CHAPTER 4

Energy and Agriculture

FOR THE BASIC RESOURCE INDUSTRIES, 1973 was an unusually eventful year. Prices in all major categories of these industries—agriculture, energy, timber, and minerals and metals—rose sharply, even in relation to the rising average level of prices. In some cases additional supplies could not be obtained even at the higher prices. These conditions reflected a worldwide state of affairs.

The growing scarcity of resources in 1973 was a significant departure from the long-term trend. Since World War II prices of basic resources have increased much less than prices generally. Wholesale prices of crude materials, for instance, increased only 13.6 percent from 1947 to 1971, compared to a 53.4 percent increase in wholesale prices of finished goods. During the same period the consumer price index rose 81.3 percent, and the GNP deflator for the private economy 78.2 percent. Prices of basic resources thus declined by a considerable amount relative to prices in the entire economy throughout most of the postwar period.

This downward trend of relative prices began to be reversed in 1972, and in 1973 it changed significantly. Some have interpreted this reversal as an early indication that along with the rest of the world we are entering a new era of increased scarcity of basic resources, during which prices for these materials will rise faster than prices for other products. Others have attributed the reversal to the coincidence of essentially temporary factors. Neither generalization can be conclusively supported at this time.

With the exception of energy, basic resource demands and prices tend to exhibit strong fluctuations. The demand for timber rises when housing construction accelerates, and housing construction is highly cyclical. The demand for minerals and metals is tied closely to the cycle of economic activity, and the agricultural sector is influenced heavily by weather conditions and its own production cycles. Thus the unusual price pressures on basic resources in 1973 are to a significant extent explained by an exceptional combination of economic fluctuations that impinged upon all basic resource industries in the context of high total demand and output.

The reduction in oil exports by several Arab nations focused attention upon a severe shortage of energy resources. But in recent years the market demand for energy has been growing faster than our capacity to produce

it at the existing price. While the oil cutbacks created obvious new short-term problems for the economy, they also precipitated what was emerging as a serious long-run problem.

It would be naive to assume that so fundamental a question as whether or not we are entering a new era of scarcity for basic resources can be answered adequately on the basis of the limited information now available. The question is nevertheless important for the following reasons.

1. Basic resource industries utilize many minerals and metals that ultimately will be exhausted. Because the opportunities to correct faulty public policy and private decisions affecting exhaustible resources are also limited, a high value to society accrues from accurate information on future demands and supplies.
2. Public policy has played a particularly important role in the evolution of basic resource industries. Specific policies in varying degrees inhibited the capacity for adaptability that is inherent in the operation of the market system. During periods of sudden and substantial change in world patterns of production and demand, these industries may therefore experience particularly difficult problems of adjustment.
3. Most basic resource industries involve commodities that are traded very extensively in international markets. The volatility of these markets, the commonly strong cyclical nature of the domestic industry, and the rapidly expanding consumption in foreign countries can combine in such a way as to create significant political and economic tensions between nations. As international markets expand and nations become more economically interdependent, such tensions could become more serious.
4. The production processes in many basic resource industries interact with the environment in an important and complex way that has in the past resulted in abuse of the environment. Public policy to protect the environment in turn interacts with—and in an ultimate sense may well determine—the appropriate public policy toward basic resource industries.

The following sections of this chapter seek to separate the enduring from the transitory factors that shape the Nation's energy and agricultural industries. This is a risky business. In the past the initial stages of new trends have often been dismissed by wise men as unusual, even unique, events; and many an authoritative forecast of an imminent new trend has proved to be based upon random episodes.

ENERGY

Energy prices have been generally lower in the United States than in other developed countries. Abundant supplies of coal, petroleum, and natu-

ral gas have contributed to the low market prices of these fuels. This situation coupled with relatively plentiful capital, and advanced technology, permitted rapid growth in conversion of fossil fuels to electric power. In addition, a generous depletion allowance and low excise tax rates have helped keep down consumer prices of energy.

Low prices and a high rate of economic growth have encouraged domestic consumption of energy to expand. From 1950 to 1972 U.S. gross consumption of energy increased at an annual rate of 3.5 percent (Table 27). In 1972 the United States consumed about one-third of the world's production of energy. Tables 28 and 29 show the distribution of U.S. energy use by sector and by source. Americans have often been accused of wasting energy, but the low prices prevailing until 1973 provided little reason to economize in its use. Because the price of labor was rising relative to the prices of capital and energy, it paid, both in industry and in the home, to substitute capital and energy for labor.

TABLE 27.—*Gross consumption of energy in natural units, selected years, 1950–72*

Year	Total (quadrillions of Btu's)	Natural gas (trillions of cubic feet)	Petroleum [1] (millions of barrels per day)	Coal [2] (millions of tons)	Hydropower (billions of kilowatt-hours)	Nuclear power (billions of kilowatt-hours)
1950	34.0	5.94	6.52	494	103	0.0
1960	44.6	12.27	9.89	398	154	.5
1970	67.4	21.37	14.70	525	253	21.8
1972 [3]	72.3	22.43	16.41	526	282	54.0

[1] Includes petroleum products refined and processed from crude oil, including still gas, liquefied refining gas, and natural gas liquids.
[2] Includes anthracite, bituminous, and lignite coals.
[3] Preliminary.
Note.—Data relate to annual totals unless indicated otherwise.
Source: Department of the Interior, Bureau of Mines.

TABLE 28.—*Consumption of energy, by user sector and source, 1972*

[Quadrillions of Btu's]

Source	Consumption of energy [1]			
	Total	Industrial	Transportation	Household and commercial
Total consumption	59.6	23.2	18.1	18.3
Petroleum [2]	29.8	5.8	17.3	6.7
Natural gas	19.0	10.6	.8	7.6
Coal [3]	4.8	4.4	(4)	.4
Electric power	6.0	2.5	(4)	3.5

[1] Preliminary.
[2] Includes petroleum products refined and processed from crude oil, including still gas, liquefied refining gas, and natural gas liquids.
[3] Includes anthracite, bituminous, and lignite coals.
[4] Less than 0.05 quadrillions.
Note.—While in 1972, 18.6 quadrillion Btu's were used for generating electricity, the electricity so generated represented only 6.0 quadrillion Btu's. This accounts for the difference between 72.3 quadrillion Btu's of gross energy consumption in Table 27 and 59.6 quadrillion Btu's of consumption by user sector.
Detail may not add to totals because of rounding.
Source: Department of the Interior, Bureau of Mines.

