Who We Are

• Founded in 1980
• Mission-based nonprofit
• Innovative, nationally-recognized industry leader
  – Energy-saving programs and pilots
  – Energy efficiency financing
  – Technical training and certifications
  – Marketing, planning, and support services
Who We Work With
Since 2001, WECC has helped save:

- $978 million in energy costs
- 7.3 million MWh of electricity
- 23.8 million Dth of natural gas
- 6.3 million metric tons of CO₂

That’s equal to: 572,116 homes powered for a year
Manufactured Homes Overview

**Definition:** Single-story, constructed in a factory, wood-frame bolted to steel chassis, designed to be transported.
Manufactured Homes Overview

• 6% of all single family households in U.S.
• 19 million people occupy 9 million mobile homes
• Lower energy standards than site-built homes not updated since 1994
Why target manufactured homes?
Underserved Market

The manufactured housing market requires a targeted, separate program with low delivery costs to capture energy savings and affect utility bill non-payment.
## Michigan Market Analysis

<table>
<thead>
<tr>
<th>Regions</th>
<th>Total MH Homes</th>
<th>% MH Homes</th>
<th>Avg Age</th>
<th>Median MH Value</th>
<th>Average owner income</th>
<th>Average renter income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Upper and Northern Lower Michigan</td>
<td>39,910</td>
<td>10%</td>
<td>1978</td>
<td>$43,450</td>
<td>$42,983</td>
<td>$23,586</td>
</tr>
<tr>
<td>Michiana Counties</td>
<td>13,088</td>
<td>8%</td>
<td>1972</td>
<td>$33,700</td>
<td>$50,010</td>
<td>$26,456</td>
</tr>
<tr>
<td>Southeast Lower Michigan</td>
<td>98,274</td>
<td>4%</td>
<td>1982</td>
<td>$28,300</td>
<td>$52,569</td>
<td>$32,829</td>
</tr>
<tr>
<td>Southwest Lower Michigan</td>
<td>87,713</td>
<td>7%</td>
<td>1979</td>
<td>$39,700</td>
<td>$48,059</td>
<td>$26,679</td>
</tr>
<tr>
<td>Upper Central and Western Michigan</td>
<td>10,163</td>
<td>7%</td>
<td>1968</td>
<td>$37,950</td>
<td>$48,328</td>
<td>$22,566</td>
</tr>
<tr>
<td>Statewide</td>
<td>249,148</td>
<td>5%</td>
<td>1980</td>
<td>$35,900</td>
<td>$49,729</td>
<td>$29,090</td>
</tr>
</tbody>
</table>

Source: US Census Bureau American Community Survey State and Local Areas
## Wisconsin Market Analysis

<table>
<thead>
<tr>
<th>Regions</th>
<th>Total MH Homes</th>
<th>% MH Homes</th>
<th>Avg Age All Homes</th>
<th>Median MH Value</th>
<th>Median Owner Income All Homes</th>
<th>Median Renter Income All Homes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern Wisconsin</td>
<td>22,693</td>
<td>5%</td>
<td>1972</td>
<td>$24,500</td>
<td>$59,902</td>
<td>$28,886</td>
</tr>
<tr>
<td>Southeastern Wisconsin</td>
<td>9,725</td>
<td>1%</td>
<td>1973</td>
<td>$27,650</td>
<td>$69,183</td>
<td>$32,313</td>
</tr>
<tr>
<td>Northeastern Wisconsin</td>
<td>23,916</td>
<td>4%</td>
<td>1975</td>
<td>$25,600</td>
<td>$58,250</td>
<td>$29,829</td>
</tr>
<tr>
<td>Northern Wisconsin</td>
<td>16,355</td>
<td>6%</td>
<td>1974</td>
<td>$41,700</td>
<td>$50,420</td>
<td>$24,755</td>
</tr>
<tr>
<td>Western Wisconsin</td>
<td>23,305</td>
<td>6%</td>
<td>1975</td>
<td>$29,500</td>
<td>$58,085</td>
<td>$28,518</td>
</tr>
<tr>
<td>Statewide</td>
<td>95,799</td>
<td>4%</td>
<td>1974</td>
<td>$30,300</td>
<td>$58,197</td>
<td>$28,146</td>
</tr>
</tbody>
</table>

Source: US Census Bureau American Community Survey
Manufactured Homes Pilot Overview

- Free Energy Assessment and Direct Install with Duct Sealing
- Electric and gas utilities/statewide program
- 2015 pilots in Wisconsin and Michigan
- Train contractors and provide QA/QC
- Collected market characterization data
Manufactured Home Pilots
Marketing and Outreach

EFFICIENCY. SAVINGS. COMFORT.

SEMCO ENERGY Gas Company and Energy Optimization are joining together to offer a special Manufactured Homes Program at no cost to eligible customers.

A professional, trained contractor will come to your home to:
- Test and seal your home’s heating and cooling system ductwork.
- Install up to 10 Compact Fluorescent Light Bulbs.
- Install water- and energy-saving items.

Contact the Energy Optimization program to sign up for this special program. Contact: 817.296.4319 Email: intermichigan-energy.org

CONGRATULATIONS!

