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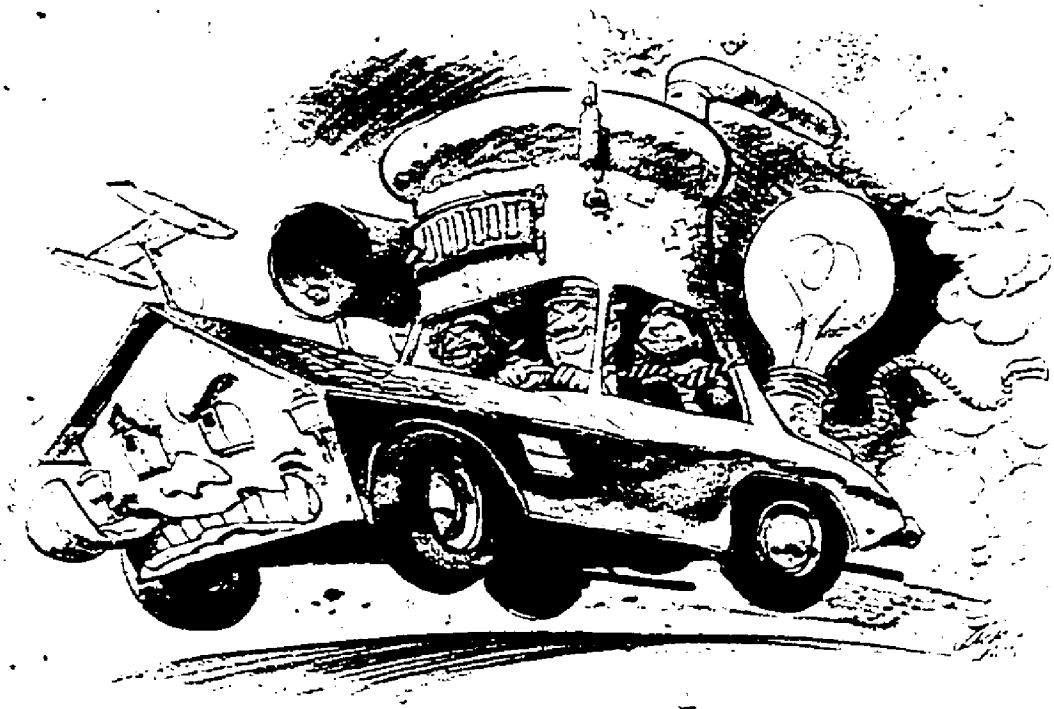
ABSTRACT

This pamphlet presents simple suggestions for energy conservation. Sections include: (1) In and around the home; (2) Using the family car; and (3) In the marketplace. The suggestions given are mostly common sense tips like dressing appropriately for either hot or cold weather, use electrical appliances and lights sparingly and at off-peak times, set the thermostat down in the winter and up in the summer, carpool, drive slowly, and vacation closer to home. (MR)

TIPS FOR ENERGY SAVERS

IN AND AROUND THE HOME
ON THE ROAD
IN THE MARKETPLACE



DON'T BE FUELISH.

Federal Energy Administration
Washington, D.C. 20461
Frank G. Zarb, Administrator
Roger W. Sant, Assistant Administrator for Conservation and Environment

THE WHITE HOUSE

WASHINGTON

My fellow Americans:

In no nation in the world do so many citizens enjoy so high a standard of living as in America. Much of this standard of living depends in some way on energy. Consequently, while we comprise only six percent of the world's population, we consume more than one-third of the energy used in the world. In recent years, we have had to rely on increasingly vulnerable foreign sources of fuel to meet our energy requirements.

Today, if we are to maintain our standard of living, we must be far more conscious of the need to use our energy wisely, and to conserve energy wherever possible. The Federal Government has made great efforts to reduce its consumption of energy. But demand for fuel has increased at such a rate that fuel conservation by government alone is no longer enough. Only a truly national effort will meet this critical challenge to our future.

Therefore, as one of my first requests as President, I ask each of you to apply our most abundant natural resource—American ingenuity—toward including energy conservation in your life. The goal is not to change our standards of living, but to ensure that, as we enjoy our American way of life, we are not wasteful and that we use our energy resources wisely. Each person has a part to play in this effort. I ask each of you to play your part.

Gerald R. Ford

FEDERAL ENERGY ADMINISTRATION

WASHINGTON, D.C. 20461

Dear Energy Saver:

The sooner we understand our energy problem, the better we can work at saving our disappearing supplies. I'd like you to help me do that.

We Americans are very productive. We use more than a third of the energy used in the world every year, yet we have only 6 percent of the world's people.

This is our problem:

--Through just plain bad habits, and through careless engineering and design in our buildings and cars, we have been wasting a shocking amount of energy.

--We import about a third of the oil we use, and foreign nations have been able to manipulate the price and supply of that energy.

--In the United States, we use energy faster than we produce it. Our energy needs have been growing 5 percent each year, but our energy supplies have been growing only 3 percent a year. It's obvious that we are slowly running out of the fuel that has made our country so strong.

