



# Home ENERGY MAKEOVER

## Jamestown, North Dakota

Properly weatherizing your home will save you money.

***But exactly how much money?***

Otter Tail Power Company decided to tackle that question by awarding seven customers free home energy makeovers. Each home presented different challenges, but the overall goals were the same:

- Make each home more energy efficient through weatherization and updated heating/cooling systems.
- Ensure heating safety.
- Maintain the integrity of each home.

# Here's what happened in Jamestown

**Home:** 1958 one-and-a-half story bungalow

**Owner:** Barb

**Makeover budget:** \$7,500

**Contractor:** Don Williams of Williams Construction, Jamestown

**Project partner:** Vinylite Windows of Fergus Falls, Minnesota, provided, at a discounted price, highly efficient windows that meet Energy Star guidelines.



## Pinpointing problems

Otter Tail Power Company and Jamestown contractor Don Williams of Williams Construction based their work on an energy audit, visual inspection, and blower door test. Blower door testing measures air infiltration into a home by depressurizing the home and simulating a strong wind blowing against all its surfaces.

## Before and after

### Air leakage based on blower door test

**Before** makeover: 2,150 cubic feet per minute (cfm)

**After** makeover: 1,100 cfm

### Annual heating cost adjusted for weather

**Before** makeover: \$1,213

**After** makeover: \$525

**Total annual savings: \$688**

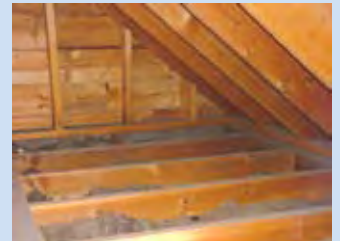
## FYI: Importance of sealing leaks

- Properly sealing air leaks from living spaces into the attic will slow or prevent warm, moisture-laden air from passing into attic spaces, where moisture can condense on cold surfaces and cause water damage to ceiling and attic structures.
- Sealing attic bypass leaks, in conjunction with sealing leaks at the lower levels of the home, slows the “chimney effect” of cold air entering the home, becoming warmed with costly home heating fuel, and then escaping through leaks into the attic space.
- When warm air escapes through ceilings or walls and warms the roof from underneath, snow on the roof melts and runs down to outside roof edges. Because the roof edge is colder, the water freezes there. Over time this creates an ice dam, which can cause structural damage to the home.

## Insulation

### Problems:

- Little or no insulation in upstairs walls, ceiling, and attic.
- No insulation in knee walls (the short upstairs walls in one-and-a-half story houses).
- Floor joist cavities in the attic space, behind knee walls, weren't sealed, causing warm air to escape into the attic space.



### Solutions:

- Blew insulation into attic through roof vents to R-44.  
The higher the R-Value of a material, the greater its insulating properties and the slower heat flows through it.
- Created access to back side of knee walls and insulated to R-19.
- Insulated and sealed floor joist cavities with 2-inch extruded polystyrene and urethane foam.
- Blew cellulose insulation into the joist cavities between the upstairs and downstairs wall to a value of R-44.
- Added roof vents behind the knee walls to prevent condensation.



## Windows and doors

### Problems:

- Single-pane windows throughout home.
- Leaky basement windows.
- Wood entry doors with no insulation and inadequate weather stripping.

### Solutions:

- Replaced basement windows with Vinylite insulated-glass windows.
- Installed new insulated steel door and sealed it with high-quality weather stripping.
- Added or replaced caulking throughout home.



### FYI:

On average, the value of a weatherization improvement to your house is 2.2 times greater than the cost of the improvement itself.

— U.S. Department of Energy

## Foundation

### Problem:

- Air leaks along rim joists; between sill plate and foundation; and around utility, electrical, and plumbing entrance points.

### Solutions:

- Sealed rim joists with silicone caulk.
- Insulated rim joists with 2-inch extruded polystyrene and sprayed urethane foam.
- Owner had previously insulated interior foundation walls with 1½-inch extruded polystyrene.



## Heating system

### Problem:

- Natural gas furnace converted from fuel oil system, with a seasonal energy efficiency rating (SEER) of less than 60 percent.

### Solutions:

- Installed new off-peak electric heating system, featuring an electric plenum heater and a high-efficiency gas furnace with a SEER of more than 90 percent to provide heat during electric service control periods.

The new heating system should save at least 20 percent in energy consumption and even more in dollars because it is served on a low dual-fuel rate.

- Supplied 200-amp electric service panel.



## Extra benefits

In addition to saving on heating costs, proper weatherization:

- Increases your property value.
- Extends the life of your home.
- Reduces incidence of fire and enhances overall safety of your home.
- Makes your home more comfortable.
- Shrinks your family's carbon footprint.
- Reduces national energy demand.

Source: Oak Ridge National Laboratory



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For more information about what you can do to make your home more energy efficient, call our **Idea Center** at **800-493-3299** or visit our web site at **[www.otpco.com](http://www.otpco.com)**.

  
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Otter Tail Power Company is headquartered in Fergus Falls, Minnesota. It provides electricity and energy services to nearly a quarter million people in Minnesota, North Dakota, and South Dakota.