

THE ENERGY CRISIS: FACT OR FICTION

Our energy supply is in trouble. We cannot meet the enormous energy demands through the year 2000 without increasing the energy imported each year from overseas. We imported 30 percent more oil in 1974 than we did in 1972. This means that more than 40 percent of the oil used in the United States in 1974 was imported oil. We imported at the same rate in 1975.

We are in a massive energy crunch, and no one is doing anything about it. The causes for the crunch are senseless, inflexible governmental regulations and fanatical demands of extreme environmentalists. Although we will not solve our energy problems before the year 2000, we can alleviate the shortage slightly if

1. We become reasonable about the environmental demands and
2. We become sensible

about encouraging U.S. businessmen to find new energy (especially oil and gas), conserving energy of all kinds, doing without certain luxuries, using coal on a much larger scale, using nuclear energy widely, encouraging research and development on broad fronts, and letting the marketplace establish the price of energy.

I, too, am an environmentalist. I want clean air and clean water. I am a member of the National Council for Environmental Balances and chairman of the National Air Quality Control Committee. We all want a clean environment, but we just cannot have no particulates in our air or distilled water in our streams. Yet, extreme environmentalists expect this purity even though it was never attained on this planet even before the advent of humans. Trade-offs are required for the best interests of society, and these trade-offs can be achieved only if the historical miscalculations of government and the overlay of new misjudgments are quickly countered.

The public believes that the energy crisis is over because there is much gasoline available at the pump. Unfortunately, the public is not told that approximately half of the liquid products we use comes from outside of our shores and that the actual liquid production in the United States was about 4 percent less in 1975 than it was in 1974. The imported liquid, however, has increased approximately 23 percent over 1973 (Table 1). Table 1 also shows that the cost of imported liquid was approximately \$29 billion in 1975 compared with \$7.5 billion in 1973. The public should be told that, even though the supply of gasoline is at the pump, the country will have great difficulty in paying for this imported liquid.

Figure 1 shows the total energy used by the United States from 1956 through 1974 and the total energy produced during those years. The area between these 2 lines indicates the amount of energy imported: more than 18 percent of total energy used in 1974 alone.

The dashed line in Figure 2 shows total gas used by the United States from 1956 through 1974, and the dotted line shows the gas produced, and the solid line indicates the total amount of gas found. Since 1967, we have consistently discovered less gas than

Table 1. Production and imports of liquid products.

Item	1973	1975	Percentage Difference
Production (crude and NGL), million barrels per day	9.372	8.978	-4
Imports (crude and products), million barrels per day	5.864	7.223	+23.2
Total, million barrels per day	15.236	16.201	+6.3
Percentage imported	38.2	44.5	
Cost per barrel of imports, dollars	3.5	11.0	
Cost per year of imports, billions of dollars	7.5	29.2	

Note: 1 barrel = 0.16 m³.

Figure 1. Energy used and produced by United States.

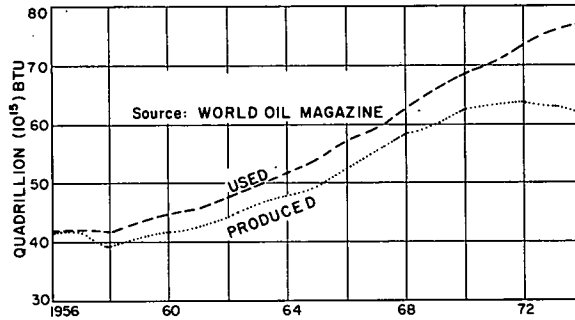


Figure 2. Gas used, produced, and found by United States.

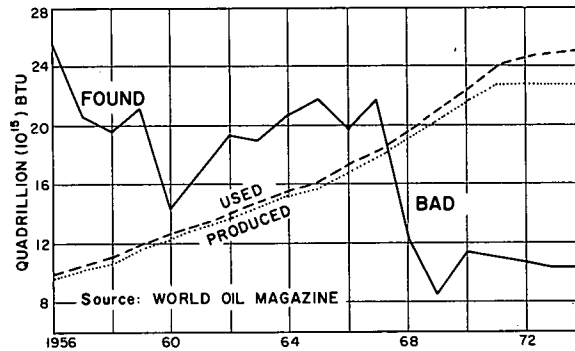


Figure 3. Oil used, produced, and found by United States.