Here are some solutions you and I can work on together.

--We can start saving energy as if it were money.

--We can drive less and drive more slowly, turn off extra lights, and turn down thermostats.

--We can make energy thrift part of our way of life, simply by starting some good common sense energy habits.

--By working together and working one at a time, we can balance America's energy budget, just as each of us balances our personal checkbooks.

In this little booklet, I point out some simple and practical advice for saving energy. If you, especially, and every other American, follow these tips, the result will be a huge national energy saving. And when we save fuel, we save money. You win--and America wins.

Frank G. Zarb
Administrator
Federal Energy Administration

TIPS FOR ENERGY SAVERS

IN AND AROUND THE HOME

A few basic statistics show how important it is for Americans to save energy at home. Almost 20 percent of all the energy consumed in the United States is used in our 70 million households. That includes more than half of all the space heating fuels used in the country, and about a third of all the electricity.

More than half of the energy we use in our homes goes into heating and cooling. Heating water takes about 15 percent. Lighting, cooking, refrigeration and operating appliances account for the rest. What appear to be small savings in the average household can add up to sizeable savings for the Nation if every family in the country takes part in the effort.

Conserving energy is a relatively new idea for most of us, but today it is as timely for the average family as getting higher interest from the bank—and in a way even more rewarding.

By the judicious use of energy at home, you can save money for yourself and help avert uncomfortable shortages in energy supplies in the years ahead as we develop new technologies to meet our goal of energy self-sufficiency in the next decade.

The money-saving potentials mentioned in this brochure are percentages of current energy costs. They translate into savings at 1974 prices, and should not be confused with reductions in energy bills, which may be higher than they have been in the past.

TIPS FOR YEAR-ROUND ENERGY SAVINGS

Rising energy costs make these ever-more sensible.

Cooling and heating the Nation's households in 1974 is expected to consume about 11 percent of all the energy that will be used in the United States throughout the year. Lighting consumes over 16 percent of all electricity used in American homes.

It is in these energy-intensive household operations where waste often is found, and where you can save considerable amounts of energy and reduce family expenses accordingly. Consider the following all-weather energy conservation measures:

INSULATION—Self-protection against heat and cold

Proper insulation can increase temperature-control efficiency by as much as 20 to 30 percent by reducing the load on both heating and cooling equipment.

Spring, summer, and fall are the best times to insulate, and effective improvements need not be expensive.

☐ **Caulk and weatherstrip doors and windows.**

This inexpensive measure, which can be an easy project for the do-it-yourselfer, could reduce the family's energy costs by 10 percent or more.

If every household were caulked and weatherstripped, the equivalent of 580,000 barrels of home heating fuel could be saved each winter day, thus reducing chances of shortages in cold weather areas of the country.

☐ **Install storm windows and doors.**

Combination screen and storm windows are the most convenient because they do not have to be

removed when temperatures are moderate and open windows are desirable. Conventional storm windows cost about $30 each, and storm doors about $75 each. But a sheet of clear plastic film tightly taped to the inside of the frames can be equally effective; and the entire cost for the average home would be around $10. (Renters might prefer this low-cost method.) Either type of protection could reduce individual fuel costs by about 15 percent and make the home more comfortable all year.

If the estimated 18 million single-family homes lacking this protection were so equipped, the Nation's fuel demand would drop the equivalent of 200,000 barrels each day of the winter season (enough to heat 1.6 million homes).

☐ **Insulate the attic and the walls.**

Install mineral wool, glass fiber, or cellulose insulation to a depth of 6 inches in the attic. Heating costs should drop about 20 percent.

If 15 million homes with inadequate attic insulation were upgraded, about 400,000 barrels of heating oil would be saved each winter day—reducing the Nation's demand for residential heating fuels by 4 percent. Installation of insulation in the walls also yields a large energy saving but requires special equipment and professional help in existing homes.

ELECTRICITY—The energy that comes to us from generators

Many of the conservation measures contained in this brochure involve saving electricity. But there is one way householders can help save it before it gets to their homes.

During the late afternoon and early evening hours the load on the Nation's electrical systems often reaches its peak. To meet the heavy demand, electric utilities must use back-up generating equipment that is not energy efficient.

☐ **Try to use energy-intensive equipment and appliances such as dishwashers, clothes washers and dryers, and electric ovens in the early morning or late evening hours.**

If everyone scheduled household chores so as to lighten the load at the generating plants during peak load hours, fewer inefficient generating units would have to be placed in service, and the utilities' daily fuel consumption would be reduced. So would the possibilities of brownouts and blackouts.

LIGHTING—It's easy to use more than you need

Careful use of lighting provides the homemaker other conservation opportunities.

