DAILY SENTINEL
Grand Junction, CO
(Mesa County)
W-F (PM) 29,930; S/Su (AM) 34,572

Firm getting ready to begin mining in Piceance Basin

80

By MARIJA B. VADER
The Daily Sentinel

PARACHUTE — Come Tuesday, 168 rail cars carrying hundreds of sections of pipe will begin rolling through Parachute in preparation for American Soda's 44-mile closed-loop system.

American Soda officials hope to mine nahcolite in the Piceance Basin between here and Meeker and process the mineral into soda ash at the old Unocal plant at Parachute.

Plans call for a 44-mile insulated pipeline to carry the brine from the deep wells to Parachute.

The number of employees working on the Parachute plant and pipeline should increase from a current figure of about 220 in Parachute to as many as 445 by April 2000.

Now with its business offices relocated to Parachute and construction in full swing here to retrofit the plant for American Soda, the company is close to beginning work on the pipeline, said General Manager Kurt Nielsen.

The company still has some regulatory hoops to jump through.

It must get permission from both the U.S. Environmental Protection Agency and the U.S. Bureau of Land Management to drill the wells. Nielsen said he expects both decisions within two weeks.

Monday marked the deadline to submit comments on the BLM's draft environmental impact statement, Nielsen said. He added that the Sierra Club and American Soda competitors waited until the last moment to turn in 120 pages of remarks.

"We've been aloof and quiet lately," Nielsen said. "The more public we've been, the more public our competitors have been."

Construction workers shouldn't clog hotel rooms in Garfield and Rio Blanco counties during hunting season, Nielsen said, because the real influx of employees should begin after Jan. 1.

At that time, the number of employees working on the Parachute plant and pipeline should increase from a current figure of about 220 in Parachute to as many as 445 by April 2000, said Charlie Yates, plant manager.

■

Marija B. Vader can be reached via e-mail at mvader@gjds.com.

WORLD'S FIRST CFB PROJECT IS OPERATIONAL

Source:
Colorado Country Life
August 1987
Pub. by Colorado Rural Electric Association

NUCLA, Colorado—The world's first utility-scale power plant using a clean-coal technology known as "circulating fluidized-bed combustion (CFB)," is producing power.

Colorado-Ute Electric Association Inc. owns the 27-year-old Nucla Station, which has been out of service for retrofitting and upgrading since 1984. Major construction activities began in May 1985, and coal was fed to the boiler for the first time on June 11, 1987.

SOLUTION TO ACID RAIN

"The CFB technology we are using at Nucla Station has great significance for the electric industry and for our customers," said Ted Rosiak, Colorado-Ute's vice president in charge of Thermal Generation. "Perhaps the single most important characteristic of the plant's technology is the promise it holds as a long-term, cost-effective solution to the acid rain issue."

Acid rain is created when pollutants like sulfur dioxide, nitrogen oxides and carbon monoxide linger in the atmosphere and return to the earth in the form of acidic rain. Automobiles and power plants, among other things, are suspected to contribute to the phenomenon.

"All of Colorado-Ute's coal-fired units meet federal and state emissions standards, but Nucla Station achieves this in a novel way," Rosiak said. "In our conventional units, expensive add-on pollution-control equipment reduces sulfur dioxide emissions. Nucla Station won't need all of this equipment because sulfur dioxide emissions are controlled within the boiler."

HOW IT WORKS

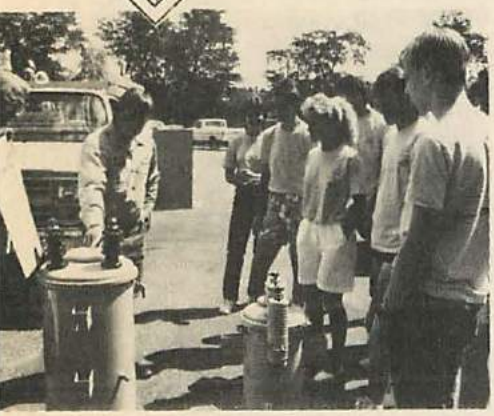
A CFB boiler is similar to a hot-air popcorn popper. Fuel—various grades of 3/8-inch coal, or even materials like old tires, wood and municipal refuse—is injected into the boiler where it is suspended in a strong, upward flow of air. At the same time, a sorbent like limestone, which absorbs and neutralizes sulfur dioxide produced during combustion, also is added to the combustion chamber.

Fluidized-bed combustion, which evolved from industrial applications in Europe, provides up to a 90 percent capture of sulfur dioxide. In addition, because fuel is burned at a relatively low temperature (1,550 degrees Fahrenheit, versus 2,500 degrees Fahrenheit for conventional technology), the production of nitrogen oxides is curtailed.

BROAD INDUSTRY INTEREST AND IMPACT

In addition to its environmental benefits, CFB technology offers capital and operating cost advantages. Building a new plant of the same capacity as Nucla Station (100 megawatts) using conven-

continued on page 24



Colorado Youths Look at Electricity

The Colorado Power Council's annual Youth Energy Leadership Institute was held this year in Fort Collins June 8th through 12th. This tour of electrical generating facilities provides interested high school students with an opportunity to view the production of electricity, learn about alternative sources of energy and about the materials and equipment used in power distribution.

The Colorado Power Council is a non-profit organization of representatives from the energy field in Colorado. Their objective is to foster the development and wise use of all forms of energy for the benefit of all Colorado citizens.

Forty students from around the state are selected for the Institute. Each sponsoring CPC member selects one or two students and an alternate. Students are usually entering the sophomore, junior or senior class in the fall.

The Institute this year featured tours of the Rawhide Electric Generating Station, the Fort St. Vrain Nuclear Generating Station, Hewlett Packard Company, the Woodward Governor Company, and the atmospheric sciences facilities at CSU. Students also enjoyed an on-the-line demonstration by Poudre REA, and sessions on the energy problem, acid rain and power generation. On the light side, institute participants relaxed with a barbecue, talent show, a dance and magician shows.

If you are interested in attending next year's institute, contact your local REA for more information.□

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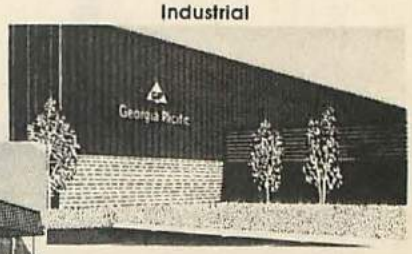

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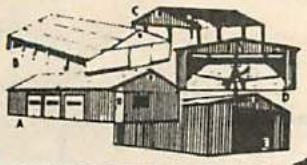

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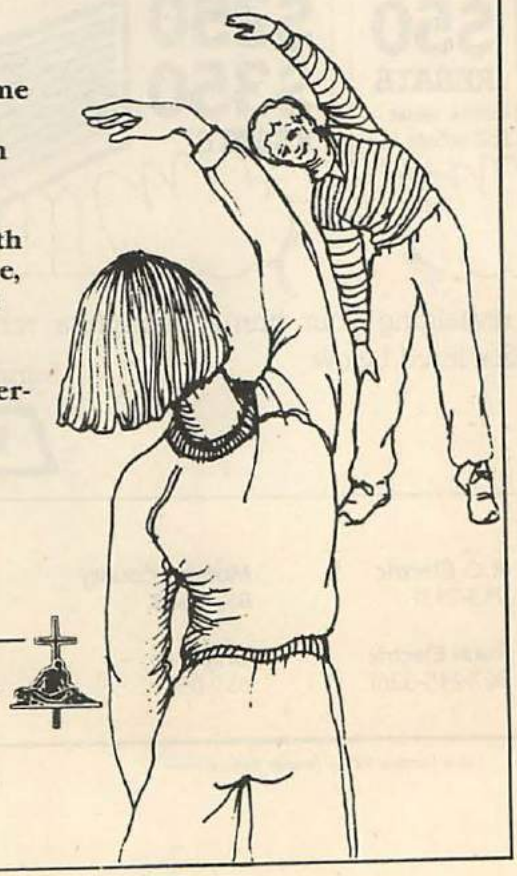

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Circle Number 15 On Reader Service Form

Power Plant continued from page 13

tional pulverized coal technology would be at least twice as expensive as building a CFB plant like Colorado-Ute's.

The Nucla Project demonstrates a state-of-the-art technology that will hold down the cost of generating electricity while keeping the environment clean.

CUSTOMERS NOT SHOULDERING 'RISK'

There's even more interesting news about Colorado-Ute's $100-million Nucla CFB Demonstration Project: First of all, the project has no government funding at this time. And, secondly, end-use customers are not shouldering the major risk associated with the project.

"We have performance guarantees from our major equipment vendors, which means we don't pay for things until we're sure they are going to work under a variety of operating conditions," said Vice President Rosiak. "We have substantial support from the boiler manufacturer, Pyropower Corporation; the architect-engineering firm, Stearns-Roger; and the general contractor, Bechtel Corporation."

WHAT IS 'HIGH TECH' DOING IN RURAL COLORADO?

Southwestern Colorado may seem like an unlikely threshold of emerging technology, but electric history is taking shape here.

"One reason we pursued this project is because Nucla Station is an answer to a big industry question: 'How do we meet future power requirements, while meeting stricter environmental regulations, and still minimize power costs in the face of growing competition?'" Rosiak said. "Developing this technology on a commercial basis was an ideal application for upgrading our 27-year-old plant because we were able to reuse a good deal of the original 36-megawatt plant, thus minimizing capital costs.

"The Nucla Project will pave the way for future applications of fluidized-bed combustion, and promises to provide a new option for the production of electricity."□

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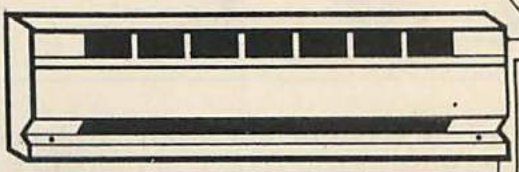

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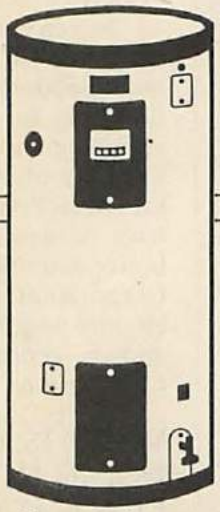

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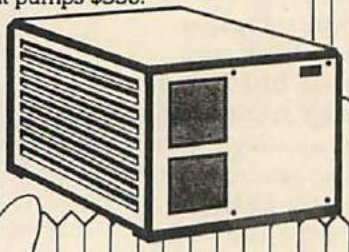

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

November 29, 1979

OFFICE OF
PLANNING AND MANAGEMENT

Dear Fellow Member of the Environmental Community,

We could add the equivalent of several million barrels of oil per day to domestic energy production by 1990 by developing previously uneconomic natural gas formations, so-called "unconventional gas". (Total oil imports are now 8 million barrels a day.)

In his July energy message the President asked the independent Federal Energy Regulatory Commission to allow this new gas a price competitive with oil that would permit its prompt development. He also asked the Congress for a tax credit that would phase out as prices rose above what is needed to produce this new gas (roughly $24 per barrel of oil equivalent.) Both measures are in doubt now.

This is a resource that should play a major role in solving our energy needs. It is fast becoming a bargain; we can develop it quickly; it is safe and clean (both to produce and use) - and consequently will help our cities grow while remaining healthful.

I thought you might be interested in seeing the attached background papers the Administration has just sent members of the Senate on this subject. I also enclose some recent editorials on this subject.

Ensuring that we develop so important a clean energy alternative is clearly an important environmental objective.

Yours sincerely,

William Drayton, Jr.
Assistant Administrator
for Planning & Management

Enclosures

THE WHITE HOUSE
WASHINGTON

"Tight Sands" Natural Gas Could Save Millions of Barrels of Oil

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We could add the equivalent of several million barrels of oil per day to domestic energy production by 1990 by developing previously uneconomic natural gas formations, so-called "unconventional gas". (Total oil imports are now 8 million barrels a day.) Almost all of this new production would come from "tight sands" areas, low permeability sandstone and limestone formations in the South-west, the Rockies, and the Northern Great Plains. Recoverable tight sands natural gas reserves probably exceed total proven U.S. reserves of oil.

These tight sands formations would produce the equivalent of between several hundred thousand and two million barrels a day of this safe, clean, economic fuel by 1985. Given world energy uncertainties, this early relief is urgent business.

The President's program proposed a tax credit for all unconventional gas production. However, the credit in the current Windfall Profits Tax bill excludes tight sands gas. The Administration urges the Senate to amend the bill to include tight sands production, the heart of the matter.

The tight sands formations are already yielding the equivalent of 500,000 barrels of oil a day. This production could grow to over 4,000,000 barrels a day by 1990 assuming either a $20/barrel price and advanced technology or prices exceeding $20. Four million barrels a day is half our current level of oil imports. The higher and more secure the price, the more energy we will produce.

The Department of Energy estimates that it may cost $24 per barrel to produce the bulk of this gas. The Administration's proposed tax credit of 50 cents per thousand cubic feet will make the gas worth that much to the producers. The credit phases out at higher prices.

In addition to providing a great deal of new energy quickly, this gas has a number of other advantages:

* It is one of our least expensive means of replacing foreign oil.

* It is clean and safe -- both to produce and to use.

* Tight sands drilling is a known technology -- with known costs that are unlikely to escalate dramatically.

* It will generate jobs.

* It would be produced from many thousands of wells encouraging competition and ensuring against large scale interruptions and military vulnerability.

Some of the easiest to get tight sands is already in production, but most tight sands gas is still too expensive to produce. The massive production increases we could achieve and the reduction in oil imports they imply will not occur unless the unconventional gas tax credit also covers tight sands gas.

Production Estimates for Tight Sands Areas

Tight Sands production could provide the equivalent of up to 4 million barrels of oil a day by 1990:

Estimated Tight Sands Production
(in barrels of oil equivalent per day
assuming a $20/Barrel price
in 1979 dollars)

	Low		High
1985	800,000	to	1,850,000
1990	1,750,000	to	3,800,000
2000	2,100,000	to	3,350,000

Source: Lewin Associates (Report for DOE, 1978)

For comparison, the U.S. imported 8 million barrels of oil in 1978.

The actual level of production we achieve over the next decade will depend on the price of the gas produced, the risks, and the pace of technological development. Covering tight sands under the unconventional gas tax credit will help push production towards the upper end of these ranges.

Recoverable Reserves of Unconventional Gas

Recoverable U.S. reserves of unconventional natural gas are truly enormous. Tight sands natural gas recoverable reserves at current oil prices exceed the U.S.'s current proven oil reserves.

"Unconventional Gas" is natural gas from western and southwestern tight sands, from Devonian shale in the Appalachians and Midwest, from geopressurized methane along chiefly the Gulf of Mexico, from coal seams in most regions, and from very deep wells. Limited production, chiefly from the tight sands regions, has begun.

DOE's National Energy Plan estimates of recoverable reserves of unconventional gas were as follows:

Recoverable Unconventional Gas Reserves
(Trillions of Cubic Feet (Quads))

Tight Sands Formation	40	420
Devonian Shale	25	400
Coal Bed Methane	50	700
Geopressurized Methane	5,000	63,000

Source: NEP II, Table IV-6

Lewin and Associates and the Institute of Gas Technology have made similar estimates. To put these figures in perspective, we now import 16 quads of oil a year.

In addition, the United States Geological Survey has recently informed the National Petroleum Council that their examination of drilling logs from old wells indicates the existence of previously uncounted tight sands gas deposits below 10,000 feet. These deposits are roughly equal to 400 quads (less than half recoverable), but they will cost the equivalent of $25 to $55 per barrel to recover because of the depth involved. These reserves are in addition to those shown in the table and illustrate an important point. These estimates only include discovered basins. No provision is made for new field discoveries.

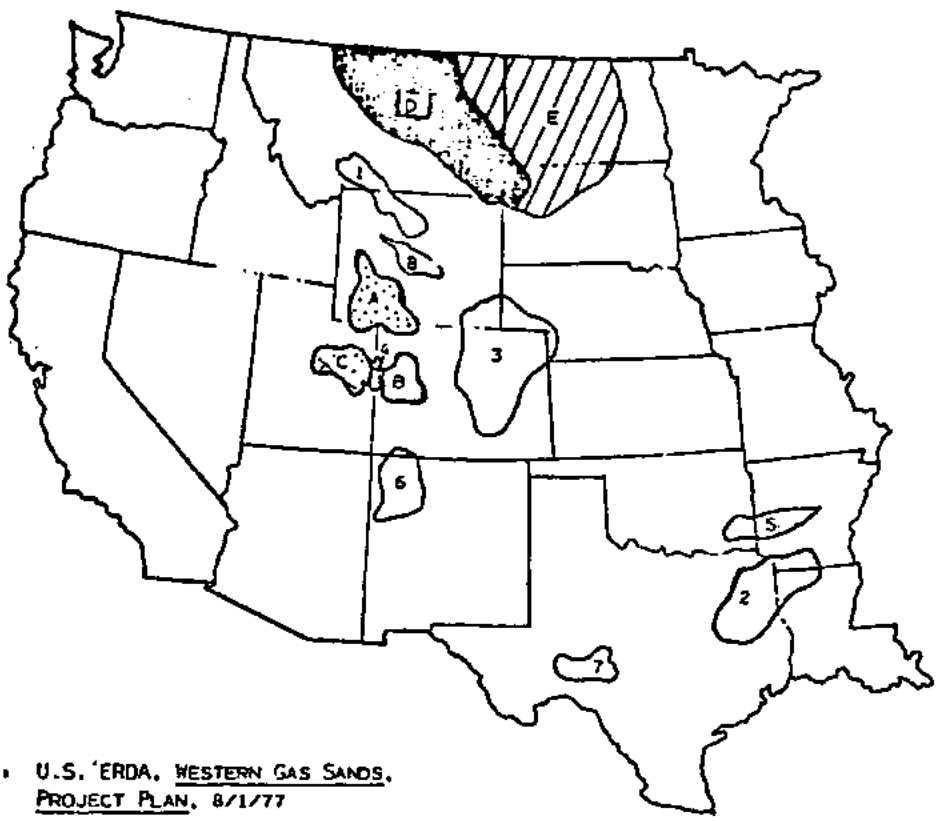
Price will be the chief determinant of how quickly these reserves are developed. The Administration's proposed tax credit of 50 cents per thousand cubic feet for all forms of unconventional gas, specifically including tight sands, would make an enormous difference.

Location of Western Tight Sands Basins

ERDA'S PRIMARY STUDY AREAS	GEOLOGICAL AREA
A. GREATER GREEN RIVER BASIN	TERTIARY AND CRETACEOUS
B. PICEANCE BASIN	TERTIARY AND CRETACEOUS
C. UINTA BASIN	TERTIARY AND CRETACEOUS
D. NORTHERN GREAT PLAINS PROVINCE	CRETACEOUS
E. WILLISTON BASIN	CRETACEOUS

ADDITIONAL LOW-PERMEABILITY AREAS IN THE STUDY	
1. BIG HORN BASIN	TERTIARY AND CRETACEOUS
2. COTTON VALLEY TREND	JURRASSIC
3. DENVER BASIN	CRETACEOUS
4. DOUGLAS CREEK ARCH	CRETACEOUS
5. OUACHITA MOUNTAINS PROVINCE	MISSISSIPPIAN
6. SAN JUAN BASIN	CRETACEOUS
7. SONORA BASIN	PENNSYLVANIAN
8. WIND RIVER BASIN	TERTIARY AND CRETACEOUS

OTHER LOW-PERMEABILITY AREAS NOT INCLUDED IN STUDY	
a. ANADARKO BASIN	PENNSYLVANIAN
b. ARKOMA BASIN	PENNSYLVANIAN
c. FORTH WORTH BASIN	PENNSYLVANIAN
d. RATON BASIN	TERTIARY AND CRETACEOUS
e. SNAKE RIVER DOWNWARP	TERTIARY AND CRETACEOUS
f. WASATCH PLATEAU	CRETACEOUS
g. WESTERN GULF BASIN	TERTIARY AND CRETACEOUS



SOURCE: U.S. ERDA, WESTERN GAS SANDS, PROJECT PLAN, 8/1/77

Washington Post, November 26, 1979

The Missing Fuel

FOR REASONS no one completely understands, one potentially major energy resource has been largely ignored in the debate over the right mix of fuels for the coming decades. We are referring to the several types of natural gas known collectively as unconventional gas. That unmemorable name refers to the unusual geologic deposits in which this gas is found, including such unfamiliar types as tight sands located in the Rockies and geopressurized methane reserves around the Gulf of Mexico.

Assuming a price equivalent to $23.50 per barrel of oil (already surpassed by escalating OPEC prices), the administration estimated last summer that somewhere between 5,000 quads and 65,000 quads of such gas could be recovered in the United States. The estimate is so broad because there has been little exploratory drilling in these reserves and because several uncertain economic assumptions have to be made to arrive at a guess of how much of the total can be recovered at a given price. Nevertheless, since the country's total annual energy consumption is 75 quads, even the lowest estimate amounts to 70 *years* of the country's total energy needs—a pretty staggering number, to say the least.

The technology for extracting some types of unconventional gas already exists, though there is much room for improvement. But it is well enough understood for the Department of Energy to have predicted that these reserves could yield the equivalent of four million barrels of oil a day by 1990—double the amount of the most optimistic predictions for synthetic fuel production, at a lower cost and with fewer environmental hazards. Of all the fossil fuels, for example, synthetic fuels contribute most to carbon-dioxide buildup in the atmosphere; natural gas the least.

With all these attractive qualities, why does unconventional gas need government help in entering the marketplace? The answer is that it shouldn't; but two related government policies—heavy subsidies for other competing energy sources, such as synthetic fuels, and an artificially low price for natural gas—could prevent, or seriously delay, its development. Before completing its consideration of the president's energy proposals, particularly the Energy Security Corporation to promote the development of synthetic fuels, Congress should therefore make sure that, in the rush to *do* something about energy, it has not unwittingly set up a system that will inhibit the production of an at least equally promising resource.

The New York Times

Founded in 1851

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Gas Embedded in Rocks and Controls

Of all the unconventional fuels that could ease the nation's dependence on foreign oil, none is more promising than the huge deposits of natural gas trapped in rocks in the American West. By failing to provide adequate incentives for recovering this "tight sands" gas, Congress and energy regulators may be denying the country a desperately needed leg up on OPEC.

Somewhere between 50 and 400 trillion cubic feet of gas are known to be available in tight formations of sandstone and limestone. That range would be roughly equivalent to total American oil reserves. Tight sands already provide about 5 percent of America's natural gas, and research commissioned by the Energy Department suggests that their yield could be increased four times by 1985, as much as eight times by 1990. A fourfold increase would replace about 1½ million barrels of foreign oil — as much as the President's massive synthetic fuels program. Unlike fuels produced from coal, tight sands gas would not much harm the environment, either at the source or when burned.

But its costs, and price controls, are holding back production. Extracting gas from tight sands is far more expensive than taking it from conventional wells. It requires shattering rock formations miles below ground and saturating them with chemicals. Under current price controls, there is little reason for private energy companies to pursue the effort.

The Federal Energy Regulatory Commission, which administers the gas price controls, is aware of the problem. But it has been reluctant to provide more generous incentives because a few producers with less than average costs would then reap a windfall. It proposes to raise the price by about 50 percent, to the equivalent of $18-a-barrel oil. But that is an abstract compromise. The standard of $18 is substantially less than what the Energy Department believes necessary to reach the maximum potential production of tight sands gas — which could replace 2 million to 4 million barrels of oil a day. And $18 is less than we already pay for Arab oil. It is less than we have agreed to pay Mexico for natural gas. It is far less than the projected cost of pipeline gas from Alaska.

The simple solution would be a change of mind at the commission. It could tie the price of tight sands gas to the price of foreign oil — a price so high that tight sands gas would, in effect, become deregulated. Congress set a precedent last year by exempting four other high-cost gases from price controls; a fifth could be added in the same spirit.

Unfortunately the commission appears immovable. It has traditionally placed a higher priority on protecting low prices for consumers than on assuring them adequate supplies. That leaves the matter up to Congress. There is little hope that it will directly exempt tight sands gas from price controls; hardly anyone wants to reopen the bitter gas debate that held up energy legislation for more than a year. But Congress could promote this promising gas by making it eligible for a tax subsidy.

The available vehicle for subsidy is the "windfall" oil profits tax now being debated in the Senate. The Finance Committee advocates a tax credit equal to $6 a barrel of oil for some types of high-cost gas. If the bill were amended to include tight sands gas, and the regulators granted the $18 ceiling, the return to producers would be raised to $24.

A tax subsidy would be less desirable than letting free markets establish the price. Someday, perhaps, the costs of energy price controls will be more widely understood. But the nation needs this clean and plentiful fuel too much to quibble. Congress should make certain that tight sands gas becomes available as fast as the industry can extract it.

issues

- ☐ Size of operations — immense scale
- ☐ Socioeconomic impact of the industry — boom-town problems
- ☐ Disposal of spent (waste) shale — huge quantities
- ☐ Upgrading and refining of shale oil — location of facilities
- ☐ Air pollution — regional air quality
- ☐ Water availability — competition with other needs
- ☐ Water pollution — contamination of groundwater and surface runoff
- ☐ Decision-making — local and state involvement in federal decisions

uranium

reserves

(recoverable at a forward cost of $30/pound)

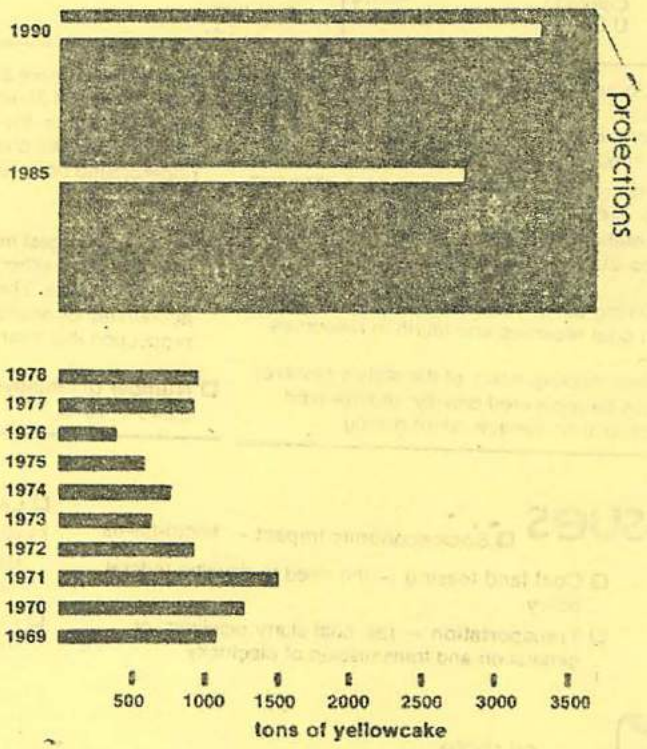
Western Colorado	**16,769 tons**
U.S.	**690,000 tons**

resources *

(recoverable at a forward cost of $50/pound)

Colorado	**423,000 tons**
U.S.	**3,225,000 tons**

*excludes reserves



- ☐ Uranium resources are classified in terms of **forward cost**, which covers production costs but provides no margin for return on invested capital. An acceptable selling price is, in fact, almost double the forward cost.
- ☐ The **market price** for yellowcake remained constant for many years around $8/pound. After a rapid rise in price between the years 1974 and 1976, the market price has since ranged above $40/pound. (This would theoretically make uranium resources at a forward cost of just above $20/pound feasible to develop.)

- ☐ Western Colorado is the oldest uranium mining area of the U.S., but the state's largest mine (Schwartzwalder) is in Jefferson County.
- ☐ From 1948 through 1974, Colorado mined about 12 percent of the nation's total production of uranium. However, Colorado's share of national production has dropped since more attractive deposits have been found in New Mexico and Wyoming.
- ☐ Uranium is unique among energy sources because virtually all of it is used to generate electrical power. Unlike sources such as coal or oil, uranium does not have a variety of industrial uses.

issues

- ☐ **Radioactive contamination** — from mining and milling waste
- ☐ Effect of radioactive **radon gas** — on miners and local popula
- ☐ **Uncertainty of uranium demand** — because of public attitud toward nuclear power, possible changes in the fuel cycle, a nuclear plant licensing delays
- ☐ **Ground water contamination** — from solution mining
- ☐ **Nuclear proliferation** — e.g. accessibility to plutonium

colorado open space council
2239 E. Colfax Ave., Denver CO 80206

This handout has been excerpted from the Colorado Energy Research Institute Energy Fact Book 1980/81 by the Colorado Open Space Council Mining Workshop. (303) 321-6588. A complete list of data sources is available from C.E.R.I., (303) 279-2881.

Colorado Energy

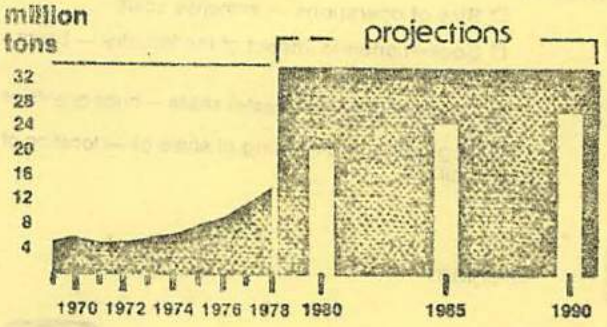
coal

reserves
(in-place, 1976)

Colorado	16,300 million tons
U.S.	438,300 million tons

resources
(in-place, 1974)

Colorado	434,200 million tons
U.S.	3,968,300 million tons



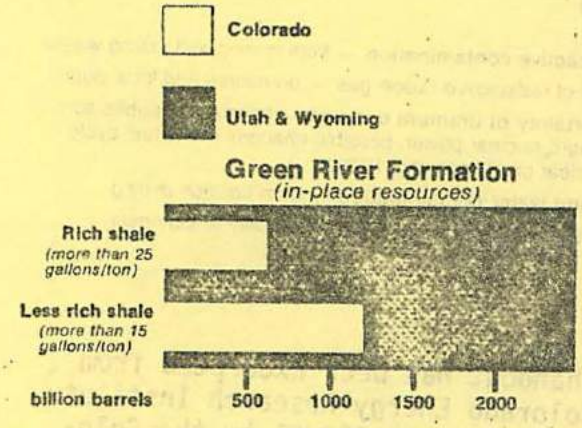
- Colorado's reserves generally consist of high quality coal with a low sulfur content. Over half is classified as bituminous, and the rest is subbituminous and lignite
- Most of this coal—steam coal—is attractive for generating electricity. Some of it—metallurgical coal—meets the special requirements of the iron and steel industry.
- Among other states, Colorado ranks eighth in coal reserves and fourth in resources.
- Over three-quarters of the state's reserves can be recovered only by underground rather than surface (strip) mining.
- In 1978 there were 55 producing mines—24 surface and 31 underground. Although fewer in number, the surface mines more than doubled the production of the underground ones (9.8 million tons vs. 4.5 million tons).
- In 1978 the largest mine produced 2.9 million tons and three others each produced over one million tons. These four surface mines accounted for nearly half of Colorado's production that year.
- Number of employees at all the mines was 3,645 in 1978.
- The ability of Colorado's steam coal to com in markets outside the state will depend on transport costs and pollution control regulations (regarding the burning of coal).
- Future demand for coal will also depend or development of synthetic fuel plants whi convert coal into a gas or oil-like product. A typical "synfuel" plant* would require abou eight million tons of subbituminous coal per year.

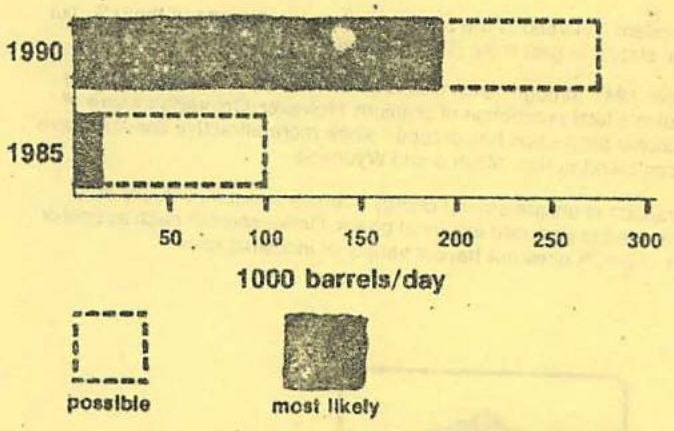
* *oil—50,000 barrels/day; gas—250 million cubic feet/day*

issues

- Socioeconomic impact — boom-towns
- Coal land leasing — the need to develop federal policy
- Transportation — rail, coal slurry pipelines, or generation and transmission of electricity
- Land reclamation — concerns about adequacy
- Water availability and air pollution — additional issues raised by power plants and synthetic fuel plants
- Possible shortage of trained miners — especially for underground

oil shale





- A typical above-ground retorting oil shale plant would mine at least 70,000 tons of shale a day to produce 50,000 barrels of oil a day. This mining operation would be about eight times the size of the largest coal-mining operation in Colorado.
- At present, oil shale is categorized under resources only. It has not yet been proven that the oil can be economically recovered, so none of the shale is classified under reserves.
- Most of the U.S. oil shale resources—and the most important—is found in the Green River Formation underlying 16,500 square miles of Colorado, Utah and Wyoming. Although Colorado's Piceance Creek Basin covers only a small area of the Green River Formation, it contains about 85 percent of the high grade oil shale—and therefore most of the valuable oil shale in the U.S.
- Once termed the "elusive bonanza", oil shale has seemed on the verge of commercialization for decades. But, production is still on an experimental basis in the U.S. Oil is commercially produced from shale in the U.S.S.R. and China.
- Estimates of future production of shale oil are highly speculative because of environmental controls and uncertain economics. Various government subsidies have been suggested.

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Synfuels Article inside

SUN TIMES

A Publication of Solar Lobby

July 1979

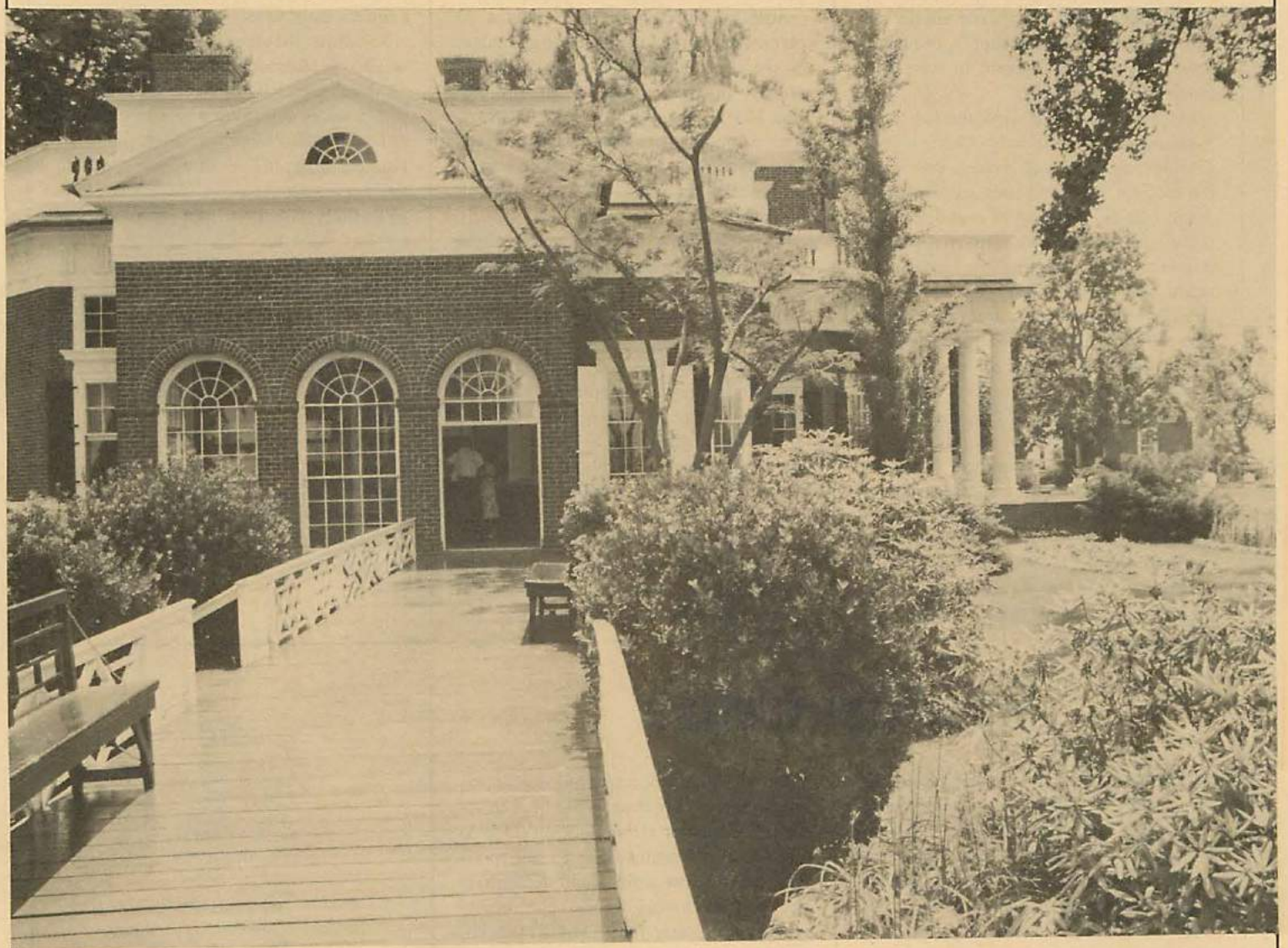

photo by Kennedy Maize

Jefferson's Monticello and the Roots of Appropriate Technology

IN THE LOBBY

No Money Down

Last month, President Carter delivered his long-awaited solar energy address. Speaking from the White House roof at a ceremony to dedicate the newly installed solar collectors, the President said that "True energy security, in both price and supply, can come only from the development of solar and renewable technologies."

But in a style that Washington has come to recognize as distinctly Carter's, the President declared a 20 percent solar goal for the year 2000 and then outlined programs that fall far short of enabling us to make good on that commitment. A small step in the right direction, the Carter plan might have been welcomed from Presidents Nixon or Ford. But from a president who ran on a platform of redirecting federal energy funds toward solar energy, we expected more. Now, in the context of new OPEC price hikes, the numbers in the solar program look even punier.

Although the 20 percent goal is significantly better than the seven percent target set by the Department of Energy two years ago, the $3 billion the Carter administration would spend between 1980 and 1985 (according to the figures calculated by the Domestic Policy Review staff) will not get us there. The most far-reaching of the scenarios they outlined—which reflects the assumption that conventional fuels will be high-priced and that federal solar policies will be aggressive—yields a solar contribution of slightly more than a 33 percent of the total national energy budget by the year 2000. The net cost of the aggressive program would be between $40 and $70 billion over the next 21 years. This is roughly the amount we spend each year on imported oil and it pales next to proposed expenditures for synfuel development.

The Solar Bank, the cornerstone of the new program, is a worthy and important plan to provide long-term, low-interest loans to consumers. The concept has been in legislative form for two years and will most likely pass this year whether or not the Administration supports it. More important, Congress proposes to open the Solar Bank this fall; President Carter would postpone the start-up dates for both the bank and several solar tax credits (for passive architecture, industrial process heat, and wood stoves) for 15 months until fiscal year 1981 begins. The stall could be seriously disruptive for the young solar industry. Perhaps most discouraging, the Carter solar plan draws its funding from the controversial Energy Security Fund and "windfall profits" tax on decontrolled oil. The linkage stands to help the Energy Security Fund pass but does not represent a commitment to solar energy.

So while the speech contained warm words, the Administration's solar outlook remains essentially unchanged. Other energy sources continue to receive annually more than $20 billion in direct and indirect spending, but no new solar spending has been authorized for fiscal year 1980. Even the $100 million more for fiscal year 1981 is substantially less than the increment requested by DOE. Under the Carter plan, solar energy development projects will probably continue to hobble along on about 6 percent of DOE's total budget. Clearly, we cannot achieve a 20 percent goal with a 6 percent funding level.

The Administration has bungled its chance to assume leadership in the solar transition. Now the Solar Lobby and other groups will work with Congress to exceed the "20 percent solar" goal that the Administration's programs can't even approach.

Synfuel Craze

"The American people are in the mood to do something, even if it is wrong," said Dale Bumpers (D-AK), capsulizing the political frustrations of attaining energy independence. As gasoline lines grow longer and energy prices soar, Congress seems eager to support any massive energy development program. And so, Congress has gone crazy for synthetic fuels—coal and oil shale converted to oil and natural gas.

The frontrunner in the legislative derby is Representative William Moorhead's (D-PA) amendment to have the military purchase 500,000 barrels a day of synthetic fuels. The difference between the market price of oil and the purchase price could mean a $3 billion federal subsidy for synfuels.

But the most encompassing legislation on the synfuel bandwagon has been introduced by Senator Henry Jackson (D-WA) and 18 other senators. The $5 billion effort they propose would fund demonstration projects throughout the country. According to Senator John Durkin (D-NH), Jackson's bill is "one of the most extraordinary catalogues of energy porkbarrel in legislative history," with most of the funds going toward "Solvent Refined Coal" projects, coal gasification plants, geothermal facilities, and fuel cell programs. (Ironically, many policy-makers have linked solar technologies with synfuels under the label "alternate energies." While synfuels may be an alternative, they are by no means renewable.)

Skeptics argue that the enormously ex-

(Continued on page 7)

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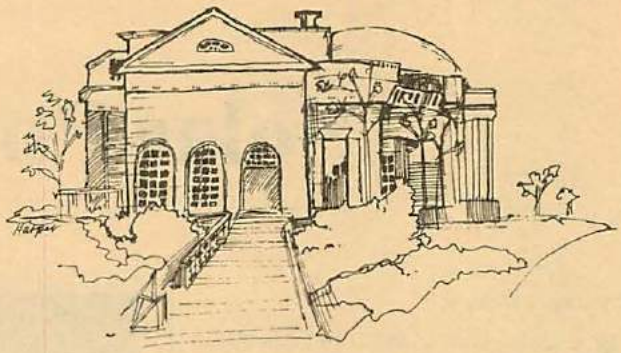
Jefferson's Monticello and the Roots of Appropriate Technology



by Kennedy Maize

In the spirit of Independence Day celebrations, writer Kennedy Maize traveled to Thomas Jefferson's home, Monticello, in Charlottesville, Virginia, to look at the roots of the Appropriate Technology tradition. Jefferson, in all his work, as writer and statesman, inventor and farmer, cultivated the very tenets of self-reliance and independence we find ourselves celebrating.

On the roof of the east porch at Monticello, prominent from the entry path, stands a large wind vane. On this fine, clear summer day, it points to the Southeast. The shaft of the weather vane runs through the roof and porch so that the wind direction can be read without leaving the house. So too, someone working outside can read the large seven-day clock in the entrance hall. Time and wind, weather and season, creation and invention were vital elements in Thomas Jefferson's world.

Lawyer, statesman, politician, scientist, farmer, inventor, architect, and writer. Jefferson slipped from one role to another with such skill and grace that even discounting the rose-tinting passage of time, he makes our modern leaders look as though they are made of pretty thin stuff. Of him, historian Adrienne Koch said that "No leader in the period of the American Enlightenment was as articulate, as wise, as conscious of the implications and consequences of a free society as he."

Although many contemporary figures try to legitimate themselves and their causes by wrapping themselves in the robes of past heroes, an understandable if suspicious practice, there are real lines of intellectual inheritance and there are family trees that help us put modern-day political movements into perspective. We can even hazard some guesses about which issues of our time a figure from the past would have championed. Clearly, Jefferson the agrarian, the tinker, or the statesman stands as a forebear of the appropriate technology movement. Arguably, were he around today, he would be experimenting at his Monticello farm with windmills and solar collectors, gasohol, and composting toilets.

The linkage is easily traced in Jefferson's political writings. Phrases such as "less is more" and concepts such as self-reliance directly echo Jefferson's writing on decentralized forms and powers. Jefferson considered himself "savage enough to prefer the woods, the wilds, and the independence of Monticello to all the brilliant pleasures" of Paris. He believed that "dependence begets subservience" and that the American character draws its strength from the obligation "to invent and execute, to find means within ourselves and not to lean on others." As far as Jefferson was concerned, "restriction of monopolies" belonged in the Bill of Rights along with freedom of speech, freedom of religion, and trial by jury. To him, the ideal nation consisted predominantly of small, independent farmers. Concentrations of wealth and power, he thought, eroded liberty.

But casting Jefferson as an appropriate technologist and solar enthusiast is more than a matter of finding words to justify the assertion. It is his domestic inventiveness that provides the clearest and most convincing evidence.

Jefferson was continually trying new ideas in his household to solve domestic problems. A practical man, he sought to make his house as comfortable as possible at the least cost and effort. His genius emerges at Monticello in countless small but significant ways. Knowing that heat passes through windows faster than through walls, for instance, Jefferson double-glazed Monticello's windows. In the colder north side of the house, the windows are triple-glazed. Wary of storms that could whip up without warning, he also made all the window shutters open and close from the inside of the house. Turning yet another bit of wisdom into an economy measure, he nailed planks to the basement side of the floor joints and filled the cavity between the planks and the floor with bricks and clay. This kept heat from escaping through the floorboards into the cold basement and offered some additional fire protection.

By the standards of its day, Monticello must have been exceptionally comfortable, easy to heat and cool. The thick brick walls function as thermal reservoirs, the house is well ventilated, and Jefferson's care with sealing windows and floors must have paid off well.

Originally, the main house was heated with fireplaces, one in each room. But Jefferson switched to wood stoves after finding they produced twice the heat with half the amount of wood.

Jefferson thought of the public's well-being as well as his family's comfort. The University of Virginia campus that Jefferson designed was as much a triumph of public architecture as Monticello was of private architecture. Less idiosyncratic than Monticello, it is cooly classical, with long columns of student residences linked to the commanding dome of the main building. Appropriately, the architecture testifies to the roles of reason, analysis, and good design. And it demonstrates again Jefferson's understanding of how to use light and shade to make buildings habitable. The university buildings' overhangs and thermal masses give it many of the attributes of good passive solar design, even though weatherization does not appear to have been Jefferson's intention.

The point is not that Jefferson was a solar pioneer of the 18th century. It is that the solar pioneers of today are re-establishing a tradition and an attitude toward life that is rooted in the vision of a founding father. Surely, if Jefferson were alive today, he would help us declare our technological independence and our rights to sunpower. ■

Solar Power Satellite

by Garry DeLoss

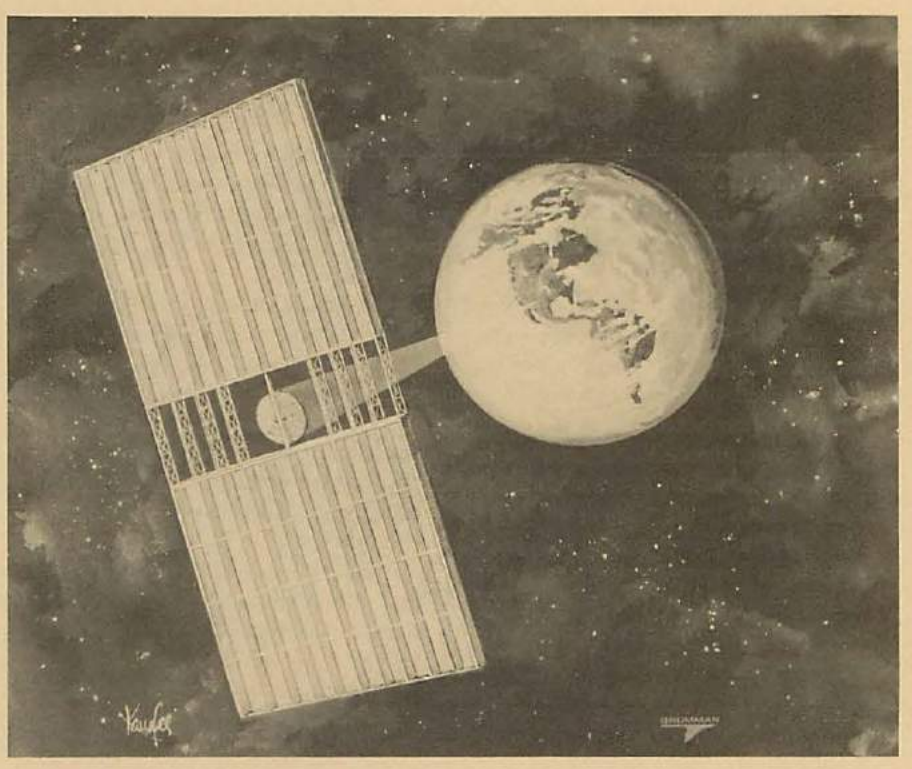
In the national scramble to locate new sources of power, the aerospace industry and its allies in Congress have developed more than a passing interest in solar energy. The object of their interest is a system of solar power satellites (SPS) that could deliver 300,000 megawatts of electricity—the equivalent of 300 nuclear power plants—by the year 2030.

The vision: a system of 60 giant space satellites, each about the size of Manhattan Island, joining our communications satellites in an orbit 22,000 miles above the earth.

Construction of the SPS system would take place in a "space factory" employing several hundred workers, using raw materials delivered by giant rockets from earth. Covered with photovoltaic cells, each SPS would collect and convert solar energy to electricity 24 hours a day in unshaded space. The solar-generated electricity would then be converted to a microwave beam and transmitted to receiving antennas, each covering nearly 50 square miles of the earth's surface. At the receiving antennas, the microwave radiation would be converted back to electricity and transmitted to cities and industries through large new power lines. The price tag? Over a trillion dollars, including 80 to 100 billion dollars to develop the new rocket and other equipment needed to build the satellites.

Environmentalists and solar activists are understandably concerned. The project description reads like a plan to bolster the floundering aerospace industry rather than a blueprint for developing environmentally benign, small-scale, and locally built, owned, and regulated solar technologies. But the SPS boosters are seeking to exploit solar's growing political popularity. As a source of baseload electric power for the next century, they argue, the satellite is economically, environmentally, and socially superior to nuclear, coal, and land-based solar applications.

Major federal involvement with the SPS began in 1977 when Congress authorized the Department of Energy to conduct a



three-year, $16 million study of the satellite concept. However, the SPS promoters decided not to wait until June of 1980 for the results of that study and launched an effort to add $25 million into SPS research in the Energy Department's fiscal year 1979 budget. The satellite, they argued, should receive funding comparable to that for the breeder reactor and fusion technology research. Thus, their $25 million bill was the first step toward future SPS spending at a rate of hundreds of millions of dollars annually. The proposal passed the House easily in June of 1978, but met tougher resistance in the Senate and died in October without reaching a vote in the Senate Energy Committee.

In early 1979, the SPS advocates reintroduced their bill and are now seeking to add $25 million to the $8 million for SPS research already included in the FY80 budget. The bill should reach the House floor by late July. If approved, it will then be introduced in Senate hearings and will possibly come to a floor vote in the fall.

Budgets aside, the environmental, social, and economic consequences of a satellite-based power system provide grounds for resisting a substantial congressional commitment in future years. To begin with, the vast upper atmosphere is not immune to pollution damage. The two-stage "heavy lift launch vehicle" required by the SPS to transport materials to the space factory would be five times as powerful as the Saturn rocket. Over 11,000 rocket launches would be needed—375 launches and landings per year for 30 years. Each launch would burn 20 million pounds of liquid hydrogen and liquid oxygen and create millions of pounds of water vapor, much of which would be deposited in the upper atmosphere where it would constitute a pollutant.

Carbon dioxide, carbon monoxide, and hydrogen would comprise smaller but significant fractions of the rocket exhaust. Also ozone-destroying nitrogen oxides would be formed as the burning rocket fuel mixed with surrounding air in a sec-

ondary combustion process. Over a 30-year period, SPS construction would require the introduction of millions of tons of rocket exhaust contaminants into the upper atmosphere—a move with uncertain but probably unfavorable consequences on climate and human health. A second or third 30-year cycle would cause incalculable damage given the absence of natural cleansing processes in the very stable layers of the upper atmosphere.

A second major environmental concern is the possible effects of the SPS microwave beams on the earth's atmosphere, wildlife, and people. The proposed 60 microwave beams, each several miles across, might harm the ionosphere and thereby decrease our protection from the sun's ultraviolet rays, with adverse consequences for human health and food production. The principal danger to wildlife arises from the short-term but high-level and probably fatal exposure of birds to unaccustomed heat as they fly through the microwave beams. People would not be exposed to the beams unless they flew through them in non-metal aircraft, but those who live or work within several miles of the receiving antennas would receive long-term exposure to the weaker microwave radiation that strays from the receiving antenna. Growing concern that even low-level exposure to microwave radiation induces adverse effects, ranging from cataracts to psychological problems, has led the Soviet Union and several Eastern European countries to impose much stricter microwave radiation exposure standards for humans than the U.S. has adopted.

Another negative impact of the SPS relates to the use of great expanses of land as sites for the 60 receiving antennas. Finding publicly acceptable locations for new power plants, power lines, coal mines, pipelines, refineries, Liquid Natural Gas terminals, and other energy facilities is hard enough in the late 1970s. The difficulty of siting 60 of the 50-square-mile receiving antennas needed by the SPS can only grow as competition for scarce land increases and as public concern over exposure to microwave radiation grows. Since the most likely sites for receiving antennas are in sparsely populated areas of the southwestern states, land for thousands of miles of new powerline corridors would also have to be pre-empted from other uses to get the electricity to consumers. Alternatively, some SPS proponents propose relocating industry and population closer to the SPS receiving antennas. Either way, SPS advocates don't seem dismayed by the prospect of choosing between great social dislocations and high economic and environmental costs.

Other equally grave SPS-related problems might best be characterized as diseconomies of scale. The system entails high "front end" costs since new rockets, a space factory, and other new-fangled equipment must be developed before the first commercial-scale SPS can be built. Total research and development costs over a 15-to 20-year period would range from 60 to 80 billion dollars. By contrast, developing a land-based commercial-scale (10 megawatt) photovoltaic power plant would cost taxpayers less than half a billion dollars. These development expenses would doubtless pre-empt funds that otherwise could have been used to develop a multitude of less expensive alternative technologies over the next 20 years, many of which might prove to be economically and environmentally superior to the SPS. A commitment to develop the SPS is clearly a commitment to putting too many eggs in one basket.

Adequate utility back-up power poses another problem that SPS proponents have glossed over. To make up for a possible loss of power from the satellite system—the equivalent of that from five nuclear power plants—a utility grid would require a "spinning reserve" power source at least as big as the SPS. Also the system itself is highly vulnerable to intentional disruption aimed at the satellites, the receiving antennas, or the high voltage transmission lines. An individual terrorist or a hostile government could at small cost cause tremendous economic disruption.

Finally, the satellite would serve to further centralize federal control of energy policy. Since the government is the only entity that can afford to build and own the SPS, state public utility commissions and local citizens' groups would lose their say in decisions on power plant technologies and sites, environment impacts, and electricity rates.

Clearly, the SPS represents an approach to resource development that no longer suits our society. The decision to launch the great masses of scarce raw materials needed to build the satellites into space where they cannot be retrieved or recycled is based on logic from the pre-industrial age. If the same materials were used to construct earth-based solar energy systems, they could be recycled periodically as they wear out or become obsolete.

In truth, the SPS is not likely to be built twenty or even fifty years from now. Way before then the public, Congress, and perhaps even Boeing, Lockheed, Grumman and other aerospace company technocrats will have perceived these insuperable obstacles. The immediate danger is an economic one. Whether the SPS is built or not, its proponents may well siphon off hundreds of millions of dollars of solar energy research and development funds that should be spent instead on better solar energy technologies. ■

Garry DeLoss is a lobbyist with the Environmental Policy Center.

