ENERGY AND THE ENVIRONMENT

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Americans are far and away the most energy intensive society in the world, accounting for more than one-third of total energy consumption while representing only about six percent of the world's population. Our hard-working energy servants have made us the most productive and affluent people on Earth, and we like these servants so well we get more all the time. Thirty years ago Buckminster Fuller estimated that the average American had at his beck and call the equivalent of 153 slaves. Today that number would be about 400.

Americans use 70 quadrillion Btu's of energy every year. That's the equivalent of 2.8 billion tons of coal, or 616 billion gallons of oil, or 70 trillion cubic feet of gas. These are impressive figures, but they're really incomprehensible.

To put it into one frame of reference -- 2.8 billion tons of coal is a string of 100-ton railroad hopper cars 265,000 miles long; and the mean distance to the moon is only 240,000 miles.

Aerospace Industries Association, Williamsburg, Va.,
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Or try this -- the GLOBTICK TOKYO, at 477,000 deadweight tons, is the largest supertanker now in service. Depending on cargo density, this ship can carry about 180 million gallons. If we had to import all our energy needs by tanker, nine of these mammouth vessels would have to be offloaded every single day -- nearly 3,400 ships a year.

We have become so accustomed to energy in its various forms that we take it for granted. Reportedly, a schoolboy when asked to name Edison's greatest achievement, replied: "Without Edison we'd have to watch television by candlelight."

That's an ingenuous response to be sure but it typifies a general attitude. We have been so prodigal in our energy habits for so long that very few people give more than scant thought to energy sources and the complexities involved in making that energy available for our use. We're numb to what making this much energy means.

How many people translate household electricity into strings of coal hopper cars or strip-mined hillsides? How many people realize that the gas which flames beneath the morning coffee pot may have left a well far out into the Gulf of Mexico days beforehand? What motorist,

refueling at the neighborhood service station, thinks of tankers and refineries, pipelines and oil spills?

Yet, as an environmentalist, I want energy, too. Energy is a vital component in our environmental rehabilitation program, as well as to our efforts to bring the full measure of prosperity to all Americans. The problem is not what we want, but how we get it. How can we satisfy a reasonable demand for energy, and keep our environment whole and healthy, too? In a sense, the answer to that question is plain. We will have to produce more and waste less. These are not options -- we must do both.

For America's energy needs today are supplied overwhelmingly by fossil fuels, with oil and gas providing 77 percent. There are all kinds of estimates on fossil fuel reserves and a confusing array of predictions on how long they will last under varying degrees of husbandry. One thing alone is certain -- fossil fuels are finite.

We need time -- a great deal of it -- to develop a perpetual supply. Fossil fuels powered the industrial and technological revolutions. They have made us a

high-energy culture. But if we are to maintain our high standard of living and preserve our environment as well. we must look to other power sources for the long term. And we must develop these sources while we still have fossil fuels available to provide the energy required for further breakthroughs.

The National Science Foundation estimated that the United States could have 395 million kilowatts of geothermal electric generating capacity by the year 2000. That's more than today's total capacity.

We are working on breeder reactors which are perpetual power systems but they must contend with problems of radiation and disposition of spent fuel elements. And we have barely begun our search for ways to use our largest nuclear power source -- the Sun itself. NASA is studying the feasibility of an orbiting satellite to collect and convert sunlight into electricity and beam it by microwave to Earth.

There is much work to be done and, to buy the time we need, it is imperative that we make the wisest use of our existing fossil fuel resources. The trick is to get us

safely into the 1980's with known technology. To accomplish this in ways which are least harmful to the environment will demand judicious evaluation and balancing of the environmental complexities in the whole energy chain--exploration, production, processing, transportation, and consumption.

There is no perfect solution. The energy situation is replete with bittersweet alternatives. Our greatest fossil fuel resource is coal -- but most of it has a high sulfur content. The ideal fuel is natural gas -- but it's the fuel in shortest supply. There are large reserves of oil and gas in Alaska's North Slope area -- but there is the permafrost, earth faults and the North Pacific.

