

ENGINEERING

Enough Fuel if Not Wasted

Although production of coal, oil, and gas are approaching an all-time high this year, there is also an increased demand from the field of powered tools.

By A. C. MONAHAN

► THERE WILL BE fuel enough for the nation's homes this winter if fuel users cut unnecessary wastes, and no special emergency arises. Reasonable conservation is all that is required.

Total fuel production is about at an all-time high in America, but demands are higher than ever before. Much of the production is needed for power, which is as essential as heat. But comfortable homes during the cold months ahead will prevail if available fuels are properly used.

There is little that is really new in the practices to be followed to save fuel and still enjoy heating comfort. The steps to be taken are well summarized in a new bulletin of the U. S. Housing and Home Finance Agency, entitled Fuel Consumption in the Home. They are somewhat as follows:

1. The person who pays for the fuel should fire the furnace.
2. Fuels should be selected that are best adapted to the particular heating plant.
3. Houses must be put in good condition to save heat.
4. Heating plants must be kept in good operating condition.
5. Overheated houses waste fuels and cause discomfort to occupants.
6. Proper firing of the particular fuel used is essential.

Fuel Economy

Maximum economy of household fuels means equally as much to the national economy as it does to the individual, the government agency states.

Coal production this year is approaching an all-time high. About 11% more crude oil is being processed this year than last. Natural gas pipe lines have an increased carrying capacity. But this does not mean that there will be fuel to waste.

Along with the increased production there is an increased demand. The American population has increased and there are more homes to heat. Also the use of powered tools is rapidly replacing hand implements, and power requires fuel.

Even the ordinary housewife appreciates this when the monthly electric bill comes in. Then she remembers that all the new electrically driven household gadgets, from heated bed blankets to furniture polishers, use energy that came from fuel.

The demand for fuel oil and gasoline has increased much more rapidly than the demand for coal, although coal is still the

principal household fuel in the United States. Part of the increased demand for fuel oil is a result of conversion from coal heaters to oil-burners. The number of homes in America now heated with oil approaches 4,000,000, compared to some 2,500,000 in prewar days.

But there are other liquid fuel users that play a big part in oil shortages. Horse and mule power on American farms are disappearing. Considerably over 3,000,000 farm tractors are now in use. This is nearly a 60% increase over 1940 figures. Before the end of this year there will be some 40,000,000 motor vehicles on the nation's streets and highways, compared to 38,000,000 in prewar days. They burn gasoline, it is true, but the more gasoline made from petroleum, the less fuel oil is obtained.

Crude Oil

Crude oil does not yield a fixed ratio of oils and gasoline. In the refining process, crudes are "cracked" to yield additional gasoline when the demands for it are heavy. Therefore home-heaters have a primary interest in gasoline conservation, even if they own no automobile. A saving in gasoline makes a larger production of fuel oils possible. Avoiding unnecessary driving and riding will cut gasoline usage, and properly adjusted carburetors save much fuel.

While coal production has increased, demands have increased also. Europe is still in need of American coal. Public utilities are heavy coal users, and the greatly expanded use of electricity for lighting, cooking and power has expanded the demands of the power plants for fuel.

The oil industry seems to be certain that there will be no general suffering this winter for the lack of liquid fuels in spite of increased demands, providing users cooperate by easily taken conservation steps. There may be temporary shortages in certain areas because of distribution problems. The Middle West is the most important of these because much of its supply of oil is brought by tank cars. Present pipelines are inadequate, and delay in laying new lines is due largely to steel shortages.

Barring unforeseen contingencies such as a sudden rise in demand for oil products from the military, the East Coast area will probably have enough gasoline and light fuel oils for the winter provided proper conservation steps are taken by users, a recent report from the Oil Industry Information Committee states. This area is served largely by ocean tankers from the

Gulf Coast, the cheapest form of transportation for petroleum products.

The Gulf Coast area will have sufficient supplies to meet needs because this area produces some 60% of the United States petroleum supply and transportation problems are easily handled. The Rocky Mountain area presents special problems, but the oil industry says they can all be met. West Coast supply and demand is in balance, and no special problem is expected if conditions remain normal.

