

Newsletter



Washington State Energy Office

June 1979

Volume 2/Number 2

The Need To Reduce U.S. Petroleum Use

The U.S. has entered into a commitment with the International Energy Agency (IEA) to reduce petroleum consumption by up to 5 percent as its contribution to offset the world's shortfall brought about by reduced oil production in Iran. The 20 member countries of the IEA entered into this joint agreement to prevent shortfalls and to stabilize the world oil market and reduce pressures for premium oil prices. The U.S. obligation under this agreement is to reduce demand for oil imports by up to 1 million barrels per day (MMB/D) by the end of 1979. The President set forth the specific measures to meet that commitment in his speech of April 5, 1979.

Since December, world oil reductions from the termination of Iranian exports have resulted in a total shortfall of about 200 million barrels (MMB). Although Iran has now resumed oil exports at less than 3.2 MMB/D, its foreign sales are more than 1.8 MMB/D below its export level in 1978. Conditions in Iran remain uncertain, and it would not be prudent to depend heavily on continued exports from Iran at even the current low level.

As Iran's oil exports ended last December, other major exporting countries increased production to offset about 3 MMB/D of the 5 MMB/D shortfall. Continuation of this higher level of production cannot be relied upon. Saudi Arabia and other Arab producers, which contributed most of the surge production, have indicated an intent to cut back production as Iranian exports resume, and Saudi Arabia is in the process of cutting

back production by about 1 MMB/D. Reduced production will keep supplies tight and support the higher price levels announced by OPEC on March 27, particularly high premiums for light crudes.

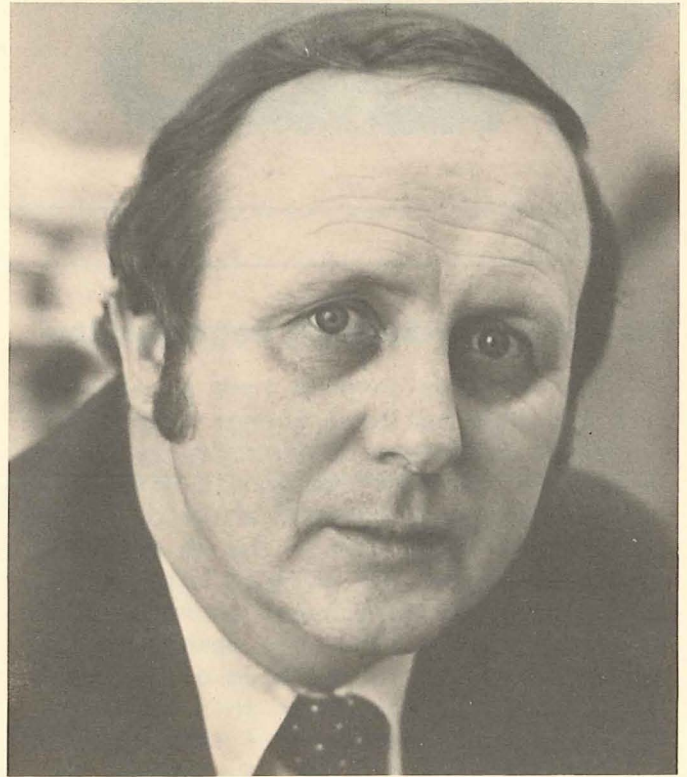
The IEA commitment will ease the interim oil supply problem faced by the U.S. as a result of the reduced oil production by Iran. Imports to the U.S. in the first quarter were about 700,000 barrels per day (B/D) less than needed to maintain stocks at desired levels. The loss of crude oil imports resulted in reduced refinery output; refinery utilization rates have dropped from 91 percent last December to 88 percent in January, 84.5 percent in February, and 83.5 percent in March. The shortfalls in refinery output and imports have required excess use of petroleum stocks to meet demand. As a result, industry oil stocks are about 70 million barrels (MMB) below projected normal levels.

Distillate fuel oil stocks are at an unacceptably low level, and it is critical that these stocks be rebuilt to safe levels before the next heating season. Gasoline stocks also have been drawn down faster than desired and are now below projected normal levels going into the summer peak demand period. Unless petroleum demand is restrained, heating oil stocks would not be built to safe levels by next fall. If distillate fuel oil demand is not reduced, fuel oil stock for next winter must be built by reducing gasoline production. If demand for gasoline stays at current high levels (4.5

percent above the 1978 demand) there would be substantial shortfalls before the summer is over. The shortfall of gasoline would be due to the reduced stocks and the reduced refinery throughput, as well as the heavier crude oil substituted for Iranian oil, which reduces gasoline production capability.

A failure to reduce world oil consumption will result in further increases in foreign oil prices as refiners bid for the limited supplies. "Premium" prices for foreign oil may be bid significantly above the new high base price established by OPEC. Effective action by the IEA member countries to reduce consumption will help to stabilize market conditions and discourage further price increases.

Washington State shares the petroleum fuel shortage with the rest of the nation. The major strategies available to the state to combat this problem are: maximizing wise and efficient use of energy; adding new domestic energy supplies from all practical resources; shifting from oil to other domestic energy sources where practical; and adding to available domestic resources through new, particularly renewable, resource development. Presently the Washington State Energy Office administers a small amount of petroleum fuels under the State Set-Aside program to meet hardships and emergency needs for fuel. The office is also developing a motor gasoline contingency plan for implementation during severe energy shortfalls.



Editor's Note: In this issue of the newsletter, we would like to introduce the new director of the Washington State Energy Office. Jack O. Wood was appointed by the Governor and confirmed by the Senate on April 25, 1979. Mr. Wood has been a resident of the state for 13 years with a background in mechanical engineering and the energy distribution industry.

As I enter government service as Energy Office Director I find myself most concerned with the threat the petroleum fuel shortage poses to the economic well-being of the State of Washington. The current situation is only one of a series of shortages occurring over the past few years, and may be indicative of annual occurrences.

There are several factors contributing to the current petroleum fuel shortfall. First, fuel demand is growing faster than supply. Second, a diminished world crude oil supply and a limited capability to refine Alaskan high sulfur crude on the West Coast limit our ability to satisfy a

Energy Programs

growing demand for gasoline and distillate fuels. The inability of the federal government to adequately deal with this situation does not encourage me to expect any near-term solutions.

The Energy Office has responded to the current fuel shortage by expanding its capability to distribute petroleum fuels to most hardship and emergency needs within the state through the State Set-Aside program. The State Set-Aside fuel supply is not sufficient to overcome a statewide petroleum fuel shortage, which therefore means that it must be equitably and wisely administered.

The most critical fuel shortage problems appear to be centering around the availability of middle distillates, particularly diesel. The Energy Office is presently compiling a data base for diesel requirements within the state in order to identify potential problem areas and to estimate shortfall impacts. The U.S. DOE has enacted an Emergency Rule 9 to supply agricultural needs (farming, fishing, and logging) at 100 percent of need. This ruling helps those interests to continue functioning. The Office is working closely with the federal Department of Energy and the petroleum industry to increase the accuracy and useability of these data. A planned expansion of this data base will include detailed supply and demand figures for the winter heating season. We are also expanding our present data base for motor gasoline to further assess impacts related to fluctuations in supply and demand. The combined gasoline-diesel data inventory will be utilized as a basis for providing data and recommendations to the Governor, the Legislature, local government, the U.S. Dept. of Energy and others.

