Cooperative Petroleum Operations

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Cooperative Petroleum Operations

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Cover...

Cooperatives provided more than 40 percent of farmers' petroleum needs. Five regional cooperatives owned 4 refineries, such as this one at Coffeyville, KS, owned by Farmland Industries, Inc., Kansas City, MO.

CONTENTS

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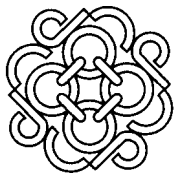


Cooperatives play a vital role in supplying petroleum products to U.S. farms and provide services at all related levels of oil production, refining and processing, wholesale and retail distribution, and related supplies.

Farm use of liquid petroleum products and liquefied petroleum (LP) gas or propane increased from less than a billion gallons in 1920 to more than 9 billion gallons in 1969. Use then declined to about 5.5 billion gallons by 1993, due to petroleum price increases, increased fuel efficiency in farm equipment, and adoption of lower tillage practices.

Diesel and gasoline are the most important fuels used to power farm equipment. Propane, home heating oil, and kerosene are used in farm production for drying crops, fueling irrigation pumps, and heating poultry and livestock facilities.

Fuels used on farms have changed considerably. In 1950, gasoline constituted about two-thirds, diesel 10 percent, and propane less than 1 percent of petroleum use. By 1993, gasoline had declined to 26 percent and diesel and propane had increased to 60 percent and 14 percent, respectively.

Overall Status of Cooperatives

In the late 1920s and 1930s, farmers in many parts of the United States organized local petroleum cooperatives or added petroleum to grain marketing cooperatives. Farmers soon realized, however, that retailing operations alone were inadequate to meet their needs for a dependable supply and quality at a reasonable price. Local cooperatives organized regional wholesale cooperatives to pur-

chase petroleum products, blend lubricating oil, and provide transportation services. Later, wholesale cooperatives, by themselves or with others, began to refine petroleum for much of their needs and produce a limited amount of the crude oil processed in their refineries. By 1993, U.S. farmers purchased about 41 percent of their petroleum needs from about 2,500 cooperatives, more than two-thirds of all 3,761 active marketing and supply cooperatives (table 1).

Five regional cooperatives, solely or jointly, own 4 refineries that provide about 87 percent of the requirements of retailing cooperatives. Cooperative refineries received only 17 percent of their crude oil from sources owned or leased by cooperatives.

Cooperative Petroleum System

The farmer cooperative petroleum system is composed of about 2,500 autonomous cooperative businesses, operating under a variety of organizational arrangements at each vertical level of the petroleum industry from crude oil procurement through retail sales. The structure of cooperatives in the petroleum industry is described in figure 1. Interregional cooperatives are owned by groups of regional cooperatives. Regional cooperatives, if federated, are owned by local cooperatives, and if centralized, owned directly by farmers. In all cases, control ultimately rests in the hands of U.S. farmers.

Crude Oil Production

Early Developments

Soon after acquiring refineries, cooperatives believed exploring for and producing crude oil was necessary to assure an adequate supply. This was the last step, along with transportation, in vertically integrating their petroleum operations. Some cooperative leaders thought savings in production might be realized in years when savings from refining were small.

In September 1940 in Kansas, Consumers Cooperative Association (CCA) drilled its first producing oil well, after being forced to shut down its new refinery at Phillipsburg, KS, for lack of sufficient crude. The regional began leasing oil lands in Indiana and Kentucky in 1941. By the end of 1950, 12 cooperatives were producing crude oil and leasing 63,488 net acres of producing leaseholds in the Midwest. These cooperatives were sole owners of 1,562 producing wells and part owners of another 383. They also held 3 10,032 acres of prospective lease holds, royalties, and mineral rights.