The bill to increase SPS research funding by $25 million (HR 2335) is before the House Committee on Science and Technology and will probably reach the House floor by late July. Senate action is expected later this summer. Many members of Congress are unaware of the problems outlined in this article. Send letters expressing opposition to any additional funding for this project to your representative and senators.

The SPS would appear like a new constellation in the night sky.

A Day in the Life of a Solar Lobbyist

Lobbying is such an amorphous sport that by day's end I often find myself wondering how I spent my time and just what I've accomplished. So much of my work depends on other people and so much of it consists of getting other people to do things. Behind-the-scenes work is important but often not as gratifying as direct intervention. In lobbying, one thing leads to another but seldom to the sense of finishing a task.

9:00 Begin making peace at my desk with the day's commitments, among them the promise to keep a log of conversations and activities.

9:05 Mark, the summer intern, shows up on schedule to discuss his research on competition within the solar industry. Good thing we have him working on this: the fear that the oil companies will put a meter on the sun weighs heavily on many of our Board Members and our constituents. Creating a mechanism to prevent such a takeover will be difficult; the first step is presenting the case.

Mark says he's now ready to begin work on the second phase of the project—a study of the oil companies' ownership of copper-production facilities and rights and its bearing on the manufacture of photovoltaic cells. I supply the names of Congressional researchers likely to cooperate, then call a Senate staffer and extract his promise to conduct a computer search of legislation on competition.

9:40 Review Senator Durkin's "Solar Commercialization" Bill—scrutinizing the sections on information dissemination and skimming the rest—in preparation for meeting at ten.

10:00 Meet with other Solar Lobbyists to lay plans for escorting the Durkin Bill through normal channels. We agree on which sections count most and divide up the work to be done. I take on task of developing with John [Wilson, a SL policy analyst] and Joan [Shorey, a SL lobbyist] a series of questions on the bill to present to the Subcommittee on Energy Conservation and Supply.

I'm determined to see small business included as a target for information dissemination. Because they are sensitive to climate, solar technologies are inherently regional and decentralized—the perfect field for small business involvement. That involvement would create some competition for the few mega-companies that now control our energy industry. It would also bring to the solar industry the smaller firms' capacity for innovation, which far outstrips that of their larger counterparts.

10:30 Call a Hill-wise lawyer to find out how best to orchestrate an increased appropriation for Small Business Energy Loan Programs. I get from him the phone numbers of small business contacts in two key states who can supply the names of small businesses willing to lobby their Senators.

10:45 Call Washington's Solar Energy Industries Association lobbyist to discover that he is in the hospital. I make a note to call again after a decent interval.

11:00 Telephone a contact on the Durkin Subcommittee to find out when the hearings on small solar business are to be held. We at the Lobby will make these hearings a forum for airing concerns about small business and competition in the solar field, about D.O.E. procurement practices, and about implementing the SBA energy loan program. But there's no schedule yet, partly because of another illness. Is this a trend?

Phone is silent long enough to permit a thought to ripen: in House hearings on government-procurement policies, a critical question is the lead time on contracts. Since lengthy lead times serve to discriminate against small businesses, the hearings should focus on ways to reform D.O.E.'s procurement time.

11:20 Call staffer on subcommittee that handles Small Business Administration affairs to quiz him on likelihood of getting appropriations for the loan program increased from $15 million to $30 million. Am told the staff is taking the Administration line and that I ought to be satisfied with keeping the $15 million intact in such a "budget-cutting year." Am not satisfied despite advice and counter with argument that lopping off this particular $15 million is false economy. Clearly, there is a need to be fulfilled. In the program's first 2 to 3 months, $5 million has been loaned or committed with virtually no publicity about the program.

After a pause, the staffer refers me to a

After a pause, the staffer refers me to a high-ranking member of the Appropriations Subcommittee. Progress?

11:45 Slip down the hall to the Lobby's Publications Department to propose that someone (not me) research and write articles on financing opportunities for the small solar business. So far, the Solar Lobby has done little to illuminate the business side of solar energy. We need to branch out.

12:00 Attend regular Tuesday luncheon meeting at which the main item of business is not business. Come away refreshed.

1:45 Call eight unions to set up meetings between Solar Lobby staff and the unions' legislative aides. Raw interest in placing solar-related articles in union publications is considerable, as it is in lobbying jointly for solar legislation and bringing union locals into contact with the Lobby's network. The immediate aim is to get sheet-metal workers to spearhead union activity.

Dawning of the day's second whole truth: a lobbyist must treat enthusiasm as a quantity with unknown dimensions and yet find some way to translate it into cold hard political power.

3:30 Call the Sierra Club's Washington lobbyist to invite him to meetings with Hill staff members to talk about the Energy Management Partnership Act. To us both, this Administration bill seems to hold great promise for getting slow-starting states to examine their solar potential and to lay out opportunities for replacing or displacing electrical generating capacity with energy supplied by conservation measures and alternative energy sources. We also agree that the section on renewable resources is weak, though, and plan to meet tomorrow on the Hill to see what we can do.

3:45 Call a "solar friend" who recently switched from the House to the Senate side to work for a senator who sits on committees of importance to solar energy's future. I volunteer to coach her on what she can do for the solar cause from her new position. She promises to continue to champion the sun but wants a day's respite to get settled. Make appointment for tomorrow.

4:00 Review list of workshops planned for the Second Annual Citizens' Conference in Boulder in August. Scratch a few remarks in the margins and return to the Conference's organizers. (This exchange reflects interoffice good will more than it does any special brainstorming on my part.)

4:15 Study the Internal Revenue Services' draft regulations for tax credits for residential consumers of solar technologies. Prepare comments on these disappointingly restrictive regs and write to the Lobby's Board and network members asking for their comments. Am smitten again by hope that the Lobby can use the public comment period to initiate a spirited debate on passive solar technology's selling points.

5:30 Leave office for a dinner meeting at Joan's house for energy auditors from around the country. The group was brought to Washington by the Lobby and the Institute for Local Self-Reliance to show D.O.E. how audits are conducted. The not-so-hidden agenda: to prove to D.O.E. that solar audits can and should be done at the same time as general energy audits. The regulations on this National Energy Act provision now specify that the two audits should be separate. A waste of energy?

6-8:30 Helped serve lasagna and picked up information on auditing. Delighted at the opportunity to sign up these experts to comment on the Model Solar Building Code that is being developed on a D.O.E. contract—another of the issues I cover. Enjoyed the relaxed mood, the meal, and Joan's garden.

Maybe the hardest part of lobbying is leaving at the end of the day saddled with half-finished business. Surely the best of it is working with an incredible variety of people in an equally incredible variety of settings inside and outside Washington.

—Susannah Lawrence

LEGISLATIVE UPDATE

Omnibus Energy Bills

In the spate of synthetic fuel bills moving through Congress, solar provisions are being tacked onto much of the new legislation. The most encompassing proposal so far is that of Senator Henry Jackson (D-WA)—the **Omnibus Energy Bill (S.1308)** (see "Synfuel Craze," page 2). Jackson's bill contains solar provisions already on the docket in Senator John Durkin's (D-N.H.) **Omnibus Solar Commercialization Bill (S.950)** and then adds some to it.

Both bills set a national goal of supplying 20 quads of energy per year by 2000 (roughly 20 percent of our estimated energy demand) with renewable resources. They would also expand the information-dissemination activities of the National Solar Heating and Cooling Information Center, require all Federal fueling stations to dispense gasohol, authorize the Federal Power Marketing Administration to purchase power from generating facilities that use renewable resources, and create a Solar Energy Development Bank. (This last, a low-interest loan program, is nearly identical to the Neal Bill in the House except that the Durkin version places the bank within DOE's Office of Conservation and Solar Applications.)

The Jackson legislation goes on to include a section on the commercialization of wind energy and to require the sale of gasohol at retail outlets. The bill calls for a FY'80 authorization of $100 million for the Solar Bank, $200 million for the wind program, and $1 million to administer programs for meeting the gasohol production goals.

Local and State Energy Planning

Hearings for two bills on state and local energy planning will be held in July. The Carter Administration introduced the **Energy Management Partnership Act (EMPA) (S.1280)** to provide funds for states to undertake comprehensive energy planning. At the same time, Senator Charles Percy (R-IL) has introduced the **Local Energy Management Act (LEMA) (S.930)** to provide grants and technical assistance directly to local governments.

The Solar Lobby will promote joint hearings on these two bills and work for the inclusion of measures that will require recalcitrant states to assess their solar potential. The Lobby will also work to assure that the legislative measures passed during the 95th Congress are implemented in the state energy-management programs.

The Solar Bank

The House version of the Solar Energy Development Bank (HR.605), introduced by Representative Stephen Neal (N.C.), was recently approved by a House Banking subcommittee only to be referred to another subcommittee for separate hearings and mark-up. The bill should reach full committee following the August Congressional recess.

The Administration's recently proposed solar bank (see "No Money Down," page 2) would be financed by the controversial, and as yet, non-existent Energy Security Fund; it would not operate until 1981.

The Solar Lobby will continue to promote the Neal bill to spare the solar industry and consumers the year delay the Administration proposes.

Synfuel Craze

(Continued from page 2)

pensive new synfuel technologies cannot produce any oil or natural gas for at least 10 to 15 years. Environmentalists contend that increased strip mining of coal will damage the land and that increased deep mining will take its toll on the health of workers. Many farmers and city officials in the coal-rich western states also fear that synfuel plants will require large quantites of scarce water. Other critics note that synfuel plants would be centralized facilities controlled by our current energy conglomerates.

Senator Jackson deals with the environmental problems by rolling over them. In fact, Jackson's 98-page bill makes mincemeat of most of the major environmental legislation passed in the last ten years. One Jackson provision would eliminate a requirement for the Secretary of Energy to file environmental impact statements as mandated by the National Environmental Policy Act. Another would sharply limit judicial review of controversial projects and would create an Office of Priority Energy Projects within DOE to shepherd critical energy programs through the permit and regulatory processes.

Freedom from OPEC price increases and supply interruptions is what we all want. But to spend scarce federal resources to develop a depletable, costly, and environmentally-damaging energy sources is the wrong move. Isn't it time Congress vented its political frustrations constructively by speeding the development of renewable resources that will provide energy security to individuals and communities?

SOLAR SCAN

Hot Water For The White House

They're up and running, the White House solar collectors that is. But for all the presidential fanfare, the project was poohpoohed by the press. "It's a shame," said Gordon Preiss of Solar Processes, Inc., Mystic, Connecticut, who installed the system. "Most of the stories I've seen dwell on the question of payback and miss the point of the whole thing."

The $28,000 system heats water primarily for the West Wing offices and the staff mess kitchen (approximately 600 gallons a day) and will save about $1,000 a year on fuel bills. Intertechnology Solar Corporation of Warrenton, Virginia supplied the 32 collector panels.

"First of all, it's unfair to compare an installation at the White House to any other," Preiss explained. "A similar project on another building would have cost less and saved more. The project had unique design requirements specified by the Fine Arts Commission, security precautions, and lags in the production schedule due to Cabinet meetings in the room below, none of which made economic sense. Also, the White House has been heating water with very inexpensive steam from a coal and oil-fired General Services Administration facility."

"But the purpose wasn't to demonstrate economic or technical feasibility; those things have already been established," Preiss continued. "It was a statement endorsing solar energy for the country."

Nearly every president has taken on some project at the White House. For Benjamin Harrison it was installing light bulbs. President Carter chose solar energy.

MUSE

American music has always been closely intertwined with social movements and so it seems only appropriate that some of the leading musicians in the country today are turning their talents toward the movement for safe energy.

At a recent press conference in New York, Jackson Browne, John Hall, Graham Nash and Bonnie Raitt announced the formation of a non-profit organization—Musicians United for Safe Energy (MUSE)—that will sponsor two benefit concerts at Madison Square Garden, September 19th and 20th, with proceeds going to groups working for "a non-nuclear future and safe energy technologies."

Although the ticket prices are unusually high for a rock concert ($18.50), the organizers hope the stellar line up will draw capacity crowds. Other musicians slated to perform include the Doobie Brothers, James Taylor and Carly Simon; other artists are expected to join the bill as the date approaches.

"No Nukes in Our Garden," as the event is called, differs from previous rock benefits in that it is being organized and run by the performers themselves.

"The most exciting thing about the benefit is that it's a cooperative effort on the part of the musicians," said John Hall. "The people who come to the concert will be seeing more than a Jackson Browne set or a Doobie Brothers set. We're going to be performing together." (Hall has a hit single about renewable resources called "Power" on his latest album.)

Energy notables including Dr. Helen Caldicott, Dr. Barry Commoner, Denis Hayes, Dr. Hazel Henderson and Ralph Nader are serving as a scientific advisory board for MUSE.

Solarex

Money is tight everywhere these days but it is particularly scarce for solar businesses. The Solarex Corporation, a photovoltaic manufacturer in Maryland, long exalted as the largest solar cell manufacturer free of oil company involvement, recently sold a minority interest in the firm to Standard Oil of Indiana. Solarex President Dr. Joseph Lindmayer has long resisted oil company offers but this time, he explained, the firm needed capital to finance the construction of an advanced production facility.

"In view of the divergent government policies with respect to photovoltaics," Lindmayer said, "these corporate investments provide Solarex with the means to rapidly move our technology out of the research laboratory and into production." Lindmayer stressed that a majority interest in the company would remain with the original stockholders.

Most of the major oil companies have been dabbling in solar energy development, picking up small companies across the country for the last ten years. (Look for more information on oil company involvement in solar in an upcoming issue of ***Sun Times***.)

SOLAR SCAN

Builders for Solar

The National Association of Home Builders, an important constituency for solar energy but not one of its most avid supporters, is changing its reluctant wait-and-see approach. The Association president, Vondal Gravlee, told a conference of building products manufacturers that "the time has come to make cost-effective solar energy a reality." Gravlee indicated the Association would take a much more active role in promoting solar use. With 37,000 builder-members and 80,000 other members, the Association's support will greatly influence the number of builders involved in solar and will help develop the solar industry.

ARCO Steps Out

ARCO Solar, a subsidiary of Atlantic Richfield Company, is one of the few oil-company-owned photovoltaic firms to go high profile with its marketing promotion strength. At the invitation of Senator John Durkin (D-N.H.), chairman of the subcommittee on energy conservation and supply, the firm brought a photovoltaic-powered mobile home to the Capitol grounds for a week to show members of Congress and the Administration a working example of solar electricity.

A three-kilowatt array (5,616 cells) mounted on the roof of the mobile home powered flourescent lights, an air conditioner, refrigerator/freezer, dishwasher, waste disposer, clothes washer and dryer, and color television. A commuted inverter converted the direct current from the array into alternating current for the appliances. The entire system was connected to the local utility and fed surplus power back into the grid during the sunny afternoons. Outside the trailer a control panel registered the source and amount of electricity being supplied as well as the amount of surplus power going into the utility system.

An ARCO executive likened the exhibit to the first public demonstration of television at the New York World's Fair in 1939. While the ubiquitous tube took less than ten years to develop a reliable market, photovoltaic development will be even faster, say ARCO sales representatives.

In addition to the mobile unit, ARCO displayed photovoltaic-powered equipment and appliances for use in remote areas as well as a scale model of a photovoltaic-powered U.S. community.

The solar cells used in the exhibit currently sell for approximately $7.00 a peak watt. The Department of Energy estimates that this price will drop to about 50¢ a peak watt by 1986.

Changing Plans

Standard Oil Company of Indiana will become the first major oil firm to sell gasohol in the United States when it begins a market test this month in the Midwest. Amoco, the gasoline marketing arm of the company, has asked DOE for an exemption from pricing regulations to allow the price of the gasohol to reflect the full cost of the alcohol content. The company's new-found interest in gasohol surprised renewable-resource advocates in Washington because Standard has been known as an adamant gasohol opponent. British Petroleum, Standard Oil Company of Ohio and Sun Oil Company are also contemplating similar market tests.

ISES

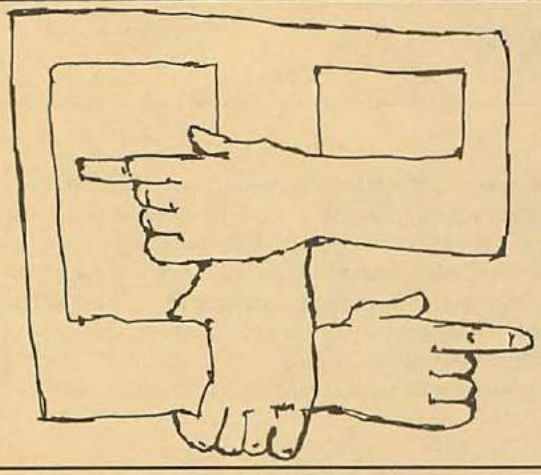
The International Solar Energy Society (ISES), the venerable forerunner of all solar energy organizations, convened for its 25th anniversary in Atlanta with over 2,000 leaders in solar technology development from over 30 countries attending the week long conference.

The technical society was founded by a small group of businessmen and scientists whose interest in solar energy branded them as mavericks. Now, with energy a paramount issue in all countries, ISES has grown in size and stature throughout the world. Several foreign television news crews—from Japan, Belgium, and France—covered the conference to document the growing international groundswell for solar energy.

ISES conferences have traditionally focused on the presentation of technical papers, outlining the refinements made in research over the years. However, as solar energy has grown from a research topic to a popular political and social issue, the ISES membership has just begun to grapple with some of the socio-economic questions as well. Interspersed among the more than 400 technical sessions, a concurrent program, "On the Rise," sponsored by the American Section of ISES, addressed a wide range of issues relating to local solar initiatives. Over 50 of these sessions, including presentations by California Energy Commissioner Ron Doctor, Tennessee Valley Authority Chairman David Freeman, and consumer activist Lola Redford, gave some of the clearest examples of solar energy at work.

These "On the Rise" sessions represent a new bent in the ISES membership, particularly in the American section which includes a growing number of environmentalists, state and local government officials, and community solar leaders. A new concern for the non-technical aspects of solar challenges some of the old precepts of the organization. There are already pressures building for the society to enter political debates, either as advisors or advocates, presenting evidence favoring solar energy development, as countries around the world look for new energy sources.

Australian William Charters, the newly elected chairman of the 15-nation organization, is pleased by the broadening membership and open to the society playing a more "activist" role in energy politics. American Section Chairman Douglas Balcomb, however, feels the organization should remain professionally aloof and has adamantly opposed involvement in any political skirmishes in this country.



THE NETWORK NEWS

Much of the energy for the transition to renewable resources comes from state and local level efforts. Citizens' groups far afield and frequently independent of federal power politics are the high-achievers we keep discovering. As the ***Sun Times*** expands in length, it seems only appropriate that we dedicate some of our new found space to these efforts. We'd like to use this section of the publication to work two ways —to channel information we come across in Washington out to the field, and to spread lessons, anecdotes, and news about local groups on to others. Please submit your contributions to ***Sun Times,*** 1001 Connecticut Avenue, N.W., 5th fl., Washington D.C. 20036.

The Second Annual Citizens' Solar Conference

Solar energy's technical, economic, social and political aspects have all been debated as independent issues at conferences and in other public forums. Next month in Boulder, solar enthusiasts will have the chance to go one better—to sketch a larger picture by combining and adapting a broad range of successful technologies, organizing techniques, and political strategies.

Organizers of the Second Annual Citizens' Solar Conference, "A Convention for a Solar America," stress that the object of the conference is to set realistic regional and local goals for solar development, to lay plans to meet those goals cooperatively, and to build a solar platform to present to the growing number of political candidates paying court to pro-solar constituents. "The conference will gather representatives of national organizations, citizen activists, state and local energy officials, and union leaders to form a truly national coalition for solar energy," according to Larry Shirley, one of the conference organizers at the Center for Renewable Resources.

Five categories of activities will fill the weekend sessions, August 16-19. Plenary sessions will be addressed by Denis Hayes, Chairman of the Board of the Solar Lobby and author of *Rays of Hope,* Amory Lovins, author of *Soft Energy Paths,* and other solar partisans. "Hands-on" workshops will afford participants the chance to test gasohol and construct solar-heated showers. Seminars will consist of 90-minute sessions on skills such as proposal writing, basic energy research techniques, and media liaison-building, while half-day workshops cover broader topics: fund-raising, lobbying, and coalition-building among them. Tours to nearby solar installations will also be offered.

The major focal point of the conference will be the presentation of model solar projects from around the country. Citizen solar groups will present working examples of solar programs that can be duplicated by other groups in other areas, while the skills workshops will teach how to actually implement them. "We hope to stimulate a visible multiplier effect out of the conference," commented organizer Dusky Rhodes. "At this point, show and tell is one of the most successful methods for promoting and explaining solar energy."

The City of Boulder will serve as the center for an array of other solar activities that week. As well as an appropriate technology fair at a downtown mall, the city will host a conference on Community Energy Planning, August 20-22. Sponsored by the Solar Energy Research Institute, the conference is designed primarily for state and local energy officials.

So skeptics and fanatics, as well as the mildly curious, if there is anything you ever wanted to know about solar energy, be in Boulder the week of August 16th. (See perforated cards inserted in this issue for information on registration and accommodations for the Citizens' Solar Conference.)

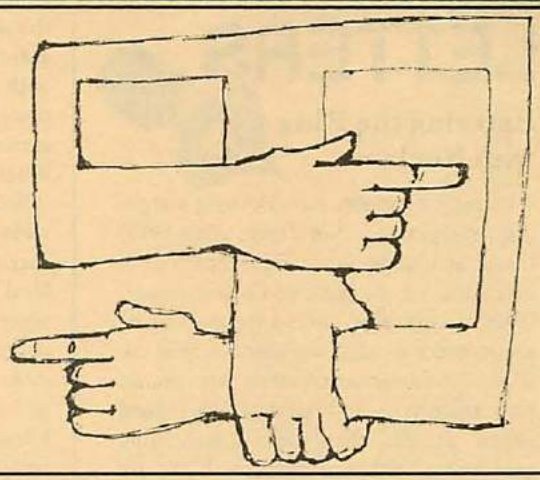
Energy and Ethics

The National Council of Churches, the nation's largest ecumenical organization, has called for a new national energy policy that will develop conservation and renewable resources and not nuclear power. The policy statement, "The Ethical Implications of Energy Production and Use," was endorsed by the Council's Governing Board after a three-year process of research and debate, much of which centered on the nuclear energy section of policy.

The statement calls for an energy policy "which fosters the values of sustainability, fairness and participation." It also calls on members to "challenge traditional modes of thought and behavior." With the policy statement finally in hand, member churches can now actively pursue conservation and renewable resource initiatives within their communities.

(The National Council of Churches has several publications out on different aspects of the energy issue: *Energy and the New Poverty,* by Katherine Seelman, $1.00; *The Energy Suppliers,* by Carter Henderson, $1.00; "The Social Costs of Energy Choices," 90¢; *The Ethical Implications of Energy Production and Use* (a study document with discussion questions and action suggestions), $1.00. To order send checks to the National Council of Churches Energy Project, 475 Riverside Drive (Room 572), New York, N.Y. 10027.)

THE NETWORK NEWS

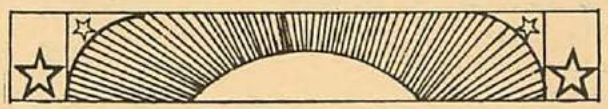


Solar Training Program

The first large-scale training program for solar contractors and installers was announced recently and graced with a $1.5 million Department of Energy grant. The program, to begin this summer, is sponsored by the Sheet Metal and Air Conditioning Contractors National Association and the Sheet Metal Workers' International Association.

The 24-month training program will be set up at six specially outfitted sheet metal schools across the country with a total enrollment of about 300 contractors and 150 installer/instructors. These installer/instructors will then help establish a nationwide training program at 150 industry sites, where more than 11,000 solar installers can be trained each year.

The six solar training facilities will be in Sacramento, Denver, Atlanta, St. Louis, Columbus, and Louisville. For further information contact the Solar Training Institute of the Sheet Metal and Air Conditioning Industry, Suite 405, 1900 L Street, N.W., Washington D.C. 20036.



SUN/REP

Setting a trend that may evolve in other parts of the country, a collection of citizen groups, environmental organizations and local solar advocacy groups in the South have formed a regional coalition to assist the development of local renewable energy projects. The non-profit educational organization SUN/REP (Southern Unity Network/Renewable Energy Projects), recently received a DOE grant to organize an appropriate technology advisory committee for the region. By combining forces, the groups aim to maximize outreach and creative resources. For more information contact SUN/REP, c/o the Georgia Solar Coalition, Suite 412, 3110 Maple Drive, Atlanta, GA 30305.

States Vote for Gasohol

California will require all motor vehicles in the state to run on gasohol by 1982 under legislation passed recently by the Assembly Transportation Committee. Despite strong lobbying from oil companies, the bill was approved 10-0. All gasoline sold in the state after January 1, 1982, is now required to contain 1 percent methanol or ethanol. The blend would be boosted to 5 percent by 1985. The bill also requires electric utilities with capacities of 1,000 megawatts or more to use methanol as an additive to fuel oil or as a primary boiler fuel.

On a different tack, the Nebraska state legislature approved a 1¢ per gallon tax on gasoline to subsidize construction of alcohol fuel production facilities. Estimated at $10 million per year, the tax will provide collateral for governments in the capital city of Lincoln and the surrounding county of Lancaster to issue bonds for the construction of the plants. Six cities in the state are considering building alcohol production plants.

New Ideas, Please

The Department of Energy is looking for new ideas on how to bring state and local governments into solar energy development.

DOE's Advanced Energy Systems Policy Division wishes to identify organizations with ideas for renewable energy systems that can be locally developed and controlled and that are "efficiently matched to local needs in scale and thermodynamic quality."

Organizations that respond should be able to do "innovative planning, research and analysis for the development of renewable energy resources at the local, state and regional level." The analyses should take account of local variations in resource availability, climate, economic activity, and end-use demands. They should also stress low-cost systems that could be developed and marketed quickly and that could involve state and local governments as well as the general public.

Those interested are asked to send a description of their ideas, capabilities and experience in this area (no longer than five pages, please) to DOE, Division of Advanced Energy Systems Policy, Room 6E-068-AC, Forrestal Building, Washington, D.C. 20585.

LETTERS

Entering the Ring with Nuclear

I strongly support Ken Bossong's argument ("Opinion," *Sun Times*, May 1979) that solar advocates can no longer afford to be neutral on the issue of nuclear power. If we are tiptoeing around the nuclear issue in order to hold together a fragile coalition of faint-hearted allies who would turn against us and solar if we turned against nuclear, then there is something very wrong with our alliance. If we are afraid our labor support would vanish if we oppose nuclear plants, then we have done a poor job of persuading our labor friends of the dangers of nuclear power and the clear advantages of solar and conservation job opportunities.

Nuclear power is not a separate issue we can afford to ignore. Because of the direct competition for funds, any nuclear development adversely affects the advancement of solar.

We are all too familiar with the shortfalls of public money for solar and conservation. But what about the use of private sector money? According to *Business Week* (May 28, 1979), private utility expansion projects over the next 15 years, even under low-growth forecasts, will require at least $500 billion in new capital, much of it for new nuclear and coal capacity.

Besides cutting off capital from renewable projects, such investments in nuclear seriously limit any future flexibility for utilities. Once they are mortgaged to the hilt and tied down to huge power plants for three or more decades, utilities couldn't promote conservation or decentralized renewables even if they wanted to.

If we are serious about solar energy, we cannot sit idly by and watch capital continue to flow to nuclear development. Although some are timid about joining in anti-nuclear demonstrations or dealing with the heated issue of nuclear safety, there is a real need to carry the positive message of solar into those forums where it has not yet been heard.

Solar Lobby should coordinate a nationwide campaign spearheaded by well-prepared task forces at both the state and local level whose mission will be to convince utilities and regulatory commissions not to license and build even one more nuclear plant. Armed with economic studies of individual utility service areas showing kilowatt by kilowatt the advantages of conservation and renewables, such groups could intervene in NRC licensing cases and state rate-making, demand forecasting and siting hearings. The groups could also prepare workable, realistic plans tailored to the local level to show how alternatives can be financed and implemented.

We will not be taken seriously as solar advocates unless we begin to meet the nuclear promoters on their own turf and turn some of their massive investment toward renewables.

Willie Osborn
Renewable Energy Consultant
Boston, MA
(former director of the
Massachusetts Solar Action Office)

Regarding Nuclear Neutrality

I've put off renewing my membership for a long time, but the May ***Sun Times*** has prompted me to continue my support.

I wish to voice my approval of Solar Lobby's approach to energy politics. Why alienate "borderline" solar supporters who might be turned off by "radical" teeth-gnashing? Three Mile Island has already tipped the scales your way. I think your positive approach is the best way to enlist potential converts.

Anne Beattie
Germantown, OH

I accept nuclear power while I support solar. As we learn how to make complete and acceptably priced solar systems, I, too, will demand the elimination of nuclear. Meanwhile, nuclear power is our cheapest supply of base load electricity. Suffering from the environmental and safety hazards of the next cheapest option, coal, is far more likely than suffering a nuclear catastrophe.

Jack Andressen
Old Greenwich, CT

I am against nuclear power—not so much for what might happen in the U.S. but for what might happen in countries where safety is given little consideration. Still, I'm on the fence as to whether Solar Lobby should make a prompt blanket statement against nuclear.

I see some arguments for it, mainly the ones Ken Bossong raised. But, I think there is a risk that Congress could misinterpret the mission of the Solar Lobby. They may conclude that the Lobby is made up of people who are less interested in solar than they are frightened by nuclear.

I think the question is really more complicated than merely establishing Solar Lobby's position. We must know the context. Will other countries continue to develop nuclear power? Could safety at our plants be increased tenfold? Would a shift to coal entail killing 1,000 additional coal miners every year? How many people would lose work? How many homes would be cold this winter?

Bill Shurcliff
Cambridge, MA

SUN TIMES
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SHALL WE SACRIFICE UTAH'S CANYON COUNTRY?

Southern Utah is wild, spectacular canyon country. National Park country. Recreation country. Because it is too rugged and arid to farm and lacks operable timber, it will never be anything else. Or so many Americans thought.

But they overlooked one resource -- coal. And they didn't allow for the rapaciousness of an energy-wasteful Nation when it began to run out of oil.

Now southern Utah is about to become a National Sacrifice Area. Only a ground swell of public concern throughout the Nation for this great natural heritage will save it. Here's what's happening:

The Department of the Interior is actively considering a collection of industry proposals that would initiate one of the largest, most expensive coal-mining operations ever undertaken in the West. The site is in southern Utah on the Kaiparowits and Colorado Plateaus, in the heartland of Utah's National Parks and undeveloped canyon country. Largely public land, it's owned by all Americans.

The Southern Utah Regional Environmental Statement recently prepared by the Department of the Interior contains the energy developers' plans. The statement makes it clear that environmental and socio-economic effects of the projects would dwarf those of the huge, ill-advised Kaiparowits Project which conservationists helped kill a few years ago. Here are the plans:

Developmental Destruction

• A 237 mile railroad would be built from Cedar City, Utah, to haul 30 to 40 million tons of coal each year from 20 or more deep mines on the Kaiparowits Plateau. The railroad alignment would bisect the Colorado Plateau and parallel U. S. Highway 89, one of the most popular and scenic tourist routes in the Southwest. It would approach the Bureau of Land Management's Paria Primitive Area and cut across the proposed Cockscomb Wilderness, a geologically unique sandstone upwarp. Trains arriving or leaving the coal-mine region hourly would eliminate the wild character of the magnificent landscape.

• The Allen-Warner Valley Project would involve two large strip mines in the Alton Hills near Bryce Canyon National Park. The mines would provide 10.5 million tons of coal yearly via slurry lines to two power plants. The 2,000 megawatt Allen Plant would be located near the Desert National Wildlife Refuge northeast of Las Vegas, Nevada. The 500 megawatt Warner Valley Plant would be situated 23 miles upwind of Zion National Park in southwestern Utah.

• An 11,360 acre strip mine in the famed Henry Mountains, four miles east of Capitol Reef National Park, would provide two million tons of coal annually. The strip mine would destroy 6,210 acres of crucial winter range of one of the nation's last free-roaming herds of buffalo. Coal-hauling diesel trucks, arriving and leaving every two minutes, 18 hours a day, would shatter the solitude of the area.

• A combination of strip and deep-mining operations producing five million tons of coal a year would desecrate the large sculptured bowl of the Paria Amphitheater, which includes Bryce Canyon National Park. Strip-mining would take place in a highly scenic area below the colorful Pink Cliffs of the Aquarius Plateau, adjoining a proposed national forest Table Cliffs Wilderness.

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Impacts and Impairment

Other environmental impacts of the energy development proposals include serious impairment of southern Utah's pristine air quality and visibility. The industrial complex would belch over 30,000 tons of particulates yearly into the air -- seven times the amount that the huge Kaiparowits Project would have produced! Strip mines could violate present Class I air quality standards.

Mining and associated developments would eliminate the vegetation and wildlife habitat on more than 50,000 acres and render many thousands of acres of nearby habitat largely useless.

A ten-fold increase in human population, from some 7,000 to nearly 80,000 residents, would place excessive pressure on wildlife populations, cause overcrowding of National Parks and other recreational resources. Endangered bald eagles, bighorn sheep, elk, mountain lions and other wilderness-associated species would suffer from loss of wild habitat and increased human depredations.

Drastic reduction in water quality would result from major surface erosion, coal dust, lime, heavy metals, salts and industrial wastes. These would ultimately end up in Lake Powell and the Colorado River. The salts would increase the already excessive salinity of the Colorado.

Coal boomtowns near Glen Canyon City, Escalante, Alton, Tropic and Hanksville, Utah, would permanently alter rural, quality lifestyles. Gross inadequacies in social services, hospitals, schools, fire protection, water and sewer systems and law enforcement would result. Increased crime would compound the social impacts.

Despite all this environmental destruction, mining techniques planned for the Kaiparowits Plateau would actually leave 65 percent or more of the coal, nearly 3 billion tons, below ground and unrecoverable for future use!

But that's not all. No specific plan for use of the coal accompanies the proposals. Yet, Union Pacific Railway and other firms have advised that the natural market for the coal is to supply increasing electrical energy demands of distant urban centers -- in California, and for export to Japan!

Conservationists' Alternatives

Conservationists believe that much more than corporate-energy economics must be seriously considered before irreversibly committing this largely primeval region to wide-scale industrialization and destruction. The Colorado Plateau, with its heartland of magnificent National Parks and proposed Wilderness Areas, simply cannot accomodate such massive industrial development without major sacrifice of the tremendous natural values already set aside here "to remain unimpaired for the enjoyment of future generations". The Kaparowits Plateau is too sensitive, environmentally and scenically, for the planned coal-mining complex. Present techniques of deep-mining these coal deposits are extremely wasteful, causing large-scale destruction of natural landscapes. Proponents have not demonstrated the need for the proposed energy development.

Conservationists urge adoption of the following alternatives:

1. Apply broad energy conservation measures in the energy load centers -- where major waste is commonplace.

continued...

2. Make increased use of solar, wind, biomass and other renewable resources to meet proper energy needs.

Secretary of the Interior Cecil Andrus needs your support to make sound resource management decisions in the long-range public interest. If you agree that the irreplaceable National Parks and wild canyon country of the Southwest should not be made a National Sacrifice Area, you can help! Conservationists can prevent this catastrophe!

Call To Action! *(1) Write to Cecil Andrus, Secretary of the Interior, Washington, DC 20240. (2) Urge him to reject coal mining and related development plans in the Southern Utah Regional Environmental Statement. (3) Ask that he designate the surface (strip) mine sites as "unsuitable for mining" under Section 522 of the Surface Mining Control and Reclamation Act of 1977. (4) Request that the Kaiparowits Plateau be protected from planned coal mining developments by designating it as an Area of Critical Environmental Concern. (5) Get your friends to write, also!*

BLM REVIEWS WILDERNESS

The U. S. Forest Service isn't the only federal land agency to be interested in the wilderness potential of the wild country it administers.

Since 1971, the Service has been in the public spotlight with its RARE program (Roadless Area Review and Evaluation).

But now the Bureau of Land Management (BLM), which manages over 173 million acres of public lands in the West, has gotten into the act. The BLM is in the Department of the Interior.

The "act" is the Federal Land Policy and Management Act of 1976. Section 603 of this law requires the Secretary of the Interior to study and recommend to the President by 1991 the roadless areas over 5,000 acres on the public lands that should be established as wilderness. The President will send his recommendations to Congress, and Congress will make the final decisions.

The 1976 law also directs the Secretary to report to the President by July 1, 1980, his recommendations on 55 administratively established Primitive Areas and Natural Areas. The BLM calls these units "instant study areas" and has given them evaluation priority over the other areas to meet the 1980 deadline.

In determining wilderness values, the law directs the BLM to use the criteria contained in Section 2(c) of the 1964 Wilderness Act. The 1964 law defines wilderness essentially as an area of undeveloped federal land in a natural condition, without permanent improvements or human habitation. It must have opportunities for solitude or a primitive and unconfined type of recreation. The area may also contain ecological, geological or other features of scientific, educational, scenic or historical value.

The wilderness review process consists of three phases: inventory, study and proposal to Congress. Phase I is made up of two inventory stages, initial and

continued...

intensive. The Bureau is now at the point of initial inventory, which entails a 90 day public comment period on all BLM roadless areas that show wilderness potential in each state. For most states, this period will end by mid-summer.

The BLM recently announced its tentative initial inventory of possible wilderness in the West. This resulted in dropping more than 115 million acres that lacked wilderness potential and selecting nearly 57 million acres for intensive inventory. A summary by states of the acreages recommended for intensive review appears in this report.

State	Total BLM Acreage In State (Approx.)	Acreage Selected For Intensive Inventory
Arizona	12,500,000	5,600,000
California	15,500,000	7,576,000
Colorado	8,300,000	1,170,000
Idaho	12,000,000	3,703,000
Montana	8,100,000	2,700,000
Nevada	48,300,000	19,644,000
New Mexico	13,000,000	1,900,000
Oregon/Washington	16,000,000	6,814,000
Utah	22,700,000	6,360,000
Wyoming	17,400,000	1,219,000
Totals	173,800,000	56,686,000

The potential BLM wilderness areas range from the alpine summits of the Powderhorn in Colorado to the Dark Canyon country of Utah and the California Desert beyond. They encompass areas in the Ruby Mountains of Montana to the Vermillion Cliffs in Arizona and the Big Hatchet Mountains of New Mexico. The areas contain some of the most colorful and spectacular wild landscapes on the continent. Most of them deserve a permanent place in the National Wilderness System.

After the public comment period, each BLM state director will announce an additional number of areas to be dropped from further consideration and a list for closer wilderness review. From these studies, following another 90 day comment period, will come the BLM national director's decision regarding the areas to be proposed as wilderness. These proposals will go to the Secretary of the Interior for Presidential and Congressional action.

The inventory, evaluation and proposal stages provide numerous opportunities for conservationists to influence the decisionmaking. The American Wilderness Alliance urges them to get involved.

Conservationists can obtain more information about the areas and the review process by writing or calling the State Director, Bureau of Land Management, at the following locations:

ARIZONA: 2400 Valley Bank Center, Phoenix, AZ 85073
CALIFORNIA: Federal Bldg., 2800 Cottage Way, Sacramento, CA 95825
COLORADO: Colo. State Bank Bldg., 1600 Broadway, Room 700, Denver, CO 80202
IDAHO: P. O. Box 042, Boise, ID 83724
MONTANA, NORTH & SOUTH DAKOTA: P. O. Box 30157, Billings, MT 59107
NEVADA: Room 3008, Federal Bldg., Reno, NV 89509
NEW MEXICO, OKLAHOMA, TEXAS: P. O. Box 1449, Santa Fe, NM 87501
OREGON, WASHINGTON: P. O. Box 2965, Portland, OR 97208
UTAH: Univ. Club Bldg., 136 East South Temple, Salt Lake City, UT 84111
WYOMING: P. O. Box 1828, Cheyenne, WY 82001

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2239 E. Colfax Ave., Denver
Colo. 80206 (303) 355-3554

Rev. Richard Magnus, Chairman
Lutheran Campus Ministry at Auraria

Richard Butler
Denver Catholic Community Services
Santiago Chavez
Chicano Affairs-Catholic Archdiocese of Denver
Jock Cobb, M.D.
University of Colorado Medical Center
Barbara Coopersmith
Antidefamation League of B'Nai B'Rith
Chic St. Croix
Oil, Chemical, and Atomic Workers International Union, AFL-CIO
Hiawatha Davis
Denver Opportunity, Inc.
Joe Giron
Brothers Redevelopment, Inc.
Bayonne Holmes
Urban League of Colorado, Inc.
Thomas B. Jenkins
Colorado Opportunities Industrialization Center
James H. Joy
American Civil Liberties Union of Colorado
Mac McLaughlin
Episcopal Diocesean Committee on Social Concerns
Felicia Multic
Metropolitan Denver District Attorney's Consumer Office
Ted Neptune
Rio Blanco Oil Shale Company
Norman Pledger
Colorado AFL-CIO
Eve Rodriguez
Regional Transportation District
Rev. Larry Watson
Rocky Mountain Conference — United Church of Christ
Dan Wiedemeier
Mountain Bell
Morey Wolfson
Environmental Action of Colorado

Roger Kahn, Executive Director

July 26, 1978

Mr. Ralph "Butch" Clark III
Crested Butte, Colorado 81224

Dear Butch:

It was good seeing you at the Energy Conservation Conference in Gunnison. I particularly enjoyed your remarks.

I'm enclosing a copy of a speech that I gave recently. If you have any feedback, I'd appreciate your comments.

Best Regards,

Roger Kahn
Executive Director

RK:dd

Enclosure

"TOWARD A NEW ENERGY POLITICS"

by

Roger Kahn
Executive Director
Colorado Coalition for Full Employment

A speech presented at the Fourth Annual Conference on Alternative State and Local Public Policies.

July 14, 1978

Earnings Reflect Foreign Currency Fluctuations

Estimated consolidated earnings for the third quarter of 1976 were $635 million, $1.42 per share, down 3.8 percent from restated 1975 third quarter earnings of $660 million, $1.47 per share. Revenues totaled $12,902 million in the third quarter of 1976 as compared with $12,269 million in the same period of 1975.

In the first nine months of 1976, earnings were $1,960 million, $4.38 per share, on revenues of $38,475 million. This is an increase of 5.0 percent from restated earnings in the first nine months of 1975 of $1,867 million, $4.17 per share, on revenues of $35,906 million. The 1976 earnings were 5.1 cents per dollar of total revenue, essentially the same as in 1975.

Restatement of Earnings

The 1975 per share earnings have been restated to reflect the two-for-one stock split effective July 14, 1976. The 1975 total and per share earnings have also been restated to reflect the adoption, in late 1975, of the Financial Accounting Standards Board's standard on foreign exchange translation.

With exchange rates fluctuating widely, the adoption of this new accounting standard has had a considerable impact on Exxon's earnings and their comparisons with prior periods. For example, under the new standard, each quarter's earnings include changes from translating into dollars foreign affiliates' local currency balance sheets. This reduced third quarter's earnings by $33 million as compared to gains of $296 million recognized in the same quarter a year ago. For the nine months, there were gains of $92 million and $217 million in 1976 and 1975, respectively. In the absence of these foreign exchange effects, worldwide earnings would have been up 13 percent in the first nine months of 1976.

Highlights of the Earnings Report

The results of the first nine months of 1976 and a comparison with 1975 figures included the following:

- Earnings in the first nine months of 1976, expressed as an annual return on shareholders' equity, were 14.9 percent as compared with 15.3 percent for the full year 1975.
- Worldwide earnings from petroleum and natural gas operations, excluding foreign exchange gains, totaled $1,715 million in 1976, up about 12 percent from 1975.
- In the United States, petroleum and natural gas earnings increased 18 percent to $958 million. Principal factors contributing to the increase were increased realizations on natural gas and a 15 percent rise in petroleum product sales volume.
- Abroad, petroleum and natural gas earnings declined 8 percent. In the absence of the foreign exchange gains these earnings would have been up 5 percent. The effect of higher sales volumes and prices for petroleum products and natural gas more than offset lower earnings from Venezuela, following the year-end 1975 nationalization in that country.
- Worldwide chemical earnings improved by 20 percent to $161 million. In the United States where sales volumes were up 32 percent, earnings increased $40 million to $114 million. Despite volume increases abroad, price improvements did not keep pace with rising costs, resulting in lower earnings.
- The previously reported extension of LIFO inventory accounting to worldwide operations, effective January 1, 1976, reduced the nine months 1976 earnings by about $55 million, $0.12 per share.

Capital and Exploration Expenditures

In the nine months of 1976 capital and exploration expenditures totaled $3,770 million, almost twice the amount of earnings. Expenditures were up $696 million from the comparable period of 1975. Of the 1976 amount, 56 percent was spent in the United States, including $1,711 million for exploration and development of new oil, gas and other energy sources.

A report available to shareholders in mid-January will summarize an address by Chairman C. C. Garvin, Jr. made at the invitation of the Houston Society of Financial Analysts during its December meeting. The brochure will also include key questions and answers from that meeting as well as other recent meetings held with financial and investment advisors in Atlanta, Chicago, New York and Rochester. For copies, write Mr. R. E. Anderson, Secretary, Exxon Corporation, 1251 Ave. of the Americas, New York, N.Y. 10020.

Comments or questions concerning the Corporation and requests for the quarterly financial and operating data, which will be available five weeks prior to the dividend payment date, should be addressed to Mr. R. E. Anderson, Secretary, Exxon Corporation, 1251 Avenue of the Americas, New York, New York 10020.

Address changes as well as inquiries about dividends and stock transfer requirements should be sent to our agent, Morgan Guaranty Trust Company of New York, Post Office Box 7600, Church Street Station, New York, New York 10249. Please include your name as shown on your stock certificate, your address, telephone number, and Exxon shareholder account number which is shown on your dividend check.

Consolidated Financial and Operating Data

(Financial data are unaudited and expressed in millions)

Income Statement	Third Quarter 1976	Third Quarter 1975	First 9 Months 1976	First 9 Months 1975
Revenue:				
Sales and other operating revenue	$12,716	$12,032	$37,807	$35,199
Dividends, interest and other revenue	186	237	668	707
Total revenue	12,902	12,269	38,475	35,906
Costs and other deductions:				
Crude oil and product purchases	6,471	5,534	19,511	15,830
Operating expenses:				
Exploration expenses, including dry holes	117	95	289	273
Selling, general and administrative expenses	713	666	2,080	2,000
Depreciation and depletion	359	403	1,053	1,103
Other operating expenses	1,106	935	3,171	3,155
Income and other taxes	3,373	3,850	10,040	11,274
Interest expense	105	85	287	294
Income applicable to minority interests	23	41	84	110
Total deductions	12,267	11,609	36,515	34,039
Net income	$ 635	$ 660	$ 1,960	$ 1,867
Net income per share	$ 1.42	$ 1.47**	$ 4.38	$ 4.17**

Summary of Financial Position	September 30 1976	September 30 1975
Cash	$ 976	$ 1,202
Marketable securities	3,642	3,253
Securities purchased under resale agreements	365	64
Notes and accounts receivable	4,936	4,900
Inventories:		
Crude oil, products, and merchandise	3,730	3,653
Materials and supplies	425	456
Prepaid taxes and other expenses	448	633
Total Current Assets	14,522	14,163
Property, plant and equipment—net	18,139	16,117
Investments and other assets	2,637	2,060
Total Assets	35,298	32,340
Notes and loans payable	1,766	1,658
Accounts payable and accrued liabilities	7,237	6,584
Income taxes payable	866	1,136
Total Current Liabilities	9,869	9,378
Long-term debt	3,784	3,165
Reserves, deferred credits and other liabilities	3,529	3,133
Total Liabilities	17,202	15,676
Capital	2,602	2,580
Earnings reinvested	15,494	14,084
Total Shareholders' Equity	$18,096	$16,664

Distribution of Earnings				
Petroleum and natural gas operations:				
United States	$ 321	$ 305	$ 958	$ 814
Other Western Hemisphere	73	40	165	223
Eastern Hemisphere	209	312	700	717
Chemical operations:				
United States	35	32	114	74
Foreign	—	(6)	47	60
Other	(3)	(23)	(24)	(21)
Consolidated totals	$ 635	$ 660	$ 1,960	$ 1,867

Sources and Uses of Working Capital	First 9 Months 1976	First 9 Months 1975
Sources:		
Net income	$ 1,960	$ 1,867
Depreciation and depletion	1,053	1,103
Other funds from operations	394	(242)*
Working capital provided from operations	3,407	2,728
Additions to long-term debt	655	439
Other	286	65
	4,348	3,232
Uses:		
Additions to property, plant and equipment	3,111	2,484
Cash dividends to Exxon shareholders	907	839
Other	357	365
	4,375	3,688
Net increase/(decrease) in working capital	$ (27)	$ (456)

Miscellaneous Financial Data				
Detail of income and other taxes:				
Income taxes	$ 1,183	$ 1,758	$ 3,875	$ 5,337
Excise taxes	781	734	2,233	2,251
Other taxes and duties	1,409	1,358	3,932	3,686
Total taxes	$ 3,373	$ 3,850	$10,040	$11,274
Percent of total revenue	26.1	31.4	26.1	31.4
Effective income tax rate-percent	65.1	72.7	66.4	74.1
Net income as a percent of total revenue	4.9	5.4	5.1	5.2
Average number of shares (000's)			447,671	447,286**
Capital and exploration expenditures	$ 1,539	$ 1,067	$ 3,770	$ 3,074
Exploration and development expenditures	$ 1,189	$ 721†	$ 2,800	$ 1,990†

*After effect of reclassification to state deferred tax amounts included above on a basis comparable with full-year 1975.
**Based on average number of shares outstanding after the two-for-one stock split effective July 14, 1976.
†Restated for comparability.

Operating Data (thousands of barrels a day)

	Third Quarter 1976	Third Quarter 1975	First 9 Months 1976	First 9 Months 1975
Gross production of crude oil and natural gas liquids, including offtake under special arrangements	5,545	5,435	5,499	5,421
Refinery runs	4,475	4,275	4,309	4,308
Petroleum product sales	5,110	4,756	5,225	4,896
Natural gas sales (billions of cubic feet a day)	8.8	9.3†	10.4	10.4†
Chemical product sales, including sales and transfers to petroleum affiliates (millions of dollars)	921	754	2,803	2,182

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EXXON CORPORATION

1251 AVENUE OF THE AMERICAS, NEW YORK, N.Y. 10020

C. C. GARVIN, JR.
Chairman of the Board

August 18, 1977

DEAR SHAREHOLDER:

Congress is in the final stages of deliberation on legislation which, if enacted, will not only seriously delay petroleum exploration and development on the nation's Outer Continental Shelf (OCS), but also could be the first step toward a federal oil and gas company (FOGCO). The bill is entitled the OCS Lands Act Amendments of 1977. The Senate has already passed its version of the bill (S.9), and the House is expected to act on its version (H.R. 1614) in early September.

Principal features now in both versions of the bill include new and lengthy procedures for the states' involvement in OCS leasing, mandated use of new and untried leasing methods, separate leases for exploration and production (so-called dual leasing) and authorization of exploratory drilling by the federal government. These features, together with recent slippage of the OCS lease sale schedule and new provisions in the Coastal Zone Management Act, would delay OCS development an estimated two to four years, thus increasing oil imports in 1985 by as much as two million barrels per day. In addition, the federal exploration provisions could lead to a FOGCO type of bureaucracy which would be extremely costly to the consumer and threaten our competitive private enterprise system.

Proponents of this legislation have contended that such amendments to the existing OCS Lands Act of 1953 are needed to assure efficient and environmentally safe development of the OCS, and to enable the federal government to obtain a fair market value for its leases. We believe existing laws already provide for such development, and for adequate involvement by adjacent states; and that the proposed amendments are not only unnecessary, but will prove counterproductive. Further, current government revenues from OCS leases (bonuses, rentals, royalties and income taxes) are more than fair, as evidenced by the fact that oil and gas company returns on OCS investments have been considerably less than the average return for all of U.S. manufacturing.

We believe that you will share our concerns about this proposed legislation, particularly those provisions allowing exploratory drilling by the federal government, and that you will agree that such legislation is undesirable. If this is the case, you may wish to contact your congressman promptly and provide him with your views on this vital issue.

Sincerely yours,

C C Garvin

THANK YOU.

I WORK WITH A NONPROFIT, COMMUNITY EDUCATION ORGANIZATION CALLED THE COLORADO COALITION FOR FULL EMPLOYMENT. OUR PRIMARY GOAL IS TO CREATE A SOCIETY IN RURAL AND URBAN COLORADO IN WHICH EVERYONE WHO WANTS TO WORK IS ABLE TO DO SO AT A JOB THAT HAS MEANING FOR THAT INDIVIDUAL AS WELL AS FOR THE COMMUNITY IN WHICH HE OR SHE LIVES. ADDITIONALLY, BECAUSE OF THE INCREDIBLE MAJESTIC BEAUTY OF THE COLORADO LANDSCAPE--AND THAT IS CLEARLY WHAT ATTRACTED THE MAJORITY OF OUR PRESENT RESIDENTS--WE ARE PARTICULARLY CONCERNED THAT JOBS WHICH ARE CREATED KEEP THE INTEGRITY OF OUR VERY DELICATELY BALANCED ENVIRONMENT INTACT.

THE TWIN CONCERNS OF EMPLOYMENT AND ENVIRONMENT AND THE WAYS IN WHICH THEY INTERSECT HAVE CAUSED US TO THINK ABOUT THE COLORADO ECONOMY AND WHAT'S HAPPENING TO IT, AND PARTICULARLY TO THINK ABOUT WHAT EFFECT THE INCREASED NATIONAL DEMAND FOR ENERGY PRODUCTION WILL HAVE ON US. I'D LIKE TO SHARE SOME OF THAT THINKING WITH YOU TODAY AND, IN THE PROCESS, BEGIN A DIALOGUE ABOUT WHAT WE THINK SHOULD BE CONSIDERED IN FORMULATING A RATIONAL AND COMPREHENSIVE ENERGY PLAN, WHAT KINDS OF PROGRAMS NEED TO BE STIMULATED, AND WHAT NEEDS TO BE DONE IN ORDER TO BUILD SUPPORT FOR THESE ACTIVITIES.

WHEN WE THINK ABOUT THE TRADITIONAL COLORADO ECONOMY AND THE INDUSTRIES THAT FORM ITS BASIS, WE THINK OF AGRICULTURE FIRST, TOURISM AND RECREATION SECOND, AND THEN MINERAL PRODUCTION. NONE OF THESE INDUSTRIES REQUIRE LARGE RESIDENTIAL POPULATIONS, AND IN A SEMI-ARID STATE WHERE WATER IS ALL TOO SCARCE, THAT IS A MAJOR ASSET. AGRICULTURE AS WELL AS TOURISM AND RECREATION, MOREOVER, ARE ECONOMICALLY DEPENDENT ON A PURE ENVIRONMENT. AGRICULTURE NEEDS GOOD WATER FOR IRRIGATION AND GOOD LAND FOR FOOD PRODUCTION: TOURISM AND RECREATION NEED GOOD WATER FOR FISHING, CAMPING, KAYAKING, SKIING, ETC., AND UNSPOILED VISTAS TO ATTRACT VISITORS.