TABLE 29.—*Use of energy inputs for electric power*, 1972

[Quadrillions of Btu's]

Energy input	Total uses [1]
Total uses	18.6
Petroleum	3.1
Natural gas	4.1
Coal	7.8
Hydropower	3.0
Nuclear power	.6

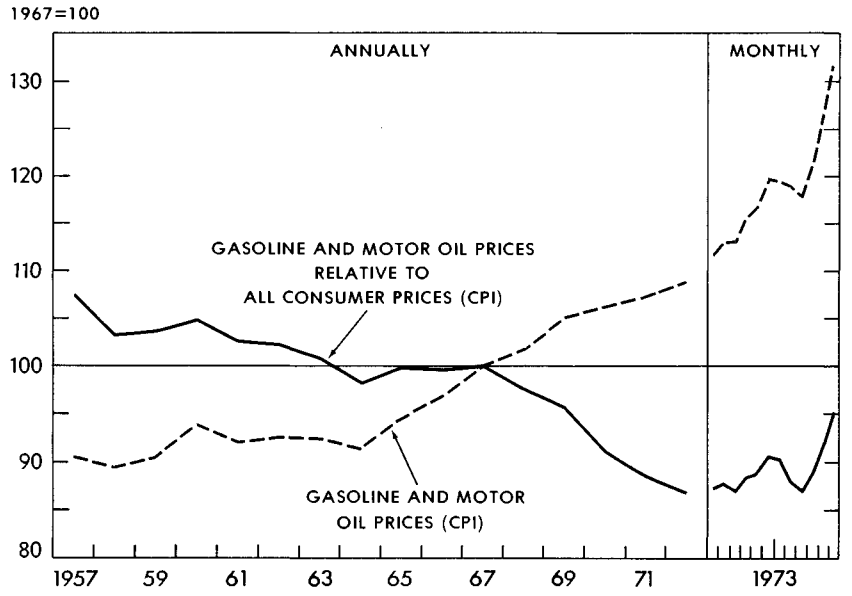
[1] Preliminary.

Source: Department of the Interior, Bureau of Mines.

Wholesale energy prices in the United States were quite stable, relative to other wholesale prices, during the 1960's. But toward the close of the decade the price of coal began to move upward, and in 1973 petroleum prices increased sharply (Table 30). Consumer prices of energy actually were declining from 1960 to 1972, relative to other consumer prices. For instance, the relative price of gasoline and motor oil fell 17.2 percent between 1960 and 1972 but began to increase steeply near the end of 1973 (Chart 7).

Chart 7

Consumer Prices of Gasoline and Motor Oil



SOURCE: DEPARTMENT OF LABOR.

TABLE 30.—*Wholesale prices, all industrial commodities and selected fuels, selected periods, 1950–73*

[1967=100]

Periods	All industrial commodities	Coal	Crude petroleum	Gas fuels	Electric power
1950	78.0	83.3	83.2	(1)	(1)
1960	95.3	95.6	98.6	87.2	101.2
1970	110.0	150.3	106.1	103.6	105.9
1972	117.9	193.8	113.8	114.1	121.5
1973	127.0	218.1	126.0	126.7	129.3
December:					
1972	119.4	205.5	114.7	119.2	122.9
1973	137.1	240.7	146.2	137.6	135.9

[1] Not available.

Source: Department of Labor, Bureau of Labor Statistics.

During 1973 the United States also experienced threats of shortages of petroleum and natural gas, and in some areas of the country electric power brownouts and blackouts. Shortages of petroleum intensified late in the year, following an October decision by several Arab nations to cut back crude oil production and to curtail shipments to the United States. By the end of 1973 our once abundant and secure energy supplies seemed to be seriously threatened; and what appeared earlier in the year as a problem turned into a crisis. To conserve scarce petroleum, a variety of restrictions previously unknown to peacetime America had to be adopted. They focused attention on the dependence of the economy on energy, the importance that oil imports have assumed, and the vulnerability of the economy to arbitrary acts by foreign states.

The energy crisis has its roots in events dating back a decade or more. To understand the present situation, it is necessary to examine the factors that have influenced energy supply and use in the United States.

Natural Gas

Since 1954 the Federal Power Commission (FPC) has regulated the wellhead price of all natural gas sold to interstate pipeline companies. The FPC maintained prices at approximately the same level throughout the 1960's. In response to increased exploration costs and constant prices, producers cut back on exploration, so that the ratio of reserves to annual production declined rapidly from over 20 in 1960 to 10.5 in 1972. At the same time, the use of natural gas was expanding rapidly. With a growing gap between production and desired consumption, producers called for deregulation to permit higher prices and to stimulate exploration.

Beginning in 1969, the regulated price was permitted to rise. The natural gas shortage continued to intensify, however, as demand received an additional stimulus from environmental limitations imposed on the use of high-sulfur coal and high-sulfur oil. The FPC estimated that in 1973 the shortage reached 7 to 10 percent of demand at the prevailing price. To restrict con-

sumption to available supplies, the industry has been forced to curtail deliveries under both firm and interruptible contracts. In addition, many gas distributors have been unable to add new customers. Recently, arrangements were made to import liquefied natural gas (LNG) at a price several times the domestic price for natural gas. Because the gas price has been maintained below the market-clearing level, a heavier burden has been placed on other fuels, mainly oil.

Petroleum

In 1959 the Mandatory Oil Import Program was adopted to limit dependence upon foreign sources of supply. This program was partly a response to the curtailment of Middle East oil exports during the Suez Crisis of 1956. Under the program, quotas were imposed on imports of oil, especially crude oil. These quotas increased the profitability of domestic production and led to additional drilling. The major oil-producing States had earlier established a maximum efficient rate of recovery (MER) for oil fields, and had limited production to some percentage of MER. This prorationing, together with import quotas, served to support the domestic price above the price of imports. In addition, prorationing resulted in excess capacity in crude oil production, in the form of production below MER.

After 1960 the only major new discoveries of petroleum in the United States were on the North Slope of Alaska and on the Outer Continental Shelf. In the "lower 48" States, the ratio of proved reserves of crude oil to annual production declined throughout the 1960's. Excess crude oil production capacity also declined as allowable rates of recovery were raised by the State regulatory agencies. This permitted output to increase rapidly during the 1960's. But after 1969 the increases in production failed to keep pace with the growing domestic demand. As an alternative to raising the supported price which would have stimulated domestic production and restrained demand, exceptions were made to the existing quotas, to permit a greater level of petroleum imports. Finally, in April 1973, the system of import quotas was abandoned altogether in favor of a flexible import fee. This fee is currently set at a low level to encourage importation.

Beginning in the late 1960's, the expansion of domestic refinery capacity failed to keep up with the growing demand for oil products. Frequent exceptions to oil import quotas and the continuing review of the Mandatory Oil Import Program gave rise to uncertainties about whether future policy would encourage importation of crude oil or of refined products. In the face of this uncertainty few new domestic refineries were built. In some cases domestic refinery construction may also have been discouraged by the difficulty of finding a site that would not arouse community objections for environmental and other reasons. In addition, the income tax credit to companies for income taxes paid to foreign governments may have increased the incentive to build refineries outside the United States.

The use of petroleum products in the United States increased by 66 percent from 1960 to 1972. Much of this increase occurred in the transporta-

tion sector, which in 1972 accounted for 53 percent of the Nation's total petroleum use. A low excise tax has made the retail price of gasoline lower in the United States than in most other developed countries. The low gasoline price and a rapid growth in incomes have contributed to large increases in the number of motor vehicles on the road and in the total mileage driven, and thus to the rapidly growing demand for gasoline. Gasoline consumption has also been increased by the trend toward heavier automobiles with air conditioners and automatic transmissions, and by the use of emissions control devices. This expansion in demand for petroleum products was underestimated, as was the need for additional refinery capacity to meet that demand, with the result that the United States became heavily dependent on imports of refined products.

Imports of crude oil and refined products rose from 22 percent of domestic consumption in 1969 to 36 percent in 1973, prior to the embargo. For the first 9 months of 1973 the U.S. share of total world oil imports amounted to 19 percent. This increased U.S. dependence on imports coincided with, and probably contributed to, a general tightening of the world petroleum market.

