

Developing Residential Energy Usage Baselines and Energy Efficiency Options

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Presentation Outline

- **Background and Context**
- **Objectives**
- **Scope of Work**
- **Deliverables**
- **Progress of Work**
- **Next Steps**

Background and Context

- **Previously, FCPC focused and implemented energy conservation and on-site generation projects for government and business facilities.**
- **This grant helped FCPC to focus on residential energy management**
 - **211 tribally owned homes located on the reservation**
- **Baselines and energy auditing exercises are crucial for identifying home-specific energy conservation opportunities and evolving broader energy management guidelines for tribal homes.**

Objectives

- 1. Develop Residential Energy Usage Baselines and**
- 2. Identify Energy Efficiency Options for Tribal Homes on Reservation Lands**

Scope of Work

- 1. Establish tribal homes to be included in the project**
- 2. Gather home energy data and establish energy baselines**
- 3. Conduct energy audits and identify energy efficiency improvement options**
- 4. Develop home energy action plans.**

Deliverables

- 1. A Report on Residential Energy Usage and Baselines Analysis**
- 2. Residential Home Energy Audit Reports**
- 3. Residential Home Energy Action Plans**

Progress of Work

Community Outreach

Thirteen different types of outreach activities conducted

- **Information meetings**
- **Door-to-door visits**
- **Mass mailing**
- **News Articles/Brochures/Tri fold leaflets**
- **Incentive kits**

Progress of Work-Continued

Number of Tribal homes and tribally owned rentals located on the reservation that have either signed-up or been identified for Energy Audits through November 2018

Tribal homes	34
Tribally owned rentals	41
Additional residential facilities	4

Progress of Work-Continued

Energy Usage and Baseline Year

**Obtained home energy usage data for
15 tribal homes and established FY15-17
as the period for energy use baselines**

Progress of Work-Continued

FCPC Energy Specialist and Energy Auditor obtained the following certifications:

- 1. DOE's Home Energy Score Assessor (HESCORE Assessor)**
- 2. Focus on Energy Trade Ally for its Whole Home Improvements Program**

Progress of Work-Continued

Project activities got delayed by around six months

- **DOE and FOE Certifications**
- **Slow Start to initial Sign-up**
- **Issues with Audits Scheduling**

Scheduled Project completion: 4/2019

DOE has been requested for project extension up to 10/2019

Progress of Work-Continued

Energy Audits

- **Whole-house approach**
- **SnuggPro Modeling Tool**
- **DOE's Home Energy Score**
- **Establish a baseline and identify concerns**
- **Identify waste and inefficiency**
- **Develop an Energy Audit Report**

Progress of Work-Continued

Energy Audits-Continued

- **Successfully completed twelve (12) energy audits on Tribal homes through November 2018**
- **A series of energy audits have been scheduled on Tribal homes**

Progress of Work-Continued

Typical Tribal Home



Progress of Work-Continued

Infrared Camera



Progress of Work-Continued

Blower Door Testing



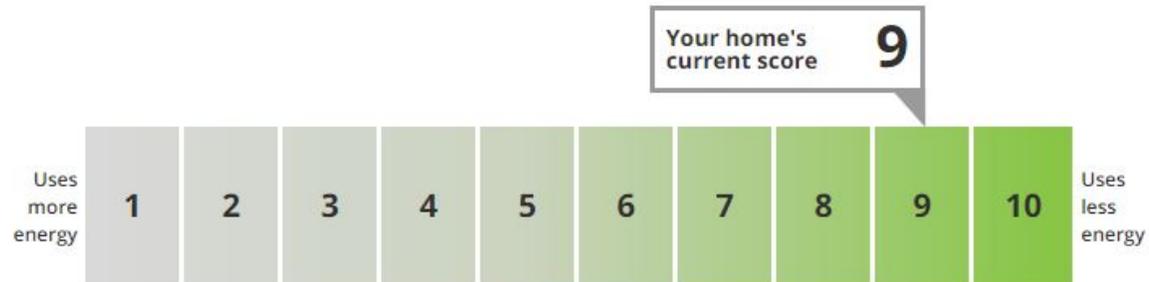
Progress of Work-Continued

Home Energy Score

Get Score

View Score

ADDRESS: 5586 Kwe Da Kik
Unit_15Crandon, WI 54520
HOME SIZE: 1,788 square feet
YEAR BUILT: 1995
AIR CONDITIONED: Yes



