BUILDING IN ALASKA

EEM-00252

Searching the Market For Energy-Saving Homes — A Checklist for Alaska

Many features about a home can make a difference in your comfort and in the amount of energy needed for heating, cooling, and lighting. The following checklist will help you evaluate the energy-saving potential of a home, or help you determine whether a home you may be buying, building, or remodeling will be economical to operate.

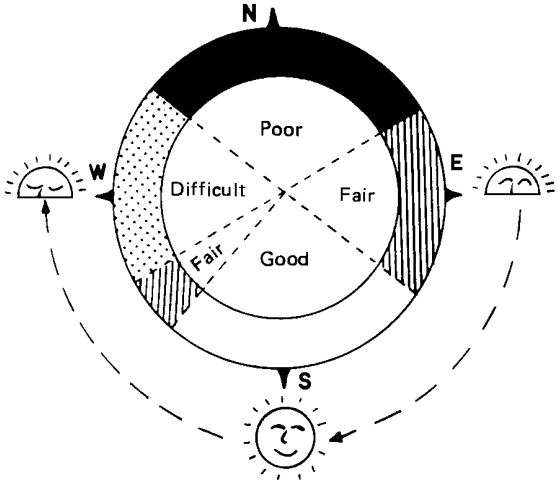
\+ Put a plus by each statement that describes your home.

— Put a minus by each statement that does not describe your home.

You will have to decide the relative importance of the plus and minus characteristics, or whether minus conditions can be altered. Where improvements can be made, the pay-off will be in lower energy bills. The primary energy-saving reason for each statement below is printed in italics.

CHECK POINTS

Siting
House Design
Construction & Insulation
Heating/Cooling Systems
Color and Lighting
Appliance Efficiency



SITING

_____ House is on south or southwest slope of hill (sun hits at angle so that the greatest amount of solar heat is received through south windows in winter).

_____ House is protected from winter wind by a hill or the placement of a garage or other structure (air infiltration and heat loss are reduced when wind velocity is lower).

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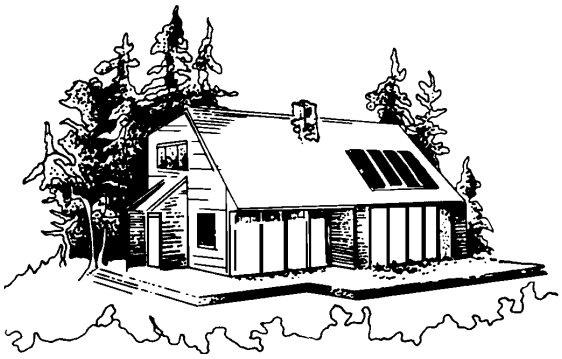
_____ House is built into the hillside or partially into the ground *(relatively constant year-round ground temperature buffers extreme temperatures and cuts down on air infiltration, BUT, constitutes a radon risk as well. Check this house for radon).*

_____ The long axis of the house runs east and west *(allows more windows on the south to take advantage of winter sun, and south windows can be protected from summer sun by awnings and roof overhang).*

_____ Deciduous shade trees are located on east, southeast, and west of the house *(provides summer shade if needed, but allows winter sun to heat house).*

_____ Low evergreen trees and shrubs are placed on side of house exposed to winter winds *(provides a wind break and reduces air infiltration. Avoid high evergreen on southeast, south and southwest, as they block winter sun from house).*



HOUSE DESIGN

_____ Shape of house is a slight rectangle *(long rectangles L-shapes, H-shapes, T-shapes, and U-shapes provide more outside wall surface for heat loss).*

_____ House has one or more common walls with other dwelling units *(as town-house, duplex or other type where heat loss is greatly reduced).*

_____ Entry halls for front and back doors can be closed off to form Arctic Entries *(reduces flow of cold air to inside and warm air to outside).*

_____ Main living area has as few partitions as possible *(for best heat distribution).*

_____ Windows facing east and west are kept to a minimum. North windows and doors are eliminated if possible *(northern windows and doors always lose more heat than they gain).*

