Nebraska Law Review

Volume 54 | Issue 2 Article 6

1975

Agriculture and Energy: A Legal Perspective

Doug C. Nelson
Northwestern Mutual Life Insurance Company

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."[1] The energy crisis caused and will continue to cause serious concern in agriculture, particularly with respect to petroleum and natural gas.[2] 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.[3] The interrup-

* Real Estate Representative, The Northwestern Mutual Life Insurance Company. B.S. 1968, J.D. 1971, M.S. 1973, University of Nebraska.

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:

Source	Percent of U.S. Supply
Petroleum	46
Natural Gas	31
Coal	18
Hydropower	4
Nuclear	1

   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.

   CCH ENERGY MANAGEMENT 9813 (U.S. DEP'T OF AGRICULTURE, ENERGY LETTER, December 1973) [hereinafter cited as U.S. DEP'T OF AGRICULTURE ENERGY LETTER]. Don Paarlberg, Director of Economics for the USDA states that 62 per cent of farm inputs are now of non-farm origin. Breimyer, Resource Scarcity: The Perils of Economic Maturity 3 (Paper #1973-50, Dep't of Agricultural Economics, Univ. of Mo., Columbia, 1973).
7. *See* Schneeberger & Breimyer, *The Energy Shortage and Agriculture*, J. AM. SOC. OF FARM MANAGERS & RURAL APPRAISERS, Oct. 1974 at 7, 8

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.[8] 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.[9] The processing, packaging and transportation of agricultural products constitute the largest portion of energy consumption,[10] and farm inputs such as fertilizers and machinery are the second major category of energy use in agriculture.[11]

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.[12] These petroleum products are primarily consumed in the operation of tractors and equipment for crop establishment, cultural operations and harvesting.[13] The second major category of petroleum use on the farm is in the operation of trucks and pickups.[14]

Natural gas provides nearly one-third of the nation's energy and supplies almost half of the energy of all industrial and residential markets,[15] because it has been relatively inexpensive and is the most environmentally compatible of the fossil fuels.[16] 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].

8. U.S. DEP'T OF AGRICULTURE ENERGY LETTER, *supra* note 6. *See* Schneeberger & Breimyer, *supra* note 7, at 8; Pimentel, *et al., Food Production and the Energy Crisis*, 182 SCIENCE 443 (1973).
9. U.S. DEP'T OF AGRICULTURE, AGRICULTURAL SITUATION 3 (January-February, 1974). *See* Paxton, *The Energy Crunch—Implications for Louisiana Agriculture*, 36 LA. RURAL ECONOMIST No. 2, 5-6 (1974) [hereinafter cited as Paxton].
10. U.S. DEP'T OF AGRICULTURE, AGRICULTURAL SITUATION 3 (January-February, 1974).
11. *Id.*
12. Kletke, *supra* note 5, at 4. *See* U.S. DEP'T OF AGRICULTURE ENERGY LETTER, *supra* note 6.
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.*
15. U.S. ENERGY, *supra* note 2, at 20.
16. EXPLORING ENERGY CHOICES, *supra* note 2, at 7. *See* PUB. UTIL. FORT., June 10, 1971, at 134.

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

17. U.S. DEP'T OF AGRICULTURE ENERGY LETTER, *supra* note 6.
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.
20. U.S. DEP'T OF AGRICULTURE ENERGY LETTER, *supra* note 6. *See* THE U.S. FERTILIZER SITUATION AND OUTLOOK, *supra* note 18, at 1.
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.
22. *See* Spivak, *OEO Seeks Ways to Ease Fuel Woes' Impact on Poor People—and Also to Keep Itself Alive*, The Wall Street Journal, May 20, 1974, at 36, col. 1. Migrant labor is important in the harvest of vegetable produce, and the Federal Energy Office distributed information on gas supplies along travel routes and telephone hotlines during the petroleum shortage of early 1974. CCH ENERGY MANAGEMENT 7 (March 20, 1974).