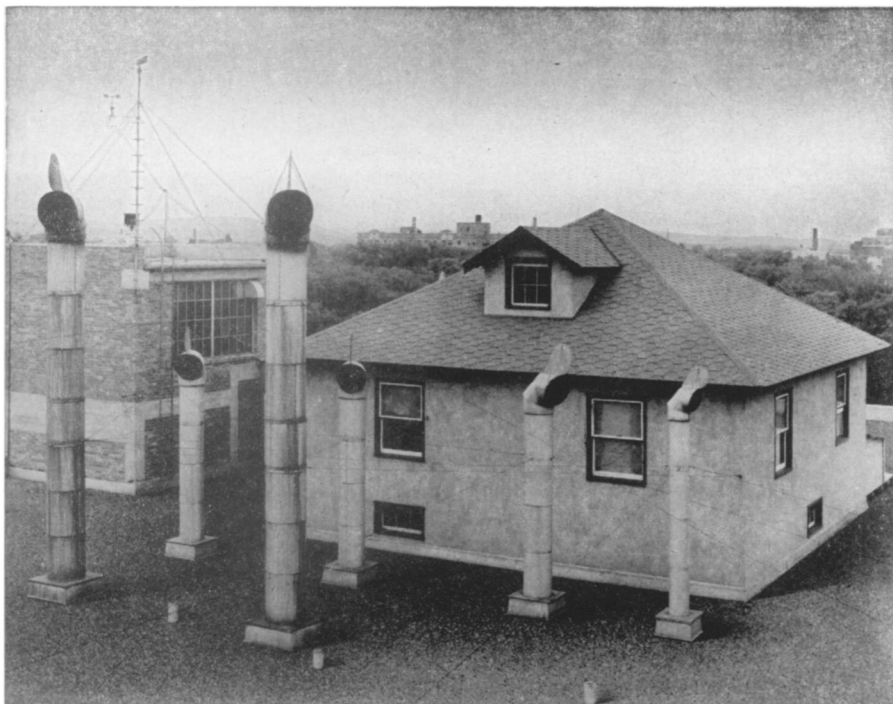
Clean Furnace

To conserve fuel in the oil-burning home, proper cleaning and adjustment of the furnace equipment is important. It is a job for an expert. The cost is more than returned in the fuel saved. The coal-burning furnace needs thorough cleaning and adjustment also, but it is a job that can be done satisfactorily by ordinary users although expert service is desirable occasionally.

The number one essential in cleaning the coal-burner is concerned with the interior walls of the combustion chamber and the upper chamber and tubes where the heat comes in contact with the walls that pass it through to the steam, hot water or air that circulates throughout the house. The layers of soot that form on them can cut heating efficiency from 20% to 40%, allowing the heat to escape up the chimney



PREVENTING HEAT LOSS—Fiber glass stripping is easily inserted in cracks and crevices and along windows to prevent the escape of hot air.



EXPERIMENTS IN HEATING—This bungalow has 144 recording thermocouples to study heat losses from a building and to test new heating controls.

instead of warming the building. The special wire brush, made for the purpose, does a good job if vigorously used, even by an amateur.

Furnace drafts and dampers must be adjusted so that there are no leakages and so that the proper amount of air is admitted to insure complete combustion. One of the greatest losses in the coal burner is due to the escape of combustible gases given off from the heated coal which should be burned completely in the furnace rather than permitted to pass to the outer world by the chimney route.

A house in poor physical condition can not be heated economically. Heat escape must be prevented. Heat losses are through cracks and crevices, unnoted by the ordinary eye, and through walls and windows and doors.

Window stripping is an important item in preventing heat escape. But there are often, even in apparently well-built houses, spaces between window frames and brick or other masonry walls through which air easily passes. A wet finger held near the frame on the inside of a house will often detect the existence of such spaces if there is a wind blowing on the outside.

The answer is simple. It is easy to stuff the cracks and crevices with strips of rags or with some of the special plastic products or putty made for the purpose. A new fiber glass stripping, made by Malanco, Inc., Blue Island, Ill., will not rot, is unharmed by vermin, and can be inserted with the back of a kitchen knife.

Other leak spots are common in basements where the house sills do not fit snugly to the masonry foundation. They

are common also in the attic along the eaves. Great losses occur through the roof itself unless the under sides of the rafters are boxed in with relatively airtight wood or insulation panels. If winter snow melts rapidly in cold weather on the roof of a house, it is a sign that better insulation is probably needed.

Heat losses from ordinary buildings are no longer just a guess. Many scientific studies have been made to determine where they occur and to what extent. University of Illinois studies are outstanding, but other technical colleges may make important contributions. Outstanding work was done also by Minneapolis-Honeywell Regulator Company which manufactures among other items heat measurers and regulators. This company built a special bungalow on a roof-top seven stories above the ground. The building was equipped with 144 recording thermocouples put in all sorts of places. The purpose was two-fold: to study insulation and heat losses, and to test new heating and air-conditioning controls.

Storm windows have been found in all studies to be a number one step in heat conservation. Double sash can save up to 30% of the heat ordinarily wasted from rooms without them. Wall insulation is also important. Another fuel-saving step is leaving unused rooms unheated. It is very important that the fireman knows best firing methods. The techniques with anthracite, high-volatile and low-volatile bituminous coals are far different. Coal companies and state technical colleges usually have available expert directions for using the various fuels.

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