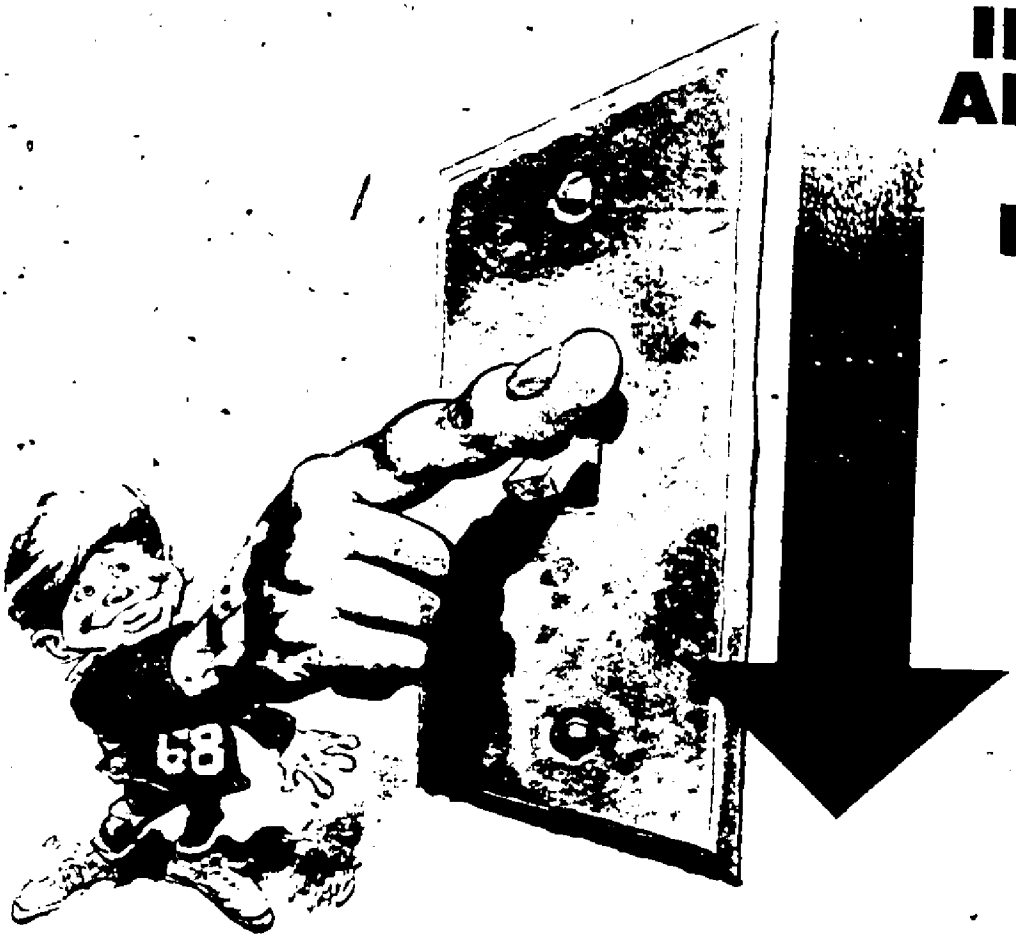
To save electricity through wise lighting:

☐ **Remove one bulb out of three and replace it with a burned-out bulb for safety; replace others with bulbs of the next lower wattage.** But be sure to provide adequate lighting for safety (e.g., in stairwells). Concentrate light in reading and working areas, and for safety.

This should save about 4 percent in electricity costs in the average home.

If everyone took these conservation steps, the Nation's consumption of energy would drop by about 50 million kilowatt hours of electricity per day (enough to light about 16 million homes).

IN AND AROUND THE HOME



- ☐ **Turn off all lights when not needed.** [One 100-watt bulb burning for 10 hours uses 11,600 Btu's, or the equivalent of a pound of coal or one-half pint of oil.]
- ☐ Use fluorescent lights in suitable areas—on the desk, in the kitchen and bath, among others. They give more lumens per watt. One 40-watt fluorescent tube, for example, provides more light than three 60-watt incandescent bulbs. (A 40-watt fluorescent lamp gives off about 80 lumens per watt; a 60-watt incandescent gives off only 14.7 lumens per watt. The lower-watt but higher-lumen fluorescent would save about 140 watts of electricity over a period of 7 hours.)

- Where higher illumination is desirable in areas lighted by incandescent bulbs, use one large bulb instead of several small ones. The larger bulb is more efficient.
- Use long-life incandescent lamps only in hard-to-reach places. They are less efficient than ordinary bulbs.
- Keep lamps and lighting fixtures clean. Dirt absorbs light.
- Reduce or eliminate ornamental lights except on special holidays or festive occasions.
- Use outdoor lights only when essential.
- Light colors for walls, rugs, draperies, and upholstery reduce the amount of artificial lighting required.
- Install solid-state dimmer switches when replacing light switches. They allow more efficient use of light.

ADDITIONAL YEAR-ROUND ENERGY SAVERS

- Close off unoccupied rooms and turn off the heat or air-conditioning.
- Use bath and kitchen ventilating fans only as needed.
- Repair all leaky faucets, especially hot water faucets, as quickly as possible.
- Insulate hot water storage tank and piping.
- Turn off radio and television sets when not in use.
- Instant-on television sets, especially the tube types, use energy even when the screen is dark. To eliminate this waste, plug the set into an outlet that is controlled by a wall switch. Turn the set on and off with the switch. Or ask your TV serviceman to install an additional on-off switch on the set itself or in the cord to the outlet.