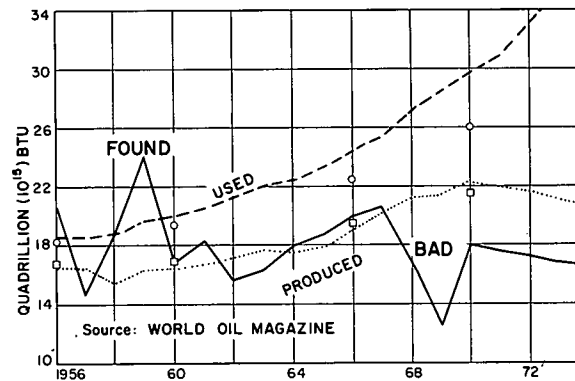
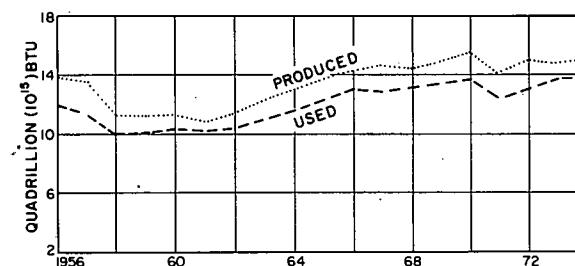


Figure 4. Coal used and produced by United States.



we have produced or used; the discovery line will not again cross the used or produced line in our lifetime. In 1974, we imported about 11 percent of the total gas that we used. The gas produced declined in 1973 for the first time.

Figure 3 shows similar information for oil. We imported more than 40 percent of the liquid hydrocarbon used in this country in 1974, and the quantity imported has continually risen. In 1973, imports averaged 6.0 million barrels (0.95 million m³) per day. On January 11, 1973, President Nixon increased the import allowable by another 1 million barrels per day (0.16 million m³). We now import more than 44 percent of all the liquid hydrocarbons we use. To import such large quantities is not desirable because the imports add to a negative balance of payments and dependence on imports constitutes a threat to our national security. The solid line in Figure 3 indicates the amount of new oil found from 1956 through 1974. We are now finding less oil each year than we produce or use, and in addition the production of oil continues to decline.

Figure 4 shows that the information for coal is the reverse of that for oil and gas. We have consistently produced more coal than we use. We have exported coal to Germany and Japan since 1946 as part of our reparations agreement. In 1974 the total income from the coal was \$1 billion compared with \$29 billion expended for hydrocarbon liquid. In 1970 the effect of the mine safety act and regulations of the Environmental Protection Agency on the production and use of coal can be seen. Twenty-two percent of the coal mines were closed, and production decreased during 1970 and 1971. During that same time, the use of high sulfur coal was restricted. The coal supply should be tripled by 1985 if we are to approach self sufficiency.

The left bar in Figure 5 shows the proved recoverable gas reserves as of December 31, 1972. At the end of 1974 we had 228 trillion ft³ (6.45 trillion m³) and approximately 10 years of proven recoverable gas reserves. We used 26.0 trillion ft³ (0.74 trillion m³) in 1974. The right bar shows the undiscovered potential of gas in the United States. Most of it is expected to be off the continental shelf. Even the most optimistic figures of 750 trillion ft³ (21.23 trillion m³) will last only 35 years. I believe it is extremely significant that, even though 70 percent of the proven recoverable reserves of gas are in the southwestern states, including Texas and Louisiana, these states are planning to depend on nuclear reactors for their electrical energy beginning in 1980.

Figure 6 shows that the proven recovered reserves for oil were 35.6 billion barrels (5.66 billion m³) at the end of 1972 and 32.2 billion barrels (5.12 billion m³) at the end of 1974. The 1974 usage rate of 6.4 billion barrels (1.02 billion m³) gives us a 5-year reserve. The bar on the right side indicates the undiscovered oil potential, which may be as high as 100 billion barrels (15.89 billion m³), slightly more than a 17-year supply.

