

# Home Insulation

The average home in the US could decrease its heating and cooling bill by at least thirty percent with improved insulation. In the calculator the effect of home insulation is computed as a percentage reduction over what has been selected for home heating in cooling.

The energy leakiness of a house is measured in units of  $W/^\circ C$  ; the amount of extra power needed for each degree of temperature difference between the inside of the house and the outdoor temperature.

Randolph and Masters in their book *Energy for Sustainability* (p245) do a detailed calculation for a conventional 1500 square ft home and arrive at  $282W/^\circ C$ . For a very well insulated home of the same size they have  $170W/^\circ C$ , an improvement of forty percent.

Nevada homes tend to be larger (2000 square feet) resulting in a leakiness of  $373 W/^\circ C$  that could be reduced to  $225 W/^\circ C$ . Nevada has 0.8 million housing units. We assume that we add another 0.5 million housing units by 2050.

## **Level 1**

We assume no effort and thus no improvement over current building codes.

## **Level 2**

We assume that the average heat loss parameter is reduced by 33%. Half of existing homes get triple glazing, loft insulation and draft proofing, floor insulation and cavity wall insulation

## **Level 3**

We assume that the average leakiness falls by 40%. Two thirds of existing homes get triple glazing, loft insulation and draft proofing, floor insulation and cavity wall insulation.

## **Level 4**

We assume that the average leakiness falls 50%. All existing homes get triple glazing, loft insulation and draft proofing, floor insulation and cavity wall insulation.