Do as much household cleaning as possible with cold water. This saves energy used to heat water (and some cleaning products work better in cold water). If you have a fireplace, be sure the damper is closed except when the fire is going, otherwise heated or cooled air goes wastefully up the chimney.

HOT WEATHER ENERGY SAVERS

Some special summer, or warm climate saving tips:
Set air-conditioning thermostats no lower than 78 degrees! The 78 degree temperature is judged to be reasonably comfortable and energy efficient. One authority estimates that if this setting raises the temperature 6 degrees (78 degrees vs 72 degrees)

home cooling costs should drop about 47 percent. (The Federal Government is enforcing a strict 78-80 degree temperature in all its buildings during the summer.)

If everyone raised cooling thermostats 6 degrees during the summer, the Nation would save more than the equivalent of 36 billion kilowatt hours of electricity, or 2 percent of the Nation's total electricity consumption for a year.

- ☐ Run air conditioners only on really hot days and set the fan speed at high. In very humid weather, set the fan at low speed to provide less cooling but more moisture removal.
- ☐ Clean or replace air conditioner filters at least once a month. Turning the fan requires more electricity when the filter is dirty.
- ☐ If you can confine your living spaces to fewer rooms, close off the rooms that will not be occupied.
- ☐ If rooms are to be unoccupied for several hours, turn off the air-conditioning temporarily.
- ☐ Buy the cooling equipment with the smallest capacity to do the job. More cooling power than necessary is inefficient and expensive. Energy-efficiency ratios (EERs) for most air-conditioning units should be available from dealers, and some window units are labeled to show the EER (the higher the EER, the more efficient the air-conditioner). If you don't see a label in the showroom, ask for the information.

ADDITIONAL HOT WEATHER ENERGY SAVERS

- ☐ Deflect daytime sun with vertical louvers or awnings on windows, or draw draperies and shades in sunny windows. Keep windows and outside doors closed during the hottest hours of the day.

- ☐ Keep the lights low or off. Electric lights generate heat and add to the load on the air-conditioning equipment.
- ☐ Use vents and exhaust fans to pull heat and moisture from attics, kitchens, and laundries directly to the outside.
- ☐ Do as much cooking as possible, and use heat-generating equipment, in the early morning and late evening hours.
- ☐ On cooler days and during cooler hours, open the windows instead of using air-conditioner or electric fans.
- ☐ Turn off the furnace pilot light. But be sure it is re-ignited before you turn the furnace on again.
- ☐ Dress for the higher temperatures. Neat but casual clothes of lightweight fabrics are most comfortable for men and women and are acceptable almost everywhere during the summer.

COLD WEATHER ENERGY SAVERS

To save on heating energy and heating costs:

- ☐ **Lower thermostats to 68 degrees during the day and 60 degrees at night.** If these settings reduce the temperature an average of 6 degrees, heating costs should run about 15 percent less.

  If every household in the United States lowered heating temperatures 6 degrees, the demand for fuel would drop by more than 570,000 barrels of oil per day (enough to heat over 9 million homes during the winter season).
- ☐ Setting nighttime temperatures back can reduce heating costs significantly. Consider the advantages of a clock thermostat which will automatically turn the heat down at a regular hour before you retire and

turn it up just before you wake.

- **Have your furnace serviced once a year, preferably each fall.** Adjustment could mean a saving of 10 percent in family fuel consumption.
- When buying a new furnace, select one that incorporates an automatic flue gas damper, a device which reduces loss of heat when the furnace is not in operation.
- If you use electric heating, consider a "heat pump" system. The heat pump uses outside air in both heating and cooling and can cut the use of electricity for heating by 60 percent or more.

IN AND AROUND THE HOME

ADDITIONAL COLD WEATHER ENERGY SAVERS

- ☐ Clean or replace the filter in forced-air heating systems every month.
- ☐ Dust or vacuum radiator surfaces frequently.
- ☐ Keep draperies and shades open in sunny windows; close them at night.
- ☐ For comfort in cooler indoor temperatures use the best insulation of all—warm clothing.

KITCHEN, LAUNDRY AND BATH—
Centers for hot water and electricity savings

Heating water is second only to heating and cooling residences in energy consumption. It accounts for 15 percent of the energy used in the home and 3 percent of all the energy used in the United States. Sensible use of hot water, along with conservative use of electricity, is the basis for the following tips:

In the kitchen...

☐ **Be sure the dishwasher is full, but not overloaded, before you turn it on.** An average dishwasher uses 14 gallons of hot water per load.

If every dishwasher user in the country cut out just one load a week, the country could save the equivalent of about 9,000 barrels of oil each day (enough to heat 140,000 homes in winter).

☐ Scrape dishes before loading them in the washer. Rinsing is seldom necessary, but when it is, use cold water.

☐ Let your dishes air dry. After the final rinse, turn off the control knob of the dishwasher and open the door.

☐ **Use proper defrosting methods for manual refrigerator/freezers.** These appliances consume less energy than those that defrost automatically, but they must be defrosted frequently and as quickly as possible to maintain that edge. Frost should never be allowed to build up to more than one-quarter of an inch.

