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Agriculture and Energy: A Legal Perspective

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By Doug C. Nelson*

Agriculture and Energy: A Legal Perspective

I. INTRODUCTION

During the latter part of 1973 and the early part of 1974 the United States experienced wide publicity given to a concept called the "energy crisis." The energy crisis caused and will continue to cause serious concern in agriculture, particularly with respect to petroleum and natural gas. Agricultural production is a sequence of interdependent energy using activities, commencing with fertilizer manufacturing and continuing through delivery of food and fiber to consumers from processing plants. The interrup-

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1. The concept of an "energy crisis" is highly controversial. See e.g., Roberts, Is There an Energy Crisis?, 31 THE PUBLIC INTEREST 17 (1973) (an "energy crisis" was disputed but instead there exists a number of distinguishable, if interlinked, energy problems); and Breimyer, Future Agricultural Production with Limited Energy (Paper #1974-4, Dep't of Agricultural Economics, Univ. of Mo., Columbia, 1974) [hereinafter cited as Breimyer] (the situation is a "cultural crisis" rather than one of energy).

2. Attention is focused on these fuels because they power more than 75 percent of the United States economy. U.S. DEP'T OF INTERIOR, UNITED STATES ENERGY, A SUMMARY REVIEW (1972) [hereinafter cited as U.S. ENERGY].

Sources of United States energy supply in 1973, as determined by the U.S. Bureau of Mines, are:

<table>
<thead>
<tr>
<th>Source</th>
<th>Percent of U.S. Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum</td>
<td>46</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>31</td>
</tr>
<tr>
<td>Coal</td>
<td>18</td>
</tr>
<tr>
<td>Hydropower</td>
<td>4</td>
</tr>
<tr>
<td>Nuclear</td>
<td>1</td>
</tr>
</tbody>
</table>

THE FORD FOUNDATION, EXPLORING ENERGY CHOICES: A PRELIMINARY REPORT 69, Chart 2 (Appendix C) (1974) [hereinafter cited as EXPLORING ENERGY CHOICES].

A study based on 1955 data demonstrated that 89 per cent of the purchased energy requirements for agriculture were derived from petroleum and gas. S. SCHURR & B. NETSCHERT, ENERGY IN THE AMERICAN ECONOMY 1850-1975, 264-92 (1960).

3. CALIFORNIA DEP'T OF FOOD & AGRICULTURE & UNIV. OF CALIF.-DAVIS, ENERGY REQUIREMENTS FOR AGRICULTURE IN CALIFORNIA ii (1974 [hereinafter cited as CALIFORNIA ENERGY REQUIREMENTS].
tion of energy flow during any time or segment of this agricultural system will restrain efficient production. Thus, the availability of petroleum and gas can affect agriculture, and in turn, have considerable impact on the consumer cost of food and fiber products. 4

This article will analyze the present agricultural uses of petroleum and natural gas, particularly by farmers, and the unique position of agricultural production. Second, the regulatory framework of petroleum and gas allocations and the contractual considerations of energy shortages are reviewed in the agricultural context. Finally, future expectations and policy considerations of agriculture and energy are discussed.

II. AGRICULTURAL ENERGY CONSUMPTION

During the past century a technological revolution has increased agriculture’s dependence on petroleum and gas. 5 Many of these advances have resulted in the substitution of purchased fuel for that produced on the farm. 6 Thus, agricultural productivity has been and will continue to be closely tied to petroleum and gas resources. 7

4. See generally Task Force of the Council for Agricultural Science & Technology, Energy in Agriculture (1973) [hereinafter cited as Energy in Agriculture]. Materials of the Council for Agricultural Sciences and Technology may be obtained by writing:
Dr. Charles A. Black
Executive Vice-President
Council for Agricultural Science
and Technology
Iowa State University
Department of Agronomy
Ames, Iowa 50010

5. Kletke, Agriculture’s Use of Energy, 46 Okla. Current Farm Econ. 4 (1973) [hereinafter cited as Kletke].

6. Id. Classic illustrations include the replacement of farm-fed horses with tractors, the substitution of windmill powered pumps with electricity, gas or petroleum power, and the utilization of artificially prepared fertilizers.

While farm production has doubled in the last 35 years, fuel consumption has more than quadrupled. However, the number of people employed on farms has dropped 70 percent at the same time that farm production per hour of labor used has jumped 555 percent.


Farming, which refers to the actual rural production of food and fiber, consumes three to four per cent of the total energy used in the United States. The total consumption of energy for agricultural uses from manufactured inputs through marketing of processed products is about 10.5 to 15.5 per cent of all energy used. The processing, packaging and transportation of agricultural products constitute the largest portion of energy consumption, and farm inputs such as fertilizers and machinery are the second major category of energy use in agriculture.

With respect to petroleum, farmers used approximately three per cent of the national total in 1972-1974, 4 billion gallons of gasoline, 2.2 billion gallons of diesel fuel, and 1.3 billion gallons of liquid petroleum (LP) gas. These petroleum products are primarily consumed in the operation of tractors and equipment for crop establishment, cultural operations and harvesting. The second major category of petroleum use on the farm is in the operation of trucks and pickups.

Natural gas provides nearly one-third of the nation's energy and supplies almost half of the energy of all industrial and residential markets, because it has been relatively inexpensive and is the most environmentally compatible of the fossil fuels. As an energy

[hereinafter cited as Schneeberger & Breimyer]. Professors Schneeberger and Breimyer have calculated that land and labor prices have nearly tripled since 1950 while fuel and fertilizer inputs have remained relatively inexpensive, hence the substitution of inexpensive fuel and fertilizer for land and labor has been economically rational. See also Youde & Carter, Energy and Agriculture: Economic Perspectives, 28 Calif. Agriculture No. 10, at 4 (1974) [hereinafter cited as Youde & Carter].


10. U.S. Dep't of Agriculture, Agricultural Situation 3 (January-February, 1974).

11. Id.


13. Kletke, supra note 5, at 5. Farmers use a relatively high proportion of the nation's LP gas (18 per cent) for the operation of tractors, crop drying, livestock and poultry space heating, etc.