State Set-Aside

As petroleum supplies run short during the spring of 1979, activity has increased in the State Set-Aside program administered by the Washington State Energy Office. The Set-Aside program was established by the Emergency Petroleum Allocation Act of 1973. State Set-Asides for middle distillates, residual fuel oil, motor gasoline, and propane were provided.

The Washington State Energy Office utilizes the set-aside supplies to meet hardship and emergency requirements within the state. The set-aside amounts to 3 percent of all motor gasoline and 4 percent of all middle distillates available for sale and use within the state. Monthly amounts vary, but the state usually controls about 8-8.5 million gallons of gasoline and slightly less for diesel fuel and heating oil.

Businesses, industries, and individual consumers experiencing temporary and emergency hardships are eligible to receive set-aside fuels. When the Energy Office receives an application for emergency fuel, that application is investigated and evaluated and an order is issued denying or granting the fuel. The decision may be appealed.

Priority fuel uses have been established by the federal government. These priority uses are entitled to allocation levels ranging from 100 percent of current needs to a limitation to the amount of fuel used during a prior year. Priorities differ for various petroleum fuels.

The Energy Office noted an upswing in the State Set-Aside activity when world oil supply grew tight as a result of the curtailment of Iranian oil production. In January, one major oil company was allocating supplies based on last year's use. By March and April, all the major Washington State suppliers were in the same condition. Each major marketer supplies over 10 million gallons of fuel within the state. The state Set-Aside

supplies are sufficient to meet the temporary and emergency hardship needs within the state but are not sufficient to overcome an acute statewide shortage. For more information contact Phil Wiatrak/Washington State Energy Office/(206)754-1377.

Curtailment Planning Status

The people of the State of Washington have faced the threat of energy shortfalls of electricity and petroleum products in the first few months of 1979. The unseasonably cold and dry weather in December and January coupled with increased demand strained the region's electrical system to its limits. Internal strife in a foreign oil exporting country has lowered world oil production which has been felt here in Washington State with an ever tightening oil situation since January. The Energy Office is well on the way to providing a way for the state to deal with these energy shortage problems.

Draft plans for the curtailment of electricity and motor gasoline have been developed in the past two months. The draft electrical curtailment plan was circulated to over 170 reviewers during March. The deadline for comments was April 9, 1979. The response has been encouraging and the comments received constructive.

A preliminary draft of a gasoline contingency plan has been prepared and has been circulated for comment. The plan provides for the continued operation of the State Set-Aside program; eventual utilization if necessary, of the odd-even license plate, carpooling and strict enforcement of the 55 MPH speed limit.

These plans when completed will enable the state to better respond to energy emergencies resulting from electricity or gasoline shortfalls. It is the policy of the State of Washington that in energy emergency shortage situations, energy requirements to maintain the public health, safety, and welfare shall be given

priority in the allocation of energy resources, and citizens and industry shall be assisted in adjusting to the limited availability of energy in order to minimize adverse impacts on their physical, social, and economic well being. For more information on curtailment planning contact Ed McGuire/Washington State Energy Office/(206) 754-1367.

Energy Saving Program for Schools & Hospitals

Washington's schools and hospitals will soon be able to participate in an energy grant program. The program, which also makes provisions for local government and public care facilities, is contained within the National Energy Conservation Policy Act (NECPA) of 1978. State Energy Offices are designated in the legislation as the coordinating and administrative agencies for the program. The intent of the program is to make funds available for identification of energy saving improvements in a structure and to fund retrofit measures to deal with those needs.

The program is broken into two phases, with each phase containing two activities. The entire program will be conducted on a voluntary basis.

Phase I involves Preliminary Energy Audits (PEA) and Energy Audits (EA). The PEA activity involves the distribution of forms to gather basic information about the eligible buildings. Information requested at this stage includes prior energy consumption data, a general building description and facility energy use patterns.

This activity performs two fundamental functions. First, it completes the survey of buildings as required by the rules and regulations for this Act, and second, it provides the basic information needed to complete the Energy Audit.

The second activity, the Energy Audit, entails an on-site visit to the buildings to gather what is called an "energy profile." This profile indicates a basic description of the amount of energy used, where it is used, and how it is used. Also incorporated in the EA is an evaluation of the building envelope and its thermal efficiency as well as an evaluation of the operation and maintenance procedures. The Energy Audits will in most cases be performed by institutional personnel who receive special training through the Washington State Energy Office (WSEO).

The aforementioned services will be made available to all eligible facilities. Participation in the second phase of the program is optional and will be entirely initiated by the institutions themselves.

The first activity of the second phase is called the Technical Assistance Program (TA). This involves the institution making application to the WSEO to hire an engineer or firm to perform a detailed analysis of the building. The analysis will be more thorough than the EA and may entail actual design work for retrofit projects. The WSEO will develop a state plan including criteria for prioritizing the Technical Assistance Grant requests. The Energy Office recommendations will be forwarded to the U.S. Department of Energy for direct funding.

The final activity of the program involves a grant application to the WSEO for funding to do the actual retrofit work. This activity is known as Energy Conservation Measures (ECM). The application procedure is anticipated to be the same as that used in the TA activity. All applications will first be ranked by the WSEO and then be forwarded to the U.S. Department of Energy with our recom-

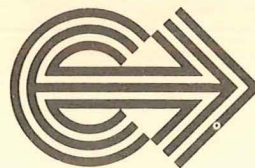
mendations. The Department of Energy will make the final grant award determination. Grant applications will be forwarded on an annual basis. The Department of Energy will make the grant awards directly to the institution. Only schools and hospitals will be eligible for these federal grants.

Funding for this three year program is authorized at over \$900,000,000 nationwide. Based on the present funding formula as prescribed by the Department of Energy, Washington will receive approximately \$12 million over the next three years. This amount will pay up to one-half of the costs of the two phases. The balance of the costs will be borne by the participating institutions. In kind services will qualify for the grant match in phase one.

While accurate potential energy savings data is not possible for each institutional category (schools, hospitals, local governments, health care institutions), the state's pilot public school energy audit program indicated there would be a 12% savings possible from operations and maintenance improvements for the average elementary school and annual financial savings of \$1,449.

For more information on this grant program contact Jake Fey/Washington State Energy Office/(206) 754-1374.

Washington Energy Extension Service



The role of the Washington State Energy Office (WSEO) in the administration of the the Energy Extension Service (EES) program has been a supportive one and has given a focus to the direction of the program. The WSEO established an EES advisory committee to review and make programmatic recommendations. The WSEO also performed a monitoring function which

includes periodic field visits in conjunction with the site visits conducted by the Department of Energy (DOE). The WSEO has developed a set of recommendations for the future of the EES program in terms of the overall WSEO conservation effort. The EES program can be thought of as a support system and a natural information conduit to the communities. The conservation programs must have a way of translating pertinent information to the citizens of the state and a statewide EES program will help accomplish that objective. As the WSEO develops the statewide EES program, an evaluation system will be designed which will allow the WSEO to measure BTU savings as a result of the conservation programs. These savings will have a positive effect on our general energy savings.

The Energy Extension Service was conceived by the Department of Energy in 1977 to provide a community based outreach effort in energy conservation. The concept included a personalized approach to residential and small business energy users encouraging energy conservation and dollar savings.

