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A second step in increasing awareness is to gather and read information relating to energy conservation, insulation, solar hardware, and alternate energy sources. Many excellent pamphlets and brochures are available from interest groups such as building materials distributors, utility companies and government agencies. In addition many colleges and universities involved in research or public service activities have large quantities of information on alternate energy and conservation ideas.

All the awareness in the world does not save energy if none of the information is put to use. This means that a logical sequence of efforts must be made to improve energy use. The exact order depends on the specific needs of the individual house and on personal choices and economic considerations.

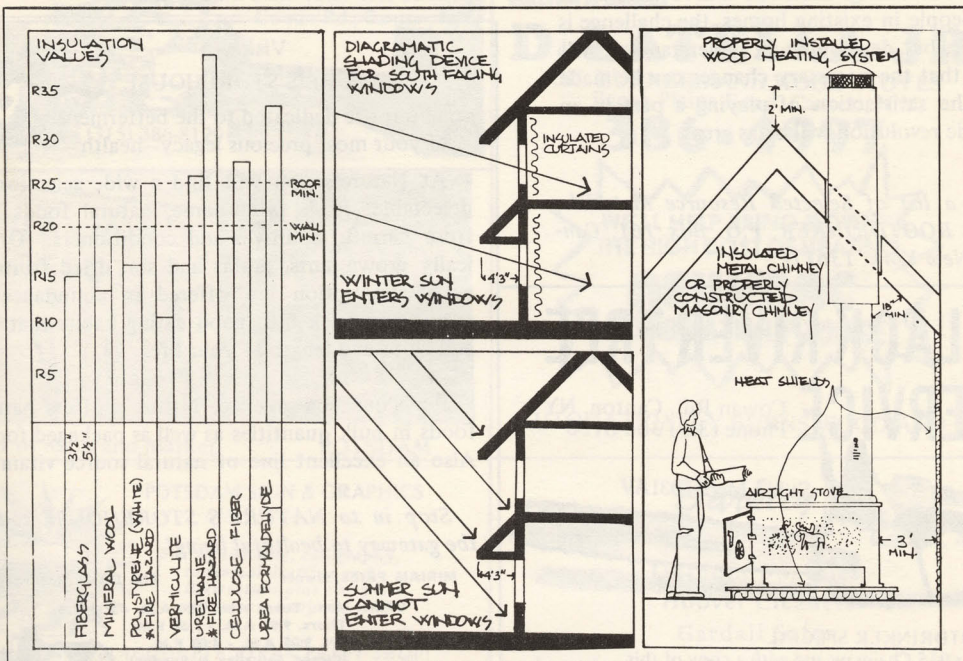
When the needed information is learned and the specific needs of a house are identified, priorities must be established. For most, financial considerations will also be a factor. It is helpful to plan a long-range approach to making energy saving home improvements. Remember, the benefits in energy savings will

be observable immediately. In addition, the ultimate possibility of conversion to alternate energy sources will become feasible at an earlier date.

Resources are not discovered; they are created. An ambitious, inventive person can not only do much of the work him or herself, but can create solutions to unique problems that are encountered and thus speed up the process as well as save money.

The ultimate addition of alternate energy devices will depend on availability of resources at the site. The kinds of data needed might include heating degree days, solar radiation, cloud cover and wind miles per day at the location. Some or all of this data is often available from nearby airports or experimental stations. Ability to obtain such information can lead to quick establishment of averages for a ten or twenty year period. If no data is available, then there is still time to start collecting, but it is important to start as soon as possible. A modest investment can provide a pyranometer for measuring solar radiation; a recording anemometer for collect-

continued next page





ing wind miles data; and a maximum-minimum thermometer for gathering temperature data from which degree days can be calculated. Again economic considerations and personal motivation are factors which will determine what is done and when.

It is not the purpose of this article to go into the details of analyzing the data and of installing energy systems. The time will soon come when experts in the field will abound. Some individuals will be able to follow a do-it-yourself plan to the end. Others will have to rely on the experts.

Becoming aware of the coming options now will be an advantage. The situation is analogous to buying a car. Those who are not acquainted with the workings of automobiles risk making an uninformed choice. They are entirely dependent on somebody else's know-how. Those who understand to a greater degree retain their freedom to ask questions and challenge the claims of the "experts" and at the same time can avoid bad investments.

Those contemplating building a home can easily incorporate energy saving ideas into the plan. Although it may increase the initial cost, the savings returned will compensate. For people in existing homes, the challenge is greater, but developing an understanding will show that the necessary changes can be made and the satisfaction of playing a part in an historic revolution will be as great.