In the mid-1960's the governments of the oil-exporting countries gradually began to assume a greater measure of control over crude oil production and pricing decisions. The Organization of Petroleum Exporting Countries (OPEC), which was formed in 1960, began to function effectively as a cartel in the 1970's. Excess capacity in crude oil production had begun to disappear in the United States, Canada, and Venezuela, thereby strengthening the market power of the Middle Eastern nations. This market power was further increased by the rapid growth in demand for petroleum. For example, from 1960 to 1972, oil consumption grew at an annual rate of 11.0 percent in Western Europe and 17.4 percent in Japan. When it became apparent that the United States would also have to expand its oil imports, the exporting countries, working through OPEC, were in a strong position to raise prices and thus to realize monopoly profits.

Coal

Although coal is our most plentiful energy resource, its use in the United States has not expanded since 1966. Enactment of the Coal Mine Health and Safety Act in 1969, together with a host of labor problems, caused a large rise in the cost of underground mining, and a decline in output. The reduction in output, together with increased transportation rates, led to the rise in the price of coal referred to earlier. The higher price, coupled with the development of improved equipment, spurred an expansion in surface mining. But the price rise encouraged many industries and utilities to switch to other fuels. Environmental regulations imposed at both the Federal and State levels prevented the use of high-sulfur coal in some areas and accelerated the substitution of other fuels. Because of the unavailability of natural gas, most of the burden has fallen on oil.

Electric Power

Until recently it was widely expected that nuclear power would be a major factor in meeting the increased demand for electricity in the early 1970's, but construction of nuclear reactors has fallen far behind schedule. Technical problems in their design and construction have been partly to blame, but there have also been unexpected delays associated with the siting of new power plants. To some extent both the construction delays and the siting delays are attributable to time-consuming litigation resulting from increased public concern about nuclear hazards and thermal pollution of water by these reactors.

Meanwhile the demand for electricity has continued to grow rapidly. So far the increased demand has been met largely by the use of fossil-fuel power plants, but in some regions the new construction of these plants has been insufficient to meet demand at existing prices. To some extent this situation may have come about because the delays in the construction and use of nuclear reactors were largely unforeseen. There is also evidence that some electric utilities underestimated the rate at which demand would rise; the rapid growth in the number of electrical appliances was not fully anticipated. At present, however, an even more serious problem for the electric utilities than the shortage of power plants is the shortage of natural gas and residual fuel oil, together with environmental restrictions on the use of coal.

THE ENERGY CRISIS

The energy crisis originated in a large number of circumstances none of which was sufficient in itself to disrupt the economy seriously. Their convergence in 1972–73, however, touched off a dramatic change in the domestic energy supply-demand balance.

During most of the 1960's the United States retained the capability to become rapidly self-sufficient in energy production, but this capability quickly disappeared in the last part of the decade. The natural gas price was kept below the market-clearing price, thereby creating a shortage and leading to an increased demand for oil. The demand for oil was further increased by environmental restrictions on the use of high-sulfur coal as well as by delays in the construction of nuclear reactors. Domestic refinery capacity was unable to meet the rapid expansion in demand for petroleum products. Although the domestic price of crude oil was supported above the price of imports, the price was not sufficiently high to discourage a rapid growth in demand or to encourage an adequate expansion in domestic production.

Preventing a rapidly growing dependence on oil imports would have required maintaining a higher domestic price. Because the enormous oil reserves in the Persian Gulf area were expected to be available to us at a very low price, a decision was made to permit exceptions to the limitations on imports of petroleum products rather than allowing further increases in the domestic crude oil price. Partly because of this increased reliance by the

United States on oil imports, OPEC could more confidently reduce crude oil output and raise the price.

Near the close of 1973 the Federal Energy Office projected that the reduction of oil imports into the United States during the first quarter of 1974 would result in a deficit of 2.7 million barrels per day, or 14 percent of total U.S. petroleum consumption. The deficit was projected to increase to 17 percent by the fourth quarter if the import curtailment continued. This projection does not adjust for the effects of higher prices on domestic demand and production. In addition, the projection assumes that there will be no leakage in the embargo and no increases in oil imports from countries not participating in the embargo. For these reasons, the projected deficit overstates the amount by which petroleum use must be reduced through nonprice conservation measures.

RECOVERY FROM THE CRISIS

The disruption generated by the unexpected reduction of oil imports has both a supply and a demand aspect. On the supply side the country has abundant energy resources for the long run, although at costs that are substantially above past levels. But in the short run there are constraints on the rate at which exploitation of these resources can be accelerated. Some increased oil and natural gas production can be obtained from existing fields, but large increases require development of new fields. There is a long gestation period for new investment in most energy-producing industries. New oil and gas fields do not begin to produce for at least a year and are not fully developed for several years. Pipelines, refineries, and nuclear reactors all take time to build. As a result the economy has less flexibility to expand energy production in the short run than over a longer period.

There is a comparable short-run inflexibility on the demand side. Most energy is used as a production input in conjunction with some item of capital equipment: for example, in a furnace to produce heat and in an automobile to produce passenger miles. To a large extent equipment design determines the energy requirements per unit of output. In some cases there is scope for reducing energy use per unit of output, but usually only to a limited extent. By increasing load factors in airline flights, for instance, the same number of passenger miles can be obtained with less jet fuel, although the inconvenience may be greater. In other cases, as in the use of clothes dryers or air conditioners, the energy-output ratio cannot be changed.

The Nation's capital stock was built during a period when energy prices were low and were expected to remain so. In view of the prices that are likely during the next few years, much of the capital stock is inappropriately designed. To obtain a major reduction in energy use without a decrease in output, we must replace the stock of capital with machines and equipment that use energy more efficiently.

A distinction should be made, however, between industrial output and household output. The latter refers to the services provided by the use

of consumer durables. There is considerable scope for conserving energy by reducing household output: for example, lowering thermostat settings and driving fewer miles. Unlike reductions in industrial output, these measures generate little unemployment, and for this reason they play an important role in the Administration's energy conservation program. During 1974, cutting back on energy used in the household will be the best available means of conserving energy without paying a high price in increased unemployment or reduced incomes.

Pricing Policy

Because of these inflexibilities with respect to energy production and use, market equilibration of demand and domestic supply in the short run would require very large price increases, at least for a year or two. Even though price increases would gradually stimulate additional production at higher cost, profits would also increase—especially before the additional production is forthcoming—and this raises problems of equity.

If price increases are not allowed, however, there will be insufficient incentives for consumers to reduce demand and for producers to expand reserves and output. Substantial excess demand would then result, requiring an extensive system of controls, allocations, and rationing. Because of serious data limitations, it is impossible to design these measures so as to ensure that resources are efficiently used. Heavy reliance on such measures is likely to lead to an inefficient use not simply of energy resources but of all resources, and thus might delay our recovery from the crisis. One has reason therefore to question the efficacy of such controls for more than a very brief period.

In addition, holding prices down is likely to create expectations that prices will rise in the future, thus further discouraging increases in production and sales. Because fossil fuels are exhaustible resources, sales made today are at the expense of earnings in the future. If the rate of appreciation of the value of a resource is expected to exceed the rate of return on alternative investments, there is little incentive to sell. A greater return could be earned by holding back production and building up inventories than by immediate sale. It has been argued that the domestic output of natural gas has been held down during the past few years, partly because of expectations that large price increases would be permitted.