Nearly everyone agrees that refineries and deepwater ports must be built -- just build them somewhere else. On the whole, offshore drilling holds great promise -- but this or that particular shoreline must be exempt. A nuclear power plant seems like a great solution -- but don't build it too close to home. And so goes the energy thrust and environmental parry of our fragmented way of developing new energy sources.

At a time which demands dispassionate analysis and sound judgement we seem, instead, to be getting escalated psychological warfare. People in the oil and gas states blame consumers in the Northeast for low fuel prices. A bumper strip in Louisiana reads: "Let the bastards freeze!" In Oklahoma they've added: "And in the dark, too!" When a trade group touts: "A nation that runs on oil can't afford to run short"; an environmentalist counters with: "A nation that runs short can't afford to run on oil."

We simply can't afford the luxury of automatic opposition, whether it be industry opposition to environmental regulation or environmental opposition to energy development. Such behavior only leads to conflicts which delay decisions, often for so long a period of time that the ultimate decision must be made between poorer alternatives than were available in the first instance.

It is extremely difficult to weigh the environmental impacts of energy facilities against the benefits of energy use. And this is especially true where, as in most instances, the people who are adversely affected are not the same people who benefit.

In this context it is important to appreciate fully that as the United States is not a self-sufficient nation, no city, no state, no region within the country can go it alone. The benefits one area provides to others at some environmental cost are recompensed by benefits supplied to it from outside at environmental costs to others. It is, therefore, just and prudent to make our environmental decisions on the basis of the society as a whole. The problem is doing it.

It is relatively easy to determine the environmental impact of each link in the energy chain; it is much harder to determine which of these impacts is the most serious. Which is the greater risk -- a coastal oil spill or an inland health hazard? Which is more disruptive -- a power brownout or gasoline rationing? Forced to a choice, which is more valuable -- clean air or clean water?

But hard as it is, we must incorporate rational consideration of tradeoffs into our decision making process, generate as many of the relevant facts as possible, carefully analyze the alternatives, debate them responsibly, and come to reasoned judgments as to the best choice for society. We -- all of us -- must learn to advocate energy programs that best solve the twin problems of power and pollution.

In his energy message last month President Nixon specifically provided for environmental assessment of each proposed new energy source. This was a call to reason; not a signal to choose sides. There is room for give and take on energy matters -- and there is a need.

The clean fuels problem is an excellent case in point. The Clean Air Act directs the Environmental Protection Agency to set air quality standards which protect the public's health and welfare. Primary standards -- those intended to protect public health -- are to be met by 1975. The secondary standards -- those relating to the public's welfare -- do not have a precise target deadline but are to be achieved within a reasonable period of time.

For stationary sources -- electric generating stations, industrial plants, office buildings, stores and residences -- the main problem lies in achieving the sulfur oxide standards. The problem is resolved by burning low sulfur fuels in the first instance or by removing sulfur from stack gases where high sulfur fuel is burned. The pinch comes because there will not be sufficient clean fuel in 1975 to do the job and there will not be enough desulfurization or stack gas cleaning facilities to make up the difference.

Our studies indicate that by 1975 power plants alone will need 600 million tons of coal, more than 1.2 billion barrels of oil and about 25 trillion cubic feet of natural gas. Analysis of state regulations shows that roughly three-quarters of this coal and five-sixths of the oil must meet stringent sulfur content limits if the clean air standards are to be met.

But strict enforcement of all state sulfur regulations in 1975 will create a clean fuel gap of 100 million tons of coal. We would just not be able to use one-sixth of the coal we would need to meet energy demands. In the process, we would put some 15 to 20 thousand miners out of work. And what would replace this coal?

It is not in this nation's best interest to rely heavily on natural gas to meet industrial environmental requirements. As a boiler fuel, gas is better suited to serve smaller users -- residential and commercial customers -- since sulfur removal equipment is most efficient and economical in large scale operations.

And oil is clearly the most expensive alternative to solve the sulfur problem. In addition to the higher cost per Btu, the probable need to increase oil imports would

adversely affect our balance of payments. Furthermore, in view of our recent problems with refining capacity and the world supply of crude oil, it is not at all clear that we can depend on large scale oil imports to solve our problems even if we wanted to.