Table l-Cooperatives' share of fuel used for U.S. farm production

Year/product	Fuel used for U.S. farm production		
	Total fuel provided by all sources	Total fuel provided by cooperatives	Cooperatives' share of fuel used for U.S. farm production
	1,000 gallons		Percent
1993			
All gasolines	1,404,393	645,130	45.9
Diesel fuel	3,298,098	1,231,723	37.3
Total liquids:	4,702,491	1,876,853	39.9
Propane or LP gas	761,204	37 1,700	48.8
Total all fuels:	5463,695	2,248,552	41.2
1988			
All gasolines	1,600,000	699,055	43.7
Diesel fuel	2,800,000	1,034,287	36.9
Total liquids:	4,400,000	1,733,341	39.4
Propane or LP gas	600,000	209,864	35.0
Total all fuels:	5,000,000	1,943,205	38.9
1982			
All gasolines	2,385,241	1,124,932	47.2
Diesel fuel	2,93 1,690	836,698	28.5
Total liquids:	5,316,931	1,961,629	36.9
Propane or LP gas	1,136,167	423,699	37.3
Total all fuels:	6,453,098	2,385,328	37.0
1979			
All gasolines	3,381,130	1,653,765	48.9
Diesel fuel	3,178,766	1,314,703	41.4
Total liquids:	6,559,896	2,968,468	45.3
Propane or LP gas	1,301,867	553,660	42.5
Total all fuels:	7,861,763	3,522,128	44.8

Figure l-Cooperative involvement in various activities in the U.S. petroleum industry, 1993

Activity	Local Cooperatives	Regional Cooperatives	Interregional Cooperative
Oil exploration	None	Very limited	Very limited
Crude oil production	None	Limited	Limited
Refining	None	3 regional owned refineries: CENEX, Farmland, and Countrymark	1 interregional owned refinery: National Cooperative Refinery Association
Pipelines	None	Own or lease limited mileage of gathering and trunk lines	Own or lease limited mileage of gathering and trunk lines
Wholesale distribution	Limited to a few large locals	Extensive network of storage and distribution throughout most farming regions	Sales of solid products
Farm sales	Extensive bulk delivery and pump station operations	Extensive bulk delivery and pump station operations	None
Nonfarm and urban sales	Substantial in some markets and rural communities	Substantial in some markets and rural communities	None

Crude oil production in 1950 from the 1,562 wholly owned wells was 15,292 barrels per day. This represented 14.3 percent of the total volume of crude oil processed by cooperative refineries that year. Cooperatives shared a partial interest in 383 wells which produced another 14,108 barrels per day. The combined volume of 29,400

barrels per day represented 27.5 percent of the crude oil processed by cooperatives in 1950.

In 1950, cooperatives drilled 145 producing wells and 77 dry wells. Of these totals, 111 producing and 22 dry wells were wholly owned by individual cooperatives. Between 1950 and 1970, cooperatives increased their crude oil production and refining capacity at about the same rate.

During the crude oil shortage of the mid-1970s, cooperatives launched programs to explore and develop alternate sources of supply. In one effort, 19 regionals organized International Energy Cooperatives, Inc., Washington, DC, to purchase crude and refined products, engage in exploration, and evaluate trading food and agricultural/industrial knowledge for petroleum in foreign markets (commonly referred to as "food for crude").

In 1974, 15 of these regionals formed a separate company, LVO International, Inc., Tulsa, OK, to explore for oil in Egypt, Portugal, and Greece, but later discontinued operations. Three cooperatives and three noncooperative companies formed Seaway Pipeline Company to move crude from tankers o'n the Texas coast to inland refineries. Cooperatives later divested themselves from the money-losing operations.

Two interregional petroleum exploration and acquisition cooperatives were formed in the 1970s. Agri-Petco International, Tulsa, OK, was owned by one regional and two interregional cooperatives. International Cooperative Petroleum Association, New York, NY, was owned by two U.S. regionals and several European cooperatives. With limited resources and increasing costs, most cooperative oil exploration ceased by the mid-1980s.

Current Operations

In 1993, cooperatives produced 1.5 million barrels of oil, down 50 percent from 1988. During the same period, net proven reserves also declined by 50 percent to 8.9 million barrels. In 1993, cooperative refineries received only 17 percent of their supply from these cooperative-controlled sources.