☐ Most refrigerators have heating elements in their walls to prevent condensation on the outside. These heaters need only be turned on when the air is extremely humid. When buying such a refrigerator,

be sure it has a switch to turn off the heaters. Better yet, buy one without heaters.

- ☐ During holidays or other extended absences from home, empty the refrigerator, disconnect it from the power outlet, clean thoroughly, and leave the door ajar.
- ☐ Check seals around the refrigerator and oven doors to make sure they are airtight. If not, adjust the latch or replace the seal.
- ☐ **Reduce energy consumption in cooking.** Use flat bottom pans that cover the burner heating element. More heat enters the pot and less is lost to the surrounding air.
- ☐ Clean heat reflector below the stove heating element —it will reflect the heat better.
- ☐ Pressure cookers save energy by reducing cooking time.
- ☐ When using the oven, make the most of the heat from that single source. Plan all-oven-cooked meals, or fill the oven with other foods that can be used at a later time with a bit of heating. Use small heaters, or small ovens, for small meals.

In the laundry...

- ☐ **Wash clothes in warm or cold water, rinse in cold.** You'll save energy and money. Use hot water only if absolutely necessary.

  If everyone washed clothes in warm or cold water, national fuel savings would amount to the equivalent of about 100,000 barrels of oil a day. That is, 2½ percent of the total demand for residential heating (enough to heat 1.6 million homes in winter).
- ☐ **Fill clothes washers (unless they have small-load attachments or variable water levels) and dryers, but do not overload them.**

If every household cut the use of clothes washers and dryers by 25 percent, the Nation would save the equivalent of 35,000 barrels of oil per day (enough to heat over 400 billion gallons of water a day).

- ☐ Remove clothes from the dryer as soon as they are dry. Extra running time is pure waste.
- ☐ Separate drying loads into heavy and lightweight items. Since the lighter ones take less drying time, the dryer doesn't have to be on as long for these loads.
- ☐ Dry your clothes in consecutive loads. The energy used to bring the dryer up to the desired temperature shouldn't be allowed to go to waste.
- ☐ Keep the lint screen in the dryer clean by removing lint after each load.

In the bath...

- ☐ Take more showers than tub baths. Showers use less hot water, hence less energy than tub baths.
- ☐ Consider installing a flow restrictor in the pipe at the showerhead to restrict the flow of water to an adequate 4 gallons per minute. This is easy to do and can save considerable amounts of hot water and the energy used to produce it. The showerhead should unscrew easily, and flow restrictors are available at most plumbing supply stores. In areas where the water pressure remains fairly constant, a washer with a small hole inserted in the pipe should serve nicely.

THE WORKSHOP, THE YARD, THE GARDEN

- ☐ Maintain electrical tools in top operating shape, clean and properly lubricated.

IN AND AROUND THE HOME

- ☐ Keep cutting edges sharp. A sharp bit or saw cuts more quickly and therefore uses less power. Oil on bits and saws also reduces power required.
- ☐ Buy the power tool with the lowest horsepower adequate for the work you want it to do.
- ☐ Remember to turn off shop lights, soldering irons, gluepots, and all bench heating devices right after use.
- ☐ Use hand tools, hand lawn mowers, pruners, and clippers whenever possible.
- ☐ When using gasoline-powered yard equipment, do not allow it to idle for long periods. Turn off and restart when ready to resume work.
- ☐ Plant deciduous trees and vines on south and west sides of homes to provide protective shade against summer sun.
- ☐ Use manure, or a natural compost from your own yard cuttings, for fertilizer. Petroleum and natural gas generally are used as raw materials (and for fuel) in the manufacture of artificial fertilizers.

HOME-PLANNING—Where energy-wasting mistakes can be avoided

When designing a new house, consider the climate and check local authorities on building codes.

- ☐ A recommended energy-efficient ratio for window areas is no more than 10 percent of the floor area. In cool climates, install fewer windows in the north wall where no solar heating gain can be achieved in winter. In warm climates, put the largest number of windows in the north and east walls to reduce the heating gain from the sun.
- ☐ Install windows you can open, so that you can use natural ventilation in moderate weather.

- ☐ Use double-pane glass throughout the house. Windows with double-pane heat-reflecting or heat-absorbing glass in south and west windows provide additional energy savings.
- ☐ Insulate walls and roof to the highest specifications recommended for your area, but provide a minimum of 6 inches in the attic and 3 inches in the walls. Insulate floors, too, especially those over cold basements and garages.
- ☐ When buying a new water heater, select one with thick insulation on the shell. Avoid purchasing a tank with greater capacity than needed. Have the dealer advise you on the size suitable for the number of people in your family.
- ☐ Install water heater as close as possible to areas of major use to minimize heat loss through the pipes; insulate pipes.
- ☐ Install louvered panels or wind-powered roof ventilators rather than motor-driven fans to ventilate the attic.
- ☐ If the base of a house—especially a mobile home—is exposed, build a "skirt" around it.

