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costs, most radiant electric systems fall in between electric baseboard—still the cheapest—and conventional air and hydronic systems. The less expensive electric radiant systems can be installed for \$1 to \$1.25 per square foot of floor area.

As for maintenance, well, you can't beat electric heat on that count. When it comes to fuel costs, however, electricity is usually a loser. To compete with oil at \$1.25 per gallon, Figure 2 shows electricity must cost less than 5¢ per KWh. Peak-load penalties and new plant demands aside, electricity is not the first choice in many areas.

## Low-load alternatives

The problem remains, then. Once you've reduced the load of a house to "micro" levels, say below 30,000 Btu/hr, by various combinations of solar and conservation, what do you choose?

For fuel, choose what's cheap and available in your area. Wood and coal are fine for the motivated client, but not for everyone. With boilers and furnaces, sizing is critical, since the seasonal efficiency of these units is low if they are oversized. As for high-efficiency units (*Solar Age*, 5/83), make sure they will be used enough to recoup the added investment.

For heat delivery, consider forced hot air if you are installing fans and ducts to move air anyway, as in some passive designs. If loads are small enough, consider room-size vented gas heaters. Another micro system that has been used successfully has a fan coil unit or a few feet of hydronic baseboard supplied by the hot water heater.

Heat pumps? They're a popular option in air-conditioned homes that also need heating. In low-energy houses, though, heat is called for primarily when outside temperatures are too low for the heat pump to operate and it reverts to straight resistance heating.

Electric-resistance heating, whether with a furnace, baseboard convectors, or radiant panels, may be a good choice where loads are small enough or rates are low enough. These systems also make sense for supplemental heating of separately zoned spaces that are otherwise difficult to heat and are only used intermittently.

## Electric Radiant Heater Manufacturers

**Aztech International, Ltd.**, 2417 Aztec Road NE, Albuquerque, N.M. 87107 (800) 545-8306

**ESWA Heating Systems**, 591 Camino de la Reina, Suite 500, San Diego, Calif. 92108 (619) 295-5183

**Radex Electric Ceiling Heat**, Proko Industries, Inc., 18601 LBJ Freeway, Suite 400, Mesquite, Texas 75150 (214) 681-9261

**Solid State Heating Corp.**, P.O. Box 908, New Canaan, Conn. 06840 (203) 966-0558

**Therma-Ray Mfg. Inc.**, P.O. Box 516, Old Saybrook, Conn. 06475 (203) 399-7933