The program was established as a pilot demonstration in ten states of which Washington was one. The central thrust of the Washington State Energy Extension Service was to develop and conduct workshops on a variety of energy savings techniques and establish a practical approach to getting the information into the community.

The program also developed information for dissemination into the community via the media and public service announcements. There was a technical support function which developed the technical information for transfer to the community on a request basis. The EES program has been demonstrated in three target areas of the state--Spokane, Yakima, and Seattle.

The Spokane program originally attempted to conduct home energy audits with weatherization projects as a follow-up

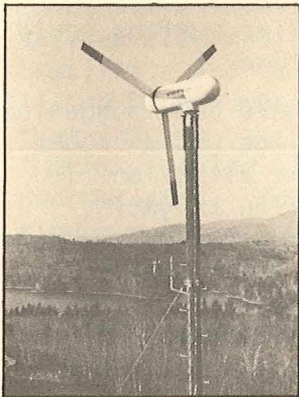
effort. The primary finding after six months indicated that while consumers were interested in saving money there were not enough incentives to do major weatherization projects. The home energy audits were popular, but the follow-up on the part of the consumer was not significant. The emphasis of the program has shifted to workshops on a variety of issues such as alternative fuels, building solar greenhouses, solar hot water heaters, earth berm housing, and weatherization techniques. The Seattle program has maintained a high level of success throughout the demonstration primarily because the target audiences were concentrated in two neighborhoods and the interest was generated by a media saturation which was kept constant.

Recently, a national evaluation was conducted of the ten EES pilot state programs. The general conclusions indicated that while the program was costly due to the long developmental time frame, it was worthwhile because there was no other similar effort which would reach the residential and small business consumer. The most positive way to generate interest in energy conservation was found to be on a one to one basis--a grass roots approach. The success of the program can be directly attributed to the management of the programs and the amount of community involvement. The more successful programs carried their own credibility due to substantial community involvement and governmental support.

Based on the results of Congressional deliberation, it is hopeful that the EES program will go nationwide and the lessons learned will be translated into positive use by the non-pilot states as they develop their programs. For Washington State, an expanded program would be developed for the whole state. Communities could develop their particular conservation programs based on resources and need, building on the current experiences of the EES pilot program. The decision on a national level of funding

will determine the extent to which a statewide program can be developed and we can only be optimistic about the future. Energy conservation and management is a real issue that must become part of our lifestyle. It will require changes which we all must be willing to make to ensure adequate energy for future generations.

Wind Conference



Small Wind Energy Conversion Systems (SWECS) have joined a list of alternative energy technologies that are ready for commercialization. This announcement was made by the federal Department of Energy at a conference in Rocky Flats, Colorado on the 28th of February.

Rocky Flats is a test site in Colorado well-suited to its name and purpose. On a barren plateau at the site, 30 towers are erected, ten of which support small wind machines. The Department of Energy records output from these small machines and monitors their performance in wind conditions sometimes approaching gales of 150 mph. The winds are funneled down a mountain canyon directly towards the test site. Amazingly, most of the Small Wind Energy Conversion Systems (SWECS) and all of the test towers have withstood the strong winds at the test site. Records of how the machines operate in various wind conditions are expected to be widely used for marketing SWECS.

DOE is sponsoring other research work in the development of SWECS to meet specific market needs. There are three contractors presently designing "high reliability" SWECS. These machines must produce 1 to 2 KW of power and be able to survive conditions of 165 mph gusts, -70°F temperatures and have a life-span of 10 years between failures.

Less stringent design criteria are being used by four different companies developing 8 KW wind machines and two companies designing 40 KW systems. All of the above systems, including large vertical axis turbines (VART's), were described in detail at the conference.

DOE has announced that it will soon purchase 125 SWECS to install all across the country as part of its field evaluation program. SWECS will be matched to suitable wind areas and load conditions. Each state is expected to have a couple of machines from the program, so that it will be a widespread field evaluation.

Of major concern to DOE is how to interconnect SWECS with utility transmission lines. Because there is very limited experience using wind turbines as part of a utility system, there was much discussion at the conference of the dangers of having an independent power source on a transmission line, and the problems that may arise in the day-to-day handling of utility loads if SWECS are used in significant numbers.

Other barriers to using wind energy were also discussed such as financial issues and product liability. More special studies and information dissemination programs are being planned. Battelle Pacific Northwest Laboratory in Richland, Washington, is planning a conference on siting wind systems. Several more wind conferences are scheduled this spring and summer. If you are interested in information on wind energy contact Mary Anderson/Washington State Energy Office/(206) 754-1370.

Municipal Waste / Steam Generation

The potential exists in Washington State to generate new energy equivalent to 75.3 million gallons of oil in 1979 and even more in the future by converting unsorted municipal waste into steam. In addition to the advantage of generating new energy municipal waste-steam generation eases landfill site problems, meets EPA clean air standards, is an attractive investment that pays for itself, and is within existing technology using on-shelf hardware.

Municipal waste has a heating value of 3,700-4,500 BTU/LB as picked up. The waste is generated at a rate of roughly 7.6 million BTU/1,000 people/day. This amounts to 2.7 billion BTU/1,000 people/year. Washington State's population was 3.66 million in 1977 producing 10 trillion BTU worth of heat (in municipal waste). The majority of this heat content was not recovered, but was buried in sanitary landfills or incinerated. In 1979 this potential will be equivalent to 74.7 million gallons of oil, assuming a 2.3 percent population growth. There is also an electric power generation potential if higher quality steam is produced and used in cogeneration. There is a 75 Megawatt (MW) electric power generation potential in residential wastes at 22 percent conversion efficiency, a conservative figure for small cogenerators. The energy and potential oil savings are significant and hinge on the development of a commercialization program to recover this energy potential.

A Municipal Waste Steam Generator Plant, using four gas generator modules, is in operation in Little Rock, Arkansas. This plant burns residential wastes, as collected, from 20,000 homes, and generates steam, which is sold to a nearby industry. The combustion meets environmental standards without control equipment. The plant capacity is 100 tons waste/day. It can generate 20,000 pounds of steam (at 150 psi) per hour. At the

present it operates at only 60 percent of its capacity. Two years of operational experience is available. Based on the overall management (collection, landfill, transportation, employment, steam sold, etc.) the plant is economic and saves about \$60,000 yearly over the conventional sanitary landfill type operation. The system is based on a modular concept, applicable to small sources and can be expanded with additional independent modules as needed. Similar systems could be used in Washington State.

Several activities have been suggested as to how the Energy Office could become involved with the commercialization of municipal waste utilization projects. Activities could include workshops to make municipalities aware of this potential energy source and technical assistance in development efforts. Development of a typical demonstration model applicable to smaller and medium sized municipalities, and surveys of the availability of wastes at all eligible municipalities, the market potential for the steam, and problems associated with site specific developments are also being considered.

Wastes are generated and collected at the present; the steam generation is within present economics; technical and operational experiences are available; financiers are interested in investing in this type of operation; revenue bonds could be issued by municipalities; and equipment development time is 4-5 years. Municipalities, hospitals, and industries could use this idea to conserve oil, or even better - to generate new energy.