IT IS WORTH NOTING THAT THESE TWO LEADING COMPONENTS OF THE COLORADO ECONOMY ARE PART OF THE NATIONAL INTEREST. CLEARLY, FOOD PRODUCTION IS IN THE NATIONAL INTEREST; WE ALL HAVE TO EAT. LESS OBVIOUSLY BUT EQUALLY CERTAIN, TOURISM AND RECREATION ARE PART OF THE NATIONAL INTEREST TODAY. ALL ONE HAS TO DO, EVEN FOR A SINGLE SEASON, IS SERVICE THE NEEDS OF THE TOURISTS FROM NEW YORK CITY, CHICAGO, ATLANTA, HOUSTON, AND LOS ANGELES WHO COME TO COLORADO'S MOUNTAIN COMMUNITIES TO UNDERSTAND THAT IN OUR PRESSURIZED, INDUSTRIAL SOCIETY WHERE PEOPLE LEAD LIVES OF <u>NOT</u> SUCH QUIET DESPERATION, THERE

MUST BE PLACES WHERE PEOPLE CAN GO TO REGENERATE THEIR WORN SOULS AND RE-CREATE THEMSELVES SO THEY CAN ONCE AGAIN RETURN TO THEIR HOME COMMUNITIES AND FIGHT THEIR DAILY BATTLES.

SO WHEN THE PRESIDENT OF THE UNITED STATES DECLARED THAT OUR ENERGY SITUATION MUST BE VIEWED AS THE MORAL EQUIVALENT OF WAR, WE IN COLORADO PANICKED. NOT ONLY DID WE UNDERSTAND, BECAUSE WE HAD LIVED THROUGH THE VIETNAM ERA, THAT WAR HAS NO MORALS, BUT WE WERE SPECIFICALLY CONCERNED THAT, BECAUSE OF OUR EXTREMELY VAST RESERVES OF OIL, GAS, OIL SHALE, URANIUM, ETC., COLORADO NOT BECOME ANOTHER BEN SUC, WHICH AS YOU WILL REMEMBER, WAS THE VIETNAM VILLAGE THAT HAD TO BE DESTROYED IN ORDER TO SAVE IT.

WE WORRIED THAT OUR ECONOMY, LIFESTYLES, AND THE ENVIRONMENT ON WHICH BOTH WERE BASED WOULD BE DESTROYED. IT IS AGAINST THIS BACKGROUND, A STRUGGLE FOR SURVIVAL IF YOU WILL, THAT WE HAVE BEEN THINKING ABOUT ENERGY PRODUCTION AND CONSUMPTION IN THE U.S.

ENERGY POLICIES MUST BE DESIGNED TO MEET THE NEEDS OF RURAL PRODUCING AREAS AS WELL AS THOSE URBAN AREAS WHERE THE GREAT PROPORTION OF ENERGY GENERATED IS CONSUMED. THESE POLICIES MUST FOCUS BOTH ON SHORT AND LONG-TERM NEEDS, AND THEY MUST DISTINGUISH

BETWEEN CONVENTIONAL ENERGY PRODUCTION--OIL, GAS, AND COAL--AND ALTERNATIVE ENERGY PRODUCTION--SOLAR, WIND, WATER, GEOTHERMAL, BIOMASS CONVERSION AND THE LIKE.

MOREOVER, THERE ARE SOME FUNDAMENTAL PRINCIPLES WHICH MUST GUIDE OUR QUEST FOR SANE ENERGY POLICIES. ENERGY POLICIES FOR PRODUCTION (AND CONSUMPTION) SHOULD EMPHASIZE EMPLOYING AS MANY PEOPLE AS POSSIBLE; THEY SHOULD FAVOR ENVIRONMENTAL INTEGRITY; THEY SHOULD STRESS PHYSICAL SAFETY: THEY SHOULD PROVIDE ENERGY AS CHEAPLY AS POSSIBLE TO THE CONSUMER: AND FINALLY, ENERGY POLICIES SHOULD ENCOURAGE THE FULL UTILIZATION OF WHATEVER AVAILABLE HUMAN AND ENVIRONMENTAL RESOURCES EXIST AT A LOCAL LEVEL.

OIL, GAS, AND COAL, THOSE FORMS OF CONVENTIONAL ENERGY PRODUCTION MOST LIKELY TO SUPPLY OUR ENERGY DEMANDS IN THE SHORT RANGE, MUST CONFORM TO THESE PRINCIPLES. THIS MEANS, FOR EXAMPLE, THAT UNDERGROUND COAL MINING, WHICH IS MUCH MORE LABOR INTENSIVE THAN SURFACE OR STRIP MINING, MUST RESPECT ENVIRONMENTAL CONSIDERATIONS INSIDE THE MINE WHERE WORKER ENVIRONMENTAL AND SAFETY ISSUES ARE PARAMOUNT, AS WELL AS OUTSIDE THE MINES. COAL COMPANIES MUST EMPLOY ADDITIONAL PEOPLE TO SUPRESS COAL DUST (HELPING TO MINIMIZE BLACK LUNG), TO DRAIN WATER

FROM THE MINES, AND TO INSTALL, CHECK, AND MAINTAIN ROOF BOLTS AND SUPPORT BEAMS (TO PREVENT CAVE-INS). ALL MINES, BUT SURFACE MINES IN PARTICULAR, SHOULD HAVE TO RECLAIM, REVEGETATE, AND REFOREST THE LAND AFTER THE COAL HAS BEEN TAKEN FROM THE EARTH.

ON THE CONSUMING SIDE OF THE EQUATION, BECAUSE COAL IS SO DIRTY, INDUSTRIAL AIR AND WATER POLLUTION ABATEMENT REQUIREMENTS MUST BE ADHERED TO STRICTLY, AND THIS ALSO CREATES MORE JOBS AND EMPLOYS MORE PEOPLE. INCIDENTLY, BECAUSE COAL EXTRACTION--AND OTHER FORMS OF MINERAL EXTRACTION AS WELL--USE SO MUCH WATER, IT IS IMPORTANT FOR THAT WATER TO BE RECYCLED SOMEHOW SO IT CAN BE USED FOR THE OTHER INDUSTRIES WHICH ARE BASED IN OUR RURAL AREAS.

UNDOUBTEDLY, THERE ARE ADDITIONAL COSTS ATTACHED TO THESE REQUIREMENTS, SO IT MUST BE POINTED OUT THAT THIS DOES NOT CONFLICT WITH THE PRINCIPLE OF PROVIDING NEEDED ENERGY TO THE CONSUMER AS CHEAPLY AS POSSIBLE. CORPORATE PROFITS ARE SO LARGE IN CONVENTIONAL FORMS OF ENERGY PRODUCTION THAT IT CAN BE REASONABLY ARGUED THAT THE ENERGY PRODUCING CORPORATIONS SHOULD ABSORB THE ADDITIONAL COST OF THESE PROGRAMS OUT OF PROFIT AND STILL BE ABLE TO ATTRACT INVESTORS.

THIS, IT SEEMS TO ME, IS WHY OPPOSITION TO THE DE-REGULATION OF

GAS SHOULD BE ENCOURAGED, AND THOSE ENVIRONMENTALISTS WHO ARGUE FOR DE-REGULATION AS A WAY TO FORCE CONSERVATION BY INCREASING COSTS TO CONSUMERS ACT LIKE ELITISTS WHO DON'T UNDERSTAND THAT ENERGY POLICIES MUST BE AFFORDABLE TO WORKING PEOPLE AND POOR PEOPLE, [redacted].

TO MINIMIZE THE NEGATIVE IMPACTS OF ENERGY PRODUCTION IN THOSE COMMUNITIES AND SURROUNDING AREAS WHERE MOST OF THE ENERGY IS PRODUCED, LARGE AMOUNTS OF PUBLIC AND PRIVATE MONIES MUST BE PROVIDED--UP-FRONT, THAT IS, BEFORE THEY ARE INUNDATED BY DEVELOPMENT--TO HELP THOSE RURAL COMMUNITIES PROVIDE THE SERVICES NECESSARY TO SUPPORT RAPIDLY INCREASED WORK FORCES. THESE INCLUDE MONIES FOR HOUSING, SCHOOLS, ROADS, SOCIAL SERVICES, AND SO ON. ADDITIONAL PROGRAMS NEED TO BE FUNDED TO PROVIDE JOB TRAINING FOR LOCAL CITIZENS SO THEY CAN WORK IN THE MINERAL PRODUCING OCCUPATIONS, AND THEREBY FURTHER MINIMIZE THE BOOM TOWN SYNDROME THAT DISRUPTS A COMMUNITY'S WAY OF LIFE. IT MIGHT BE ADDED HERE THAT, ALTHOUGH I AM SPEAKING ABOUR RURAL AREAS PRIMARILY, THE CITY AND COUNTY OF DENVER--BECAUSE IT IS THE ADMINISTRATIVE CENTER FOR MOST OF THE ROCKY MOUNTAIN

REGION'S MINERAL DEVELOPMENT--IS ALSO SUFFERING FROM THE BOOM TOWN SYNDROME AND NEEDS TO BE TREATED AS AN ENERGY IMPACTED AREA AS WELL.

INCREASED COAL, OIL, AND GAS PRODUCTION CLEARLY WILL BE NEEDED TO SUPPLY THE NATION'S ENERGY DEMANDS, AT LEAST IN THE SHORT RUN. AND I BELIEVE THAT WE IN COLORADO, PROVIDING THAT THE TYPES OF NEEDS I'VE JUST OUTLINED ARE ADDRESSED, ARE WILLING TO DO OUR PART IN MEETING THAT DEMAND. WE ARE PARTICULARLY CONCERNED, HOWEVER, THAT THE ENTIRE NATION IMMEDIATELY BEGIN A MASSIVE ENERGY CONSERVATION PROGRAM.

WE AGREE WITH COLORADO'S GOVERNER DICK LAMM THAT WE HAVE AN OBLIGATION TO SUPPLY THE NECESSARY ENERGY THE NATION NEEDS, BUT WE DO NOT HAVE AN OBLIGATION TO SUPPLY THE ENERGY THE NATION WASTES. THE AMERICAN INSTITUTE OF ARCHITECTS HAS ESTIMATED THAT BY MAKING NEW AND OLD BUILDINGS ENERGY EFFICIENT, BY 1990 WE COULD BE SAVING THE EQUIVALENT OF MORE THAN 12.5 MILLION BARRELS OF PETROLEUM A DAY, which is a little more than we are importing daily presently, and WHICH IS also ABOUT AS MUCH ENERGY AS THE 1990 PROJECTED PRODUCTION CAPACITY OF ANY ONE OF THE PRIME ENERGY SYSTEMS: DOMESTIC OIL, NUCLEAR, GAS OR COAL. CONSERVATION ACTIVITIES CAN SUBSTITUTE FOR THE RIPPING OF NONRENEWABLE RESOURCES FROM THE EARTH. EVERY UNIT

OF ENERGY SAVED THROUGH THE LABOR INTENSIVE WORK OF INSULATION INSTALLERS IN HARTFORD, DETROIT, OR PORTLAND IS A UNIT OF ENERGY WHICH NEED NOT only BE SCOOPED OUT OF THE COLORADO LANDSCAPE BY DRAG BUCKETS but is also much more cost effective. SIMPLY PUT, ENERGY CONSERVATION IS ENERGY PRODUCTION, AND THIS "SOURCE" IS IMMEDIATELY DEVELOPABLE, LABOR INTENSIVE, ENVIRONMENTALLY SOUND, SAFE, AND ECONOMICAL TO CONSUMERS. IF THERE IS NOT A MASSIVE ENERGY CONSERVATION PROGRAM INITIATED IMMEDIATELY, THEN THAT MAKES US QUESTION THE EXTENT TO WHICH THERE NEEDS TO BE SERIOUS ENERGY PRODUCTION.

TO STIMULATE MASSIVE ENERGY CONSERVATION PROGRAMS, CONGRESS, STATE LEGISLATURES, AND CITY COUNCILS NEED TO PROVIDE SUBSTANTIAL INCENTIVES AND TAX CREDITS TO HOME OWNERS WHO INSULATE AND TO APARTMENT BUILDING LANDLORDS. LANDLORDS, WHO IN MAJOR CITIES--ESPECIALLY IN THE EAST--DO NOT PAY TENANTS' UTILITY BILLS, HAVE NO ECONOMIC REASON TO INSULATE THEIR BUILDINGS. IF WE RECOGNIZE THAT MOST LANDLORDS BUY BUILDINGS FOR TAX WRITEOFFS AND SHELTERS, THEN WE WILL HAVE TO PROVIDE WRITEOFFS AND SHELTERS TO MAKE IT WORTH THEIR WHILE TO CONSERVE RESOURCES. ONE BY-PRODUCT OF THIS LANDLORD SUBSIDY WOULD BE TO REDUCE TENANTS' UTILITY BILLS, AND NEEDLESS TO SAY, MANY RENTERS ARE POOR AND MIDDLE-CLASS PEOPLE.

STATE AND MUNICIPAL LEGISLATIVE BODIES SHOULD IMMEDIATELY PASS LAWS THAT MANDATE THAT EXISTING PUBLIC BUILDINGS BE INSULATED AND RETROFITTED. TO ILLUSTRATE THIS POINT, NOTE THAT THE STATE'S GOVERNMENT UTILITY BILL IN COLORADO DURING 1977 WAS $13 MILLION AND THAT OFFICIAL PROJECTIONS INDICATED THAT IN 1988 THE BILL FOR THOSE SAME STATE BUILDINGS IS PROJECTED TO BE $118 MILLION and yet with a comprehensive retrofit program this bill could be cut in half - and would Proposition 13 fans ever love that.

ENERGY CONSERVATION, I AM ARGUING, IS AN ALTERNATIVE FORM OF ENERGY PRODUCTION. IT MUST BE UTILIZED WIDELY AND AT ONCE. THERE ARE OTHER FORMS OF ALTERNATE ENERGY PRODUCTION--BIOMASS CONVERSION, WIND AND WATER POWER, GEOTHERMAL, SOLAR--WHICH ALSO NEED TO BE UTILIZED. SOME OF THESE TECHNOLOGIES ARE PRESENTLY VIABLE AND COMMERCIALLY FEASIBLE, AND OTHERS NEED FURTHER RESEARCH AND DEVELOPMENT. IRRESPECTIVE OF THEIR PRESENT STATE OF DEVELOPMENT--AND I PERSONALLY BELIEVE MUCH MORE IS READY FOR MARKERT NOW THAT IS ACTUALLY ON THE MARKET--IN THE LONG TERM, THESE ALTERNATIVE ENERGY SOURCES WILL PROVIDE UP TO HALF OF THE NATION'S ENERGY NEEDS. AND THESE TECHNOLOGIES ARE ENVIRONMENTALLY SOUND, SAFE, OFTENTIMES BASED ON LOCAL RESOURCES, AND PERMIT SUBSTANTIAL ENERGY SAVINGS TO BE PASSED ON TO THE CONSUMER. THEY ARE ALSO VERY LABOR INTENSIVE.

A STUDY PUT OUT BY SOLAR CAL POINTS OUT THAT, FOR THE NEXT TEN YEARS, SOLAR SPACE AND HOT WATER HEATING ALONE COULD ACCOUNT FOR THE CREATION OF OVER 375,000 JOBS IN CALIFORNIA ALONE. ANOTHER STUDY PUT OUT BY CALIFORNIA'S LABOR DEPARTMENT SHOWS THAT THERE ARE ABOUT SEVEN TIMES AS MANY JOBS CREATED WITH SOLAR ENERGY COMPARED TO THE SAME NUMBER OF ENERGY UNITS PRODUCED WITH A MAJOR ELECTRIC POWER PLANT.

IT IS IMPORTANT THAT FEDERAL, STATE, AND LOCAL GOVERNMENTS STIMULATE A VARIETY OF PROGRAMS TO HURRY ALONG THE COMMERCIALIZATION AND WIDESPREAD DISTRIBUTION OF SOLAR AND OTHER ALTERNATIVE ENERGY SOURCES. LOW INTEREST LOANS AND TAX INCENTIVES FOR HOMEOWNERS AND LANDLORDS--SIMILAR TO THOSE NECESSARY FOR CONSERVATION EFFORTS, ARE NEEDED TO HELP AMORTIZE THE RELATIVELY HIGH FRONT END COSTS OF SOLAR INSTALLATIONS. LOANS TO SMALL BUSINESSPEOPLE ARE NEEDED SO THEY CAN INVEST IN NECESSARY SOLAR EQUIPMENT. FARMERS AND RANCHERS NEED INCENTIVES TO INSTALL AND DEVELOP ALTERNATIVE ENERGY PRODUCING SYSTEMS. LEGISLATION NEEDS TO BE PASSED THAT MANDATES THAT NEW PUBLIC BUILDINGS UTILIZE ALTERNATIVE ENERGY SOURCES. PROGRAMS ARE NEEDED TO STIMULATE TRAINING FOR ALTERNATE ENERGY TECHNICIANS, ENGINEERS, AND ARCHITECTS.

SEMI-SKILLED - SKILLED WORKERS,

EARLIER I SAID THAT CONCERNS ABOUT JOBS, THE ECONOMY, THE ENVIRONMENT, AND A SEARCH FOR SURVIVAL LED US TO BEGIN THINKING ABOUT ENERGY PRODUCTION AND CONSERVATION IN OUR SOCIETY. SEEMINGLY, EVERYONE

WHO IS ANYONE " UNDERSTANDS THAT ENERGY PRODUCTION WHICH IS ENVIRONMENTALLY SOUND, LABOR INTENSIVE, SAFE, AND AFFORDABLE IS ALSO AVAILABLE. AT LEAST THOSE OF US WHO HAVE HEAR BARRY COMMONER KNOW THIS. BUT IN REALITY, THE GREAT MAJORITY OF PEOPLE DO NOT KNOW THIS, AND OUR SURVIVAL DEPENDS ON THEIR BEING INFORMED, AWARE. AND ACTIVE.

TO BEGIN THIS EDUCATIONAL PROCESS, I SUGGEST THAT PEOPLE HERE ATTEND A SERIES OF WORKSHOPS THAT ARE SCHEDULED TO ENCOURAGE DISCUSSION ON SOME OF THESE ISSUES. THE IMPACT OF RAPID DEVELOPMENT ON LOCAL COMMUNITIES IS ONE; A WORKSHOP ON JOBS AND ENERGY IS SCHEDULED; ANOTHER ONE ON ENERGY ALTERNATIVES FOR CITIES, AND YET ANOTHER ON INNOVATIVE STATE ENERGY POLICIES. FINALLY, THERE IS A WORKSHOP SCHEDULED ON BUILDING COALITIONS TO CHANGE ENERGY POLICIES.

IT SEEMS TO ME THAT IF EVER WE ARE GOING TO DEVELOP CONSTITUENCIES FOR FULL EMPLOYMENT, ENVIRONMENTAL INTEGRITY, AND SOUND ENERGY POLICIES, WE ARE GOING TO HAVE TO REACH OUT TO THE MAJORITY OF GRASSROOTS CITIZENS IN OUR RURAL AREAS AND THE GLASSROOTS CITIZENS IN OUR CITIES AND RELATE THESE ISSUES TO THE DAILY CONCERNS PEOPLE HAVE--INCLUDING POLLUTED CITIES, INADEQUATE MASS TRANSIT, HIGH RATES OF UNEMPLOYMENT, UNSAFE WORKPLACES, INFLATION, ESCALATING UTILITY BILLS, AND THE LIKE--ALL OF WHICH CLEARLY ARE EFFECTED BY OUR PRESENT OBSOLETE AND SOMETIMES NON-EXISTANT ENERGY POLICIES.

IN THIS WAY WE CAN INSURE THAT THE DIALOGUE AROUND ENERGY POLICIES-- AND THE ISSUES WHICH INTERSECT THROUGH THEM-- ARE NOT JUST THE PROVINCE OF OIL, GAS, AND COAL INTERESTS. INSTEAD, TRADE UNIONS, MINORITIES, ENVIRONMENTALIST, CONSUMERS, FARMERS, CLERGY AND SOCIAL SERVICE WORKERS AS WELL AS CITY NEIGHBORHOOD RESIDENTS CAN AND WILL HELP TO DEVELOP A SANE ENERGY POLICY.

TO ACCOMPLISH THIS END, I SUGGEST A MASSIVE COMMUNITY EDUCATION PROGRAM TO EDUCATE PEOPLE FROM CALIFORNIA TO NEW YORK, MAINE, OREGON TO FLORIDA, AND ALL POINTS IN BETWEEN. THIS PROGRAM SHOULD BEGIN IMMEDIATELY, CONTINUE DURING THE COMING YEAR, INCLUDING AN ACCELERATE EFFORT NEXT SUMMER, AND CULMINATE IN THE L(') POLITICAL CONVENTIONS. MAJOR FOUNDATIONS SHOULD SUPPORT PART OF THE COST OF THIS ACTIVITY, AND THE FEDERAL, STATE AND LOCAL GOVERNMENTS SHOULD UNDERWRITE THE COST OF THIS ACTIVITY AS WELL. PEOPLE LIKE SAM BROWN OF ACTION, ERNIE GREEN AT DoL, JOAN CLAYBROOK AT DoT, FATHER BARONI AT HUD, JOAN NICHOLSON AT EPA, ALL OF WHOM EMERGE FROM THE SIXTIES AND ARE NOW "WORKING FROM INSIDE" MUST BE CALLED UPON TO UTILIZE THEIR ORGANIZATIONAL RESOURCES TO SUPPORT THIS TYPE OF LARGE BROAD SCALE EFFORT. IRRESPECTIVE OF HOW THIS PROGRAM IS SUPPORTED, THIS TYPE OF COMMUNITY EDUCATION EFFORT MUST BE CARRIED ON BECAUSE THE AGENDA FOR THE 80'S MUST BEGIN WITH A NEW, RATIONAL , DECENTRALIZED ENERGY POLICY.

THANK YOU.

Solar Lobby

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Sun Day was a success

Now the real work begins

Dear Friend,

Your support of Sun Day a few months ago helped make possible the first international celebration of our only inflation-proof, environmentally-attractive, terrorist-resistant, inexhaustible energy source.

On Sun Day millions of people in 35 countries gained a keener understanding of the solar promise. But Sun Day was just a beginning. Now the real work begins.

The next few years are critical to the development of safe, renewable energy. Now is the best opportunity we will ever have to shape the emerging solar industry to serve the public interest. The Solar Lobby can make a big difference. We need your help.

A recent Harris poll found that 94 percent of the American public favors strong efforts to develop solar energy. This public enthusiasm must be channeled into effective political programs within Congress, the federal agencies, and local governments. So, many of the people who created Sun Day have now begun to organize The Solar Lobby. I hope you will join with us in our efforts to hasten the solar transition.

The immediate priorities of The Solar Lobby will be: 1) substantial federal tax credits for people who buy solar equipment; 2) a Solar Bank to provide long-term, low-interest loans to solar purchasers; 3) a consumer protection program that discourages gimmickery and rip-offs without impeding technological innovation; 4) major federal solar procurement programs that will lower the cost of renewable energy sources for everyone by encouraging mass production; 5) the development of a healthy, competitive solar industry through measures to protect the field from monopoly control; 6) increases in the federal solar research and development budget; and 7) a shift in emphasis from a few large projects toward many decentralized applications.

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Conventional energy sources have received nearly $150 billion in federal subsidies. In fact, more federal money is being spent on nuclear power in 1978 alone than has been spent on renewable energy sources in the last hundred years. Conventional energy sources are being advanced and protected by huge Washington lobbies, including the American Petroleum Institute, the Edison Electric Institute, the Atomic Industrial Forum, the National Coal Association, and the American Gas Association. If solar energy - our energy - is to receive a fair shake in the nation's capital, its interests must be represented by a tough-minded, technically-competent, politically-savvy organization.

The transition to solar will not be easy. Mobil Oil has already conducted two national advertising campaigns to discredit Sun Day and the solar alternatives. As the solar movement becomes more political and more effective, the opposition is sure to mount. Using Sun Day as a base, The Solar Lobby is building a grass roots network around the country to advance decentralized solar technologies. And Consumer Action Now is merging its Washington operations into The Solar Lobby to create a hard-hitting professional organization.

If you have $15 you can spare today, please sacrifice a little and send $25. If you can afford $50, try to give $100. In return you will receive all Solar Lobby publications, filled with strategies for your own lobbying efforts as well as information and advice on how to create a sustainable lifestyle for yourself and your family. At the same time you will be employing a talented, dedicated team in Washington to fight for a solar future. That's not a contribution, it's an investment.

Sincerely,

Denis Hayes

Denis Hayes

p.s. Because we will actively seek to shape federal policy, your support is not tax-deductible.

p.p.s. If you contribute $25 or more, I will send you a copy of Sun! A Handbook for the Solar Decade, an anthology prepared for Sun Day. The book is a collection of some of the best solar articles, with selections by Amory Lovins, Barry Commoner, William Shurcliff, and William von Arx.

THE NEW YORK TIMES, SUNDAY, APRIL 30, 1978

The Future Is Now

By Tom Wicker

Energy consciousness in America reached its highest point when people waited in long lines at gasoline stations during the winter of 1973-74. Concern also reached a peak of sorts when a sweater-clad President Carter held a fireside chat with the nation in 1977; then he sent Congress an energy program, calling for "the moral equivalent of war" in its support.

But neither the gasoline crisis nor Mr. Carter's appeals had much effect. Oil imports are far higher today than in 1973, and the Carter energy program—at best only a beginning—has been bogged down in Congress for a year. The United States continues to be the most profligate user of petroleum and energy in the world.

IN THE NATION

Now another effort is being made by various groups to call the nation's attention to the continuing, if not very visible, energy crisis. They're sponsoring Sun Day nationwide on May 3 (also May 4, 5 and 6 in New York), in the hope that it will boost energy awareness as the first Earth Day did environmental concerns eight years ago. Many of the same persons and groups are helping with Sun Day.

In New York, for example, there'll be a "sunrise celebration" on May 3 at United Nations Plaza at 6 A.M., a showing of solar energy devices later in the day at the Custom House, and a long round of seminars, demonstrations, movies and the like throughout the Sun Day celebration.

President Carter, who officially proclaimed Sun Day, will spend part of May 3 at the Federal Solar Research Institute in Colorado, and local observances are planned all over the country. The most important thing that might be accomplished would be the refutation of the widespread belief—assiduously fostered by some energy companies — that practical applications of solar energy are far in the future.

In fact, while only about 40,000 buildings in the United States already are equipped with solar collectors, more than two million buildings have been so equipped in Japan; 20 percent of all Israeli homes (about 220,000) have solar units. Mr. Carter has set a national goal of 2.5 million solar-heated homes by 1985—but the Solar Energy Industries Association expects to triple that goal (and that association already represents 900 manufacturers and retailers).

With proper incentives and encouragement, a great deal more could be done than most Americans have been led to believe; the President's Council on Environmental Quality has predicted, for example, that with governmental incentives more than 25 percent of the nation's energy needs could be served by solar devices by the end of this century.

Not only is greater Federal and state support (California is especially active in the field) needed for solar energy research but the initial cost of solar equipment is still high. Although its virtually maintenance-free nature eventually offsets that, many families need some kind of financial incentive or help to make the costly conversion. Bogged down with Mr. Carter's overall energy program is the Administration proposal for Federal income tax credits of up to 21 percent on solar units costing $10,000; that size unit would heat a sizable house in a cold climate.

One estimate is that all American households could be fitted out with $1,000 worth of solar equipment for $320 billion over a 20-year period. Considering the gravity of the energy crisis, and the jobs such a mammoth undertaking would provide, that might be cheap at the price.

Also languishing in Congress are such proposals as a $50 billion revolving fund to provide long-term, low-interest loans to families and businesses purchasing solar units; and authority for the Small Business Administration to make such loans. An agricultural solar energy program—for research, development and demonstration projects—has been approved but no money has been provided.

Worse, the Federal solar energy budget, lately increased, is still only $750 million; in 1978, the Energy Research and Development Administration had $1.7 billion for nuclear energy alone. Government policy, in fact, has consistently favored nuclear power development, even though that energy source is costly, controversial, none too efficient (particularly for electrical power generation), possibly hazardous and without a proven means of disposal for its toxic wastes.

Solar energy, in contrast, offers no safety or environmental hazards, is cheap even after installation costs, has no waste disposal problem or organized opposition and is highly suitable for such low-quality energy demands as home space and water heating.

After Sun Day, maybe Americans will have a better understanding of all that—and high time, too.

James J. Kilpatrick

Crank up solar ingenuity

President Carter flew out to Denver last week to publicize his enthusiasm for the development of solar energy. Millions of Americans who may oppose him in other ventures will support him in this one. They will wish the president's enthusiasm were even greater.

Sad to say, we are nowhere near where we ought to be in the development of alternate forms of energy. Our country is supposed to be the most inventive country on earth; we are blessed with many of the world's finest scientists and engineers; ours is a land of "can-do" imagination. The difficult we do at once; the impossible takes a little longer.

This gung-ho spirit has yet to be seriously manifested in harnessing the inexhaustible energy of the sun. If our famed foresight had been working 5 or 10 years ago, by this time a crash program would have brought the cost of solar installations down to competitive levels with other fuels. We would be deriving 10 or 15 or 20 per cent of our energy needs from unconventional sources, rather than the miserable fraction of 1 per cent we are developing now.

Joining in last week's Sun Day fun, Mr. Carter appeared to have caught the solar spirit. High time. His pending energy package contains no more than a feeble lick and a promise for future tax credits and subsidies. His existing programs are scattered all over the bureaucratic landscape.

Doubtless, these existing programs are better than nothing. The Department of Housing and Urban Development, in cooperation with the Department of Energy, has an active program of grants for demonstration solar heating and cooling projects in residential units. Under this program, applications are solicited from builders and developers for grants that will pay the difference in cost between conventional installations and solar installations. In the third round of grants, announced last August, 169 applicants got $6 million for installations in 3,468 housing units. The fourth round is now coming up.

A few other programs are indifferently kicking around. The DOE has a $500,000 fund for small-scale projects. The HUD folks have a community block grant appropriation that might be available for solar experiments. A "hot water initiative" undertaking is languishing in Pennsylvania and Connecticut. Some solar loan money is available. Mr. Carter's proposed $100 million for research and development, if it materializes, could push the cause along.

That's about the size of it at the federal level. The states, in point of fact, are doing more than Washington. More than half the states have enacted legislation to promote solar development through a variety of property tax credits or deductions or loans. The National Solar Heating and Cooling Information Center, Box 1607, Rockville, Md., has rafts of information. HUD and the Department of Commerce also have helpful bulletins.

All this adds up to mighty little. Granted, the technical problems of adapting solar energy are tough, but the problems are not insoluble — and the potential rewards are beyond calculation. If the same spirit and money were brought to solar power that 15 years ago were applied to space exploration, the problems could be licked in another decade.

If the necessary commitment to solar development is to be made, a number of supporting decisions ought to be made also. For example: Residential subdivisions ought to be platted, and roads laid out, to take maximum advantage of sunlight. Certain solar collectors may require large areas of land; we ought to be planning for these needs.

A hundred such areas of development invite the attention of our brightest minds. We ought to be working actively on wood, on wind, on tidal energy. Certain dry plant material, according to Denis Hayes in a recent *Worldwatch Paper*, contains about as much energy per ton as low-quality coal. Not nearly enough experimental work is being done on alcohol and methane as substitutes for gasoline and natural gas. What we are talking about is a race for survival — and thus far we're only jogging along.

Why not an Oil, Gas, Coal, and Nuclear Power Day?

No question about it, there was a special meaning to last Wednesday's sunrise—the first official Sun Day, proclaimed by the President himself.

The hard fact remains that, if America is to relieve dependence on foreign oil, the obvious first step—the one needed now—is to beef up domestic production of the energy we know can work.

This means, for example, reassessing the many man-made regulatory impediments placed in the way of mining as well as burning coal. It means accelerating production of nuclear energy, for which proven technology already exists. It means encouraging production of domestic oil and natural gas through incentives for drilling in more costly environments.

Let's pay the Sun its due. But shouldn't there also be an Oil, Gas, Coal, and Nuclear Power Day? It would be a realistic reminder not to be diverted from the hard choices of our times by dreams of soft energy.

But what worries us is that all this attention to solar energy will delude our country into believing that the sun right now can do all the things that oil, gas, coal and nuclear power do. It can't.

Mobil

A. DANIEL BURHANS

The Steady State

Is the steady-state political economy an idea whose time has come? The numerous and unrelenting anomalies in the neoclassical Keynesian "growth" economy would seem to indicate that it is. Yet while physical scientists and biologists are generally receptive to the steady-state idea, contemporary Keynesian economists are generally opposed.

Much of the discussion at the last few annual conferences of the American Association for the Advancement of the Sciences has focused on a social-political-economic system at peace with the ecosphere — in other words, a steady-state political economy. And yet there has been hardly a mention of the steady state at recent meetings of the American Economic Association.

Many physical scientists and biologists see the earth and all its organisms as a steady-state open system. While growth in young ecosystems is natural and its major emphasis is upon development, productivity, and quantity, mature ecosystems emphasize protection, stability, and quality. Notably, most organisms pass the first, or growth, stage about a quarter of the way through their life's journey. Nature's model, and part of the steady-state's premise, is that the physical dimensions of bodies and artifacts must reach stability and equilibrium at a certain stage. In this view, unlimited growth by any one subsystem would be an aberration and a threat to itself and eventually all other subsystems. It seems obvious to many scientists that these constraints would equally apply to all systems including the economic system. Thus the issue is drawn between finiteness and unlimited growth.

A major guideline for the steady-state political economy is the maintenance of a constant stock of people and physical wealth, or capital. Steady state is not equivalent to stagnation. The steady-state society is open and creative. Stocks do not of themselves remain constant; people die; wealth is physically consumed, worn out, depreciated, replaced. But in a steady-state society, inflow (i.e., birth and production) is carefully and methodically regulated by outflow (death and consumption).

Physical scientists constantly work with systems which are closed-looped, material cycles powered by the sun. It is a reflection on our social scientists, particularly our economists, that while the biologists and physical scientists are concerned with "how to live a good life in a finite earth at peace and without destructive mismatches" (a problem posed by the A.A.A.S.'s 1971 meeting), economists still cling to the "growth" model and to the aim of overcoming

"scarcity," all the while ignoring the implications of pollution, the finiteness of natural resources, and the dangerous rise of thermal heat around the planet Earth because of our energy consumption.

In all our talk of the affluent-effluent economy we speak of the infinity of human wants as well as the drive to eliminate scarcity. But at the same time our advertising industry thrives on the perpetuation of the illusion of scarcity by multiplying human wants. A discussion of contrived scarcity versus genuine human needs would be essential to an understanding of the steady state, but one searches the economic journals in vain for that kind of critique and exploration.

A few economists — e.g., Herman Daly of Louisiana State University and Kenneth Boulding of the University of Colorado — tell us it is not realistic to expect traditional economists to face up to the contradictions and anomalies revealed in the present economic system's effect on the ecosphere. According to Daly, a paradigm shift would be most difficult for economists because they would have to sacrifice their intellectual (and material?) vested interests in the perpetual-growth theories and policies of the last forty years.

[According to Thomas Kuhn, paradigms are "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners." Commenting, Michael Roskin in a recent issue of *Political Science Quarterly* says: "A paradigm is the basic assumption of a field; acceptance of it is mandatory for practitioners." The paradigm shift occurs, says Roskin, still commenting on Kuhn, "when researchers, operating under their old paradigm, begin to notice that their empirical findings do not come out the way they are supposed to.... Anomalies or counter-instances crop up in the research and throw the old paradigm into doubt. Then an innovator looks at the data from another angle, reformulates the basic framework, and introduces a new paradigm."]

In *The Structure of Scientific Revolutions*, Kuhn notes that paradigm shifts have usually been made by people outside the discipline, by the young, and by people new to the discipline, i.e., "those relatively free from the established preconceptions."

Daly says in his book, *Toward a Steady-State Economy*, that the steady state appeals to physical scientists because they are "viscerally convinced that the world is a finite, open system at balance in a steady state, and they have not invested time and energy in economic growth models."

Perhaps most of us operate within narrow ideological and theoretical frameworks. Many people know that their natural and social environment is rapidly deteriorating. But the solutions we seek generally lie within the narrow confines of a single political economy. All others are dismissed as utopian or subversive. We seem to be hamstrung by an economy which is aggressive toward the environment, demands the "triumph" of man over nature, and is almost totally lacking in ecological perspective. Its central concept, growth, is itself narrowly anthropocentric, but its main error is its insistence that growth will solve any and all problems, including those caused by growth itself, a position that grows increasingly strident as it becomes more obvious that it is self-defeating. Whether the problem is inflation, poverty, unemployment, balance of payments, pollution, depletion, or war, we have been conditioned to think that an ever-expanding gross national product is the all-purpose solution.

But when traditional economists cannot or will not account for the gross anomalies in the present system, we are bound to get pressure for a paradigm shift. Today, such anomalies as pollution and depletion, rather than poverty or unemployment, seem to be the major perceived flaws in the growth model.

Classical economists did believe we would eventually have to have a steady state, because of depletion resulting from increasing costs and diminishing returns. But the weakness of the Keynesian growth paradigm is most profoundly and clearly shown in the despoliation or pollution of the environment. This is not surprising: in a market system, depletion costs are most often private, though increasingly social, while pollution costs are nearly always social. Daly explains it this way:

"On the input side, the environment is partitioned into spheres of private ownership. Depletion of the environment coincides, to some degree, with depletion of the owner's wealth, and inspires at least a minimum of stewardship. On the output side, however, the waste absorption capacity of the environment is not subject to partition or private ownership. Air and water are used freely by all, and the result is a competitive, profligate exploitation — what biologist Garrett Hardin calls 'the commons effect,' and welfare economists call 'external diseconomies,' and what I like to call the 'invisible foot.' Adam Smith's 'invisible hand' leads private interest unwittingly to serve the common good. The 'invisible foot' leads private self-interest to kick the common

good to pieces. Private ownership and private use under a competitive market give rise to the visible hand (and foot) of the planner. Depletion has been partially restrained by the invisible hand, while pollution has been encouraged by the invisible foot."

Today, while family planning and zero population growth have been widely accepted and put into practice, our economic growth paradigm continues almost unchallenged and the steady-state political economy has not yet entered the public dialogue.

Both capitalist and socialist nations look to growth for their salvation. This might be excusable in most of the socialist societies because they are poor and need to grow (though not in population). But many of the industrially advanced capitalist nations with their continued overproduction, pollution, and depletion, are adding to international inequities and are the real threat to a healthy ecosphere.

Most of the steady-state guidelines are intended for the Western technological-industrial societies. The others could still benefit from a higher capital growth rate. The less developed nations face another kind of difficulty. Their fertility rate is about 3.0; in the rich nations, it is about 1.5. While in terms of gross national product both are growing at about the same rate, the poor nations' fertility rate defeats all efforts to raise their productivity. So the gap between rich and poor continues to widen and in most cases the poor countries' per-capita annual product (and thus consumption) actually decreases.

❦

The first political economist most closely associated with the steady state is the nineteenth-century thinker, John Stuart Mill. Interestingly, Mill is also one of the great defenders of individual rights. He foresaw, in what he called the stationary state, the realization of far higher human goals. "At the end of the progressive state," he said in his *Principles of Political Economy*, "lies the stationary state; all progress is but a postponement of this, and each step in advance is an approach to it."

The stationary state is needed, Mill says, because "the increase in wealth is not boundless . . . and population must be contained and balanced to enable mankind to obtain, in the greatest degree, all the advantages of both cooperation and social intercourse."

Mill's prescription may be more relevant now than ever. But most of today's biologists and physical scientists argue that the finite quality of natural resources, waste, thermal pollution, and overpopulation are the major reasons for the need of a paradigm shift. Members of the Club of Rome seem to concur. In their most important treatise, *Limits of Growth*, they say: ". . . because our environment — the earth — is finite, growth of human population and industrialization cannot continue indefinitely. This fact must be impressed on the population — for it is not generally recognized how very close we are to the physical limitation which defines the carrying capacity of our globe."

One of the paramount limits to growth to which scientists address themselves is thermal pollution, the waste heat from energy. We must, they say, cut down much of our present industrial production because of this form of pollution. Since we cannot recycle energy (the first law of thermodynamics) and since all energy is eventually converted to waste heat (the second law of thermodynamics), we will always be plagued by some thermal pollution.

The best we can do, scientists contend, is slow down this long-run, universal thermodynamic-heat-death progression. Only a certain amount of waste heat can be absorbed by the surface of the earth. Scientists believe that if we increase our energy consumption by only four per cent for the next 130 years, we would then be releasing heat amounting to one per cent of the incoming solar radiation — enough to increase the temperature of the atmosphere by three-quarters of a degree centigrade. This does not seem like much, but the earth's temperature balance is extremely delicate and critical. An increase of three-quarters of a degree centigrade would likely lead to global climatic upheavals, leading to the further melting of the polar icecaps. Within a thirty-year period, in most cities (e.g., the Los Angeles Basin), there would be an eighteen-per-cent increase in the normal incidence of solar energy.

Thus today's scientists, in the tradition of John Stuart Mill, are playing a progressive role in the development of this new paradigm. Their view regarding the need for the steady state can be summed up fairly accurately in this argument from *Limits to Growth:*

"On a global scale man is presently experiencing an exponential growth in population and in what we will call capital — buildings, roads, cars, power plants, machinery, and ships. Some inevitable consequences of this growth are the exponentially increasing demands for food and energy and also the

exponentially increasing additions of pollution to the environment.

"Because we know that there are upper limits to the supply of food and energy the earth can provide and limits also to the amount of pollution that can be absorbed by the environment, it seems obvious that the material growth that brings us toward these limits cannot continue indefinitely. . . . Matters are most urgent since indications are that we will surpass several of these constraints within the next few generations if current growth continues. The growth must stop."

As noted earlier, there are two major stipulations for the steady state: one is a constant stock of people and capital, the other is a low rate of throughput. Since the stocks of both people and capital do not remain constant in themselves (they are always coming and going, both people and goods have definite life cycles), they must be maintained by a rate of inflow (birth and production) equal to the rate of outflow (death and consumption). So beyond specifying the equilibrium of stock, we must also specify *rate of throughput*. If we had a high-speed flow of people this would be unacceptable ethically; and a high-speed flow of goods would continue to intensify pollution and depletion.

Thus, the steady state needs this additional guideline: stocks (people and capital) should be maintained at the lowest possible rate of throughput. To maintain an equilibrium stock, the average age of death of its members is the reciprocal of the rate of throughput. This can be better understood by visualizing a water tank — the faster the flow through the tank, the shorter time each drop of water has before it is expelled. When we place a high value on a long life expectancy (which seems socially desirable within reason), then we are specifying a low rate of throughput (a low birth rate and an equally low death rate).

On the other hand, a low rate of throughput for the stock of wealth (capital) means low production and equally low consumption. This in turn suggests that we must increase the life expectancy and durability of our goods and use less time to produce them. Given the Puritan work ethic, this raises problems. But it need not mean depreciating totally the value of hard work, only a shift in emphasis away from the production of things in vast quantities to making fewer but higher quality goods. Such a shift should open the way to increased emphasis upon the quality of human relationships and human cultural development — both individually and institutionally — something major religions have been counseling for a long time.

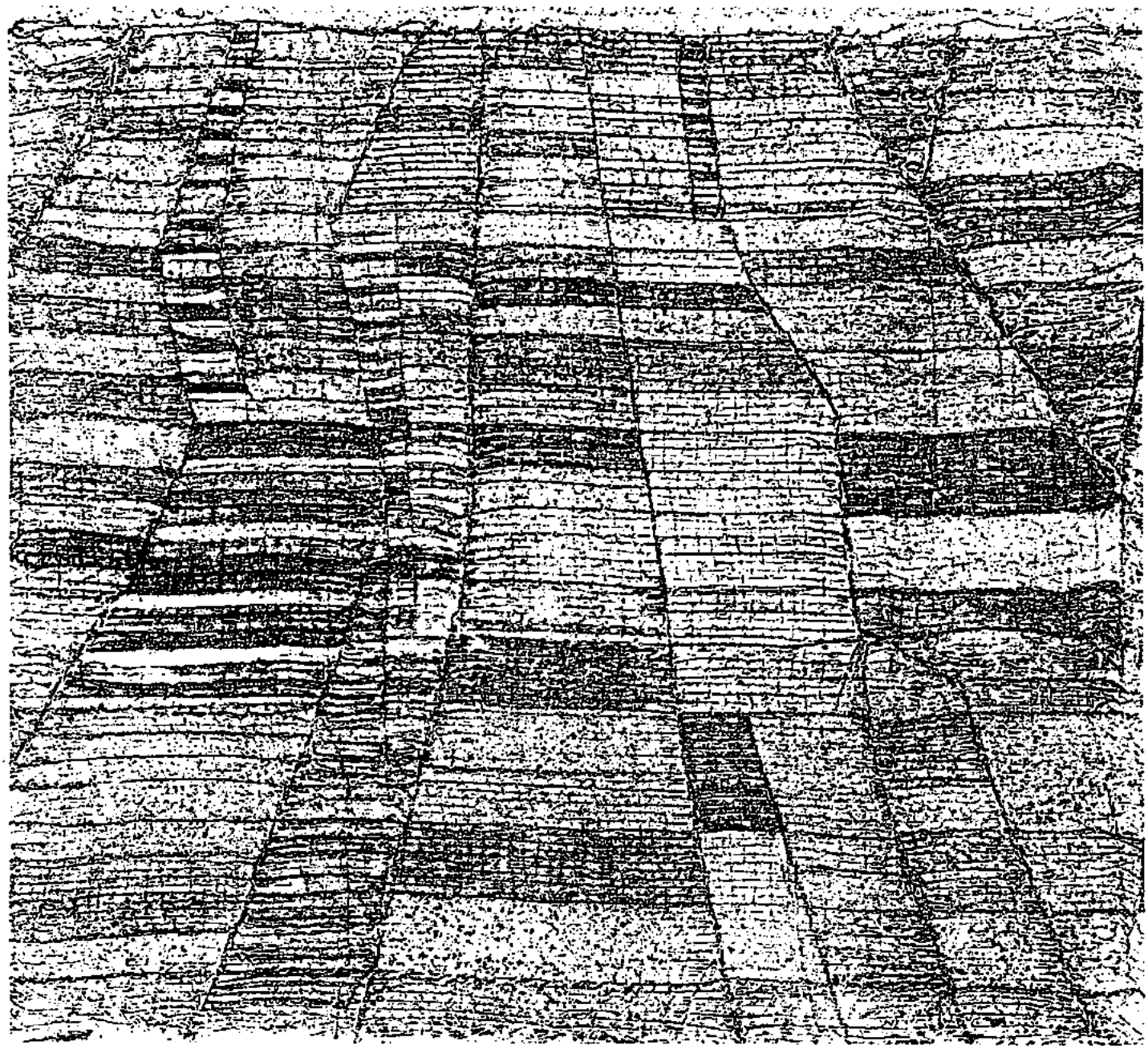
Steady-state economists suggest that we let ecological thresholds guide us in the size of the maintenance flows of matter and energy; that is, in setting tolerable limits in the rates of depletion and pollution. If these limits are exceeded, the system will break down.

In sum, then, the physical qualifications of the steady state are a constant stock of wealth and population maintained by an inflow of low entropy matter-energy (depletion) and an outflow of an equal quantity of high entropy matter-energy (pollution). Both the size of the stock and the rate of the throughput must not be so large relative to the total environment that they obstruct the natural ecological processes which form the biophysical foundations of wealth. The only way to slow down entropy is to use less energy and matter, and this in turn protects our environment from depletion and pollution.

In order to slow down throughput, the durability of goods must be maximized and/or other goods must be recycled. We have the technological ability to increase the durability of goods — it is the same technology which enables manufacturers to build in obsolescence and to design decay. We can, for example, easily extend the lifetime of our automobiles by a factor of three or four, but our economy puts profit before quality and durability.

Extending the durability of goods raises a political and ideological problem of nearly revolutionary proportions. It also treads on the traditional growth paradigm which says that in order to keep profits up (and thus micro- and macro-economic growth), advertising must contrive scarcity by creating "needs." These "needs" are satisfied momentarily (designed decay insures the ephemerality of the satisfaction), and then the "needs" begin all over again.

Often, the very considerable ecological virtues of the steady-state political economy obscure what may be its most important potential advantage, that is, its prospect for a new social perspective. The steady state is intentionally described as a political economy rather than merely a new economic paradigm, for it offers the possibility of a whole new system of power in tune with our highest sense of social and political



justice. When it optimizes rather than maximizes production and consumption, the steady-state society's central concern becomes distribution rather than production.

It is then likely that our democratic ideals will at last be applied to our economic as well as our political activities, for the steady state will not permit us to skirt any longer the ethical appeal for equal shares. Gone will be the excuse of the market society — both classical and Keynesian — i.e., that growth will bring both a greater absolute share for everyone and a more equitable relative share (the trickle down theory). While these tenets were perhaps never quite believed neither were they ever dethroned.

In order to redesign a new distributional mechanism, it will also be necessary to shed some of the market system's basic philosophical and social assumptions. First, the notion that man is an infinite desirer of utilities, an infinite appropriator and consumer; second, that inequality is necessary for incentive.

Jeremy Bentham insisted that inequality was both necessary and right to produce incentive and that equal distribution would be incompatible with security of property, including profit, which he saw as the indispensable incentive to productivity. Both these assumptions, basic to a justification of the market system theory, are essentially an outgrowth of Benthamite utilitarianism. Neither the physical nor social environment of the steady state would be amenable

to these notions. Thus, as is quite evident, while the steady state makes fewer demands on our environmental resources, it makes very great demands on our moral resources.

Those environmentalists who see the steady state as a solution to their problems come face to face with these ancient social justice questions also. However, they are pushed to a more radical critique of traditional economic and social arrangements for another reason: their movement is under heavy attack from industry. The corporate strategy is designed to put environmentalists in conflict with labor, the poor, and the consumer. Increasingly, corporate spokesmen point to current and future plant closings, loss of jobs, and higher prices as a result of safety and pollution controls. (The facts are that nearly a million new jobs have been created in the environmental control sector, though, no doubt the poor and the consumer will ultimately pay more than their fair share for the damage done to the environment.)

The defensive position of the environmentalists has led them to examine the contemporary political economy as a whole and eventually to focus on the issue of distribution of wealth and income. In the process, it has become evident to them that there were other, far more important, causal factors involved than environmental control measures: for example, corporate subsidies and taxes; corporate control of supply and demand (and other monopoly practices); advertising; government pork barrel; public works projects; discrimination; and a host of other examples of collusion among businesses and between business and government.

With aid from Herman Daly's and Louis Kelso's new studies (*Toward a Steady-State Economy* and *Two Factor Theory*, respectively), environmentalists have begun to challenge the ethic of flow of wealth through jobs: i.e., that everyone gets a share in the form of wages, interest, rent, or profit, and that it is all quite fair. "What about the stock of wealth?" asks Daly. "Not everyone owns a piece of stock."

Robert Lampman *(The Share of Top Wealthholders in National Wealth)* showed that between 1925 and 1956, seventy-six per cent of all corporate securities in the United States were owned by one per cent of the stockholders. Therefore, most people actually rely on flows engendered by capital.

Louis Kelso, along with a number of other economists (Daly and Galbraith among them), maintains that capital, not labor, plays the dominant role in production in all advanced industrial societies. Thus, a proper or proportional share of the national product is increasingly withheld from the wage earner because the Keynesian redistributional mechanism depends chiefly on wages.

On the income side, there is maldistribution, but it is not quite as extreme. The top fifth of the population gets about forty-three per cent of the income, while the lower fifth gets five per cent. According to Peter Henle of the Department of Labor, there is a persistent trend in the American economy toward actual inequality. Henle shows, for example, that from 1958 to 1970, the share of aggregate wage and salary income earned by the lowest fifth of male workers declined from 5.1 per cent to 4.6 per cent, while the share earned by the highest fifth rose from 38.15 per cent to 40.55 per cent. Herman Daly's conclusion on that kind of evidence is worth quoting:

"We all produce junk and cajole other people into buying it, not because of an innate love for junk or hatred of the environment, but simply in order to earn an income. This would suggest a look at some alternative principle of income distribution that is independent of and supplementary to the income-through-jobs link."

Thus, environmentalists have gained an important insight into the political nature of all economic distribution. They, and perhaps we, have learned that the problem has systemic roots. Individuals (e.g., environmentalists, wage earners) are not the cause of our cumulative dilemmas; they have merely served as convenient scapegoats, victims of, at best, a holding tactic for an outgoing, cracked and crumbling economic paradigm which was worthy in its day but has been made obsolete by the march of events, and which is now an idea that even may run counter to human and global survival.

The steady state, on the other hand, can offer a way out of our ecological morass with its emphasis on stabilization of population and production and quality of throughput, both human and material. On the social side, the steady state's potential for greater equality of distribution of land, labor, and capital begs to be developed and realized.

The steady state may indeed be an idea whose time has come — and not a moment too soon.

Mr. Burhans, a former Junior Fellow of the Center, is an assistant professor of political science at the University of Hawaii in Honolulu.

INTERIM POLICY ON ENERGY FACILITIES SITING

Proposed Resolution

Resolved, that the Sierra Club believes that protection of human life, public welfare, and the environment are essential factors to be considered by all levels of government when making siting decisions. We believe that siting decisions should be made only as part of the overall land-use planning and should proceed only after a need for them has been demonstrated, and should be located near load centers and, when possible, on or near existing industrial facilities. In locating such facilities each level of government should be involved in critical decisions in such a way as to ensure the most stringent environmental standards. Public participation in siting decisions should be assured at all stages of decision-making. Each state should have an energy facilities siting mechanism with open and complete processes. Actions of applicants for sites should not be allowed to prejudice sitings decisions and the "banking" of sites should give guidance rather than allowing early licensing and should not preclude small scale renewable energy alternatives. In furtherance of these goals, the following guidelines should be considered in evaluating specific proposals, plans and legislation related to energy facility siting:

ENERGY FACILITY SITING GUIDELINES

1. Decisions about the siting of energy-related facilities can only be made in the context of sound overall land-use planning. At a minimum the following categories of land should be excluded from consideration as sites for such facilities:

   a. Land included in federal, state or local park or natural area systems, or in wildlife refuges or management areas, or in such proximity as to threaten the environmental quality of the protected areas;

   b. Units of the National Wilderness Preservation System, the Wild and Scenic Rivers Syste, the National Trails System, or the National Landmarks System;

   c. Areas reserved for ecological, scenic, natural, wildlife, geological, educational or scientific value including Primitive Areas, Roadless Areas, Natural Areas, and Pioneer Areas;

   d. De facto wilderness or wild areas on federal lands which are under active study by citizen groups or government agencies prior to submission of formal proposals and final action by the Congress for inclusion of the lands in the above systems;

   e. Wild, natural, scenic or pastoral portions of coasts or shores, including bays, estuaries, lakes and rivers;

   f. Coastal or riverine areas serving as spawning grounds for commercial and sport fishing:

   g. Habitats or rare, endangered, or threatened plant or animal species;

   h. Areas containing outstanding examples of plant communities, such as virgin timber stands;

   i. Valuable archaeological or historic sites;

   j. Prime agricultural lands;

   k. Lands which play a vital role in the hydrologic cycle such as aquifer recharge areas;

   l. Land characterized by adverse geological or geophysical characteristics such as earthquake zones or floodplains.

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2. The siting of large, energy-related facilities should not proceed unless a definitive need for them has been demonstrated which cannot be met through conservation and smaller-scale alternatives. In the case of electric generating facilities, the impact of large size on raising required reserve margins should be considered as well.