WHEN BUYING A HOUSE

- ☐ Select light colored roofing in warm climates.
- ☐ Ask for a description of the insulation and data on the efficiency of space heating, air-conditioning and water heating plants, or have an independent engineer advise you about the efficiency of the equipment provided. It is a good idea to ask to see the heating bills for the previous year, but remember to adjust for current rates and costs.

☐ Consider the need for additional insulation or replacement of equipment. If improvements are necessary, you may want to seek an adjustment in the purchase price to cover all, or a reasonable share, of the costs.

USING THE FAMILY CAR

There are more than 100 million registered automobiles in the U.S. A typical car, with an average fuel economy of less than 13.7 miles-per-gallon, travels about 10,000 miles each year—and consumes well over 700 gallons of gasoline.

Altogether, these automobiles consume some 70 trillion gallons of gasoline each year—or about 14 percent of all the energy used in the United States, almost three-quarters of all gasoline used and 28 percent of all petroleum.

The importance of individual gasoline savings cannot be over emphasized. If, for example, the fuel consumption of the average car were reduced just 15 percent through fewer daily trips, better driving practices, and better maintenance, the nation's consumption of petroleum would fall by over 680,000 barrels per day, or about 4 percent of demand.

These individual savings may be accomplished through a combination of the following:

DRIVE LESS

☐ **Join a carpool.** About one-third of all private automobile mileage is for commuting to and from work.

If the average passenger load (1.3 people per commuter car) were increased by just one person, each individual's out-of-pocket expenses for commuting would be cut, and the nationwide gasoline savings would be more than 700,000 barrels per day (enough for some 67,000 cars to drive from San Francisco to New York City and back).

☐ **Eliminate unnecessary trips.** Take one less short trip a week. Do several errands in one trip, combine

your trips with those of friends and neighbors.

If every automobile consumed just one less gallon of gasoline a week (an average of about 13 miles of driving) the Nation would save about 5.2 billion gallons a year, or about 7 percent of the total passenger car demand for gasoline.

USING THE FAMILY CAR

EMPLOY ENERGY-EFFICIENT DRIVING PRACTICES

The driving technique of the individual behind the wheel is the most important single element in determining the fuel economy of any car. One authority insists a careful driver can get at least 30 percent more mileage than the average driver, and 50 percent more than the wasteful one.

- ☐ **Drive at moderate speeds.** Most automobiles get about 21 percent more miles per gallon on the highway at 55 miles per hour than they do at 70 mph.
- ☐ Accelerate smoothly—save engines, tires, and gasoline.
- ☐ Drive at a steady pace—avoid stop and go traffic.
- ☐ Minimize braking—anticipate speed changes. Take your foot off the accelerator as soon as you see a red light ahead.
- ☐ Do not let the motor idle for more than a minute. Turn off the engine. It takes less gasoline to restart the car than it takes to let it idle. Generally, there is no need to press the accelerator down to restart a warm engine.
- ☐ Do not let the gas station attendant overfill your tank. Tell him to remove the hose when the automatic valve closes. This will eliminate any chance of spillage.

KEEP YOUR CAR IN PRIME CONDITION

Good car maintenance and care in the choice of accessories can mean fuel economy and dollars saved.

- ☐ **Have your car tuned as recommended by the manufacturer.** Regular tune-ups can save you as much as 10 percent on gasoline costs.

For the Nation, this could mean savings of about 140,000 barrels of gasoline per day... 3 percent of total demand for passenger cars.

- ☐ Keep the engine air filter clean. An air-starved engine wastes gasoline.
- ☐ Use the octane-gasoline and oil grade recommended for your car.
- ☐ Check tire pressures regularly. Under-inflated tires increase gas consumption.
- ☐ Consider steel-belted radials when you buy new tires. They give better mileage and last longer. But never mix radials with conventional tires.
- ☐ Remove unnecessary weight from the car. The lighter the car, the less gas it uses.