_____ Amount of window area and door openings does not exceed the minimum required by building code for light, ventilation, and fire safety *(more heat is lost through glass, even double glazing, than through an insulated wall; and cracks around doors and windows are a source of significant heat loss).*

_____ Chimney for fireplace or wood stove is placed on an inside rather than outside wall *(so stack heat is retained inside of house).*

_____ Medicine cabinets are not recessed into exterior walls *(insulation cannot be placed behind cabinets to prevent heat loss).*

_____ Fireplace has outside air-intake for combustion of fuel, can be closed off, and can be connected to work in conjunction with the furnace *(prevents heated air in the house from escaping up the chimney, improves efficiency of fireplace).*

_____ Plumbing fixtures are located close to water heater *(reduces heat loss in water from tank to point of use).*

_____ Plumbing fixtures are water conserving, or faucets and shower heads are fitted with flow restricting gaskets, and toilets with tank bags *(money and valuable natural resources are lost with excessive water use).*

_____ Stairwells to second floor or basement have solid doors at top or bottom *(prevents chimney effect and loss of heat to upper area).*

_____ Electrical outlets and other pipes or wires are located in interior walls *(prevents excessive air infiltration due to decrease in insulation where wires and pipes are placed).*

CONSTRUCTION AND INSULATION

_____ High efficiency, low E, glass is used *(reduces heat loss through window area).*

_____ Storm doors are on all exterior doors or doors are metal insulated type *(reduces heat loss through exterior doors).*

_____ Insulation about ceiling is rated commensurate with Alaska State Thermal Efficiency standards for your region.

_____ Ceiling access openings to attic have insulation equivalent to ceiling insulation *(uninsulated attic access openings permit excessive heat loss to attic).*

_____ Insulation in walls is rated commensurate with Alaska Thermal Efficiency standards for your region.

_____ Insulation under floor over unheated crawl space is rated commensurate with Alaska Thermal Efficiency standards for your region.

_____ Moisture barrier of 6- to 10-mil polyethylene plastic has been laid over ground in crawl space *(unprotected ground disseminates moisture that is absorbed by building structure and insulation).*

_____ Vapor barrier of 6- to 10-mil polyethylene has been installed on warm (room) side of all types of insulation and all seams and holes are well sealed *(unprotected insulation will absorb moisture, lose its insulating capacity and also subject the building structure to moisture damage).*

_____ Attic and gable areas are adequately ventilated with at least one square-foot eave inlet and one square-foot gable outlet for each 300 square-foot ceiling area. Vents should be designed to keep blowing snow out of the attic *(allowing the escape of unwanted moisture from attic in winter and lessening attic heat build-up in summer).*

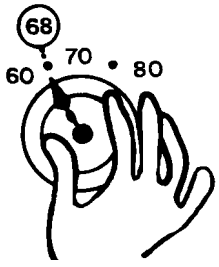
_____ Weatherstripping is installed around jambs of all doors and operable windows *(heat losses due to infiltration can increase heating costs by sizable amounts).*

_____ Caulking around all door and window frames is in good condition to reduce infiltration heat loss *(butyl and silicone caulking are more durable in cold, harsh climates).*

_____ Sill sealer/filler and caulking have been put around top of foundation wall below sill plate *(to reduce infiltration into basement area).*

HEATING SYSTEM

_____ Programmable thermostats are located on inside walls *(thermostats on exterior walls, near windows or heat-generating appliances, in drafts, or in sunlight may not react to actual room temperature. Programmable thermostats adjust the temperature automatically).*



_____ Heating controls are designed for zoned heating *(permits heating of lightly used areas only as needed).*

_____ Oil, gas, or wood-burning heaters and/or water heaters have ducts bringing outside air directly to combustion unit *(it is wasteful to use heated indoor air as the air supply for any flame-type heating unit).*

_____ Air-to-air heat exchanger is connected to ventilators in the kitchen, bath and laundry *(transfers the heat from outgoing air to incoming fresh air).*

