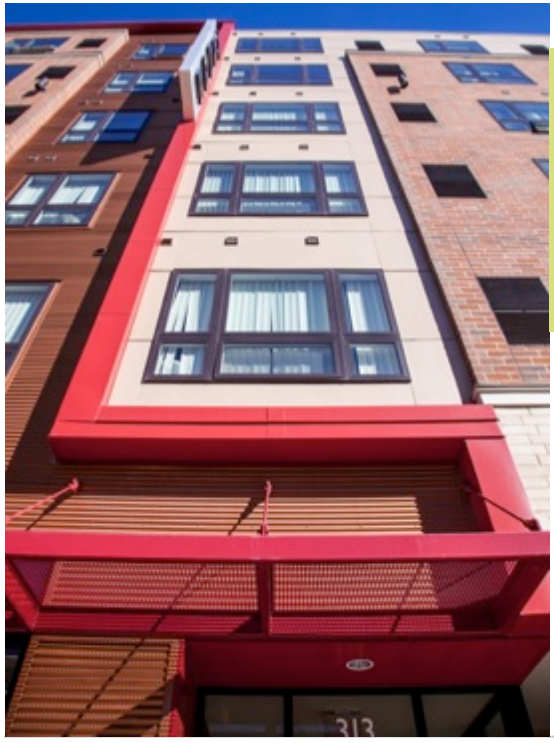
MORE THAN JUST A MORTGAGE

"Low-income households typically face the greatest energy burden. Families in these communities often live in older homes that lack adequate insulation and energy-efficient appliances. Low-income families spend more than 17 percent of their incomes on household energy, while other households spend on average just 4 percent."

~**Jonathan Reckford**, CEO, Habitat for Humanity International, quoted in Habitat's 2015 Shelter Report