For more information on municipal waste conversion to steam contact Paul Juhasz/Industrial Energy Program Coordinator/Washington State Energy Office/ (206) 754-1372

Geothermal Energy Assessment in Washington: An Accelerated Effort

R. Gordon Bloomquist and J. Eric Schuster

The state Department of Natural Resources (DNR), Division of Geology and Earth Resources, the U.S. Geological Survey, (USGS) and several universities have been collecting data on Washington's geothermal energy potential for several years. The studies which were often cooperative investigations involving the universities and state and federal agencies, have led to the publication or open filing of a number of maps and reports that provide baseline information on geothermal-related geology, geophysics, and geochemistry. However, progress has been slow because of budgetary and manpower limitations and a general lack, until recently, of interest by industry in geothermal development.

Budgetary and manpower limitations have recently been lessened as a result of an invitation from the U.S. Department of Energy to the Division of Geology and Earth Resources to cooperate, with federal funding, in their state-coupled geothermal resource assessment program. The increased level of funding will allow for an accelerated search for economically exploitable geothermal energy resources in the state.

The Division of Geology and Earth Resources as a result of the state-coupled program has hired a geochemist and fully equipped a geochemical laboratory. The division will also hire a geophysicist and subcontract heat-flow drilling, gravity, and geological studies.

In addition, the USGS is initiating a 5-year program of regional geothermal assessment in the Cascade Range of Washington, Oregon, and northern California under the coordination of Dr. Charles R. Bacon. The state and federal programs will be closely coordinated by a board of state and federal officials.

During 1979, the Division of Geology and Earth Resources plans to conduct both site-oriented and regional studies under the direction of J. Eric Schuster.

The site-oriented studies will provide information about sources of earth heat, water geochemistry, ages of rock formations, and subsurface geology near thermal or mineral springs, volcanoes, and areas where potential commercial users of geothermal energy are located. Detailed site-oriented studies will include geologic mapping in the Tumac Mountain area near White Pass; geochemical and geophysical studies at Sol Duc Hot Springs on the Olympic Peninsula; and rock age-dating, geochemical and gravity surveys at Camas.

Regional studies which are designed to localize areas where more detailed studies should be conducted will include:

1. The analysis of existing data on temperature and chemical composition of water wells throughout the state.

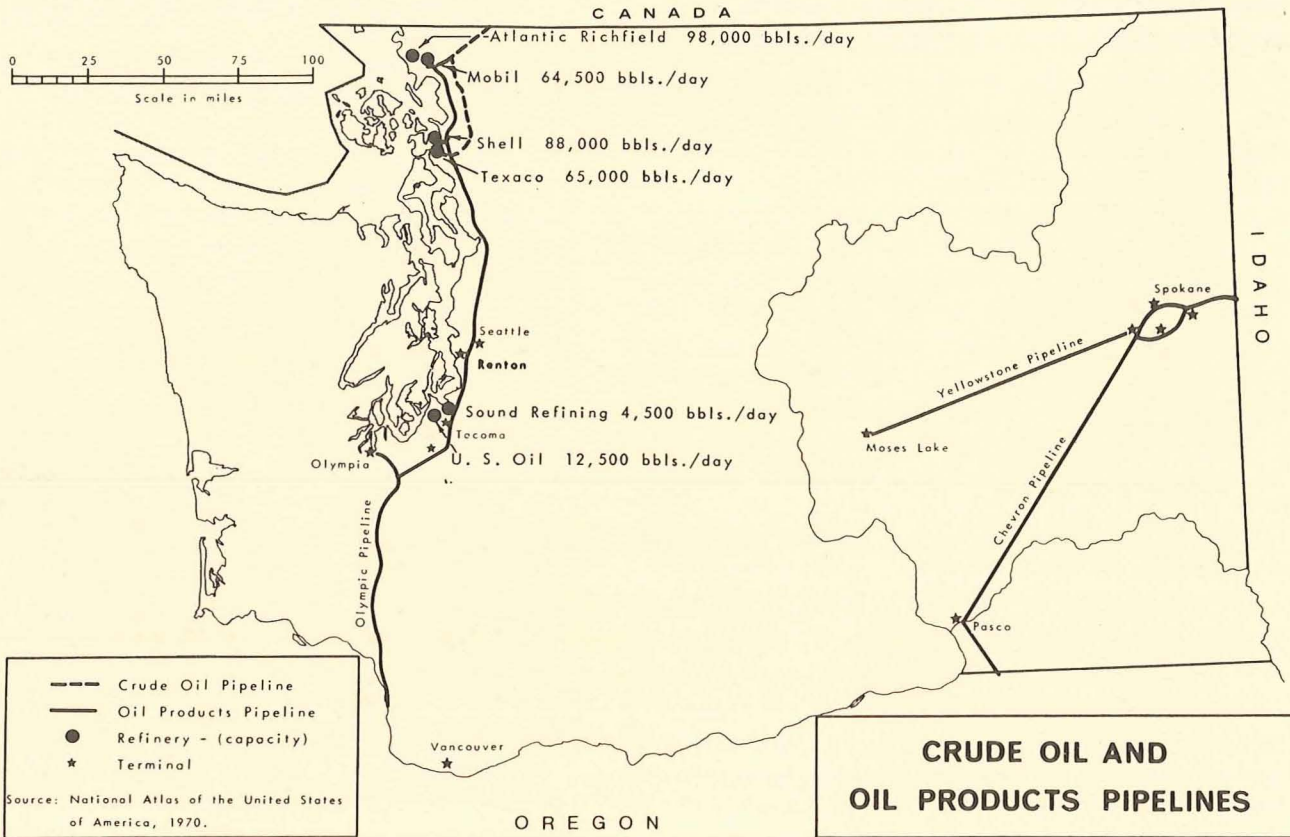
2. Sampling and analyzing thermal and mineral springs in the southwestern Cascades in order to begin characterizing geothermal systems as to their probable reservoir temperature and water quality.

3. Gravity surveys of the Cascade Range south of the Cowlitz River Valley to be conducted by personnel from Puget Sound University.

4. The drilling of what is planned to be a total of ten 500 foot heat-flow holes in the Cowlitz River Valley, on the flanks of Mount St. Helens, and at Camas to determine whether or not potential economically, exploitable geothermal energy exist in these areas.

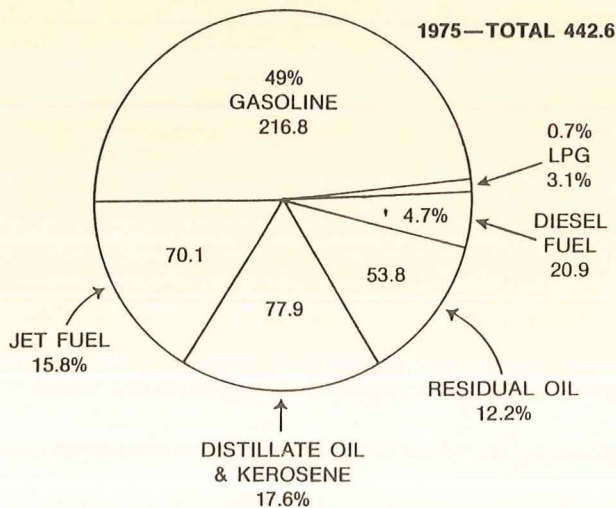
Results obtained from the USGS and Division of Geology and Earth Resources 1979 assessment programs will be critically evaluated in order to update and modify the DNR program, which currently is expected to run for a minimum of five