More than 90 percent of the crude oil received by cooperative refineries was transported by pipelines. Cooperative ownership of pipelines has increased over the past decade to more than 5,000 total miles. Cooperative-owned or -leased transportation moved 43 percent of the total crude oil needed by cooperative refineries in 1993.

Refining and Blending

Early Developments

The earliest effort by cooperative petroleum wholesalers to get involved in product manufacturing came in blending lubricating oil to improve the quality of oil to withstand rigorous use in tractors and other agricultural equipment. Cooperatives in Indiana tried unsuccessfully to get the State legislature to pass a law requiring placement of oil specifications on a container tag. Next, they attempted to buy oil from refiners on guaranteed specifications, but price fluctuations made this impossible.

In 1930, Indiana Farm Bureau Cooperative Association decided to build a compounding plant in Indianapolis. Later that year, it and other regional cooperatives in Ohio and Michigan formed Farm Bureau Oil Company, which operated the plant. In time, this organization became United Cooperatives, Alliance, OH, which blended oil and purchased farm supplies for a larger group of regionals.

By 1950, cooperatives owned 13 blending plants. Volume blended reached about 450,000 barrels in 1969, but declined to 403,000 barrels in 1982.

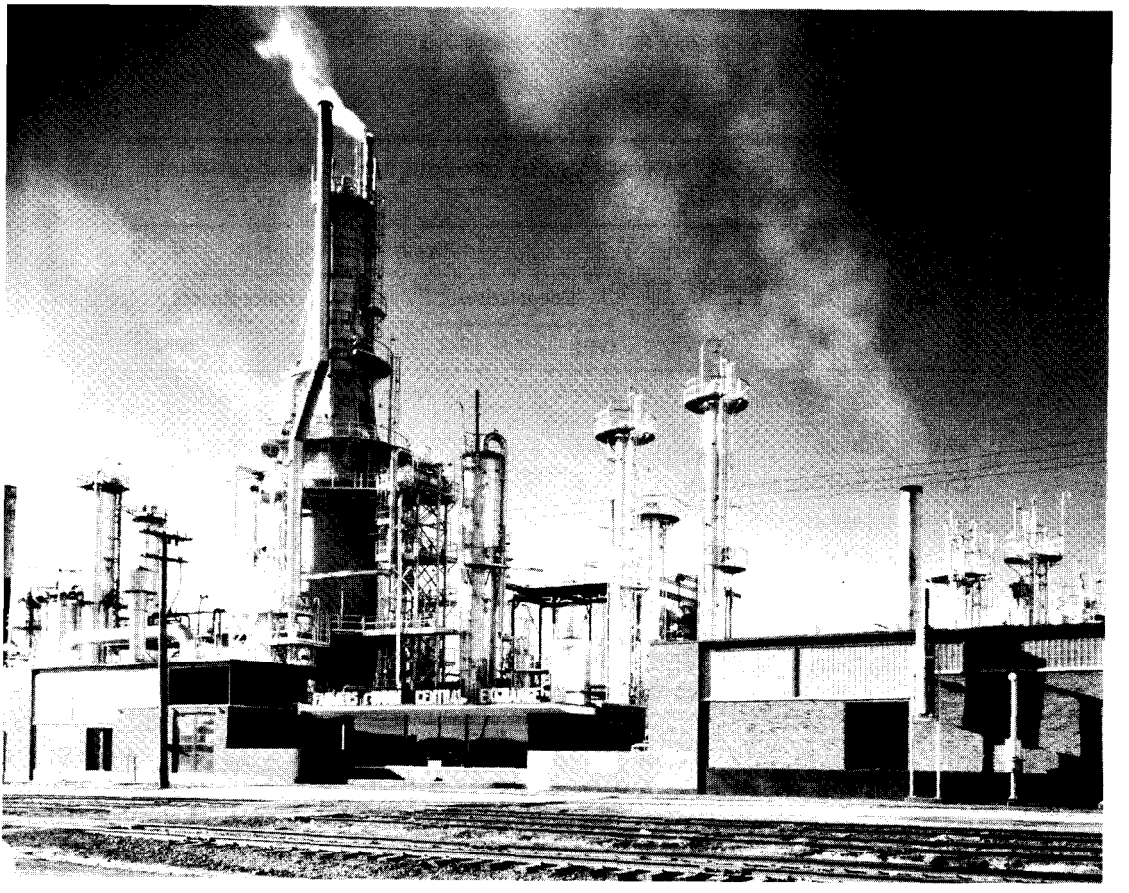
During the 1940s, several wholesale cooperatives believed they could realize additional savings by refining petroleum products. Difficulty in obtaining fuels during and after World War II hastened their entry into this field.