So we must use our coal reserves to meet our energy needs. And we must attain the primary, or health-related, air standards. We have written the Governors of the key coal-using states urging them to modify state plans as necessary to insure that national air quality health needs are met first. If these states modify their plans, the available clean coal and limited supplies of coal and limited supplies of coal stack-gas cleaning technology can be used in the most polluted areas and the primary standards can be met. This amounts to a policy of phasing-in secondary standards which would probably be achieved in all states by 1977 or by 1978. But it is a policy that allows us to have clean air and adequate energy -- both by narrow but reliable margins -- in this decade.

If this policy is implemented, and if energy producers and consumers act in good faith to solve their own problems, we must still go through a complicated transition period

between now and 1975. We must, for example, physically redistribute clean fuel supplies to where they are needed. During this transition, some spot shortages of clean fuels may occur. But if these shortages are legitimate, and are prepared to tolerate short-term spot variances from environmental regulations. Thus, our clean fuels policy and our variance policy go hand-in-glove to produce the result we all want by 1975.

This is a carefully crafted solution to a very complex problem. How easy it would be to listen to the simplistic call to abandon environmental health in favor of unconstrained energy production. But our answer offers the only prospect of achieving our environmental goals in a way which minimize dislocations in our energy situation and the costs to the consumer.

Can we do it? Yes, it is legally permissible and physically possible. Will we do it? Will the states extend the dates for meeting secondary standards? Will users voluntarily redistribute low-sulfur fuels to the areas where is most necessary? To these last questions I must confess that I just don't know. It seems naive to say "yes" and cynical to say "no."

I do know that if it is not done voluntarily Congress will be faced with two unpleasant options -- to relax the Clean Air Act or to give some Federal agency authority to allocate scarce fuel supplies to meet the Act's requirements. We intend to be vigorous in urging other Federal agencies and the Congress to adopt energy policies which will stimulate production of needed clean fuels and insure their availability where most needed.

But there are two ways of closing the energy gap -- producing more and wasting less. Until the day comes when we can afford to be as extravagant with energy as we actually are today, we must take steps to conserve it. We need not docilely accept a seven percent per year growth in energy demand.

We are energy grasshoppers, living for today without a thought for tomorrow. We consume our energy nearly as fast as we produce it. Any significant slow-down in production or delivery forces curtailments such as those we witnessed last winter.

One-half of every barrel of domestic crude oil goes for gasoline to power automobiles and trucks, very convenient but inefficient vehicles. We have let our rail passenger

and transit systems fall apart. Airliners, on the average, fill only half their seats. In intercity freight transportation railroads carry one-half of the tonnage at one-tenth of the total fuel consumption. Nine times as much energy is used by trucks to move the other half of the tonnage.

We can't make more fossil fuels but we can extend the useful lifetimes of what we have. Last year the Office of Emergency Preparedness released a study on energy conservation. The most significant suggestions were improved home insulation, more efficient air conditioning, streamlined industrial processes and equipment, and four transportation improvements:

-- shifting intercity freight from highway to rail;

-- shifting intercity passengers from air to ground;

-- shifting urban passengers from autos to mass transit; and

-- consolidating urban freight movement.

The environmental ethic for energy is not quite "waste not, want not" but conservation will carry us a long way. If we undertake a coordinated program we can reduce energy use by up to 20 percent without impairing our standard of living. The potential benefits from the energy savings in the residential and commercial markets

are particularly important for pollution control because most fuel savings will be in natural gas and electricity.

By cutting down on energy demand and with some adroit juggling of clean fuel supplies we should be able to get through the mid-1970's crunch. For the mid-term -- 1980 into the 21st Century -- we must develop our present energy technologies to the optimum. And for the long-term we need to make wise investments today in research and development of perpetual power supplies. Estimates of 300 and 400 year lifespans of fossil fuel reserves may seem like a comfortable margin but looking over our shoulder that would only take us back to around the founding of Williamsburg. And that wasn't so very long ago.

I know that we have the ability to develop and use our energy wisely. I'm confident that we can and will pull it all together and come up with a cleaner and even more prosperous America.