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TODAY'S ENERGY SOURCES - THEIR PROJECTED LIFE

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Our energy supply is in trouble. We just cannot meet the fantastic energy demands through the year 2000 without yearly increasing the energy imported from overseas. In 1973 we imported 20% more oil than we did in 1972. This means that 36% of the oil used in the USA in 1973 was imported oil.

We are already in the clutches of a massive energy crunch and no one is doing anything about it. This crunch was caused by

- (a) senseless, inflexible governmental regulations and,
- (b) fanatical demands of extreme environmentalists.

I see no way to get out of this whole mess before the year 2000. We can alleviate the shortage slightly -- but only if

- (a) we become reasonable about the environmental demands
- (b) we become sensible about:
 - (1) encouraging U. S. businessmen to find new energy (especially oil and gas)
 - (2) conserving energies of all kinds
 - (3) doing without unnecessary luxuries

- (4) using coal on a much larger scale
- (5) using nuclear energy widely
- (6) encouraging research and development on broad fronts to help find additional help.

Just like you, I too am an environmentalist. I want clean air and clean water for my wife and family. I am a member of the National Council for Environmental Balances, I also have the pleasure of being the Chairman of the National Air Quality Control Committee. We all want a clean environment, but something has to give. We just cannot have zero particulates in our air nor distilled water in our streams. Yet, these concentrations are expected by millions of extreme environmentalists, even though these concentrations were never attained before man arrived on this planet.

There must be trade-offs for the best of society. These trade-offs can be achieved but only if the historical miscalculations of government and the overlay of new misjudgments by the Mine Safety Act, EPA and others are quickly countered.

The public feels that the energy crisis is over because there is much gasoline available at the pump. Unfortunately, no one tells them that approximately half of the liquid products we use comes from outside of our shores. Little do they know that the actual liquid production in the U.S.A. is about 4% less this year than it was in 1973. The imported liquid, however, has increased approximately 23% as shown in Table 1. Table 1 also shows that the cost of imported liquid will be approximately \$29 billion in

TABLE 1

Production Plus Imports
June 1
(Million Barrels Per Day)

	1973	1974	Diff
Prod. (Crude + NG)	9.372	8.978	-4%
Import (Crude + Products)	5.864	7.223	+23.2%
Total Liq.	15.236	16.201	+ 6.3%
% Imported	38.2	44.5	
Cost of Import., \$/bbl	3.5	11.0	
Billion \$/year	7.5	29.2	

1974 compared to \$7.5 billion in 1973. That sort of information should be made available to the general public so that they know that even though the supply of gasoline is at the pump the country will have great difficulty in paying for this imported liquid.

The real story can best be presented in the form of charts and figures depicting the situation as it now exists in the various energy categories. Figure 1 shows the total energy used by the United States in the period 1956 through 1973. Also shown on Figure 1 is the total energy produced during these same years. The area between these two lines represents the amount of energy that we imported in each year. In 1973 we imported over 17% of the total energy used in the United States. The most disturbing trend

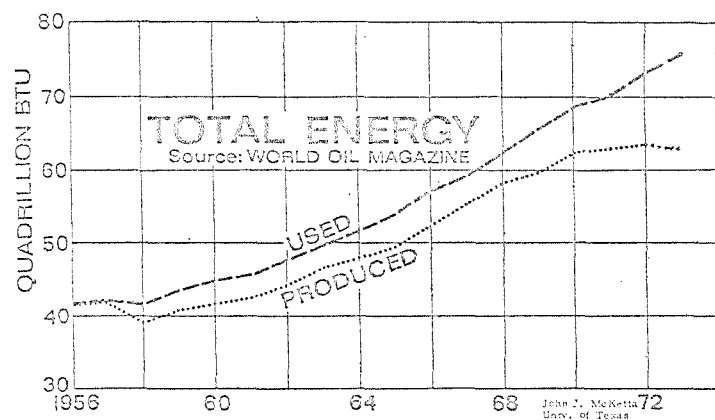


FIG. 1

Total Energy Picture in the United States

shown in Figure 1 is the increasing percentage of imported energy with the passage of time.

Figure 2 shows the total amount of natural gas consumed in the United States for the years 1956 through 1973. The dotted line shows the quantity of natural gas produced in the United States over the same period of time. The solid line indicates the total amount of natural gas found during this same period of time. Beginning in 1967 the United States consistently has discovered less natural gas than has been produced or used. The discovery line will never again cross the consumed or produced line throughout the rest of our lives. In 1973 the United States imported about 11% of the total natural gas that was consumed. Notice that Figure 2 shows that the natural gas produced in the United States declined in 1973 for the first time.