Habitat for Humanity®

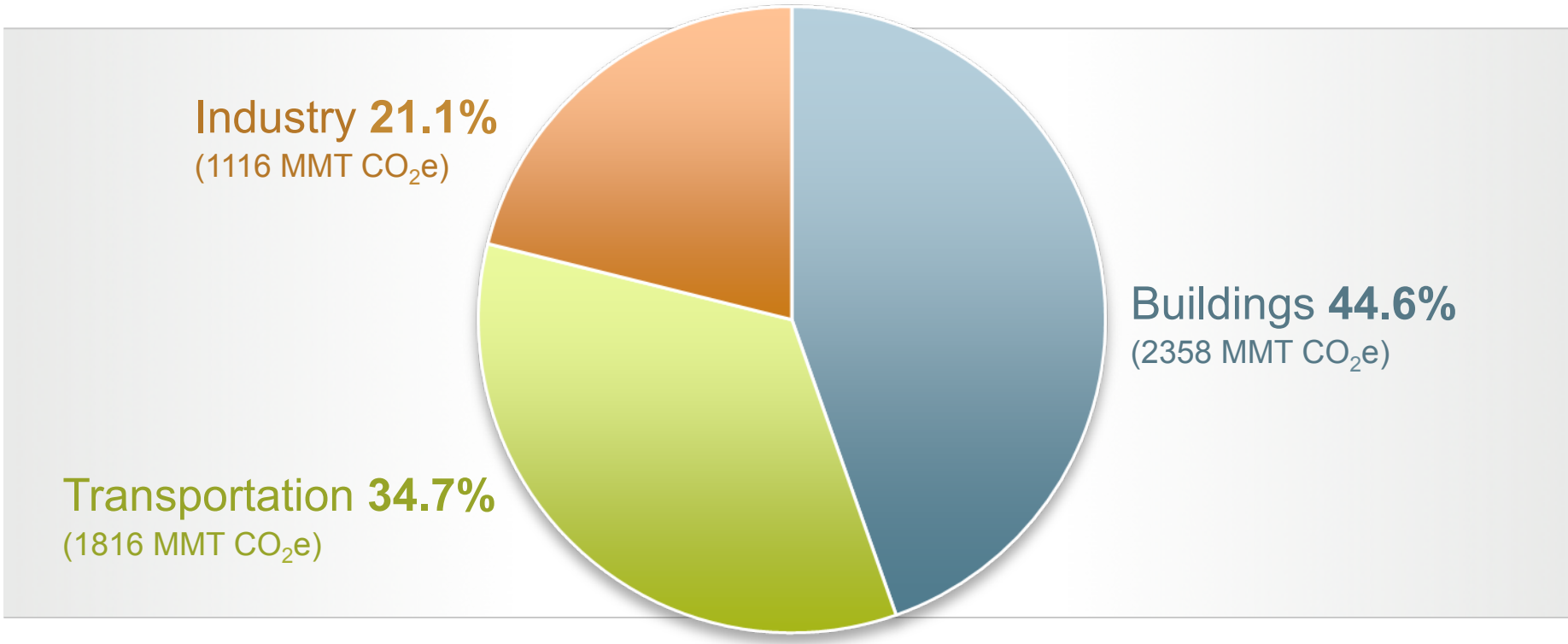
THE CHALLENGE AND OPPORTUNITY



134 Million
U.S. Housing Units

Source: http://quickfacts.census.gov/qfd/states/00000.html

Buildings Are Responsible for Nearly Half of U.S. CO_2 Emissions



U.S. CO_2 Emissions by Sector

Source: ©2013 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration (2012).

GREEN BUILDING IS BIG BUSINESS

Construction of LEED buildings will directly contribute $29.8B to GDP by 2018

$29.8 billion

In 20 years with ENERGY STAR, U.S. families and businesses have saved $230B in energy costs

$230 billion

BARRIERS TO DATE

- **Affordability**
- **Innovation**
- **Public/Private Sector Collaboration**

A HOLISTIC, DATA-DRIVEN APPROACH

Habitat for Humanity U.S. Construction Resource Stewardship Standard:

Sustainable building promotes the conservation and efficiency of resources through a whole systems approach that works together to develop higher-performing homes cost effectively. Sustainable components are based on building science fundamentals that are measurable performance metrics.

ENERGY STAR AS MINIMUM STANDARD

FEATURES:

- Efficient insulation
- High-performance windows
- Tight building envelope and ducts
- Efficient HVAC equipment
- Qualified lighting and appliance

Money Isn't All You're Saving

NOT JUST FOR NEW CONSTRUCTION

Four-Step Process for Retrofits:

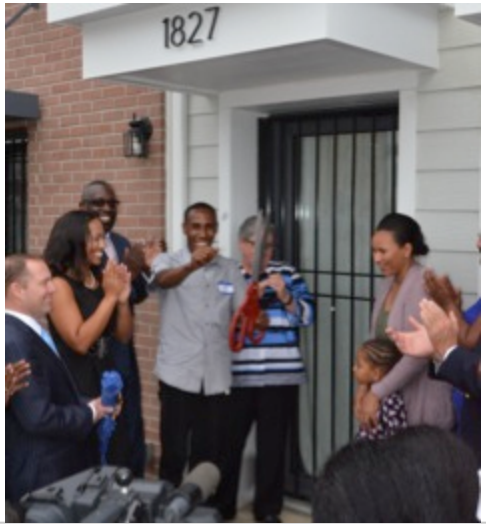
1. Pre-Repair Energy Audit
2. The Work
3. Post-Repair Energy Audit
4. Homeowner Education

AFFILIATE PARTNERSHIP IN ACTION

Map of neighborhood revitalization affiliates

SR homes in St. Louis

DC Habitat for Humanity Passive Home ribbon cutting



GLOBAL ADVOCACY

EDUCATING AND EMPOWERING HOMEOWNERS

MEETING THE CHALLENGE

Explore a new model for net zero in affordable housing using integrated design and ongoing community engagement. Recognized as the 2014 Green Builder Affordable Home of the Year, the Eco-Village community in River Falls, Wisconsin, is living proof that sustainable homes can provide tangible economic and social benefits to homeowners.

THE VISION

Create a community that is safe, sustainable and affordable.

Strive for zero energy and carbon negative impacts by using best construction practices and innovative materials and methods.