3. Generating plants should be located as close as possible to load centers to avoid unnecessary, long, wide transmission corridors; to encourage conservation and pollution abatement by linking the environmental burdens of power generation with its benefits; and to maximize efficient use of energy through utilization of of waste heat for beneficial purposes. Where this policy conflicts with clean air goals, emphasis should be placed on reducing the emission of pollutants rather than relying on remote siting. Since airborne pollutants have been found to cause damage to the natural environments far from their source (e.g., via acid rain), remote siting will not prevent environmental degredation. Any tradeoffs between impacting urban and rural/wild environments should be discussed explicitly with input from spokespeople on behalf of both environments. In general, new energy facilities should be located on land that has little other productive value, be sited in such a way as to be compatible with and encourage the use of waste heat and waste water and the development of renewable energy resources.

4. The need to protect other important resources such as water resources and quality, air quality, and minerals should be carefully considered in the planning for and siting of energy facilities by all levels of government.

a. Air quality: Three scales of impact on air quality must be considered.

1) Local scale. EPA ambient air quality standards and non-degredation standards must be met and potential future growth must be allowed for.

2) Sub-regional scale. Cumulative impacts on the order of Air Quality Control Regions or air basins must be considered such as result from persistent air mass flows.

3) Regional scale. Long-range transport of pollutants must be considered on the order of several states or air basins.

In addition, impairment of visibility must be assessed in preventing degredation of air quality and the potential impacts of cooling towers must be considered.

b. Water resources.

1) There should be no net depletion of groundwater.

2) Municipal and industrial wastewater should be used for cooling purposes whenever possible.

3) Stream flow should not be depleted so as to harm aquatic species or alter the scenic or wild character of designated or candidate rivers.

4) Alternate requirements for water must be considered and priorities for use set.

c. Water quality.

1) Sites for disposal of ash and sludge and other solid waste products should be free of all flood potential and should not lead to runoff or leaching to surface or groundwater.

2) In siting more than one plant along a shoreline or river, both cumulative and interactive effects of power plant discharges must be considered in terms of thermal effects and destruction of aquatic life.

5. In the siting of such facilities, each level of government affected should be involved in the decisions to allow a balancing of national/regional and state/local energy and land-use policies. When federal policies are found to conflict with state policies, the state should be allowed to promulgate more stringent, but not less stringent, standards than the federal government. The federal government should not be allowed to pre-empt state control over energy facility siting except that in cases where a facility such as a pipeline by necessity impacts more than one state, the federal government must act to ensure the least environmental damage for the overall project.

6. Full public participation should be a part of all phases of the decision-making process at all levels of government with appropriate funding made available. Funding of public interest groups should be at a level to allow their use of expert witness and lawyers in order to present their case in a credible manner. Reimbursement should be by the applicant or by the government entity initiating the planning process.

   Public notice in plain English should be published in all areas impacted environmentally or economically by the proposed facility to inform the public regarding its opportunity to participate, the purpose of the hearing, and the hearing schedule. Hearing should be held during hours accessible to the working public whenever public comment is solicited.

7. Each state should create an energy facilities planning and siting mechanism in the context of statewide land use planning which includes an independent board or commission and which provides for full public participation. Decisions should incorporate the principles detailed above and should be made in the context of their long-run implications. In addition, consideration should be given to the impact of all phases of production, including mining or drilling, transportation, and waste disposal.

   When considering a specific facility, a full record should be developed in order for the least environmentally damaging alternative to be selected. The decision should be made on the record by the independent board or commission selected in advance.

8. Applicants should not be allowed to purchase land or equipment in advance of site approval since this invariably skews considerations in favor of the applicants preferred site and mode, thereby biasing the final decision against alternative which might minimize environmental impact. The value of the land should be fixed at the time of the declaration of the site with the final price subject to increases based only on increases experienced by comparable land types elsewhere.

9. Any proposal to bank power plant sites by selecting potential sites in advance of need should:

a. ensure the selection of sites which represent the minimum adverse environmental impact;

b. include sites presenting a range of options, rather than relating exclusively to one mode and/or scale of generation;

c. provide funding for public participation in the site selection process;

d. preserve all licensing procedures for final approval of a specific plant on a specific site;

e. be subject to periodic review to allow consideration of changing circumstances.

SOLAR FEATURES OF THE

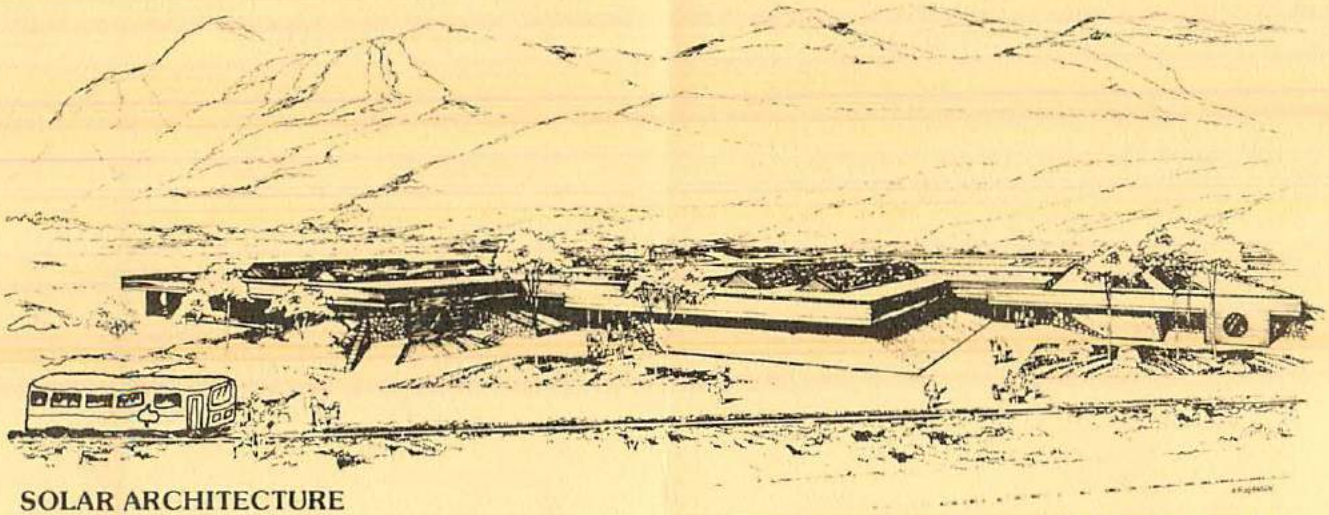
Pitkin County Air Terminal

The Pitkin County Air Terminal is the nation's largest passively solar-heated structure and the first public building in the United States to use a movable insulation system. This is one of the primary systems being used to reduce our dependence on irreplaceable fossil fuels. The terminal is also designed to accommodate a comprehensive transportation center for air, auto and ground mass transportation systems serving Aspen and its contiguous population centers.

In addition to the accommodation of specific terminal functions, an overall design objective was resource conservation. The architects designed the building to utilize materials, components and construction techniques that placed a low demand on natural and labor resources for its completion.

The understated architectural character attempts to harmonize with the natural earth forms surrounding the building. To further lower the building profile, as well as reduce the building heat loss, earth berms are used against all north perimeter walls. Simple and warm interior elements relate the environmental experience of the terminal to the Aspen character.

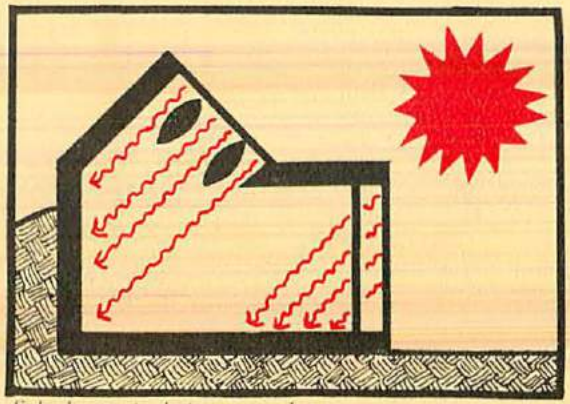
The building consists of three pods staggered and linked together to achieve maximum solar orientation for the south walls. This creates exterior entry spaces, maximizes expansion potential and avails the exterior surfaces necessary for the movement of passengers and goods.



SOLAR ARCHITECTURE

Solar architecture is the design of buildings which utilize the sun's energy with active and/or passive systems to reduce considerably energy usage in buildings for space heating. Passive solar systems simply use solar-oriented and energy-conserving architecture to reduce space heating requirements of buildings. In many cases, a well-designed passive system may reduce the heating requirements by over 50% with little or no additional construction cost. Active solar systems generally utilize special hardware to collect and store solar heat in order to replace or supplement conventional heating systems.

The Pitkin County Airport Terminal utilizes a passive solar system. The basic elements of passive solar systems are abundant southern glazing with movable insulation, interior thermal mass and a well-insulated structure. Most of the southern wall is double-glazed with a Kalwall system (by Kalwall Corporation, Manchester, N.H.). This system allows solar energy penetration into the building during sunny winter days.

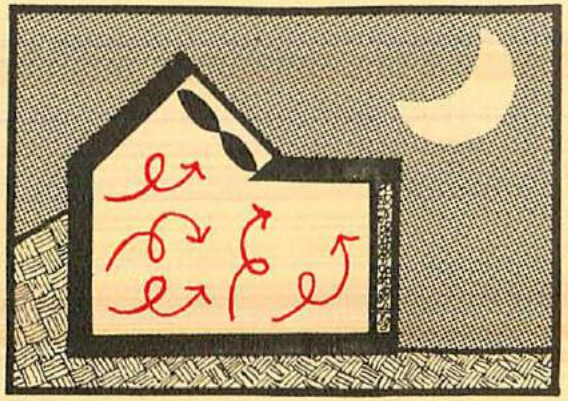


Solar heat gain during sunny days.

During the evening or on cold, cloudy days, the space between the glazings is filled with styrofoam beads (Beadwall) to provide insulation. There are also south-facing skylights with fiberglass glazing and movable-insulating louvers (Skylids).

The interior thermal mass for the terminal consists of such elements as the thickened concrete floor and the solid block walls. These elements used for thermal mass absorb the solar heat during sunny days and re-radiate this heat into the building's interior space, particularly at night. This offsets the demand for using the conventional forced-air heating system.

The building is highly insulated and uses minimum window exposure on the remaining north, east and west walls. The north and east walls have small windows placed high in the walls in order to allow earth berming against the outside surface of the walls. This earth berming reduces the heat loss through these walls. Well-insulated structures are required in Pitkin County by the "Energy Conservation and Thermal Insulation Building Code Amendment" (June 1975).



Thermal energy re-radiation at night.

PITKIN COUNTY AIR TERMINAL

ARCHITECTS:
Copland, Finholm, Hagman, Yaw, Ltd.
210 South Galena
Aspen, Colorado 81611

PLANNERS:
Design Workshop
415 South Spring
Aspen, Colorado 81611

SOLAR CONSULTANTS:
Zomeworks Corporation
P.O. Box 712
Albuquerque, New Mexico 87103
(Local Representative: Ronald Shore)

CONTRACTOR:
Greer Construction Company
0141 Ventnor Avenue
Aspen, Colorado 81611

FOR MORE INFORMATION, CONTACT:
Airport Manager
506 East Main
Aspen, Colorado 81611

PAMPHLET PREPARED BY:
Roaring Fork Resource Center
Heidi Hoffmann, Designer
Gregory Franta, Solar Architect

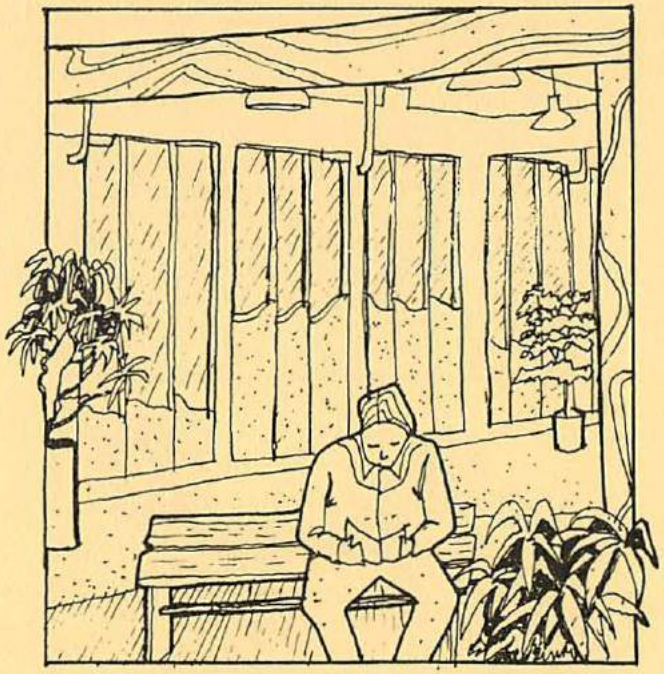
The Roaring Fork Resource Center is a non-profit organization promoting and developing alternate energy applications and design considerations that contribute to the preservation and the most efficient utilization of natural resources. The Resource Center provides and sponsors the annual Aspen Energy Forum, continuing educational and research programs and an energy clearinghouse. The Resource Center also publishes a quarterly energy periodical, the *SunJournal*, to disseminate related information. For more information, contact:

Roaring Fork Resource Center
P.O. Box 9950
Aspen, Colorado 81611

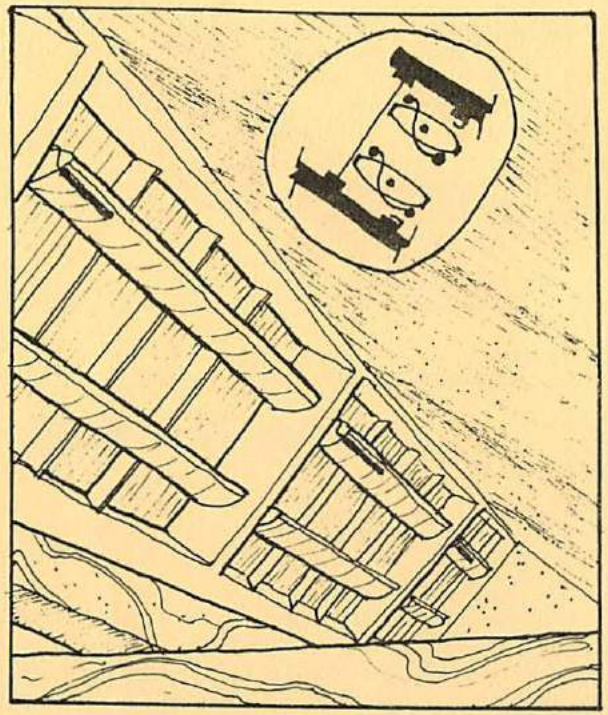
MOVABLE INSULATION

Beadwall

The "beadwall" is a movable insulation system whereby a 3-inch wide cavity between two transparent glazings is filled with styrofoam beads when there is no solar heat gain (such as at night or during cold, cloudy days). When empty, solar energy is allowed to penetrate the building. A simple, reversible vacuum motor is used to empty or fill the wall cavity with the styrofoam beads from the bead tank storage. When filled, the beadwall provides an insulating effect that is approximately equal to three inches of fiberglass insulation (U factor = 0.1 Btuh/square foot/1 degree Fahrenheit). The beadwalls and skylid are patented systems by Zomeworks. For more information, contact Zomeworks, P.O. Box 712, Albuquerque, N.M. 87103.



The "Beadwalls" in the background provide the movable insulation for the vertical south-facing windows.



The "Skylids" in the ceiling provide the movable insulation for the south-facing skylights.

Skylids

The "skylid" system in the skylights is a series of insulated, aluminum-covered louvers which automatically open during periods of solar heat gain and are generally closed the remainder of the time. The louvers are balanced with a freon canister on the exterior and interior surfaces. The canisters are connected by a copper tube, allowing the heat-sensitive freon to flow from one to the other as it expands and contracts with small variations in temperature due to exposure of the sun's radiant energy. This weight shift automatically opens and closes the skylids. In the closed position, the skylids provide an insulating U factor ranging from 0.1 to 0.33 Btuh/square foot/1 degree Fahrenheit, depending upon installation and orientation.

State of Colorado

EXECUTIVE CHAMBERS

DENVER

RICHARD D. LAMM
Governor

ENERGY CONSERVATION FACT SHEET

Colorado Office of Energy Conservation
1410 Grant Street, B-104
Denver, Colorado 80203
839-2507

Tax Incentives for Solar and Alternate Energy Systems

INCOME TAX BREAK

Colorado taxpayers now get a full deduction on their state income tax forms for the cost of solar and other alternate energy systems for their homes or businesses. The new law, enacted in 1977, covers the acquisition, installation, construction, reconstruction or remodeling of any such system or device for use in any building owned by the taxpayer.

The types of devices for which the tax deduction is permitted are those using solar radiation, wind or geothermal resources (this would include systems using the sun's energy to provide hot water, to heat swimming pools or for heating or cooling a building). In addition, "fluid-to-air" heat pumps using a fluid reservoir headed by solar radiation of geothermal heat qualify. Heat pumps are like reverse air conditioners that collect and concentrate heat in the outside air for use inside during cold weather.

The deduction can be used whether the taxpayer is itemizing deductions or taking the standard deduction. If, for example, the taxpayer is in the 5% tax bracket for the Colorado income tax, the installation of a $5,000 solar heating system would result in a $250 reduction in the state tax bill. The deduction is also applicable to corporations.

PROPERTY TAX BREAK

Solar energy systems for providing hot water or heating and/or cooling a building are not to be assessed at their full value for property tax purposes, under a state law enacted in 1975. The systems are to be assessed only 5% of their value, and not at the usual 30% applied to the rest of the property.

But property owners must apply for this 5% assessment either to their local county assessors or to the State Division of Taxation. This special

assessment rate covers both new buildings with solar energy systems designed into them and older homes that have had the systems added to them.

SOLAR EASEMENTS

It is possible under Colorado law to acquire legal easements from your neighbor to guarantee you adequate sunlight for your active or passive solar energy system.

The solar easements, like any other easement, must be negotiated and may involve a financial payment. In some cases, solar easements are required by lending institutions before they will make a loan for the installation of a solar heating or cooling system.

REMODELING BREAK

Another state law provides an incentive for remodeling older homes by delaying the property tax reassessment of the completed project for five years. The remodeling could include conservation measures or the installation of an alternative energy system.

The law applies to buildings that are more than 30 years old. The increased value from the remodeling can't show up on the tax rolls for five years unless the building is sold.

Also, the incentive isn't extended to any increases in the size of the building. Thus, if you are adding square footage, that additional space can be taxed right away.

State of Colorado

EXECUTIVE CHAMBERS

DENVER

RICHARD D. LAMM
Governor

COLORADO OFFICE OF ENERGY CONSERVATION

1410 Grant Street, Suite B-104
Denver, Colorado 80203

839-2507

On Wednesday, the 10th of August, 1977, Governor Richard Lamm signed an Executive Order creating the Colorado Office of Energy Conservation (OEC) and appointed Buie Seawell as director of that office.

The demand for, and the availability of energy is an issue of vital concern to this state and nation. There is needed a central point in State government charged with the responsibility for the informational, policy, planning, and operational aspects of energy and energy conservation. A focus is needed for the implementation of state energy policy and state elements of national energy policy. Therefore, the functions of the OEC will be as follows:

(1) The office's major activities are the administration and implementation of Colorado's State Energy Conservation Plan. The energy savings goal of the Colorado plan is to reduce the state's 1980 overall energy consumption by 5.4 percent -- the equivalent of 8.6 million barrels of oil a year. The U.S. Department of Energy (DOE) will provide this office with $457,000 for 1977. $914,000 has been authorized for 1978 and 1979, and $644,000 for 1980. With these funds the office will address the following:

a. Commerce and Industry

Colorado's small and medium-sized businesses will be provided assistance in saving energy through the Energy Conservation and Alternatives Center, located at 1576 Sherman Street, Denver, Colorado. Interplan, Inc., a planning firm and subsidiary of Rogers, Nagle, Langhart, Inc., architects, will develop and implement this service, which will include technical assistance workshops, demonstrations, seminars, on-site energy "audit" visits, and extensive publicity of firms which have made significant conservation achievements. The Center will also promote the re-use and recycling of process heat, solid wastes and waste oil.

b. Building Standards

In order to receive federal funding for energy conservation, Colorado agreed to develop energy efficiency standards for residential and non-residential buildings. The Lamm administration drafted, and the State Legislature passed, two companion bills in 1977 to establish the standards. The standards for new residential construction and major renovation projects took effect statewide October 1, 1977. The standards for non-residential buildings were adopted by the Office of State Planning and Budgeting (OSPB) November 1, 1977, and must be implemented by all local building departments by July 1, 1978. The OSPB and the Division of Housing are funded to provide technical and enforcement assistance to local governments. The OEC will provide assistance to the two state offices in this area.

c. Purchasing

Currently, the state considers life cycle cost only with the construction of new buildings, and with the purchase of motor vehicles and window air-conditioners. Plan funds will enable the Division of Purchasing to calculate the entire "cost of ownership" for hundreds of items purchased annually. This includes maintenance, length of service, and energy consumed. This information will then be made available to local governments through the Division of Local Government, and to the business community through the Energy Conservation and Alternatives Center, if appropriate.

d. Public Information

An energy conservation and renewable alternative energy information education program will be developed and conducted by the OEC. Components of this program will include most of the following:

i. Lifestyle Audit - Every Colorado resident, through participation in the "audit", can determine what steps need to be taken to bring his/her lifestyle up to a specified energy efficiency, how much each step should cost, and how long it will take for such an investment to be amortized, given existing and projected utility rates. This "audit" will cover the home environment, appliance use and transportation.

ii. Television - A program will be produced in 1978, designed to guide the viewer through the lifestyle audit. Mass distribution of the audit forms will precede the airing of this program. The OEC Public Information Program personnel and others will establish "viewer groups" such as students, civic organizations and religious organizations so that participation in the TV audit "walk-through" will be a group experience for as many people as possible.

iii. Energy Hotline - Funding for the Denver Public Library's Regional Energy/Environment Information Center will be supplemented with Plan funds so that they will have the necessary additional capacity to provide extensive information and consultation to persons with questions about conserving energy. Included here will be the establishment of a statewide toll-free telephone line.

iv. Consumer Protection/Fraud - The OEC is preparing printed materials aimed at helping consumers protect themselves against fraudulent conservation and solar materials and equipment sales schemes. Information on how to buy insulation is included. In addition, the office will develop fraud prevention workshops with the aid of Phil Stern, an engineer and investigator with the Metropolitan Denver District Attorneys Consumer Office.

v. Energy Conservation Information - The office will prepare and distribute fact sheets, news releases, brochures and other printed materials dealing with various aspects of energy conservation.

vi. Community Organization Project - The Domestic Technology Institute will establish local energy conservation centers in several communities within the state. They will then establish local action-oriented conservation programs around these centers which will be coordinated with related state and local organizations. The effectiveness of this vehicle will also be evaluated.

vii. Cooperative Extension Service - The CSU Extension Service will help distribute all materials developed for this program. Also, through in-service training, the agents will be provided with a fundamental working knowledge of conservation/alternative technologies.

viii. Weatherization Drawing - The OEC will cooperate with the DOE on a $17,000 program to weatherize (add insulation, storm windows and doors, caulking, weatherstripping, etc.) the homes of 10 Colorado families this winters. The families are to be chosen by lottery to kick off a federally-funded public information demonstration program in conjunction with Denver area hardware and department stores selling home weatherization materials.

ix. Special Impact TV Series - The Colorado OEC is producing a series of four 10-minute television programs aimed at the energy problems of the poor, the elderly, persons on fixed incomes and minorities under a contract with the U.S. Department of Energy. Each program in the series is designed to be used as a core for a longer television program or as a discussion-starter at a community meeting.

The programs are being produced for use throughout the six-state region (Colorado, Wyoming, Montana, Utah, South Dakota, and North Dakota). The topics for the series are THE ENERGY CRISIS (an overall look at problems posed to the impact groups), HOME WINTERIZATION, LOW-COST ALTERNATE TECHNOLOGIES (solar, wood, etc.), and ENERGY DOWN ON THE FARM AND IN THE FOOD CHAIN.

(2) The OEC will take a leadership position in the effort to reduce energy consumption within state government. The office will initially coordinate with appropriate departments within state government for the purpose of developing a well-documented budget request for retrofit of state buildings for which matching federal funds will be available.

The OEC is establishing a pilot vanpool program for state employees within the Capitol complex.

(3) The OEC is developing the capacity to promote and provide information on renewable alternative energy systems and the use of appropriate technology. Several on-going activities already are underway in this area:

a. Colorado Solar Information Handbook

The book is being designed to provide answers to the most commonly asked questions about solar energy and direct readers to information sources, products and services.

b. U.S. Solar Energy Research Institute

The OEC is taking the lead in developing Colorado's role in the federal Solar Energy Research Institute's regional network program. Colorado must prepare a plan to encourage and increase the widespread use of solar, wind, bio-mass, and other renewable energy technologies. The state plan then becomes part of the total plan for the 13-state Western Regional Solar Network associated with the SERI facility based in Golden, Colorado.

c. Sunshine Still

The OEC is co-sponsoring a $62,170 project to demonstrate the feasibility of using solar energy to convert agricultural wastes into usable motor vehicle fuels. The Domestic Technology Institute is under contract to build two test distillation units that convert grains and other wastes into ethyl alcohol, which can be used directly as a fuel (with some engine modifications) or can be mixed with gasoline (gasohol). The heat necessary for the process is to be supplied with solar collectors. The bilingual program, aimed at Spanish-speaking persons, is funded by a grant through the OEC from the U.S. Department of Commerce Office of Minority Business Enterprise.

(4) The OEC will work with Public Utilities Commission, utilities, and the DOE in developing an energy emergency contingency plan.

(5) The Colorado Office of Human Resources, in its weatherization program, is required by the Community Services Administration to provide energy conservation information to particpatns. The OEC proposes to assist COHR in providing this service.

(6) The energy information and data collection/analysis section of the OEC will serve as a clearinghouse and referral center of energy information and data. The section will serve to locate and coordinate a statewide energy reporting mechanism from existing sources with expansion to new sources in the future. The information will be used to monitor the conservation programs, provide a basis for policy analysis and impact, and provide energy supply and demand information to the communication section of the department.

(7) The OEC will coordinate conservation activities at both the federal and local levels to assure both an equitable distribution of conservation program benefits statewide, and a minimization of unnecessary duplication. This activity will also include the development of funding sources for additional conservation programs. Appropriate items to be considered by the state legislature will also be developed.

(8) Staff support and coordination for development and implementation of state energy policies will be provided to the Governor and the cabinet-level Planning and Coordinating Council by the OEC.

COLORADO SOLAR ACTION PROGRAMS: 1978-1983

A Five-Year Plan for Expediting Solar Applications

EXECUTIVE SUMMARY

-Prepared for-

Western Solar Utilization Network
Solar Planning Office-West
2500 Stapelton Plaza
3333 Quebec
Denver, Colorado 80207

-Prepared by-

Peggy Wrenn
Colorado Office of Energy Conservation

and

Rebecca Vories
Colorado Energy Research Institute

March 1, 1978

EXECUTIVE SUMMARY

Colorado's Solar Action Plan, submitted to the Solar Planning Office-West for inclusion in the Western Region proposal to the U.S. Department of Energy on March 1, 1978, proposes four programs to accelerate rapid, orderly commercialization of solar energy applications. The overall intent of the plan is to develop regional, state and local initiatives that substitute use of solar energy for non-renewable energy sources.

The programs and projects outlined in this plan were developed in response to the needs and priorities expressed by the state Solar Advisory Group, local government officials, citizens and solar commercial interests from a broad range of Colorado communities.

The Solar Advisory Group, which met three times during the planning period (September-December 1977), was composed of over 30 people representing financial institutions, building contractors, solar technology manufacturers, distributors and installers, wind and bio-fuels specialists, government officicals and researchers.

The plan was written and revised by an investigative team composed of two principal investigators representing the Colorado Office of Energy Conservation and the Colorado Energy Research Institute, as well as several subcontractors. An extensive literature search and papers contributed by the Solar Adivsory Group on their respective areas of expertise were incorporated into the plan.

Colorado's Solar Action Plan is intended as a state planning document, still open to review and revision until the 1979 session of the Colorado legislature, as well as a part of the Western Region Solar Energy Network proposal to the U.S. Department of Energy.

This document defines Colorado's preliminary five-year plan for accelerating the use of state-of-the-art solar technology in governmental, residential, industrial, commericial, and agricultural facilities. The plan also establishes operational, administrative, and budgetary elements of the proposed programs.

The total proposed budget over the five-year life of the plan is $4.9 million.

MAJOR PROBLEMS

These discussions led to a general agreement that the major barriers to extensive use of solar energy are:

- High initial costs of solar energy systems.
- Insufficient knowledge in the public and private sectors to make adequate decisions regarding the usefulness of a variety of solar technologies for specific applications.
- Insufficient knowledge within the solar energy industry about marketing the technologies.
- Insufficient financial incentives for solar investments.
- An inability to significantly increase the capacity to deliver solar energy systems because of a lack of trained personnel and an inadequate business community infrastructure.
- Insufficient data on the performance of solar energy systems for use by lenders, builders and potential consumers.

The terms "solar" and "solar technology", as used in this proposed plan, refer to a broad range of energy resources, such as direct heating from the sun, wind power and bio-mass conversion. For many applications envisioned, these technologies appear to be competitive in reliability and life-cycle costs with other commercially available energy technologies.

To increase the use of solar technologies in residential and other kinds of facilities, four general program areas have been identified:

- LEGISLATION
- EDUCATION, TRAINING AND PUBLIC COMMUNICATION
- TECHNICAL ASSISTANCE
- DATA DEVELOPMENT

Balanced emphasis is placed on new and retrofit applications, all of which will be coordinated closely with state-sponsored energy conservation efforts. Active and passive solar heating and hot water technologies are stressed state-wide. In agricultural regions, wind, process heat, and bio-mass technologies also will be emphasized. Public communications efforts will be used to present the full range of available economic options. Most important, communities and neighborhoods will be involved in setting and implementing solar use goals.

Use of state-of-the-art technologies is emphasized because the plan is action-oriented rather than research-orinted. Implementation of the plan is designed to:

- Help consumers make better-informed decisions about which solar technologies to purchase.
- Encourage participation of the building industry and its supporting manufacturing, servicing and maintenance infrastructure.
- Make investment in solar technology more attractive.
- Help reduce the cost of solar technology acquisition and use over time by stimulating competitive distribution and maintenance services.

OVERALL GOALS

The primary objective of the plan in the first year is to establish specific quantifiable goals for accelerating the use of solar technologies for new and retrofit applications in residential and non-residential facilities. The primary objective during the second through fifth years is to achieve the specific goals established during the first year.

The secondary goal of this program is to accelerate the accomplishment of Colorado's energy conservation objectives.

OVERALL STRATEGY

To achieve the goals of this plan, eight general strategic objectives were developed:

- Create capacity within state government to carry out a solar action plan.
- Create a level of public awareness that is appropriate for more informed decision-making.
- Link the use of solar to energy conservation.

-- Strengthen local organizations interested in solar energy.

— Stimulate job creation.

-- Maximize the attractiveness of solar investments.

— Simplify the marketing of solar technologies.

-- Evaluate the impacts and consequences of this plan.

PROJECTS

The plan proposes 15 projects within the four general program areas. In many cases, the projects would involve multi-state Western regional cooperation. Some have been proposed by other Western states. The Solar Planning Office-West has reviewed the proposals from all the Western states and selected from them a series of regional projects to propose to the U.S. Department of Energy for funding. The 15 projects proposed in the Colorado plan follow with their project numbers, which indicate by letter the corresponding program area (L=Legislation; E=Education; T=Technical Assistance; and D=Data Development):

L-1: LEGISLATION -- proposes a Solar Energy Office within Colorado government; further proposes hiring counsel to research and draft a comprehensive five-year package of solar legislation, addressing a large array of legal issues and solar incentives, with a five-year "sunset" examination of the Office and the laws.

E-1: MASS COMMUNICATION -- proposes to disseminate solar information through T.V., radio, and other mass communication channels, through five sub-state, regional Solar Energy Resource (SOURCE) Centers.

E-2: EXHIBITS/SPEAKERS/SEMINARS -- proposes travelling solar exhibits, speakers bureau, and a series of seminars for specific target audiences, with a decentralized approach through the SOURCE Centers.

E-3: QUESTION ANSWERING -- proposes to support Denver Public Library Energy Hotline with solar expertise and referral service; also to answer questions locally by phone, mail, and personal contact through SOURCE Centers.

E-4: TECHNICAL TRAINING — proposes "hands-on" workshop for specific target audiences, using many existing trade publications and expertise taken from the target audience groups.

E-5: CURRICULA DISSEMINATION — proposes workshops for teachers and school officials to help them make use of solar energy curricula materials, many of which are already available. Also uses SOURCE Centers.

E-6: PUBLICATIONS — proposes to make solar publications available through SOURCE Centers, public libraries, and widely circulated, annotated bibliographies.

E-7: MEDIA MATERIALS — proposes packages of media materials (slide shows, tapes, video spots, etc.) to be collected and/or produced as necessary, for use by SOURCE Centers, speakers bureau, etc.

T-1: TECHNICAL AND PLANNING ASSISTANCE TO LOACL ORGANIZATIONS — proposes to provide a roving state solar specialist and engineering consultants to assist local governments and public officials who wish to install or build solar applications on public buildings. SOURCE centers also provide follow-up assistance. Addresses land use planning.

T-2: TECHNICAL AND PLANNING ASSISTANCE TO EDUCATION INSTITUTIONS — proposes similar support services (see T-1) for educational institutions.

T-3: TECHNICAL AND PLANNING ASSISTANCE TO STATE GOVERNMENT AGENCIES — proposes similar support (engineering expertise, planning, considerations) to a host of state agencies considering new buildings or otherwise involved in potential solar applications.

D-1: NATURAL NETWORK ANALYSIS — proposes to study the natural networks and marketing/distribution channels in Colorado communities, for baseline evaluation data and for facilitating other projects.

D-2: INSTRUMENTATION — proposes to instrument public solar buildings to create data on the performance of a variety of applications in various locations.

D-3: R & D MONITORING — proposes to solicit, read, and process information as it is generated by various national solar R & D projects; to screen useful information for decentralized SOURCE Centers, etc.

D-4: EVALUATION — proposes mechanisms to evaluate the effectiveness of Solar Action Plan programs and projects.

BENEFITS

The major benefits to the State of Colorado from the activities proposed in this plan are:

- Increased use of solar energy technologies will take the pressure off the use of non-renewable resources.
- Strengthening of the economy through the creation of new business opportunities and jobs will result from widespread use of solar.
- A broad-based educational program will help citizens become more capable of making informed decisions about the use of energy.
- Colorado will make a contribution to the overall U.S. goal of 2.5 million new and retrofit solar buildings by 1985.
- A decentralized network of solar expertise can provide quick, localized assistance for supplemental heating systems in times of emergency fuel shortage.

ATTACHMENTS

1. Proposed budget breakdown over the five years of the plan.
2. Acknowledgements section of the plan, listing the members of the Solar Advisory Group and others who helped with the plan.
3. Table of Contents for the plan.
4. Table from the plan outlining the various implementers of the Colorado plan.
5. Organization chart showing the proposed organization and management scheme.

SECTION 5. BUDGET ($X000)

ITEM	1	2	3 YEAR	4	5	SUB-TOTALS	TOTALS
1. Personnel							
a. Solar Energy Office Director	32.0	34.2	36.2	37.5	38.6	178.5	
b. Solar Energy Office Deputy Director	25.0	26.8	28.4	29.3	30.2	139.7	
c. Program Managers—3	66.0	70.5	74.7	77.1	79.5	367.8	
d. Roving Solar Engineer	25.0	26.8	28.4	29.3	30.2	139.7	
e. Staff Assistants—2	24.0	25.6	27.2	28.8	30.6	136.2	
f. SOURCE center Directors—5	75.0	80.5	85.5	90.5	96.0	427.5	
h. SOURCE center secretaries—2.5	20.0	22.5	25.0	26.5	30.0	124.0	1,513.4
	267.0	286.9	305.4	319.0	335.1		
2. Fringe (14% of 1)	37.4	40.2	42.7	44.7	46.9		211.9
3. Travel	7.0	8.0	10.0	9.0	8.0		42.0
4. Supplies and Expenses (incl. phone, postage)	65.0	63.0	52.0	50.0	47.0		277.0
5. Computer Terminals and time	15.0	54.0	94.0	94.0	94.0		351.0
6. Subcontractors/Consultants Ceta Labor/Interns	527.4	673.0	827.0	529.0	381.0		2,937.4
7. Total Direct	848.1	1,103.5	1,388.5	1,113.6	988.7		5,442.4
8. Indirect Charges (30% of 1 and 2)	91.3	98.1	104.4	109.1	114.6		
9. TOTALS	939.4	1,201.6	1,492.9	1,222.7	1,103.3		4,959.9

*Budget does not include $3,000,000 to be allocated for cost-sharing on solar projects (see Technical Assistance Projects, T-1 through T-3).

ACKNOWLEDGEMENTS

This Plan could not have been written without the invaluable contributions of the members of the Colorado Solar Advisory Group. They provided a real world look at what was needed and what could reasonably be accomplished through increased state activity.

The following persons made up the Colorado SAG.

Joe Zettle, (SAG Chairman), Johns-Mansville Corp.
Neal Allen, Public Service Co. of Colorado
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Floyd Blake, Solar Thermal consultant
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William McKinnell, Marathon Oil
Austin Moore, Colorado Association for Housing & Building
Lee Salmon, Solar consultant
Buie Seawell, Office of Energy Conservation
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Ed Tomsic, Bureau of Reclamation
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Co-principal investigator
Rebecca Vories, Colorado Energy Research Institute
Co-principal investigator
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Rod Roberts, Domestic Technology Institute
Lee Salmon, Consultant
Tom Sladek, Colorado School of Mines Research Institute

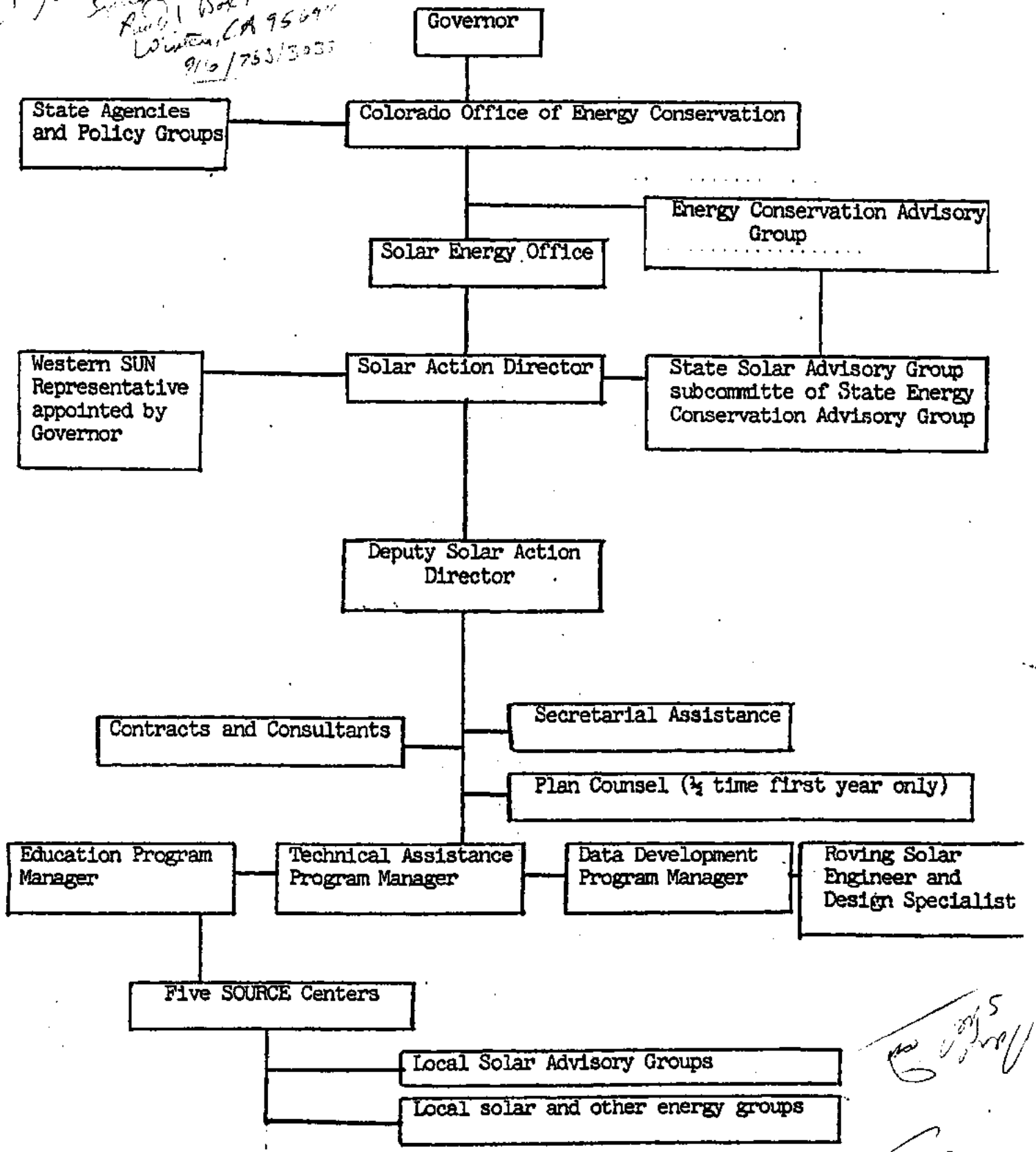
We would especially like to acknowledge the many people in Colorado communties, who cheerfully provided assistance in organizing community meetings and identifying key contacts to interview.

TABLE OF CONTENTS

Table 1-1. Implementers of the Colorado Plan

Implementer(s)	Description
Colorado Solar Coordinator	The individual in Colorado state government who has complete authority and responsibility for implementing the plan.
Colorado Solar Programs Staff Specialists	The goups of State Government employees providing management support to the Project Coordinator and providing communication and support within state government throughout the five year period. This group provides management and technical continuity.
Regional Solar Use Resource (SOURCE) Centers	This network of five SOURCE Centers to be established will provide the major information points for the public throughout the state. They will also serve as the focal point for sub-regional input to goal setting for each program are to be accomplished in their sub-region.
Equipment Manufacturers, Distributors	This group is the industry currently involved in manufacturing and marketing solar technology.
Architect/ Engineer Firms	Local architect/engineer firms will be employed to provide the definition of specific site requirements and on-site system application designs.
Building contractors	The State will contract with firms normally employed in each region for the work of building and installing solar systems at all sites participating in the technical assistance projects.
Service and Maintenance Groups	The State will contract with firms that typically perform service work on heating and plumbing systems to provide service and perform maintenance on demonstration projects.
Financial Institutions	The State will encourage lenders who are early solar innovators to share their experiences with other financial institutions.
Public Utilities	The State will encourage public utilities to support solar energy use through non-discrimminatory rate structures, gas tap priorities and other policies (see Legislation project L-1).
Media	All forms of media will be used to ensure that as wide an audience as possible will be reached with information about solar technologies and incentives for using them.
Neighborhood Groups	Through the SOURCE Centers' advisory groups neighborhoods will be able to participate in the goal setting process for their areas, and will play a role in implementation primarily in the Education Program.
Volunteer Groups	Would play a role similar to the Neighborhood Groups.
Local Governments and Educational Institutions	With technical and planning assistance form the State, will use solar energy on public buildings and put solar on local and educational planning agencies.

Organization chart.



State of Colorado

RICHARD D. LAMM
Governor

OFFICE OF ENERGY CONSERVATION
DENVER

BUIE SEAWELL
Director

ENERGY CONSERVATION FACT SHEET

FEDERAL SOLAR ENERGY GRANT OPPORTUNITIES

-RESIDENTIAL DEMONSTRATION PROGRAM-

Sponsor: U. S. Department of Housing and Urban Development

Program: For residential demonstration project that comply with HUD Intermediate Minimum Property Standards. The program is designed to demonstrate solar heating and domestic hot water systems. Individual homeowners MAY NOT apply. Applications must come from developers, builders, contractors, government agencies, residential solar energy equipment manufacturers or distributors.

Contact: Joe Sherman
U. S. Department of Housing and Urban Development
Washington, D. C. 20410

* * *

-COMMERCIAL DEMONSTRATION PROGRAM-

Sponsor: U. S. Department of Energy

Program: For commercial (non-residential) buildings utilizing integrated solar space heating and cooling, space heating only or space cooling only systems. Approved projects would be eligible for partial federal funding. Applicants must show that the project involves technically feasible solar technology and provide sufficient indication that financing necessary approvals can be obtained.

Contact: Bill Corcoran
U. S. Department of Energy
Solar Heating and Cooling Division
Washington, D. C. 20410

* * *

1410 Grant Street, B-104, Denver, Colorado 80203 (303) 839-2507

-NATIONAL CENTER FOR APPROPRIATE TECHNOLOGY-

Sponsor: National Center for Appropriate Technology and the U. S. Community Services Administration

Program: Limited grants to aid low-income persons, families or communities. The projects must be undertaken in association with a local community action program or with the support of the Community Services Administration.

Contact: National Center for Appropriate Technology
P. O. Box 3838
Butte, Montana 59701

* * *

-INFORMATION UPDATE-

HUD SOLAR STATUS -- This newsletter will give you updated and continuing information on the HUD Residential Demonstration Program previously described. For subscription, write:

Status Mail
P. O. Box 1607
Rockville, MD 20850

DOE INFORMATION -- This newsletter will give you updated and continuing information on grant opportunities as they arise. To subscribe, write:

U.S. Department of Energy
Office of Public Affairs
Program Coordination Branch
AL-5107-XXI
Washington, D.C. 20545

SOLAR ENERGY HOTLINE -- For on-going information in specific grant opportunities, call the National Solar Heating and Cooling Information Center at this toll-free number: (800) 523-2929. The more specific your request, the better information you'll receive.

Energy Developers Express Discouragement

The United States has sufficient energy supplies to maintain the existing standard of living for fifty years – allowing for development of other energy sources in the interim.

That was the good news. The bad news was it probably won't happen, because the energy program is courting disaster.

These were some of the conclusions of a three-hour symposium sponsored by Club 20 in conjunction with Mining and Petroleum Days in Grand Junction.

Subject of the symposium was the five, 10 and 15 year effect of energy development on the Rocky Mountain West. However, most of the speakers indicated that even though the needed resources are in the Rocky Mountains, the development may be stopped altogether and if so, the impact nil.

Charles Margolf, director of Western Coal Operations for W. R. Grace & Co. said, "You have invited the wrong people to tell you about impact. Development is no longer in the hands of business. You must seek out those who formulate law through the judicial system and create delay, which is often fatal."

Max Eliason, senior vice president of Skyline Oil Company and former president of Rocky Mountain Oil & Gas Assn., said he posed the question of impact to an independent oilman and the reply was: zero at five years, zero at 10 and zero at 15.

Eliason then detailed both the nation's needs and ability to fill those needs and the forces working against the effort. He called oil and gas price controls the confiscation of money from industry that would have been used for exploration and development. Eliason labeled the forcing of some to sell oil at $5.25 a barrel while the Arabs are being paid $14 a barrel, "outright thievery."

The United States has gone from purchasing 3.9 million barrels a day for $3.6 billion in 1971 from foreign countries to purchasing 8.8 million barrels a day for a total $46 billion this year, according to Eliason, who said a continuation of that trend will bankrupt the United States. He also said the U.S. military is 90 per cent dependent on foreign oil and increased world demand will exceed supply by 1990.

Eliason said, energy development is getting "bogged down and tied up" in environmental problems and "I fear all development will come to a complete stop." He said that Washington politics have resulted in the arming of environmental groups with a weapon that is "almost impossible to fight," and he expects a requirement for an environmental impact statement on any oil or gas well on the public domain soon.

He cited a U. S. Geological Survey estimating a 50-year supply of oil and natural gas within the borders of the United States and called the Carter Administration's policy of conservation, one of "spreading the misery around," unnecessary.

Margolf, whose company operates the ColoWyo coal installation near Craig, said that while industry could meet the coal goals of both Presidents Ford and Carter it has been stymied. He produced a 20-foot-long flow chart showing procedures for mining companies from initial interest to construction. He said ColoWyo spent four years and $40 million to get to the middle of the chart, only to have the U.S. Department of Interior change procedures last month.

In another example, Margolf said coal companies began intensive development efforts in the West in the early 1970's because of federal clean air requirements. He said the West's low sulphur coal would meet requirements without extensive air pollution control devices. Margolf said federal regulation and a virtual zero-leasing policy on federal lands are pushing companies back to the East.

Margolf said there is an absence of leadership and people who believe in freedom in Congress. He said the only reason the Alaskan oil pipeline was built was because Congress said it would not permit judicial challenge to the adequacy of the environmental impact statement. He said the only way the Alaskan gas pipeline will be built and the only way energy development in the West will take place is if Congress makes the same declaration.

Margolf said he does not anticipate that happening. He said even though 99 out of 100 persons believe in a project, as long as one person has a filing fee (for court challenge) the project will be delayed or killed. "We do not have an energy crisis; we have a crisis of time," he said.

W. C. Thurber, manager of Uranium and Asbestos Businesses of Union Carbide Corporation said the United States must rely on coal and nuclear power for the next 15 or 20 years. And, the United States is already committed to nuclear power.

Thurber said 60 per cent of total electrical generation in Northeastern United States is nuclear and the total cost is 1.4 cents per kilowatt hour as compared with the fuel cost alone of fossil fuel fired power plants of 2.3 cents per kilowatt hour.

Thurber said if approved, a recommendation by Carter advisers to declare a moratorium on nuclear power plants until the year 2000 would cost the American consumer an additional $50 to $100 billion dollars.

Despite strong support of nuclear power by the people at large, special interest and environmental groups are getting their way and "the mining community can no longer keep a low profile. I urge you to become activists," Thurber said.

In a report on regional development, Thurber said, 86 per cent of the known uranium reserves and 76 per cent of the probably potential deposits are in the Colorado Plateau and Wyoming Basin areas. Figures given by Thurber place 56 per cent of the nation's known uranium reserves and half of the potential reserves in the Colorado Plateau, which consists primarily of Southwestern Colorado and Southeastern Utah.

Thurber said he anticipates expenditures between now and 1992 of $2.3 billion for exploration and drilling in the Rocky Mountains and a capital investment for new mines and mills of $3.7 billion in the same area and time period.

Prognosis on transportation for energy development was mixed. W. J. "Bill" Holtman, president of the Denver & Rio Grande Railroad, said that after massive capital outlays, the D & RG could handle anticipated demand increases. Holtman said the railroad, which gets half its tonnage and 30 per cent of its freight revenue from coal, has spent $60 million on equipment and $40 million on roadbeds in the past five years.

However, R. A. "Dick" Prosence, district engineer for the 14 northwest Colorado counties of the Colorado Department of Highways said of roads in and around oil shale developments, that with the exception of Interstate 70, the beds are not strong enough, the paving isn't wide enough and the designs need to be improved.

He gave as one example, 72 miles of Colorado 139 in the Douglas Pass area. He said to provide the appropriate roadbed, eliminate some curves and provide drainage and shoulders on a good two-lane mat would cost $36 million. Prosence said the road will not even get $2 million in improvements in the next five years, since his total annual budget for all secondary roads in the 14-county district is $2 million.

Prosence said due to safety and environmental considerations and inflation, the per unit cost of road construction and improvements has tripled in the past 10 years.

He said the federal government funded defense roads during World War II and funded roads to facilitate uranium development 20 years ago. Prosence said, "It might be time for the feds to fund energy access roads throughout the country."

In delivering the keynote address and summation, Dr. Guy McBride, Jr., president of Colorado School of Mines traced a string of events beginning 50 million years ago with what was the beginning of mineral deposits to a point 50 years from now.

McBride, who echoed concerns over government intervention environmental groups and delays said, "Resources are limited but adequate for our standard of living for 50 years or so. We must do something to carry on after. It seems to me we're not doing all of that."

The Club 20 symposium was conducted in cooperation with the Colorado Plateau Section of the American Society of Mining Engineers of the American Institute of Mining, Metalurgical and Petroleum Engineers.

EXPLORE
COLORADO WEST

Small Communities Affected

Colorado Faces Energy Impact

As the nation turns to ways of expanding energy supplies, Colorado will be called upon to provide a greater share of coal, shale and crude oil, natural gas, uranium and alternative energy technology.

From the increased white-collar work force for Golden as a result of the Solar Energy Research Institute to the thousands of workers necessary for expanded coal production on the western slope, the impact of energy development will change the face of our state.

Availability of housing, water, local government services, transportation, and schools will dictate the shape and limits of new growth.

All too often, the federal planning effort becomes a stumbling block rather than a program which provides needed aid. While the energy boom is still on the horizon for most Colorado communities, the Wyoming towns of Rock Springs, Hanna and Rawlins have experienced incredible growth in the past 5 years with little or no assistance from the federal government.

With the passage of the Payments-In-Lieu-of-Taxes bill and the Coal Leasing Act of 1976, the Congress established its intent to make local governments the beneficiaries of funds they have been entitled to, but funds which have historically been administered by the federal government. As a prime sponsor of both pieces of legislation, I believe the bills have laid the groundwork, but considerably more needs to be accomplished.

As Chairman of the Senate Subcommittee on Energy Production and Supply, I have spent considerable time this session on coal-related issues. In November the subcommittee continued its probe into energy impact with two hearings in Colorado, one in Brighton on November 15, the second in Grand Junction on November 16.

Given the expected increase in Colorado coal production – expected to triple by 1985 – cities and counties located near our coal reserves will mushroom. Yet today, those cities and counties are, by and large, wholly unprepared for the onslaught.

In a criticism of the federal impact effort to date, the Western Governors' Conference has termed existing programs "narrow and too strictly drawn."

Socio-economic impact, the Conference says, should not be viewed looking down from above, but should be viewed from the shoes of a bewildered small-town Mayor. He holds office because no one else will take it, earns $50 a month for his after-hours efforts, holds a full-time job, and has lived in town all his life. He has just learned that his town of 243 people will have a new coal mine and a 1250 megawatt electrical generating plant.

The mayor didn't ask for the development and probably would prefer it didn't come. But he needs to turn to someone for aid. He is dimly aware of HUD and Farmers Home programs, but has never experienced the countless forms, phone calls and red tape.

Soon the mayor finds out he needs a town planner. The mayor must now be a full-time engineer, financing expert, grant administrator and public relations man. The town needs a new water system, a sewer plant, new roads and a town survey even before the newcomers arrive. When they do arrive, the pressures on housing, law enforcement, recreation facilities – on almost all facets of town life – are overwhelming.

Energy-impact legislation will be a top priority over the coming months. Working with mayors, county commissioners, and citizens in affected areas is essential for a balanced approach to this complex problem.

GASOHOL: Today's Fuel

Converting excess and spoiled crops into energy to power automobiles and farm machinery is not as far-fetched a proposition as many believe. The 1977 Farm Bill, which was signed by the President last month, contains funds to guarantee loans for four pilot "Gasohol" plants.

Gasohol -- a blend of unleaded gasoline and alcohol -- can power most motor vehicles without modification. Gasohol proponents claim that its nationwide use would enable the United States to meet President Carter's goal of reducing gasoline consumption by 10 per cent over the next eight years.

In an effort to locate one of the pilot gasohol plants in Colorado, a task force has been formed consisting of farmers, engineers, interested citizens, businessmen and others in the energy field.