is *increasingly* dependent upon petroleum and gas inputs,[23] and agriculture consumes more petroleum than any other industry.[24] Further, in the near term, the demand for these fuels will be primarily determined by the stock of energy-using capital goods[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.[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.[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.[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.[29] The timeliness of fuel availability for farm operations has a considerable impact on the quantity and quality of crop production.[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.[31] This phase of the agricultural system, in-

23. Paxton, *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, *supra* note 7, at 8.
24. HOUSE COMM. ON AGRICULTURE, 92d Cong., 20 (1971).
25. *See* Houthakker, Verleger, Jr. & Sheehan, *Dynamic Demand Analyses of Gasoline and Residential Electricity*, 56 AM. J. AG. ECON. 412, 413 (1974).
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.
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. CALIFORNIA ENERGY REQUIREMENTS, *supra* note 3, at ii.
28. *See* Youde & Carter, *supra* note 7, at 5. *See also* Schneeberger & Breimyer, *supra* note 7, at 10.
29. Kletke, *supra* note 5, at 6.
30. ENERGY IN AGRICULTURE, *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.
31. *See* Breimyer, *supra* note 1, at 5; ENERGY IN AGRICULTURE, *supra* note 4, at 7.1-7.4.

volving 2.8 million farmers in the United States,[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.[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.[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.[35] More importantly, agriculture's use of solar energy contributes substantially to the efficient production of food and fiber.[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.

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[37] and farmers were in the process of har-

32. U.S. DEP'T OF AGRICULTURE & NEBRASKA DEP'T OF AGRICULTURE, STATE-FEDERAL DIVISION OF AGRICULTURAL STATISTICS, NUMBER OF FARMS AND LAND IN FARMS (Jan. 7, 1975).
33. Youde & Carter, *supra* note 7, at 4.
34. *Id.* *See* ENERGY IN AGRICULTURE, *supra* note 4, at 1.3.
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.
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.
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.

vesting crops, a mandatory allocation program for diesel fuels was established which gave farmers a preference in obtaining these fuels.[38] Congress concluded, however, that such action was not adequate to meet the prevailing energy shortage, and passed the Emergency Petroleum Allocation Act of 1973.[39]

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.[40] Essentially, Congress urged the administration to implement a mandatory fuel allocation program directed toward accomplishing various objectives. One of these was the prioirty use of petroleum for the maintenance of agricultural operations and directly related services.[41] With this goal in mind, as well as others, the Act directs the administration to promulgate price regulations[42] and mandatory allocation of petroleum.[43]

The regulatory agency of the Emergency Petroleum Allocation Act is the Federal Energy Administration ("FEA"),[44] and within

38. Initially, the administration attempted a voluntary allocation program which encouraged the major oil companies to share their supplies with their competitors in order to meet petroleum demands. Later, the Office of Petroleum Allocation of the U.S. Interior Department promulgated rules to allocate the short supply of middle distillate fuel which includes diesel fuel. EPO Reg. 1, 38 Fed. Reg. 28660 (1973). Thereafter, an Advisory Notice was issued to suppliers to encourage them to make monthly adjustments of their supplies in pursuit of meeting fuel needs for harvesting operations. Office of Petroleum Allocation, Advisory Notice No. 1, 38 Fed. Reg. 31547 (1973). Ultimately, the Office of Petroleum Allocation granted preference, effective November 15, 1973 for 60 days, to farmers (and fossil fuel producers and public mass transit operators). Office of Petroleum Allocation, Advisory Notice No. 2, 38 Fed. Reg. 31857 (1973).
39. Act of Nov. 27, 1973, Pub. L. No. 93-159, 87 Stat. 627 (1973). The Act was scheduled to terminate on February 28, 1975; however, it has since been extended to August 31, 1975. Act of 1974, Pub. L. No. 93-511, 88 Stat. 1608 (1974).
40. *See* 11 *U.S. Cong. News* 4436 (1973) for the legislative history of the Emergency Petroleum Allocation Act.
41. Pub. L. No. 93-159, § 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.
44. The FEA was created by the enactment of the Federal Energy Administration Act of 1974, Pub. L. No. 93-275, 88 Stat. 96 (1974). On May 7, 1974 this agency replaced the Federal Energy Office which was established by Executive Order. Exec. Order No. 11748, 3A C.F.R. 232 (1973). In addition to the responsibilities of the Emergency Petroleum Allocation Act of 1973, the FEA collects and disseminates energy-related information under the Energy Supply and Environmental Coordination Act of 1974.

