

Navajo Nation Priority List for Hogan Housing

The *Navajo Nation Priority List for Hogan Housing* lists the weatherization measures that shall be installed in Navajo hogan homes. The measures should be installed in order, as conditions dictate and funding allows. The most cost-effective measures are listed first. When no electric service is present, a more restrictive list of measures must be followed (see note on Electric Service below). Site-specific audits should be completed for unusual hogan homes or when measures not listed below appear suitable for a particular house.



An analysis of typical homes identified the following weatherization measures to be cost effective based on Navajo housing stock, energy costs, and climatic conditions.

Ensuring the health and safety of clients, contractors, and local agency personnel is an important component of the Weatherization Assistance Program. Health and safety inspection and testing should be conducted before delivery of weatherization services and after completion of work.

Wood Stoves:

- For wood stoves, DOE analysis indicates that **\$1,150 of total replacement costs can be financed through program operations funds**. The remaining installed cost should be financed from alternate non-federal funding sources.
- If total installed cost (including chimney kit) is under \$1,150, charge to program operations
- If total installed cost is over \$1,150, the chimney kit can be charged as health and safety to bring down the total installed cost.
- All wood stoves not being replaced should be checked for draft and CO to ensure they are safe.

Health and Safety Measures:

- The Navajo budget for health and safety measures is not to exceed 15% of program funding.
- DOE Health & Safety Notices (Weatherization Program Notice [WPN] 11-6 and subsequent versions) contain the guidance on allowable costs.
 - Excludes items such as windows, doors, ramps, and handrails
 - Costs are reasonable as determined by DOE in accordance with the Navajo Nation's approved Annual Plan; **AND**
 - The actions must be taken to effectively perform weatherization work; **OR**
 - The actions are necessary as a result of weatherization work.

Electric Service: Homes with no electric service must not install electricity-based priority list measures, including:

- Duct Sealing
- Lighting Retrofits
- Refrigerator Replacement

General Heat Waste Measures: (Items must only be performed on homes with hot water service)

- Set back water heater temperature to 120° F (with client approval)
- Install low-flow showerheads if existing showerhead has a flow rate greater than 2.5 gallons per minute. (with client approval)
- Install faucet aerators.
- Install insulating blanket on water heater tank if none exists. Follow unit labeling and safety guidelines detailed in the *Energy OutWest Field Guide*.
- Install pipe insulation on the first six feet of hot water pipe exiting the water heater.
- Install new furnace filter and air conditioner filter.

1. Air Sealing:

- Use the blower door and digital manometer to guide air sealing.
- Determine the closure target.
- Seal plumbing, electrical, and HVAC penetrations through ceiling, flooring, and exterior walls. Use proper materials for high-temperature surfaces.



Primary Space Heating Fuel	Cost limit per 100 CFM50 of reduction:
Wood	\$25.00
All other	\$50.00

2. Attic Insulation: The amount of attic insulation that can be cost-effectively added depends on the heating fuel used.

In hogans with vaulted un-insulated ceilings, NWAP personnel shall consult with the client to discuss adding a drop ceiling to improve efficiency and comfort with insulation. **NWAP must obtain written client approval to convert vaulted ceiling into a flat ceiling in order to add R-38 insulation.** Use the insulation guidelines below. Ensure the ceiling can bear the weight of insulation. Consider using fiberglass if necessary.



- Air seal the attic, including wire and plumbing penetrations, recessed light fixtures, and other bypasses, prior to the installation of attic insulation.
- Check electrical circuits. Enclose exposed wires and connections in junction boxes and mark with flags for subsequent access.
- Use caution and consider building an enclosure around active knob-and-tube wiring before insulating.
- Check attic ventilation. There should be 1 square foot (ft²) of attic net free vent area for every 150 ft² of ceiling area if there is no vapor barrier¹, The ratio is 1:300 if a vapor barrier is present, or if 50% to 80% of the vents are placed at least 3 feet above the lower vents. Generally, half of the vent area should be located low and half should be located high to induce good ventilation.

Table 1 –Post-Weatherization Attic Insulation R-Values (No Existing Insulation)

Primary Space Heating Fuel	Add Insulation to:
Propane	R-49
All other	R-38

3. Lighting Retrofits: (Skip measure if home is without electric service)

- Install compact fluorescent lamps (CFLs) in sockets used more than two hours per day.
- Tip: Use ENERGY STAR-qualified CFLs with a correlated color temperature between 2,700 – 3,000K (warm white).
- Educate client on proper disposal.



¹ A sound, painted ceiling counts as a vapor barrier.

4. **Replace Refrigerator: (Skip measure if home is without electric service)**

- Determine annual energy consumption of existing unit by metering it for at least two hours. **Note: DOE requires grantees to meter at least 10% of units that are replaced.** Electricity usage of older refrigerators can also be found in the database http://www.waptac.org/sp.asp?mc=techaids_refrigerator.

Table 1 – Refrigerator Replacement: Maximum Cost for a Cost-Effective Refrigerator Replacement

Annual kWh/yr Existing Unit	Annual kWh/yr of New Refrigerator		
	400 kWh/yr	500 kWh/yr	600 kWh/yr
900	\$442	\$353	\$265
1,000	\$530	\$442	\$353
1,100	\$618	\$530	\$442
1,200	\$707	\$618	\$530
1,300	\$795	\$707	\$618
1,400	\$795	\$795	\$707
1,500	\$795	\$795	\$795
1,600	\$795	\$795	\$795

- Replacement refrigerators *may not* have through-the-door ice or water service.
- Original units must be removed and decommissioned

Incidental Repairs:

- Cost is limited to **\$400.00**
- Incidental repairs should only be undertaken after other priority list measures have been performed
- Incidental repairs must be energy related or installed to protect an energy related measure. Some examples include window or door repair.