After two meetings with Agriculture Secretary Bob Bergland and considerable correspondence with those in the USDA gasohol program, I have assurances Colorado will be given good consideration during the site selection process.

IMPACT AID OKAYED

House-Senate energy conferees have accepted my proposal to provide $180 million in aid to energy-impacted communities affected by expanded coal and uranium production. The appropriation, available during 1979 and 1980, will allow local communities to plan for exanded growth and services due to increased energy production.

This section is part of the total energy package which will be sent to President Carter sometime in December.

U.S. Senator
Floyd K. Haskell
reports to
Colorado

Floyd K. Haskell
U.S.S.

Senate Office Bldg., Washington, D.C. 20510

RALPH E CLARK
519 E GEORGIA AVE
GUNNISON CO 81230

1075852

HASKELL

U.S. Senator

ENERGY REPORT TO COLORADANS

452 RSOB, Washington, D.C.

December, 1977

Water Is Key Factor In Energy

Any energy-producing industry will draw on the supply of Colorado's most vital and important natural resource – our water. Protecting the rights of farmers, ranchers, cities and towns while allowing increased energy production presents us with a unique dilemma.

On the federal level, there are decisions being made which will affect Colorado water. I will continue to fight any attempts to institute a national water policy which seeks to supercede the rights of the state. However, almost any energy decision the Congress makes on increased production will affect Colorado water.

Take for example, the proposal to grant eminent domain to coal slurry pipeline companies. Coal slurry pipelines – which carry a mix of equal parts of water and coal – are an efficient and inexpensive way to transport the fuel from the coal-rich west to the South. Should the Congress encourage these pipelines, millions of gallons of Colorado water will be needed.

While slurry pipelines may be an environmentally acceptable way to transport coal, I will oppose any slurry proposal which uses Colorado water unless the pipeline has a "closed loop" which returns the water or the State is guaranteed an equal amount of water from outside sources.

Water is also a necessary ingredient in the actual mining and production of coal, oil shale, and other resources.

Water will be a factor in almost any decision we make on energy development. As a member of the Senate Energy Committee, I will continue to bring the Colorado perspective to the committee's attention.

ENERGY PACKAGE STATUS

As a member of the House-Senate Energy Conference Committee, I am hopeful a workable package will be sent to the President by the end of December which is fair to consumers and will encourage government, industry and the public to conserve our dwindling fossil fuels.

The Conference Committee is a unique institution of the Congress where Representatives and Senators take their respective versions of the bill, and reconcile the differences.

In the case of the energy bills, there is considerable distance between the House and the Senate versions. Many major issues remain to be resolved in Conference. Among the proposals I have supported and will continue to support are:

- The President's natural gas plan, which in the end will cost consumers far less than de-regulation. Given the astronomical rise in natural gas prices, the President's plan allows gas companies adequate incentive to explore for new gas, while keeping the lid on prices.
- Inclusion in the final Coal Conversion bill of an energy-impact section which will help states like Colorado deal with increased growth due to energy development.
- A measure which would curb the bias against solar and wind power systems by utility companies.
- An outright ban on new cars which do not meet minimum mileage requirements.
- A lifeline rate where senior citizens on fixed incomes are protected from the undue burden of ever-rising utility bills.

SOLAR HIRING

The National Solar Energy Research Institute (SERI) at Golden is aggressively pursuing an affirmative action program aimed at placing minorities and women in top level positions.

If you are interested, call Peter Chavez, 234-7171 or send your resume to him at 1536 Cole Blvd., Golden, Colo., 80401.

SOLAR LOANS APPROVED

The nation's first solar loan program for homeowners, a plan I introduced after a solar energy hearing in Golden, Colo. last spring, has cleared the Energy Conference Committee and will be part of the package sent to the President.

This is a major step toward commercialization of solar energy. Under the plan, an agency of the Department of Housing and Urban Development(HUD) will subsidize the interest rate on solar loans for home heating and cooling. HUD would guarantee 90 per cent of the loan to local banks and savings institutions, eliminating much of the risk factor -- a factor which has been a major roadblock in front of increased solar usage.

Up to $8,000 can be borrowed for a solar system, at rates as low as 7 per cent. A recent Library of Congress study indicates that the plan will spur as many as 86,000 solar homes within 5 years.

Meeting with President Carter on water policy.

SIERRA CLUB 530 Bush Street San Francisco, California 94108 (415) 981-8634

26 August 1977

LEGISLATIVE ALERT: SUPPORT NEEDED IN SENATE FOR NATIONAL ENERGY ACT

To: Energy Activists List, Chapter & Group Conservation Chairpersons & Legislative Chairpersons, Letterwriters -- all in selected states

From: Jonathan Gibson, D.C. Office

September will be "energy month" in the U.S. Senate, with two committees and the full Senate expected to vote on the National Energy Act (NEA). The omnibus energy bill passed the House as H.R. 8444 on 5 August. Environmentalists were generally pleased with the House outcome and hope to maintain and strengthen key energy conservation provisions in the Senate.

President Carter's energy package was initially divided into two bills in the Senate -- S. 1469, which was referred to the Energy & Natural Resources Committee, and S. 1472, referred to the Senate Finance Committee. The Energy Committee has reported out as separate bills two segments of S. 1469. One of these deals with federal grants for energy conservation in schools and hospitals (passed as S. 701). The other (reported as S. 2057, Rept. # 95-409) provides conservation incentives in the residential and transportation sectors. The Energy Committee will deal with natural gas price regulation and electric utility rate reform immediately after returning from the August recess. Meanwhile, the Finance Committee will begin markup of S. 1472, the set of tax incentives for energy conservation, the week of 12 September.

Support is needed before 9 September for provisions in the two Senate bills dealing with utility rate reform, gas guzzlers, and crude oil taxes. The Club's two energy lobbyists in Washington are facing an uphill struggle on these important energy conservation measures. *Letters to senators will play a vital role in securing their passage.*

Utility Rate Reform

The House has passed a strong and comprehensive set of electricity pricing reforms which are far preferable to the provisions in the administration's bill, now pending before the Senate. We should therefore urge the Senate Energy Committee to base its deliberations upon this House-passed version and to work to strengthen it where necessary.

The Senate could improve the House bill by authorizing the Department of Energy to issue regulations concerning the methods to be used by the state regulatory authorities in determining the costs of providing electrical service. This rule-making authority could be essential in assuring that electricity rates reflect the full cost of providing this form of energy. Anything less is in the nature of a subsidy, which could result in over-consumption of electricity.

The producer-oriented Finance Committee is expected to weaken seriously the administration's energy proposals. Club members should urge their senators to (1) support the crude oil equalization tax and rebate system as proposed in S. 1472 and oppose any energy production plowback or trust fund, and (2) strengthen the gas guzzler tax by taxing all cars not achieving fuel economy standards in existing law.

The crude oil equalization tax is designed to raise the price of domestic oil over the next three years to the price of imported oil. Pricing oil at its true replacement value makes good economic sense. In addition, the tax will capture the windfall profits now available to refiners who buy domestic crude at an arerage controlled price of approximately $8.50 per barrel and sell the refined product at a world oil price of approximately $13.50. The oil tax will not result in excessive price increases for consumers, but will serve as an incentive for energy conservation.

President Carter proposed that oil tax revenues be rebated on a per-capita basis. This would be a progressive approach toward alleviating the burden of higher energy prices. The Finance Committee, however, is expected either to create a plowback tax credit which will reduce the oil tax of producers by a percentage of their investment in new development or to establish a trust fund from tax revenues to be used to subsidize energy development, such as that of oil shale and synthetic fuels. Either approach would undermine the energy conservation aspects of the NEA and result in increased environmental damage. *Sierra Club members should urge their senators vigorously to resist both of these subsidies to energy producers.*

The Gas Guzzler Tax

The gas guzzler tax proposed by President Carter was seriously weakened by the House, which provided a 3- to 4-mile-per-gallon "window" below the legal fuel economy standards before the tax takes effect. This window has been widened to as much as 5.5 mpg by recent announcement of higher 1981-1984 standards by the Secretary of Transportation, Brock Adams. *The Finance Committee should be urged to apply the tax to all vehicles not meeting current fuel economy standards and to assure that light duty trucks* (exempted in the House bill) *are covered by the law. The Committee should also be urged to earmark revenues from the gas guzzler tax to public transportation programs for which there is now no funding whatsoever in the NEA.*

WHAT YOU CAN DO

Our earlier mailing on the energy bill to Club members in districts of key House members did not produce the grassroots support needed in Washington. This mailing is therefore directed to members with known energy interests, letter writing abilities, and/or group or chapter leadership positions.

We are asking you to get as many members as possible to contact their senator(s) on the issues before their committees. You are being sent this letter because one or both of your senators are on the key committees (see lists below). Remind people that a letter does not need to be long and detailed to be effective. You should state your request for a senator's support or oppostion on a given measure briefly and specifically. When time becomes a factor, a Western Union mailgram (100 words for $2.75) or a political opinion message (15 words for $1.00) is particularly effective.

Our best chance to obtain strong national energy conservation legislation is between now and 9 September; let's not waste this opportunity.

If you can, please send copies of any letters you write and responses from senators you receive to: Campaign Desk, Conservation Department, The Sierra Club, 530 Bush Street, San Francisco, CA 94108.

Thank you!

Finance

Democrats

Russell B. Long, La., chmn.
Herman E. Talmadge, Ga.
Abraham Ribicoff, Conn.
Harry F. Byrd Jr., Va.
Gaylord Nelson, Wisc.
Mike Gravel, Alaska
Lloyd Bentsen, Tex.
William D. Hathaway, Maine
Floyd K. Haskell, Colo.
Spark M. Matsunaga, Hawaii
Daniel Patrick Moynihan, N.Y.

Republicans

Carl T. Curtis, Nebr.
Clifford P. Hansen, Wyo.
Robert Dole, Kans.
Bob Packwood, Ore.
William V. Roth, Jr., Del.
Paul Laxalt, Nev.
John C. Danforth, Mo.

Energy and Natural Resources

Democrats

Henry M. Jackson, Wash., chmn.
Frank Church, Idaho
Lee Metcalf, Mont.
J. Bennett Johnston, Jr., La.
James Abourezk, S.D.
Floyd K. Haskell, Colo.
Dale Bumpers, Ark.
Wendell H. Ford, Ky.
John A. Durkin, N.H.
Howard M. Metzenbaum, Ohio
Spark M. Matsunaga, Hawaii

Republicans

Clifford P. Hansen, Wyo.
Mark O. Hatfield, Ore.
James A. McClure, Idaho
Dewey F. Bartlett, Okla.
Lowell P. Weicker, Jr., Conn.
Pete V. Domenici, N.M.
Paul Laxalt, Nev.

100 foot head produces

one gallon per second falling 100 feet produces 1 kw.

110,000 gals per sec for 680 megawatt 2.9
330,000 gals per sec. = 4x 1/4 time for peak
3600 seconds to hour
f^3 = 7.48 gallon 4 hours generation a day
acre = 46,530

Relationship of Operative Head to Water Flow.
100 ft head ; flow in gallons per second 120,000 ; Power Megawatts 120
680 110,000, 680
6 Need 2000 MW so use for 680 × 2.9 = 2000 MW size
demand in gallons per second or about 330,000 gals/sec
operate for 4 hours at capacity or 60 × 60 × 4 = 14,400 seconds
14400 seconds × 330,000 gallons per second = 4752,000 gals
and in acre feet
7.48 gallons per cu ft^3 and 46,530 ft^3 to acre foot = gals per af
~~run through of 102.12 acre feet per 4 hour period~~
348,044. gals per af
so 13 af run through per four hour period.
13.65 af run through per four hour period.

The Houston Post 12-26-71

Your World

Save on suds!

By HAROLD SCARLETT
Post Environment Writer

as a parallel

You might call Ronald O. Ostrander a defector from a detergent factory.

And for any housewives who might be casting about for a New Year's resolution to do something that would help our hard-pressed environment, Ostrander has what sounds like a splendid idea:

Stop using 10 times as much phosphate detergent as necessary to do the family wash.

Ostrander, a chemical engineer, expounded on this advice — and on his qualifications for giving it — during a recent hearing on the phosphate problem before a House subcommittee on conservation and natural resources.

His testimony was about as fascinating and revealing as any heard in Congress since the late Joseph Valachi spilled the inner secrets of the Mafia.

Ostrander explained that when he used to work for Procter & Gamble (he's now with the Wisconsin Department of Natural Resources), he was the project engineer who developed the first heavy-duty, sodium tripolyphosphate detergent. It was named Tide, and it has now been a dominant brand on store shelves for 20 years.

Clouds of suds

In the beginning, Ostrander said, the P&G marketing experts stressed as selling points the high efficiency of the new product at low concentrations, with clouds of suds not necessary or even desirable.

Consumer surveys soon showed, however, that people were using too much detergent — and were delighted with the resulting billows of suds. So the sales department quickly took the cue and recommended high levels of usage. Other detergent makers followed suit.

Though it might seem incredible that "such a great hoax could be foisted upon the American public," Ostrander testified, it was really quite understandable.

"For the most part, the public was relatively affluent," he said, "and they were already adjusted to a high consumption philosophy."

As for detergent makers, Ostrander said, they were delighted to build additional plants and supply as much of the high-profit detergent as housewives wanted to use.

Nevertheless, Ostrander said, testing programs from the start showed the optimum amount of Tide for a machine-load of wash was ½ of a cup (two tablespoons)—a tenth of what the company now recommends.

He said his own family has used ½ of a cup from the beginning and as a result, he estimates, has now saved almost $2,000 in detergent bills.

Ronald O. Ostrander says don't take his word for it — try his low-detergent wash for yourself:

1) Measure ⅛ cup (two tablespoons) of detergent.

2) Wet the most soiled spots (shirt cuffs and collars), sprinkle on detergent and fold garment to hold in place.

3) For cool-water washes, very hard water or extremely dirty loads, add a bit more detergent, but never more than ¼ cup.

4) Check machine after two minutes of operation. With right amount of detergent, there should be a narrow ring of suds only around edge of tub, only half an inch wide. If no suds, add about a half teaspoon of detergent.

Extends life of fabrics

The lesser amount of detergent, he said, keeps colors bright and extends the life of fabrics. It reduces yellowing from unrinsed detergent residue and avoids the diaper rash which may result from the heavier usage.

"A typical family following my recommendations . . . will discharge less than one pound of elemental phosporus annually with their laundry waste waters," Ostrander told the House group.

"The annual discharge of elemental phosphorus from that same family's human wastes would amount to about 10 pounds."

Consumers who have tried his low-use formula report that it works equally well with other heavy-duty detergents, Ostrander said.

In laundering sheets, he said, recent tests show that even far smaller amounts of detergent will do the job.

Southern Colony, a Wisconsin home for retarded children, laundered a 400-pound load of sheets with only 1¾ cups of Dash, he said, while the manufacturer recommends 19 times that much. The Waupon Prison Laundry, for a similar load, got good results with only 1-28 of the recommended amount.

Ostrander agrees with the federal position that tertiary sewage treatment is the only real way to control all the multiple sources of phosphorus. At the same time, he questions the necessity of bans on phosphate detergents when, in his view, correct usage would eliminate 90 per cent of that problem.

Ostrander predicted that if everyone followed his washday advice, the savings nationally would amount to almost $1 billion a year — enough to build a lot of advanced sewage treatment plants.

"The fact that detergent manufacturers would lose a large chunk of business," Ostrander said, "should not deter anyone from disseminating the correct information."

Fryingpan-Arkansas Project, Colorado, Final Environmental ~~Impact~~ Statement

Corps
p II-124

Mt Elbert Pump Storage Project

Power load curves indicate that summer peaks are long and flat, caused by air conditioning demand; winter peaks are sharper and shorter, caused mainly by lighting

Summer peaks require about 8 hours a day operation

Winter peaks require about 6 hours a day operation

Spring - Fall peaks require about 4 hours a day operation

Average operation is expected to be 6 hours a day and no weekends - power demands fall off on a weekend

6 hour operation and 275 ft^3/second give a 1-foot daily fluctuation of 11 feet.

p II-62 — Pump storage plant will have 2 generators each of 100 MW

are generators and motor

405 feet of head.

3540 cuft per second

operate at an average load of 17% or about 6 hours average

15 foot diameter penstocks

p II-52 Mt Elbert Forebay — maximum water storage acre on surface 282

maximum water capacity storage 10,276 ac feet

maximum inactive storage 7014

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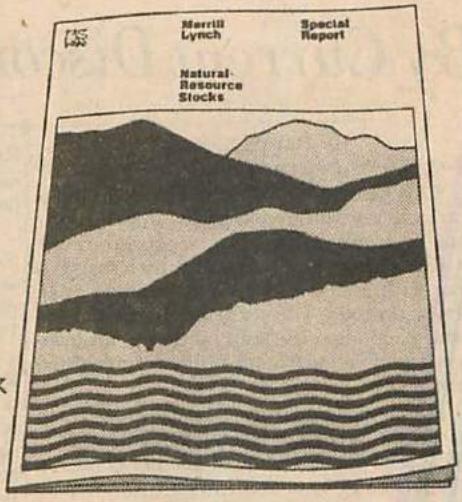

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Generals' Distress

Pakistani Army Fears the Nation C By Current Discord, but It Shuns a

By BARRY KRAMER
Staff Reporter of THE WALL STREET JOURNAL

RAWALPINDI, Pakistan—In 1971, Pakistan's army suffered a great drop in prestige by trying to suppress a popular revolt in East Pakistan, failing and then losing a war with India. Even many military men here blame the army's brutality toward the local population for the creation of an independent Bangladesh out of the former province.

So Pakistan's army has little desire to crush any more popular movements. Yet it finds itself in the middle of another domestic struggle, and in a predicament common to many Third World countries: It is the only force cohesive enough and strong enough to hold the nation together, but it is reluctant to endanger its prestige by taking a political role.

The current power struggle here pits Prime Minister Zulfikar Ali Bhutto and his ruling Pakistan People's Party against the Pakistan National Alliance. The Alliance, a nine-party coalition, accuses Mr. Bhutto of rigging the March parliamentary elections to give the People's Party a five-to-one majority in the National Assembly.

Shortly after the election, which in fact was marred by widespread rigging, the National Alliance boycotted provincial elections and also refused to take the 36 seats it had won in the National Assembly. Then the Alliance began nationwide strikes and protest marches that have cost almost 300 deaths and more than $200 million in damage. Even a few People's Party assemblymen have resigned in protest, as have Pakistan's ambassadors in Athens and Madrid and two diplomatic aides, in Moscow and Paris.

Competitive Demonstrations

If the size of the demonstrations is any Rawalpindi Saturday, a move that observers believe could plunge the entire country under martial law.

The Alliance also named a new chief: Skandar Shah Pir Pagaro, head of the conservative Moslem League, and spiritual and political leader of half a million Moslems in Pakistan's Sind Province. Pir Pagaro is regarded as a saint by his followers, who kiss the ground he walks on. Oxford-educated, he is son of the previous pir (spiritual guide), who led a 1942 revolt by his Hur tribesmen against the British and was executed. (The British then had second thoughts and sent the pir's two sons to school in Britain.) Pir Pagaro says he will lead the march on Saturday.

Bhutto's Tactics

Although Mr. Bhutto probably won't permit the march, he probably would hesitate to arrest Pir Pagaro because of the unrest such an affront would spark in Sind. So Mr. Bhutto is reacting in other ways. One of them reflects two facts: Of Pakistan's 75 million people, 97% are Muslims, and the National Alliance itself is dominated by fundamentalist Muslim parties that during the electoral campaign called for a return to strict Muslim rules against drinking, gambling and obscenity. So, in an effort to split the Alliance, Mr. Bhutto announced last week that he was ordering nationwide shariat, or strict Muslim law, to enforce the same rules.

Paradoxically, however, Mr. Bhutto also seems to be promoting unity within the Alliance in the hope that his disparate opponents can get together enough to be able to negotiate a settlement with him. So a few days ago he arranged a meeting between Pir Pagaro and at least eight jailed leaders of the Alliance, who are discussing terms on which they might talk to the prime minister.

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KENJI KAWANO

MacDonald: Circling the wagons again.

The Navajo Oil Bonanza: How They Plan to Use It

By John Peer Nugent

What you mean "our" energy crisis, white man?

At 49, trim, aviator-shaded Peter MacDonald is the full-blooded elected chairman of the Navajo Tribal Council. As such, he is the leader of 150,000 native Americans living on the biggest Indian reservation in North America—bigger than 10 of our states—covering areas of New Mexico, Arizona and Utah. He's the most powerful Indian leader in America, where 800,000 Indians, or native Americans, reside.

But despite his pleasure in playing 80s golf, dressing spiffily in Brooks Brothers clothing and occasionally dining on gourmet French fare, MacDonald is no Tonto. He's all warrior for Indian rights. And he's using business acumen, rather than political sit-ins, as his club. When he says, "We're circling the wagons, so to speak," he means it—though his is a strong voice that is more cautionary than threatening.

It's what he's circling the wagons *with* that is important here: The Navajos, you see, thanks to an unwitting government, have been placed right on top of 100 million barrels of oil, 25 trillion cubic feet of natural gas, 80 billion pounds of uranium and 50 billion tons of coal. And those are conservative estimates. If the entire mineral production of his nation's land in just one year were converted into electric power, it would produce nearly 5 billion kilowatt hours—enough to supply New Mexico and Arizona's power requirements for more than 15 years. The world's largest uranium mine and open-pit coal mine are there.

As for MacDonald, he is in the position

must be accompanied by parent). Kids brown-bag it at 5:30 p.m.; story begins at 6:30. Cost: $1.50 or $1 per family member. A **Storytelling Festival** (plus magic shows, puppets, films) will be held Aug. 20, 10 a.m.-4 p.m. at Eagle Rock Plaza, 2700 Colorado Blvd., Eagle Rock, sponsored by Arroyo Seco Branch Library; call 256-3178. Most public libraries also hold storytelling sessions; call your local branch.

28

Highland Park Rec Center, 6150 Piedmont Ave., 256-0621, sponsors the **Novice Children's Tennis Tournament** Aug. 9-11 at Arroyo Seco Park from 9 a.m.-4 p.m. all days. Four age divisions; must be their first tournament. First and second place winners will go on to the East Area tournament Aug. 16-18 at Montecito Heights Park. **Santa Monica Open Tennis Tournament** begins Aug. 27, two age groups, at Lincoln Park. Call 394-4282.

29

Youngsters will stage **"King Neptune's Water Frolics"** on Aug. 4 at Los Angeles Swimming Stadium (3970 S. Menlo Ave.), and on Aug. 11 at Roosevelt Pool, (456 S. Matthews). Call 749-7381 for information. As part of the **International Surfing Festival**, there's a beach run at Torrance Beach Aug. 6, 9 a.m., for all ages; Sand Castle Design Contest at Manhattan Beach Pier, Aug. 7, 8:30 a.m. for ages 5 and above; and several youth events at Torrance Beach, Aug. 7, 2 p.m. (surfmat race, tandem, swimming competition). Call 545-4502.

30

Kids 3-14 can be part of the "greatest show on earth" by joining the **Traveling Circus**, sponsored by L.A. Parks & Rec Dept. The circus tours local rec centers throughout August; for information, call your local rec center or 485-5515. Registration begins Aug. 1 for the **National Classic Bicycle and Foot Race**, co-sponsored by Beverly Hills Rec Dept. and other organizations. Children's competitions for the Sept. 18 event include distance run, family fun run and trike-a-thon. For entry blanks, information, call 550-4864 or 550-4761.

31

The **L.A. Free Shakespeare Festival**'s special presentations for kids are original adaptations of four folk tales done in story-theater style—part improvisation, part music and dance. *The Foolish Man* (Armenian), *Two of Everything* (Chinese), *Agayk and the Strangest Spear* (Eskimo) and *Tug of War* (African) are scheduled for 16 public performances at various locations through Aug. 13. Call 469-3974. ■

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Tues. Eve Art Walk 7:30-10

of negotiating tough – but apparently bearable – leases for the good of both his worlds: the Navajo nation, which needs the money, and the outside world of the Anglos, which needs the energy. He firmly believes that the Navajos – most of whom do not even have electricity – will only make it if the federal government and energy combines are made aware of the true depth of importance of his nation's resources in the big picture.

What the buttoned-down chairman is demanding is a better cut of the mineral pay cake. His thinking is quite prescient. In about 30 years the reservation will be out of known minerals; by then, he hopes to have his people self-sufficient in other businesses *not* relying on nonrenewable resources. The thrust is for a *permanent* economic base created with mineral revenues. He is not trying to hold up American corporations – he is trying to provide for the survival of a nation that's been around America longer than the Anglo one.

And to reach this goal, his nose is often as flinty as granite. In negotiations with El Paso Natural Gas over a pipeline lease through the reservation, for example, things got bogged down, and a weary El Paso executive noted that its lease would run out in mere days. MacDonald, whose philosophy is fair deal or no deal, calmly observed that El Paso had made a lot of money from the pipeline to Southern California.

"So you have two choices," he said, "pay or take it out." They paid MacDonald's price of $500,000 – considerably higher than the $40,000 they originally paid for the lease through negotiations with the Bureau of Indian Affairs. "Now the tribe gets a piece of the action," he said afterward. "What we tell companies is that we want a long-term relationship, not the kind of mineral snap-up that leaves a developing area as poor as it was before."

The Anglo world didn't – or didn't want to – catch MacDonald's smoke signals at first. So he united 22 Indian tribes into the Council of Energy Resource Tribes (CERT) and declared it a native American OPEC. Under the blankets of the member tribes is impressive booty: 53 million acres containing most of the nation's known uranium, one-third of the known low-sulphur coal and huge oil and gas resources.

There was suddenly – after all these years of Indian stoical and silent passivity – instant fury from paternal Great White Fathers in Washington. "How cheeky," they grumbled. "That's what we get for being good to *them*." MacDonald compounded fractured bureaucratic prides by announcing in early June that he was actively engaged in contacts with OPEC emissaries in order to gain some tricks of the negotiating trade and insights into the world picture for CERT members. And in

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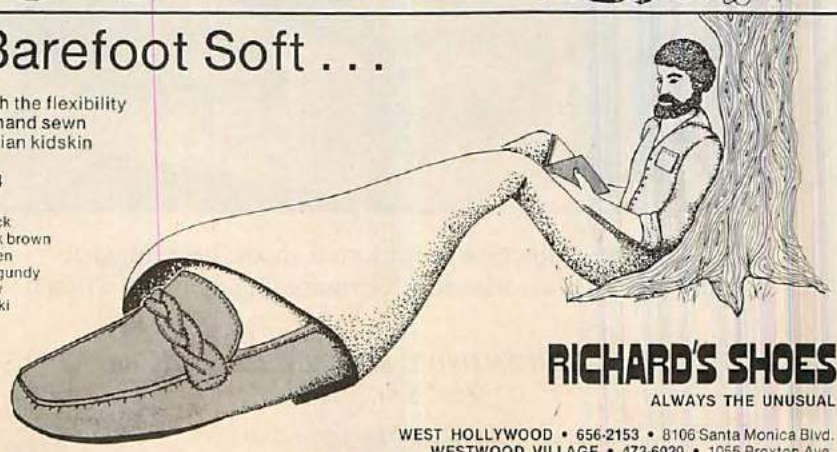

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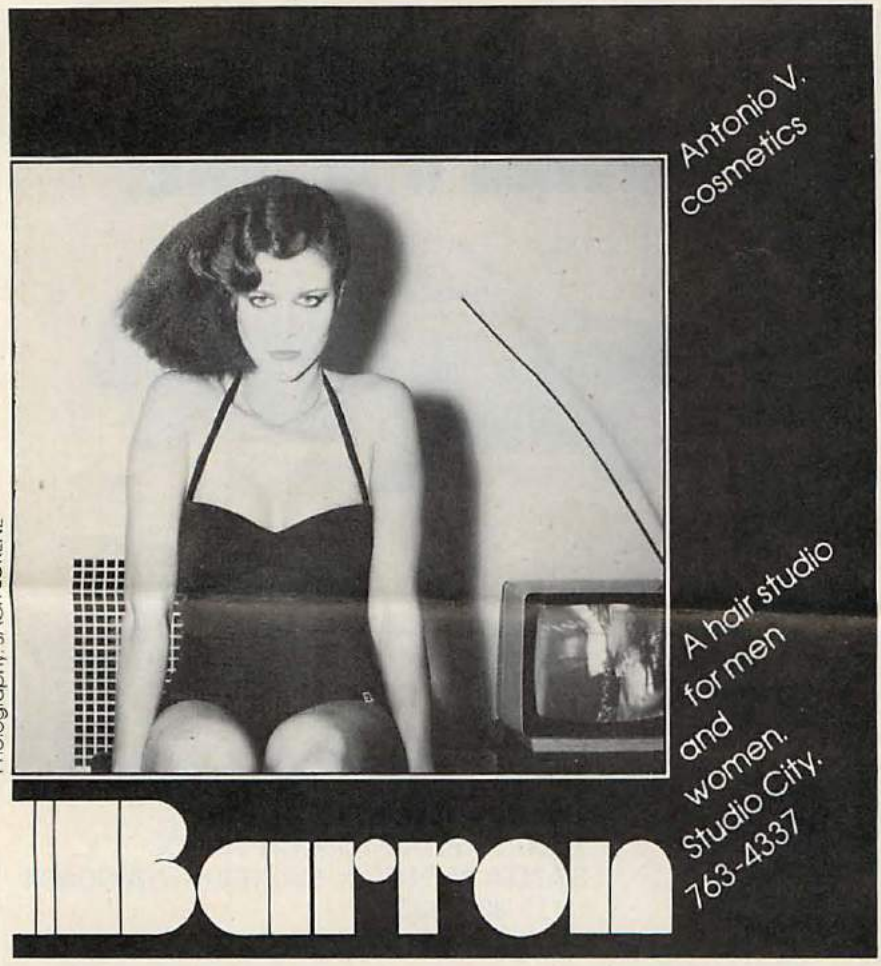

Photography: JACK LORENZ

late June, he went to Washington and, indeed, did meet with OPEC people to discuss mutual interests of energy negotiation and building alternate industries for the inevitable future.

Meet with them? He started actively to plot serious seminars for Indians to find out what Third-World lands plan for the day when they are drained out of *their* last natural resource and have to resort to making it as a people resource.

For an American ethnic group one might suspect has had the least world travel, the Indians show considerable international savvy. Pacific Northwestern tribes have had conversations with representatives of the People's Republic of China for several years on timber and fish trade. California's 112 reservations are attempting a Common Market approach to trade. Not a few Indian tribes have even expressed admiration for the Palestine Liberation Organization. The common bond: being displaced persons, refugees from their own homeland.

MARGARET CORO

MacDonald, who received his electrical engineering degree from Oklahoma University and has twice been selected as one of *Time* Magazine's 200 Rising American Leaders, has an intriguing overview on the subject. "We may indeed have an energy crisis, but if America responded to Pearl Harbor the way it's responded to this energy crisis, we would all be speaking Japanese today."

Ever since MacDonald was first elected chairman in 1970, he's been on an economic warpath, emphasizing that his people are tired of neglect and obscurity, tired of being known mostly for jewelry and drinking. The enemies are pretty much today the same ones of more than a century ago, when Kit Carson's bluecoat pony soldiers herded 10,000 surviving Navajos onto a

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bleak and barren piece of territory that was adjudged of no value to white men. Indeed, the government is still the enemy. There's more than a hint of scorn when MacDonald talks about the paternalism and indifference of "our trustee." He also considers the government an inept mineral-lease negotiator. Since minerals are the plasma of most Indian reservations, the attitude is understandable.

He naturally wants the profit from mineral leases to make the nation self-sufficient, self-sustaining, and perhaps even capable of becoming a 51st state.

Indeed, there is a pulsating sense of a Third World nation on the rise across the "res," as some call it. Navajos are being unionized, given job training, starting small enterprises. More than 3,000 are in colleges around the country. Window Rock is constantly under construction: housing tracts, new highways, a communications center, a shopping mall with fast-food stores. And if the talent is beginning to make impressions on the outside world, so is the negotiating style, which now faces some of the most powerful American corporations in the energy business and in heavy construction.

Not long ago, MacDonald signed a contract with Exxon for uranium prospecting on 400,000 acres only (out of 15 million acres). The price he demanded was $6 million up front and the right of the tribe to 49 per cent participation in any uranium mines started. Twenty years ago, prospecting companies could have gotten rights—from the Bureau of Indian Affairs—for no more than a couple of dollars' worth of paperwork. For this deal, the Navajos did their own bargaining.

"We're not thinking of pulling a switch," says MacDonald, "but we want recognition. We have been neglected and ignored for too long. We want what little is left to us in the way of resources to be properly managed by us so that we won't end up with ugly and empty holes and mounds everywhere and all the equipment pulled out leaving us worse off than before. We don't want that. We want our trustee to help. We are so serious about it that we are going to do it whether the trustee helps us or not. That's the reason for putting out a feeler to OPEC. We plan to visit them and see what they're doing."

Sticking to his guns has been MacDonald's forte. His six years as project engineer at Hughes Aircraft in El Segundo taught him many tricks—including how to design proposals in government, not Navajo, jargon and how to get to the highest level possible for decision making. "You don't make your pitch just because you're going to get it. It can't be some wild idea just to get it. It has to be practical and it has to be proven."

MacDonald is no stereotypical Indian. He drinks moderately, subscribes to both *Business Week* and *Golf Digest* and lives in a three-bedroom ranch house right out of the San Fernando Valley. He has executive-suite tastes, including a metallic Lincoln Continental, and he moves around the reservation in the tribe's private plane, a Piper Navajo. He rather enjoys jetting into Washington for congressional meetings and is not shy about challenging Barry Goldwater's claim of being a spokesman for Southwestern Indians.

He doesn't hesitate to claim the senator from Arizona has spoken with a "forked tongue," and he takes relish in noting that Goldwater reportedly sells prints of a photo he took in 1938 of an old Navajo woman for $500 "or more than half the average yearly income of a Navajo." He sees no redeeming virtues in the American Indian Movement (AIM) and has pretty much banned it from the reservation, where its last sit-in ended in a Fairchild Semiconducter plant shutting down and moving out (leaving 500 Indians unemployed).

There is little about him that would indicate that he didn't speak English until

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he was 6, worked his way through college as a night-shift orderly in a mental hospital, and took his Anglo name when he went into the outside world to lessen a common identity crisis. (He selected it from his favorite grammar-school song, "Old MacDonald Had a Farm.") His office, eclectically furnished, with a beamed ceiling, captures a sense of a man who still honors the words of his great granduncle: "We can never forget what has happened—but we cannot go back nor can we just sit beside the trail." The flags of the three states his reservation stands on are displayed behind his high-backed chair, as is the Navajo-nation flag. There's a coffee mess in the office of his secretary with a sign reminding drinkers to make a 20-cent contribution.

He runs an open-door policy that can be most distracting to the business at hand. Recently, he hosted a delegation of Canadians, including the minister of Indian affairs, anxious to get a reading on what he had in mind for the CERT tribes and an OPEC connection. As he discussed the history of the Navajos and their recent efforts to gain control of their own destiny, in and out came bulky Indian aides, who seemed at best to be mostly interested in looking at the correspondence on the chairman's desk or just listening to the conversation. As the winds of June blew dust around the stone-walled, one-story building, the door to the chairman's office was allowed to slam with deafening regularity.

It didn't seem to faze MacDonald. This is a man who, despite his outside indoctrination, is still a Navajo. He understands his people's ways and honors them. He is their servant and this is *their* tribal council. He will meet with any that come to his office. He realizes that many of them have been trekking rutted roads for several days in order to see their leader.

Though he is a Baptist, keeps a Bible on his office desk and a plaque of the Ten Commandments right by his phone, he also seeks counsel from tribal medicine men from time to time.

MacDonald is a consummate Grand Designer. In 1974, he worked out an arrangement with the AFL-CIO hierarchy — in return for being allowed to launch a major voter-registration drive on the reservation, the union promised to start a major job-training program for MacDonald's people. The result: 20,000 voters signed up within months. Their votes are given major credit for the victories of two Democratic governors in Arizona and New Mexico.

Of course, he's paid a price for this assertiveness, which he feels bothers some Anglos. And the tribe has had an inordinate number of federal audits in the last several years — 176. In February, MacDonald was indicted for allegedly making false state-

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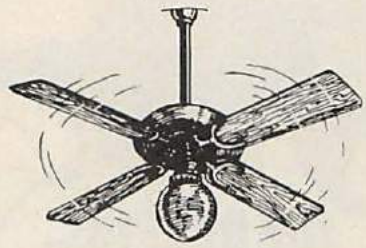

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ments concerning travel expenses involving an Arizona utility company doing business on the reservation, but with the assistance of the forensic panache of an old Marine-court buddy, lawyer F. Lee Bailey, he was acquitted after a 10-day jury trial.

At about the same time, John Harvey Adamson, a convicted hit man in the murder of Arizona *Republic* reporter Don Bolles, told state prosecutors that he had been approached about someone's need for a dynamite hit on the Navajo Tribal Council headquarters. It was to be done, presumably, when the chairman was present.

It all seems a heavy burden for the $30,000-a-year chairman, who reckons that he would easily be making double that – and more – if he had stayed on the outside in the Hughes organization.

But his goal of self-sufficiency seems to be rising with the moon. The tribe now has assets of $200 million. It runs its own small airline and airline authority (to protect rights in the future for a tourist industry), wool-marketing board, forest industries, banks and a giant, 110,000-acre agricultural irrigation project.

Although there are the bureaucratic scoffers, as well as sniffers, at what MacDonald is doing with OPEC, it seems to have accomplished the chairman's purpose: The Indians are no longer being ignored. He has a burning pride, and he doesn't want his nation to be forever in a beggar position. He dismisses welfare talk for his people, preferring instead to tell them, using an old Chinese proverb, "Give a man a fish and he'll eat for a day; teach a man to fish and he'll eat for a year."

One of MacDonald's aides called my attention to a story that seemed most illustrative of Navajo views of priorities in life: In 1969, two astronauts began trial runs of the moon buggy near the reservation's Grand Canyon area. The site was selected because the terrain most resembled what the moon's surface should be like.

An old medicine man sitting on a mesa observed the activity. He finally came down to inquire what it all meant. MacDonald, then directing the tribe's economic-opportunity program, explained the planned moon landing. The moon is close to Navajo mythology; some think they came from there on rainbows, sunbeams and lightning bolts.

After giving the old man a ride in the buggy, the astronauts offered him a cassette on which to tape a message for any moon men they might encounter. The medicine man did, then left.

The astronauts asked MacDonald what he said. Not too embarrassingly, he translated: "Welcome from us on earth...The men you will meet look suspicious to me...If they show you any leases for land or minerals to sign, stay away..." ■

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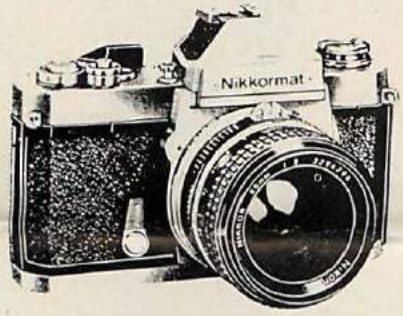

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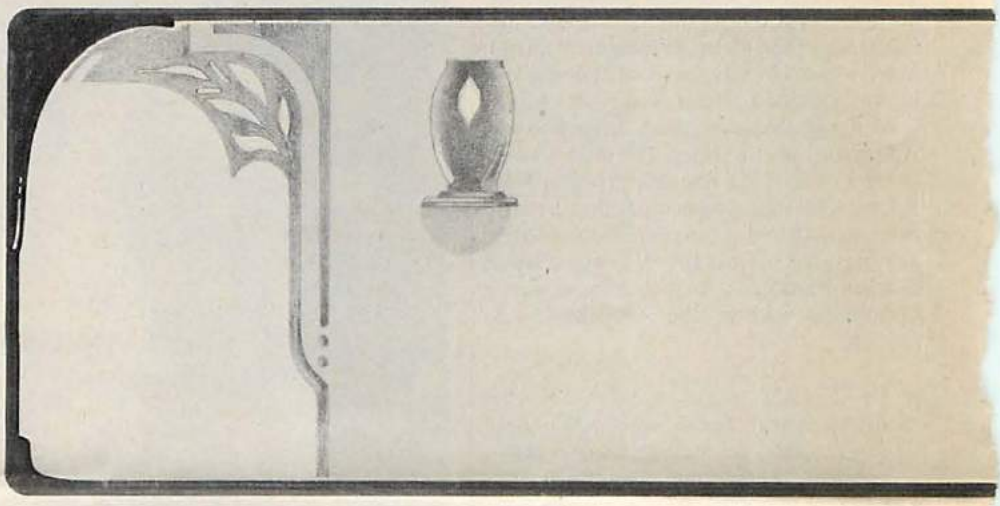

Lunching Under $10 at L.A.'s Most Expensive

By Gloria Nagy

Noontime pleasures at Scandia, etc.

I stumbled onto a secret quite by accident last year. A very social friend of mine, whom I had invited to lunch for her birthday, suggested we try her favorite place: Perino's. A slight twitching began in my left eye, but my manner remained calm. I made the reservation—and, armed with three credit cards and $75, arrived, murmuring to myself: "How bad can it be? How much can a spinach salad cost?"

Well, I found out, and it wasn't bad at all. We had a full, exquisite lunch—quietly—which we couldn't even finish. We were treated superbly. And the tab for two, with a glass of wine, came out to *under* $10 per person. Tip included.

That was only the beginning. I have now lunched in several of the finest restaurants in Los Angeles and have spent some of the most sensual, relaxed, stroking hours of my week this way. It makes getting back to work easier and, with something in the middle of the day to look forward to, even going to the office becomes a pleasure. And I have also discovered several practical plusses. With a reservation (or, if you go early enough, often without) you rarely have to wait in the first-class restaurants, and because the service is so good, you can lunch not only better, but *faster* than queuing up at the Hamlet, waiting 35 minutes for the sound of your first three initials. Best of all, dinner prices at *haute* restaurants are more than double the lunch tab. So you don't have to wait for a special occasion to partake at some of L.A.'s best.

The five restaurants following represent a cross section of "tastes": Perino's, Scandia, the Palm, L'Ermitage and the Tower. L'Ermitage and the Palm draw a heavy movie-industry clientele. Scandia caters more to business people, sports figures, and the wheeling-dealing end of the entertainment industry. Perino's collects more corporate types, like the president of Atlantic Richfield and the Pasadena-Hancock Park crowd. The Tower is another corporate-exec watering hole.

All five have special luncheon menus, and reservations are recommended. And your check will come to well under $10 a person, including coffee, tax, tip and a glass of house wine.

The Palm

Old New York incarnate. Terrific for homesick Easterners. Sawdust on the floor. Green and white checkered tablecloths. Baskets of the crustiest, moistest French bread in Los Angeles. And pots of fresh butter. The waiters wear black ties and long white aprons—and give excellent service.

In my opinion, the absolute best lunch buy in town is the Palm Burger, a 10-ounce portion of beautiful meat served with a mammoth scoop of perfectly fried onion rings. Price: $3.50. As a side dish, there's the Palm Salad, a fresh mixed-green served with a choice of homemade dressings, including a Roquefort that combines

Frank

Thanks for the soy sauce and for the readings. The U.K. inflation report is particularly interesting. I feel that money inflation is aggravated by resource scarcity the total effect being: ① to encourage "greed" reactions, ② discourage consumption with a high resource input which unfortunately are generally shelter and maintenance goods or transportation, and ③ encouraging further demands for governmental control of the allocation of resources which leads to higher administrative costs and imperfect the problems of imperfect markets.

copy

I was aware of the bibliography service and greatly appreciate a current list of what is available.

I would appreciate being able to retain the New Mexico Alumnus as the articles on Arnold Sensing, Vermejo Park, and as well as on filing the gas lands

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plant ecologist, a limnologist, and a resource economist. Students are required to have competence in the physical sciences, the biological sciences, and ethnography and anthropology. The aim is to produce "applied human ecologists" equipped with a "working method which allows them to go anyplace using scientific data and perceptions to find out what it is, why it is what it is, and where it's going, and also to know of people why they are where they are and what they're doing, and to ask the people what their perceptions of their natural and social environment are. . . ."

The vehicle to convey McHarg's all-embracing personal vision has been a course he has been running for the past 15 years, called "man and the environment." Each year he invites a series of distinguished lecturers to take students through the evolution of the cosmos, the solar system, plants and animals, the biosphere, and finally, the evolution of man. With man thus put in perspective, lectures move on to "the attitudes toward God, man, and nature represented in the major philosophies and theologies of the world," from the polytheism of ancient Egypt to the transcendentalism of Emerson and Thoreau. Then on to human behavior, the effects of environmental stress and overcrowding—and a discussion of the Midtown Manhattan Study of 1962 in which it was concluded that 20 percent of the population were indistinguishable from patients in mental institutions.

Finally, students hear speakers whose thinking may offer guidance toward the shaping of a healthier future. Among these have been poet Howard Nemerov, naturalist Loren Eiseley, Lewis Mumford, Margaret Mead, Hans Selye, Barry Commoner, and Erich Fromm.

Academy Study Finds Low Energy Growth Won't Be Painful

A National Academy of Sciences committee that is conducting a comprehensive study of future energy options has given some intriguing hints of its thinking. The group seems to have reached a consensus that a low rate of energy growth is possible without imposing adverse effects on the economy or requiring major changes in the life-styles to which Americans have grown accustomed.

The committee may thus add credence to previous studies that have endorsed the possibility of low rates of energy growth. Two of the most prominent of those previous estimates were the controversial low-growth scenario of the Ford Foundation's Energy Policy Project (*Science*, 1 November 1974) and recent projections by the Institute for Energy Analysis, headed by nuclear expert Alvin Weinberg (*Science*, 14 January 1977).

The significance of this increasing acceptance of low growth forecasts is that—if they are right—the energy problem may be a bit more manageable than is commonly portrayed. There may be less need to despoil the earth in a frantic search for new sources of fuel; the pampered public need not worry about reverting to primitive living because of insufficient energy; and decision-makers may have the luxury of downgrading the uses of particular fuels that are considered dangerous or undesirable.

The academy's study is perhaps the most comprehensive of the many energy studies to emerge in recent years. It is certainly one of the most ambitious studies ever launched by the academy in its long history of advising the government. The study was commissioned by the federal Energy Research and Development Administration at a cost of $2 million (additional funds may be added before the project is completed). Some 250 scientists, engineers, and other professionals are participating in the study under the direction of Harvey Brooks, professor of technology and public policy at Harvard, and Edward L. Ginzton, board chairman of Varian Associates; a full-time staff is headed by Jack M. Hollander, on leave as associate director of the Lawrence Berkeley Laboratory of the University of California.

The committee's final report is not due until 30 June, and it has thus far carefully avoided announcing any conclusions or recommendations. But in an interim report issued in mid-January, the committee indicated the "thrust and direction" of its inquiry in language deliberately chosen to reveal "some trends and directions" in the committee's thinking.

It seems clear that the committee envisions the possibility of a lower rate of energy growth than those suggested by most previous studies. The scenarios currently under consideration by the committee would put total energy use in this country in the year 2010 somewhere between a low of 70 quads (quadrillion Btu's) and a high of 210 quads. The low estimate is essentially equivalent to current energy use and is far less than the low-growth estimates of the Ford study (100 quads in the year 2000) and the Weinberg study (118 quads in 2010). The academy's high estimate is higher than Weinberg's, but it is still far less than the figure that would prevail if historical patterns of energy growth continued. The academy's final report will not designate any one scenario as most probable or most desirable. But the scenarios indicate the range of future energy use that the committee considers plausible.

The reduced rate of energy growth could occur, in the committee's opinion, without harming the economy as measured by the gross national product (GNP) or by the number of jobs. The committee believes that there is "substantial technological leeway" for providing a high level of goods and services with less energy [as might occur, for example, if we built factories and automobiles that were more energy-efficient]. It concludes that "there may be considerable leeway, over the long term, in the amount of end-use energy required for a given rate of growth of GNP and employment."

Similarly, the committee suggests—at least by implication—that energy moderation need not imply a drastic change in life-styles. In a list of alternative ways to reduce energy use, the committee puts "curtailment" of demand for goods and services in last place, thereby indicating that it is not considering asking everyone to abandon cars and refrigerators. Instead, it focuses attention on increasing the efficiency of energy use and changing the mix of goods and services toward those that require less energy. Even the academy's lowest growth scenario, which projects per capita energy consumption far below today's levels, is said to envision essentially the same level of amenities as we enjoy today. Whatever changes in life-style occur are expected to result from factors other than energy constraints.—PHILIP M. BOFFEY

Briefing by IPP personnel
at Capitol Reef N.P.
Visitors Center

1 IPP. May 22
Filing Draft BLM - USGS, SEPA report.
Joes ICPA no longer get preference power
problem of siting small plants
not have size for infrastructure to support
participant all municipal.
? RBA Corp., 26 cities in Utah, 6 in Calif.
Project oriented financing
Inter Mt. Consumers Power Assn 23 cities REK
3/4 the Calif new figure
? State agency type financing in Utah
Non profit corp. financing
Quasi state agency
want to issue tax free power revenue bonds
cooperative city financing
"Inter local cooperation act" entity
issuing of bond 6-7% bonds
Some general fund support
Westinghouse Environmental Consultants -
Did not file on much water by purchase
look at Victorville near L.A. 3 months study
? [what % is this project of your expected demand]
Coal / El. trans.
assumption a problem - key to result.
assumption of new transmission facility
50% more expensive to haul.
4½% line loss from IPP to Calif
Nothing of escape on el. trans. as opposed to
coal,
Slurry too much water. legal decisions
If coal hauled would have looked to Book Cliff
Coal for IPP from south
Meteorology & air data
Restricted by visibility. 8 miles of 24
On Mancos Mancos shale flat bed.

12 May 22

Infrastructure 750' stack

Best available 50% of precip

90% of SO2

Kaiparowits 200 miles of coal.

Need 200,000,000 tons per unit

AMAX has lease holds on Haney Mts.

very near.

New Railline proposed from Emery 60 miles

all deep mine coal.

Coal .05% and S.

Each train is 100 car unit.

With low sul coal more precip. before air pre heat use of flue gas.

Scrubber sludge.

40,000 acft

Need proven technology to sell $2.5 Billion.

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Program D.C. 500,000 volts.

like one to Dallas?

D.C. is less impact.

Zero Discharge

Water 2 sources Fremont 21-26 th acft

available during winter of 50 th acft

50,000 acft reservoir

700' artesian top of Nav. Sand stone.

est. 25 million acft.

need only 1 million ac ft over life of project.

$1.5 million spend in studies.

Looked at pumping effect on river - little effect.

Aquifer recharge 13-15 th acft per year.

Water is 2800 ppm TDS needs to be lime softened.

Lassume outflow of acquifer at 15 13-15 th af.

equilization in acquifer.

% of Demand

Base load

? Peak Power

Res

Limestone

Water

Geology

Matt

Fuel Stand

of exceed

other demands on acquifer

How many extra people

/3 May 22

2500 to construct 550 operation

2000 miners to mine coal,

Tax base antcipation (Tax Gap)

7-8 million they will bond against

$35 million.

[illegible] for construction double density

[illegible] for operation lower density

have 5 sites, want 4 corners grant for planning assistance. [demand for 4 Corners money]

if developer Coal company

1,100 ac ft of supply

550 operators yields 2-4th people

In Wayne County Area

Tar Sands

Gordon Flute - Oil Development Company of Utah started in 1976
leasing acquired, planning com

Intermountain Power Project ICPA (Los Angeles Dept)
coal and power

Coal Mines

Factory Butte - Atlas Minerals Strip mine.

Intermountain Power Project Mine, ICPA operator underground
10,000,000 tons per year, by 1985
3450 miners
(Developed by Utah and California Private Utilities)

Intermountain Power Plant 4 (750 MW units) = 3000 MW
peak construction force 3,000 employed.
operation force 275 employed
requires 50,000 af water per year

Intermountain Power Project (U16) Coal Mine
operated by ICPA
underground mine, 10,000,000 tons per year by 1985
for ICPA power plant at Casineville
No coal analysis, seam thickness,
operational employment estimated at 3450
Developed by Utah and California private utilities

Intermountain Power Project (E9) Generating Plant
Nos. 1-4 Casineville
operated by ICPA (Pos A. Dept of Water and Power et. al.
Fuel requirements - coal, 10,000,000 tons
4 x 750 Mw units = 3000 Mw total
built 1983 to 1986, one each year
Construction employment 3,000
Operational employment 375
Coal requirements 50,000 acft

Wayne County

Tar Sands

(T3). Gordon Flats, Tar Sand Triangle Deposit
operated by: Oil Development Co. of Utah
Tar Sands oil extraction
planned capacity unknown (?: "Leasing acquired
planning completed")
Initial date of operation 1976
Park Supervisor construction —, operation —
"Leasing acquired and planning completed.
Approvals needed from BLM and Park
Service. Map location is county specific"

(S 14) Factory Butte
operated by: Atlas Minerals
Strip mine 1,000,000 tons per year by 1980
for power generation (location not specified
No coal analysis, seam thickness, or depth of overburden
Employs estimated 145 persons
Started in 1976.

p

I-13 Moon Lake Electric Association Plant 1000 MW
using 3.7 million tons of coal per year. (Northeast Rangely)

III-56 Construction requirement 1,400

I-15 Water Requirements for 3000 Mgw

Power plants (water cooled) 15 acft per Mw 45,000 af

Per 1000 population increase (urban

Acreage Requirements for Development

per million tons of coal mined - 100 acres 1000 acres per year underground

per mile of 230 KV power line 18 acres

per 1000 population increase 100 acres

water cooled power plant 1.8 acres per Mgw 3000

roads 175' right of way 21 acres per mile

ps I-II III-57 underground requirements for employment is 200 per million tons per year. or 2000 miners

(less than 10 miners)

WSJ

California PUC urged utility companies to start charging more for electricity used during peak demand periods 3/18 - 13;2

Interior, B of Mines, total U.S. Energy use dropped in 1975 for second year in row - lower industrial demand cited 4/5 - 7;1

Kaiparowits $3.5 billion 4/5 - 4;2

Electrical utilities cut commitments on capital spending 69% in first quarter from year before [illegible] 6/29 - 42;4

Electricity use begins to rise [illegible] - stirs fear of lag in demand capacity 8/17 - 1;6

~~Trimming~~ Trimming Peaks - Utilities seek methods of cutting peak demand 11/17 - 1;6

2042 Sea Sci Ed.

State of Colorado

EXECUTIVE CHAMBERS

DENVER

RICHARD D. LAMM
Governor

The state of Colorado, through the Governor's Energy Policy Council and a Citizens' Committee on Energy Conservation, has been working for the last several months on developing a statewide energy conservation plan with funds made available by the Federal Energy Administration. The Committee assisted in studying the state's energy conservation needs and compiling information relating to the substance and structure of the energy conservation plan. The group was comprised of persons representing a wide variety of interests, divided into different work teams to study the areas of conservation in buildings, transportation, state and local government and education. The result of their work is a draft state energy conservation plan, which will now be presented to the citizens of Colorado in a series of public hearings around the state for the purpose of review of the plan and solicitation of comments from the public. Following is a list of the dates and locations of these hearings:

Monday, Dec. 13 -- Holiday Inn, Pueblo, 5:00-8:00 P.M.
Tuesday, Dec. 14 -- Holiday Inn North, Colorado Springs, 10:00 A.M. - 1:00 P.M.
Thursday, Dec. 16 -- Hilton Hotel, Denver, 1:30-7:30 P.M.
Monday, Dec. 20 -- Ramada Inn, Grand Junction, 1:30-7:30 P.M.