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.[45]

In addition to the federal administrative framework, state energy offices have been established under the auspices of the Emergency Petroleum Allocation Act[46] 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 product[47] 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-

45. *See* 39 Fed. Reg. 15965 (1974), *as codified in* 10 C.F.R. § 211.12(d)(3). The general function of the ASCS is the administration of federal agricultural policy.
46. 39 Fed. Reg. 15969 (1974), *as codified in* 10 C.F.R. § 211.15.
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.
48. 39 Fed. Reg. 15971, 15973 (1974), *as codified in* 10 C.F.R. § 211.51.
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 designation 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 reduction 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 Industrial Classification Manual.[55] Considerable debate has focused on this definition, particularly because of the priority status of agriculture and the complexities of petroleum-using activities and industries associated with food and fiber production.[56] In general, "agricultural production" refers to farming, dairy, poultry, livestock, forestry and fishing activities, as well as agricultural fertilizer 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.
52. 39 Fed. Reg. 15961-83 (1974), *as codified in* 1 C.F.R. §§ 211.1-211.225.
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 agriculture, 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.
55. 39 Fed. Reg. 15971 (1974), *as codified in* 10 C.F.R. § 211.51, republished without substantive amendment in 39 Fed. Reg. 35521-22 (1974).
56. The original definition of "agricultural production" in 39 Fed. Reg. 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 priority. *See* 39 Fed. Reg. 11768-69 (1974). For a general discussion of the problems encountered in the definition of agriculture, see Sundquist, *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 forestry crops by air, the use of aircraft by those engaged in agricultural production to transport priority supplies and personnel to sustain or increase crop and animal yields, to transport crop, forestry, and animal products to distribution points, and in commercial fishing.

39 Fed. Reg. 15978 (1974), *as codified in* 10 C.F.R. § 211.142.

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.[58] It does not include petroleum for subsequent resale by the agricultural producer.[59]

Second, current requirements do not include the accumulation of petroleum inventory greater than that customarily maintained in normal business practices.[60] 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.[61] Basically, this is a nebulous efficiency requirement which requires agricultural producers to certify to their petroleum suppliers that a program is in effect.[62] 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.[63] 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.[64] On the other hand, if the agricultural producer is a "wholesale purchaser-consumer" (using 20,000 gallons or more per year), he must submit

58. 39 Fed. Reg. 15971-72 (1974), *as codified in* 10 C.F.R. § 211.51.
59. *Id.*
60. *Id.*
61. *Id.*
62. *Id.*; 39 Fed. Reg. 15970 (1974), *as codified in* 10 C.F.R. § 211.21.
63. 39 Fed. Reg. 15964-66 (1974), *as codified in* 10 C.F.R. § 211.12. The FEA encourages voluntary arrangements between purchasers and suppliers.
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].
68. 39 Fed. Reg. 15965 (1974), *as codified in* 10 C.F.R. § 211.12(d)(3).
69. *Id.*
70. Emergency Petroleum Allocation Act of 1973, Pub. L. No. 93-159, §

may appeal to the national Temporary Emergency Court of Appeals in Washington.[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.[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.[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[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.[75] These agricultural producers generally receive natural gas from retail distributors,[76] who in turn receive natural gas from interstate pipeline

---

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.

71. Emergency Petroleum Allocation Act of 1973, Pub. L. No. 93-159, § 5 (a)(1), 87 Stat. 633 (1973). This court was originally established to hear wage-price control appeals. Herman, *supra* note 67, at 18.
72. 39 Fed. Reg. 1931 (1974), *as codified in* 10 C.F.R. § 210.61.
73. 39 Fed. Reg. 15969 and 15970 (1974), *as codified in* 10 C.F.R. § 211.17.
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].
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*.
76. Retail gas distributors, which for the most part are regulated monopo-

companies.[77]

Unlike the mandatory allocation program governing petroleum products, allocations of natural gas are primarily regulated by the Federal Power Commission ("FPC")[78] under the Natural Gas Act of 1938.[79] During periods of gas shortages, pipeline companies may be forced to reduce deliveries to retail distributors who supply agricultural producers.[80] This allocation concept is referred to as gas curtailment, and has been fashioned by the FPC[81] 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) 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.