14. Id.


source for farming, natural gas represented less than three percent of the total national consumption in 1972.17

More importantly, however, natural gas is critical to the manufacture of fertilizer.18 Anhydrous ammonia, for example, is the source of over 90 per cent of nitrogen fertilizers and it is directly dependent upon natural gas.19 The use of nitrogen fertilizer alone is credited with providing one-third of the productive capacity of crops.20

Additional illustrations of agriculture's dependence on gas and petroleum include: drying and conditioning of grains, livestock husbandry,21 irrigation pumping, and frost protection of orchards. Gasoline is also used by migratory workers to travel to their work sites,22 and aviation fuel is consumed by agricultural aircraft for certain types of seeding, fertilizing and pesticide operations.

Although the proportion of petroleum and natural gas use by agriculture is small when compared to the total demand in the United States, several factors must be considered. First, agriculture

18. Natural gas supplies 70 to 80 per cent of the total energy used in fertilizer production. About 60 per cent of the natural gas used in fertilizer production is for its chemical constituents, with most of the remaining 40 per cent used to provide process heat. TASK FORCE OF THE COUNCIL FOR AGRICULTURAL SCIENCE & TECHNOLOGY, THE U.S. FERTILIZER SITUATION AND OUTLOOK ii (1974) [hereinafter cited as THE U.S. FERTILIZER SITUATION AND OUTLOOK]. Production of fertilizer with natural gas in California represents 13.4 per cent of the total energy used by that state's agriculture in 1972. CALIFORNIA ENERGY REQUIREMENTS, supra note 3, at ii.
19. All 86 American plants which produce anhydrous ammonia use the Haber-Bosch process of combining \(N_2\) and \(H_2\) under high temperature and pressure, and natural gas is the source of \(H_2\) in all cases. Schneeberger & Breimyer, supra note 7, at 8. Although natural gas is not a feedstock for phosphate and potash, the other two major fertilizers, significant quantities of natural gas are used in their processing. U.S. DEP'T OF AGRICULTURE ENERGY LETTER, supra note 6.
21. Livestock husbandry encompasses animal care and feeding tasks, processing animal products, and controlling animal environments. ENERGY IN AGRICULTURE, supra note 4, at 6.1.
is increasingly dependent upon petroleum and gas inputs,\textsuperscript{23} and agriculture consumes more petroleum than any other industry.\textsuperscript{24} Further, in the near term, the demand for these fuels will be primarily determined by the stock of energy-using capital goods\textsuperscript{25} such as equipment and machinery. Consequently, agriculture will remain in vigorous competition for petroleum and gas supplies until technology provides an economical energy substitute for agriculture or the other sectors of the economy.\textsuperscript{26}

A second consideration is the importance of agricultural production within the economy of a particular region. That is, the national averages may mask the significance of petroleum and gas inputs within a particular locality.\textsuperscript{27} The availability and cost of energy may ultimately influence the competitive position of agricultural production in various areas, as well as agriculture's position in relation to non-agricultural production.\textsuperscript{28}

Third, agriculture's demand for petroleum and gas is subject to seasonal concentration within and between particular areas of the United States, such as high fuel use in the corn belt during spring planting and fall harvest.\textsuperscript{29} The timeliness of fuel availability for farm operations has a considerable impact on the quantity and quality of crop production.\textsuperscript{30}

Another aspect of energy in agriculture is the delivery of inputs to the farmer, as well as the transport of farm products to the processor and consumer.\textsuperscript{31} This phase of the agricultural system, in-

\begin{itemize}
\item \textsuperscript{23} Paxton, \textit{supra} note 9, at 6. In 1970, energy costs were about 12 per cent of the U.S. farm expenditure, but in some areas such costs were 20 per cent and higher. Schneeberger & Breimyer, \textit{supra} note 7, at 8.
\item \textsuperscript{24} House Comm. on Agriculture, 92d Cong., 20 (1971).
\item \textsuperscript{26} Historically, agriculture has relied heavily on the availability of petroleum as the power source of field machinery and road transportation. These moving uses, as compared with stationary uses, provide less technological substitutes of energy use.
\item \textsuperscript{27} In California, for instance, farm operations and transportation and processing of agricultural products used over five percent of the total energy consumed in that state in 1972. \textit{California Energy Requirements}, \textit{supra} note 3, at ii.
\item \textsuperscript{28} See Youde & Carter, \textit{supra} note 7, at 5. See also Schneeberger & Breimyer, \textit{supra} note 7, at 10.
\item \textsuperscript{29} Kletke, \textit{supra} note 5, at 6.
\item \textsuperscript{30} \textit{Energy in Agriculture}, \textit{supra} note 4, at 2.1. For example, if planting or harvesting operations are delayed beyond an optimum date, the crop yield will be reduced and quality of the crop will be lower.
\item \textsuperscript{31} See Breimyer, \textit{supra} note 1, at 5; \textit{Energy in Agriculture}, \textit{supra} note 4, at 7.1-7.4.
\end{itemize}
volving 2.8 million farmers in the United States,\textsuperscript{32} is inherently affected by the allocation of petroleum used in the movement of farm inputs, such as fertilizer, and the shipment of perishable farm commodities.

A fifth consideration is the impact of energy upon the domestic and world demand for food and fiber produced in the United States. Domestic demand for agricultural products is influenced by increasing energy prices which affect economic growth rates, general price levels and income distribution.\textsuperscript{33} World demand for agricultural commodities produced in the United States is affected by energy prices, balance of payments, economic growth rates and relative currency valuations.\textsuperscript{34} Thus, energy availability and prices will affect both the demand and supply of agricultural products.

Finally, agriculture is not only a consumer but also a source of energy. Plants are major converters of solar energy into usable and storable energy, and provide a renewable energy source.\textsuperscript{35} More importantly, agriculture's use of solar energy contributes substantially to the efficient production of food and fiber.\textsuperscript{36}

These factors demonstrate the complex and important role of energy in agriculture. Thus, the energy demand by agriculture and the allocative framework of petroleum and gas are evaluated in this context.