The hearings will be organized as follows:

I. Introduction of Chairperson (30 minutes)
II. Summary of plan proposals (30 minutes)
    a. Transportation
    b. State government
    c. Buildings
    d. Education
    e. Plan supervision
III. Public Testimony (2 hours)

The two hearings running from 1:30 to 7:30 P.M. will allow a break from 4:00 to 5:00 and then begin again.

The purpose of the hearings is to determine what changes, corrections or additions to the plan might be necessary. This notice is being sent to you in the hope that you will be able to attend the hearing nearest you. Your input would be appreciated. Copies of the draft energy conservation plan are available for your review in public and college libraries and the mayor's office in your town. If you would like your own copy of the plan or desire further information about the hearings, please call the Governor's Energy Policy Council in Denver, 892-2507.

You will find a summary of the plan on the reverse side of this letter.

Summary of the State of Colorado

DRAFT

Energy Conservation Plan

This plan was created in response to the federal Energy Policy and Conservation Act (EPCA), signed into law December 22, 1975. That act offers funding to states (in Colorado's case approximately $2 million for the four-year life of the plan), contingent upon the Federal Energy Administration's (FEA's) acceptance of their plans and requires that the states incorporate into their plans programs in carpooling and vanpooling, in government purchasing practices, and in thermal and lighting efficiency for buildings. To qualify for EPCA funding, Colorado must also comply with the law's stated goal: that the states should conserve, through their plans, 5% of each state's projected energy consumption for the year 1980.

Colorado's plan goes well beyond the minimum federal requirements. Our projected energy consumption for 1980 amounts to 802.2 trillion British Thermal Units (BTU's, a measure used as a common denominator for all energy sources), of which 5% would equal 40.11 Trillion BTU's. The proposals contained in the plan should earn at least 52.80 Trillion BTU's, thereby exceeding the federal requirement by 25%.

There are twenty-two proposals. To fund costs above EPCA funding, the plan draws on other federal funds, makes several proposals self-funding, uses private resources and asks the state legislature for some direct funding. Several proposals, including the thermal and lighting efficiency codes, will require action by the Colorado Legislature before they can be implemented. Some other programs of interest include a statewide bikeway construction proposal, a utility-sponsored insulation program, an energy-saving iriigation proposal, an energy use awareness program, and proposals considering staggered work hours and four-day work weeks for metropolitan areas.

Implementation of the proposals will be shared by the public and private sectors, with the predominant responsibility held by various departments of state government.

PROPOSAL ABSTRACT

Colorado is an "energy state". It has an already established high level of activity and interest in energy production, energy conservation and alternate energy research and development. Colorado is keenly interested in participating in the ERDA Energy Extension Service (EES) program because of these and other special qualifications. Notably, it offers special outreach opportunities via its existing institutional infrastructure, particularly its in-place extension service, which will allow immediate impact of energy extension agents and action services. However, Colorado also represents special energy consumption challenges directly related to its physical and population diversities. The State is a mix of rapidly developing urban communities and declining rural areas; natural-resource industries and technological industries; natives and newcomers; semi-desert and arctic tundra.

Colorado, therefore, has developed an EES proposal to fit these factors and ERDA's pilot program information needs. Colorado's program themes are: Promotion, Outreach, Action. EES promotion activities should lead small energy users to a better understanding of and commitment to energy conservation and alternative energy options. EES outreach activities primarily will involve the personalized process of leading users to decisions to save energy and/or use substitute fuels. EES action initiatives will help strengthen the supply/delivery/installation infrastructure needed to implement energy-saving decisions.

These three levels of EES activity are based on: the recognition that the State consists of "five Colorados"; the targeting of seven "dynamic" communities; the utilization of existing organizations (from the Governor's Energy Policy Council to the Colorado Energy Research Institute to the Denver Research Institute to the Colorado State University); and the involvement of community advisory panels, trade and business associations, and volunteer groups. The Colorado EES also recognizes the critical need for evaluation of impacts, for transfer of knowledge gained to ERDA and other states--and for results. Thus, its implementation strategy and management plans are geared to achieve one primary outcome objective and five intermediate program goals related to small energy users, beginning with specific knowledge, attitude and behavior changes and leading to specific alternate energy substitutions and energy consumption reductions in natural gas and electricity usage.

State of Colorado

EXECUTIVE CHAMBERS

DENVER

RICHARD D. LAMM
Governor

July 8, 1977

Dear Friend:

Thank you very much for taking time out to respond to the questionnaire requesting your input on the development of the State's energy extension service proposal for ERDA. We received well over 200 responses, and many of them provided useful insight and suggestions for the development of the proposal. It is regretful that short response time did not allow the proposal team members to follow up on many of the offers of assistance, but we were all quite pleased with the overwhelmingly favorable response, and the obvious desire of many Coloradans to participate in this program.

On the reverse side of this letter is a copy of the proposal abstract, outlining the main features of the State's proposal. A number of copies of the proposal will be available for public review after July 20th at either:

Energy Policy Council
1313 Sherman St., 7th Floor
Denver, Colorado 80203
Contact: John Higgins, 892-2507

or

Colorado Energy Research Inst.
2221 East Street
Golden, Colorado 80401
Contact: Rebecca Vories, 279-2881

Please feel free to come in and review these copies after that time.

For those of you who live out of the metropolitan area, copies should also be available at the Regional Council of Governments office for your region.

It is doubtful that we will receive word regarding the fate of this proposal before September.

Once again, thank you for your participation in this process.

Sincerely,

Richard D. Lamm
Governor

Coal		Hydro	
JP Juniper Power	6000	Oak Creek	3600
Craig 1-4	1070		
Craig - Slater	650		
Yampa - Oak Creek	6400		
Hatch Flats	225 150 - 300		
Oak Creek - Blacktail	~~20~~		20
General North Park	500		
Sheephorn	~~30~~		30
~~Dominguez~~ Dominguez			15
Kim Basin			300
Crystal			28
Cinnamon			1600
Morrow Point 2			69
Cebolla Creek			1600
Boulder Gulch			2400
Catarad Creek			1750
Silver Lake			2200
Cunningham Creek			1600
Wilson Meadows			3500
Sunshine Mesa			1500
Leopard Creek			2500
East River			2000
Mt. Elbert			200
Nixon	200		
Comanche No. 2	350		
Foothills #			1 150
Big Thompson			100-200
Platte River	600 200 - 1000		
Pawnee	500		
Fulton #1 and #2	1000		
	17,495		25,363
			42,858 MW

Source: ~~Proposed Energy Facilities~~

Energy Resource ~~Development~~ Maps - Proposed Energy Facilities.

Colorado Geology in Survey 1976. September

ENERGY AND FUEL REQUIREMENTS FOR SELECTED FARMING OPERATIONS

FIELD OPERATION	ENERGY REQUIRED # Pull HP Hrs.		FUEL REQUIRED Gallons per Acre	
	Per Foot	Per Acre	Gasoline	Diesel
Moldboard Plow	950	20.9	2.32	1.67
Chisel Plow	635	13.9	1.55	1.12
Field Cultivator	240	5.3	0.58	0.42
Disc Harrow-Stalk Ground	250	5.5	0.61	0.44
Disc Harrow-Tilled Ground	280	6.2	0.68	0.49
Spike Tooth Harrow	105	2.3	0.26	0.18
Spring Tooth Harrow	160	4.0	0.44	0.32
Plant-Conventional	180	4.0	0.44	0.32
Plant-No Tillage	90	2.0	0.22	0.16
Spray			0.14	0.1
Rotary Hoe	100	2.2	0.24	0.18
Row Crop Cultivator	195	4.3	0.48	0.34
Combine-Small Grain	375	8.25	0.92	0.66
Combine-Corn	650	14.3	1.59	1.14
Mow	130	2.9	0.32	0.23
Rake	80	1.8	0.20	0.14
Bale	400	8.8	0.98	0.70
Flail Type Harvester	400	8.8	0.98	0.70
Field Chop-Green	800	17.6	1.46	1.40
Hay or Straw	200	4.4	0.49	0.35
Row Crop	1250	27.5	3.06	2.20
Rotary Mower	375	8.3	0.92	0.66

Energy requirements shown are for typical conditions and include only field work. transport to and from the field is not included. The chisel and moldboard plow figures are based on plowing in loam 8 inches deep at 4½ miles per hour.

INTERIM POLICY ON ENERGY FACILITIES SITING

R. Clark

Proposed Resolution

Resolved, that the Sierra Club believes that protection of human life, public welfare, and the environment are essential factors to be considered by all levels of government when making siting decisions. We believe that siting decisions should be made only as part of the overall land-use planning and should proceed only after a need for them has been demonstrated, and should be located near load centers and, when possible, on or near existing industrial facilities. In locating such facilities each level of government should be involved in critical decisions in such a way as to ensure the most stringent environmental standards. Public participation in siting decisions should be assured at all stages of decision-making. Each state should have an energy facilities siting mechanism with open and complete processes. Actions of applicants for sites should not be allowed to prejudice sitings decisions and the "banking" of sites should give guidance rather than allowing early licensing and should not preclude small scale renewable energy alternatives. In furtherance of these goals, the following guidelines should be considered in evaluating specific proposals, plans and legislation related to energy facility siting:

ENERGY FACILITY SITING GUIDELINES

1. Decisions about the siting of energy-related facilities can only be made in the context of sound overall land-use planning. At a minimum the following categories of land should be excluded from consideration as sites for such facilities:

   a. Land included in federal, state or local park or natural area systems, or in wildlife refuges or management areas, or in such proximity as to threaten the environmental quality of the protected areas;

   b. Units of the National Wilderness Preservation System, the Wild and Scenic Rivers System, the National Trails System, or the National Landmarks System;

   c. Areas reserved for ecological, scenic, natural, wildlife, geological, educational or scientific value including Primitive Areas, Roadless Areas, Natural Areas, and Pioneer Areas;

   d. De facto wilderness or wild areas on federal lands which are under active study by citizen groups or government agencies prior to submission of formal proposals and final action by the Congress for inclusion of the lands in the above systems;

   e. Wild, natural, scenic or pastoral portions of coasts or shores, including bays, estuaries, lakes and rivers;

   f. Coastal or riverine areas serving as spawning grounds for commercial and sport fishing:

   g. Habitats or rare, endangered, or threatened plant or animal species;

   h. Areas containing outstanding examples of plant communities, such as virgin timber stands;

   i. Valuable archaeological or historic sites;

   j. Prime agricultural lands;

   k. Lands which play a vital role in the hydrologic cycle such as aquifer recharge areas;

   l. Land characterized by adverse geological or geophysical characteristics such as earthquake zones or floodplains.

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l. Land characterized by adverse geological or geophysical characteristics such as earthquake zones or floodplains.

2. The siting of large, energy-related facilities should not proceed unless a definitive need for them has been demonstrated which cannot be met through conservation and smaller-scale alternatives. In the case of electric generating facilities, the impact of large size on raising required reserve margins should be considered as well.

3. Generating plants should be located as close as possible to load centers to avoid unnecessary, long, wide transmission corridors; to encourage conservation and pollution abatement by linking the environmental burdens of power generation with its benefits; and to maximize efficient use of energy through utilization of of waste heat for beneficial purposes. Where this policy conflicts with clean air goals, emphasis should be placed on reducing the emission of pollutants rather than relying on remote siting. Since airborne pollutants have been found to cause damage to the natural environments far from their source (e.g., via acid rain), remote siting will not prevent environmental degredation. Any tradeoffs between impacting urban and rural/wild environments should be discussed explicitly with input from spokespeople on behalf of both environments. In general, new energy facilities should be located on land that has little other productive value, be sited in such a way as to be compatible with and encourage the use of waste heat and waste water and the development of renewable energy resources.

4. The need to protect other important resources such as water resources and quality, air quality, and minerals should be carefully considered in the planning for and siting of energy facilities by all levels of government.

a. Air quality: Three scales of impact on air quality must be considered.

1) Local scale. EPA ambient air quality standards and non-degredation standards must be met and potential future growth must be allowed for.

2) Sub-regional scale. Cumulative impacts on the order of Air Quality Control Regions or air basins must be considered such as result from persistent air mass flows.

3) Regional scale. Long-range transport of pollutants must be considered on the order of several states or air basins.

In addition, impairment of visibility must be assessed in preventing degredation of air quality and the potential impacts of cooling towers must be considered.

b. Water resources.

1) There should be no net depletion of groundwater.

2) Municipal and industrial wastewater should be used for cooling purposes whenever possible.

3) Stream flow should not be depleted so as to harm aquatic species or alter the scenic or wild character of designated or candidate rivers.

4) Alternate requirements for water must be considered and priorities for use set.

c. Water quality.

1) Sites for disposal of ash and sludge and other solid waste products should be free of all flood potential and should not lead to runoff or leaching to surface or groundwater.

2) In siting more than one plant along a shoreline or river, both cumulative and interactive effects of power plant discharges must be considered in terms of thermal effects and destruction of aquatic life.

5. In the siting of such facilities, each level of government affected should be involved in the decisions to allow a balancing of national/regional and state/local energy and land-use policies. When federal policies are found to conflict with state policies, the state should be allowed to promulgate more stringent, but not less stringent, standards than the federal government. The federal government should not be allowed to pre-empt state control over energy facility siting except that in cases where a facility such as a pipeline by necessity impacts more than one state, the federal government must act to ensure the least environmental damage for the overall project.

6. Full public participation should be a part of all phases of the decision-making process at all levels of government with appropriate funding made available. Funding of public interest groups should be at a level to allow their use of expert witness and lawyers in order to present their case in a credible manner. Reimbursement should be by the applicant or by the government entity initiating the planning process.

   Public notice in plain English should be published in all areas impacted environmentally or economically by the proposed facility to inform the public regarding its opportunity to participate, the purpose of the hearing, and the hearing schedule. Hearing should be held during hours accessible to the working public whenever public comment is solicited.

7. Each state should create an energy facilities planning and siting mechanism in the context of statewide land use planning which includes an independent board or commission and which provides for full public participation. Decisions should incorporate the principles detailed above and should be made in the context of their long-run implications. In addition, consideration should be given to the impact of all phases of production, including mining or drilling, transportation, and waste disposal.

   When considering a specific facility, a full record should be developed in order for the least environmentally damaging alternative to be selected. The decision should be made on the record by the independent board or commission selected in advance.

8. Applicants should not be allowed to purchase land or equipment in advance of site approval since this invariably skews considerations in favor of the applicants preferred site and mode, thereby biasing the final decision against alternative which might minimize environmental impact. The value of the land should be fixed at the time of the declaration of the site with the final price subject to increases based only on increases experienced by comparable land types elsewhere.

9. Any proposal to bank power plant sites by selecting potential sites in advance of need should:

a. ensure the selection of sites which represent the minimum adverse environmental impact;

b. include sites presenting a range of options, rather than relating exclusively to one mode and/or scale of generation;

c. provide funding for public participation in the site selection process;

d. preserve all licensing procedures for final approval of a specific plant on a specific site;

e. be subject to periodic review to allow consideration of changing circumstances.

cling energy through modular integrated utility systems

by Jerome Rothenberg

HUD Challenge June 1976

For decades we Americans have consumed fuel and allowed much of its energy to be dissipated into the air or water as unused heat. Recently we have been forced to recognize that the sources of conventional energy, both domestic and foreign, are limited. With that recognition has come a growing realization that there are limits also on how much we dare pollute our air and water by heat and other emissions. It is plain that our wasteful practices of the past must be stopped. It is equally plain that decent housing and a suitable living environment require energy for heating homes and water, power for lights and appliances, and cooling systems for relief from summer heat.

HUD's Office of Policy Development and Research has been working on the user side of the energy problem for several years, specifically on residential energy consumption. One of its important research efforts is the development and demonstration of the Modular Integrated Utility System (MIUS), which provides improved means for furnishing essential utility services for residential communities through integration of these services. One significant advantage of MIUS is the conservation of fuel through recovery of energy that normally is wasted when essential utility services are supplied from separate sources. MIUS "recycles" energy by "packaging" into one processing plan all of the five utility services necessary for community development, namely: electricity, space heating and air conditioning, solid waste processing, liquid waste processing, and potable water.

Conventional methods of generating electricity waste about 65 percent of the energy input in the form of excess heat. MIUS recovers better than half of this waste energy and uses it for space heating, air conditioning, water heating, water treatment, and liquid waste treatment. An additional 5-10 percent fuel savings is made by recycling solid waste for its energy content. This is referred to as a "total energy system" by engineers.

MIUS is an extension of a total energy system which, in addition to performing energy/heat recovery functions, also processes solid wastes and liquid wastes and purifies water.

In addition to saving energy, MIUS minimizes the adverse environmental impact of utility systems by reducing thermal pollution from the generation of electricity, air pollution from fuel combustion, water pollution from sewage, and land pollution from solid waste disposal.

Goals of MIUS

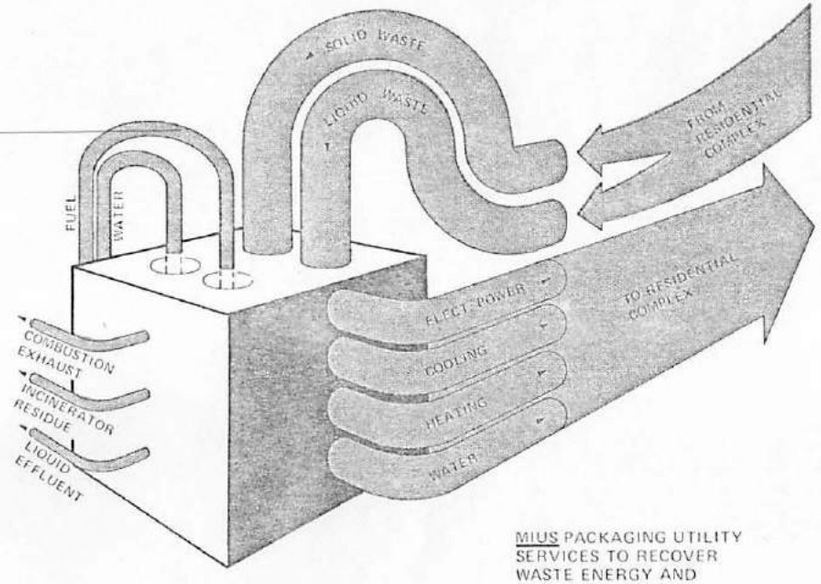
The goals of the MIUS program are to:

- provide options in utility services needed for urban/suburban development that reduce the time span from planning to operation, reduce risk, reduce plant operating cost, add capacity in phase with actual demand, develop financing methods and make possible more flexible and economic urban/suburban growth patterns through a self-contained utility system that is independent of the existing infrastructure;
- provide more efficient utilization of energy and other resources by improving utility systems fuel usage efficiency by recovering energy from power generation, by using solid wastes for its energy content, by using recovered energy to provide heating and cooling services and to enhance liquid waste treatment processes, and by improving the efficiency of domestic water usage;
- reduce total cost of providing utility services;
- improve the quality and environment of life by reducing thermal pollution, air pollution, solid waste pollution, and water pollution.

Early Stages of Program

The MIUS program was initiated more than 2 years ago. Its initial phase included evaluation of available technology, development of component and system performance specifications, and completion of detailed technical, economic and institutional feasibility studies of the MIUS concept. Various governmental agencies have been involved with HUD in this phase—the National Aeronautics and Space Administration, the Atomic Energy Commission, the National Bureau of Standards, the Environmental Protection Agency, and the Departments of Defense, Health, Education, and Welfare and the Energy Research and Development Administration through the Office of Fossil Energy. In addition, HUD awarded a contract to the National Academy of Engineering for the establishment of an Integrated Utility Systems Board to independently assess the state-of-the-art and the applicability of MIUS.

A second phase of the MIUS Program is the construction and evaluation of a demonstration project in an actual private sector residential development to be initiated after completion of the design study later this year. The project would provide utility services for a community with an equivalent of 900 dwelling units including some commercial and shopping areas. The demonstration would be carried out by a private sector developer on a cost-sharing basis, with the residential development built on the developer's site in accordance with a performance specification. HUD would then gather data and evaluate the results. Should the demonstration verify the advantages of the MIUS concept, the role of HUD will be to address the institutional and regulatory barriers to MIUS which may impede future private sector development.



MIUS PACKAGING UTILITY SERVICES TO RECOVER WASTE ENERGY AND REDUCE POLLUTION

At present, the Office of Policy Development and Research is conducting a demonstration of a total energy system coupled with an "automatic" pneumatic trash collection system.

The facility, now in a long-term "real life," monitored operation, is located in a HUD-insured development in Jersey City, New Jersey. The site includes 486 dwelling units in six structures, as well as a grade school, swimming pool, and 50,000 square feet of commercial area on 6.5 acres. Installed electric capacity consists of five 600 KW diesel engine generator units. Reject heat from the generating system is used to supply hot and chilled water to all of the structures for space conditioning. The plant has the capability for the evaluation of generating systems. Future plans call for the installation of advanced incineration/waste heat recovery systems to the automatic trash collection system to recycle the energy and integrate it automatically into the total energy system.

A MIUS Integration and System Test (MIST) facility is in operation at the NASA Johnson Space Center in Houston, Texas. This facility is used by NASA and HUD for developing and verifying MIUS control systems as well as other urban utilities research.

A coal-fueled MIUS is being developed by HUD and the Energy Research and Development Administration. This will enable the use of coal as a substitute for oil in residential energy systems, in accordance with national policy. A pilot unit is scheduled for test and evaluation in late 1976; its successful development could lead to a coal-fueled MIUS demonstration in 1977 or 1978.

Mr. Rothenberg is Program Manager, Modular Integrated Utility System, HUD Office of Policy Development and Research.

HASKELL U.S. Senator special report

December 1975

Dear Friend:

House and Senate conferees wrapped up work November 20 on the Energy Research and Development Administration's authorization bill. The bill agreed to in conference retains Section 103, the synthetic fuels loan guarantee program.

Confused press reports following the conference only added to the controversy which has surrounded Section 103 from the beginning. I'd like to explain the nature and intent of several amendments I offered to the bill in conference and what I think they mean to Colorado.

Before the conference began I announced I would try to strike the $6 billion loan program unless I could get five minimum protections Gov. Richard Lamm and I agreed were necessary to protect Colorado from the impact of oil shale demonstration plants which might be built through the program.

I was successful. The conferees accepted the following provisions:

1. After the ERDA administrator selects a project, the governor must concur. His disapproval can be overridden by the administrator only on a finding that the project is in the national interest--and the governor can then challenge the administrator's decision in federal court.

As a practical matter, it will be difficult for the energy administrator to make a case that a single project to test unproven technology is a matter of overriding national interest. That, however, is what he will have to do to proceed with a project over the governor's disapproval.

Some reports indicate that this state concurrence provision was adopted in a weaker form. It was not. The so-called "limited veto" exists in the bill which will be sent back to the House and Senate for approval.

2. Federal funding of direct impact from any demonstration project will be required. I sought guarantees for both direct impact, such as physical facilities to accommodate population growth, and indirect impact but did not get the latter. Still, the governor can refuse to concur unless and until he gets the impact aid he thinks is necessary.

3. Projects will be no bigger than necessary to prove commercial feasibility.

4. All synthetic fuels projects will be subject to state and local laws.

5. State and local officials will be actively involved at an early stage in planning projects.

Some environmental groups and Members of Congress wanted Section 103 stricken and considered as a separate bill. Others wanted oil shale removed. Neither view was realistic. In fact, the House conferees voted down an attempt

by some of their members to insist that shale be stricken. And there was even less sentiment among Senate conferees for eliminating either oil shale from Section 103 or that section from the bill.

Faced with that reality, I believe we had to do what we could to make sure that Colorado was adequately protected. I think we achieved that, though some who bitterly oppose shale development obviously disagree. They contend that there is no environmentally sound technique for extracting oil from shale. They may be right; if so, it's important to find out in as controlled a way as possible. Section 103, with the amendments I offered, gives us that chance.

The oil shale deposits in western Colorado and neighboring states are an enormous energy resource. But they are worthless to this energy-hungry nation unless the value of getting oil out of shale exceeds the cost--in environmental, social and economic terms. Communities in the oil shale region of our state are pinning a lot of hopes on the belief it will. Opponents firmly believe it will not. We need proof, not just guesses, no matter how good they look on paper. It's as important to fail as to succeed.

If the demonstrations fail, oil shale is better left untouched for some future generation with the technology to develop it soundly.

I am willing to support guaranteed loans to industry to tell us, once and for all, if we can get oil from shale at a price we're willing to pay. But that is as far as I will go.

Press reports have been confused over another amendment I offered in conference on the ERDA bill dealing with price supports. Sen. John Glenn offered an amendment which would have required the ERDA administrator to notify Congress of the potential need for further subsidies for any synthetic fuels project before he approved it. Such subsidies would likely be in the form of price supports for the finished products--whether oil from shale or gas from coal. They could also take the form of direct grants to the industries involved.

Senator Glenn's intent, I believe, was to give Congress some kind of early warning of the need for further subsidies. But my fear was that it was an invitation to private industry to seek either grants or price supports. I firmly oppose both.

So I offered a substitute to the Glenn amendment which clearly states that enactment of Section 103 in no way indicates Congressional support for further subsidies. This, I believe, will put the ERDA administrator on notice that any project he selects for a loan guarantee must be able to stand without further federal support. If he picks one which will not, he will have exceeded the intent of the legislation.

The intent of my amendment was to shut the door on price floors for synthetic fuels, not open it as I believe the Glenn amendment would have done. The charge is circulating that my opposition to the Glenn amendment has virtually guaranteed separate legislation authorizing price supports. Such legislation has already been introduced in Congress at the request of the Ford Administration.

It is precisely because of this legislation--and my conviction that loan guarantees should be the only federal stimuli for synthetic fuels demonstration plants--that I offered my amendment as a substitute for Senator Glenn's.

We probably will face a major battle when the Administration's $4.5 billion price support bill is considered. I plan to fight it and I will appreciate your support and comments. Meanwhile, if you have any questions or comments about the loan guarantee program, or any other matters, please let me know.

Sincerely,

Floyd K. Haskell
United States Senator

tions while disregarding those which others are addressing.

"Does segregation of children in public schools solely on the basis of race, even though the difference," he says. For him, "it's a gain to do something to eliminate institutional racism."

A Man-made Natural Resource

By RICHARD A. GIRARD

This comment is by a professor emeritus of economics at New York University.

ALTHOUGH the Organization of Petroleum Exporting Countries and the countries that import oil are locked in controversy, they agree in calling petroleum a natural resource. But both sides are wrong and the oil importers make a capital error in accepting the term. Oil is not a gift of nature. In an economic sense, it is man-made.

Begin with a less controversial resource, the potato. The South American Indians found it as a nourishing nodule about the size of a pea. Over the centuries they bred bigger nodules, until they developed the potato that was later carried to Europe. What makes it one of the great economic resources is man's want for it as a food and his ability to breed the pea-sized nodule of nature up to the potato we know.

THAT IS TRUE of the other resources we speak of as natural. The fact is that they satisfy human wants as they do only because of some human input—selective breeding, an advance in chemistry, the investment of capital.

We are used to thinking of man as a menace to the earth, and so he is; but that is only half the story. He is a creator of the environment, too. That fact throws a new light on economic problems, including, for example, the tensions among the oil-exporting and oil-importing countries.

Some parts of the earth are literally man-made. "God made the world," said Descartes, "but the Dutch made Holland." About a third of the island of Manhattan is "made" land or platforms extended over the water. Almost as literal is the improvement of land by fertilizer.

Man cannot exist without oxygen, water, salt, iron and many other substances. But the amounts required for life are small compared with our culturally determined wants. Great amounts become valuable only because man wants more than his biological necessities demand.

Technology is a second great determinant of the things in the environment that are resources.

The American Indians had no use for coal—at best it was meaningless. Worse, if it lay on the surface it occupied space that might have supplied corn, fish, branches for fuel and other goods the Indians valued.

To the colonists it became a fuel superior to wood for many purposes. To us it supplies not only fuel but also coke for making steel and raw materials for medicines, solvents, nylon, flavors and dyes.

THE FACT that man shapes the environment has enormous implications.

- We should drop the term "natural resources" from the vocabulary of economics and politics. Man determines what are and what are not resources.

It is true that because coal seams run wider in the United States than in Britain, American coal producers enjoy a natural advantage. Nature furthermore sets limits to the liberties man can take with her. He can introduce a coffee tree into Java, but not into Greenland. He can use coffee beans for a zestful brew, but not peachstones.

Still, the natural limits on man's creativity are so permissive and the cultural determinants are so important, that the term "natural" is misleading.

Those resources that bear price tags in ordinary markets should be called economic resources. They could then be discussed with less heat and more insight.

Countries are richer or poorer not because of natural determinants but because of the character of the people—their social, political, economic institutions. Coal, oil, and other deposits are meaningless to people who know of no use for them and do not know how to develop them.

In contrast, the lack of great deposits of oil or iron need not doom a country to poverty. Switzerland has been made by the hand and brain of man. Its basic resource is a highly motivated, educated, industrious people.

- Scarcity is largely an invention of man. The output of the economy fails to satisfy our public and private wants. However, the gap depends not on nature but on our proliferating wants.

WHEN WE FIT together the two halves of the whole—man as creator and man as destroyer—other implications emerge.

- The pricing mechanism sometimes sets unjustifiably low prices. If a factory pollutes a river, the costs downstream communities have to pay to purify their water should be charged against the factory's product.
- While man has contributed monumentally to the creation of the earth, he has also set in motion a race between his power to create and his power to destroy the environment. He must not overestimate his ability to increase his numbers and pursue economic growth, or underestimate the risk of irreparable damage to a finite spaceship.

The oil-importing and oil-exporting countries can and should agree on some points, notably that the world should conserve oil deposits, though at the cost of prices higher than before the effective assertion by OPEC of power to fix the price of oil.

Oil has evolved into a major resource—a necessity to motorists and defense ministers, a prize to corporations, a concern to foreign offices. Modern man has highly important uses for it; he has the technology to recover, refine, and transport it and he has the necessary capital to risk.

BEFORE THE LAST century, except to the extent that man utilized surface supplies, oil might almost as well have been dry sand. For nature does not shower oil on man like rain. Of every 50 wells drilled in unexplored territory, on the average only one will open a field that produces oil or gas in quantities that return appreciably more than the cost.

To complete an oil well for production the open hole must be cased with steel pipe cemented in place. Holes are blown through the casing opposite producing formations so oil or gas may enter. Those technological feats are costly. On the average, to drill and complete a well in this country costs about $100,000.

At first the most valuable distilled product of crude oil was kerosene. Gasoline was a by-product in little demand, and dangerous to boot. Oilmen learned how to recover more of the valuable end-products, how to find new and more advanced products. So the value of a barrel of crude is defined not by nature but by knowledge of its uses and chemistry.

THE MEN who bargain over the price of the ownership of the oil fields would bargain whether oil were called an economic resource, natural resource, chalk or marbles.

But the use of the accurate term has practical importance. If oil continues to be as a gift of nature the importing countries have special status.

If, however, oil were recognized as man-made the spokesmen for the exporters would be able to concede that the value of their oil is largely the creation of the importing country's consumers, technicians and investors. The spokesmen for the importers would be armed with enhanced sense of the justice of their claim.

Continued on following p

The Steamboat Pilot
January 13, 1977, page 1

Planning group split on power project

Conflicting opinions surfaced as members of the Routt County Planning Commission studied plans for a massive power generating system proposed to be located in Routt County.

The proposal of the Oak Creek Power Company for construction of five reservoirs and two power plants met with divergent opinions from Commission members at their regular meeting last Thursday night.

John Yurich saw the project as an economic gain for the county and employment opportunity for county residents. Doug Boggs, on the other hand, expressed grave concerns for the impacts of a project on Oak Creek Power's proportions. He cited the added pollution of air and water, the impact on all public facilities, and the change in the environment due to the large influx of people into the county resulting from the proposal.

Oak Creek Power has submitted an application for a preliminary permit to the Federal Power Commission. If granted, the permit would then give the company 36 months, during which time Oak Creek Power would have priority for application for a license to construct the facilties.

The permit period would be used for engineering and economic studies required for the license application. The initial permit, if granted, would not enable the company to begin construction of any of the proposed facilites.

Routt County had until Jan. 10 to submit comments and until Jan. 31 to file a protest or a petition to intervene, with the FPC, on the application.

The County Commissioners have directed their attorney, Dan Maus, to draft a petition of intervention. Last Thursday the Planning Commission voted its support of the County Commissioners' action.

Petitions for intervention or protest are not limited to the county. Any person desiring to be heard or to make any protest with reference to Oak Creek Power's applica5tion can be filed with the Federal Power Commission, 825 N. Capitol St., N.E., Washington, D.C. 20426. The petition to intervene or protest must be filed with the FPC on or before Jan. 31.

The intervention petition would then involve the county in all actions pertaining to the proposal at federal and state levels.

The proposal of the Oak Creek Power Company is to build five reservoirs with a total storage capacity of 465,000 acre-feet and a hydroelectric generating generating capacity of Public Service of Colorado. For comparison, the four units of the Craig Power Plant will have a generating capability of 1,520 MW. The total peak generating capacity of Oak Creek Power Company's proposal, 10,000 MW, is 6.5 times the eventual capacity of the Craig Power Plant.

RESOURCE REQUIREMENTS OF THE PROPOSED PROJECT (formulas from BLM study):

A. Land Required

1. Power Plant

6,400 MW x 2 acres - 12,800 acres (A portion of this area includes the Lower Middle Creek Reservoir)

2. Transmission Lines (to reach existing lines)

230 KV Line - 100 acres per mile of line

Power Plant to Colo.-Ute line 2.5 miles - 250 acres

Blacktail Dam to Colo-Ute line 14 miles - 1,400 acres

3. Reservoirs and Conduit

1. Yampa River

Annual Water yield - 339,800 acre-feet

Capacity of Blacktail Dam - 229,000 acre-feet

Oak Creek Power Conditional Water Right - 151,300 acre-feet

Priority Date - 6-25-64 Very late

2. Oak Creek Power Conditional Water Rights

Name Priority Amount

Service Creek Pipeline, 6-25-64, 320 cfs

Morrison Creek Pipeline, 6-25-64, 500 cfs

Yampa Reservoir (Blacktail), 6-25-64, 151,300 acre-feet

Oak Creek Pipeline, 6-25-64, 70 cfs

Oak Creek Pipeline (Enlargement), 3-15,66, 140 cfs

Childress Reservoir, 6-25-64, 24,159 acre-feet

Oak Creek Power Plant, ———, 2,000 cfs

Middle Creek Reservoir, ——, 17,000 acre-feet

Trout Creek Pump Conduit, ——, 200 cfs check capacities

COAL REQUIREMENTS (BLM formula and constants)

Oak Creek Power Plant

1 kilowatt hour = 8,530 BTU at 40 per cent efficiency

6,400 Kilowatts = 6,400,000 watts

Average BTU value of northwest Colorado coal - 10,000 BTU per pound of coal

$$\frac{10{,}000 \text{ BTU} / 1\text{b}}{8{,}530 \text{ BTU} / \text{KWh}} = 1.17 \text{ kilowatt hour per pound of coal}$$

$$\frac{6{,}400{,}000 \text{ W}}{1.17 \text{ KWh} / 1\text{b.}} = 5{,}470{,}085 \text{ lbs} / \text{hour} = 2{,}735 \text{ tons} / \text{hour}$$

= 23,958,600 tons of coal per year required to operate a 6,400 MW power plant

To mine 1,000,000 tons of coal requires disturbance of 100 surface acres.

$$\frac{23{,}958{,}600 \text{ tons} / \text{year}}{1{,}000{,}000 \text{ tons} / 100 \text{ acres}} = 2{,}395 \text{ acres of land required to produce coal}$$

Conflicting opinions on the project within the Planning Commission were not resolved during last Thursday's meeting. Aaron Huffstetler and Jim Funk stated their concerns over critical impacts on the county if the proposed project would be approved and built. They questioned the need of giant power plants located in the county and transmitting power either outside the county and/or outside the state. The question was raised as to air pollution created by the coal-fired power plant and its negative effect on the quality of life within the county.

Although presently proposed as a private company, and therefore taxable, several Commission members were sceptical as to continuation of the project as a private enterprise.

"There are absolutely no guarantees that this will not become a public utility and a non-taxable entity within Routt County," was Joe deGanahl's comment. "We also have no guarantee that one or more of the proposed reservoirs will not eventually be used for water diversion to the east slope...something this Commission has gone on record as opposing."

Although there is no proposal for water diversion under Oak Creek Power's plan, staff planner Diane Blake pointed out that there was also no proposal not to direct water out of the county.

Commission members brought discussion to a close with a vote to support the action of the County Commission. Planning Commission members also agreed to hold further discussion about the proposed project as it would affect planning matter.

Oak Creek Power Company Proposal

Estimated Impacts

CONSTRUCTION (1-10 YEARS)	CONSTRUCTION (1-30 YEARS)	

protest must be filed with the FPC on or before Jan. 31.

The intervention petition would then involve the county in all actions pertaining to the proposal at federal and state levels.

The proposal of the Oak Creek Power Company is to build five reservoirs with a total storage capacity of 465,000 acre-feet and a hydroelectric generating capacity of 3,600 megawatts of power. Also included in the proposal is a coal-fired power plant with an ultimate capacity of 6,400 megawatts of power.

Surface Area of Proposed Reservoirs - approximately 22,000 acres

Conduit - 10 miles length x 50 acres / mile - 500 acres

WATER REQUIREMENTS

Proposed Total Storage Capacity - 480,109 acre-feet

The Blacktail reservoir would back water up 60 feet above the proposed lake at Stagecoach. The Blacktail Dam (335 feet) and the Lower Green Creek Dam (387 feet) are much larger than any existing dams in the county.

The thermal (coal fired) power plant proposed on Middle Creek (6,400 MW) would have more than double the

6,400 Kilowatts = 6,400,000 watts

Average BTU value of northwest Colorado coal - 10,000 BTU per pound of coal

$$\frac{10{,}000 \text{ BTU} / 1\text{lb}}{8{,}530 \text{ BTU} / \text{KWh}} = 1.17 \text{ kilowatt hour per pound of coal}$$

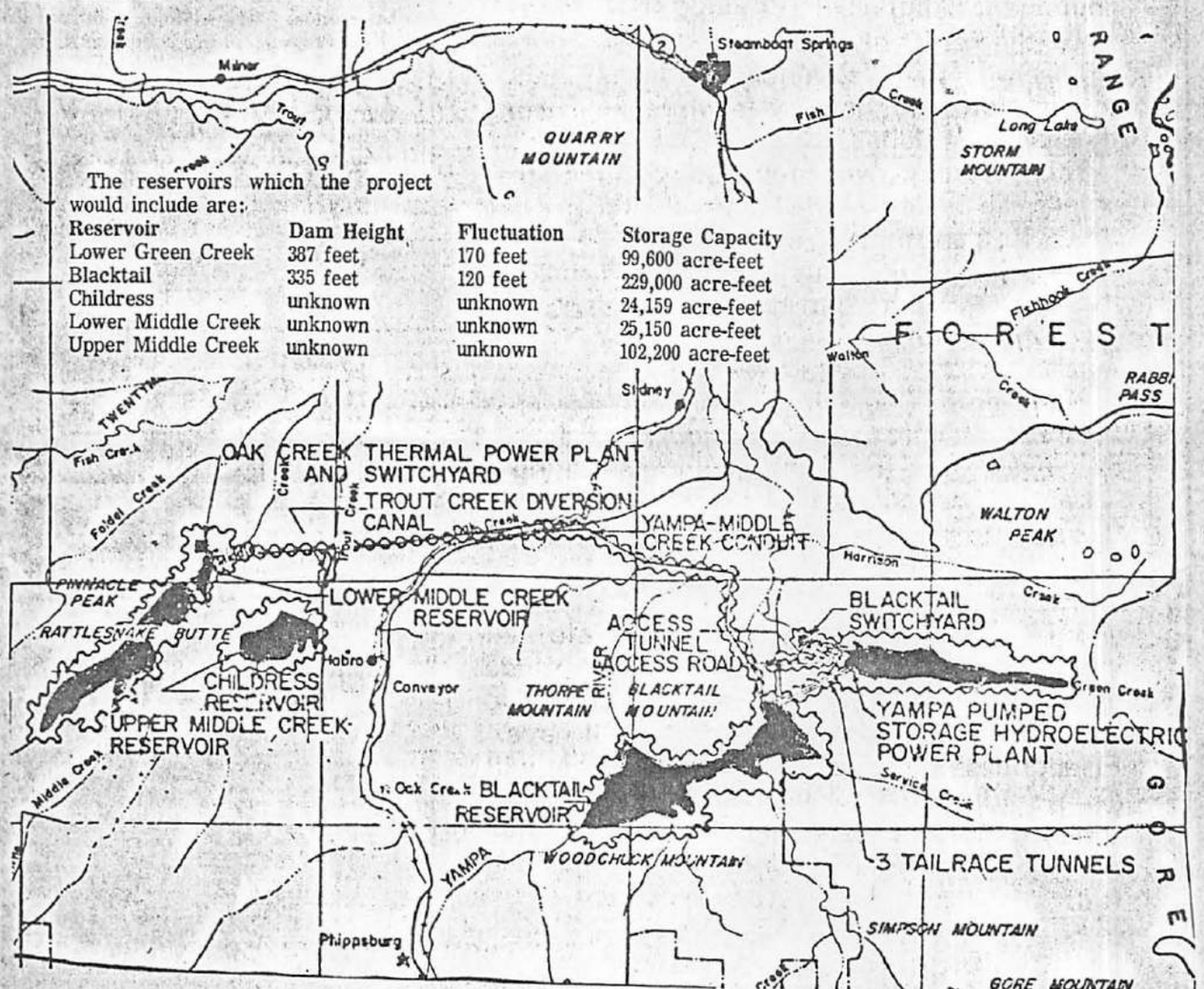
as it would affect planning matter.

Oak Creek Power Company Proposal Estimated Impacts

	CONSTRUCTION (1-10 YEARS) NOT PHASED		CONSTRUCTION (1-20 YEARS) PHASED		OPERATION (LONG TERM)	
	Employment	Total Added Population (1.2)	Employment	Total Added Population (1.7)	Employment	Total Added Population (2.3)
HYDROELECTRIC RESERVOIRS	500	600	300	510	150	345
STORAGE RESERVOIRS	300	360	150	255	20	46
POWER PLANT	2,925	3,510	630	1,071	550	1,265
CONDUIT AND SWITCHYARDS	300	360	100	170	50	115
TRANSMISSION FACILITIES	200	240	100	170	15	34
RELATED GROWTH (3:1)		1,690		725		1,203
TOTAL ADDED POPULATION	4,225	6,760	1,280	2,901	785	3,008
DWELLING UNITS REQUIRED		5,500		2,000		2,000
LAND AREA REQUIRED 10A/100 DU		550A		200A		200A

The reservoirs which the project would include are:

Reservoir	Dam Height	Fluctuation	Storage Capacity
Lower Green Creek	387 feet	170 feet	99,600 acre-feet
Blacktail	335 feet	120 feet	229,000 acre-feet
Childress	unknown	unknown	24,159 acre-feet
Lower Middle Creek	unknown	unknown	25,150 acre-feet
Upper Middle Creek	unknown	unknown	102,200 acre-feet



finor

encroach upon city park Page 1 A

Business Beat: new PROSPECTOR feature

Prospector

S P E C I A L A L E R T - - - - A C T I O N N E E D E D N O W

SYNTHETIC FUELS SUBSIDY LEGISLATION REVIVED

Congress has revived a proposal to provide billions of dollars to subsidize "commercial" development of oil shale and coal gasification, despite the fact that a $6 billion synfuels guaranteed loan program was resoundingly defeated (263-140) in the House of Representatives last December. The House Committee on Science and Technology, chaired by Rep. Olin Teague (D-Texas), is now considering similar legislation as a result of heavy lobbying pressure from the oil shale and coal gasification interests.

The bill under consideration, HR 12112, would provide $2 billion in guaranteed loans to synthetic fuel development, but numerous amendments are anticipated in the legislation when the mark-up begins during the last week in April. The concept of the legislation--to provide billions of taxpayer dollars to uneconomic and environmentally damaging synthetic fuels projects--will remain as the basis of the legislation, however, and heavy citizen pressure is needed to insure that we can once again defeat this ill-conceived program.

Letters to Congressional representatives should stress opposition to the entire concept of subsidizing the energy companies to develop synthetic fuels, rather than to a specific provision or bill number, since the Committee may make many changes in HR 12112. It is important to inform members of the House Science and Technology Committee and other members of Congress who voted against the subsidies last December that the only acceptable "improvement" in this subsidy legislation is to kill it. Amendments cannot cure the basic problem of this subsidy proposal.

A list of members of Congress who voted against the subsidy program is at the end of this bulletin. Committee members are marked with an asterisk (*). As top priority, WRITE THE COMMITTEE MEMBERS LISTED, URGING THEM TO REASSERT THEIR OPPOSITION TO SYNTHETIC FUELS SUBSIDIES. Also write other Representatives listed, reminding them that this issue may come to the floor again, and that they should VOTE AGAINST THE SUBSIDIES.

ARGUMENTS AGAINST SYNTHETIC FUELS SUBSIDIES

ECONOMIC ARGUMENTS

A guaranteed loan program for synthetic fuels will not "guarantee" one gallon of fuel. The guaranteed loan program will provide enough money to build a few plants, but only further taxpayer subsidies such as price supports will entice the companies to operate the plants. The Ford Administration has already testified that additional subsidies will be necessary. For starters, they want a program of loans, grants and price supports totalling $11.5 billion. Thus, passage of a guaranteed loan program will insure more subsidies later--otherwise, if companies default, the government will be stuck with useless billion-dollar plants. With so much taxpayer money invested in the plants, future bail-outs such as price supports and guaranteed purchase contracts will make the Lockheed deal look like penny-ante poker.

The companies want--and the current subsidy bill would give them--a "sweetheart" deal. Not only would the government guarantee the loans to build the plants, thereby obtaining a low interest rate for the company, but also the government would actually make the payments on the loan, if the company said it had a cash-flow problem. If the company were to default eventually on the loan, the government would have no recourse to the company's assets, even those of a multi-national oil company such as Gulf; and although these plants would be subsidized, the companies would be able to keep the patents and other confidential information for their own private benefit.

Most of the subsidies would go to those who need taxpayer help the least--the large energy companies. The Oil Shale Corporation (TOSCO) has been lobbying for subsidies for their oil shale ventures, yet at the same time they have been able to purchase the entire west coast operations of Phillips Oil Co. TOSCO has also linked up with some of the largest corporations in the world--Atlantic Richfield, Shell and Ashland Oil Companies--to form an oil shale consortium. Other companies who would like to get subsidies for synthetic fuels development include Gulf Oil Co. and WESCO (a consortium of Pacific Lighting Co. and Texas Eastern Transmission Corp., who have joined with Utah International Inc., one of the largest mining companies in the world which is also about to merge with General Electric). It is clear that synfuels subsidies are not destined for small companies who really need help from the taxpayer. It's also clear that companies put up their own money for financially promising ventures like conventional oil refining or developing Alaskan oil and gas, but when faced with uneconomic projects like synfuels, they'd much rather risk the taxpayer's money.

Synthetic fuels just aren't economic today. Inflation has pushed the projected costs of oil shale and coal gasification plants to well over one billion dollars apiece and the price of the synthetic oil and gas to over $20 per barrel equivalent. Not only do these companies want the taxpayer to foot the bill for the plants but also to insure a high enough price for energy so that they can sell the high-priced product. Banks have recognized the uneconomic nature of synfuels projects. That's why the companies are hoping the taxpayer will absorb the risk.

Even the Ford Administration has admitted that the costs of subsidizing synthetic fuels are greater than the benefits, and that the amount of energy to be produced will be "negligible." These conclusions are from the Administration's four-volume Synthetic Fuels Commercialization Program Task Force Report, published last year. The simple fact is that synthetic fuels are extremely expensive--economically and environmentally. The companies have decided that to proceed to commercial scale now (as opposed to later, when better technology might have been developed), they must have taxpayer dollars, since they don't want to risk their own.

ENVIRONMENTAL ARGUMENTS

Synthetic fuels development will be environmentally damaging. Consumption of scarce water supplies, strip mining, massive waste shale disposal, water pollution, air pollution, massive influxes of people into sparsely-populated areas, wildlife destruction, and production of cancer-causing substances would result from synthetic fuels development. The adverse effects of synfuels developments have been described by the Ford Administration itself, in their massive Synthetic Fuels Commercialization Program Task Force Report. We don't need to build the plants just to observe the massive damage we know will occur.

The West cannot afford to use its scarce water supplies for marginal developments like synfuels. Synfuel plants require massive amounts of water, diverting it from other users, affecting agricultural, industrial, municipal, recreation and ecosystem uses. Yet, if the bill passes, most plants are planned for the arid West.

Synthetic fuels production will increase the salinity of the Colorado River. The results will be disastrous for agricultural activities in California and Mexico, where a Federal Energy Administration report found millions of dollars in damage could occur.

Boom towns due to rapid population influx will degrade the quality of life in rural areas of the West. Health, education and other social services will suffer, mental health problems will increase, and worker productivity is low in boom town situations. Experience has shown that no amount of government aid or planning has been able to reduce boom town problems in the west and in Alaska.

Cancer caused by synthetic fuels development has been noted in this and other countries. There is a documented link between synfuels and cancer of the lung, skin and scrotum. At a time when more and more links between man-made substances and cancer are being proven, it would be foolish to proceed with large-scale synfuels development until the cancer question has been resolved.

Air pollution will be significant. Oil shale developers in Colorado are already trying to get air pollution standards weakened to accommodate the plants.

Land disturbed in synfuels development will be difficult, if not impossible to reclaim. Waste shale material, which will be deposited in massive quantities in canyons, will be very difficult to stabilize and reclaim. Surface mining for coal on the Navajo Reservation, where the first coal gasification plant is proposed, is in an area with less than 10 inches of rain per year, where the National Academy of Sciences states that strip mine reclamation may well be impossible.

ALTERNATIVES ARGUMENTS

Subsidies for "commercialization" of synthetic fuels are inappropriate and premature. Instead of providing money to build huge, uneconomic synfuels plants, the government should be encouraging further research and development into less damaging and more promising energy alternatives. Existing Energy Research and Development Administration (ERDA) legislation gives the agency sufficient authority to support research and development activities. For the free enterprise system to work in the energy industry, "commercialization" should not be included with government-financed research and development.

Conservation is probably the most promising alternative to massive subsidies for synthetic fuels. For example, an MIT research team concluded that the heat pump installed on existing furnaces was a favorable alternative to high-BTU coal gasification for space heating, the primary purpose for which synthetic gas would be developed. Also, studies for ERDA have shown that conserving energy is one-[illegible] as costly as developing similar amounts of new energy sources.

Even if synfuels such as shale oil and high-BTU coal gasification are desired, a massive subsidy program now could actually hinder rather than promote their development. ERDA estimates that at least one loan default--out of a mere handful of projects--would occur. That default would prove the fears of the bankers, who believe that such projects are neither technologically nor economically ready for commercialization. The default of a billion-dollar-plus"white elephant" would cast doubt on the value of developing synthetic fuel resources--not only the specific technology involved--just as the Hindenburg disaster wiped out the future of the young airship industry. In addition, subsidizing a few first generation technologies, instead of waiting for improvements in technology, would take the place of funding more diversified research and development.

The billions of dollars which synfuels subsidies would absorb could be spent in ways which would provide more energy. For example, $2 billion could buy and install the solar equipment for over half a million new homes or completely pay for retrofitting 400,000 homes with solar equipment. This would provide for continuous energy savings and avoid the tremendous environmental and socio-economic destruction from synthetic fuels development. Unlike synfuels, no price supports would be needed.

TARGET LIST

IN DECEMBER, GRASS-ROOTS LOBBYING BEAT THE SPECIAL INTERESTS. WE CAN DO IT AGAIN WITH YOUR HELP! These members of the House of Representatives voted against the subsidy program last December. An asterisk (*) indicates members of the House Science and Technology Committee. Please write at least two letters: one to a Committee member and one to a Congressional Rep. from your state or region. URGE THEM TO VOTE AGAINST SYNTHETIC FUELS SUBSIDIES. Address: U.S. House of Representatives; Washington, DC 20515.

Abdnor, James (R-SD)
Abzug, Bella (D-NY)
Addabbo, Joseph (D-NY)
Allen, Clifford (D-Tenn.)
Anderson, Glenn (D-Cal.)
Andrews, Ike (D-NC)
Andrews, Mark (R-ND)
Archer, Bill (R-Tex.)
Armstrong, Wm. (R-Colo.)
Ashbrook, John (R-Ohio)
Ashley, Thomas (D-Ohio)
Aspin, Les (D-Wis.)
AuCoin, Les (D-Ore.)
Badillo, Herman (D-NY)
Baldus, Alvin (D-Wis.)
Barrett, Wm. (deceased)
Baucus, Max (D-Mont.)
Bauman, Robert (R-Md.)
Beard, Edward (D-RI)
Bedell, Berkley (D-Iowa)
Biaggi, Mario (D-NY)
Biester, Edward (R-Pa.)
Bingham, Jonathan (D-NY)
*Blanchard, James (D-Mich.)
*Blouin, Michael (D-Iowa)
Boggs, Lindy (D-La.)
Boland, Edward (D-Mass.)
Brademas, John (D-Ind.)
Breaux, John (D-La.)
Brodhead, Wm. (D-Mich.)
Brooks, Jack (D-Tex.)
Broomfield, Wm. (R-Mich.)
Brown, Clarence (R-Ohio)
Broyhill, James (R-NC)
Burgener, Clair (R-Cal.)
Burke, James (D-Mass.)
Burke, Yvonne (D-Cal.)
Butler, Caldwell (R-Va.)
Byron, Goodloe (D-Md.)
Carney, Charles (D-Ohio)
Carr, Bob (D-Mich.)
Chisholm, Shirley (D-NY)
Clancy, Donald (R-Ohio)
Clausen, Don (R-Cal.)
Clawson, Del (R-Cal.)
Clay, Wm. (D-Mo.)
Cochran, Thad (R-Miss.)
Cohen, Wm. (R-Maine)
Collins, Cardiss (D-Ill.)
Conable, Barber (R-NY)
Conte, Silvio (R-Mass.)
Conyers, John (D-Mich.)
Cornell, Robert (D-Wis.)
Coughlin, Lawrence (R-Pa.)
Crane, Philip (R-Ill.)
D'Amours, Norman (D-NH)
Daniel, Robert (R-Va.)
Daniels, Dominick (D-NJ)
Danielson, George (D-Cal.)
de la Garza, E. (D-Tex.)
Delaney, James (D-NY)
Dellums, Ronald (D-Cal.)
Derrick, Butler (D-SC)
Devine, Samuel (R-Ohio)
Diggs, Charles (D-Mich.)
Dingell, John (D-Mich.)
*Dodd, Christopher (D-Conn.)
Downey, Thomas (D-NY)
Drinan, Robert (D-Mass.)
Duncan, Robert (D-Ore.)
du Pont, Pierre (R-Del.)
Early, Joseph (D-Mass.)
Eckhardt, Bob (D-Tex.)
Edgar, Robert (D-Pa.)
Edwards, Don (D-Cal.)
Eilberg, Joshua (D-Pa.)
Erlenborn, John (R-Ill.)
Eshleman, Edwin (R-Pa.)
Evans, David (D-Ind.)
Fascell, Dante (D-Fla.)
Fenwick, Millicent (R-NJ)
Findley, Paul (R-Ill.)
Fish, Hamilton (R-NY)
Fisher, Joseph (D-Va.)
Fithian, Floyd (D-Ind.)
Florio, James (D-NJ)
Ford, Harold (D-Tenn.)
Fountain, L.H. (D-NC)
Frenzel, Bill (R-Minn.)
Gibbons, Sam (D-Fla.)
*Goldwater, Barry (R-Cal.)
Gonzalez, Henry (D-Tex.)
Gradison, Willis (R-Ohio)
Grassley, Charles (R-Iowa)
Green, Wm. (D-Pa.)
Gude, Gilbert (R-Md.)
Guyer, Tennyson (R-Ohio)
Hagedorn, Tom (R-Minn.)
Haley, James (D-Fla.)
*Hall, Tim (D-Ill.)
Hamilton, Lee (D-Ind.)
Hanley, James (D-NY)
Hansen, George (R-Idaho)
*Harkin, Tom (D-Iowa)
Harrington, Michael (D-Mass.)
Harris, Herbert (D-Va.)
Harsha, Wm. (R-Ohio)
Hastings, James (R-NY)
Hawkins, Augustus (D-Cal.)
*Hayes, Philip (D-Ind.)
Hays, Wayne (D-Ohio)
*Hechler, Ken (D-W.Va.)
Heckler, Margaret (R-Mass.)
Hefner, Bill (D-NC)
Henderson, David (D-NC)
Holland, Kenneth (D-SC)
Holt, Marjorie (R-Md.)
Holtzman, Elizabeth (D-NY)
Howard, James (D-NJ)
Hughes, Wm. (D-NJ)
Hungate, Wm. (D-Mo.)
Hutchinson, Edward (R-Mich.)
Jacobs, Andrew (D-Ind.)
Jeffords, James (R-Vt.)
Johnson, James (R-Colo.)
Jones, Ed (D-Tenn.)
Jones, Walter (D-NC)
Jordan, Barbara (D-Tex.)
Karth, Joseph (D-Minn.)
Kasten, Robert (R-Wis.)
Kastenmeier, Robt. (D-Wis.)
Kelly, Richard (R-Fla.)
Kemp, Jack (R-NY)
Keys, Martha (D-Kan.)
Kindness, Thomas (R-Ohio)
Koch, Edward (D-NY)
Krebs, John (D-Cal.)
LaFalce, John (D-NY)
Lagomarsino, Robt. (R-Cal.)
Latta, Delbert (R-Ohio)
Leggett, Robt. (D-Cal.)