These considerations argue for letting energy prices rise so that markets will clear, and for initiating a tax to limit windfall profits. In this way, the price system is permitted to play an important role in guiding production decisions and encouraging consumers to conserve energy.

With respect to the price of domestically produced crude oil, a distinction has been made between "old oil" and "new oil," the latter referring to all oil produced on a property in excess of output in the same month of 1972. To stimulate increases in production, the ceiling price has been removed from new oil production. The ceiling price on old oil was raised to $5.25 per barrel late in 1973 to reduce the widening gap between prices

of old oil and prices of imported and new crude. As required by the Trans-Alaska Pipeline Authorization Act, there is no price ceiling on oil produced from stripper wells, that is, those producing less than 10 barrels per day.

To limit windfall profits, the President recommended that Congress enact an Emergency Windfall Profits Tax. The proposed measure taxes increases in crude oil prices at rates graduated up to 85 percent on all sales of domestic crude oil at prices higher than base prices determined by reference to the December 1, 1973 ceiling set by the Cost of Living Council; the same price would apply in the case of uncontrolled oil. The tax, which would be phased out over 5 years, is designed to eliminate significant windfall profits resulting from short-term increases in crude oil prices, but to give producers enough incentive to invest in the expansion of crude oil output in the future.

Sound natural gas policy calls for more competitive pricing. The Administration has asked Congress to pass legislation deregulating prices on new interstate natural gas contracts. The Administration's proposal would permit the price to rise, in stages, toward the long-run, market-clearing level. Prompt steps in this direction are desirable as a means of avoiding the natural gas shortages that have recently occurred. Deregulating the interstate price will increase reserves and production and will permit users who depend on interstate pipelines for supplies to compete with intrastate users. Many electric utilities and industries now buy intrastate gas at a price above the regulated interstate rate. When the interstate price rises, more gas will flow in interstate commerce, where in many cases it will substitute for oil. Natural gas would thus be available where the need is most critical. Deregulation will also result in a greater output of natural gas liquids, a prime feedstock used by the petrochemical industry.

Prospects for Increasing Domestic Production

Production of petroleum, and of associated natural gas, can be increased within a year by expanding output from existing oil fields. Part of this increase will result from the use of secondary and tertiary recovery methods. An additional increase can come from maintaining the production of stripper wells that would otherwise be abandoned. Some stripper wells can be reworked to yield a greater rate of flow.

In 1973 most wells in the United States were producing at 100 percent of the MER. In most States the law does not permit production in excess of the MER, which is in principle the maximum rate at which oil can be extracted without seriously reducing the total amount of the resource that can ultimately be recovered from the field. But the MER is an imprecise figure. In many instances total output would be reduced by only a small amount if production went beyond the MER for 2 or 3 years. Moreover the MER should reflect economic as well as technological factors. The economically efficient rate of production is a function of market prices, both present and future. An increase in the value of oil today, relative to the expected future value, should lead to a more rapid rate of

recovery today. In some cases, therefore, it would be in the national interest to adjust the MER's upward.

Progressively larger increases in the production of petroleum and associated natural gas can be expected after 1974. Increases in the price paid for the so-called new oil will stimulate exploration, mainly offshore, and an expansion in production. It is likely that offshore production of crude oil will begin to rise by 1976. The Prudhoe Bay fields in Alaska are expected to begin producing by 1977 or 1978 and to yield up to 2 million barrels of oil per day by 1980, to be delivered via the new trans-Alaska pipeline, which received final congressional authorization in December 1973. It is expected that another pipeline will be completed by 1980 to ship associated natural gas from the Prudhoe Bay fields to the "lower 48" States. In addition, major new refinery construction and expansion plans have been announced.

In 1973, natural gas exploration increased sharply in response to increases in the wellhead price and a stepped-up rate of offshore leasing. The annual total of gas well completions in that year surpassed by 15 to 25 percent the all-time high reached in 1961. This high level of drilling is expected to be maintained in 1974 and will lead to a build-up of reserves. Production is likely to begin to rise in 1974 and to increase more rapidly in the following years, particularly if higher prices are permitted.

Energy Conservation

Higher producer prices for oil and natural gas will not only stimulate additional production but also dampen energy use and lead to a shift to coal in the industrial, commercial, and electric power sectors. An acceleration of the rate of construction of nuclear reactors and coal-fired power plants might lead to some substitution of electric power for oil and gas in the residential and commercial sectors.

Because the real prices of all fuels and electric power will be higher than in the past, there will be a substitution of other productive inputs for energy inputs, both in industry and in the household. Americans can be expected to drive cars that are smaller and have more efficient engines; to improve the insulation in their homes; and to pay greater attention to the energy requirements of appliances when making a purchase. In some parts of the country it will become economic to install solar space-conditioning systems that substitute energy from the sun for more conventional kinds. There will also be shifts in the composition of output away from energy-intensive goods and services toward those that use less energy.

These effects will restore the balance between domestic demand and production. The system of controls and allocations that was instituted at the close of 1973 to deal with the crisis will become increasingly less important, and it will be possible and desirable for energy resources to be allocated principally by the market system.

LONG-TERM PROSPECTS

The price of imported oil is now probably far above the long-run cost of supplying the entire U.S. market from domestic production. Because of OPEC's monopoly power, it is possible that the world price will remain above the long-run domestic cost for some time. The probability of this occurrence would be significantly increased if the United States were to continue to depend heavily on imports. Even if the world price were to decline, moreover, there would be a risk of a subsequent sudden sharp price rise or a cutoff of supply.

These prospects argue for an accelerated development of domestic energy resources. The United States has sufficient energy resources to last for centuries, even if demand continues to grow as rapidly as in the past. The Nation has untapped oil and natural gas resources on the Outer Continental Shelf. Synthetic hydrocarbon liquids and gas can be obtained from our vast shale and coal resources. Nuclear power may still play the role once expected of it, and the development of the breeder reactor will greatly expand the power that can be ultimately obtained from domestic uranium resources. New technologies that are being developed may eventually permit an economic use of geothermal, solar, and fusion power.

However, large capital investments are required to expand domestic energy production. The private sector will be willing to undertake this investment only if there is a reasonable assurance that the price will remain sufficiently high to provide an adequate rate of return. As long as domestic producers face the possibility of a significant decline in their price, the domestic investment required to expand production will be held back.

The risk to the domestic energy industry comes from the very low cost of producing oil in many OPEC countries. Although OPEC is now able to charge a price that is many times the cost of production, there is always the chance that OPEC countries will lower their prices substantially. Such a price reduction might result from a deliberate decision by producing countries to undercut U.S. energy producers, or from a breakdown of the cartel.

A decision regarding energy self-sufficiency in petroleum production is complicated by the important effect that U.S. policy may have on the price of oil imports. A U.S. policy oriented toward one price level is likely to help bring about a different price level and thus make the policy appear costly. A growing dependence on imports, however, involves a potentially higher cost than would result from expanded domestic production and also poses a threat to our national security.

Project Independence

In response to these considerations, in November 1973 the President inaugurated Project Independence, designed to ensure an expansion in domestic energy production so that the Nation would no longer be subject to economic disruption, or the threat of such disruption, from a sudden curtail-

ment of vital energy supplies. This program include large proposed expenditures for research and development, which are described below.