\section*{III. THE EMERGENCY PETROLEUM ALLOCATION ACT OF 1973}

During 1973, agriculture as well as other sectors of the country's economy, was faced with a worsening energy situation. As oil supplies became more scarce\textsuperscript{37} and farmers were in the process of har-

\begin{itemize}
\item[33.] Youde & Carter, supra note 7, at 4.
\item[34.] Id. See Energy in Agriculture, supra note 4, at 1.3.
\item[35.] Photosynthesis is the process through which a growing plant captures solar energy and stores that energy in chemical bonds within the plant tissue. Energy in Agriculture, supra note 4, at 1.2. See U.S. DEP'T OF AGRICULTURE ENERGY LETTER, supra note 6.
\item[36.] Energy efficiency, meaning the ratio of output per unit of input, in agriculture is highly dependent upon whether "free" solar energy is included. Schneeberger & Breimyer, supra note 7, at 9. Natural fibers, such as cotton, wood and wool, are more efficient consumers of fossil fuels than their synthetic competitors. U.S. DEP'T OF AGRICULTURE ENERGY LETTER, supra note 6.
\item[37.] Cessation of Middle East oil shipments to the United States in October and November, 1973 and the unilateral escalation of oil prices by exporting nations is largely responsible for this situation.
\end{itemize}
vesting crops, a mandatory allocation program for diesel fuels was established which gave farmers a preference in obtaining these fuels. Congress concluded, however, that such action was not adequate to meet the prevailing energy shortage, and passed the Emergency Petroleum Allocation Act of 1973.

The purpose of the Act is to enable and direct the President to deal with shortages and prices of crude oil, residual fuel oil and refined petroleum products in order to minimize the adverse effects of these shortages on the economy. Essentially, Congress urged the administration to implement a mandatory fuel allocation program directed toward accomplishing various objectives. One of these was the priority use of petroleum for the maintenance of agricultural operations and directly related services. With this goal in mind, as well as others, the Act directs the administration to promulgate price regulations and mandatory allocation of petroleum.

The regulatory agency of the Emergency Petroleum Allocation Act is the Federal Energy Administration ("FEA"), and within

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41. Id. § 4(b) (1) (C), 87 Stat. at 629.

42. Id. § 4(b) (2), 87 Stat. at 630.

43. Id. § 4(a), (b) (3) and (c) (1), 87 Stat. at 629-30.

each of the ten regional offices the FEA has designated an Agricultural Coordinator for assisting in resolving area fuel problems. The United States Department of Agriculture ("USDA") is also instrumental in assessing fuel and other short-supply situations of farmers, as well as attempting to resolve local supply problems. The state and field offices of the USDA's Agricultural Stabilization and Conservation Service ("ASCS") have been assigned these responsibilities in order to expedite FEA administrative action necessary to alleviate energy shortages.46

In addition to the federal administrative framework, state energy offices have been established under the auspices of the Emergency Petroleum Allocation Act46 to assist in procuring fuel for customers, as well as to administer programs of energy policy.

Under the FEA allocation regulations, the agricultural consumer of petroleum is referred to either as a "wholesale purchaser-consumer" or an "end-user." The classification wholesale purchaser-consumer includes a farmer or firm who receives an allocated product47 into a storage tank and subsequently uses more than 20,000 gallons of this product for its own agricultural production in any calendar year since 1971.48 An end-user is one who does not meet the bulk purchase and volume requirements of the wholesale-consumer status.49

The significance of the wholesale purchaser-consumer and end-user dichotomy is of limited importance to an agricultural producer. The classification, however, is crucial to non-agricultural users of allocated products because it establishes their basis of entitlements under the petroleum allocation program.50 The key feature of this status, insofar as an agricultural producer is concerned, is the ad-

47. Products allocated under the Emergency Petroleum Allocation Act are separated into nine separate headings for administrative purposes under FEA regulations. They are: (1) crude oil, (2) propane, (3) butane, (4) motor gasoline, (5) middle distillates, meaning diesel fuel, kerosene, home heating oil and stove oil, (6) aviation fuel, (7) residual fuel oil, (8) petrochemical feedstocks used in processing, and (9) other products including lubricants. See 39 Fed. Reg. 1932-49 (1974), as codified in 10 C.F.R. §§ 211.1-211.222.
49. Id. at 15972.
50. In general, it appears the non-agricultural end-user of petroleum is at a disadvantage in the procurement of fuels, relative to the purchaser classified as a wholesale purchaser-consumer. See 39 Fed. Reg. 15961 (1974), as codified in 10 C.F.R. §§ 211.1-211.225.
ministration of claims for fuel or additional fuel, and the designa-
tion of a petroleum supplier. 51

Agricultural production has been allocated 100 per cent of its
current requirements of the allocated petroleum product.52 That is,
a farmer or other agriculturalist who is within the FEA regulatory
classification of "agricultural production" is not subject to a reduc-
tion of his petroleum use. All other petroleum users except the
Department of Defense, 53 are entitled to only a percentage of their
current requirements or percentage of their base period needs.54

"Agricultural production," under FEA regulations is defined by
reference to industry code numbers set forth in the Standard Ind-
ustrial Classification Manual.55 Considerable debate has focused
on this definition, particularly because of the priority status of agri-
culture and the complexities of petroleum-using activities and in-
dustries associated with food and fiber production.56 In general,
"agricultural production" refers to farming, dairy, poultry, live-
stock, forestry and fishing activities, as well as agricultural fertili-
zer and chemical production, crop irrigation, grain and seed drying,
and farm to market trucking.57 The definition does not encompass

51. See notes 63-73 and accompanying text.
53. Id.
54. Id. Space heating is entitled to 100 per cent of current need subject
to a required temperature reduction. Except for the priorities of agri-
culture, defense and space heating, all other petroleum customers are
subject either to a fraction of their current needs or a percentage of
their historical purchase volumes, depending upon the petroleum use.
1936 (1974), as codified in 10 C.F.R. § 211.51 was so vaguely defined
that it resulted in inconsistent application of the agricultural petroleum
of the problems encountered in the definition of agriculture, see Sund-
quist, Removing Legal Constraints on Agriculture—Likely Impacts on
Producers, Agribusiness Interests and Consumers, 19 S.D.L. Rev. 512,
514-15 (1974). See also Energy in Agriculture, supra note 4, at 1.2,
wherein agriculture is narrowly defined to mean all activities until
the material produced loses its identity as a "farm product."
57. Agricultural production flying is also entitled to 100 per cent of current
requirements of aviation fuel, and such use of general aviation aircraft
under the FEA regulations includes:

- seeding, spraying, fertilizing, and dusting of food and for-
estry crops by air, the use of aircraft by those engaged in ag-
icultural production to transport priority supplies and per-
sonnel to sustain or increase crop and animal yields, to trans-
port crop, forestry, and animal products to distribution points,
and in commercial fishing.
veterinary and animal specialty services, nor landscape and garden services.

The agricultural production priority entitles farmers and other qualifying agriculturalists to receive their "current requirements," meaning the entire supply of an allocated product needed to perform their present operation. "Current requirements" is negatively defined by the FEA regulations. It does not include petroleum for subsequent resale by the agricultural producer.