Lehman, Wm. (D-Fla.)
Lent, Norman (R-NY)
Litton, Jerry (D-Mo.)
*Lloyd, Jim (D-Cal.)
Long, Clarence (D-Md.)
Long, Gillis (D-La.)
Lott, Trent (R-Miss.)
McCloskey, Paul (R-Cal.)
McCollister, John (R-Neb.)
McDonald, Larry (D-Ga.)
McEwen, Robt. (R-NY)
McHugh, Matthew (D-NY)
Macdonald, Torbert (D-Mass.)
Madden, Ray (D-Ind.)
Madigan, Edward (R-Ill.)
Maguire, Andrew (D-NJ)
Mann, James (D-SC)
Matsunaga, Spark (D-Hawaii)
Melcher, John (D-Mont.)
Meyner, Helen (D-NJ)
Mezvinsky, Edward (D-Iowa)
Miller, George (D-Cal.)
Mineta, Norman (D-Cal.)
Minish, Joseph (D-NJ)
[illegible], Patsy (D-Hawaii)
Mitchell, Donald (R-NY)
Mitchell, Parren (D-Md.)
Moakley, Joe (D-Mass.)
Moffett, Toby (D-Conn.)
Moore, Henson (R-La.)
Moorhead, Carlos (R-Cal.)
Moorhead, Wm. (D-Pa.)
Moss, John (D-Cal.)
Mottl, Ronald (D-Ohio)
Murphy, John (D-NY)
Neal, Stephen (D-NC)
Nedzi, Lucien (D-Mich)
Nolan, Richard (D-Minn.)
Nowak, Henry (D-NY)
Oberstar, James (D-Minn.)
Obey, David (D-Wis.)
O'Hara, James (D-Mich.)
*Ottinger, Richard (D-NY)
Patman, Wright (deceased)
Pike, Otis (D-NY)
*Pressler, Larry (R-SD)
Pritchard, Joel (R-Wash.)
Quie, Albert (R-Minn.)
Rangel, Charles (D-NY)
Regula, Ralph (R-Ohio)
Reuss, Henry (D-Wis.)
Richmond, Frederick (D-NY)
Rinaldo, Matthew (R-NJ)
Robinson, Kenneth (R-Va.)
Rodino, Peter (D-NJ)
*Roe, Robt. (D-NJ)
Rogers, Paul (D-Fla.)
Roncalio, Teno (D-Wyo.)
Rooney, Fred (D-Pa.)
Rose, Charles (D-NC)
Rosenthal, Benjamin (D-NY)
Roush, Edward (D-Ind.)
Rousselot, John (R-Cal.)
Roybal, Edward (D-Cal.)
Ruppe, Philip (R-Mich.)
Russo, Martin (D-Ill.)
Ryan, Leo (D-Cal.)
St. Germain, Fernand (D-RI)
Santini, Jim (D-Nev.)
Sarbanes, Paul (D-Md.)
Satterfield, Davis (D-Va.)
*Scheuer, James (D-NY)
Schneebeli, Herman (R-Pa.)
Schroeder, Pat (D-Colo.)
Schulze, Richard (R-Pa.)
Seiberling, John (D-Ohio)
Sharp, Philip (D-Ind.)
Shriver, Garner (R-Kan.)
Shuster, Bud (R-Pa.)
Skubitz, Joe (R-Kan.)
Smith, Virginia (R-Neb.)
Snyder, Gene (R-Ky.)
Solarz, Stephen (D-NY)
Spellman, Gladys (D-Md.)
Spence, Floyd (R-SC)
Staggers, Harley (D-W.Va.)
Stanton, James (D-Ohio)
Stark, Fortney (Pete) (D-Cal.)
Steelman, Alan (R-Tex.)
Steiger, Sam (R-Ariz.)
Steiger, Wm. (R-Wis.)
Stokes, Louis (D-Ohio)
Studds, Gerry (D-Mass.)
Sullivan, Leonor (D-Mo.)
*Symington, James (D-Mo.)
Symms, Steven (R-Idaho)
Talcott, Burt (R-Cal.)
Taylor, Gene (R-Mo.)
Taylor, Roy (D-NC)
Thompson, Frank (D-NJ)
Thone, Charles (R-Neb.)
Traxler, Bob (D-Mich.)
Treen, David (R-La.)
Tsongas, Paul (D-Mass.)
Ullman, Al (D-Ore.)
Van Deerlin, Lionel (D-Cal.)
Vander Veen, Richard (D-Mich.)
Vanik, Charles (D-Ohio)
Vigorito, Joseph (D-Pa.)
Waggonner, Joe (D-La.)
*Waxman, Henry (D-Cal.)
Whalen, Charles (R-Ohio)
Whitehurst, Wm. (R-Va.)
Wiggins, Charles (R-Cal.)
Wilson, Charles (D-Tex.)
Wolff, Lester (D-NY)
*Wydler, John (R-NY)
Wylie, Chalmers (R-Ohio)
Yates, Sidney (D-Ill.)
Young, Andrew (D-Ga.)
Young, Bill (R-Fla.)
Zeferetti, Leo (D-NY)

COLORADANS: Write also to Representatives Frank Evans and Tim Wirth, who voted to support the subsidy in December. Urge them to reconsider their decisions.

This bulletin was prepared by:
Colorado Open Space Council Mining Workshop & Friends of the Earth Colorado Branch
2239 East Colfax Avenue, Denver, CO 80206; phone 303/321-6588

Please reproduce this bulletin and distribute to members of your organization and to friends and colleagues! Only grass-roots lobbying will defeat this legislation.

We need your help to carry on this citizen effort. If you can give us a contribution, send and make it payable to: COSC Mining Workshop-Synfuels, 2239 E. Colfax Ave., Denver, CO 80206

Friends of the Earth
Colorado Open Space Council
2239 East Colfax Avenue
Denver, Colorado 80206

SPECIAL ALERT ON SYNTHETIC FUELS SUBSIDIES

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NECC

NATIONAL ENERGY CONSERVATION CHALLENGE!

Dedicated to the idea that waste consciousness is a state of mind that can be changed to conservation consciousness, and that simply by changing our habits we can save up to 20 per cent in energy output, the students of Western State College of Colorado, in Gunnison, have challenged any other institution in the nation to save as much energy output as they can from October 1, 1977 until April 30, 1978. Gunnison is a town of about 5,000 population, located high in the Rocky Mountains, and the college has about 3,200 enrollment. The liberal arts college has already begun to show savings by simply turning off unused lights and turning down thermostats, and the student support has been outstanding. Gunnison frequently has the coldest temperatures in the contiguous 48 states, so the real test will be during the winter months.

The challenge was stated in a telegram to President Carter following his April 18 energy speech. Several institutions soon responded with plans to try to beat Western's record.

NECC is in no way opposed to further development of energy resources, and is located in a potentially rich area for such development. However, the college community is convinced that personal saving habits on the part of people, without hassels, fines, rations, or humiliations, would cut the amount of energy needed, and perhaps bridge the gap to prevent outages. They feel strongly that the idea that conservationists and energy producers should be opposed is a convenient myth, and hope to see both groups work out the problem in a mutually satisfactory manner.

They intend that the NECC program be fun, and are not asking that people make huge sacrifices in their living styles. Brain-storming sessions on the campus have produced hundreds of ideas as to how conservation can be practiced without loss of normal convenience. Necessary energy usage will be maintained; it is only unneccessary usage that we are trying to stop. Awareness of such waste can cut the output tremendously, and since embarking on the program we have seen many of our habits which are essentially wasteful and add nothing to the pleasures and conveniences of life. This creative self-discipline idea can lead to new patterns of thinking which have characterized the American tradition, and which we think have been overlooked in the proposals for dealing with the energy crisis.

On campus, we are having weekly projects ranging from research paper contests and a speakers' week to having a dance with band instruments powered by human energy, a walking demonstration to a nearby ski area, huge ice sculptures and a great trash monster, as well as many other "spectaculars" to launch the consciousness anew during each phase of the challenge. Each institution could devise the program best suited to its size and location in meeting the challenge. Western State College will be a clearing house for the challenge; and each participating institution will keep its own records. We would like to know the BTUs, kilowatts, and gallons saved by each institution per person enrolled or involved in the operation. Western will also furnish information to the press and other media as to the participation plans and events throughout the nation.

We take seriously the President's suggestion that this peacetime goal be treated with the effort of a war, and are totally dedicated to the belief that it can be done within institutions, with ourselves as one example. We are tired of hearing "they oughta"; we're gonna!

Any encouragement will be sincerely appreciated; most nay-saying will be largely ignored, unless based on solid evidence. All participation is entirely voluntary, and no public funds are being used, and there is no payment for any services. If you or your institution are interested, simply write to NECC, Western State College, Gunnison, Colorado, 81230. Jim Zulevich is the student director, and his number is (303) 641-3903. Abbott Fay is faculty coordinator, with phone numbers (303) 943-2039 (office), and (303) 641-0931 (home).

NATIONAL ENERGY CONSERVATION CHALLENGE
Western State College
Gunnison, Colorado 81230

OVERVIEW OF
Conservation Sections of
ENERGY CONSERVATION AND PRODUCTION ACT (P.L. 94-385)

The Energy Conservation and Production Act was signed into law on August 4, 1976. The bill contains three titles with major provisions involving energy conservation. Those titles are briefly outlined below:

Title II - Electric Utilities Rate Design Initiatives

-- requires FEA to develop proposals for improving electric utility rate design

-- authorizes FEA to fund demonstration projects to improve utility load management and to fund rate reform initiatives

-- authorizes FEA grants to states for setting up offices of consumer services

Title III - Energy Conservation Standards for New Buildings

-- directs Department of Housing and Urban Development to develop within three years Federal standards for energy efficiency in new commercial and residential buildings

-- denies Federal financial assistance for failure to comply with the new standards, conditioned upon later Congressional review and approval of such sanctions

Title IV - Energy Conservation Assistance for Existing Buildings

-- authorizes FEA grants to states and in certain circumstances directly to community action agencies and local governments for insulation and weatherization of dwellings of low-income persons (up to $400 per unit)

-- directs FEA to develop guidelines and authorizes grants for supplemental state energy conservation plans

-- directs HUD to conduct a demonstration program to encourage the use of conservation measures in existing dwellings; authorizes grants, loans and other financial incentives

-- authorizes FEA to guarantee loans for corporations, small businesses, and other eligible borrowers such as state and non-profit institutions for financing energy conservation measures; aggregate guarantees of $2 billion

SUMMARY OF CONSERVATION PROVISIONS
ENERGY CONSERVATION AND PRODUCTION ACT (P.L. 94-385)

Title II - Electric Utilities Rate Design Initiatives

Sec. 201-207 - Rate Design Proposals and Grants

-- requires FEA to develop proposals for improving electric utility rate design and transmit them to Congress within six months

-- authorizes grants totaling $2 million to states for establishment of offices of consumer services to represent consumer interests before utility regulatory commissions

-- provides for funding of demonstration projects to improve electric utility load

-- allows FEA intervention in rate proceedings by request of participants in proceedings

-- authorizes $13 million for the transition quarter and FY 1977

Title III - Energy Conservation Standards for New Buildings

Sec. 304 -- Energy Conservation Performance Standards

-- directs HUD to develop within three years Federal performance standards for energy efficiency in all new commercial and residential buildings

Sec. 305 - Application of Standards to New Buildings

-- denies Federal financial assistance for any new construction which does not meet the Federal standards

-- provides that both Houses of Congress must approve such sanctions before they will become effective

Sec. 306 - Federal Buildings

-- requires the head of each Federal agency responsible for construction of any Federal building to adopt such procedures as necessary to assure that any construction meets or exceeds the final standards

Sec. 307 - Grants

-- authorizes $5 million in FY 1977 for Federal aid to states and local governments to assist in adopting and implementing the new standards

Sec. 308 - Technical Assistance

-- authorizes technical assistance from HUD to state and local governments to meet the new requirements

Sec. 309 - Consultation with Interested and Affected Groups

-- requires consultation with appropriate public officials and organizations in developing and promulgating new energy conservation standards

Sec. 310 - Support Activities

-- allows HUD to utilize the services of other appropriate Federal agencies in developing the performance standards

Sec. 311 - Monitoring of State and Local Adoption

-- requires HUD to monitor progress of state and local governments in adopting and enforcing the energy conservation standards

-- requires report to Congress and identification of any obstacles

Title IV - Energy Conservation in Existing Buildings

Part A - Weatherization Assistance for Low-Income Persons

Sec. 411-422

-- authorizes FEA grants to states and under certain circumstances local governments and community action agencies for weatherization materials for low-income persons' dwellings

-- imposes general limitation of $400 per unit and authorizes total of $200 million for the program through FY 1979

-- provides for judicial review of any final action on an application

-- requires an annual report from FEA on the progress of the weatherization assistance program

Part B - State Energy Conservation Plans

Sec. 432 - Supplemental State Conservation Plans

-- amends EPCA and directs FEA to develop guidelines for supplemental state energy conservation plans

-- authorizes grants for state implementation totaling $105 million through FY 1979

-- includes provision for energy audits to determine the energy efficiency of various buildings

-- report to Congress under EPCA state conservation program will now also include this program

Part C - Conservation Demonstration Program for Existing Dwellings

Sec. 441 - Conservation and Renewable-Resource Demonstration

-- directs HUD to undertake a national demonstration program to test feasibility of aid to encourage energy conservation in dwellings

-- authorizes grants, loan guarantees, and other financial incentives to encourage these conservation measures

-- authorizes $200 million for the program

Part D - Energy Conservation and Obligation Guarantee

Sec. 451 - Program

-- provides FEA authority to guarantee loans to corporations, small businesses, and other eligible borrowers (including non-profit institutions) for financing energy conservation measures in buildings

-- limits guarantee to 90% of the cost

-- limits total commitment to $2 billion with a $5 million ceiling for any one recipient

-- authorizes appropriations of $60 million to pay for defaults on loans guaranteed

Part E - Miscellaneous Provisions

Sec. 461 - Exchange of Information

-- directs FEA to encourage and facilitate exchange of information on energy conservation among the states and between states and Federal government

Sec. 462 - Report by Comptroller General

-- requires annual report by Comptroller General on the activities of FEA and HUD under this title

ELECTRIC POWER DEVELOPMENT IN COLORADO

The Problems and Impacts

By

John J. Bugas

COLORADO-UTE ELECTRIC ASSOCIATION, INC.

MONTROSE, COLORADO

Presented at

TOOLS FOR TRANSITION

Ramada Inn, Grand Junction, Colorado

Saturday, November 15, 1975

Colorado-Ute Electric Association is a public utility engaged in the business of generation and transmission of electric power and energy. It supplies the wholesale electric power requirements of its 13 member systems in the State of Colorado. It is organized as a cooperative and is owned by the member systems it serves.

Colorado-Ute's member systems are also public utilities and serve the electric power needs of approximately 100,000 consumers scattered throughout western and southern Colorado. A map of the certificated service territory of Colorado-Ute's member systems is attached to the copies of my written presentation. As the map indicates, Colorado-Ute's distribution members provide electric service over a major portion of the land mass of the State of Colorado. This territory consists of some of the most sparsely settled and remote areas of the State. Our member systems serve basically rural areas and a few of the smaller towns and cities. The larger cities of the region such as Grand Junction and Pueblo are served by others. Only three communities with a population over 5,000 (based on the 1970 census) are served by Colorado-Ute's member systems: Durango (population 10,333), Montrose (population 6,496), and Cortez (population 6,032). Craig, with a population of 4,205 in 1970, is by now probably the fourth.

Compared to other electric utilities, Colorado-Ute is certainly a small one, and its loads are scattered throughout a wide area. In fact, while Colorado-Ute supplies the electric needs of over half of the land mass of Colorado, it serves but a small fraction of the total electric requirements in Colorado -- only about 8%.

Being small, and at the same time serving a large territory, poses some special problems for Colorado-Ute in developing its generating facilities. Normally in locating its power plants, a utility can choose between two basic options: (1) Locate the power plant near the load center and transport the fuel from a distant source; or (2) Locate the plant close to the fuel source

and transmit the power to the load center. Colorado-Ute, because of its scattered loads, does not really have the opportunity to exercise the first option. Accordingly, we try to locate our plants as close to the fuel source as possible. At the present time and for the next couple of decades, the only reasonably available fuel source, especially in this part of the country, is coal. In Colorado, most of the economically mineable coal for power plant use is located in Northwest Colorado. It is basically for this reason that Colorado-Ute has chosen Routt and Moffat Counties as the location for the large power plants that produce the electricity needed to serve its Colorado consumers.

Being a relatively small utility, Colorado-Ute could not, by itself, take advantage of economies of scale and the latest technology to provide power to its consumers at a reasonable cost. To solve this problem, Colorado-Ute has been a pioneer in joint power projects and joint planning. It is for this reason that we have sought and found other electric utilities as partners in our projects at Hayden and Craig. At present, Colorado-Ute owns and operates Hayden Unit No. 1 (180 MW capacity), and is constructing, jointly with Salt River Project, Hayden Unit No. 2 (250 MW capacity). This unit is scheduled for commercial operation in mid-1976. At Craig, the Yampa Project Participants which, besides Colorado-Ute, include the Salt River Project, Platte River Power Authority, and Tri-State Generation and Transmission, are constructing two 380 MW units, scheduled for completion in 1978 and 1979, respectively.

I hope I have given you some of the reasons why Colorado-Ute is involved in these large power projects in Northwest Colorado. Our purpose for developing these projects is to provide the most economical source of power for Colorado consumers. This is certainly a case where Colorado's natural resources are used for the benefit of the Colorado consumer.

The location of these large power generating facilities undoubtedly has a large impact upon Northwestern Colorado. The impact, however, is not all bad. In the long run, these projects will more than pay their way in the local areas that they affect. The electric utility industry is very capital-intensive as opposed to being labor-intensive. This is another way of saying that a relatively small number of employees operate some very large and expensive machines. What it means to the local community is that the added population is a relatively small number, while the added assessed valuation for property tax purposes is considerable. As an example, let us look at some Routt County figures: Hayden Unit No. 1 was completed and placed into service in 1965. Hayden Unit 2 is now under construction and will be completed next year. A total of 87 permanent employees will operate and maintain these two units. The 1974 assessed valuation of the Hayden units was already up to $5,645,830 -- over $60,000 per permanent employee. It must be remembered that this assessed valuation was based on the work completed at Hayden Unit No. 2 as of December 31, 1973 -- almost two years ago. Upon completion of Hayden Unit No. 2, we estimate that the total assessed valuation for the Hayden Station will be about $22 million -- or a quarter of a million dollars per employee. The total non-agricultural employment in Routt County in 1974 was 4,970. The total non-agricultural, non-residential valuation amounted to only $31,977,230, including the valuation of the Hayden Station. Thus the total assessed valuation for industrial, commercial establishments, and mining was only $6,434 per employee.

The figures are even more impressive for the Craig Station Units 1 and 2. These units are almost twice the size of the two Hayden Units, yet the number of permanent employees is only slightly higher -- the staffing pattern calls for 120 employees. Because of inflation, the costs of construction at Craig will be substantially higher than at Hayden and so will the assessed valuation. In fact, it is expected that the assessed valuation for Craig Units 1 and 2 will amount to about half a million

dollars per employee. In comparison, the average 1974 non-agricultural employment in Moffat County was 2950. The total non-agricultural, non-residential valuation was less than 17 million dollars, or less than $6000 per employee.

While there can be little question that electric generating plants, when completed, do pay their own way as far as local taxes are concerned, there is an obvious concern over the so-called front-end impact. Property tax revenues start flowing at about the mid-point of the construction phase of the project, but do not reach their full level until the second year after the project is completed. Construction workers create the largest impact at about the mid-point of the construction period. Community facilities such as schools, hospitals, and water and sewer systems must be ready prior to the influx of the population associated with construction. At Hayden, about 700 construction workers are now employed.* At Craig, it is expected that a peak of about 1400 construction workers will be reached in 1977. The impact of these numbers cannot be overlooked. The basic problem is the difference in timing between the impact on public facilities, and the flow of tax revenue.

One approach that is frequently mentioned and often pursued is to insist that industry provide the front-end financing for the necessary community development projects. Requests for direct cash grants are not unusual. The Yampa Project Participants have provided some front-end money to the City of Craig for water and sewer needs. The Yampa Project Participants are constructing Shadow Mountain Village to provide mobile home sites and bachelor quarters for approximately half of the construction workers to be employed at the Craig Station. It is our hope that

*It is interesting to note that even if temporary construction workers are included, the 1974 assessed valuation at Hayden is about the same as the county-wide average of $6,434 per employee.

an acute housing shortage will be substantially relieved by this development, resulting in lower labor costs for the construction of the Project. The need for expansion of the water and sewer systems of the City of Craig could be directly attributed to the need to house construction workers. Accordingly, we were able to justify an expenditure of about $900,000 for this purpose. $324,589 of this amount was in the form of a direct cash grant to the City for sewer main construction and purchase of water pipe. The balance is represented by the construction of off-site water and sewer facilities to connect to the Craig system; and water and sewer tap fees.

This contribution to the City of Craig is all that could justifiably be made and included as part of the Yampa Project costs. I am sure the local officials will confirm Colorado-Ute's reluctance to make further cash grants for local public needs. To fully explain our position in this matter, let me take a few minutes to discuss our own financing problems. Because of the complicated world we live in, especially the necessity to comply with the myriad of environmental laws and regulations, and red tape in general, the lead time for construction of a large power supply project is at least 8 years; in some cases as long as 10 years may be needed. The utility itself must make large front-end expenditures long before getting the project off the ground. Colorado-Ute, being a cooperative and relatively small, has no capital of its own to finance the development of these projects. It borrows 100% of the construction cost of its facilities. It even borrows the interest that it must pay on the amounts advanced on loans during the construction period. Upon completion of the facility, our ultimate consumers are required to pay rates that are sufficient to repay the amount borrowed with interest. Electric rates paid by consumers will also include substantial amounts needed to cover the local property taxes to the jurisdictions within which our facilities are located. Under these

February 27, 1976

Marty:

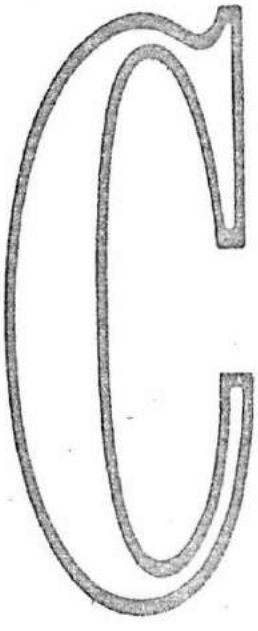
Thanks for the opportunity to review the Energy Development and Conservation Act.

The following are general comments, more detailed notes are attached.

a. The concept is good but it may be opposed by the REA cooperatives who consider themselves rather independent. Its applicability to federally related projects or municipal projects is questionable. It is unlikely the latter will be a problem.

b. Effective implementation will require good funding support. The self-financing concept is attractive but the fee limit of $150,000. is too low. The provision to account for expenditures and to return what is unused will control abuse, so a .5% of the estimated project cost is reasonable for a fee.

c. Consolidation of the application requirements and hearings is good. The review process is not overly lengthy.



d. As counties prefer to use H.B. 1034 as opposed to H.B. 1041, the elimination of the application of H.B. 1041 but the requirement to comply with all other local regulations does not gain much. Requiring complyance with all local regulations may cause problems for the timely development of energy facilities.

e. The potential for citizen's suits is an excellent motivator for effective implementation, though it is seldom used. Those objecting seem to protest too much; there is adequate protection against harassment.

f. The requirement to submit long range plans is excellent and can provide a basis for coordinating energy planning with other planning activities. We have got to begin coordinated anticipatory planning.

Best Wishes: Butch

519 EAST GEORGIA AVENUE • GUNNISON, COLORADO 81230

Notes on proposed Energy Conservation and Development Act

36-30

102 (1) (a) application to transmission facilities is good but will create opposition from the REA cooperatives that are used to being independent.

how or can this be applied to federal projects such as the Colorado River Storage project?

(d) siting and construction will affect the state and localities, but can localities evaluate the implications of the information they receive; and

(2) (a) who is to evaluate the extent of information provided - provision is costly and creates problems for proponents?

(b) good - the determination of mechanisms and funding prior to development forces decision making, integration of decisions, and permits definition of "capacity" in part 102 (2) (c).

(d) sometimes there is no choice or opportunity to achieve diversity in economy.

(e) is "compatable" sufficient to address problems related to trade-offs between use of water for energy production or for agriculture?

102 in general sounds great; to implement what is intended will require tough decisions to be made fast, the gathering and use large amounts of data - much by original research, and personpower.

103 (1) affected "directly or indirectly" is open ended - impacts can be traced for ever; "significant" is a cop-out word but is useful in this case.

(2) "person" is defined elsewhere as corporation, etc.? Ok reference (9).

(5) (b) might be checked in reference to nuclear initiative.

(7) generally the larger the facility the more economical or lower the unit cost of construction and operation within the energy industry; so the sizes seem reasonable to provide that this act covers the major proposals - unless there is a technological breakthrough which permits development of much smaller facilities. The size limits will not discourage development of small facilities related to solid waste treatment or by-product power production.

(7) (a) (II) why the difference in size between coverage for a new facility and expansion of an existing one - 50 million cubic feet and 100 million cubic feet of synthetic gas per day? I don't know whether we have one operating in the state now which is of commercial size. This is to apply to coal-gas production but would also apply to the Monfort of Colorado methane production facility which is proposed to treat feedlot waste.

(c) 115 kilovolts may be too large a size; many are 69 kilovolt systems - reference Electrical Power Plants and Distribution Systems, May 1974, published by the Colorado Land Use Commission as a map.

104 (1) (b) the executive directors are already exofficio members of a number of boards; they will need staff just to sit on the boards and represent them. The boards composed of the executive directors does provide the opportunity for needed coordination, such as between weather modification and energy siting. This coordination is essential.

36-30
201 (3) (e) How does this process relate to the NEPA environmental impact statement process? At some point the projects covered by the act will normally require an EIS for some aspect of the project, if not for the project itself. Early coordination between the proponent and the Board would be very useful and should begin at the time the design for the environmental evaluation of the project is prepared. Ok, 201 (8) answers some of this, but the identification of the problems to be addressed in the EIS is critical to determining its quality and all parties should coordinate on this aspect.

(9) (10) The identification of "potential areas of any permit denial" and local concerns at this point is great. It lets the proponent know what is going to be looked for in his reports. It starts everyone thinking at an early stage while the development plans are still flexable. This is the opportunity to coordinate.

202 (3) A uniform application incorporating the information requirements of all reviewing agencies will greatly reduce "red tape" for proponents and make agencies justify their requirements for information.

(e) Add methods of enhancing positive environmental impact as for example coordinating the project with other projects or controlling the timimg to reduce "boom - bust" cycles.

(4) (a) The fee could be simply .5% as many projects are over $30 million and study fees for assessment are high. The refund provision is very good as is the requirement to account for the expenditure of fees. In local government such fees go to the general fund and the proponent does not receive his money's worth in local review.

203 (1) (c) A representative of the public interest is a good idea if the person would not be assumed to speak for the public but rather to identify and facilitate public input. A very difficult job it is.

(3) The opportunity for agency input and public input is good; this would be a chance to get federal input also.

204 In general the review process is good, particularly the provision for a common hearing, 204 (2) (b), and a hearing in the general locale, 204 (2) (c).

(3) This forces action by the agencies but leaves open the question of what happens when and agency will not issue a permit but the board approves.

(5) (a) This is saying that H.B. 1041 does not apply, but there could be problems satisfying regulations under the H.B. 1034 approach favored by most counties. Local governments could pose a major problem for the timely development of energy facilities if their every regulation is met.

207 This and 212 are related. When agencies are short handed and under funded, other agencies are a useful prod in activating concern for a problem. If the other agencies are told to keep out or not monitor activities over which the inactive have responsibility, the citizen's right to seek mandamus is an essential back-up system. This approach is incorporated into the 1972 Water Quality Act.on the federal level.

Notes on proposed Energy Conservation and Development Act

Last page missing

36-30

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(7) (a) (II) why the difference in size between coverage for a new facility and expansion of an existing one - 50 million cubic feet and 100 million cubic feet of synthetic gas per day? I don't know whether we have one operating in the state now which is of commercial size. This is to apply to coal-gas production but would also apply to the Monfort of Colorado methane production facility which is proposed to treat feedlot waste.

(c) 115 kilovolts may be too large a size; many are 69 kilovolt systems - reference Electrical Power Plants and Distribution Systems, May 1974, published by the Colorado Land Use Commission as a map.

104 (1) (b) the executive directors are already exofficio members of a number of boards; they will need staff just to sit on the boards and represent them. The boards composed of the executive directors does provide the opportunity for needed coordination, such as between weather modification and energy siting. This coordination is essential.

LDO NO. 76 0443/1

Second Regular Session
Fiftieth General Assembly

HOUSE BILL NO.

STATE OF COLORADO

Butch, Let me know what you think. Marty

BY REPRESENTATIVE Hogan

Hi Butch & Judy — Mamie

A BILL FOR AN ACT

ESTABLISHING A STATE ENERGY FACILITY SITING PROGRAM.

Bill Summary

(NOTE: This summary applies to this bill as introduced and does not necessarily reflect any amendments which may be subsequently adopted.)

Enacts the "Energy Development and Conservation Act" to establish a state energy facility siting program. Declares that state energy development and conservation policy requires a full assessment of the impact of a proposed energy facility upon the state and affected local governments. Requires that any person proposing to construct an energy facility obtain a siting permit from the energy facility siting board. Provides for notices, investigations, and reports by the department of natural resources, investigations and comments from local governments, and for public comment concerning the granting or denial of a siting permit. Provides procedures for advance meetings between an applicant and the board and the department and for the receipt of public comment before actual application for a siting permit is made. The granting of a siting permit for the construction and operation of an energy facility may include such conditions as the board deems appropriate. Exempts persons having a permit from having to obtain a development permit from local government to engage in development in an area of state interest or to conduct an activity of state interest.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. Title 36, Colorado Revised Statutes 1973, as amended, is amended BY THE ADDITION OF A NEW ARTICLE to read:

ARTICLE 30

Energy Development and Conservation

Capital letters indicate new material to be added to existing statute.
Dashes through the words indicate deletions from existing statute.

PART 1

GENERAL PROVISIONS

36-30-101. Short title. This article shall be known and may be cited as the "Energy Development and Conservation Act".

36-30-102. Legislative declaration - state energy development and conservation policy. (1) The general assembly finds and declares that:

(a) The siting of major facilities to generate, convert, enrich, and transmit energy is a matter in which the state has responsibility for the health, welfare, and safety of the people of the state and for the protection of the environment of the state;

(b) The prudent use of the state's natural resources to meet energy needs is essential to the general welfare of the people of the state, the maintenance of a productive and diverse economy, the beneficial exchange of goods and services with other states, and the maintenance of a quality of life cherished by the people of the state;

(c) The siting and construction of major energy facilities will have substantial impact upon the use of the state's natural resources, on population concentration, on the ability of the state and local governments to provide necessary public services, and on the overall environmental quality of the state; and

(d) The siting and construction of major energy facilities will have environmental and socioeconomic impacts that will profoundly affect this state. Therefore, the state and local governments shall be vested with the authority to have full

knowledge of the impact and to mitigate its adverse effects.

(2) It is the policy of the state and the intent of the general assembly that:

(a) A full assessment of the impact of a proposed energy facility must be provided by the proponent which shall include all environmental impacts as well as all potential direct and indirect costs to municipalities, counties, and the state which will be likely to result from the proposed facility;

(b) Mechanisms and funds for dealing with all direct and indirect costs resulting from the proposed facility as well as the utilization of the best technology available for commercial application to mitigate adverse environmental impact shall be determined prior to developments;

(c) The pace and magnitude of growth caused by energy resource development shall not exceed the capacity of state and local governments to mitigate and absorb the adverse environmental, economic, and social impacts of such growth;

(d) Economic diversity shall be maintained in the state and in areas affected by energy resource development;

(e) Development of the state's energy resources shall be compatible with other uses of the state's land, air, and water resources, such as food and fiber production and recreation, and with the maintenance of scenery and wildlife habitats;

(f) The cost of growth impacts caused by energy resource development shall not be unfairly borne by local residents and industries;

(g) The state should embark on a comprehensive, long-range

assessment and planning process for the development of energy which recognizes the needs of future generations and the limits to economic growth based on the consumptive use of nonrenewable resources; and

(h) In order to establish and consolidate the state's role and responsibility for conservation and development of energy resources and to ensure that the location, construction, and operation of energy facilities will produce minimal adverse effects on the environment and upon the citizens of this state, no energy facility shall hereafter be constructed in this state without a siting permit acquired pursuant to this article.

36-30-103. Definitions. As used in this article, unless the context otherwise requires:

(1) "Affected local governments" means any unit of local government which would receive physical, environmental, social, economical, or other substantial impact, directly or indirectly, as a result of the locating, constructing, or operation of an energy facility.

(2) "Applicant" means any person who submits an application for certification of an energy facility pursuant to provisions of this article.

(3) "Application" means any request for a permit to locate, construct, and operate an energy facility which is filed in accordance with the procedures established by this article.

(4) "Board" means the energy facility siting board created pursuant to this article.

(5) "Construction" means:

(a) Any on-site clearing of land, excavation, construction, or other action that would affect the physical nature of a site, but does not include:

(I) The installation of environmental monitoring equipment;

(II) A soil or geological investigation;

(III) A topographical survey;

(IV) Any other study or investigation to determine the environmental acceptability or feasibility of the site for a particular energy facility;

(V) Any work to provide access to a site for any of the purposes specified in subparagraphs (I) to (IV) of this paragraph (a).

(b) Any physical preparation for the detonation of any nuclear device for the purpose of developing an energy resource.

(6) "Department" means the department of natural resources.

(7) "Energy facility" means:

(a) Any energy-generating, energy-conversion, or demonstration facility:

(I) Designed for or capable of generating one hundred megawatts of electricity or more or any enlargement or addition of units increasing the capacity of an existing facility by at least one hundred megawatts of electricity;

(II) Designed for or capable of producing fifty million cubic feet of synthetic gas per day or more or any enlargement increasing the capacity of an existing facility by at least one hundred million cubic feet of synthetic gas per day;

(III) Designed for or capable of producing ten thousand

barrels per day or more of synthetic crude processed from shale rock; or

(IV) Designed for or capable of enriching uranium minerals from U_3O_8 (yellow cake) in quantities exceeding five hundred pounds of U_3O_8 per day;

(b) Any in situ gasification or liquification of coal;

(c) Any electric transmission line and appurtenant facilities of a design capacity of more than one hundred fifteen kilovolts;

(d) Any pipeline and associated facilities designed for or capable of transporting gas, coal slurry, or liquid hydrocarbon products from or to any energy facility as such is defined in paragraphs (a) and (b) of this subsection (7), whether or not such energy facility is located within or without this state, and any such pipeline located in more than one county; or

(e) Any nuclear fuel reprocessing plant, waste storage and disposal facility, or nuclear fuel fabricating plant.

(8) "Executive director" means the executive director of the department of natural resources.

(9) "Person" means an individual, corporation, government or governmental subdivision or agency, business trust, estate, trust, partnership, association, or other legal entity.

(10) "Site" means any location upon which an energy facility or associated facilities are constructed or are proposed to be constructed.

(11) "Siting permit" means a permit granted pursuant to the provisions of this article authorizing the site of an energy

facility.

36-30-104. Board created. (1) (a) There is hereby created within the department of natural resources the energy facility siting board which shall exercise its powers, duties, and functions as if transferred to said department by a type 1 transfer. The board shall consist of seven members who shall be appointed in the manner and serve for the terms set forth in this section. The board shall assume its duties July 1, 1976, and all terms of the board members shall commence on that date.

(b) The board shall include the executive directors of the departments of health, agriculture, local affairs, and natural resources. In addition, the governor shall appoint three citizens of the state of Colorado, who shall be confirmed by the senate.

(2) The terms of office for the three members appointed from citizens of the state shall be for four years. Any board member vacancies shall be filled by appointment by the governor with confirmation by the senate for the unexpired term.

(3) The governor shall appoint a chairman from among the members of the board.

36-30-105. Powers and duties of the board. (1) The board shall have the following powers and duties:

(a) To hold hearings upon and adopt rules concerning applications for siting permits to construct energy facilities and the basis upon which the board will ultimately decide to grant or deny said permits;

(b) To grant or deny siting permits for the construction of

energy facilities in accordance with the procedures set forth in this article;

(c) To assist the department in developing policies and rules to effectuate the state energy development and conservation policy set forth in section 36-30-102;

(d) To keep abreast with the most recent technology concerning the locating, constructing, and operating of energy facilities;

(e) To assist the department in enforcing the provisions of this article, the rules promulgated under this article, and any order of the board;

(f) To issue appropriate orders in furtherance of its duties given in this article;

(g) To give its opinion concerning any finding or decision of the board when deemed necessary or proper;

(h) To perform all duties given to it by this article and any necessary acts related to such duties;

(i) To perform such other duties as may lawfully be assigned to it.

36-30-106. Administration - promulgation of rules - delegation of duties. (1) The executive director is authorized to promulgate such rules as are necessary for the administration of this article in accordance with article 4 of title 24, C.R.S. 1973.

(2) The powers and duties of the executive director may be delegated to qualified employees of the department.

PART 2

STATE PERMIT AND REVIEW PROCESS

36-30-201. Preapplication process. (1) All persons proposing to make application for a siting permit for the construction of an energy facility should consult with the board and the department at the earliest possible date. For such consultation the department shall bring together all the appropriate state agencies to discuss the permit process with the developer, and the various state agencies involved shall begin to assemble the required baseline data prior to formal application.

(2) Any person proposing to construct an energy facility is required to file a "notice of intent to apply" with the board at least six months prior to the date of formal application.

(3) The notice of intent shall include:

(a) The location of the proposed site;

(b) A description of the type of facility, including its size, capacity, and estimated cost;

(c) A list of the types of fuels to be used and their intended use;

(d) A development schedule; and

(e) A list of any federal requirements imposed on the facility and any other studies the operator may choose to tender.

(4) Upon receipt of a notice of intent to apply, the department shall immediately distribute such notice to all appropriate state agencies and affected local governments and shall cause to be published one time in a newspaper of general circulation in each affected local government an announcement of

receipt of the notice of intent to apply.

(5) An application fee of five thousand dollars shall accompany the notice of intent to apply. Such fee shall be used for the preapplication process and publication of the notice.

(6) Upon receipt of the notice by appropriate state agencies, the department shall arrange for a meeting of such agencies and the person filing the notice to discuss the nature and extent of the required application.

(7) Within sixty days after receiving the notice, but not before the termination of the meeting required in subsection (6) of this section, all state agencies shall tender comments to the department concerning the proposed application.

(8) After the department receives the state agency comments, the board shall formally meet with the proponent prior to his making application for a permit to determine the extent to which a federal environmental impact statement or other documents prepared by the applicant might suffice for the information required in the application. Wherever it deems such possible, the board is to utilize all reports and environmental impact statements required of the developer in place of original information required by this process. The board shall also determine the amount of the application fee pursuant to section 36-30-202 (4).

(9) The board shall use the formal preapplication meeting to note potential areas of any permit denial by a state agency based on comments from state agencies and may request certain additional information in the application. The board shall have

the responsibility to determine that local residents, locally elected officials, and appropriate regional governments are sufficiently aware of the intent of the proponent to apply for a permit to construct an energy facility.

(10) Members of the public shall be allowed to comment on the proposed energy facility during the formal preapplication meeting between the board and the person filing the notice.

36-30-202. Application for siting permit. (1) No person shall commence the construction of an energy facility without a siting permit obtained from the board.

(2) All applications for a siting permit, together with the required application fee, shall be tendered to the department.

(3) The board shall adopt universal permit application requirements which will meet the requirements of all other state agencies requiring individual permits for the energy facility. The permit application shall include, but not be limited to:

(a) A description of the potential hazards which could affect the health, welfare, and safety of any person of this state and which could result from the construction or operation of the facility;

(b) Potential direct and indirect socioeconomic impacts of the development;

(c) Benefits derived from the construction and operation of the facility;

(d) Alternatives to construction of the facility and alternatives to the selected location of the facility;

(e) Methods of mitigating the adverse environmental,

social, and economic impacts, together with the cost of such mitigation;

(f) A detailed development plan; and

(g) Information concerning the utilization of energy conserving techniques and technology in the construction and operation of the facility.

(4) (a) At the time of filing an application, the applicant shall pay an application fee to be determined by the board based upon the estimated cost of investigating, reviewing, processing, and publishing and posting notices concerning the application. The fee shall be credited to a siting permit reserve account set aside and maintained by the state treasurer and used only for the prompt payment of expenditures incurred by the department for publication of notices and for posting the proposed site, for expenditures incurred by affected local governments for investigations required to be made by the executive director, and for making any refund due the applicant. The maximum fee chargeable shall not exceed one-half of one percent of the estimated construction cost of the energy facility or one hundred fifty thousand dollars, whichever is less. Any unallocated portion of the fee shall be refunded to the applicant.

(b) The board shall determine that portion of the application fee to be allocated to affected local governments to defer the costs to such governments to investigate the application.

(c) The amount of any refund shall be that portion of the application fee not allocated by the department for

investigating, reviewing, processing, and publishing and posting notices of the application or for affected local governments for investigations required to be made.

(d) The executive director shall provide the applicant with a full financial accounting, including, but not limited to, all materials, labor, and overhead costs relating to the expenditures of the fee at the time of the board's final decision.

(e) Any balance of the application fee not expended pursuant to paragraph (a) of this subsection (4) or not allocated or refunded pursuant to paragraph (c) of this subsection (4), shall be transferred to the general fund.

36-30-203. Review of permit. (1) Upon receipt of an application for a siting permit, the department shall:

(a) Transmit a copy of the application to all appropriate state agencies and affected local governments;

(b) Publish notice of receipt of the application one time in a newspaper of general circulation in the county in which the facility is proposed to be located, post similar notice on the site of the energy facility, and utilize any other means of notifying the public that the board deems necessary; and

(c) Appoint a state employee or hire a consultant from the public sector who shall participate in all department staff reviews, hearings, and deliberations on behalf of the public and whose duty it is to see that the public is well informed about the proposed energy facility and to facilitate broad public input.

(2) Within sixty days of receipt of the application, all

state agencies shall report to the department concerning:

(a) The adequacy of the application, including whether sufficient information exists upon which to base a decision; and

(b) Any potential areas of denial of the siting permit or any other permit required of the facility and any variance with state policy.

(3) Within thirty days after the date for receipt of comment from state agencies, the department shall issue a staff report to the board concerning the adequacy of the application, and the board shall hold a public hearing to determine the adequacy of the application, including whether sufficient information exists in the application upon which to base a decision. Such hearing shall include public comment upon the application which shall be accepted by the board.

(4)(a) Within thirty days after the public hearing, the board shall issue a finding with respect to the adequacy of the application.

(b) If the board determines that the application is inadequate or if it deems any other information necessary to review the substance of the application, it shall provide the applicant with specific requests for such information and it shall provide the applicant sufficient time to supply such additional information required.

(c) Within sixty days after receipt of additional information requested by the board, the board shall determine whether the additional information renders the application adequate, and if the board determines that the application is

still inadequate, it shall deny the permit.

36-30-204. Final review and decision of the board. (1) Upon a finding by the board that the application is adequate, all state agencies shall have sixty days to review the substance of the permit application and to report to the department as to whether the construction of the energy facility is consistent with laws and regulations of the state of Colorado. Any agency, board, or commission which has the responsibility to issue a permit for the energy facility shall report as to any possible reasons for denial of such permit.

(2) (a) Within thirty days after receipt of the reports by the department, it shall transmit them to the board, and the board shall conduct a public hearing on the substance of the application.

(b) The hearing shall be a common hearing for all state agencies which are reviewing the siting permit application or are responsible for issuing its own permit for the energy facility.

(c) At least one day of the hearing shall be conducted in the general locale of the proposed energy facility.

(d) Representatives from affected local governments shall be allowed to sit with the board during the hearing and question all witnesses.

(3) Within thirty days after the conclusion of the public hearings, all state agencies shall either modify their original reports on the substance of the application or waive further comment, and all state agencies responsible for issuing a permit for the energy facility shall make their determinations as to

whether the various permits will be issued and notify the board of such determinations.

(4) Within sixty days after the conclusion of the public hearings, the board shall make complete findings upon all issues raised during the review and hearing process and render its decision upon the record, either granting or denying a siting permit based upon the application as filed or granting it upon such terms, conditions, or modifications in construction, operation, or maintenance of the energy facility as the board may deem appropriate.

(5) The board shall not grant a siting permit either as proposed or as modified by the board unless it finds that:

(a) Except as provided in section 36-30-213, all permits and regulations required by local units of government having jurisdiction over the energy facility have been issued or met to the satisfaction of said local governments;

(b) The public utilities commission has issued a certificate of public convenience and necessity to the facility;

(c) The appropriate state air and water quality agencies have certified that the proposed energy facility will not violate state or federally established standards and implementation plans. The judgments of such agencies shall be conclusive on all questions relating to the satisfaction of such state and federal air and water quality standards and plans; and

(d) The applicant has the financial capacity and technical ability to meet all environmental standards and all conditions attached to the permit.

(6) A complete verbatim transcript shall be made of all hearings held pursuant to this section.

(7) A copy of the decision and any opinion issued with the decision shall be served upon the applicant, affected local governments, and appropriate state agencies and made available to the public for the cost of reproduction.

36-30-205. Burden of proof on applicant. The burden of proof as to all issues of fact presented in the application or supplements thereto shall be upon the applicant and must be established by a preponderance of evidence.

36-30-206. Confidentiality of information. Any records, reports, or information obtained by the board shall be available to the public; except that, upon showing satisfactory to the board that any records, reports, information, or particular part thereof, if made public, would divulge methods or processes entitled to protection as trade secrets, the board shall consider such record, report, information, or particular part thereof confidential in accordance with the purposes of section 1905 of title 18 of the United States Code and except that such record, report, information, or particular part thereof may be disclosed to other officers, employees, or authorized representatives of the United States or the state of Colorado who are concerned with the administration of this article or to other appropriate persons when relevant in any proceeding under this article.

36-30-207. Monitoring. The department, utilizing and cooperating with, to the fullest extent possible, the staff and resources of all state agencies, boards, and commissions, shall

have the continuing authority and responsibility for monitoring the operations of all energy facilities which have been granted a siting permit under this article, for assuring compliance with this article and the siting permit issued under this article, and for discovering and preventing noncompliance with this article and the applicable siting permit; except that the department shall not monitor activities over which other state agencies are responsible for issuing and monitoring permits.

36-30-208. Revocation or suspension of permit. (1) A siting permit may be revoked or suspended upon a finding by the board of:

(a) Any false statement knowingly made in the application or in accompanying statements or studies required of the applicant, if a true statement would have warranted the commission's refusal to grant a siting permit;

(b) Failure to comply with the terms or conditions of the siting permit after notice of the failure from the board and reasonable opportunity to correct such failure; or

(c) Any violation of the provisions of this article, any rule promulgated pursuant to this article, or any order of the board.

(2) A revocation or suspension may be issued only after adequate notice of the alleged grounds for the revocation or suspension and a full and fair hearing in which the siting permit holder has an opportunity to confront any witness and respond to any evidence against him and to present rebuttal or mitigating evidence.

36-30-209. Injunctive relief. Whenever the department finds that any provision of this article or any rule or order issued pursuant thereto is being violated or an apparent violation, which in the opinion of the board constitutes an emergency requiring immediate action to protect the public's health, welfare, or safety, is imminent, the department shall request the attorney general to bring, and if so requested it shall be his duty to bring, a suit for a temporary restraining order, preliminary injunction, or permanent injunction to prevent any further violation or imminent violation constituting an emergency. In any such suit the final findings of the department, based upon evidence in the record, shall be prima facie evidence of the facts found therein.

36-30-210. Penalties for violation. (1) It is unlawful for any person:

(a) To commence to construct or operate an energy facility without first obtaining a siting permit as required by this article;

(b) Who has first obtained a siting permit to construct, operate, or maintain an energy facility other than in compliance with the permit; or

(c) To cause any of the acts in paragraphs (a) or (b) of this subsection (1) to occur.

(2) Any person who violates any of the provisions of subsection (1) of this section shall be subject to a civil penalty of not more than ten thousand dollars per day for each day during which such violation occurs. The penalty shall be

recoverable in a civil suit brought by the attorney general on behalf of the state in the second judicial district of Colorado.

36-30-211. Judicial review of board action. Any person affected or aggrieved by the final decision of the board on an application for a siting permit may obtain judicial review in accordance with the provisions of this article and article 4 of title 24, C.R.S. 1973, by the filing of a complaint in the district court where the violation occurs within thirty days after the issuance of such final decision. Upon being served a copy of such complaint, the board shall deliver to the court a copy of the written transcript of the board's final decision and any opinion entered therewith which shall constitute the record on judicial review. Subject to the provisions of section 36-30-206, a copy of such transcript, decision, and opinion shall remain on file with the board and shall be available for public inspection.

36-30-212. State resident may seek mandamus. (1) Any resident of this state with knowledge that a requirement of this article, a rule adopted under this article, or condition of a citing permit issued pursuant to this article is not being enforced by a public officer or employee whose duty it is to enforce such requirement may bring such failure of enforement to the attention of the public officer or employee by a written statement under oath that shall state the specific facts which constitute the failure of enforcement. If the resident knowingly makes a materially false statement or charge in such written statement, he commits perjury in the second degree.

(2) If the public officer or employee neglects or refuses for an unreasonable time after receipt of the written statement to enforce the requirement, rule, or condition of a siting permit, the resident may bring an action in the nature of mandamus in the district court of the second judicial district of this state, in and for the city and county of Denver. If the court finds that a requirement of this article, a rule adopted, or a condition of a siting permit imposed is not being enforced, the court may order the public officer or employee, whose duty it is to enforce such requirement, to perform his duties. If such officer or employee fails to obey such orders, the court shall find the public officer or employee to be in contempt of court and issue such additional orders as may be necessary to require enforcement measures by the department.

36-30-213. Applicability of other laws. Any person who obtains a siting permit pursuant to the provisions of this article shall not be required to obtain a permit from a local government to engage in development in an area of state interest or to conduct an activity of state interest pursuant to the provisions of part 5 of article 65.1 of title 24, C.R.S. 1973.

PART 3

LONG-RANGE ENERGY PLAN

36-30-301. Submission of long-range plans. (1) Any person owning or operating or contemplating the construction or development of any energy facility shall file with the department, not later than January 1, 1977, and on January 1 of each year thereafter, a long-range energy plan for the location,

development, construction, and operation of all energy facilities contemplated by that person.

(2) The long-range energy plan shall include the following:

(a) The general location, size, and type of all energy facilities to be owned or operated by the person, the construction of which is projected to commence during the ensuing ten years;

(b) A detailed explanation of the need for the energy facilities, the reasons for selecting the sites proposed, and a feasibility analysis of all alternative sites considered; and

(c) A description of the person's long-range energy planning process and the efforts made by the person to involve the public and environmental protection and land use planning agencies in this process.

36-30-302. Report on long-range energy plans. (1) The department shall distribute long-range plans to all appropriate state agencies and shall notify all affected local governments of the potential development of an energy facility that may impact their jurisdiction.

(2) The department shall compile a staff report on all long-range energy plans which they have received and submit such, together with comments from state agencies, to the governor and the general assembly by June 1 of every year. The report shall also be available to the public for the cost of reproduction.

SECTION 2. 24-1-124, Colorado Revised Statutes 1973, as amended, is amended BY THE ADDITION OF A NEW SUBSECTION to read:

24-1-124. Department of natural resources - creation -

divisions of. (5) The department of natural resources shall include the energy facility siting board created in section 36-30-104, C.R.S. 1973, and said board shall exercise its powers, duties, and functions as if transferred by a type 1 transfer to the department of natural resources.

SECTION 3. 24-65.1-501 (1), Colorado Revised Statutes 1973, as amended, is amended BY THE ADDITION OF A NEW PARAGRAPH to read:

24-65.1-501. Permit for development in an area of state interest or to conduct an activity of state interest required. (1) (c) The provisions of this part 5 shall not apply to a person granted an energy facility siting permit pursuant to article 30 of title 36, C.R.S. 1973.

SECTION 4. Effective date. This act shall take effect July 1, 1976.

SECTION 5. Safety clause. The general assembly hereby finds, determines, and declares that this act is necessary for the immediate preservation of the public peace, health, and safety.

URBAN BRIEF 2

WHO'S IN CHARGE? 1977

Who are the leaders in developing and activating strategies to deal with the problems of cities? Given the interconnections of urban issues and a new Administration and Congress, that leadership and the arenas for action are still difficult to pinpoint. Here is a reading at the federal level in the early months of the Carter administration and the 95th Congress.

ADMINISTRATION

President Carter, during his campaign, expressed strong support for cities--through jobs, welfare, direct aid to cities, housing, transportation and crime programs coupled with a close working partnership with the nation's cities. During the transition period, he announced urban priorities in three general areas: more precise targeting of federal aid where the need is greatest (i.e. revising allocation formulas for federal aid to help ailing cities), use of public dollars to stimulate private reinvestment, and untangling the red tape that often frustrates intergovernmental operations. Of course, his economic stimulus proposals, announced shortly after he took office, have significant implications for cities--especially public works, public service employment, job training, jobs for youth and countercyclical revenue sharing.