_____ Ventilators are controlled by timer switch or humidistat *(operating of exhaust fans for longer periods of time than needed to remove moisture, odor, or smoke is wasteful of heated air).*

_____ Heating ducts are wrapped with insulation except where they pass through heated rooms *(metal ducts in unheated crawl spaces, basements, and attics radiate excessive heat to such areas).*

_____ Home with vaulted ceilings has a forced air heating system that has a continuously operating fan *(keeps warm air at ceiling circulated through the house).*

_____ Heating system is properly sized to needs of home *(oversized equipment operates in short cycles giving lowered efficiency and higher energy consumption; undersized equipment will not maintain desired temperature during cold extremes).*

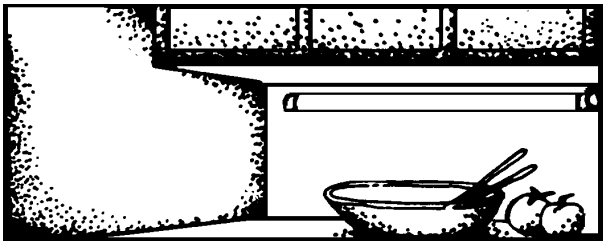
_____ Wood stove or fireplace is designed so that it can be closed completely when not in use *(heated air will not escape up the chimney).*

_____ Furnace design and location permits easy access for maintenance *(clogged filters or improper burning reduce efficiency).*

_____ Hot water pipes are wrapped with insulation *(reduces heat loss).*

_____ Two-stage thermostats or temperature modulating controls are used on boiler system *(reduces heat loss and energy consumption).*

_____ Water heater is located in a heated space such as closet, utility room, or basement *(even a well-insulated heater loses more heat when placed in an unheated area).*



COLOR AND LIGHTING

_____ Outside walls and roof are dark colors *(light colors reflect, dark colors absorb heat).*

_____ Interior wall and ceiling colors are light tints or white *(so both daylight and artificial light are reflected more than absorbed).*

_____ Floor covering is medium to light in color *(so light reflectance will save on amount of artificial light needed).*

_____ Fluorescent lighting is used where low background illumination is desired, such as valance, cornice, or cove lighting around walls *(to gain three to four times the light per watt in comparison to incandescent bulbs).*

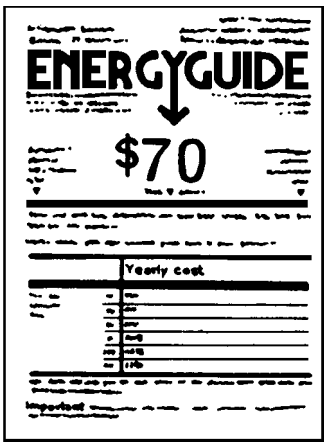
_____ Fluorescent lighting is used in kitchen in an extended soffit or ceiling panels *(to provide light for working surfaces without shadows).*

_____ Fluorescent lighting is used under upper kitchen cabinets to light the countertop work area *(concentrates light on areas of work, but ceiling fixture also needed for general lighting and to see inside upper cabinets).*

_____ Fluorescent lighting is used in bathroom in a canopy structure over the lavatory with deluxe warm white for good skin color *(for general room illumination and also good lighting of mirror area).*

_____ Fluorescent lighting is used in the laundry area in an extended soffit or ceiling panel over the washer and dryer *(provides adequate light where tasks are performed).*

_____ All light fixtures are located so they can be easily cleaned *(dust on bulbs and tubes reduces illumination).*



MAJOR APPLIANCES

Selection and operation
Become familiar with the energy using aspects of the appliances your family uses. Does the appliance operate only occasionally for short periods of time (e.g., a vacuum cleaner or a food mixer) or much of the time (as does a broiler or refrigerator). Estimating the operating cost of appliances is fairly simple. Find the wattage rating on the appliance nameplate. Multiply the wattage by the operating time in hours to determine the energy consumption. Then divide by 1,000 to obtain kilowatt-hours (kwh) the unit in which the electric utility sells electricity to you. To determine cost, multiply kwh by the local utility rate per kwh. When purchasing new appliances check the ENERGY GUIDE LABEL (the Federal Trade Commission requires these on high usage appliances, such as refrigerators, freezers, dishwashers, and clothes washers, to compare the annual operating costs. Other appliances: ranges, microwave ovens, clothes dryers, and portable appliances use comparable amounts of energy regardless of brand or model and are not rated with the ENERGY GUIDE label).