The choice of policies to bring about the capability for self-sufficiency in energy production should depend primarily on economic criteria. Because domestic energy investment is now inhibited by the risk that the oil-exporting countries will disrupt the market for political or economic reasons, the policy should be oriented toward reducing that risk. It is important, however, to ensure that the incentives for efficient domestic production will continue, and that any reductions in costs are passed on to consumers. In addition, policy should be designed to permit prices of different sources of energy to reflect differences in quality (or desirability), so that resources will be used efficiently. This means that, while the Nation needs to be protected from dependence on unreliable supplies, domestic producers should not be isolated from the normal business risks arising from domestic competition. Policy should not protect against the risk of a decline in the price because of technical advances by other domestic producers; to reduce this risk would encourage inefficient production. There should be adequate incentives for development of new products, for innovation in production methods, and in general for measures that reduce the social cost of producing energy.

One way to achieve the capability for energy self-sufficiency is to provide selective incentives for the introduction of designated new sources of energy, such as shale oil or synthetic gas from coal. For example, the Government could agree to purchase a specified amount of shale oil, over a number of years, at a guaranteed price. If the market price is above the support level, there is no need for the Government to act; but if the price falls below the support level, the Government would make deficiency payments to producers. Such action would encourage the development and construction of the necessary shale oil production facilities, while market forces would determine prices to producers of other types of energy and to energy users. This proposal results in lower profits to producers of conventional energy resources, for which no price guarantee is made.

A drawback of the proposal is that different energy sources would have different prices, thereby leading to an inefficient resource use. Moreover, the Government would be required to determine which new sources of energy to support. There is also a likelihood that production from nonsupported energy sources would be discouraged and that the Government could be forced to support an ever-increasing part of the market. For these reasons many believe it would be preferable to rely on general market incentives rather than selective subsidization.

It is also important to recognize that the exercise of monopoly power by the oil-exporting countries has increased the real cost of energy to the United States. Although Project Independence will reduce energy prices below the prices currently charged for imports of petroleum and liquefied natural gas, the cost of energy is unlikely to return to the pre-1973 levels. It is therefore

important that the higher costs be reflected in the prices paid by consumers, to ensure that they economize on energy use.

Another way to achieve the capability for self-sufficiency is to give domestic energy producers assurance that import prices would not fall below certain levels. Variable tariffs could be used to ensure that prices of imported oil and natural gas do not fall below such levels. This would ensure competition among domestic producers and would encourage development of the lowest-cost domestic sources of energy. The price of all energy sources would reflect their value to consumers and would therefore encourage efficient use.

An important factor in selecting an appropriate policy is the responsiveness of domestic supply to changes in price. Restricting energy imports may appear to be an attractive option if it is believed that the long-run domestic price will be, say, $5 per barrel of crude oil. But if the cost is expected to be triple that amount, import restrictions appear decidedly less attractive.

Role of Imports

At least until 1980 the United States will continue to depend on oil imports to supplement domestic production. As domestic energy output expands, it will be possible gradually to reduce this dependence. If imports can be obtained at a sufficiently low price, however, without posing a threat to our national security, they can continue to play a role in our long-term energy policy.

The risks associated with petroleum imports could be substantially reduced by means of a storage program. Petroleum could be stored both in salt domes and in the form of oil fields with shut-in production capacity. In the event of an unexpected curtailment of oil imports, the salt dome storage would be immediately available to offset the loss of foreign supplies; and the shut-in capacity would be available within a few months to supply petroleum until it is possible to produce from new wells. On the basis of the level of imports and an assessment of the risk of an actual or threatened reduction in foreign supplies, the Government could determine the appropriate amounts of storage and shut-in capacity.

Energy Research and Development

The principal object of a Federal energy research and development program is to develop new technologies that permit the production and use of energy at a lower cost to society, either by reducing the cost (including the environmental cost) of providing a given amount of energy or by reducing the quantity of energy needed to produce a given output of goods and services.

Until recently, most energy research and development has been conducted by the private sector. There is now a need for the Government to play a more active role, partly because of the long-term nature of many energy research and development projects and partly because of the fundamental nature of much of the research that is needed. There are other reasons. The

payoff from such projects depends critically on future Government policies with respect to environmental control, leasing of mineral rights, and import restrictions. It may therefore be unusually risky for private investors to undertake this research. Many kinds of research and development concerning energy involve benefits to society as a whole that cannot be fully captured by the investor, so that it is unprofitable for any one firm to conduct the research. Finally, the interdependence among projects provides a compelling case for the Government to provide an overview and to coordinate research and development in the energy field, though not necessarily to conduct the research itself.

There is an additional potential benefit that might result from an energy research and development program. By making a coordinated effort to develop those technologies required to ensure self-sufficiency, the United States will improve its bargaining power vis-a-vis the oil-exporting countries. In this way a federally coordinated energy research and development program may play an important role in forcing the world price of oil down to the competitive level.

A major component of Project Independence is a stepped-up program of energy research and development. The Administration has recommended an expenditure of $10 billion over a 5-year period beginning with fiscal 1975. This program is principally addressed to the accomplishment of six tasks:

1. Improving the efficiency of energy use and of the conversion of fossil fuels to electric power.
2. Increasing the domestic production of petroleum and natural gas.
3. Expanding the use of coal.
4. Increasing the use of nuclear power.
5. Developing renewable energy sources.
6. Reducing the environmental effects associated with all stages of energy production and use.

The Administration's research and development program represents an important step in moving the economy toward an established capability of being self-sufficient in energy production. However, the program deals only with the technological aspect of energy production and use.

Energy production is limited not only by the state of current technology, but also by economic incentives. The prospect of higher energy prices will accelerate the development and application of technological advances by the private sector. If the private sector is given a larger role in Project Independence, expenditures on research and development will be more closely geared to those techniques likely to become commercially applicable, thus further assuring the success of the program.

ENERGY AND ENVIRONMENTAL POLICY

The Nation's urgent need for adequate and dependable supplies of energy has raised concerns about how efforts to fill the need will affect the goal of

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improving the environment. The fundamental premise of economic policy is that the Nation's total resources must be allocated as efficiently as possible. This concept includes careful allocation of our scarce environmental resources, but it does not follow that environmental policy should be insulated from other problems and policies.

In enacting laws to protect environmental quality, Congress was responding to the strong public demand that environmental resources—clean air, water, and land—should be enjoyed as amenities rather than used as receptacles to absorb residual wastes of production and consumption. The new legislation set environmental standards that would be costly to achieve, but it did so with the presumption that the goals were worth the costs. However, the standards also assumed certain basic cost relationships among the additional resources devoted to meeting the standards; the energy crisis has disrupted these relationships by sharply raising the cost of fuels.

As the price of energy increases, environmental policy provisions that call for significant consumption of energy become more expensive, and energy-conserving provisions become cheaper. If policy adjustments are not made, unnecessary amounts of society's scarce energy resources will be used to attain any given level of environmental quality. Adjustments to avoid such waste do not represent a change in the relative importance that either the Government or the public places upon environmental quality. Instead, they are similar to the reduction in consumption that occurs if the price of any commodity increases significantly while other nonprice influences on the consumption of that commodity remain unchanged. The appropriate short-term adjustments indicated in environmental policy because of energy price increases have two requirements: First, they must accurately reflect the increased scarcity of energy expected in the near future; second, they must not interfere unnecessarily with appropriate adjustments to the somewhat less intense scarcity of energy likely to prevail in the more distant future.