Just who is taking the lead in the new Administration in translating these priorities into action is still unclear. The cast of characters is becoming known but how they will interrelate is another matter.

White House

President Carter's background as a governor, with experience working with both the federal government and local governments, indicates that he is likely to devote personal attention to urban affairs and intergovernmental relations. Three members of his staff appear to have prime responsibilities:

- Stuart E. Eizenstat, presidential assistant for domestic policy, has been assigned to develop legislation related to cities among his other domestic duties. The assignment puts him in a lead position for urban policy development for the Administration.

- Jack H. Watson Jr., Cabinet secretary and coordinator of intergovernmental relations, is (under the latter function) Carter's liaison with the mayors, governors and county officials and troubleshooter for their problems with the federal government.

- Bert Lance, director of the Office of Management and Budget, has the responsibility and staff capability for implementing the various directives for distributing federal funds to state and local governments. Because both Eizenstat and Watson have additional duties besides urban concerns and because of the reduction in the White House staff, Lance and OMB may end up with a strong role in managing intergovernmental matters.

Cabinet

Carter is committed to use his Cabinet secretaries more extensively than recent administrations. In the light of White House staff reductions and Eizenstat's other domestic policy duties, it is likely that more policy development, as well as policy management, will fall to the departments. It will be interesting to watch how Eizenstat and the Cabinet will handle their shared policy-making duties. (In reality, the line between making policy and managing it are often blurred. Management strategies, such as the allocation formulas mentioned below, can determine policy as well.)

The Cabinet department with the most obvious urban responsibilities is the Department of Housing and Urban Development (HUD), although many other departments are clearly involved.

"Targeting" or allocating aid to areas of greatest need, is a key issue at HUD (and at other departments that dispense federal aid to cities). A recent Brookings Institution study sponsored by HUD shows that the present allocation formula for Community Development Block Grants (CDBG), which HUD administers, favors fast-growing towns and cities, which lie mostly in the South and West, at the expense of the older declining cities, located mostly in the northeast quadrant. At issue: a new formula might cut the pie differently and alleviate both the fiscal burdens of older declining central cities and the growing pains of burgeoning communities.

HUD has proposed adding a factor of age of housing to the formula, in order to direct more funds to cities with old and deteriorating housing. The proposal is tied to a request for a three-year extension of the CDBG program, progressing from $4 billion to $4.15 to $4.30 annually. Secretary Patricia Harris, who has already identified herself as a friend of the cities, also proposes a $400 million-a-year action fund to be used for dealing with the most critical urban problems on a flexible emergency basis.

Other key HUD appointees (subject to confirmation) include Robert E. Embry Jr., Baltimore's former housing and community development commissioner as assistant secretary for community planning and development; Donna Shalala, former professor at Teachers College at Columbia University and treasurer of Municipal Assistance Corporation as assistant secretary for policy development and research; Geno Baroni, from the presidency of National Center of Urban Ethnic Affairs to the new post of assistant secretary of neighborhood development, consumer affairs and regulatory functions.

All the other domestic departments and many independent agencies bear watching. Of special interest:

- Commerce, particularly the Economic Development Administration (EDA), where targeting is also a key issue. EDA has been under attack by large-city mayors for an apparent rural-suburban bias in allocating anti-recession public works funds. In a number

of cases, small communities with relatively low unemployment got more than large cities with high unemployment. Secretary Juanita M. Kreps has pledged that large cities and other high unemployment areas will fare better in the next distribution of funds and that Commerce will use its influence to stimulate private reinvestment in depressed cities.

•Treasury, where an urban development bank (Urbank) is under consideration to provide low-interest federal loans to cities and businesses willing to locate in them. Plans for it are high on the agenda of Secretary W. Michael Blumenthal's new urban office.

•Health, Education and Welfare, where Secretary Joseph Califano is chairing an intergovernmental task force on welfare reform. If that reform meant assumption of a larger share of welfare payments by the federal government, this change would have strong implications for cities and states. Almost the entire panoply of HEW programs are significant to cities because of the urban concentration of health, educational and welfare problems. (Another significant development: the large cities are now discovering what many others have already discovered--that federal aid to schools is dependent on HEW's assessment of nondiscrimination practices. New York City faces possible loss of $200 million for alleged discrimination.)

•Transportation,with its responsibility for the Urban Mass Transit Administration

•Labor, which manages manpower training and other stimuli to reduce unemployment, which is greatest in the older, declining cities. Jobs are basic to the long-term recovery prospects for cities.

•Defense, whose decisions about locating installations can add or subtract jobs in the surrounding area. Northeastern cities are particularly concerned.

Independent federal agencies significant to urban problems include those dealing with small business, environmental protection, banking and mortgage practices, energy (which, subject to Congress' reaction to Carter's reorganization plans, may move to departmental status) and others.

CONGRESS

Urban overtones could be detected in the early weeks of the 95th Congress: reorganization of Senate committees, shifting some of the functional areas that relate to the cities...a new House Subcommittee on Citis, with a mandate to look at (although not act upon) urban problems as a whole rather than in their segmented legislative parts...introduction of bills, discussed below, designed to spotlight the importance of neighborhood vitality.

Senate

Sen. William Proxmire (D-Wis), chairman of the Committee on Banking, Housing and Urban Affairs, has introduced three city-oriented bills early in the session--one to establish a National Commission on Neighborhoods to study and make recommendations to strengthen neighborhoods (National Neighborhood Policy Act, S.417), to encourage neighborhood preservation (Neighborhood Preservation Act of 1977, S.411) and to encourage financial institutions to meet credit needs of their communities (Community Reinvestment Act of 1977, S.406)

Under reorganization, many urban-oriented responsibilities are grouped under this committee, including urban development, public and private housing, urban mass transit, financial aid to commerce and industry, monetary policy, money and credit.

While reorganization increased this committee's scope over urban affairs, it also underscored the reality that the problems of cities are so varied and interrelated that it is almost impossible to lump them for assignment to one committee. Other relevant committees and functions include:

•Environment and Public Works (solid waste, air, water and noise pollution, improvement of rivers and harbors, public works, bridges and dams and regional economic development.)

•Finance (general revenue sharing)

•Governmental Affairs (intergovernmental relations)

•Human Resources (education, labor, health, public welfare, vocational education and the study of income maintenance.)

•Agriculture (food stamps)

•Energy and Natural Resources to the extent that it is concerned with location of energy installations.

•Armed Services to the extent that it is concerned with the location of military installations.

House of Representatives

Rep. Henry S. Reuss (D-Wis.), chairman of the Banking Currency and Urban Affairs Committee, has formed and staffed a new non-legislative subcommittee on the city. Reuss, who conducted two weeks of hearings in September 1976 on the "Rebirth of the American Cities," is chairing the subcommittee himself. He has outlined these policy considerations he believes must be addressed:

1. Jobs: to bring jobs to the people in the cities; to take the people to where the jobs are; and interim public service jobs.

2. Restructure federal aids to cities: assume welfare benefits; equalize the transfer of funds; revise formulas for grants in aid.

3. Conservation of neighborhoods, land and energy.

4. Equalize tax burdens among area jurisdictions.

His subcommittee will be conducting hearings on the experience of foreign cities, on the distribution of federal grant-in-aid funds to cities, and on energy and land use as they affect cities.

Other items on the subcommittee's agenda--whether by hearings, studies or other means: neighborhood revitalization, impact of federal programs on cities, economic decline of central cities, streamlining operations of state, regional and local governments. Special projects planned are an analysis of the federal budget, tracking the flow of federal funds to cities, and publication of a set of urban indicators designed to reflect the well-being (or lack thereof) of cities.

As new people, with new promises and hopes, and new ways to deal with urban problems begin to fall into place, urban buffs around the country will want to monitor both ends of Pennsylvania Avenue to see what kind of impacts federal policies and programs (existing and proposed) will have for the future of cities.

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INFORMATION SHEET

INTERMOUNTAIN POWER PROJECT

Project and location: 3000-megawatt coal-fired power plant approx. 10 miles east of Capitol Reef National Park, Utah, on 7½ sections (4640 acres).

Project participants: Intermountain Consumers Power Assoc. (Utah & Nevada), 15%; Anaheim, 15%; Burbank, 2½%; Glendale, 2½%; Los Angeles, 50%; Pasadena, 5%; Riverside, 10%.

Studies: fifth of five volumes of "Preliminary Engineering and Feasibility Study" to be completed by L.A. Dept. of Water & Power and Westinghouse Environmental Systems Division in late May 1977. Draft EIR to be completed by LADWP & WESD in spring of 1977. Draft EIS to be done by BLM and included in USGS's Central Utah Regional Coal Development EIS in Jan., 1978 (final EIS in June, 1978).

Water requirements: 50,000 acre-feet per year from Fremont River and deep wells in sandstone aquifer. ICPA has agreement with Wayne County for minimum of 25,000 AF per year of Fremont River Water. Application has been made to Utah State Engineer for 250,000 AF groundwater per ten-year period. An earthen or earthen and concrete dam would divert water to a 50,000-AF reservoir. One reservoir site under study would require relocation of 4 miles of Highway U-24.

Transmission systems: would require approx. 1040 miles of new transmission lines in Southern California and 453 miles of new lines in Utah. Land requirements for So. Cal. lines rights-of-way alone would be approx. 24,500 acres. New converter stations would be constructed and some transmission lines rebuilt.

Air pollution control: IPP expects 90% sulfur dioxide removal and 99.75% particulate removal, using "best practicable control technology" and supplementary control systems. IPP claims Class II standards would never be exceeded; Class I in Capitol Reef would be exceeded no more than 50 hours per year with SO_2, and never exceeded with NO_x or particulates.

Coal: 10 million tons per year to come from underground mines in southern portions of Emery and Wasatch fields. 63.4 miles of new railroad track required, plus a diesel-electric railroad with two unit trains of 84 cars each to run 2 trips per day, 5 days per week. (Using 2.38 gallons diesel fuel per 1000 net ton mile.)

Employment needs and population impact:

Coal system related: 2000 mine operation workers plus transportation system construction force of 430 people and operating force of 60. Population of Emery Co. (present pop. 6700) would increase by 7300. Pop. of Sevier and Sanpete Counties (present combined pop. 26,300) would increase by 8800. Emery Co. would need 2100 new housing units, 2 new elementary schools, one new junior-senior high school. The 7300 new residents would need 1.7 million gal. water per day & would produce 0.73 million gal. sewage and 36,500 lb. solid waste per day.

Plant-related: Increased population of Wayne Co. (present pop. 1600) would be 10,800. (After project completion, pop. increase would drop to 3800.) The 10,800 would require 3200 housing units, 90% of them trailers; would require 2.58 million ga. water/day; would produce 1.1 million gal./day waste flow and 56,000 lb./day solid waste. 3100 new students would need 3 new elementary schools, one new jr. high, and one new high school. A new town is expected, occupying 1000 acres of land & taking 85% of the new population.

(Information from IPP feasibility study.) 19 May 1977

$2.5 billion power complex planned in N. M.

ALBUQUERQUE (AP) — A $2.5 billion coal-fired power generating complex is planned for construction by the 1990s in northwest New Mexico by three utilities providing electricity to New Mexico.

Public Service Co. of New Mexico, El Paso Electric Co. and Plains Electric Generation and Transmission Cooperative announced their proposal Monday.

"This plan follows a three-year study by the utilities of their future generation needs, fuel options, sites and economics of the land and water development potential for constructing generating facilities in New Mexico," the utilities said in a news release.

Pending state and federal approvals, the first unit is expected to be brought into commercial service in the 1983-1985 time period, the utilities said. The others are tentatively scheduled for service in 1987, 1989, 1990 and 1991.

The utilities said New Mexico "will continue to experience gains in population which are now running twice the national average. This influx of residents as well as the increased mining and energy related industrial development is the primary reason for the new facility.

The utilities said both coal-fired and nuclear possibilities were considered for the generators, "but the decision to use coal appeared to be the most prudent choice at this time. The nuclear option is being reserved for the future."

The 500 megawatt coal-fired generators, to be built about 25 miles south of Farmington, "are designed with the latest in environmental control systems and represent considerable improvement over the technology used at the time the older coal-fired Four Corners power plant was built," the utilties said.

"Some of the environmental control systems planned for the project include hot side electrostatic precipitators of the same general design as those now in operatiion at the San Juan generating station," the companies said. "These devices, by applying an electric charge to ash particles just as the hot combustion gas leaves the boiler, collect over 99.3 per cent of this ash."

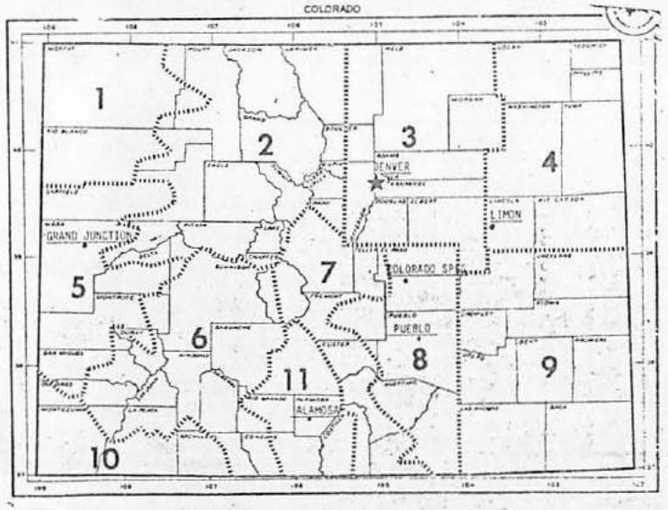
Sulfur dioxide removal systems are designed to meet or exceed New Mexico's regulations governing emissions and the equipment will also remove a portion of the ash which is not collected by the precipitators, the utilities said.

"Water used at the plant will be treated in a variety of ways, and no discharge will be necessary. Water will be recycled through the plant over and over until lost through natural evaporation," the companies said.

They also said the "most up-to-date methods of surface mining will be employed in providing fuel for the plant. This includes reclamation work proven successful at the San Juan mine."

Public Service Co. said it presently serves about half of New Mexico's residents through divisions in Albuquerque, Santa Fe, Las Vegas, Deming, Belen and Bernalillo. El Paso Electric serves customers in southern New Mexico, primarily in the Las Cruces area. Plains Electric serves rural customers primarily in the western two thirds of the state through 11 of the state's 17 electric cooperatives.

State Zone Weather Forecast



Zones 3, 4 — Cloudy and cool with periods of rain or drizzle likely through Wednesday. Rain mixed with snow at times mainly nights and mornings. Possible thunderstorms afternoons and evenings. Highs today and Wednesday 40s and lower 50s. Lows tonight 25 to 35. Winds variable 5 to 15 mph today and tonight. Precipitation probability 80 per cent today, 70 per cent tonight, 60 per cent Wednesday.

Zones 6, 7 — Variable cloudiness and cool with rain or snow likely through Wednesday. Fossible thunderstorms mainly afternoons and evenings. Highs today and Wednesday 40s and lower 50s. Lows tonight mostly 20s. Winds southwest to west 10 to 25 mph today and tonight. Precipitation probability 60 per cent today and tonight, 50 per cent Wednesday.

ity 70 per cent today and tonight, 60 per cent Wednesday.

House panel OKs strip mining bill

By JOHN LENGEL
Associated Press Writer

WASHINGTON (AP) — The House Interior Committee tentatively approved on Monday a strip-mining control bill seen as the equal of proposls vetoed by former president Gerald Ford.

—Set standards for restoring the mined land.

—Require all mining companies to submit a comprehensive mining plan before receiving a permit.

—Allow states to enforce the federal standards through their

The Washington Merry-Go-Round

By JACK ANDERSON
with Les Whitten

WASHINGTON—Tongsun Park, the Korean-about-town who passed out financial favors to Washington bigwigs, has no intention of returning to face bribery charges in the United States. The Justice Dept. considered his testimony crucial to making a case against congressmen on the take.

Another major witness in the Korean bribery scandal, Korean Embassy defector Kim Sang Keun, has been unable to give direct testimony about payoffs to congressmen.

These two developments, according to sources familiar with the investigation, probably will doom the dept.'s efforts to convict a single congressmen of bribery.

We called attention to Park's operations as far back as April 1, 1974. By July 17, 1975, we were able to report for the first time that the Justice Dept. was investigating charges that the Koreans had tried to buy off congressmen.

Now we have had access to some of Park's papers, which were saved from the shredder. He has told associates categorically that he won't come back to the United States. The papers strongly indicate he has transplanted his base to London.

Payroll information, financial details and policy questions have been forwarded from his Washington headquarters to "Mr. T. S. Park, 44 Green Street, London, WIY3FJ, United Kingdom." The papers also contain references to a staff member in London.

The Korean entrepreneur, organized by Rep. Edward Beard, D.-R.I., a former painter, boasts that its 11 members were erstwhile pipefitters, glass workers, bartenders, longshoremen and boxers.

Actually, only three members came to Congress direct from their blue-collar jobs. Rep. Paul Simon, D.-Ill., claims credentials as a printer. Yet at age 19, he purchased his own newspaper and became publisher of a large chain of Illinois weeklies.

Rep. Dale Kildee, D.-Mich., lists his credentials as an electrician. All he did, it turns out, was help install lights in a Michigan foundry for about a month in 1967.

Rep. John Dent, D.-Pa., was a rubber worker in his early years. But he has spent the last 40 years as a legislator and executive in various coal, building and transportation companies.

And Rep. Gus Yatron, D.-Pa., a former heavyweight boxer, spent years as a successful businessman before coming to Washington.

Berry

"Genetic re
scientists a
nothing but

ALLEY OOP

Montana Daily Press
March 16, 1977
Page 5

at Columbine Junior High for the month of
back, Marshall Bowen, Patti Plumer, and
Stacie Looper, Barbara Wilson, and Bryan
son of Mr. and Mrs. Ray Bowen. "He is a
Junior Honor Society and the house of
spokesman said. "He participates in
has won several awards and is also the
ademic awards. He is well liked by all his
tudents for his sense of humor and sense of
okesman said. Miss Plumer, the daughter
Plumer, "is one of the most outstanding
Columbine. She is active in sports, and has
ecords in track. She is a cheerleader, vice
Junior Honor Society, a member of mini-
f representatives, and was team captain of
recent Knowledge Bowl. She is a state
Teenage America pageant, and has been
st Club and Lions Club, just to name a few of
," the spokesman said. Finnegan is the son
k Finnegan. "He is manager of the Colum-
forms this task extremely well," the
is the winner of several speech meets and
ptimist Club. He is an active committee
is to complete a job he starts. An honor roll
the house of representatives and vice-
b, David feels he is doing his share to make
ive, great, school." Miss Looper is a
ine and is the daughter of Mrs. Jan Looper.
ecome very involved in many activities, in-
, and gymnastics. She is an honor roll stu-
dge Bowl participant. Her friendliness and
many friends," the spokesman said. Miss
r. and Mrs. Wayne Wilson, "is an honor roll
e House of Representatives, and very ac-
several first place ribbons in track last spr-
basketball player. She sings in her church
her church activities. She is very helpful to
w students," the spokesman said. Hawks,
hn Hawks, "enjoys all sports. He has been
tball, basketball, track and rodeoing, win-
He has been in 4-H for five years, vice-
rs, and is now 4-H councilor. He is proud to
ine and always does his best to accomplish
," the spokesman said. (Columbine J.H.S.

Huge gasification plant pla

By BILL DENSMORE
Associated Press Writer

CHICAGO (AP) — Two of the nation's largest utilities, citing a projected doubling in the price of natural gas by 1981, have agreed to build the first half of a $1.2 billion coal gasification plant in a small North Dakota town.

Spokesmen for subsidiaries of Peoples Gas Co. in Chicago and Michigan Consolidated Gas Co. in Detroit said late Tuesday the plant is one of a handful of commercially feasible projects on the drawing boards in the United States to extract methane gas from coal.

The project would produce 137.5 million cubic feet per day of methane gas suitable for home use, a Peoples' Gas spokesman said—enough gas to meet about one-seventh of Chicago's gas needs in mild weather.

Gas extracted from the coal would be used mainly in Illinois, Indiana, Iowa, Michigan and Wisconsin, the utilities said.

The preliminary pact between the two firms calls for first-phase construction totaling $600 million. Each firm would chip in $75 million in capital and seek federal loan guarantees for the other $450 million.

"By the early 1980s we expect that the price of gas is going to double," and it may triple by the mid-1980s, said Robert W. Lindgren, a vice president of energy resources at the Chicago-based Natural Gas Pipeline Co.

The current wholesale price of natural gas from operating southwestern U.S. fields averages about $1.44 per 1,000 cubic feet, Lindgren said.

But supplies from existing sources are dwindling, and the two utilities said they expect to market gas extracted from the North Dakota soft coal at $4 to $5 per 1,000 cubic feet in the early 1980s.

"The traditional sources will be unable to meet the mand," Lindgren said, "and if we don't bring in less conventional sources, then the amount of gas we're going to have available to sell is going to decrease."

The technology to take methane gas from coal is not particularly complex and has been around for some time. But it has not been a serious option for utilities as long as natural gas could be pumped from underground fields at a fraction the cost.

Lindgren's company and the American Natural Resources Co., of Detroit, say they will build the huge plant for extracting the coal in Beulah, N.D., a town of 1,344 persons in the west-central part of the state 75 miles west of Bismark.

It would be in the middle of one of the nation's largest deposits of lignite, or soft coal, that can be strip-mined easily.

To get the gas, the plant will consist of several airtight vessels 50 feet high and 14 feet in diameter. Inside, the coal will be placed under high pressure, and water at high temperatures pumped in.

The addition of the water and pressure—and transfer to separate containers where additional chemical changes occur—yields tar, plus methane, sulfur, ammonia and other gases, project spokesmen said. He said flyash—a solid residue—will be placed in the open pit where the coal was mined to be buried during reclamation of the scarred land.

PSC withdraws rate hike request

DENVER (AP) — Public Service Co. of Colorado has withdrawn its request for a $25 million increase in electric rates, but said it would seek increases in both gas and electric rates in the near future.

The combined gas-electric increases would be more than $25 million, a company spokesman said Tuesday, but the exact amount has not been determined.

Public Service filed its request for the $25 million electric rate increase with the state Public Utilities Commission on Feb. 17. The increase, 8.8 per cent, would have added $1.50 a month to the bill of about $16 now paid by the average household user, the company said.

The PUC last week suspended the rate increase request and said it would schedule public hearings on it. Such hearings would probably have produced substantial consumer opposition and could have delayed implementation of the rate increase until October.

Public Service's president, R. F. Walker, said Tuesday the company's Feb. 17 request "clearly established the need for immediate rate relief based on criteria already established by the commission."

He said the company "is clearly disappointed that the PUC didn't recognize the company's need for immediate rate relief."

Public Service will file new requests for gas as well as electric rate increases as soon as complete data necessary to support the rate request are available, Walker said.

Public Service serves about three-quarters of the state and is Colorado's largest public utility.

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Fast Ship

The oceanliner The United States, which set the Atlantic crossing record in 1952, was the fastest ever placed in service. The ship frequently cruised faster than 36 knots. Designed for conversion to a troopship, the 817-foot vessel could steam at 40 knots, or 48 land miles an hour. Removed from service in 1970, the ship is berthed at Norfolk.

Between 1932 and 1935 Paraguay and Bolivia fought a war over a desolate plain called the Chaco. Paraguay won the war and the major part of the Chaco.

A leopon is a cross between a leopard and a lion. The world's first leopons were born in Tokyo's Hanshin Park Zoo.

The country of Malta is made up of three islands, Malta, Gozo and Comino, and two islets. The total area of this Mediterranean nation is 122 square miles.

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ce page 7

The Intermountain Power Project — 10 miles from Capitol Reef

Coal plant planners eye Southern Utah

by Ruth Frear

In the wake of Kaiparowits, another 3,000-megawatt, coal-fired power plant is planned for the canyon country of Southern Utah. It's the Intermountain Power Project (IPP), to be located 10 miles east of Capitol Reef National Park.

A Kaiparowits-sized controversy is arising to meet the power plant proposal. Project proponents claim that they are doing things right, that IPP would not be another dirty smokestack. Opponents contend that the fragile Southern Utah parks country and small Utah towns cannot stand the impacts of such massive industrialization.

The project would bring 11,000 people to Wayne County (pop. 1,600) and use 10 million tons of Utah coal and 50,000 acre-feet of water per year. The project package also includes a dam and reservoir, roads, railroad tracks, a power plant and buildings, a new town, and transmission lines to deliver electricity to Southern California, Utah, and Nevada.

The Intermountain Power Project began with the Intermountain Consumers Power Association, a consortium of Utah and Nevada municipal electric cooperatives and Rural Electrification Administration cooperatives, formed in 1957. In 1970 ICPA officials discussed power supply possibilities with representatives of the Kaiparowits and Huntington projects, but were unable to reach agreements. Deciding to produce their own power, ICPA in 1971 filed applications for water from the Escalante and Fremont rivers. Consortium officials met with California utilities in 1973, and in 1974 the Intermountain Power Project was initiated as a non-profit corporation.

According to Joseph Fackrell, IPP president and executive director of ICPA, "In order for it to be economical to get the transmission to California, we have to build a big plant."

IPP has proposed a plant bigger than any now in the country — 3,000 megawatts. Fifteen per cent of the power will go to Nevada and Utah and 85% to six Southern California cities.

Why a power plant 10 miles from a national park? IPP studied several possible locations. "The best, most economical site was the Escalante (River)," Fackrell says. "But because of our open planning process, and because of the guidance you (environmentalists) gave us, the first thing we did was to move out of Escalante. It cost us several million dollars to do that. We counted environmental concerns highest."

The only water available to IPP, outside of the Escalante, was in Wayne County. We looked at five sites in Wayne County," Fackrell says. "In balance, Salt Wash was the best location.

"You can't make a power plant look good, so we decided to put it out of sight, where it wouldn't do environmental damage." Nevertheless, the Salt Wash site, northwest of North Caineville Mesa, would be visible to hikers from such places as Cathedral Valley, Boulder Mountain, Thousand Lake Mountain, and the Henry Mountains.

Water for the project is to come from the Fremont River, which flows through Capitol Reef, and from 20 deep wells drilled into an underground aquifer just east of the park boundary.

FREMONT WATER

Hank Hassell, an environmentalist from Southern Utah, says, "The people of Utah don't have near the amount of water they thought," he says. "And there's no surplus in the Fremont. IPP has bought the winter runoff, and in a dry year the people in Wayne County won't get any water."

Hassell, a native of Utah and the son of an agricultural extension agent, fears for

(continued on page 4)

The Environmental Bi-Weekly

h Country News

Friday, May 6, 1977 Lander, Wyoming

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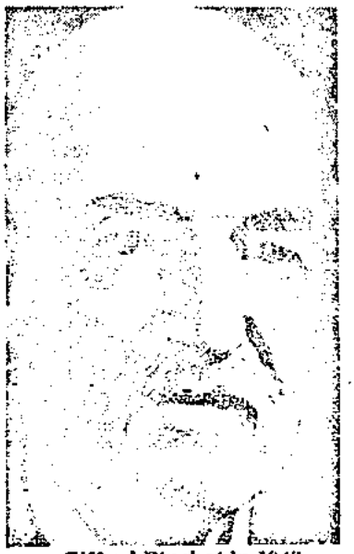
l the word "con-
use, those who

thought at all about the environment thought about trees — and the nation's new forester had a mania for contemplating trees in terms of perpetual cash flow. On the one hand, settlers, miners, and lumbermen, mostly in the West where the reserves were, cried socialism whenever the government curbed their exploitation of federal lands — exploitation which the country's forester saw as, "...the murder of our future prosperity. . . ." On the other, Pinchot despaired at concerned citizens such as John Muir; they wanted nature preserved intact as national parks. To them, foresters were technocrats bent on meddling with God's creation.

Seventy-five years later, the differences between preservationists and use-oriented conservationists still trouble the environmental movement. Pinchot, like many today, could understand greed; he couldn't understand the Muirs of the world. Pinchot's biography summarizes a stroll in the Grand Canyon with the founder of the Sierra Club: "And when we came across a tarantula, he wouldn't let me kill it. He said it had as much right there as we did," the utilitarian official said with wonder. The Forestry Division's first job, then, carried out with speeches and pamphleteering, was to convince the public that scientifically managed forests would be in the nation's long-term best interests.

To help, Pinchot organized the Society of American Foresters, whose influential members gathered in the bachelor's home to plan the future of conservation while munching on gingerbread, baked apples, and milk served by his mother. In support of its most famous member, the family contributed $150,000 to establish a forestry school at Yale — a school that would turn out a steady stream of Forest Service chiefs. In contrast to Fernow's sleepy agency, the division now sent out teams to demonstrate the advantages of applying scientific methods to private woodlands.

It was a crusade of bigger and better.



Gifford Pinchot in 1945
U.S. Forest Service photo

With the combination of aroused public awareness and Pinchot politicking, the division was upgraded to the Bureau of Forestry within the Department of Agriculture. In the meantime, the staff grew from 11 to 179 by 1901.

One large bone stuck in Pinchot's craw: he had the foresters but no forests. The federal reserves remained with the General Land Office of the Department of Interior, an agency with a poor record of public stewardship. Pushing for transfer to his control, the forester plunged into enemy territory. He lobbied among the sheepmen, the cattle barons, and the powerful Western Congressmen, striving to convince them that they would benefit from management of the federal lands they used.

What he said made a good deal of sense. Much of the West was a chaotic treasure house just broken open. Feuds were common, shootings not unusual, as men competed for resources. Viewing the clouds of

(continued on page 15)

IPP plant . . .

(continued from page 1)

the future of Wayne County farmers. "Those people really work together. They have a wonderful irrigation system — just sprinklers — and they don't waste a drop. With IPP and the reservoir, everything would be changed."

AIR QUESTIONS

The IPP Board in April 1976 passed a resolution which stated in part that "IPP is an economically and environmentally sound project, having selected a site such that prevailing winds would direct any emissions away from scenic and recreational areas."

Utah conservationists aren't reassured by that statement. If it is true, they believe it means that most pollution will be blown away from Capitol Reef and towards such scenic and recreational areas as the San Rafael Swell, Goblin Valley, the Henry Mountains, and Arches and Canyonlands National Parks.

Project participants expect 90% sulfur dioxide removal and 99.75% particulate removal, using "best practicable control technology" and supplementary control systems.

"Two years ago, you didn't have to put on

"We fear fiscal, social, and environmental impacts we cannot, of ourselves, face."

—South Eastern Utah Economic Development District

90% scrubbers and 99.8% precipitators," Fackrell says. "But we decided to go with what we thought would be best available. We've honestly tried to do what's right and reasonable and fair. But how do you convince people you're trying to do something different when they've seen so much bad?"

Fackrell claims there would be less deterioration from IPP than from the smaller Navajo plant near Page, Ariz. "Even though we'll have four units, we're only

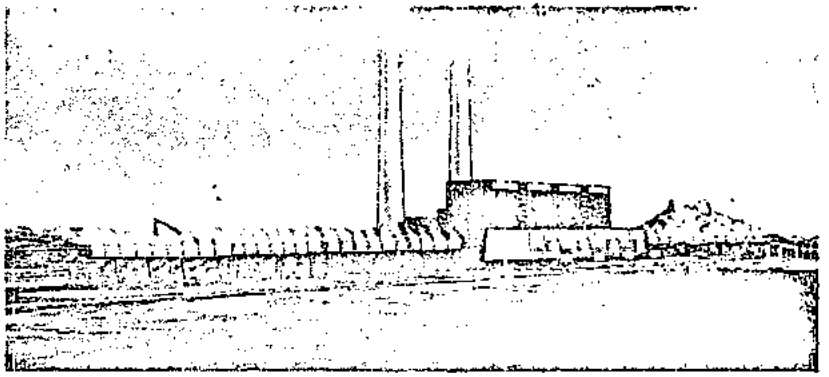
JOSEPH FACKRELL, president of Intermountain Power Project, switched the proposed power plant site from the Escalante River to the Fremont River in response to environmentalists' advice, he says.
Photo courtesy of IPP

impacts of the Huntington and Emery power plants, the newcomers would need 2,100 housing units, two new elementary schools, and one new junior-senior high school.

The power plant would also bring large numbers of people into the area. The estimated 11,000 newcomers to Wayne County generated by it would require 3,200 housing units, 90% of them trailers, according to IPP figures.

The increased population would need a water supply of 2.58 million gallons per day and produce 1.1 million gallons per day of liquid wastes and 2.58 million gallons per day of solid wastes. The 3,100 new students would need up to three new elementary schools, one new junior high, and one new high school. A new town is expected, occupying 1,000 acres of land and absorbing 85% of the new population.

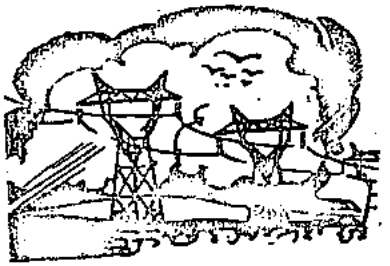
"I talked to folks in Wayne County last summer," says Hassell, "and they don't realize what's going to happen to their communities. There will be 11,000 new people at the peak of construction, but then most of them will move out, leaving Wayne County high and dry. There will be wall-to-wall trailer houses, and the social and



INTERMOUNTAIN POWER PROJECT. The IPP coal-fired plant would be the largest of its kind in the country, producing 3,000 megawatts of electrical power. The proposed site is about 10 miles from Capitol Reef National Park.
Drawing courtesy of IPP

was attributed to economic difficulties rather than directly to environmental opposition, however.

But environmentalists aren't the only ones worried about IPP. An association of local governmentsof Carbon, Emery, and



Grand Counties — the South Eastern Utah Economic Development District (SEUDD) — have told IPP officials: "We fear fiscal, social, and environmental impacts we cannot, of ourselves, face."

With none of the plant's tax revenues going to Carbon or Emery Counties, the district feels these counties cannot afford the huge population increase. SEUEDD executive William Dinehart says that the people already in this area would be subsidizing the project. It would take local money to build the roads, schools, and water treatment plants needed to handle the population surge.

THE SCHEDULE

Already complete is a five-volume "Preliminary Engineering and Feasibility Study" by the Los Angeles Department of Water and Power. In process is a Draft En-

any major financial commitments until the federal EIS is done and we have a decision from Interior." And, until California requirements are met, the Los Angeles municipal utilities are legally prohibited from making any commitments beyond those for feasibility studies.

Ruth Frear is a librarian at Marriott Library at the University of Utah and a well-known conservationist. She is also a free lance writer and photographer, devoting her efforts to preserving Utah's wild and scenic areas from destruction and industrialization. She is the Southwest Regional Vice-President of the Sierra Club and Legal Coordinator for the Utah Chapter. She has been a leader in efforts to stop the Kaiparowits Power Project and to preserve the Escalante Canyon Country as wilderness.

99% scrubbers and 99.5% precipitators," Fackrell says. "But we decided to go with what we thought would be best available. We've honestly tried to do what's right and reasonable and fair. But how do you convince people you're trying to do something different when they've seen so much bad?"

Fackrell claims there would be less deterioration from IPP than from the smaller Navajo plant near Page, Ariz. "Even though we'll have four units, we're only using two stacks, so there will be better plume rise and dispersion. There would be few days when you'd be able to see anything at all."

Environmentalists are concerned about [illegible]

[illegible] Attorney, IPP Project Engineer, stated that "the [illegible] listic standards of the proposed (Clean Air) legislation would prevent construction of the Intermountain Power Project because of its proximity to Capitol Reef."

According to Fackrell, the plant could meet Class I standards in the park "except for about 30 hours a year with sulfur dioxide. We wouldn't exceed Class I with particulates [illegible]

[illegible] at all of the air quality in that country would be tragic."

TRANSPORTATION, SOCIAL IMPACTS

Coal for the project is expected to come from underground mines in the Wasatch and Emery fields and will be shipped 50 to 65 miles by rail to the power plant.

Mining and shipping the necessary 10 million tons of coal per year would boost the population in Emery County (pop. 6,700) by approximately 7,300 and in Sevier and Sanpete Counties (combined pop. 20,000) by 8,000. In Emery County alone, which is already staggering from the [illegible] these would need [illegible] elementary schools, one new junior high [illegible] new high school. A new town [illegible] occupying 1,000 acres of land and absorbing 85% of the new population.

"I talked to folks in Wayne County last summer," says Hassell, "and they don't realize what's going to happen to their communities. There will be 11,000 new people at the peak of construction, but then most of them will move out, leaving Wayne County high and dry. There will be wall-to-wall trailer houses, and the social and agricultural costs will be staggering. You can't mitigate those impacts, you can't plan for them."

Hassell grew up in Price, Utah, just north of the Huntington power plant site, and [illegible] the changes [illegible] [illegible] like a shot."

LEGAL ACTION

The Sierra Club Legal Defense Fund and the Center for Law in the Public Interest are investigating possible legal action against the Intermountain Power Project. The two groups worked together against the Kaiparowits power project. Its downfall [illegible] the huge population increase. [illegible] executive William Dinehart says that the people already in this area would be subsidizing the project. It would take local money to build the roads, schools, and water treatment plants needed to handle the population surge.

THE SCHEDULE

Already complete is a five-volume "Preliminary Engineering and Feasibility Study" by the Los Angeles Department of Water and Power. In process is a Draft Environmental Impact Report, required by the California Environmental Quality Act. The draft environmental impact statement required by the federal government is to be completed by the Interior Department in January 1978.

Fackrell says that IPP will [illegible]

HANK HASSELL, a Utah environmentalist, fears that local farmers will be left without water in dry years if the Intermountain Power Project is [illegible]

> "We've honestly tried to do what's right and reasonable and fair. But how do you convince people you're trying to do something different when they've seen so much bad?"
> —Joseph Fackrell, president
> Intermountain Power Project

[illegible]

Grand Teton Environmental Education Center is now offering a Summer Natural History Course Series. The Teton Science School, operator of the Center, will bring highly qualified instructors to teach these non-residential courses. The seminars are available with or without credit from University of California, Davis. The cost is $60 per 5-day session plus credit ($10 per unit). The combination of outstanding instructors and the environment of Grand Teton National Park makes these course offerings an educational opportunity of a lifetime.

June 6-10 Teton Wildlife, June 13-17 Birds of Grand Teton, June 20-24 Geology of Jackson Hole, June 27-July 1 The Wilderness Idea in America, July 5-9 Aquatic Ecology of Grand Teton Nat'l Park, July 18-22 Backpacking and Techniques of Wilderness Living, July 18-22 Soils of Jackson Hole and their Relationship to Pleistocene Geology, July 25-29 Vascular Flora of Grand Teton, July 27-31 Terrestrial Insects of Jackson Hole, July 18-Aug. [illegible] Alpine Flora of the Teton Range, Aug. 1-5 Field Identification of Lichens, Aug. 1-5 Human History of Jackson Hole, Aug. 22-26 Field Identification of Mushrooms, Aug. 22-26 Vegetative Communities in Grand Teton National Park, Aug. 22-26 Outdoor Photography, Aug. 29-Sept. 2 Natural History of Grand Teton National Park, Sept. 5-9 Conservation Issues in Jackson Hole. (307) 733-4765

Further inquiries should be addressed to: Director, Grand Teton Summer Seminars, Box 68, Kelly, Wyoming 83011.

Business Brief

Who does best out of America's 43% of North Sea oil

North Sea oil has not only been a lifesaver for the British economy, and a bonanza for a few parts of Scotland, it has also proved a healthy boost to profits for a number of small and medium sized American oil companies. In all, 43% of the oil planned for development, British and Norwegian, will flow through North American hands.

In absolute terms the biggest company does best, of course. By the early 1980s, **Exxon** could be getting a net cash flow, after all British taxes, of $350m a year from just one field: Brent. But the company's overall earnings (net income 1976: $2.6 billion) rather dwarf such figures. For the oil majors, the North Sea is just another province, providing any number of striking photographs for the annual report, but no more than run-of-the-mill oil production or profits.

Most of the big boys have put in an appearance in the North Sea—**Mobil,** for instance, has 13% of Statfjord, and bits elsewhere—but their success in finding oil has been varied (see map and table, which excludes a few very small holdings). To start among the also-rans:

Amoco, also known as Standard Oil of Indiana, has been dabbling in the North Sea for years, starting with its involvement in the southern gasfields. Its shares of the Indefatigable, Leman Bank and Rough fields produce around 260m cubic feet of gas a day, worth around $24m a year at British Gas's monopsonist prices. That is around 3.5% of Amoco's worldwide gas turnover.

Just over half its oil reserves lie in the Montrose field, for which it is operator. Montrose should start giving earnings per share of around 9 cents this year rising to 14 cents by 1980, according to Wood Mackenzie, the Edinburgh stockbrokers and North Sea analysts. (For comparison, net income per share in 1976 was $6.09.) The company has also had good exploration results recently.

But its present North Sea total of 105m barrels of reserves (boosted by tiny shares—under 1%—of Ekofisk and Statfjord) is small beer compared with the December, 1976, company total of 4 billion barrels of reserves worldwide.

Gulf Oil went into the North Sea early, drilled lots of dry holes and ended up with a mixed bag of fields and around 320m barrels of reserves, some in fields with relatively poor rates of return by industry standards. They will not give Gulf much crude either—perhaps 22,000 barrels a day (b/d) in 1980—compared with Gulf's 1976 production worldwide of 1.7 billion b/d.

Texaco, another company with bad luck in its exploration record, bought a 24% share of the Argyll field, Britain's first North Sea field, in November, 1974, seven months before production began. Profits from the field have been shortlived, since water encroachment now looks like curtailing production, perhaps as early as 1978. Still, capital costs were low, so Texaco gets a reasonable return on its money, and perhaps an average of $10m a year in pre-tax profits from the field in the two moneymaking years of 1977 and 1978. The company is hoping for better things from its Tartan field, in which it owns 100% of the estimated 250m barrels of reserves. But the project is one of the North Sea's less attractive undertakings. Cynics in Aberdeen suggest that a desire to be seen working as an operator in the world's busiest offshore oil province may have helped to persuade Texaco that the figures looked a little rosier.

Other big firms in the North Sea include **Conoco**, with the bulk of its reserves tied up in Statfjord, the North Sea's biggest oilfield. Sometimes called "the world's biggest marginal field" by oilmen disenchanted with the Norwegian government's cautious attitude towards the development, it certainly holds a lot of oil—but it too may work out expensive.

Still, do not pay too much attention to the oilmen's grumbles: even expensive North Sea oil is still likely to be a lot cheaper—perhaps $3-$4 a barrel cheaper—than oil of the same desirable quality from Opec. Which is what keeps crude-short companies like Texaco, with huge distribution and marketing networks to supply, in the game.

Socal, the remaining American major, has needed the oil slightly less, and has confined its North Sea interests largely to developing the Ninian field (of which it owns 17%).

Small fry

These are the giants of the industry. The pattern of their North Sea involvement has been largely through joint ventures, traditional for decades when risking capital outside the United States. It cuts down the risks—but it cuts down the profits too. The British government's system of block allocation also has diluted the potential profits. So none of the American majors is in line for a burst of real good fortune of the sort that Forties gave its 100% owner, BP.

Smaller North American oil companies are very differently placed. The nature of the United States' law on oil discoveries—the so-called "law of capture"—has historically encouraged a proliferation of small companies. Present tax rulings ensure their continued existence. Few of the very smallest companies have tried their luck in the North Sea. Even medium-sized companies, which in any other industry would be regarded as financial heavyweights, have had to weigh the risks carefully. For some it has paid off spectacularly.

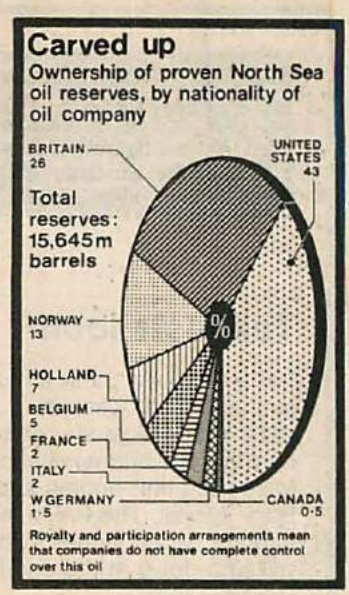
Occidental has had another coup in the North Sea to add to the spectacular impact it made, hard on the heels of Continental, on the cosy circle of the seven sisters during the 1960s. It has worldwide sales of $5¼ billion, which puts it 26th in the Fortune 500, 12th in the rankings of American oil companies, (Exxon tops the list with sales of $49 billion).

But it is just small enough to be significantly affected by North Sea success. Mr Armand Hammer, backed into a corner when the Libyan government nationalised his oil concessions there, pushed development of the Piper field ahead as a personal ambition—authorising the field on the basis of one well, it is said. It paid off.

Occidental's earnings per share from Piper and Claymore (the nearby field, developed in tandem by the same group and due to start production later this year) are estimated in New York at $0.93 in 1977, $1.96 in 1978, $1.89 in 1979 and $1.79 for 1980. Earnings per share for the whole group were $2.27 in 1976. (These figures are based on 80m fully diluted shares, rather than the 57m for common shares outstanding. They include the new, more rapid production rates recently authorised by the government, and assume corporation tax of 42%.)

In fact, Occidental's overall oil and gas earnings have recently risen sharply, helped by those Piper profits. First quarter net income from oil and gas rose to around $26m—10 times the figure a year before. The investment in Piper may well be repaid by the end of the year.

One of Occidental's partners in the two fields is **Getty Oil**. Getty's earnings per share from the North Sea (calculated on the same basis as above) are $2.68 in 1977, $5.22 in 1978, $4.92 in 1979 and $4.59 in 1980. Earnings for



Front-runners and also-rans

North American companies' reserves in present commercial fields.

	m barrels		m barrels		m barrels
Exxon	1679	Texaco	256	Murphy	77
Phillips	974	Allied Chemical	242	Odeco	77
Mobil	711	Socal	187	Ranger	66
Conoco	682	Amerada Hess	171	Tenneco	46
Occidental	442	Texas Eastern	157	Ashland	27
Getty	326	Amoco	105	Hamilton	9
Gulf	320	Santa Fe	81	**Total**	**6,636**

Estimates. Source: Wood Mackenzie

Business this week

Talkfests loom

IMF and World Bank annual jamboree next week in Washington. Agenda: getting the hesi out of world hesiflation; increasing IMF quotas and World Bank capital. The IMF's managing director, Mr Johannes Witteveen, will step down at the end of his five-year term.

President Carter's tax reforms may reduce business taxes. Second-quarter growth figures revised upwards, to 6.2% annually adjusted, but indicators showing an end-of-summer lull sent Dow Jones down to a 21-month low.

Down, down, down go German growth estimates. Outgoing economics minister Hans Friderichs says only 3% this year.

France expects 1977 growth of 3%, but export-led 4.5% in 1978, when the government plans to continue wage restraint and its 6.5% "norm" for price rises.

The world steel crisis is getting worse. America's Lykes Corporation has closed a plant, laying off 5,000 workers. Japan offers lower exports in return for higher prices. European losses are remorselessly mounting up.

India plans to open three quarters of its capital-goods market to foreign competition, as foreign exchange reserves rise past $4 billion mark. But wants to Indianise its little bit of IBM.

The EEC urged companies with South African subsidiaries to improve pay and conditions for black workers.

Italy's balance of payments hit a record surplus of $1.4 billion in August, as imports fell and the balance of trade moved into the black.

An American senate report predicted international debt crisis, saying $50 billion of Arab short-term holdings threatens the west.

Jugoslavia's balance of payments moves towards a $1.5 billion deficit for 1977. Import curbs likely.

Australia expects to invest $22 billion in energy over the next decade, but says the EEC won't get uranium without softening its farm policy.

Devaluation has brought improvement in Spain's gold and foreign reserves, and record tourist receipts in July ($683m).

The EEC failed to agree on its attitude for the world sugar talks, blocked by France.

Citibank launched the largest-ever corporate Eurobond issue: $300m in two tranches.

Some bad news

Awful British September unemployment figures. Another 56,000 school leavers have jobs so the crude total fell. But an extra 29,000 adults were out, and the seasonally adjusted total figure hit 1.45m—a post-1945 record. Gdp was down in the second quarter. Earnings rose only 8.8% during the 12 months of stage-two controls. In sum: more pressure for reflation.

The bakery workers went back to work. Miners' leaders shelved a £135-a-week claim and started talks on a productivity deal—both in contradiction of their union's conference decisions. But farmworkers put in for a minimum of £60. Ford workers said no to the company offer of about 10%. Leyland got a new strike at its bus and truck division, and yet another warning from the NEB. A Belfast company was told by the government to renege on a 22% settlement: unions demurred.

BAC signed a £500m contract to run the Saudi airforce.

Sir Eric Miller, former and controversial boss of Peachey Property Corporation, died from gunshot wounds on Thursday.

Construction company Tarmac revealed it could lose up to £12m on Nigerian contracts.

Mrs Thatcher's solution to a possible Tory confrontation with the unions: a referendum.

Key indicators: **Major economies**

	% change (at annual rate)								Trade balance† $m		Unemployment % rate	Unemployment 000's		Exchange rate‡ per $
	Industrial production		Wages/earnings§		Consumer prices*		Money supply** M1							
	3 mths	1 year	3 mths	1 year	3 mths	1 year	3 mths	1 year	latest	12 mths to date		latest	since 3 mths	
Australia	− 6½	nil (5)	+19½	+12½ (4)	+10	+13½ (5)	+ 7½	+ 9 (7)	− 26 (5)	+ 1300	5.4	337 (7)	+ 14	0.91
Canada	+ 5	+ 3½ (7)	+14½	+11½ (5)	+10	+ 8½ (7)	+19	+ 9½ (6)	+ 31 (5)	+ 1300	8.0	847 (6)	− 90	1.07
France	− 3	+ 4 (6)	+ 9½	+13 (4)	+11	+10 (7)	+ 6	+ 8 (5)	− 378 (8)	− 4900	na	1216 (8)	+119	4.92
W. Germany	nil	+ 3½ (7)	+ 6	+ 6½ (7)	+ 1	+ 4 (8)	+15½	+ 8½ (7)	+ 700 (7)	+14800	4.6	1052 (8)	+ 14	2.32
Holland	− 3	nil (6)	+18	+ 6 (7)	+ 1½	+ 7 (8)	+17	+ 7 (3)	− 210 (5)	− 1100	5.1	220 (6)	+ 18	2.47
Italy	−14	+ 1½ (5)	+38	+35 (4)	+10½	+19 (7)	+ 6½	+19 (3)	− 550 (5)	− 6000	6.6	1432 (4)	− 27	883
Japan	−11½	+ 1 (7)	+ 8½	+11 (5)	+ ½	+ 9½ (8)	− 2½	+ 6 (6)	+1712 (7)	+13800	2.1	1160 (7)	+154	267
Sweden	−13½	− 3 (5)	+ 5	+ 3½ (5)	+18½	+13 (7)	+26	+ 6 (8)	+ 27 (6)	− 1000	1.5	82 (6)	− 3	4.85
USA	+ 2	+ 5 (8)	+ 6½	+ 7 (7)	+ 7	+ 6½ (7)	+ 9½	+ 7 (8)	−2326 (7)	−19000	7.1	6926 (8)	+ 7	1.00
Britain	− 4½	nil (7)	+ 4½	+ 9 (7)	+ 7	+16½ (8)	+21½	+12 (8)	+ 245 (8)	− 5300	6.1	1446 (9)	+ 94	1.74
UK indices 1970=100	102 (7)		286½ (7)		261½ (8)		215 (8)							$ per £

*Small figures in brackets denote month of indicator. All figures seasonally adjusted except where stated. §Hourly wage rates in manufacturing, not seasonally adjusted; except for USA, Canada and Sweden (average hourly earnings), Japan and UK (average monthly earnings), seasonally adjusted. *Not seasonally adjusted. **Netherlands, Sweden, not seasonally adjusted. †USA, Canada, Australia, Japan, France and UK imports fob, exports fob. All others cif-fob. ‡Wednesday closing rates in London.*

PUBLIC UTILITIES COMMISSION HEARING #5685

STATE of COLORADO

15 - 16 JULY, 1976

PRESENTATION by the SIERRA CLUB

Mr. Chairman, members of the Public Utilities Commission, my name is Richard B. Schwendinger and I am here representing the Sierra Club. The Sierra Club is a nationwide conservation organization with 163,000 members, represented in the State of Colorado by the Rocky Mountain Chapter with 24,000 members, and in Denver by the Enos Mills Group with 1,300 members. We certainly appreciate this opportunity to share our thoughts and concerns with you.

This statement has been prepared by the Energy Subcommittee after much study and consideration, and represents the general thoughts of the membership. We would like to express our concerns about electric rate structures as they affect solar-heated homes, and wish to suggest a structure to be used solely for solar-heated homes: specifically, a two-tier rate structure that is a straight energy rate up to some predetermined number of kilowatt-hours and over that a 15 minute peak demand rate.

Strong environmental reasoning has brought us to these conclusions. First of all, we agree that prices generally should reflect the true cost of providing electrical services and that Public Service Co. should include capital costs of its plants and distribution networks in all its different rate structures. Secondly, we agree that conservation of energy is extremely important to the nation as a whole and will be even more important in the near future. However, while increased conservation will be helpful to the overall energy picture,

increasing demand for and pressure on fossil fuels must force the development and use of alternate and/or supplemental energy sources. One such alternate source is solar energy. Further, solar energy for space-heating in homes, while not yet a well-developed technology, shows great promise and should be encouraged.

At the present time, solar energy cannot realistically be expected to heat a home without some sort of supplemental heating because of unresolved problems in the heat-storage systems presently in use. This back-up now must be electric-resistance heating. The current 15 minute peak demand rate structure for electric-resistance heating is, we believe, a discouragement to solar energy development. The high costs relative to the low total power demands (which are, to a great extent, at off-peak hours) in a solar-heated home, so penalizes the solar-heating system that it must be detrimental to the continuing development of this technology. In fact, it will make solar-heated homes prohibitively expensive to the point of crippling the potential of this much-needed energy source.

We understand that many solar-heating units now in use or planned are relatively profligate users of energy because of inefficient pump design and inadequate heat storage. We certainly do not wish to encourage this kind of inefficiency in promoting a solar energy strategy. Therefore, to encourage the development of solar-heated homes while at the same time discouraging the use of inefficient solar units, we suggest the two-tier rate structure.

This rate would be based on a straight energy rate up to some predetermined

number of kilowatt-hours and the use of a 15 minute peak demand rate over that figure. Because of variation in the heat load of different sized homes, the Public Utilities Commission would be best able to identify and set the optimum cross-over figure between the two rates. With the present number of solar-heated homes in Public Service Co.'s territory and with the limited number projected over the next five years, such a rate structure for solar-heated homes would not cause a significant impact for Public Service Co. However, we do suggest that this be a rate subject to review at regular intervals.

Public Service Co. makes the following excellent points in its "Policy Statement on Solar Energy" which we would like to quote:

1. Public Service Co. of Colorado encourages the effective use of its services while discouraging the wasteful use of these services. The Company encourages the use of solar energy if such can be utilized without wasting resources...
2. The Company supports research and demonstrations into solar energy usage that prove the practicality, performance and operating characteristics of solar technology...
3. Where solar installations are proposed that utilize Company service as a supplemental energy source, appropriate energy storage systems should be used to maximize the independence of the solar system and to minimize the impact on the Company's systems...

We agree with these points. We believe that the proposal we set before you today encourages this policy of Public Service Co.

Thank you for your attention and consideration.

The Sierra Club.