Energy In The Evergreen State



WASHINGTON STATE GROSS PETROLEUM CONSUMPTION 1975 (Trillions of BTU)

SOURCE: Federal Energy Data System (FEDS) Statistical Summary February 1978 by Raymond F. Fuller



AVERAGE ANNUAL YIELDS FROM A BARREL OF CRUDE OIL — 1976^{P/}

Product	Gallons Per Barrel	% Yield
Gasoline	19.11	45.5
Jet Fuel	2.86	6.8
Ethane (including ethylene)	0.04	0.1
Liquefied gases	1.01	2.4
Kerosene	0.46	1.1
Distillate fuel oil	9.16	21.0
Residual fuel oil	4.33	10.3
Petrochemical feedstocks	1.39	3.3
Special naphthas	0.29	0.7
Lubricants	0.54	1.3
Wax	0.04	0.1
Coke	1.09	2.6
Asphalt	1.18	2.8
Road oil	0.00	0.0
Still gas	1.55	3.7
Miscellaneous	.42	1.0
Shortage ¹	-1.47	-3.5
Totals	42.0	100.0

^{P/}Preliminary
¹Processing gain (-) or loss (+)
 Source: Percentage yield, U. S. Bureau of Mines; Gallons per barrel computed by American Petroleum Institute.

Petroleum In Washington / Some Basics

Petroleum is an essential element of Washington State's energy picture. It provided about 45% of our total energy needs in 1975. Petroleum mainly provides gasoline and diesel fuels to keep our cars, trucks and other transportation equipment moving; aviation gas and jet fuel for air transportation; and fuel oils for industry and home heating. The economy of the state and the health and safety of its citizens is heavily dependent upon an adequate and uninterrupted supply of petroleum products. The main elements of the system that brings petroleum fuels to the thousands of users in Washington State include: 1) exploration and production; 2) transportation; 3) refining and processing; and 4) distribution and marketing.

Exploration and Production

Washington State currently has no petroleum production capability. During 1978 there were no oil or gas exploration wells drilled anywhere in the state. Washington refineries must import all crude oil from out of state.

Transportation

Over 300,000 barrels of crude oil are processed in Washington per day. Of this amount, 95% is brought in by water transportation; the remainder enters by pipeline. About one third of the imported amount is domestic Alaskan crude and the balance is imported primarily from the Middle East and Indonesia. This heavy reliance on foreign crude implies that the state is extremely vulnerable to oil embargoes and price increases.

Refining and Processing

This is where crude oil is converted into its thousands of useful products. The products derived from a barrel of crude oil is a result of market demand factors and technological capability.

Refining is a three step process including separation, conversion, and treating. Separation produces the desired petroleum products, usually by distillation. The molecular structure of the hydrocarbons is changed into products such as gasoline through conversion techniques. Impurities are removed and products are improved by chemical treating. Within certain limitations, refiners can maximize the production of one fuel over another to fit customer's or seasonal needs, such as heating oil for winter and gasoline for summer.

Washington has a refining capacity which presently can produce more than enough petroleum products for the state alone. About 55% of the crude oil refined in the state is consumed in the state; the rest is exported out of state, mainly to Oregon and California. However, refined product is also imported to serve a portion of the state's needs (20%); this is due to the nature of the supply system.

Distribution and Marketing

Washington is only one part of the entire production, refining, transportation and distribution system in the West. Within the state itself the supply structure is geographically divided into two parts by the Cascade Mountains. West of the Cascades, around Puget Sound, the major refineries are found: ARCO (the largest), Shell (second largest), Texaco (third), and Mobil (fourth), followed by US Oil and Sound Refining, Inc. These refineries distribute their product by pipeline and tank truck within the area. Additional products are brought into the western portion of the state by barge and truck from refineries in Montana and Utah. Distilled products, such as gasoline, diesel and distillate fuels reach Eastern Washington from these refineries by two major pipelines: the Yellowstone and Chevron lines. Petroleum supply is also supplemented by barging in product up the Columbia.

years. In future years, the focus of DNR investigations is planned to shift to the southwestern Cascade Range, the central and northern Cascade Range, and the Yakima-Walla Walla-Tri Cities area.

It is hoped that enough new information will be obtained through the state and federal programs to encourage individuals and industry to develop Washington's geothermal resources for a wide variety of applications, including electric power generation, space heating, industrial process heating, aquaculture, and agricultural production and processing.

As part of the overall geothermal assessment program and as a complement to the comprehensive geological assessment program now underway, the Oregon Institute of Technology (OIT) Geo-Heat Utilization Center through a U.S. Department of Energy contract stationed a geothermal specialist in Washington State in January 1978. The geothermal specialist is housed with the Division of Geology and Earth Resources and has become an integral part of the overall assessment program working closely with state and federal agencies and industry.

The OIT program is designed to identify and assess the factors affecting geothermal development in Washington, to provide state and federal agencies with an objective analysis of the steps which need to be taken in order to ensure development at the earliest possible time, and to work toward the removal of impediments to development. In addition, the geothermal specialist is responsible for facilitating the assimilation and dissemination of all geologic data collected by state and federal agencies so as to provide industry with immediate knowledge of additions or improvements in the data base relative to geothermal development.

In the first year of the OIT program, existing data and information were compiled on geological, environmental, legal and institutional factors, population, ec-

onomics, and the geothermal development potential of Mount Adams, Indian Heaven, Mount St. Helens, Mount Rainier, Kennedy Hot Springs, Mount Baker, Yakima, and Olympic-Sol Duc Hot Springs.

The published report, Geothermal Energy in Washington: Site Data Base and Development Status, is expected to be available through the Washington State Energy Office by June 1, 1979. For further information, contact Steve Craig/Washington State Energy Office/(206) 754-1361 or Dr. R. Gordon Bloomquist/Department of Natural Resources/(206) 754-1220.

U.S. DOE Sponsored Geothermal Technical Assistance Program

The Oregon Institute of Technology (OIT) currently has a contract with the U.S. Department of Energy to provide technical assistance for the development and commercial utilization of geothermal energy for space and process heating, aquaculture and agriculture production and processing in the states of Alaska, Washington, Oregon, California and Hawaii. The contract currently extends through July 14, 1979.

Under the terms of the contract, the program can provide to any individual or organization, public or private, 100 hours of on-site investigations, including engineering feasibility studies, economic analysis and limited resource evaluation.

The program is intended to stimulate and accelerate the use of geothermal energy to replace fossil fuel by providing preliminary help when and where it is needed. The program is not intended to compete with consulting engineers and geologists by providing detailed plans, specifications, or other services when qualified private consulting is available.

For further information or requests for assistance under the program contact Steve Craig/Washington State Energy Office/(206) 754-1361 or Gordon Bloomquist/Department of Natural Resources/(206) 754-1220.

Announcements

ANNOUNCEMENT

The U.S. Department of Energy (DOE) plans to issue a Program Research and Development Announcement (PRDA) for site participation in an experimental solar thermal electric power plant of approximately 1 MWe with startup scheduled for the end of CY 1982. The site application for this first engineering experiment is to be a small community with an electric demand of less than 100 MWe. Participation requirements, evaluation and qualification criteria will be described in the PRDA, anticipated to be released during May 1979. For more information contact U.S. Department of Energy/Albuquerque Operations Office/Attn: Ms. B. Bradley, Contracts and Procurement Division/PO Box 5400/Albuquerque, NM 87115.