15 U.S.C. § 717(b) (1971).

78. The FPC had its origins in the Federal Water Power Act of 1920, the title of which was changed to the Federal Power Act in 1935. 49 Stat. 838, *as amended*, 16 U.S.C. §§ 791-825 (1970). State regulation of natural gas is aimed primarily at producers' conservation practices and production quotas and the rates and services of local utility companies. Comment, *FPC Natural Gas Allocation: Curtailment in Context*, 50 TEXAS L. REV. 1370, 1389, n.89 (1972) (a comprehensive critique of the FPC and the curtailment framework) [hereinafter cited as *Curtailment in Context*]. *See generally* 25 OKLA. L. REV. 427 (1972).

79. 15 U.S.C. §§ 717 *et seq.* (1970). *See* DeVane, *Highlights of the Legislative History of the Federal Power Act of 1935 and the Natural Gas Act of 1938*, 14 GEO. WASH. L. REV. 30, 38-40 (1945) and Meeks & Landeck, *Area Rate Regulation of the Natural Gas Industry*, 1970 DUKE L.J. 653, 666, for discussions of the legislative history of the Act.

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 *FPC v. Louisiana Power & Light Co.*,[82] recognized the national gas shortage and the need for a comprehensive curtailment program.[83] The Court upheld the power of the FPC to curtail interstate gas to all customers regardless of the character of sales.[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.[85]

On January 8, 1973 the FPC issued several significant orders and opinions relating to the establishment of nationwide priorities for gas curtailment.[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 Curtailment in Context, supra* note 78, at 1387 & 1388; and Recent Developments, 6 IND. L. REV. 589, 599 & 600 (1973).

82. 406 U.S. 621 (1972).

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, *supra* note 81 at 591-92.

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.*

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).

86. *Utilization and Conservation of Natural Resources—Natural Gas Act,* Order No. 467, 49 F.P.C. 85 (Jan. 8, 1973) (Docket No. R-469). *See generally* 39 Fed. Reg. 23960 n.48 (June 28, 1974) (curtailment list). The FPC has subsequently modified portions of the priority framework. *See* Section Affairs, *Report of Natural Gas Committee,* 6 NATURAL RESOURCES LAW. 401, 406-15 (1973).

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.[87] 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."[88]

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,"[89] and has uniformly applied its definitions to other curtailment plans.[90]

---

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.
88. El Paso Natural Gas Company, F.P.C. Opinion No. 697-A (Dec. 19, 1974) (Docket No. RP72-6) (appeal pending), at 18.
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.[91] Thus, the agricultural gas user must consider the likelihood of continued gas shortages,[92] the feasibility of conversion to alternative fuels, such as propane or diesel,[93] and the expectation of higher natural gas prices.[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.[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

---

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):

> 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.

476 F.2d at 148.

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.

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.

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, 390 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. 14295 (1973); 39 Fed. Reg. 34304 (1974).

95. 40 Fed. Reg. 4485 (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.
99. Pub. L. No. 93-511, 88 Stat. 1608 (1974).
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 unforseen supervening circumstances not within the contemplation of the parties.[101] Although a seller availing himself of this defense must notify the agricultural buyer of delay or non-delivery,[102] 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.[103] 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.[104] 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.

101. U.C.C. § 2-615, Comment 1.
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,[105] conservation measures, and tax considerations[106]—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,[107] 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.[108] On the

---

this objective, 3 E.O. 11834, 40 Fed. Reg. 2971 (January 17, 1975). For a general discussion of national energy policies *see e.g., The Energy Crisis: The Need for Antitrust Action and Federal Regulation*, 24 VAND. L. REV. 705 (1971); and Notes, *Toward a Rational Future Energy Policy*, 14 NATURAL RESOURCES J. 239 (1974) [hereinafter cited as *Toward a Rational Future Energy Policy*].