IT TAKES A VILLAGE

LEED FRAMEWORK

ENERGY

+

WATER

+

MATERIALS

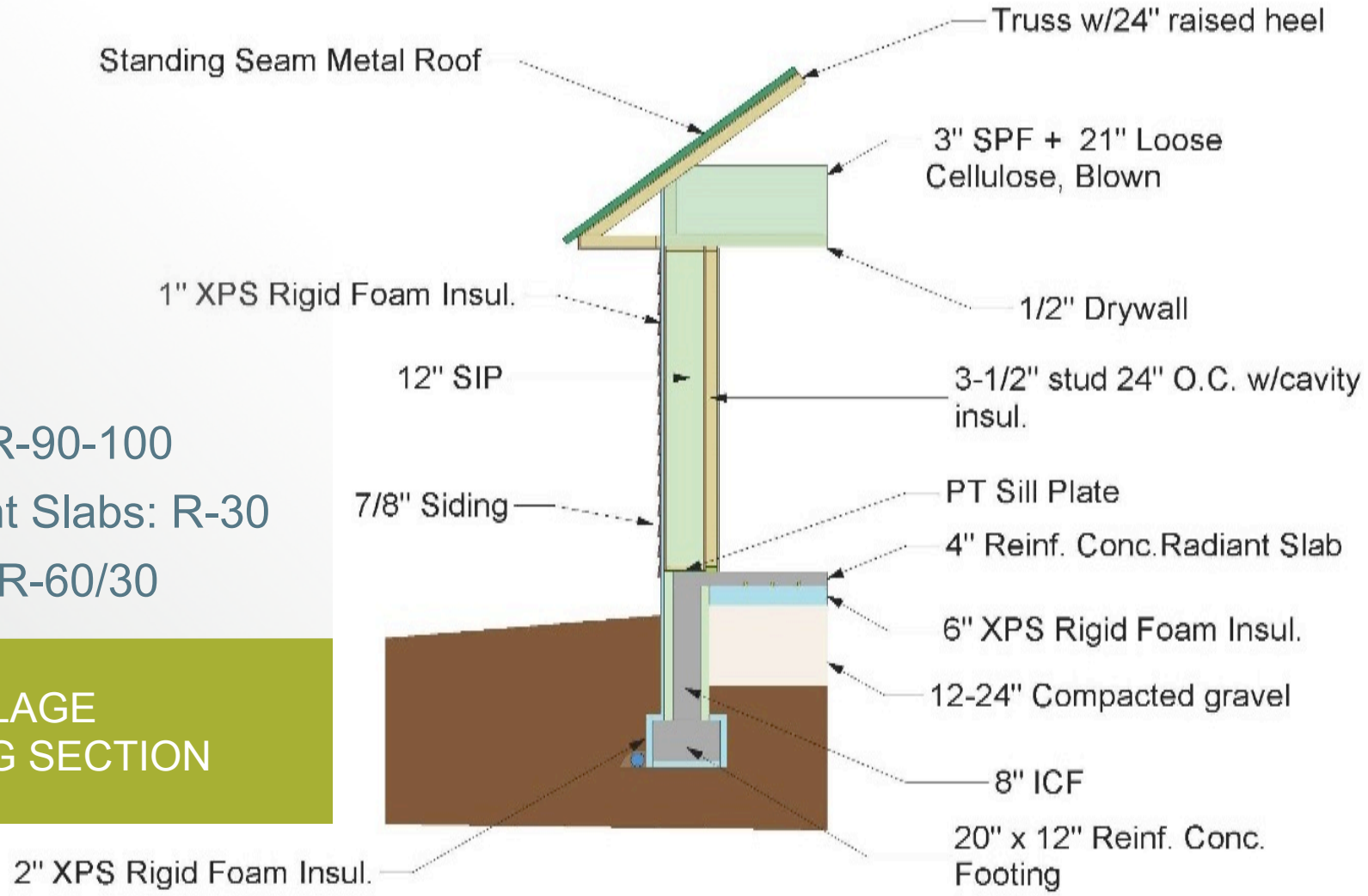
- Zero energy ready
- Carbon negative
- Renewable energy
- Rainwater harvesting
- Recycled/Renewable building materials
- Low-maintenance exteriors
- Permeable pavement
- Edible landscape
- Community gardens

Connectivity and Community

IDENTIFYING THE RIGHT ENERGY SOLUTIONS

- Roof: R-90-100
- Radiant Slabs: R-30
- Walls: R-60/30

ECO-VILLAGE BUILDING SECTION



HEATING, COOLING AND VENTILATION

Primary Heating and Cooling

- Fujitsu 12RLS minisplit heat pump

Backup Heat

- Uponor In Floor Radiant Heating
- Cove Heat (2-level homes)