Second, current requirements do not include the accumulation of petroleum inventory greater than that customarily maintained in normal business practices. This is an attempt to limit petroleum hoarding. The unresolved issue relating to permissible inventory levels is whether this means inventory during times of adequate supply or during a period of shortages. The latter interpretation might permit somewhat higher inventories to assure continued operations, particularly since agricultural petroleum storage capacities have recently expanded in agriculture.

A third limitation on current requirements is the constrained use of allocated products to conform with an energy conservation program. Basically, this is a nebulous efficiency requirement which requires agricultural producers to certify to their petroleum suppliers that a program is in effect. The voluntary conservation of energy use, nevertheless, is a primary component of the Emergency Petroleum Allocation Act.

An agricultural producer who is a new customer of an allocated product or needs a new petroleum supplier should attempt to make independent arrangements with a supplier. If the agricultural producer cannot locate or make arrangements with a supplier, his course of action will depend upon his status under the allocation program. That is, the agricultural producer who is an "end-user" (using less than 20,000 gallons per year), must submit an application to the state energy office for assignment to a supplier. On the other hand, if the agricultural producer is a "wholesale purchaser-consumer" (using 20,000 gallons or more per year), he must submit

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59. Id.
60. Id.
61. Id.
64. Id.
his application to the FEA regional office for supplier assignment. 65

Supposedly, an agricultural producer is considered to be a new customer under FEA regulations whenever a particular fuel is used for the first time. Hence, he may be required to apply for assignment to a supplier if he changes his fuel program and is unsuccessful in negotiating voluntary arrangements with a supplier.

Suppose an agricultural producer is unable to receive delivery of 100 per cent of his current requirements from his petroleum product supplier. 66 Perhaps the supplier refuses to continue historical bulk deliveries to the agricultural producer. Or the agriculturalist may experience an emergency fuel shortage, such as running out of fuel at mid-month. What are his remedies and what procedures should be undertaken? 67

Obviously, the agricultural producer should attempt to solve the fuel problem through settlement with the supplier, who is usually the local distributor. If such efforts are unsuccessful, he may contact the local ASCS office for assistance. The ASCS county executive director will coordinate the communication between the local fuel distributor, state ASCS office and the state energy office, in an attempt to mediate the dispute. 68

In the event of the supplier's unwillingness to deliver 100 per cent of the current requirement of petroleum product, the agricultural producer or ASCS director must apply to the FEA regional agricultural coordinator for assistance. 69 The supplier's refusal to continue historical bulk deliveries to the agricultural producer will require submission of a formal complaint to the FEA regional office.

After consultation with the local ASCS director and FEA regional office, the agricultural producer who is unable to resolve informally the delivery requirements with his supplier may seek enforcement of his allocation rights in the United States district court. 70 If he is dissatisfied with the result in district court, he

65. Id.
66. Various interpretations have been given to the FEA regulations by different oil companies to suit their respective purposes. Interview with C.W. "Jick" Myers, and Tom Fleming, Director and Assistant Chief Allocation Section, respectively, Arizona State Fuel and Energy Office, in Phoenix, September 24, 1974.
67. See generally, Herman, Selected Legal Aspects of the Energy Shortage, 1 BARRISTER No. 4, 17 & 18 (1974) [hereinafter cited as Herman].
69. Id.
may appeal to the national Temporary Emergency Court of Appeals in Washington.\textsuperscript{71} Under any circumstances, the FEA regulations expressly preclude retaliatory action on behalf of the supplier if the agricultural producer files a complaint or otherwise exercises his rights under the allocation program.\textsuperscript{72}

An agricultural producer who is experiencing emergency fuel shortages may petition the state energy office for relief. This office, which is established in each state, is delegated the authority to administer a set-aside program, wherein a percentage level of each petroleum product is reserved monthly for the purpose of meeting hardship and emergency situations.\textsuperscript{73} The state energy office may elect to use some of the set-aside petroleum to relieve the shortage by having a designated supplier make delivery to the petitioner.

IV. THE NATURAL GAS ACT OF 1938

Since the 1950s\textsuperscript{74} farmers have used natural gas as a source of power for such activities as irrigation pumping, crop drying and feed preparation. Fertilizer production also relies heavily on natural gas, both as a feedstock and as process heat.\textsuperscript{75} These agricultural producers generally receive natural gas from retail distributors,\textsuperscript{76} who in turn receive natural gas from interstate pipeline

\textsuperscript{5(a)(1), 87 Stat. 633 (1973).}

The Emergency Petroleum Allocation Act of 1973 incorporates by reference Section 210 of the Economic Stabilization Act, which specifically provides that any person suffering a legal wrong as a result of "any act or practice" arising out of the regulations may bring an action, without regard to the amount in controversy, in United States District Court for a declaratory judgment, injunctive relief, or damages.

Herman, supra note 67, at 17.


\textsuperscript{73. 39 Fed. Reg. 15969 and 15970 (1974), as codified in 10 C.F.R. § 211.17.}

\textsuperscript{74. Natural gas distribution may be divided into three periods: 1950-57, an innovating period for natural gas pipeline construction and initiation of service to users; 1957-1962, extension of more service to established customers; and 1962-the present, a reallocation period of gas service from one class of users to others. See MacAvoy, The Regulation-Induced Shortage of Natural Gas, 14 J. Law & Econ. 167, 190-91 (1971) [hereinafter cited as MacAvoy].}

\textsuperscript{75. Natural gas consumption accounts for an estimated 70-80 per cent of the total energy consumed in fertilizer manufacture. The U.S. FERTILIZER SITUATION AND OUTLOOK, supra note 18, at 8 & 9. See notes 18 & 19 supra.}

\textsuperscript{76. Retail gas distributors, which for the most part are regulated monopo-}
Unlike the mandatory allocation program governing petroleum products, allocations of natural gas are primarily regulated by the Federal Power Commission ("FPC") under the Natural Gas Act of 1938. During periods of gas shortages, pipeline companies may be forced to reduce deliveries to retail distributors who supply agricultural producers. This allocation concept is referred to as gas curtailment, and has been fashioned by the FPC to settle gas supply and demand differentials.

Lies like electric utilities, have their gas rates set by states through public service commissions.