105. Numerous articles have been published on the environmental implications of energy supply and demand. *See e.g.*, Baldwin, *Public Policy on Oil—An Ecological Perspective*, 1 ECOLOGY L.Q. 245 (1971); and Weinberg, *Contrived Crisis: An Environmental Lawyer's View of the Supposed Fuel Shortage*, 23 BUFFALO L. REV. 435 (1974).

106. *See e.g.*, Comment, *Taxation as a Tool of Natural Resource Management: Oil as a Case Study*, 1 ECOLOGY L.Q. 749 (1971); Webb, *Petroleum Tax, Price Controls and the Energy Crisis*, 22 OIL & GAS TAX Q. 203 (1974).

107. U.S. Representative James Howard states:

> The crux of the problem is that historically raw material prices [of oil and gas] have reflected only the cost of production and distribution, as if the supply were unlimited.

6 NATURAL RESOURCES LAW. 475, 477 (1973). *See Toward a Rational Future Energy Policy, supra* note 104, at 239. *See also* Fischer, Agriculture and Energy (Staff Paper #1973-10, Dep't of Agricultural Economics, Univ. of Neb., Lincoln, 1973).

108. *See* Mead, *Discussion: Energy Supply and Demand in the United States*, 56 AM. J. AGRICULTURAL ECON. 433, 435 (1974). *See also* Wenders, *Energy "Shortage" Attributed to Price Rise Limitations*, 23 ARIZ. REV. No. 1 at 7 (1974).

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

109. *See e.g.*, H. Landsberg, Low-Cost Abundant Energy: Paradise Lost? 14 (Reprint No. 112, Resources for the Future, Inc. 1973); Leonard, *How Economic Policies Provoked the Energy Crisis*, 17 CHALLENGE No. 1, at 57 (1974); MacAvoy, *The Regulation-Induced Shortage of Natural Gas, supra* note 74, at 167-71; McDonald, *Incentive Policy and Supplies of Energy Sources*, 56 AM. J. AGRICULTURAL ECON. 397 (1974).

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).

112. *See* Brandow, *Agricultural Policy: Different Now?* 17 CHALLENGE No. 1, at 54 (1974). *See also* Spitze, *Economic Implications of the 1970 Agricultural Act*, 35 AM. SOC. OF FARM MANAGERS & RURAL APPRAISERS 9 (1971).

113. Pub. L. No. 93-86, Aug. 10, 1973, 87 Stat. 221; Pub. L. No. 93-125, Oct. 18, 1973, 87 Stat. 450.

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.[114] A comprehensive policy is obviously needed to correlate the energy-intensive production capabilities of agriculture with strategies[115] 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.[116]

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.[117] 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.[118]

---

114. *See* Youde & Carter, *supra* note 7, at 4.
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).
See also, Tweeten and Plaxico, *U.S. Policies for Food and Agriculture in an Unstable World*, 56 AM. J. AGRICULTURAL ECON. 364 (1974); and Reubens, *The Food Shortage Is Not Inevitable*, 17 CHALLENGE No. 1 at 48 (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).
118. Youde & Carter, *supra* note 7, at 4.

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.[119] 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.[120] 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[121] 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.[122] 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,[123]