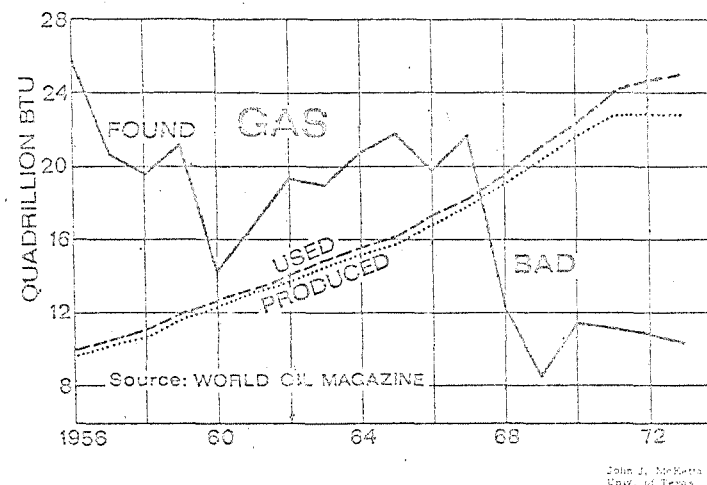


FIG. 2

Natural Gas Picture in the United States

The same information for oil is presented in Figure 3. In 1973 the United States imported over 36% of the liquid hydrocarbons consumed. The amount of oil and oil products that is imported continues to increase annually. In 1973 the United States averaged 6 million barrels per day of imported hydrocarbon liquids. On January 11, 1973, President Nixon increased the import allowable by another 1 million barrels per day. Presently, the United States is importing over 44% of all the liquid hydrocarbons consumed. Importing these large quantities of oil and oil products is undesirable for many reasons. Among these reasons are: (a) The imports add to a negative balance of payments; (b) Dependence on imports constitutes a threat to our national security. The solid line indicates the amount of new oil found in each year from 1956 through

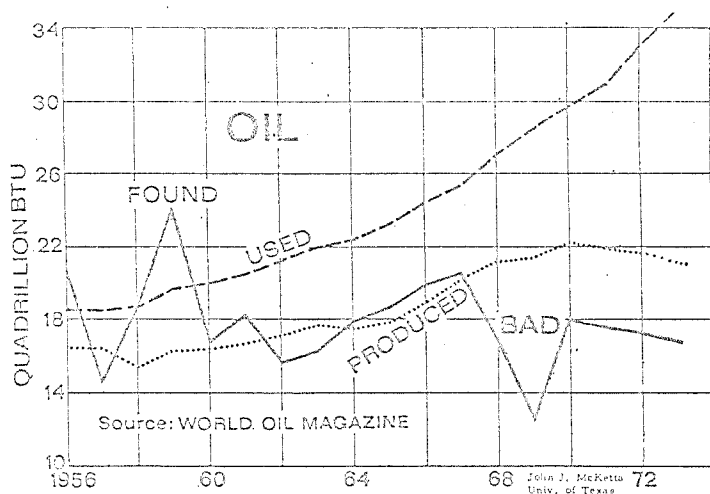


FIG. 3

Picture for Oil in the United States

1973. Just as in the case of natural gas, the United States is now finding less oil each year than it produces or uses. Note that since 1970 the production of oil has declined consistently.

As shown in Figure 4, the picture for coal is the reverse of that for both oil and natural gas. The United States has consistently produced more coal than it consumes. Since 1946, the United States has exported coal to Germany and Japan as part of our reparations agreement. The total income from this exported coal is 1/2 billion dollars compared to the 7-1/2 billion dollars we spent for imported hydrocarbon liquid in 1973. In 1970 the effect of the Mine Safety Act and EPA regulations is noticed on the production and usage of coal. 22% of the coal mines were closed and therefore the production was decreased during 1971. During the

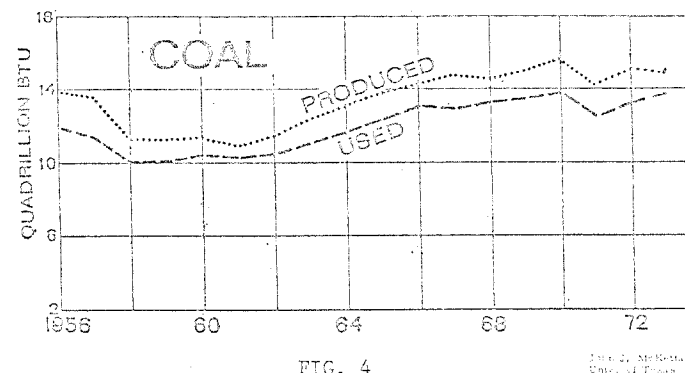


FIG. 4

U. S. Picture for Coal

same time, the restriction on the use of high sulfur coal added to the decrease in coal consumption. The coal supply in the United States should be doubled or tripled by 1985 if the U. S. is to approach self sufficiency in energy.