Thus, provisions of environmental policy that save energy become cheaper, and as a result comprehensive efficiency criteria indicate a greater use of them. For example, to achieve the air quality standards specified in the Clean Air Act, the Environmental Protection Agency (EPA) has stated that a very substantial reduction in the number of vehicle miles traveled (VMT) by automobiles and lightweight trucks will be necessary in several large urban areas. This reduced fuel consumption would be desirable both in countering the energy crisis and in improving the environment. Since higher energy prices reduce the costs of such VMT reductions, efficiency criteria suggest faster implementation of this particular environmental policy. In accordance with this view, the Administration has acted to provide on a priority basis for substantial funding of mass transit in areas in which air quality will require large VMT reductions.

The theory of implementation in the Clean Air Act calls for the States to formulate plans to achieve the act's air quality standards. The act requires only that the more important primary or human health standards be

met in 1975, but stipulates a "reasonable period of time" for attainment of the secondary standards which are intended to protect esthetics and vegetation. However, some States required in their plans that the secondary and primary standards be reached at the same time, and this became legally binding under the Clean Air Act. Such advanced timing of the environmental goals would require much more low-sulfur coal than is now available domestically. It would also seriously constrain the ability of other States to reach the more urgent primary or health standards. Although estimates vary, the so-called clean fuels deficit is roughly equivalent to one-quarter to one-half of all coal burned in 1970. In States with advanced secondary standards and in States where the primary standards will not be met, the only legal course open to coal-burning utilities would be to switch to low-sulfur oil or natural gas. In a period of high prices and short supplies for these fuels, such substitution is inefficient.

The Administration has therefore proposed in the Emergency Energy Act to give the EPA the authority to postpone attainment of the secondary air quality standards in States where such action would reduce the clean fuels deficit. One longer-term danger of this action, however, is that it removes some of the incentive that users of high-sulfur coal would have to develop improved emission control technology. A relatively easy way to restore this incentive, and give it a more efficient form, would be congressional enactment of the Administration's sulfur emissions tax proposal.

This example of the adjustments in enviromental policy that are indicated by higher energy prices is only a postponement of an implementation schedule, not a lowering of standards or other change in the policy itself. As a short-run response to the energy crisis, postponement has two advantages over a structural policy change. It entails less risk of obstructing the realization of long-term goals of environmental policy; and it avoids adding to the uncertainty about these goals which might inhibit the investment required by both energy and environmental needs.

Efficient Environmental Policy: The Post-Crisis Challenge

Although postponing the implementation of environmental standards is preferable to revising such standards, one should not conclude that current standards are optimal and need no revision. Indeed, the standards—particularly those in the Clean Air Act—should be regarded as interim and provisional targets that reflect the urgency of the Nation's commitment to environmental protection at the time they were adopted. These standards may become more stringent or less stringent. In any event, they do not yet embody the careful distillation of scientific knowledge that will be required for the most efficient use of our scarce environmental resources in the longer run.

For example, air quality standards permit only specified concentrations of a limited number of particular pollutants in the ambient air. But, although concentrations of some pollutants might damage health or create other costs for some individuals, regulations to limit processes that release particular

pollutants into the atmosphere will also impose costs upon others. Standards ought to be based on a careful balancing of these risks, costs, and benefits, as they would be perceived and evaluated by fully informed individuals.

Not enough is known, however, about the ways in which activities that result in the release of pollutants are linked with ambient air quality to permit such a balancing, nor is enough known about the effects of various concentrations of pollutants upon human health. Another consideration is the efficiency of the means employed to reach optimal environmental standards once they are identified. Thus far, legal and administrative regulations and directives have been the principal instruments. Administrative capacity and legal enforceability require that these regulations be uniform and relatively simple. At the same time, the activity and organizations they seek to regulate are complex and varied. If individuals and enterprises had more discretion and flexibility, specified standards could be attained at a lower cost and with fewer scarce resources. Taxes, emission charges, and user charges are mechanisms that introduce this flexibility and efficiency into environmental protection.

AGRICULTURE

The problems and policies of American agriculture since the 1930's have been predominantly related to excess productive capacity and the adjustment of resources to that condition. A related condition was an underlying instability in agricultural prices and incomes brought about by variability in food production and foreign demand, and intensified by a slow response by consumers and producers to changes in prices. Government restrictions on farm output, which were adopted to deal with the problem of excess capacity, as a by-product also tended to reduce price instability.

In 1972 circumstances began to change in agriculture. One reason was a sharp rise in the demand from abroad for U.S. farm products. By 1973 the higher level of exports had eliminated almost all excess capacity, and long-standing restrictive agricultural policies were modified to encourage all-out production. In an important sense the disappearance of chronic excess capacity should be recorded as a success. With its disappearance, however, the second problem, instability, has now taken on more significance.

Wide swings in farm and food prices contribute to instability throughout the economy. This became especially clear in 1973 when rising food prices accelerated the overall inflation rate. Although instability will at times lead to reduced farm prices, there are existing standby measures that cushion the decline in farm incomes. Comparable measures do not exist at present to moderate an acceleration in consumer food prices.

New conditions now face agriculture. They have raised a new set of issues that are discussed in this section.

AGRICULTURE: FULLY EMPLOYED

The stabilization of agricultural markets, especially for grains, was an outgrowth of two related public policies designed to support farm income. There

was an underutilization of productive capacity in the farming sector, measured in terms of available cropland, underemployed labor, and underutilized capital equipment. In recent years this underutilization was a result of Government programs that provided payments to farmers and concurrently diverted or "set aside" land from production, usually on an annual basis. Since the early 1960's about one-sixth of the Nation's cropland was recorded as being withheld from production under Government land retirement programs. In addition to withdrawing land from production, farm programs caused sizable stocks of several commodities to be accumulated by the Government. Because of the stockpile program, substantial short-term fluctuations in either production or demand were largely offset by the accumulation or release of stocks of farm commodities under the various price support programs. These policies reduced instability in farm markets over the years at considerable cost in both Government budget outlays and intervention by the Government in the agricultural sector. As experience was gained, legislative and administrative actions were taken to "fine tune" production and restrict what was viewed as excessive accumulation of commodities under Government control. By the early 1970's the programs had become very effective in controlling total crop acreage to mesh prospective production with expected demand. Actual production varied, of course, with yields per acre, which were influenced by weather conditions. Nevertheless, a clear downward trend in stocks was evident and reflected the direction of Government policy (Table 31).

TABLE 31.—*U.S. grain stocks compared to grain utilization, selected periods, 1950–73*

Marketing year	End of marketing year stocks as a percent of total utilization			
	Wheat	Rice	Feed grains	Soybeans
Annual average:				
1950–54	52.1	8.5	24.9	2.9
1955–59	102.7	48.1	43.0	9.6
1960–64	96.5	14.0	49.4	8.6
1965–69	44.4	11.5	28.4	15.1
1970–73 [1]	45.8	14.6	21.2	9.2
1970	64.2	18.3	27.1	18.7
1971	48.6	23.0	18.9	7.8
1972	58.0	12.4	25.1	6.0
1973 [1]	21.7	5.7	15.0	4.6

[1] Preliminary.

Source: Department of Agriculture.