---

119. *See* Comment, *Preserving Rural Land Resources: The California Westside*, 1 ECOLOGY L.Q. 33, 333 (1971).
120. EXPLORING ENERGY CHOICES, *supra* note 2, at 23 & 24.
121. *See* Nelson, Legal Implications of Feedlot Pollution in Nebraska, 1973 (SB 529, Agricultural Experiment Station, Univ. of Neb., Lincoln).
122. Although the reliability and permanence will vary among state and local jurisdictions, the land use regulations will provide a line of defense. *See* ROCKEFELLER BROTHERS FUND, TASK FORCE ON LAND USE AND URBAN GROWTH, THE USE OF LAND 120-123 (1973). *See also* ECONOMIC RESEARCH SERVICE, U.S. DEP'T OF AGRICULTURE, RURAL ZONING IN THE UNITED STATES: ANALYSIS OF ENABLING LEGISLATION (Misc. Pub. No. 1232, Wash. D.C.) (1972); and Conklin & Bryant, *Agricultural Districts: A Compromise Approach to Agricultural Preservation*, 56 AM. J. AGRICULTURAL ECON. 607 (1974). *Cf.* F. BOSSELMAN & D. CALLIES, THE QUIET REVOLUTION IN LAND USE CONTROL (1971); W. WHYTE, THE LAST LANDSCAPE 84 (1968) (leading proponent of governmental purchase of less than fee interest in land in order to protect open spaces); and Alden & Shockro, *Preferential Assessment of Agricultural Lands: Preservation or Discrimination?*, 42 S. CALIF. L. REV. 59 (1969).
123. WATER RESOURCE COUNCIL, THE NATION'S WATER RESOURCES 4-1 (1968).

and considerable energy is expended in the development, transportation, quality modification, distribution and disposal of water.[124] Irrigation pumping is primarily by electricity,[125] although particular areas of the United States may rely more heavily on petroleum and natural gas as an energy source.[126] Second, agriculture competes with other water users, not the least of which is the production of energy, such as electricity, petroleum and gas.[127]

Unfortunately energy considerations have largely been neglected in the formulation of a national water policy.[128] Decisionmakers, 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 efficient allocative use. Second, the energy impact of water development should be subjected to explicit accounting in the cost-benefit analysis of a project.[129] In addition, there is a need for more efficient management of both energy and water resources, nationally as well as regionally.

---

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, *supra* note 4, at 4.1.

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, *supra* note 124, at 3. In California, 68 percent of all electricity used is for crop irrigation. CALIFORNIA ENERGY REQUIREMENTS, *supra* note 3, at ii.

126. *See* Kletke, *supra* note 6, at 7.

127. According to the U.S. Department of Interior, water is the critical factor in developing the abundant supplies of western coal and oil shale. U.S. DEP'T OF INTERIOR, GEOLOGICAL SURVEY, WATER DEMANDS FOR EXPANDING ENERGY DEVELOPMENT (USGS Circular 703).

128. Recent studies by the Water Resources Council and the National Water Commission have devoted limited attention to the energy considerations. Engelbert, *The Political-Social Aspects of Energy-Water Relationships*, in THE ROLE OF WATER IN THE ENERGY CRISIS, *supra* note 124, at 21.

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 evaluation by identification and measurement of future economic costs and benefits, discounted to their present value by application of an appropriate interest rate. For various discussions of cost-benefit analysis, see A. Maass, *Benefit-Cost Analysis: Its Relevance to Public Investment Decisions*, at 311, in WATER RESEARCH (A. Kneese & S. Smith, eds., 1965); J. HIRSHLEIFER, W. JEROME & J. DE HAVEN, WATER SUPPLY: ECONOMICS, TECHNOLOGY, AND POLICY 114-151 (1960); and Comment, *Judicial Review of Cost-Benefit Analysis Under NEPA*, 53 NEB. L. REV. 540 (1974).

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.[130] 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.[131] 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.[132] 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.[133]

VII. CONCLUSION

The energy crisis has brought into focus the proposition that energy, particularly petroleum and natural gas, is the *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.

---

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, e.g.*, OFFICE OF EMERGENCY PREPAREDNESS, THE POTENTIAL FOR ENERGY CONSERVATION—A STAFF STUDY (1972); EXPLORING ENERGY CHOICES, *supra* note 2, at 47 & 52; THE CHASE MANHATTAN BANK, ENERGY ECONOMICS DIVISION, OUTLOOK FOR ENERGY IN THE UNITED STATES TO 1985, 15-17 (June, 1972); and Darmstadter, *Limiting the Demand for Energy: Possible? Probably?* 2 ENVIR. AFFAIRS No. 4, at 717, 723-724 (1974).