Figure 7 shows the dramatic decrease in the total wells drilled in the United States from 1956 through 1974: 58,000 in 1956 to 26,400 in 1973. The number of independent drillers decreased from more than 39,000 in 1956 to fewer than 3,800 in 1972 because the returns on their investments were not so high as those in other fields. The lower line shows that, of the exploratory wells drilled in 1974, only 13.3 percent showed any significant amount of hydrocarbon.

The top curve in Figure 8 shows the total demand of all types of energy in the United States during the 30-year span. The next curve shows the total energy the United States can supply during this period and is made up of nuclear and hydro, coal, oil from coal and shale, crude oil, natural gas liquid, gas from coal and shale, and natural gas. The total energy produced by the United States during this period is based on several assumptions.

1. The maximum population will not exceed 271 million by the year 2000,
2. Inflexible governmental regulations will be decreased between now and 2000,
3. Less resistance will be offered by the environmentalists, and
4. No major energy usage, such as general weather control and defogging of the cities, will take place between now and 2000.

The area shown between the upper 2 curves represents the increasing amount of imports each year. By the year 2000 we will need to import more than 35 percent of our

Figure 5. Proven recoverable reserves and undiscovered potential of gas in United States.

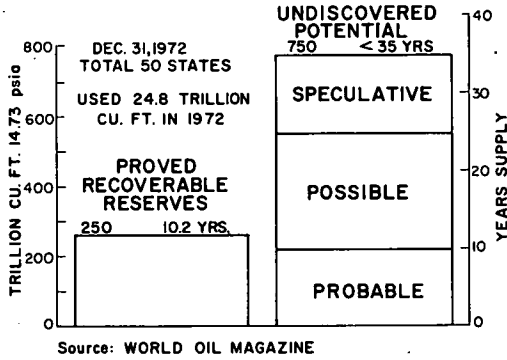


Figure 6. Proven recoverable reserves and undiscovered potential of oil in United States.

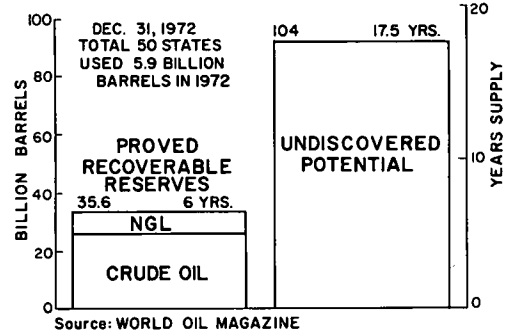


Figure 7. Wells drilled in United States.

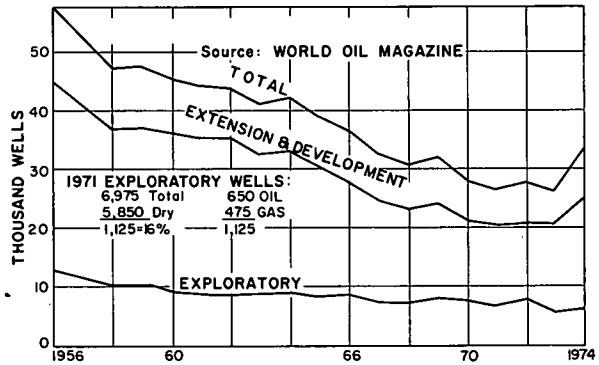


Figure 8. Energy supply and demand in United States and projection based on 1969 data.

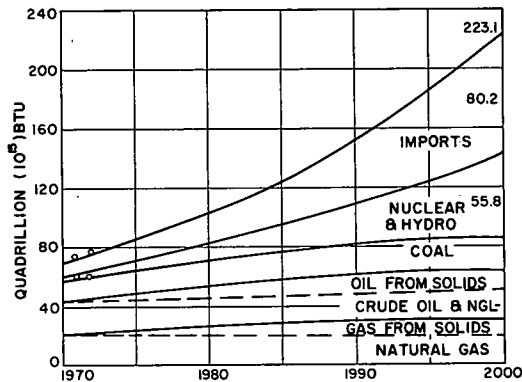


Figure 9. Energy supply and demand in United States and projection based on 1974 data.