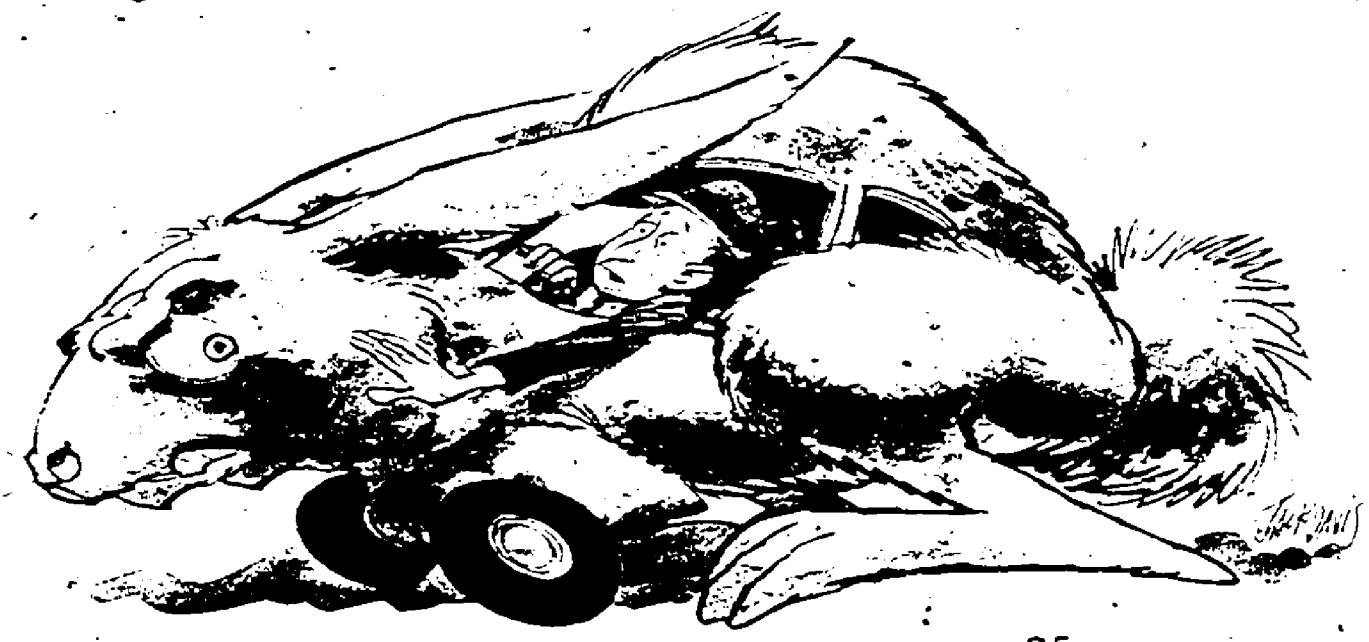
CHOOSE ACCESSORIES WISELY

USING THE FAMILY CAR

- ☐ Don't buy a car air-conditioner unless you really need it.
- ☐ If you have a car air-conditioner, use it sparingly. The cooling equipment reduces fuel economy an average of 10 percent—almost 20 percent in stop-and-go traffic.
- ☐ Purchase only the optional equipment and accessories you really need. Items like air-conditioning, automatic transmission, and power steering require considerable energy, all of which is derived from burning gasoline. Other equipment such as power brakes, electric motor-driven windows, seats, and radio antennas require less energy for their operation—however, all accessories add to the vehicle weight, and this reduces fuel economy.

STUDY THE MARKET BEFORE YOU BUY A NEW CAR

Ask your dealer, or write to Fuel Economy, Pueblo, Colo. 81009 for a free copy of the "*EPA/FEA 1975 Gas Mileage Guide for New Car Buyers.*" Study the fuel



economy figures and tables comparing specifications. Review mileage test results published by Consumers Union and motor industry magazines. Generally the best fuel economy is associated with low vehicle weight, small engines, manual transmission, low axle ratio, and low frontal area (the width of the car times its height).

- ☐ Buy the most energy efficient car of the size and model you want—on the basis of the combination of purchase price and estimated fuel costs for as long as you plan to keep it.

VACATIONING

- ☐ Vacation closer to home this year. Discover nearby attractions.
- ☐ A nearby hotel or campground can often provide as complete and happy a change from routine as one that is hundreds of miles away. Plan to stay in one place instead of "hopping" around.
- ☐ When you travel, take a train or a bus instead of the family car.
- ☐ During your holiday rediscover the pleasures of walking, hiking, and bicycling—the most energy-conserving means of transportation, and the healthiest for most people.

ENERGY-WISE BUYING PRACTICES

IN THE MARKETPLACE

- ☐ Whenever possible, buy products made of recycled materials or those which offer opportunities for recycling, such as steel, aluminum, paper, and glass, among others. More energy is used in production of products from virgin materials than from recycled or reclaimed materials. For example, producing steel from scrap requires one-fourth less energy than using virgin ores. To make a product from recycled aluminum requires about one-twentieth of the energy needed for the same product made from the ore.
- ☐ When you buy fabrics or garments, try to choose those that require little or no ironing.
- ☐ Try to buy products that will last. More durable products save energy that would be required for their replacement.
- ☐ Purchase equipment such as automobiles, appliances, pumps, fans, compressors, and boilers, on the basis of initial cost *and* operating costs rather than on the basis of purchase price alone. Often products that are more expensive initially but are energy-efficient will cost less over a period of years than lower-priced products that consume more energy.
- ☐ **Ask for information about the energy efficiency of the products you buy.** Under a voluntary labeling program, some motor vehicles and appliances bear labels, developed by the Federal Government, showing their energy consumption. Ask for comparative information if a label does not yet appear on the product you want to buy.

UNDERSTANDING ENERGY—a brief glossary

Chemical energy.
Energy stored in molecules, such as in fossil fuels.

Crude oil or "crude".
Petroleum in its natural state.

Electricity.
Energy derived from electrons in motion. Electrical energy can be generated by friction, induction, or chemical change.

Energy.
The capacity to perform work.

Fossil fuels.
Fuels derived from the remains of carbonaceous fossils, including petroleum; natural gas; coal; oil shale (a fine-grained laminated sedimentary rock that contains an oil-yielding material called kerogen); and tar sands.