Disappearance of "Excess Capacity"

For years it was fashionable to talk of "excess capacity" in agriculture. The measure most widely referred to was the acres of cropland that were idled each year by Government programs. That measure seemed to be an adequate approximation, because if more output and hence more land were demanded the complementary inputs—labor, machinery, fertilizer, and seeds—would also be available to expand production. Several decades

of research and rapid mechanization had resulted in an abundance of these other inputs, particularly of labor, because of a continuous flow of work-saving technology into agriculture. If more production were needed—more crops, more livestock, or both—the resources were already on the farms of the Nation or could be readily purchased. Only during World War II, when vast amounts of manpower had been drawn off the farm, was a shortage of labor apparent. After that period, agriculture experienced a long succession of years with excess land, excess labor, and abundant supplies of purchased inputs.

This situation led to a widespread view that excess capacity was endemic in U.S. agriculture and that it would be large enough to cover almost any potential shortfall in world food production. Given time to expand production, the Nation's farmers could produce more of everything—more grain and soybeans, as well as more meat, milk, and other farm commodities—without substantial increases in costs or prices.

The amount of labor employed in agriculture adjusted downward throughout the 1950's and 1960's (Table 32). Without its being generally realized, the availability of labor to produce more livestock as well as crops slowly approached a balance with normal requirements for food production. So long as productivity of manpower in agriculture was growing rapidly from the addition of new capital equipment or other technological innovations, the remaining workers could meet the requirements for larger output without interfering with the continued exodus of workers from the agricultural sector.

TABLE 32.—*Change in inputs used in farming, 1950 to 1973*

Period [1]	Percent change (annual rate)			
	Cropland	Farm labor	Machinery	Fertilizer
1950 to 1955	−0.8	−3.7	2.9	5.9
1955 to 1960	−1.2	−4.5	−.2	4.7
1960 to 1965	−1.3	−4.2	.7	8.2
1965 to 1970	.0	−3.6	1.4	6.9
1970 to 1973 [1]	2.8	−.5	.3	2.6
1969 to 1970	1.0	−5.3	−1.0	2.7
1970 to 1971	4.1	−1.1	2.0	7.1
1971 to 1972	−3.6	−3.4	−1.0	−.8
1972 to 1973 [1]	9.5	4.7	2.9	3.3

[1] Preliminary.

Source: Department of Agriculture.

Labor productivity and farm output were moving uniformly upward until at least the mid-1960's. Then, recent evidence suggests, some of the trends flattened out. This was especially true in livestock production, which is more labor intensive than field crop production. The annual rate of increase in livestock output declined from 1.7 percent for each year in the 1960–65 period to 1.6 percent in 1965–70, and to only 0.9 percent annually after 1970 (Table 33). The reduced availability of labor placed new restraints on expansion of livestock production. Trade-offs between more crops or more

TABLE 33.—*Production and productivity in agriculture, selected years, 1950 to 1973*

Period	Percent change (annual rate)			
	Crop output	Livestock output	Crop output per acre	Livestock output per feed unit
1950 to 1955	0.9	2.1	1.3	1.3
1955 to 1960	2.3	1.3	3.7	−1.7
1960 to 1965	1.0	1.7	2.0	−.3
1965 to 1970	2.0	1.6	1.8	.1
1970 to 1973[1]	4.2	.9	2.4	−1.5

[1] Preliminary.

Note.—Annual rates of change are based on 3-year centered averages for years shown except for 1973 which is for a single year.

Source: Department of Agriculture.

livestock became more significant, although their existence went largely unnoticed until the burst of additional export demands for farm products after mid-1972. When market prices and Government policy encouraged stepped-up farm production, the response was less than expected. Additional acres were planted, and crop production rose. Meanwhile livestock production declined in aggregate, and the indexes of labor used in agriculture, which have been declining steadily for years, either increased or declined only marginally in 1973. These results suggest that some significant changes had occurred in the structure and excess capacity of American agriculture.

The persistent decline in the hours of labor employed on farms at least temporarily bottomed out in the past year. If the long downward labor adjustment is largely over, agriculture will have to provide higher returns to labor in the future in order to compete with the nonfarm sector for workers.

The growth in productivity of all inputs used in farm production has shown some slowing, although there is no indication of a plateau. Nor has the rate of increase in yields of crops shown a decline. But the productivity of feedstuffs used in livestock production has shown some decline, partly because until recently it was economical to substitute feedstuffs for forages in dairy and beef enterprises. Dairy products and meat are an important part of consumer food budgets and continuous improvement in the efficiency of feed conversion would help to hold down their real cost. For this reason there may be a need to review the organization and use of public funds in livestock research.

Expanding Farm Exports

Growing exports have been the immediate cause of the new pressures on agriculture's productive capacity and have contributed to the shift toward crop production, particularly since mid-1972. For years the United States has nurtured foreign markets for food and fiber with Government supported export promotion efforts. A few months before the burst of world demand for U.S. agricultural products, projections had suggested that a record $10 billion of exports could be achieved by 1980, up from $8.0 bil-

lion in fiscal 1972. Actually the accelerated foreign purchases since mid-1972 caused agricultural exports to reach $12.9 billion in fiscal 1973 and $17.5 billion in calendar 1973. About 60 percent of the increase in fiscal 1973 was caused by increased volume; the remainder came from higher prices.

Causes of export growth. An important question is whether the increased demand for exports is traceable to abnormally poor weather conditions in other countries or a longer-term rise in world demand. Both of these have contributed to export demand in the 1972–73 period. Poor crop harvests during 1972 in many countries were certainly a major factor: world grain production fell 2.7 percent below the previous year.

However, there are two reasons to believe that U.S. exports have moved to a higher plateau. First, the demand for red meat and poultry in Western Europe and Japan has been expanding as incomes improved. The sharp economic expansion of 1972–73 combined with the depreciation of the dollar to augment this basic trend in 1973. In fiscal 1973, Japan and Western Europe accounted for about one-half of the growth in export volume.

The second factor has been growing markets in the Soviet Union, the People's Republic of China, and Eastern European countries. The key here is primarily how much these countries import in total, not how much they buy from the United States. The initial U.S. sales of grains to the U.S.S.R. in mid-1972 were caused partly by very poor Soviet crops, but they also stemmed from an earlier Soviet policy decision to improve consumers' diets. Implementation of the decision will mean higher Soviet grain imports, on average, in the future. Their grain purchases in 1972–73 together with Chinese purchases accounted for about a third of the increased export volume of U.S. grain in fiscal 1973. Even if such purchases are smaller in the future, they can be significant in maintaining exports at high levels.

Domestic market complications. Isolated from domestic food markets, the record on farm exports is impressive. However, the greatly expanded exports have had significant implications for domestic food markets. When more feedstuffs are shipped abroad, the result is increased competition and higher prices for the remaining supplies. This became clear in 1973 as the production of livestock products failed to respond to sharply higher livestock prices. The very large exports of feed grains and oilseeds raised the costs of livestock production, thus reducing incentives to producers.

The problem was highlighted in 1973 when the contracted supplies of soybeans for export were thought to have exceeded the amount that would be available after domestic demands were met. This finding led to a temporary embargo and a later licensing of exports of soybeans (and related products) for the months of July through September. After harvesting of large crops began in the fall months, all restrictions on exports were removed, although a newly instituted reporting system on forward export sales was continued under new farm legislation passed in 1973.