77. Interstate pipeline companies are more commonly referred to as "jurisdictional pipeline" companies by the Federal Power Commission ("FPC") and the courts. This term refers to a pipeline subject to the jurisdiction of the FPC as the result of sales or transportations of natural gas under section 1(b) of the Natural Gas Act of 1938:

The provisions of this Act shall apply to the transportation of natural gas in interstate commerce, to the sale in interstate commerce of natural gas for resale for ultimate public consumption for domestic, commercial, industrial, or any other use, and to natural gas-companies engaged in such transportation or sale, but shall not apply to any other transportation or sale of natural gas or to the local distribution of natural gas or to the facilities used for such distribution or to the production or gathering of natural gas.


80. Because of the peak winter heating season, gas demand in the year's first quarter is substantially higher than the average demand for the year as a whole. In order to meet the first quarter demand, utility and industrial sales have been curtailed to some extent in that period during recent years. Hearings on Supplies of Natural Gas Before the Subcomm. on Minerals, Materials and Fuels of the Senate Comm. on Interior and Insular Affairs, 91st Cong., 1st Sess. 1 (1969). See Jacobs, Pipeline Pinch—Industries Facing Layoffs This Winter Because of Tight Supply of Natural Gas, The Wall Street Journal, October 31, 1974, at 36, col. 1.

81. The FPC follows the policy of examining the proposed end-use of an
In 1972 the United States Supreme Court, in \textit{FPC v. Louisiana Power \\& Light Co.},\textsuperscript{82} recognized the national gas shortage and the need for a comprehensive curtailment program.\textsuperscript{83} The Court upheld the power of the FPC to curtail interstate gas to all customers regardless of the character of sales.\textsuperscript{84} Therefore, customers such as agricultural producers, who purchase natural gas from interstate pipeline companies directly or indirectly, are within the jurisdiction of the FPC allotment system of curtailment. Second, the Court liberally interpreted the Natural Gas Act of 1938 to provide the FPC flexibility in the administration and enforcement of curtailment programs.\textsuperscript{85}

On January 8, 1973 the FPC issued several significant orders and opinions relating to the establishment of nationwide priorities for gas curtailment.\textsuperscript{86} The priorities of gas service during periods of curtailed deliveries by jurisdictional pipeline companies are predicated solely on consumer end uses, rather than on the basis of contracts. The basic priorities, in order, are: (1) residential users and commercial customers which use gas mostly for space heating; (2) applicant's gas during certification proceedings. See Consolidated Edison Co. v. FPC, 271 F.2d 942, 949 n.27 (3d Cir. 1959). Gas curtailment is a retroactive allocation of "inferior" end-uses on a pro rata basis. In City of Detroit v. Panhandle Eastern Pipe Line Co., 5 F.P.C. 983 (1946) the FPC initially adopted the concept of curtailment to alleviate post-war gas shortages. See \textit{Curtailment in Context}, supra note 78, at 1387 \\& 1388; and Recent Developments, 6 \textit{Ind. L. Rev.} 589, 599 \\& 600 (1973).

\textsuperscript{82} 406 U.S. 621 (1972).
\textsuperscript{83} Id. at 633-35. The Court in a 7-0 decision reasoned the FPC was best able to administer uniform curtailment programs, rather than states, because of biased interests of gas producing and consuming states, and some state commissions are prohibited from regulating retail sales of interstate gas, even though the Natural Gas Act has been interpreted otherwise. See Recent Developments, \textit{supra} note 81 at 591-92.
\textsuperscript{84} 406 U.S. 621 (1972). FPC curtailment jurisdiction of all interstate transmissions of gas, whether ultimately sold at wholesale or retail, is within the scope of the "transportation jurisdiction," in lieu of the "sales jurisdiction," of The Natural Gas Act of 1938. The latter interpretation would restrict curtailment programs to sales for resale. See note 77 supra.
\textsuperscript{85} 406 U.S. at 642. The Court determined the administration of curtailment programs is governed by section 16 of the Natural Gas Act, 15 U.S.C. § 717 (1970).
large commercial use and industrial requirements for plant protection, feedstock and process needs; (3) a “catch-all” category for all industrial requirements not otherwise specified; (4) industrial use of 1,500 to 3,000 million cubic feet (Mcf) of gas on a peak day where alternate fuel could be used; and (5) industrial use of gas for boiler fuel in excess of 3,000 Mcf per day where alternate fuel is present. Thus, according to FPC curtailment policy, residential use commands the highest priority for fuel and boiler fuel the lowest.

The cutback in gas supplies to fertilizer manufacturers as “industrial users” was the first major impact of curtailment on agriculture, and such action has resulted in wide public concern. Natural gas used for irrigation pumping, on the other hand, had been classified as a “commercial use” under the gas curtailment programs. Hence, such use has received a higher priority than industry.

More recently, however, the FPC has issued an interim order on the curtailment plan of El Paso Natural Gas Company, placing irrigation pumping in the classification of “industrial use” (priority 3). The FPC states:

Irrigation pumping has not been shown to be a commercial use of natural gas but should instead be treated as an industrial use. Pumping operations, and agricultural activities generally, more closely fit the “industrial” definition, i.e., “service to customers engaged primarily in a process which creates or changes raw or unfinished materials into another form,” as opposed to the “commercial” classification of customers “engaged primarily in the sale of goods or services.” However, if a particular irrigation pumping use of natural gas involves a use for which alternative fuels are not technically feasible, and if otherwise consistent with the definition of “process gas,” those requirements would qualify for inclusion in Priority 2 as “process gas.”

Although the interim order is applicable only to irrigators using natural gas from the El Paso pipeline, it may be applied to agricultural use generally. The Commission has generally tended to categorize other agricultural use of gas as “industrial,” and has uniformly applied its definitions to other curtailment plans.

87. Chairman Herman E. Talmadge of the U.S. Senate Agriculture Committee charged that the FPC is threatening the nation’s food supplies by curtailing gas deliveries to fertilizer manufacturers, and such action was intended to force Congress to end regulation of gas prices. The Arizona Republic, December 15, 1974, at A-23, col. 1.