NOTICE

The Washington State Energy Office (WSEO) currently has a contract with the Environmental Research Center at Washington State University to prepare a comprehensive energy use profile of Washington State for the years 1960 to 1978 and a review and analysis of the various current energy forecasts for Washington. These two reports will be available through WSEO the first part of July 1979.

GEOHERMAL OWNERSHIP RESOLVED IN WASHINGTON

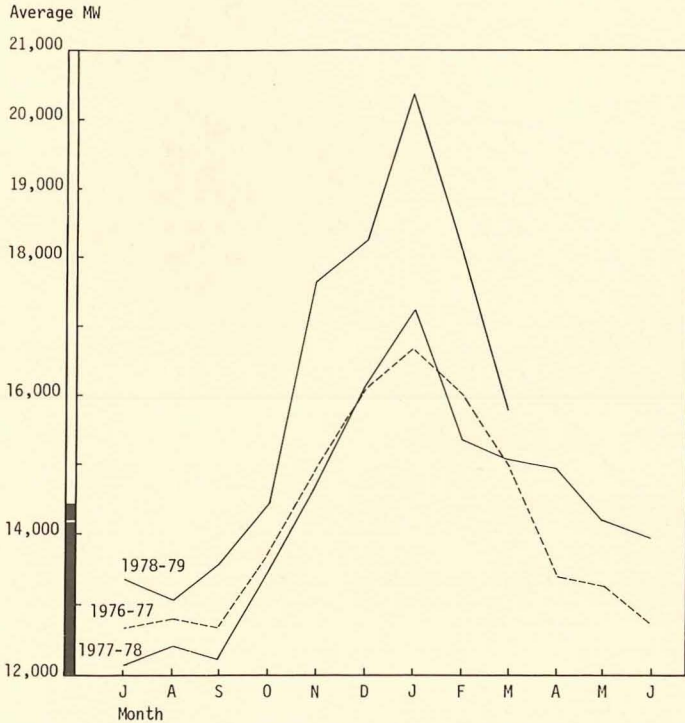
On April 13, 1979, Governor Ray signed a geothermal ownership bill passed this legislative session. This bill declares a geothermal resource to be the private property of the titleholder of the surface estate.

The fact that Washington now has a geothermal ownership law, could provide greater incentive for development on private as well as state lands. Until now the question of ownership had not been resolved.

Legal factors affecting geothermal development in Washington will be a subject covered in upcoming issues of the WSEO newsletter.

Energy Update

Regional Average Electricity Energy Load-By Month



Source: Bonneville Power Administration

Hydroelectric Power In The Pacific Northwest

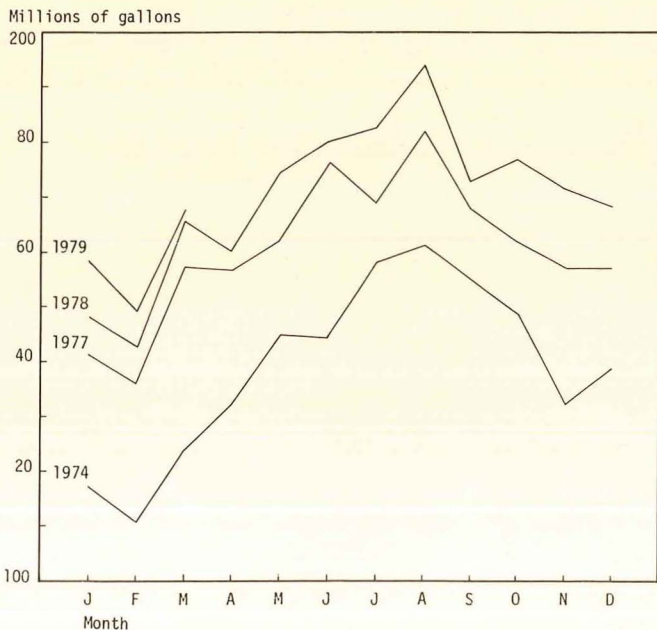
The Bonneville Power Administration (BPA) reports that as of May 1979, all the major power reservoirs are expected to refill this summer.

As a result of the 1979 fish operation, surplus energy is being generated. BPA is delivering this surplus energy to California. This surplus would not be available without the fish operation, which is jeopardizing refill very slightly.

BPA is presently marketing secondary energy to direct service industries (DSI's) and investor owned utilities (IOU's) in the Pacific Northwest. It is expected that this will continue through mid-July, 1979.

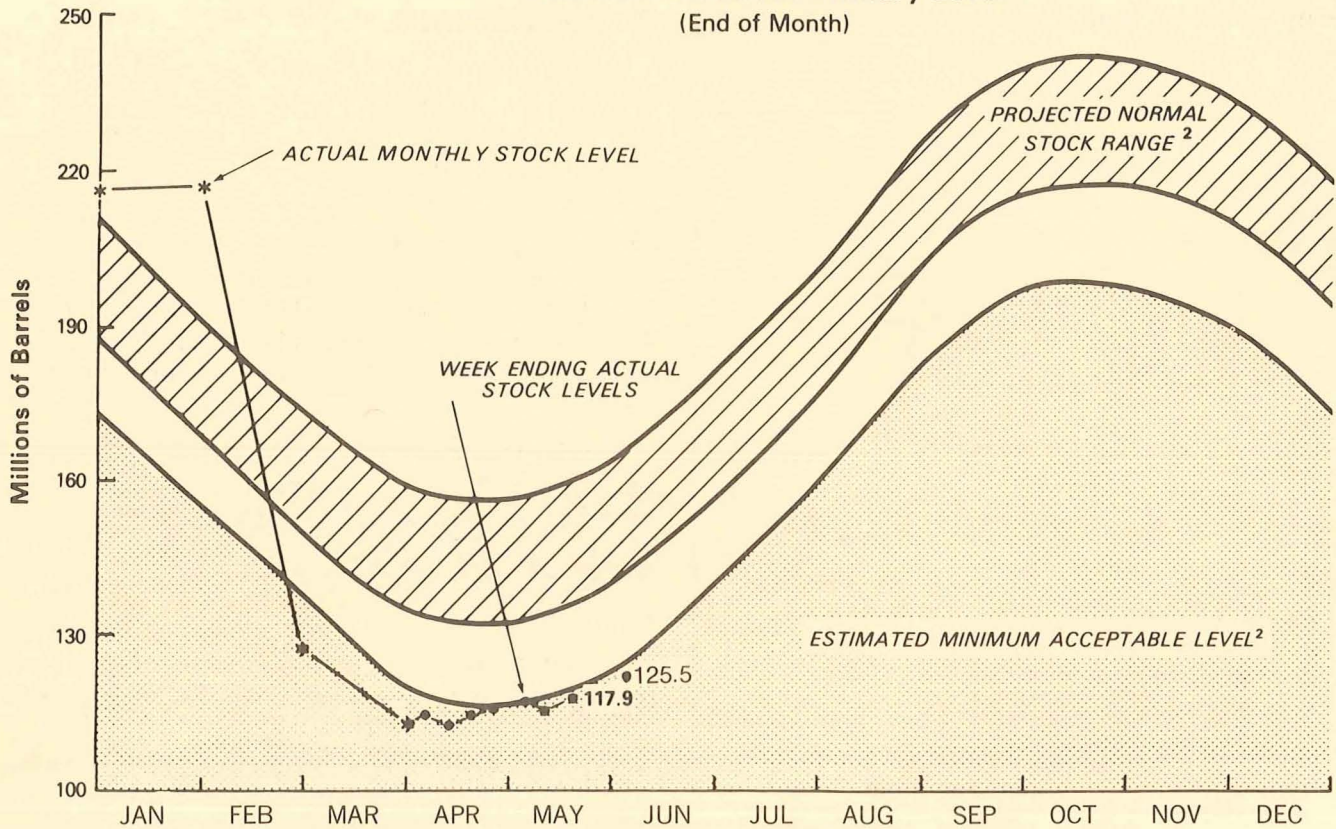
Expectations of full reservoirs is good news for the northwest power system. The outlook for sufficient electricity through the next power year (August 1, 1979-July 31, 1980) depends in part on how cold winter temperatures are, how high electrical demand is, and how much precipitation in the form of rain and snow there is. Another important factor is the amount of electricity generated by thermal power plants in the region.