Ventilation

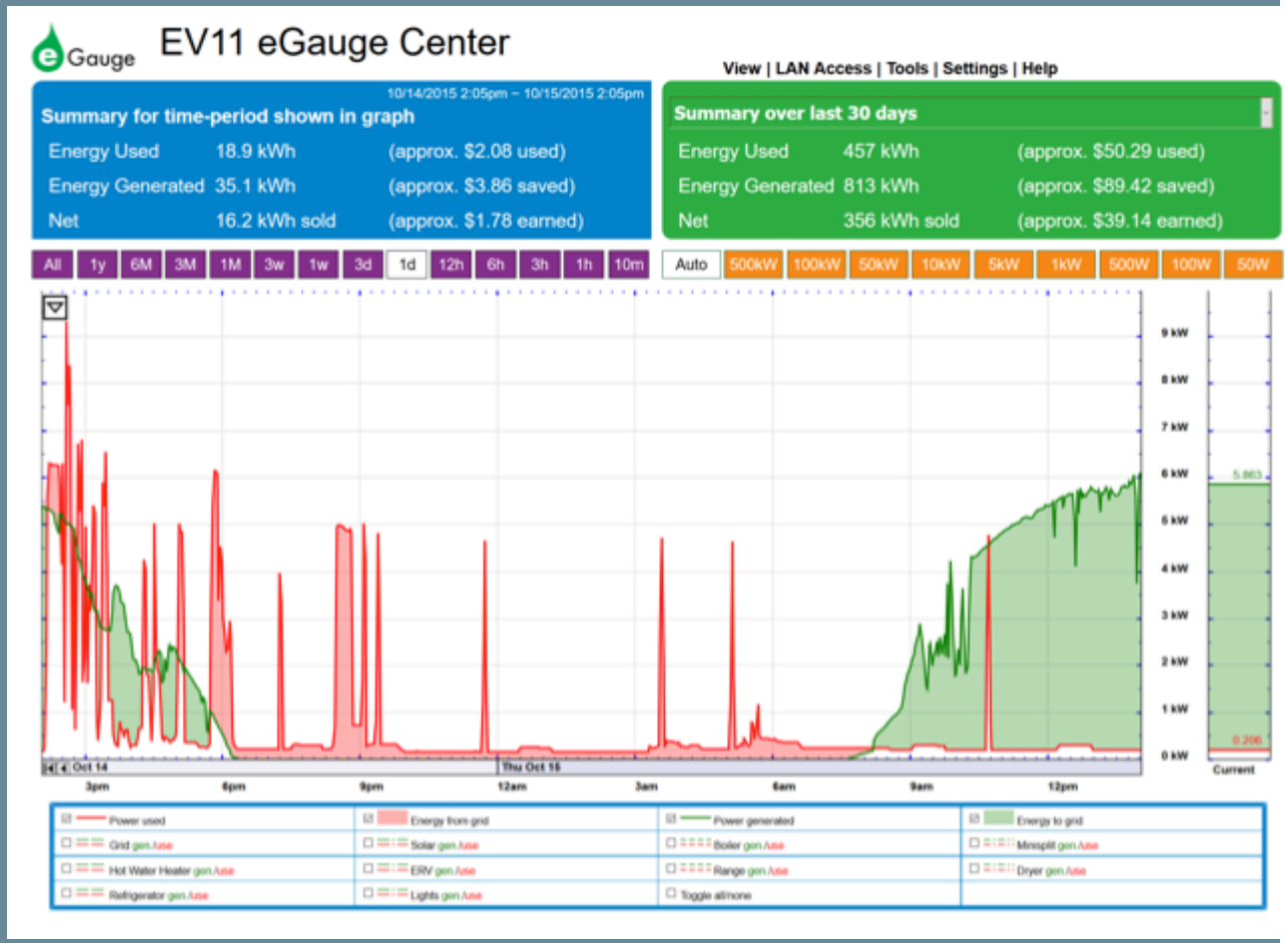
- Zehnder ComfoAir 350 ERV
- In-line fan