89. Id. at 17.

90. Id. at 16.
The FPC has authority to effect a curtailment plan on an interim basis without hearings and in reliance solely upon the interstate pipeline company's allegations of need for such a plan.\textsuperscript{91} Thus, the agricultural gas user must consider the likelihood of continued gas shortages,\textsuperscript{92} the feasibility of conversion to alternative fuels, such as propane or diesel,\textsuperscript{93} and the expectation of higher natural gas prices.\textsuperscript{94} The unavailability of natural gas will also create a substantial increase in demand for petroleum. As a result, the FEA has recently adopted guidelines and procedures for temporary adjustments and assignments of propane and butane to consumers who have their normal supplies of natural gas curtailed.\textsuperscript{95}

From a practical viewpoint, the agricultural gas consumer who is experiencing a gas shortage, may initiate an appeal first with the retail distributor and subsequently with the state public service

\textsuperscript{91} Atlanta Gas Light Co. v. FPC, 476 F.2d 142 (5th Cir. 1973). The Fifth Circuit court relied heavily upon FPC v. Louisiana Power & Light Co., 406 U.S. 621 (1972):

\begin{quote}
In essence, the Court [in Louisiana Power & Light] found that the general state of emergency created by the national shortage of natural gas necessitates a curtailment process which allows the Commission, in particular cases, to act "now" and find facts later.
\end{quote}

476 F.2d at 148.

\textsuperscript{92} An FPC study predicts a gradually worsening gas supply situation. See Federal Power Commission, National Gas Supply and Demand 1971-1990, Staff Report No. 2 (Feb. 1972). El Paso Natural Gas Company forecasted in May, 1974 that gas curtailments for industrial (now including irrigation pumping), and small and large boiler users will be necessary during the foreseeable future. Memorandum from C.W. Jick Myers, Director of Arizona State Fuel and Energy Office, to Governor Jack Williams, August 27, 1974.

\textsuperscript{93} Electricity may also be a substitute power source; however, this power conversion, as well as that of other fuels, requires substantial capital outlays. In addition there may be a time lag in the acquisition of materials necessary for conversion.

\textsuperscript{94} Under The Natural Gas Act, sections 4 and 5 [15 U.S.C. §§ 717 (c) & (d) (1971)], the FPC has authority to set rates in the producer's field for all natural gas destined for interstate commerce. See Phillips Petroleum Co. v. Wisconsin, 347 U.S. 672 (1954). Since 1954 the FPC has redesigned the method of setting gas rates, including the adoption of area pricing. See 34 F.P.C. 159 (1965), aff'd, Permian Basin Area Rate Cases, 380 U.S. 747 (1968). More recently, the Commission has implemented a national base rate system for gas produced from wells commenced on or after January 1, 1973 and gas dedicated to interstate commerce on or after that date. This rate was increased twice during 1974, and presently proceedings are pending regarding the establishment of nationwide rates for gas produced from wells commencing production before January 1, 1973. See 38 Fed. Reg. 14285 (1973); 39 Fed. Reg. 34904 (1974).

\textsuperscript{95} 40 Fed. Reg. 4465 (1975), as codified in 10 C.F.R. § 211.12(h).
commission. The retail distributor, if its gas source is under federal jurisdiction, may appeal the curtailment plan or petition for extraordinary relief if the agricultural gas users do not have alternate fuel facilities which are technically feasible.

V. ENERGY SHORTAGES AND CONTRACTS

 Farmers and other agriculturalists may execute contracts for the purchase of petroleum products and other items in short supply, such as fertilizer. To avoid legal problems, contingencies of delays in delivery, shortages, and petroleum and gas allocations should be considered in the terms of the contracts.96 The purchase of petroleum products for agricultural production, for example, is subject to the allocation of 100 per cent of current requirements under the Emergency Petroleum Allocation Act and FEA regulations.97 The agricultural buyer of petroleum products should state explicitly in the contract the product is used in "agricultural production," in order to qualify for the current requirements classification under FEA regulations. The buyer should also provide in the contract that an energy conservation program is in force. Thus, the supplier may not raise noncompliance with FEA allocation regulations as a defense in the event of contract breach for non-delivery.98

If the petroleum supply contract extends beyond August 31, 1975, the expiration date of the Emergency Petroleum Allocation Act,99 the agricultural buyer must consider the ramifications of deregulation. In the absence of specific clauses, the supplier may possibly allocate his petroleum products to all regular customers "in any manner which is fair and reasonable" during periods of shortages after the expiration of the Act.100

96. Recent shortages have caused a reappraisal of contract law and the drafting of contracts. See generally, Herman, supra note 67, at 18 & 19. See also BUSINESS WEEK, November 23, 1974, at 38 (discussion on how to write a shortage contract).
97. See Section II, supra.
98. The Emergency Petroleum Allocation Act and FEA regulations provide suppliers with a defense to breach of contract suit, if failure to perform was solely a result of compliance with FEA allocation regulations. Pub. L. No. 93-159, § 6(c) (5); 10 C.F.R. § 210.77.
100. U.C.C. § 2-615 states:
   Excuse by Failure of Presupposed Conditions.
   Except so far as a seller may have assumed a greater obligation and subject to the preceding section on substituted performance:
   (a) Delay in delivery or nondelivery in whole or in part by a seller who complies with paragraphs (b) and (c) is not a breach of his duty under a contract for sale if performance as agreed has been made impracticable by the occurrence of
Another aspect of the shortage situation is the seller's potential excuse from delivering goods under a contract where his performance is "commercially impracticable" because of unforeseen supervening circumstances not within the contemplation of the parties. Although a seller availing himself of this defense must notify the agricultural buyer of delay or non-delivery, the agriculturalist may be substantially harmed by this interruption in supply. Therefore, the agriculturalist with sufficient bargaining power should insist upon a term which requires performance in the case of shortages or other stated contingencies, or in the alternative, liquidated damages for nonperformance.

The consequences of energy shortages and costs should also be considered in the sale of agricultural products by contract prior to or during the actual delivery or production. For example, agriculturalists may be able to negotiate terms excusing performance if their direct production costs exceed a specified level. In addition, they may desire to reserve the right to deliver less than the contracted quantity of product because of petroleum, gas, fertilizer or other shortages.

VI. EXPECTATIONS AND POLICY CONSIDERATIONS

In a broader perspective, the consensus opinion is that the overriding need is for the development and implementation of a coordinated set of national energy policies. All the energy issues—

a contingency the nonoccurrence of which was a basic assumption on which the contract was made or by compliance in good faith with any applicable foreign or domestic governmental regulation or order whether or not it later proves to be invalid.

(b) Where the causes mentioned in paragraph (a) affect only a part of the seller's capacity to perform, he must allocate production and deliveries among his customers but may at his option include regular customers not then under contract as well as his own requirements for further manufacture. He may so allocate in any manner which is fair and reasonable.

(c) The seller must notify the buyer seasonably that there will be delay or nondelivery and, when allocation is required under paragraph (b), of the estimated quota thus made available for the buyer.