The left bar of Figure 5 shows the proven recoverable gas reserves in the United States as of December 31, 1973. At that time there were approximately 10 years consumption of proven recoverable gas reserves. The United States consumed 25.4 trillion cubic feet of natural gas in 1973. On the right bar is shown the undiscovered potential reserves of natural gas in the United States. Most of this undiscovered potential is expected to be off the continental shelf. Even the most optimistic figure of 750 trillion cubic feet will last the United States only 35 years. I believe it is extremely significant that even though 70% of the proven recoverable reserves of gas are found in the Southwestern States, including Texas and Louisiana, these states are planning to depend on nuclear reactors for their electrical energy beginning in 1980.

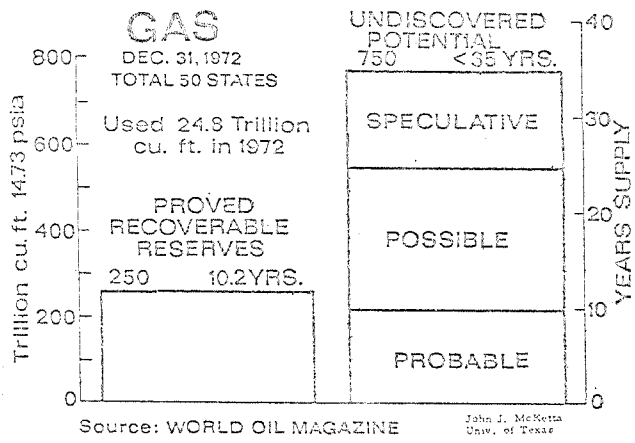


FIG. 5

Potential Supply Picture for Natural Gas

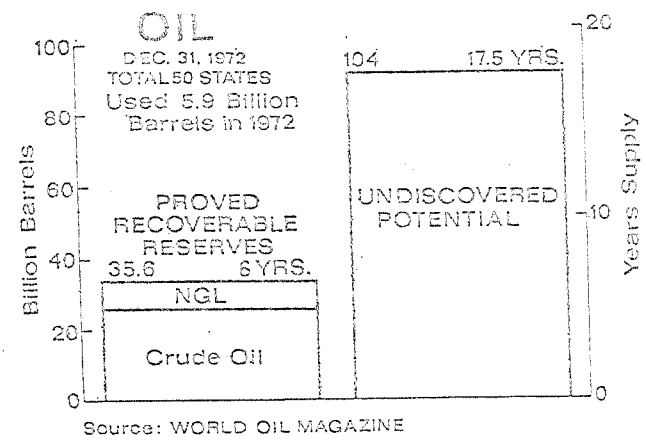


FIG. 6

Proven and Potential Reserves of Oil in the U. S.

The left bar of Figure 6 shows the proven recoverable reserves for oil in the United States to be 35.6 billion barrels as of December 31, 1972. At the 1972 rate of oil consumption in the United States this 35.6 billion barrels would provide a six year reserve. The bar on the right side of Figure 6 indicates the undiscovered oil potential which may be as high as 100 billion barrels or slightly over 17 years supply as of this date. In 1973, we used 6.3 billion barrels of oil in the United States.

The dramatic decrease in the total number of wells drilled in the United States is shown in Figure 7 for the years 1956 through 1973. The decrease was from 58,000 wells total in 1956 to 26,400 wells total in 1973. Mr. Mike Halbouty points out that the number of independent drillers in the United States decreased from more than 39,000 in 1956 to less than 3,800 in 1972. The reason these