Renewables

- Solarworld 5.3-9.4 KW PV arrays
- Viessman Solar Thermal Systems

ONGOING MONITORING

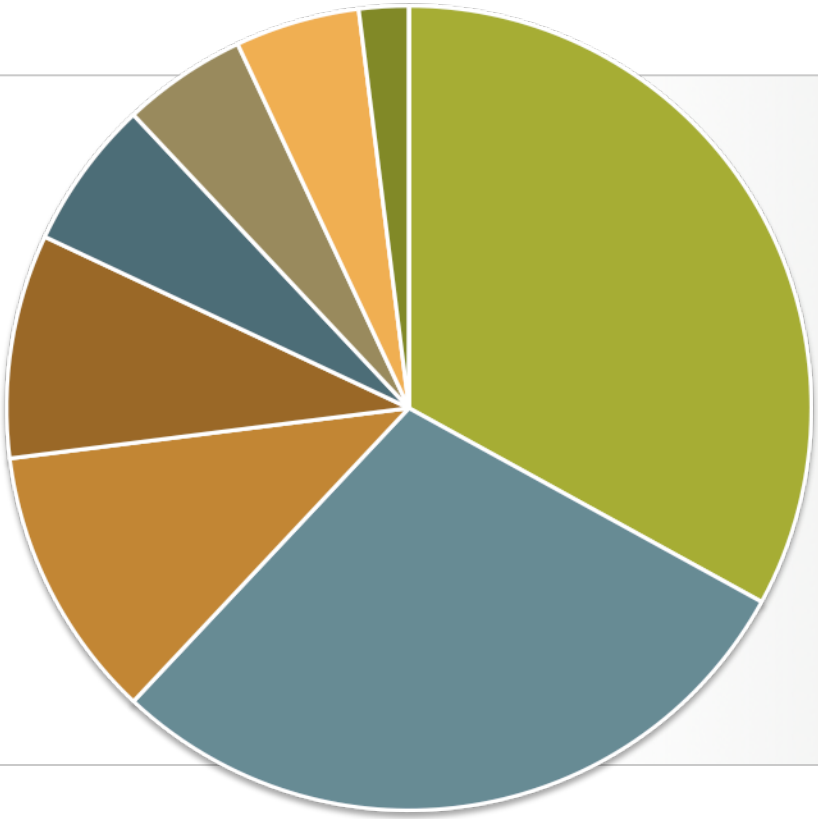
- Energy
- Water
- Interior temperatures
- Relative humidity
- Monitoring easement to allow data gathering
- Independent network for offsite monitoring



Annual Energy Use

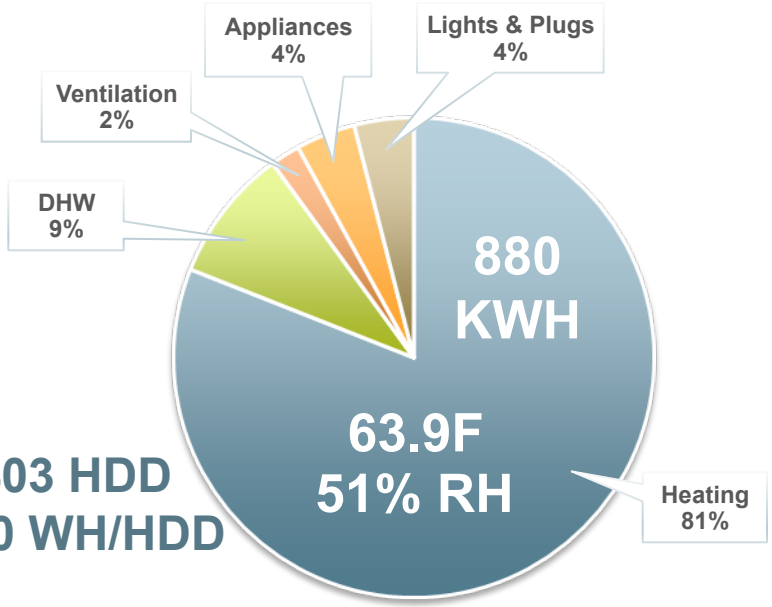
PV Production: 6,108 kWh
Total Use: 3,721 kWh

Minisplit	33%
Boiler	29%
DHW	11%
L&P	9%
Refrigerator	6%
ERV	5%
Range	5%
Solar Pump	2%
Dryer	0%



