SETTING OUR HOUSES IN ORDER

By Alan Durning

Our homes waste nearly half the energy they consume. By following a few simple steps, we can make them far more efficient.

Since our earliest ancestors leaned one branch against another and crawled underneath, humans have been preoccupied with shelter. We are a nest-building species, and perfecting those nests is our perennial passion.

The world may need a redoubling of the nest-building spirit in the years ahead, however, if it is to respond forcefully to mounting economic and environmental challenges, for the energy profligacy of our homes now threatens the health of our planet.

Our lights, refrigerators and televisions are powered by coal-burning generators that spew out the gases responsible for acid rain and the "greenhouse effect" and by nuclear reactors with thousand-year radioactive legacies. The oil that keeps our home fires burning has the dubious distinction of being the most violently contested resource of our century. The largest naval armada assembled since World War II now patrols the Persian Gulf to guarantee the flow of Middle Eastern oil to the west.

If, as energy consumers, we are each part of the problem, we can also be part of the solution. From forest death to rising seas, solutions literally start at home.

Our contribution can make a difference since most households waste half of the energy energy they consume. By gradually rebuilding our nests to use cost-effective, energy-saving technologies, we can slash our utility bills while we dramatically reduce the burden we impose on the world's environment.

But no one needs to freeze in the dark to save energy. A new generation oftechnologies on the market can provide us all the light, heat and cooling we want for fewer energy dollars. They take the sacrifice out of conservation. From furnaces that use half as much fuel to windows that insulate like walls, the energy-efficiency revolution is ready to come home.

WASTING AWAY

The world's houses and apartments consume one-sixth of all energy--more energy than all the oil Middle Eastern nations pump out of the ground every year. The environmental consequences of consuming so much natural gas, oil and electricity are colossal. Our homes are responsible for 770 million tons of carbon released into the atmosphere annually--14 per cent of that emitted from all fossil fuels. In the United States, home energy use accounts for one-fourth of sulfur emissions and one-eighth of nitrogen oxide emissions--both key causes of acid rain.

According to U.S. Department of Energy data, an average house in America guzzles energy equivalent to 1,253 gallons of oil at a cost of $1,123 per year (see Table 1). Space and water heating together account for 57 percent of this, with refrigerators, aira conditioners, lights and kitchen stoves also taking major shares. Contrary to popular belief, toaster ovens, hair dryers and other high-powered gadgets account for an insignificant part of home energy consumption because they are infrequently used.

Table I. - Annual Energy Use in Typical U.S. Household, 1984

	Energy Share (equivalent gallons of oil)	(percent)
Space heating	507	40
Water heating	203	16
Refrigerators & Freezers	145	12
Air conditioning	94	8
Lighting	87	7
Cooking	72	6
Other	145	11
Total	1,253	100

Source: U.S. Department of Energy

Since 1973, the amount of energy used by the growing stock of houses in industrial countries has changed little because efficiency has offset the increase in numbers. Better technologies and greater awagreness have reduced residential energy consumption per person by 25 percent. American homeowners are are still investing in efficiency, but at nothing like the pace of the early eighties when oil prices were higher and tax credits were available.

What is considered energy efficiency in one country, however, may represent energy profligacy in another. Typical American residences are less than half as efficient as new, tightly built Swedish homes. Soviet apartments lack thermostats, so residents use windows to adjust indoor temperatures. Most British doors and windows lack even basic wind seals.

Efficiency gaps within countries are equally extreme. While most private homes have been made more stingy with energy, rental units, which disproportionately house minorities, the poor and the elderly, remain wasteful. Thus, the efficiency revolution has helped least those who need it most.

Rental housing poses an intractable problem: Landlords ignore opportunities to increase efficiency because tenants pay energy bills, while most tenants do not invest in property they do not own. Although any market-wide solutions to the efficiency problem of rental units must come from policymakers, there are many efficiency technologies now available that can benefit even short-term renters.

DREAM HOUSES

The extraordinary levels of efficiency possible to day can be seen in Scandinavia, Canada and the northern Great Plains of the United States, where new homes have been built to get through the winter on $200 worth of heat. Montana-based builder Brian Curran goes so far as to guarantee his homes will have a heating bill under $100--otherwise, he pays the difference.

These "superinsulated" homes, first developed in Sweden, combine high-quality, sit-tight construction with ample insulation, double or triple-glazed windows and efficient appliances. Walls and ceilings are insulated to twice the standard level, and the entire structure is enclosed in a vapor and windproof barrier. So thermally sound are these houses that most of the heating actually comes from occupants, lights and appliances. Indeed, until recently it was difficult to find furnaces small enough to meet their minuscule heating demands.

Superinsulation makes most sense for new construction because much of the expense for tighter, better-insulated walls is offset by the savings from buying miniature heating cooling systems. Lowered energy bills mean the combined monthly payments for mortgage and utilities on a superinsulated home are generally under those of a less-efficient new home.

Older buildings can have their efficiency hoisted to near that of a superinsulated new home if they undergo foundation-to-roof renovation. For most homes, though, superinsulation will only define the ideal, an ultimate goal toward which the first simple, inexpensive steps of an extended home-efficency campaign should be directed.