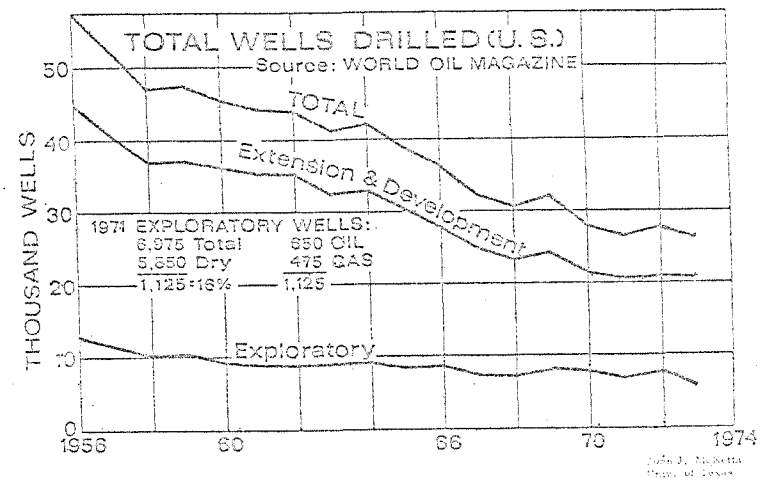


FIG. 7

Total Oil and Gas Wells Drilled in the United States

men have left the oil industry is that the return on their investment was not as high as it could be in other fields. The lower line shows the exploratory well drilling record from 1956 to 1973. Of the exploratory wells drilled in 1973 only 16% showed any significant amount of hydrocarbon.

The top line of Figure 8 shows the total demand of all types of energy in the United States during the 30 year span. The second curve from the top indicates the total energy the U. S. can supply during this period. The individual amounts of energy are shown

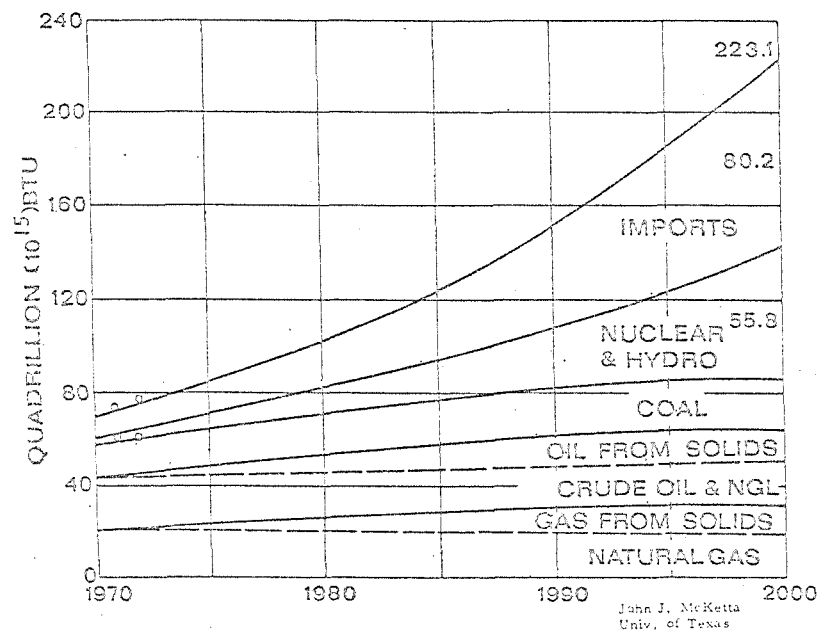


FIG. 8

The Supply and Demand for Energy in the U.S.A. 1972-2000

as nuclear and hydro, coal, oil from coal and shale, crude oil, and natural gas liquid, gas from coal and shale, and natural gas.

The area shown between the upper two curves represents the increasing amount of imports each year. By the year 2000 we will need to import over 35% of our total energy if we can get enough tankers on the ocean to deliver this much energy and if we still have a source of that energy at that time. The total energy produced by the U. S. during this period is predicted using several assumptions.

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

Figure 8 indicates that 12 billion barrels of oil will be imported during the year 2000. This means we would need over 1,000 tankers of 1 million barrels net capacity (we have none yet of this size) continuously on the high seas to make this delivery. Incidentally, the 12 billion barrels of imports make a negative balance of payments of over 120 billion dollars in the year 2000 which is the equivalent of 1200 million new jobs at \$10,000 per person.