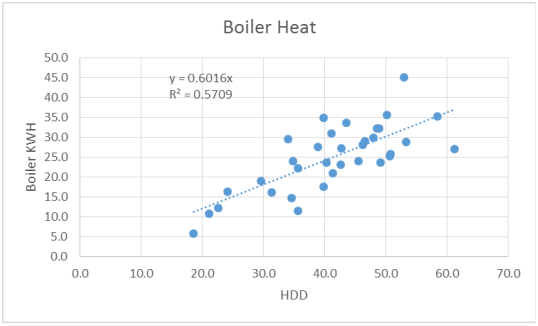
THE POWER OF HOMEOWNER PARTNERSHIP

NOVEMBER Energy Consumption

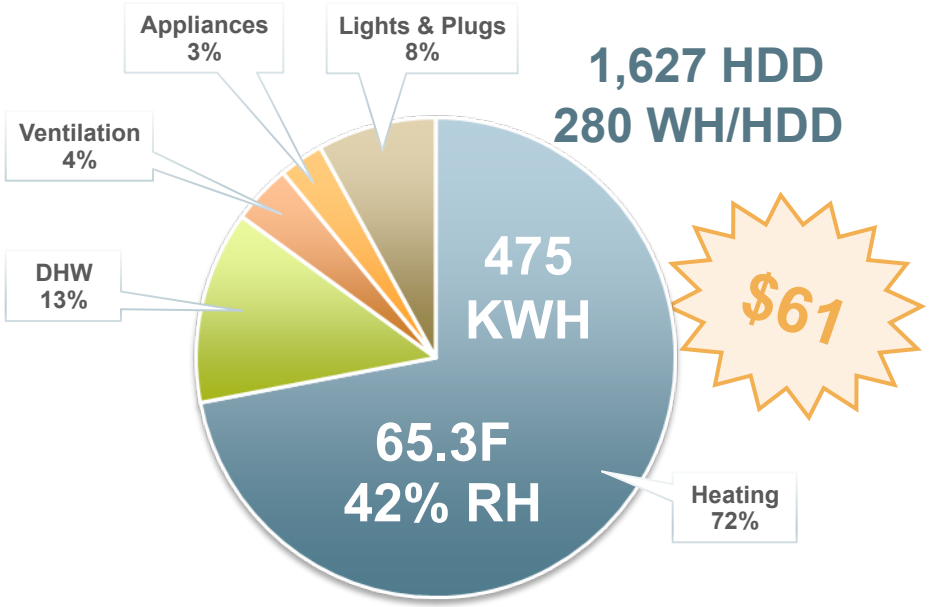


1,403 HDD
620 WH/HDD

Radiant Infloor

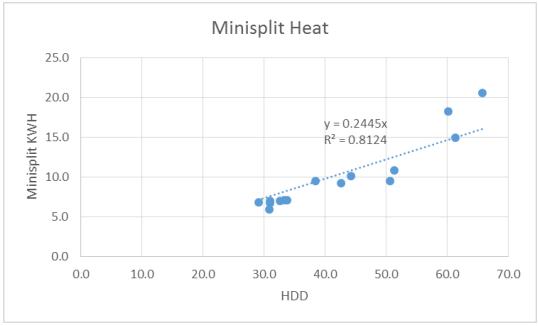


DECEMBER Energy Consumption



1,627 HDD
280 WH/HDD

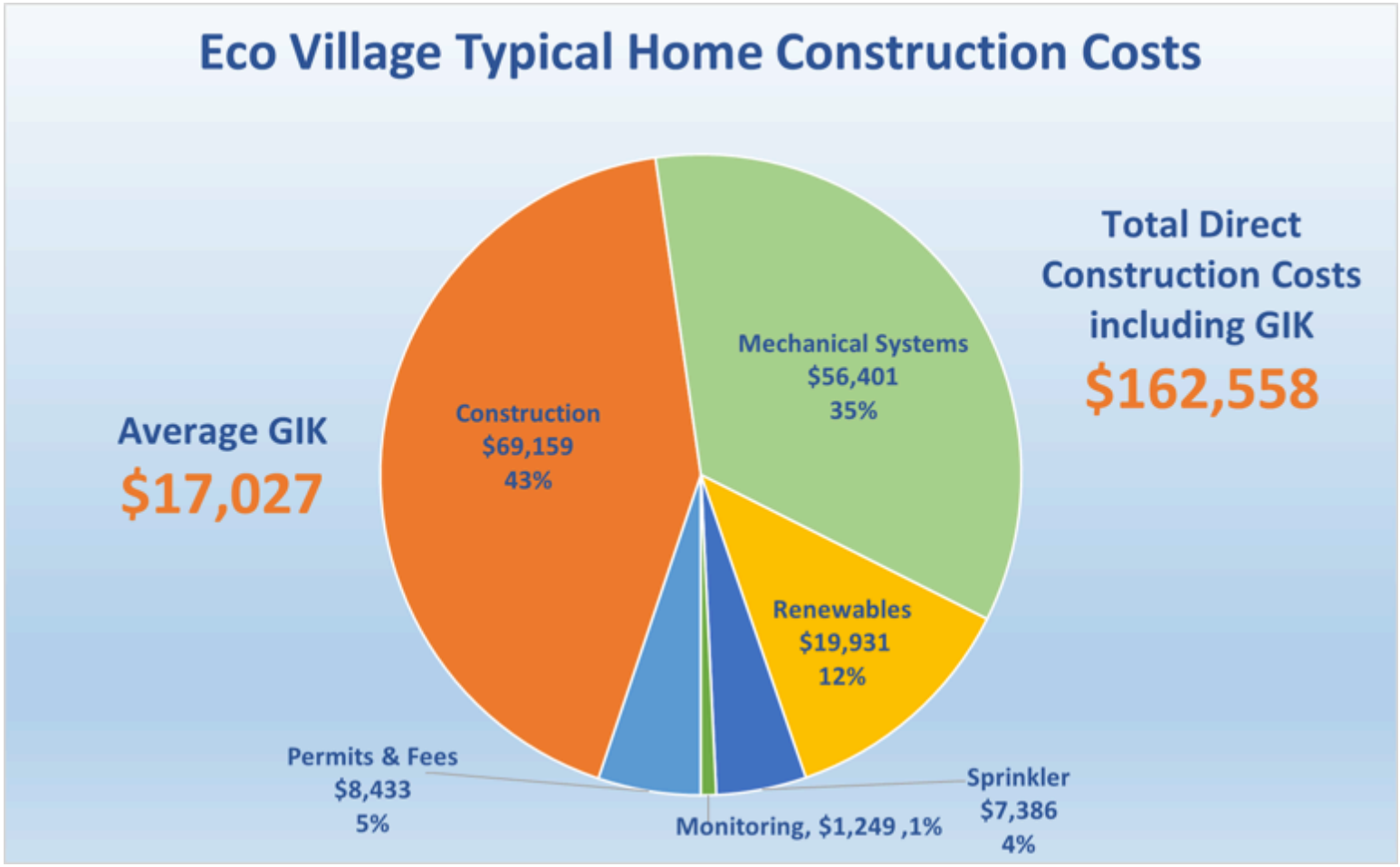
Minisplit



ACHIEVING OUR GOALS

Zero Energy and Beyond

CONSTRUCTION COSTS