With the help of our Energy’s Manufactured Homes Efficiency Pilot Program, you will immediately begin saving money and energy.

MANUFACTURED HOME ENERGY AUDIT

The trained energy cycling auditors will conduct an in-home energy audit to identify energy-saving opportunities.

INSTALLATION of:
- SHOCK VAPOR DETECTOR
- Carbon monoxide detector
- Energy efficient light bulbs
- Water heater insulation

Your Manufactured Home Energy Repair Guide for Manufactured Housing

Akt now! This offer is available for a limited time.

WECC

Your Mobile Home Energy and Repair Guide for Manufactured Housing

John Krieger
## Direct Install Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior Lighting CFL or LED</td>
<td>10-Max 15</td>
</tr>
<tr>
<td>Low Flow Showerhead</td>
<td>1</td>
</tr>
<tr>
<td>Kitchen Aerator</td>
<td>1</td>
</tr>
<tr>
<td>Bath Aerator</td>
<td>1-2</td>
</tr>
<tr>
<td>Water Heater Pipe Wrap 6 feet</td>
<td>1</td>
</tr>
<tr>
<td>Duct Sealing</td>
<td>1</td>
</tr>
<tr>
<td>Belly Insulation (WI only)</td>
<td>1</td>
</tr>
<tr>
<td>Exterior LED (WI only)</td>
<td>Max 4</td>
</tr>
<tr>
<td>Water Heater Temperature Adjustment (WI only)</td>
<td>1</td>
</tr>
<tr>
<td>ECM Replacement (WI only)</td>
<td>1</td>
</tr>
<tr>
<td>Refrigerator Replacement (WI only)</td>
<td>1</td>
</tr>
<tr>
<td>Air Sealing (WI only)</td>
<td>1</td>
</tr>
</tbody>
</table>
Robust In-Field Testing
Vent Field Images – Pre-Work
Vent Field Images – Post-Work
Low Income Customer Base

Number of Customers

Annual Household Income

$10K-$19K | $20K-$29K | $30K-$39K | $40K-$49K | $50K-$59K | $60K+ | <$10K | N/A
Small Households

Number of Occupants per Home

- 1
- 2
- 3
- 4
- 5
Transient Population

- <2 years: 35
- 3-5 years: 30
- 6-9 years: 25
- 10-19 years: 30
- 20-29 years: 20
- 30+ years: 5

Length of Occupancy
~50% Met Target Age of Home

Year Home Built

- Pre 1976
- 1976-1994
- Post 1994
Heating Fuel Mix is Different from Site-Built Homes

MECA/SEMCO (Michigan)

Focus on Energy (WI)
Water Heating

MECA/SEMCO (Michigan)

MECA

RECS 2009, MI

Focus on Energy (Wisconsin)

Focus on Energy WI

RECS 2013 WI

- Propane
- Natural Gas
- Electric
- Other

21%
36%
5%
3%
61%
74%
30%
76%
24%
61%
4%
4%
4%
Furnace Age
Pilot Participant kWh Savings
Michigan Only

Pilot Participant Savings

Updated Measures

# of Participants

kWh Savings

# of Participants

kWh Savings
Duct Leakage Analysis (MI Only)

\[ y = 0.4071x \]

Post-Test Duct Leakage

Pre-Test Duct Leakage

Values represented in the MEMD

Baseline (no duct leakage improvement)

y = 0.4071x
Customer Satisfaction
Customer Feedback

• “My furnace doesn’t run so much, and the heat seems to be more evenly spread out.
• “I keep the heat set at 68 degrees and the house feels warmer.”
• “Instant relief from the dust and cold.”
• “Much warmer with the heat turned down.”
• “The new showerheads they put in are nice.”
• “Bills went down!”
• “Light bill”
## Pilot Results

<table>
<thead>
<tr>
<th></th>
<th>Michigan (MECA/SEMCO)</th>
<th>Wisconsin (Focus on Energy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>63 - met goal</td>
<td>79 - exceeded goal</td>
</tr>
<tr>
<td>No duct sealing</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Total Annual kWh</td>
<td>41,818 kWh</td>
<td>117,020 kWh</td>
</tr>
<tr>
<td>Total Annual therms</td>
<td>9,603 therms</td>
<td>3,823 therms</td>
</tr>
<tr>
<td>Avg Annual kWh/home</td>
<td>664 kWh</td>
<td>1,481 kWh</td>
</tr>
<tr>
<td>Avg Annual therms/home</td>
<td>152 therms</td>
<td>48 therms</td>
</tr>
</tbody>
</table>

Note: Billing analysis to be completed Q1 2017.
Future Considerations

- Community engagement and recruitment
- Contractor training is valuable
- Customer intake/scheduling process
- Homes have multiple bathrooms
- Geography matters
- To increase electric savings:
  - Target homes with electric water heaters
  - Include ECM and outdoor LEDs to increase average kWh savings per home
Benefits

- Reduced Billing Arrears and Shutoff
- Community Engagement
- Workforce Development
- Demand Reduction
- Economic Development
Next Steps

• Launched as a program in Michigan 2016
• Utility billing analysis for both pilots in Q1 2017
• Explore different program approaches
Questions?

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