Learn more at homeenergyscore.gov



The **Home Energy Score** is a national rating system developed by the U.S. Department of Energy. The **Score** reflects the energy efficiency of a home based on the home's structure and heating, cooling, and hot water systems.

Progress of Work-Continued

Major findings

- **Inadequate ceiling/attic insulation**
- **Inadequate building tightness**
- **Window/Door weather sealing is often damaged or missing**
- **Heating systems are fairly new(direct vent, sealed combustion, ducts in intentionally conditioned space(heated basement))**

Progress of Work-Continued

Major Findings-Continued

- **Most window systems are vinyl framed, double glazed**
- **Most door systems are steel-framed, insulated, no or 1/2 lite double glazed, with storm doors**
- **Most homes are on full, 8" poured concrete basement walls with finished (4" poured cement) basement floor and 2"(R-10), rigid exterior, subgrade insulation(exterior) on the walls**

Progress of Work-Continued

Major Findings-Continued

- **Most above-grade wall systems are, 2x6 frame, 16" on center, many with 1"(R-5) rigid foam on the exterior**
- **Typical roof is 4/12 pitch with fiberglass shingles and soffit/ridge passive (no mechanical) venting**
- **Summer cooling is a mix of window venting, window a/c units, and split system combined furnace and common ductwork**
- **Box sill insulation is typically less than wall insulation (less than R-19) and not air sealed**

Progress of Work-Continued

Major Findings-Continued

- **Mechanical ventilation is typically less than recommended, creating moisture related issues. We are finding that an exhaust flow of less than 100 cfm in bathrooms is resulting in moisture related problems.**
- **Most ductwork is located in conditioned basements and are not sealed or insulated**

Progress of Work-Continued

Major Findings-Continued

- **Almost $\frac{1}{2}$ of the thermostats on heating/cooling systems are programmable, although almost none of them take advantage of set backs (are not programmed)**
- **Most homes utilize about 50% energy efficient light bulbs(LED or CFL's)**

Progress of Work-Continued

Energy Conservation Measures

- **Seal all penetrations interior/exterior as well as bottom plate and top plate penetrations on interior walls**
- **Improve attic insulation to attain at least a R-50 value**
- **Install energy efficient lighting throughout**

Progress of Work-Continued

Energy Conservation Measures

- **Install energy efficient bathroom exhaust fan/lights with low restriction ducting and humidity controlled motors(100cfm, dc motor, 6” exhaust, LED light)**
- **Ensuring door and window weather stripping is intact.**
- **Attic/Crawl space access panels are insulated, weather-stripped, and secured with latches**

Progress of Work-Continued

Energy Conservation Measures

- **Most heating/cooling systems are relatively new, so more strict attention to maintenance and upkeep.**
- **Test out with blower door after air sealing to determine improvement of tightness**
- **Attention to exterior grade and drainage to minimize moisture intrusion**

Next Steps in Outreach

- ✓ **Facebook**
- ✓ **Mass mailing**
- ✓ **Newspaper articles**
- ✓ **Small group presentations**
- ✓ **Door-to-door**
- ✓ **Word of mouth**

Next Steps-continued

- 1. Home energy usage and energy baseline evaluations for approximately 250 homes**
- 2. Energy audits covering 115-130 homes and 4 additional FCPC facilities including the Caring Place (Until July 2019)**
- 3. Evolve Energy Conservation Measures (ECMs) and develop Home Energy Action Plans (August 2019 - October 2019)**

Questions?

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