The controls on soybean exports seemed justified by special circumstances which made domestic processors and livestock producers unable to pay world prices for the available supplies of soybean products. The ceiling prices on red meats in March, the later freeze on all food prices in June, and the rising costs of feedstuffs combined to place producers in a severe profit squeeze. As a result, they cut back their production plans and began to slaughter breeding animals, a response that could have seriously reduced food supplies for many months and even years if it had continued. However, the export controls raised serious conflicts among a variety of national objectives. Removal of meat price ceilings and the earlier termination of all special efforts to expand exports gave domestic and foreign buyers equal access to U.S. supplies of feedstuffs and food commodities, thereby reducing the necessity of export controls.

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The recent shifts in resource use and output mix in agriculture have occurred in response to increased worldwide demands for agricultural products and tighter domestic supplies of farm resources. These changes have brought an end, at least temporarily, to the chronic excess capacity in agriculture. Exports have expanded swiftly, so much that large carryover stocks of grain commodities have been depleted. With supplies of feedstuffs for livestock extremely tight, livestock production has stopped expanding. Crop and livestock production are now competing more directly for the Nation's farm resources. Over the last year, extensive adjustments have occurred in agriculture in response to changing price relationships and sharply rising prices. Tightened markets for food have brought a new awareness of many interrelationships that could be safely ignored during periods of surpluses and have made policy decisions relating to food and agriculture more complex.

AGRICULTURAL POLICY FOR THE FUTURE

Significant progress has been made in the past decade toward less Government intervention in and control of farm production. The agricultural acts passed in 1965 and 1970 moved the Government out of mandatory control programs for major farm commodities and provided a more flexible and effective means of controlling farm output. Another significant step toward making farm legislation more market oriented was taken when Congress passed the Agriculture and Consumer Protection Act of 1973, whose principal innovation is a system of target prices for wheat, feed grains, and cotton. When market prices are above the targets, no Government "deficiency payments" are made to farmers and the Government has little involvement in agriculture. In years when market prices fall below the target prices, Government payments to farmers make up the difference between target and market prices on base production. The Government also places a floor under market prices by being ready to purchase crops from farmers at relatively low prices. Farmers are thereby assured in two ways of at least

a minimum income. Unless prices fall so low that the Government begins to accumulate inventories of commodities, however, its role is limited to making deficiency payments when they are required.

With this change in basic farm programs, market prices assume more importance in guiding resources into production. Market prices will also have greater importance in allocating U.S. agricultural products among competing buyers. The intensity of market competition is likely to be much greater in the coming year than was true under the surplus conditions of the past.

The Need for Improved Information

The 1973 act is particularly well suited to current conditions in agriculture. It permits the market to signal to farmers what priorities domestic and foreign purchasers are placing on various commodities and products. The act allows, and indeed mandates, the Government to provide market information to the private sector, so that decisions will be based upon the fullest possible knowledge about trends in market conditions. In fact, the production period for both crop and animal production is so long that current prices may be a misleading guide to the most profitable future operations. Under these conditions, advance information is especially necessary for efficient farm production.

Export demand is one important area in which a deficiency of information became apparent in 1973. The Administration has taken a number of steps to improve the flow of current economic intelligence regarding worldwide agricultural developments through consultations with other countries. Among other actions, it initiated a World Food Conference to be held in 1974 under the auspices of the United Nations. A bilateral agreement has been signed with the U.S.S.R. that will make possible more accurate forecasts of worldwide production and demand. The agreements between the United States and the Soviet Union will facilitate more prompt exchange of information on crop and livestock production. In June the Department of Commerce initiated a reporting system for forward export sales of major agricultural products. The new farm legislation later made this a permanent system under the administration of the Department of Agriculture.

Steps also have been initiated to improve domestic farm and food forecasting and planning. The Department of Agriculture has requested, and the 1975 budget will contain, increased funds to strengthen its information and analysis services to the rest of the Government and the private sector. The need and scope for such activities were less as long as agricultural reserves existed in the form of stockpiles or idle acres. Under today's conditions, it is essential to give high priority to this aspect of the Government's work.

Government Food Stockpiles

One very important issue has emerged in 1973 and remains unresolved: What policy should the Government pursue on grain stockpiles? In the past two purposes have been served by such stocks: as "operating stocks"

which the private sector needs if it is to function normally, and thus would elect to hold; and as "contingency reserves" over and above normal operating requirements to cover variations in production or demand.

As discussed above, Government policies were directed toward and succeeded in gradually reducing grain stocks in recent years. In earlier years, a substantial fraction of stocks had been held by the Government; but virtually all of these were released in 1973, and total stocks reached the lowest level since 1953. Stocks of wheat, in particular, are only adequate to provide for normal operating inventories this year; contingency reserves are nonexistent both in the United States and in the world.

The unusually low grain reserves mean that the world is at present more vulnerable to poor harvests than it has been for some time. But stockpiling obviously cannot begin until world production levels have been built up. Otherwise, such a step would cause already high prices to escalate further, or necessitate a system of nonmarket allocations. Once a more normal supply-demand food balance is restored, which should begin to occur in 1974–75, stocks can be accumulated again. In the past the world has sought protection against crop failure by relying upon stocks held principally by the United States and Canada. Although this arrangement has worked, the current supply-demand conditions provide an opportunity to improve on the system. The Administration is exploring several approaches which, through cooperative action, could improve supply stability:

1. As a minimum, improved worldwide information flows are necessary to signal a tightening of supply-demand conditions as promptly as possible. Producers and consumers will then have the best opportunity to react to higher market prices.
2. Beyond that, multiyear forward sales contracts negotiated either privately or by governments could be used to provide more supply stability. Events of 1973 have encouraged importing countries and exporting firms to seek commitments looking farther into the future. These contracts can contribute to greater stability because they provide valuable information on prospective export demand to supplying countries and because production can thus be planned to meet contract sales.
3. A broader approach has been put forth by the Food and Agriculture Organization of the United Nations. It would seek to establish stockpiling guidelines that participating countries would follow in developing their national policies. The system would be voluntary; but to the extent that the guidelines were appropriately set and complied with this approach could increase supply stability.
4. A more rigorous approach would be to establish an essentially autonomous international agency having the resources to operate a buffer stock. Such schemes take various forms. They all present common problems, however, with regard to control, financing, and interference with desirable market activity.

The Administration supports the examination of multilateral approaches to the stockpile issue. It also recognizes that this country has an interest, as the world's major exporter, in maintaining necessary levels of stocks, since otherwise we could not be a reliable supplier of food for the world. It is also in this country's interest to have adequate stocks to provide a measure of domestic price stability. According to preliminary estimates a contingency reserve would not have to be large or costly in order to offset most instances of poor harvests or abnormal demand. Large costs in the past have grown out of excessively large stock build-ups under price support programs. The prospects are reasonably strong that market conditions will not again lead to excessive stock-building in the near future. Any accumulation of contingency reserves would therefore require that the Government purchase commodities in the market or have ready access to farm-held stocks under the Government loan program.

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Agriculture has always been a cyclical industry; and the fluctuations, though relatively minor, have been around a trend of general abundance in the United States. One cannot say with certainty whether the unusually tight markets of 1973 signal a turning point toward a period in which fluctuations will be around a trend of relative scarcity, or whether 1973 represents only an abnormally large cyclical swing. This increased uncertainty implies that agriculture must be prepared to adjust to market developments as promptly and efficiently as possible. The current Government policy, with minimum restrictions on market mechanisms, is designed to make that possible.