[For a list of Selected Resource Materials, write ROOTDRINKER, P.O. Box 161, Canton, New York 13617]

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# Now is the Time to Prepare for Future Energy Options

## by Joel Bixby

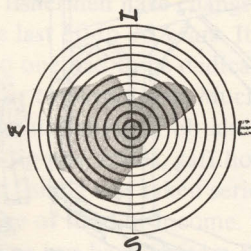
The time has arrived when the direct use of the sun's energy can be economically competitive with conventional fuels and energy sources. The main problem now is that too few people are aware of the status of fossil fuels and the degree of development of alternative energy sources.

Estimates of remaining reserves of coal, gas and oil vary depending on the information source. It is generally agreed that natural gas, oil and coal reserves will be depleted in that order. Reports indicate that natural gas supplies may run out by the end of the 1980's. Oil will most likely last into the second decade of the next century and coal (2/3 of the world's known reserve is in the United States) may be available for another two or three hundred years.

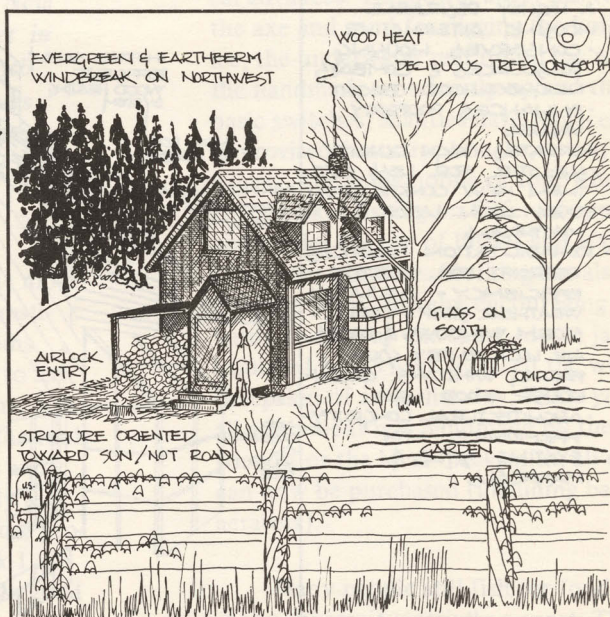
The cold winter of 1977 quickly heightened awareness of the fact that energy demand versus energy supply is becoming a problem. Although the preceding paragraph does not suggest an immediate crisis overall, the situation is indeed critical. The price is recovering these fossil fuels will be increasingly more prohibitive in terms of dollars and in terms of environmental cost. The time to explore and expand the use of clean, widely available, inexhaustible solar power is now. Solar energy as used here includes that provided by wind and ocean currents and by growing plants as well as that received directly from the sun.

The general steps to follow in preparing for the future and its changing energy options are interwoven. These include developing

- SITE PLANNING AND ARCHITECTURAL DESIGN**
- NEW AND MANY EXISTING STRUCTURES CAN RELATE HARMONIOUSLY TO ENVIRONMENTAL CONDITIONS
    - INCREASE SELF-SUFFICIENCY
    - MINIMIZE ENERGY WASTE
    - CUT MAINTENANCE COSTS
  - SITE DATA
    - 44° N LATITUDE
    - 10,000 DEGREE DAYS
    - 30-45% POSSIBLE SUNSHINE
    - 100-160 DAYS GROWING SEASON



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awareness and practicing conservation. If the appropriate preparations are made in proper sequence, the final step can be readiness for solar or other safe alternatives.

Perhaps the most important first step in developing awareness is to learn more about home heating and energy use. The function behind space heating is replacing lost heat. Every substance used in home building has what is called an "R" value by the home insulation industry. The "R" value is a measure of the insulating performance of a material or its resistance to the passage of heat. To gain an understanding of a home's energy requirements, it is helpful to obtain a heat loss calculation for the structure. This estimate can be provided by a heating expert. The calculation will be stated according to the amount of heat (in British Thermal Units—BTU's—per hour) lost from the house during the coldest expected winter temperatures. This gives an indication of what heating capability must be in order to insure comfort in the coldest weather.

The report can be broken down according to heat loss through various components

of the shell of the house depending on the "R" value assigned to each. It includes loss through doors, windows, exterior walls, ceiling and floors. An additional category is infiltration heat loss and is based on an estimate of the hourly volume of air entering from the outside to inside the house. This information provides a base for launching into the other phases of the process, in that it pinpoints specific areas in need of improvement.

While the first step progresses, it is important to simultaneously summarize household energy use according to how much oil, gas, electricity, coal or wood is used (not how much it costs—prices rise) during some period of time such as monthly or from fill-up to fill-up or any other convenient time interval. By doing this, a comparative measure can be made of conservation efforts. If such information is available for previous years it is helpful to summarize it in a similar manner. One year's data does not portray a situation as accurately as data averages from several years since effects of weather may vary greatly from one year to the next.

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