Motor Fuel Distributed in Washington



Source: Washington State Department of Licensing

Distillate Stocks at Primary Level¹
(End of Month)



1 Product Stocks at the Primary Level include those held at refineries, in pipelines, and at major bulk terminals.

2 Projected Normal Stock Range—projections are based upon trends and seasonal patterns inherent in Bureau of Mines and DOE Actual Monthly Data from 1972-1978.

3 Estimated Minimum Acceptable Level—the level that stocks can fall to without disruption of consumer deliveries or the creation of spot shortages.

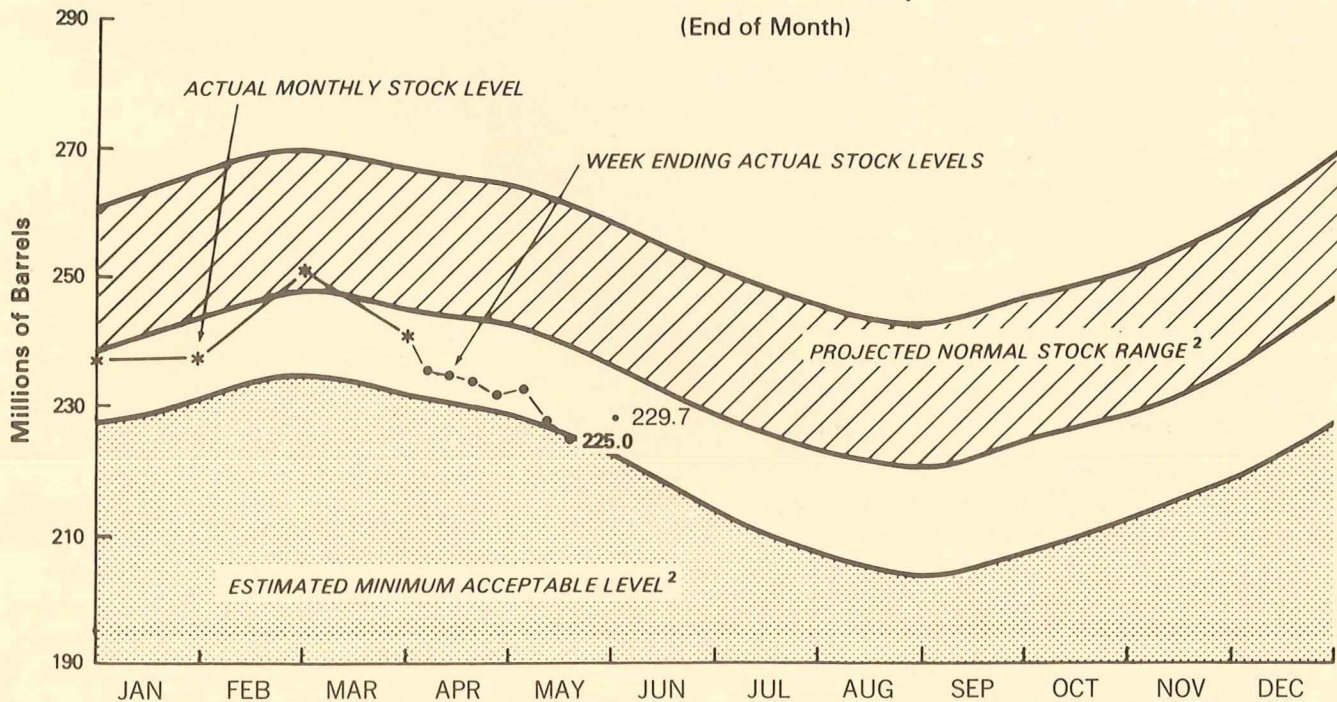
Source: Week ending average data: American Petroleum Institute (API), "Weekly Statistical Bulletin"; projections and estimates through 1979: DOE Emergency Policy Committee, Iranian Response Plan. Actual Monthly Data December 1978: EIA Energy Data Reports, "Petroleum Statement, Monthly", January through March 1979: EIA "Monthly Petroleum Statistics Report."

ENERGY.

**We can't
afford to
waste it.**

Gasoline Stocks at Primary Level¹

(End of Month)



1 Product Stocks at the Primary Level include those held at refineries, in pipelines, and at major bulk terminals.

2 Projected Normal Stock Range—projections are based upon trends and seasonal patterns inherent in Bureau of Mines and DOE Actual Monthly Data from 1972-1978.

3 Estimated Minimum Acceptable Level—the level that stocks can fall to without disruption of consumer deliveries or the creation of spot shortages.

Source: Week ending average data American Petroleum Institute (API), "Weekly Statistical Bulletin"; projections and estimates through 1979: DOE Emergency Policy Committee, Iranian Response Plan. Actual Monthly Data: December 1978, EIA Energy Data Reports, "Petroleum Statement, Monthly"; January through March 1979, EIA "Monthly Petroleum Statistics Report."

U.S. PETROLEUM DEMAND WATCH

Domestic demand for all petroleum products for the four weeks ending June 1, 1979, averaged 17.0 million barrels per day, 6.2 percent below the level for the same period in 1978. Demand was 0.5 percent below the 1977 level and 2.3 percent above the level in 1973.

Motor gasoline demand was 10.0 percent below last year's demand, 1.2 percent below the 1977 level, 1.3 percent above the 1973 level.

Demand for distillate fuel oil was 4.1 percent below the 1978 level, up 4.5

percent from the 1977 level, and 9.0 percent above the 1973 level. Residual fuel oil demand was unchanged from the 1978 level, 3.3 percent below the 1977 level and 5.5 percent above the 1973 level.

Imports for the four week period averaged 7.9 million barrels per day, 8.9 percent above the 1978 level, 8.2 percent below the 1977 level and 35.3 percent above the 1973 level. Crude oil imports were 86.3 percent above the 1973 level, while product imports were 27.1 percent below the 1973 level.

Energy Library

The WSEO library has pamphlets for distribution. Single copies are available to individuals by writing to Ginger Alexander/400 E. Union St./ER-11/Olympia, WA 98504/(206)754-1369.