Geothermal energy.
Energy extracted from the heat of the earth's interior.

Hydropower energy.
Energy created by falling or moving water.

Kinetic energy.
Energy possessed by objects in motion.

Nuclear energy.
Energy, largely in the form of heat, produced during nuclear chain reaction. This thermal energy can be transformed into electrical energy (see "Power").

Potential energy.
Energy that is stored in matter because of its position or because of the arrangements of its parts. Examples include the tension of a spring, water stored behind a dam, or chemical energy such as that contained in fuel.

Power.
The capacity to exert energy, usually the rate at which work is done. Power commonly is measured in units such as horsepower or kilowatts. Most bulk electric power is generated in this country by converting chemical energy to thermal, then mechanical, then electrical energy in steam, gas turbine or large diesel power plants, all requiring coal or petroleum resources. A lesser amount is generated by nuclear power.

Solar energy.
Energy radiated directly from the sun.

Thermal energy.
A form of energy whose effect (heat) is produced by accelerated vibration of molecules.

Wind energy.
Energy derived from the wind.

ENERGY CONSUMPTION IN THE UNITED STATES

This nation uses more energy per capita than any other nation in the world. Although we have only about 6 percent of the world's population, we use 35 percent of all the energy consumed in the world.

In statistical terms, we now are using about 77 quadrillion British thermal units (Btu's) of energy per year, derived from coal, oil, natural gas, water and nuclear energy. (This is about the equivalent of 35 million barrels, or 1,470 million gallons, of oil each day.) In recent years, we have produced about 85 percent of our needs, and imported the rest, mainly petroleum.

Our most vulnerable energy source is petroleum. We normally consume about 18 million barrels (756 million gallons) per day. Of this, we produce domestically only about 12 million barrels a day, leaving 6 million barrels a day which must be imported, or done without.

ENERGY MEASUREMENTS

Specific forms of energy are measured in many diverse terms—barrels of oil (42 gallons), therms and cubic feet (natural gas), kilowatts (electricity), tons (coal), and the standard measurement of energy content, British thermal units (Btu's).

Because oil is one of our most common sources of energy, many persons prefer to convert all energy figures to equivalent "barrels of oil per day," particularly when talking about fossil fuels.

FOLLOWING ARE THE MOST OFTEN USED ENERGY MEASUREMENTS:

barrels (bbls)
1 barrel equals 42 gallons.

British thermal unit (Btu)
The energy required to increase the temperature of one pound of water by one degree Fahrenheit.

Watt
The amount of power available from an electric current of 1 ampere (Amp) at a potential of 1 volt.

Kilowatt (kW)
1,000 watts. One kilowatt is the equivalent of about 1⅓ horsepower.

Kilowatt-hour (kWh)
1,000 watt-hours. A unit of electrical energy equal to the energy delivered by the flow of one kilowatt of electrical power for one hour. (A 100-watt bulb burning for 10 hours will consume one kilowatt-hour of energy, or enough to lift a 150-pound person 20,000 feet into the air.) One barrel of oil equals 500 kWh.

Megawatt (Mw)
One million watts, or 1,000 kilowatts.

Mcf
1,000 cubic feet (of natural gas).

therm
A unit of heat equal to 100,000 Btu's.

Frequently energy measurements are expressed in millions, billions, and quadrillions of units, requiring the use of many zeros. A numerical shorthand formula has been devised which indicates multiples of 10. For example, 10^3 represents 10x10x10, or 1,000. 10^6 equals 10x10x10x10x10x10, or 1,000,000. 10^9 equals 1,000,000,000 (1 billion).

Energy units translated into Btu's

1 kilowatt-hour =
3,413 Btu's.

1 ton of coal =
25,000,000 Btu's.

1 bbl crude oil =
5,800,000 Btu's.

1 gallon of gasoline =
125,000 Btu's.

1 gallon of No. 2 fuel oil =
140,000 Btu's.

1 cubic foot of natural gas =
1,031 Btu's.

1 Mcf natural gas =
1,031,000 Btu's.

1 therm of gas (or other fuel) =
100,000 Btu's.

THE ETHICS OF ENERGY CONSERVATION

Most observers view energy conservation as a helpmate to environmental quality. Usually the two go hand-in-hand. It has been extravagant use of energy that has pushed man toward heavy exploitation of his natural resources. Domestic oil shortages are forcing us to turn more to coal as an energy source. Eventually, research will almost certainly lead to development of cleaner ways to mine and burn coal. Research also will lead to greater utilization of energy sources such as geothermal power, solar energy, and others not yet in widespread use and will be both economically and environmentally acceptable. Development of more efficient gasoline engines, improved insulation of buildings, and new industrial processes will enable us to maintain our standard of living with lower energy expenditure. Less energy growth means important environmental savings. Truly, a barrel saved is worth *more* than a barrel found.

"Nature never gives anything away.
Everything is sold at a price.
It is only in the ideals of abstraction
that choice comes without consequence."
—Ralph Waldo Emerson