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The only thing wrong with Figure 8 is that it was prepared in January 1970 using the data through 1969. Now look at Figure 9 which shows the top two lines of Figure 8 showing the demand and supply for the total U. S. energies between 1970 and 1985. Now with the history of 1970, 1971, 1972 and 1973 behind us, it is easy enough to show the demand and supply curves (dashed) lines in Figure 9 which show that the U. S. energy picture is much more critical than we all thought several years ago. These data are shown on Table 2 where the prediction for 1985 based on 1969 data is compared with prediction based on the 1973 data. You can see that the predicted supply data for 1985 are now 2/3 of that we

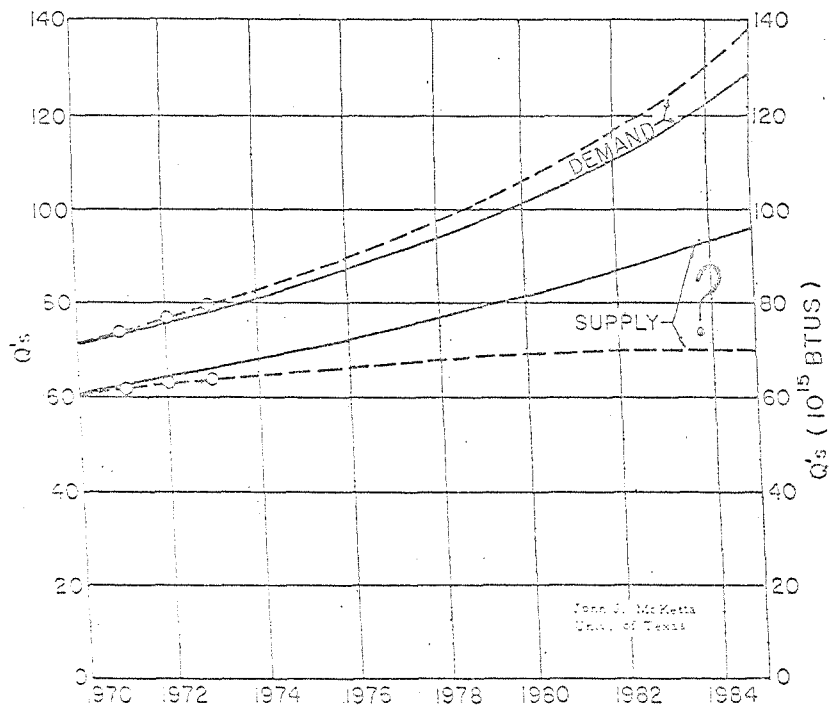


FIG. 9

The U. S. Demand and Supply Curves Based on Actual Data Including 1971

TABLE 2
Quadrillion Btu's (Q's)

	1972	1973	1985 Prediction	
			1969 Data	1973 Data
Demand	74	78.5	130	138.5
Supply	63	63.5	95	66.4
Imports, Q	11	15.0	35	71.2
Imports %	14.9	19.1	26.8	51.5
Import Bill. Bbls.	1.9	2.6	5.9	12.1

predicted in 1970. The predicted energy sources are shown in Table 3. We were all 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, etc.) into oil and gas. If all of the nuclear plants which 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 could now 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 1/7th of this source will be available by 1985 as compared to that predicted in 1970.

Therefore, as far as the energy source is concerned, there is no way the United States can meet the tremendous demand requirements between now and 1985 without annually increasing the amount of energy imported unless there is a severe rationing program.

TABLE 3
Energy Sources, 1985

U. S. Sources in 1985	Q's	
	Predicted in 1970	Predicted in 1974
Oil and Liq	18.7	18.2
Gas	16.6	15.5
Coal	20.5	18.0
Nuc. and Hydro.	18.5	10.9*
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, etc.	<u>0.0005</u>	<u>0.0005</u>
	95.25	66.405

* If all planned nuclear plants are actually built.

By 1985 the amount of imports required will be over 50% of the total energy demand. From Table 2 you can see that this will be an equivalent of 12.1 billion barrels each year, a total cost of over 120 billion dollars, IF the oil will be available for us to import. Incidentally, just to give you some idea of the quantity involved, it would take a pipe 38 ft. in diameter flowing continuously at the optimum rate of flow to transport 12.1 billion barrels per year.

WHAT CAN YOU DO TO HELP?

What can you do? There is nothing that we can do which will solve our energy crisis. We can however help to alleviate this problem somewhat and this will be certainly worth your time and effort to help.

You, as interested informed citizens, are the ones with the best background to help. First, you must become informed about the energy situation. Then you must make yourselves heard - you must meet with and serve on boards and committees where your voices will be heard before decisions are made. You must make calm, honest, intelligent speeches to the PTA groups, service clubs, churches, and other important groups to help set public opinion.

You as reasonable, practical, intelligent citizens have a responsibility to inform the public of the crisis we are in and ways they can help in conserving our energy.