102. U.C.C. § 2-615(c).
103. U.C.C. § 2-615, Comment 4. Marked increases in cost caused by a severe shortage of raw material which alters the essential nature of the performance may excuse such performance; however, increased costs alone do not.
104. The activation of the Energy Research and Development Administration and the Nuclear Regulatory Commission represents a step toward
regulatory allocation, economic incentives, environmental concerns, conservation measures, and tax considerations—are closely interrelated and cannot be dealt with independently. Consequently, energy policies have an impact on agriculture, as well as the other sectors of the economy.

For example, should energy prices be allowed to reach the market level rather than be regulated? What is the interface between farm programs and energy use? What role will energy play in determining land use and water policy? And finally, what opportunities for energy conservation and efficiency exist in agriculture?

A. Price and Regulatory Allocations

In response to the recent petroleum and gas shortages, regulatory policies have merely addressed the symptoms of the problems. The roots of the petroleum and gas shortage, however, are founded in the fact that these fossil fuels are finite, subject to the laws of supply and demand, making them sensitive to price. Government intervention in the form of regulatory allocations, however, is primarily based upon two premises: (1) higher petroleum and gas prices will have a heavy impact on people with low incomes, and (2) windfall profits would accrue to energy producers. On the
other hand, several commentators have strongly argued from an economic viewpoint that the regulated price is artificially low, creating high demand for petroleum and gas and inhibiting their production.109

The gradual de-regulation of fuel prices is currently being considered and some methods are in operation.110 The impact of this government policy upon agriculture will be determined by the fuel use of a particular activity, as well as the particular region of agricultural production. Because agriculture's demand for petroleum and gas may be characterized as technologically inelastic, i.e., agricultural technology has been designed around the availability of petroleum and gas resources and agriculture will remain in vigorous competition for these fuels.111 Even though technology may adjust to use of other energy sources, there will be a considerable time lag before changes may be implemented. Thus, the de-regulation of petroleum and gas will result in price increases for agricultural producers. This will increase the cost of food and fiber and have implications for the national farm program.

B. Farm Programs and Energy Policy

Current and future farm programs must be assessed in light of recent energy policies. For decades, farm programs have been constructed primarily to support farm income, within the context of crop surpluses and farmer dissatisfaction with commodity prices.112 The Agricultural and Consumer Protection Act of 1973,113 effective through 1977, represents another evolutionary step by which the

110. With respect to natural gas see note 94 supra. President Ford, State of the Union Message, January, 1975. The Federal Energy Administration has developed the so-called Crude Entitlement Program to equalize different crude oil prices among refiners as a means of price decontrol. See BUSINESS WEEK, September 7, 1974, at 60-64.
111. See, Comment, Taxation as a Tool of Natural Resource Management: Oil as a Case Study, 1 ECOLOGY L.Q. 749, 770 (1971).
United States Department of Agriculture may stimulate farm production.

Since large surplus grain stocks have largely disappeared, during the past 20 years there has been great pressure for the expansion of agricultural production. A comprehensive policy is obviously needed to correlate the energy-intensive production capabilities of agriculture with strategies for handling the demand for agricultural products. The availability of fertilizer, for instance, directly influences agricultural production, and the manufacturers of such inputs are likely to experience the continued curtailment of natural gas. A much needed element of food and agricultural policy is stabilization of farm prices and energy supplies for efficient agricultural production.

In a broader dimension, international trade policies concerning agricultural commodities and inputs must be consistent with the farm program and energy policies of the United States. Guidelines regarding the export of farm products, and methods of monitoring demand and sales to trading nations, are critically needed. The United States, as the principal world producer and exporter of grain, will continue to experience a strong worldwide demand. International markets for American agricultural products in general, however, are not likely to expand substantially in the near future because higher world energy prices have reduced the purchasing power of trading nations.

115. Farm programs have historically been oriented toward price support. The present need is for marketing management of agricultural production among food, fiber, feed, seed, and foreign demand. An important strategy within this contingency planning is the management and administration of reserve stocks (inventories) during periods of surplus production to be used in periods of crop failures or other disasters. See Cothern, World Marketing Management of Feed Grains, 28 Calif. Agriculture No. 12, at 10 (1974).


116. Recent uncertainty of natural gas availability has increased the cost of agricultural production because of "stand-by" alternate fuel capabilities, such as propane and butane, which may not be used except during periodic gas curtailment.

117. About 40 developing countries that now rely on advanced agricultural technology will experience a devastating effect on their farm production as a result of energy shortages and related higher prices for fossil fuels and fertilizer. UNIVERSITY OF CALIF. TASK FORCE, A HUNGRY WORLD: THE CHALLENGE TO AGRICULTURE (1974).

C. Land Use Planning and Energy Conservation

The development of land for urban, industrial, or even agricultural purposes, if misdirected or left to travel its own course, can result in misallocation of energy resources. The United States does not have a well-defined land use policy that protects agricultural land. That is, energy conservation may be enhanced by policies which encourage use of fertile, well-watered land for crop production and less productive land for residential, industrial and transportation uses. The irreversible depletion of prime agricultural land, in essence, increases the burden on energy resources.

A second aspect of land use planning is the effects of changing land use patterns from agricultural to energy-industrial operations, particularly the exploitation of coal and oil shale in the Rocky Mountain region. If proper planning and land use regulations are not adopted, the local area of development may unnecessarily inhibit agrarian activities. Further, urban encroachment can result in agricultural activities being a nuisance, for example, with respect to pollution control of feedlots and the application of fertilizer and pesticides. Protective regulations are needed to prevent incompatible development of highly productive agricultural areas for energy conservation as well as environmental purposes. Additional energy, therefore, may be expended to remedy the situation because of inadequate land use planning.

D. Water—Energy Relationships

Agriculture in the United States is a primary user of water.

121. See Nelson, Legal Implications of Feedlot Pollution in Nebraska, 1973 (SB 529, Agricultural Experiment Station, Univ. of Neb., Lincoln).
and considerable energy is expended in the development, transpor-
tation, quality modification, distribution and disposal of water.\footnote{124}
Irrigation pumping is primarily by electricity,\footnote{125} although partic-
ular areas of the United States may rely more heavily on petroleum
and natural gas as an energy source.\footnote{126} Second, agriculture com-
petes with other water users, not the least of which is the produc-
tion of energy, such as electricity, petroleum and gas.\footnote{127}

Unfortunately energy considerations have largely been neg-
llected in the formulation of a national water policy.\footnote{128} Decision-
makers, with a view toward public investments in water resource
projects, should consider the complementary and interchangeable
forms of both water and energy resources to determine their ef-
ficient allocative use. Second, the energy impact of water develop-
ment should be subjected to explicit accounting in the cost-benefit
analysis of a project.\footnote{129} In addition, there is a need for more ef-
cient management of both energy and water resources, nationally
as well as regionally.