Organizations interested in distributing them in bulk can contact the Energy Office for ordering information.

Pamphlets available:

1979 Gas Mileage Guide gives fuel economy and fuel cost estimates for the different classes of vehicles. Prepared by the U.S. Environmental Protection Agency and published by the Department of Energy.

Bicycling: Fun with Safety provides pointers on selection, maintenance and safety for bike riders.

Conserve Heating Oil: Hints to Help Cut Your Bill provided by ARCO.

The Gasoline Mileage Book tells "How to save gasoline when you buy a car, drive a car, and take care of a car." Shell Answer Book #3. 7 pages.

Suggested articles on alternate fuels for motor vehicles, available at most public libraries:

"Methanol Conversion for Your Car?" Popular Science, Aug. 1977. p. 90+

Anderson, Earl V. "Gasohol: Energy Mountain or Molehill" Chemical and Engineering News. 56: 8-13, July 1978.

"Why Not Methane?" Environment, 21(1) Jan./Feb. 1979. p. 21+

"Chapter 12: Transport" in Building for Self-Sufficiency by Robin Clarke, New York: Universe Books, 1977. P. 217-233. Includes information on LPG conversion.

ENERGY QUIZ

Even people who work with energy facts and figures every day miss an occasional quiz question. Test yourself on the following multiple choice items on oil.

1. What nation produces the most oil? United States, Iran, Japan, Saudi Arabia, Soviet Union.

2. What percentage of the world's oil production is consumed by the United States? 10%, 20%, 30%, 50%, 60%.

3. Rank the following in order of oil consumption: private automobiles, heating and cooling of buildings, generation of electricity, trains and buses.

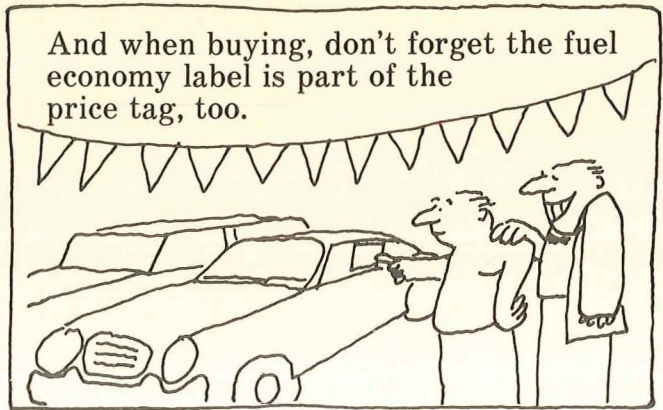
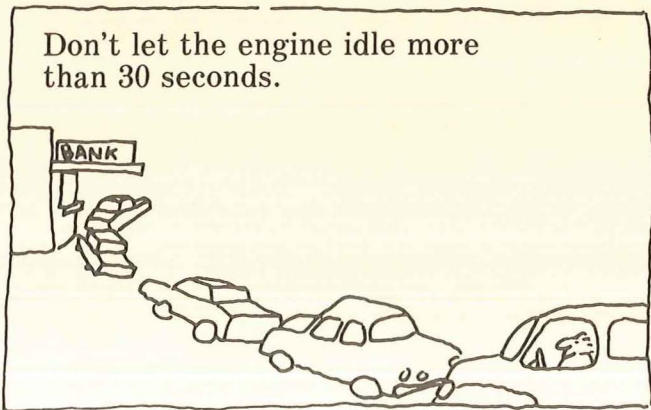
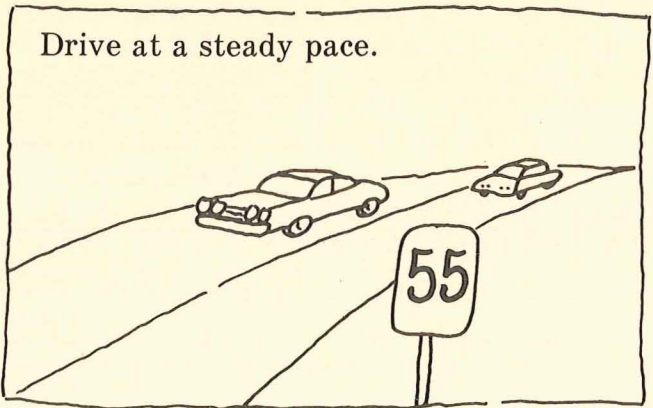
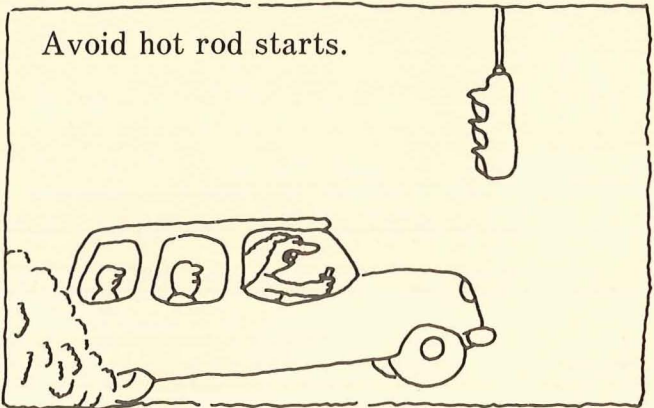
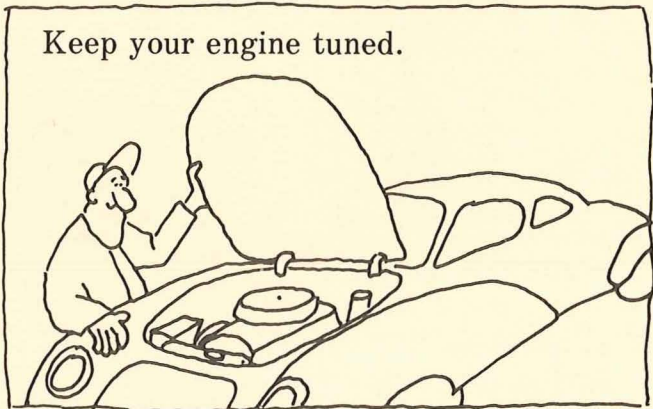
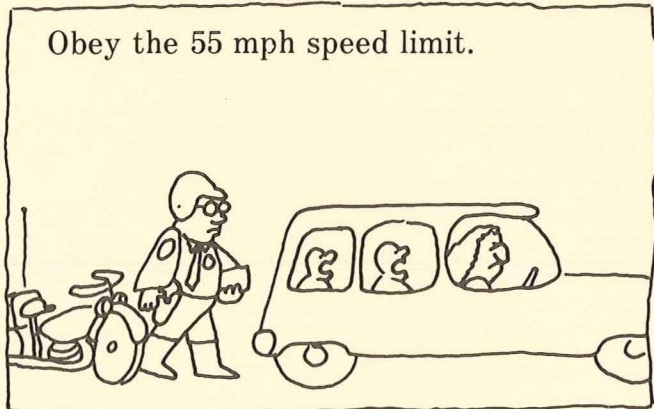
4. Which form of transportation uses petroleum most efficiently? Car, bus, train, airplane, subway.

ENERGY QUIZ ANSWERS

1. Soviet Union. 2. 30% 3. Private automobiles, heating and cooling of buildings, generation of electricity, trains and buses. 4. Bus.

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