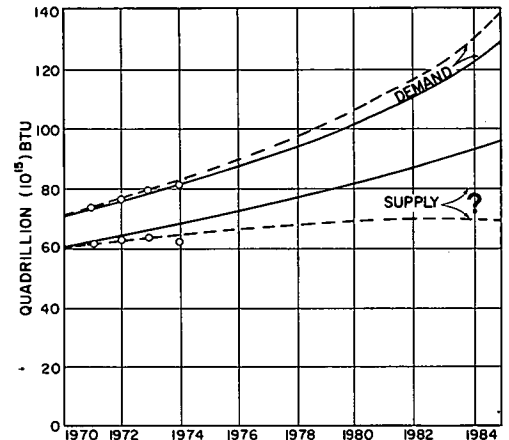


Table 2. Actual and predicted energy demand and supply.

Item	1972	1974	1985 Prediction	
			1969 Data	1974 Data
Demand, 10 ¹⁵ Btu	74	76.5	130	138.5
Supply, 10 ¹⁵ Btu	63	62	95	66.4
Imports, 10 ¹⁵ Btu	11	14.5	35	72.5
Imports, percent	14.9	19.0	26.8	52.0
Import, billions of barrels	1.9	2.6	5.9	12.3

Note: 1 Btu = 1055 J, and 1 barrel = 0.16 m³.

Table 3. Energy sources in 1985.

Source	Predicted (10^{15} Btu)	
	In 1970	In 1975
Oil and liquid	18.7	18.2
Gas	16.6	15.5
Coal	20.5	18.0
Nuclear and hydro	18.5	10.9 ^a
Oil from solids	8.4	1.7
Gas from solids	12.3	2.0
Geothermal	0.15	0.09
Solar	0.10	0.01
Fusion	0.00	0.00
Hydrogen	0.005	0.005
Winds, tides	<u>0.0005</u>	<u>0.0005</u>
Total	95.25	66.405

Note: 1 Btu = 1055 J.

^aIf all planned nuclear plants are built.

total energy, provided there are enough tankers to haul this much energy and there is still a source of that energy. During the year 2000, 12 billion barrels (1.91 billion m^3) of oil will be imported. This would require more than 1,000 tankers of 1 million barrels (0.16 million m^3) net capacity (we have none yet of this size) continually on the high seas to make this delivery. The 12 billion barrels (1.91 billion m^3) of imports would make a negative balance of payments of more than \$120 billion, or the equivalent of 120 million new jobs at \$10,000 per person.

Figure 8 was prepared in January 1970 and is based on data through 1969. Figure 9, which shows demand and supply (the top 2 lines in Figure 8) for total U.S. energy between 1970 and 1985, is based on 1974 data. With the history of 1970 to 1974, the demand and supply curves (dashed lines in Figure 9) show that the U.S. energy picture is much more

critical than we had thought. These data are given in Table 2, which also gives the prediction for 1985 based on both 1969 and 1974 data. The supply predicted for 1985 is now two-thirds of that we predicted in 1970.

The predicted energy sources are given in Table 3. We were optimistic early in 1970 that we would have a great supply of nuclear sources as well as a huge conversion of solids (coal, lignite, shale) into oil and gas. If all of the nuclear plants that are now in the planning or construction stage are completed by 1985 (many of these are now being held up in the courts for environmental, siting, and other reasons), only about half of that predicted in 1970 would be expected to be available in 1985. All of the predictors were overly optimistic on conversion of solids into oil and gas so that only about a seventh of this source will be available by 1985 as compared to that predicted in 1970.

Therefore, unless there is a severe rationing program, the United States can in no way meet the tremendous energy requirements between now and 1985 without annually increasing the amount of energy imported. By 1985 the amount of imports required will be more than 50 percent of the total energy demand. This will be an equivalent of 12.3 billion barrels (1.97 billion m^3) each year (Table 2), a total cost of more than \$120 billion, providing the oil is available for us to import.