A superb guide to the most energy efficient appliances available is published and updated annually by the American Council for an Energy Efficient Economy, 1001 Connecticut Ave. N.W., Suite 35, Washington D.C. 20036. Entitled Consumer Guide to Home Energy Savings, 6th Edition, revised 1998 (always updated annually) by Alex Wilson and John Morrill, price is $8.95 for a single copy. This guide lists the most efficient appliances available over a wide range of required sizes and loads for families and individuals. Chapters cover a helpful amount of background information on heating systems, hot water heating, freezers, refrigerators, cooking appliances, dishwashers, washing machines, dryers, lighting (especially evaluation of compact fluorescent), and a section on understanding the Federal Energy Guide labels, mentioned earlier. A good investment, which can often be obtained from your local electric utility at a very reduced cost, as well.

Other Useful Information
Top freezer refrigerators use approximately 50% less energy than a bottom freezer refrigerator. Comparison shop both as to price tag and energy cost, weigh savings against convenience.

A front-loading clothes washing machine uses less energy than a top-loading machine, but is not necessarily more energy efficient, as a

top-loading machine holds more laundry. For maximum water economy, choose a washer with a water level control that can be adjusted to match the size of the load, or choose a machine with a suds saver feature. To save energy, wash all but the most heavily soiled loads with warm or cold water, and always rinse with cold water. To conserve energy in your clothes dryer, sort laundry by fabric type and do not overload. A washer load generally equals a dryer load. Do several loads in a row and keep the filter clean.

Gas and electric ranges use approximately the same amount of energy. To conserve energy while using your range, do not preheat the surface element, use covered, flat bottom utensils on electric cooktop, turn off the control before cooking is completed and finish cooking on retained heat. Don't open oven door (heat escapes), match size of pot as closely as possible to the element, and keep drip bowls as clean and bright as possible. Convection ovens bake and roast faster than conventional electric or gas ranges, thus saving energy.

For current information and brand name comparison of energy-efficient appliances consult Consumer Reports, a monthly publication by Consumers Union of the United States, Inc. available by writing P.O. Box 1949, Marion, Ohio 43305, or on request at your nearest library.

RECOMMENDED READING

New Shelter, 33 East Minor Street, Emmaus, PA 18049.

Consumer Reports, P.O. Box 1949, Marion, Ohio 43305.

Alaska Craftsman Home Building Manual, A Guide for Energy Efficient Home Building in Alaska, Available from Alaska Craftsman Home Program, Inc., 900 West Fireweed Lane, Suite 201, Anchorage, AK 99503.

Books

The Efficient House Sourcebook, Rocky Mountain Institute, 1739 Snowmass Creek Road, Snowmass, Colorado 81654-9199.

The Superinsulated Home Book, by J.D. Ned Nisson and Gautam Dutt, John Wiley & Sons, New York, 1985.

Passive Solar Energy, Bruce Anderson and Malcolm Wells, Brick House Publishing Company, 34 Essex Street, Andover, Massachusetts 01810.

The Passive Solar Energy Book, E. Mazria, Rodale Press, Emmaus, PA 10849.

200 Ways To Save On Energy In The Home, by George B. Roscoe, Acropolis Books Ltd., Colortone Building, 2400 17th Street, N.W., Washington, D.C. 20009.

Air–To–Air Heat Exchangers For Houses, William A. Shurcliff. Published by the Author, 19 Appleton Street, Cambridge, MA 02138.

1993 Consumer Guide To Home Energy Savings, by Alex Wilson and John Morrill, American Council for an Energy Efficient Economy, 1001 Connecticut Ave. N.W., Suite 35, Washington D.C. 20036.

Additional information available at:

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