\footnote{124} See generally, Neb. Water Resources Research Institute, The Role
of Water in the Energy Crisis (October 23-24, 1973) [hereinafter
cited as The Role of Water in the Energy Crisis]. See also Energy
in Agriculture, \textit{supra} note 4, at 4.1.

\footnote{125} Over half of all irrigation pumping plants in the U.S. are powered by
electricity, and because irrigation is a seasonal user of electricity, it
creates peak load problems for power suppliers. The Role of Water
in the Energy Crisis, \textit{supra} note 124, at 3. In California, 68 percent
of all electricity used is for crop irrigation. California Energy Re-
quirements, \textit{supra} note 3, at ii.

\footnote{126} See Kletke, \textit{supra} note 6, at 7.

\footnote{127} According to the U.S. Department of Interior, water is the critical fac-
tor in developing the abundant supplies of western coal and oil shale.
U.S. Dep't of Interior, Geological Survey, Water Demands for Ex-
panding Energy Development (USGS Circular 703).

\footnote{128} Recent studies by the Water Resources Council and the National Water
Commission have devoted limited attention to the energy considera-
tions. Engelbert, The Political-Social Aspects of Energy-Water Rela-
tionships, in The Role of Water in the Energy Crisis, \textit{supra} note 124,
at 21.

\footnote{129} The energy impact may be treated descriptively as well in the project
proposal. For instance, energy expended in the project construction
and water use activities may be described on the basis of source and
quantities. Cost-benefit analysis is a method of water resource evalu-
ation by identification and measurement of future economic costs and
benefits, discounted to their present value by application of an appro-
priate interest rate. For various discussions of cost-benefit analysis,
see A. Maass, Benefit-Cost Analysis: Its Relevance to Public Invest-
ment Decisions, at 311, in Water Research (A. Kneese & S. Smith,
eds., 1968); J. Hirshheimer, W. Jerome & J. De Haven, Water Supply:
Economics, Technology, and Policy 114-151 (1980); and Comment,
More directly related to agriculture, efforts may be undertaken to reduce energy consumed by irrigation. The sequential use of lower quality water after industrial or municipal use may be possible. Other potential energy-saving alternatives include increased irrigation pump efficiency, improved irrigation scheduling and reduced water application, installation of water reuse systems, and improved pump management and irrigation system design.

E. Energy Conservation and Efficiency

While a program of energy conservation and efficiency alone cannot solve the energy problem, it can play a complementary role to increase availability of petroleum and natural gas, as well as reduce the cost of agricultural production. Various energy-saving practices that may be adopted by farmers include consolidation of field operations, implementation of minimum tillage, coordination of equipment to tractor size, and replacement of liquid petroleum (LP) and gasoline tractors with more efficient diesel tractors. Agronomic practices on the farm may also be a substitute for energy inputs, such as crop rotation and growing of crops with high nitrogen fixing capabilities.

Another means for substantial energy conservation is the development of systems, such as truck-rail combinations, for more efficient farm-to-processor transportation as well as movement of inputs to the farmer and processor. Because of the geographical

130. The National Petroleum Council, an industry advisory board established to counsel the Secretary of the Interior, recently completed a study of energy conservation and concluded that the food processing industry and farming can cut energy use per unit of output by 10 and 2 per cent, respectively, between 1974 and 1978. See BUSINESS WEEK, September 14, 1974, at 74.

131. Energy Shortage and Agriculture, supra note 8, at 9 & 10. See also ENERGY IN AGRICULTURE, supra note 4, at 2.2 & 3.2; and Youde & Carter, supra note 7, at 5.

132. CALIFORNIA ENERGY REQUIREMENTS, supra note 3, at ii. See Breimyer, supra note 1, at 5.

A Stanford study reported a 350 percent saving in energy in transporting grain by rail as opposed to truck. Other sources suggest savings of 10:1 for rail vs. truck. Of course, this assumes some of the logistics problems of rail car utilization can be improved. Similar energy savings are possible in the movement of inputs. Fertilizer materials generally make five or more separate movements from material source to the point of farm application. According to one estimate, the cost of meeting Michigan fertilizer demand could be reduced by 25 to 33 percent by improved efficiency in the production and distribution of materials. Much of the cost savings would be energy saving.

Schneeberger & Breimyer, supra note 8, at 9.
size, diversity and degree of specialization of agriculture in spatial areas, agricultural inputs and products are transported great distances. Improved efficiency of agricultural transportation systems provide the greatest opportunity for energy conservation.\footnote{1}{133}

VII. CONCLUSION

The energy crisis has brought into focus the proposition that energy, particularly petroleum and natural gas, is the \textit{sine qua non} of today's agriculture. The regulatory allocation of petroleum and gas are inconsistent in their treatment of agricultural production. The Emergency Petroleum Allocation Act of 1973 and the accompanying Federal Energy Administration regulations entitle agriculture to a preferred position. On the other hand the Natural Gas Act of 1938 and the Federal Power Commission orders and opinions have recently recognized agriculture as an "inferior" use of gas in relation to commercial activities. The recent shortages of fuel and other items in limited supply will cause a reappraisal of agricultural contract terms. Agricultural producers can expect higher production costs in the near term as fuel prices rise. Therefore, future policy considerations and energy practices will have a substantial impact on agriculture, and ultimately, the cost to the consumer of food and natural fiber.

\footnote{133}{One fourth of the nation's energy consumption arises from fuels used in transportation, and numerous studies have urged conservation of such energy use. See, \textit{e.g.}, Office of Emergency Preparedness, \textit{The Potential for Energy Conservation--A Staff Study} (1972); \textit{Exploring Energy Choices}, \textit{supra} note 2, at 47 & 52; The Chase Manhattan Bank, Energy Economics Division, \textit{Outlook for Energy in the United States to 1985}, 15-17 (June, 1972); and Darmstadter, \textit{Limiting the Demand for Energy: Possible? Probably?} 2 Envir. Affairs No. 4, at 717, 723-724 (1974).}