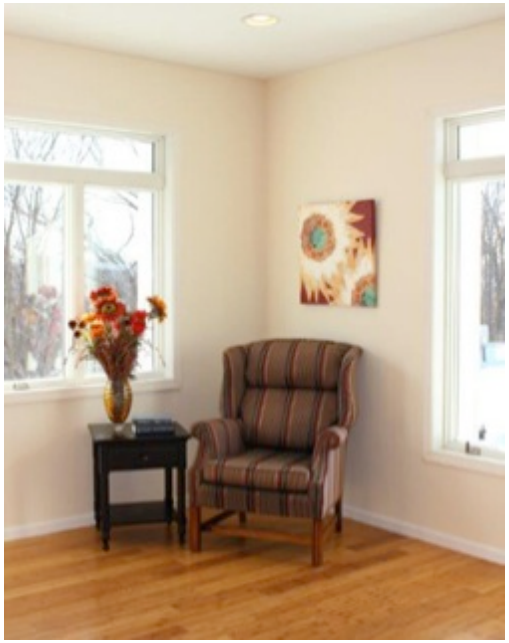


RESULTS


St Croix Valley Habitat for Humanity
River Falls Eco Village
Solar Power Generated in 2016: 104,718 kWh
Typical Homeowner Savings from Solar: $705 per year
CO2 Reduction = 73.6 metric tons = 176,378 miles driven

THE FUTURE OF NET ZERO

ZERO ENERGY HOMES
are affordable



ZERO ENERGY HOMES
cost less to own

ZERO ENERGY HOMES
can be beautiful, comfortable and durable

QUESTIONS