The first cooperative refineries were built by CCA, now Farmland Industries, which began operating a 3,000-barrel-per-calendar-day (b/cd) plant in January 1940 and Indiana Farm Bureau Cooperative Association, whose 2,500 b/cd plant started operating in March 1940. CCA encountered numerous problems in raising member capital, borrowing funds, getting a contractor, and obtaining sufficient crude oil to operate the refinery.

Cooperatives bought five more refineries in 1943. By 1948, 14 regionals owned 20 small refineries with a total capacity of 144,500 b/cd. Of these, 13 were owned by individual regional cooperatives and 7 by 3 interregionals. Transportation costs were high because only four were located on water where they could access supplies from ships or barges carrying crude oil. Only three were connected with common-carrier crude oil and product pipelines.

Changes in product requirements and uses made it necessary to modernize most refineries in the 1950s. Some plants were sold

The first cooperative-owned refinery was built in 1940 by Consumers Cooperative Association (now Farmland Industries, Inc.). A major improvement in refining came with the addition of the catalytic cracker in the early 1960's, the highest unit in this picture of CENEX's refinery at Laurel, MT



due to the high cost of modernization and their inefficiency. By 1969, only nine cooperatives owned eight refineries.

In the 1980s, two large interregional refineries were lost to the cooperative system. Energy Cooperative, Inc., East Chicago, IN, went bankrupt. Texas City Refinery, Inc., Texas City, TX, was sold. Farmland also closed small refineries at Scottsbluff, NE, and Phillipsburg, KS. Many other small refineries have closed during the past two decades and cooperative operations mirrored this trend.

Current Status of Plants and Operations

In 1993, the four remaining refineries in the cooperative system had a total capacity of 199,950 b/cd. These refineries processed 67 million barrels of crude oil, about 190,000 b/cd. They produced about 37 million barrels of finished gasolines, 25 million barrels of distillate fuel oils, and 1 million barrels of residual oil.

Cooperative refineries had a storage capacity of 8 million barrels for refined products in 1993. Pipelines were most often used for transportation, moving 74 percent of refined products from the refineries. Highway transports hauled most of the remaining volume.

Eighty-eight percent of all gasolines, 94 percent of distillate fuels, and 95 percent of propane production from cooperative refineries went to the wholesale petroleum operations of regional cooperatives. The rest was mainly solid products sold outside the cooperative system (table 2).

Table 2—Refinery sales or transfers by product and type of product recipient, 1993 and 1982

Product	Product recipient			
	Cooperatives		Other Buyers	
	1993	1982	1993	1982
	Percent			
Motor gasoline	88.4	76.1	11.6	23.9
Distillate fuel and kerosene	94.4	87.3	5.6	12.7
Residual fuel oil		2.0	100.0	98.0
Propane or LP gas	94.9	84.8	5.1	15.2
Lubricating oil		65.6		34.4
Solid products (asphalt, coke. and others)			100.0	100.0

Wholesaling

Early Developments

In the 1920s, many local retailing cooperatives had difficulty getting a dependable source of supply for refined fuels and good-quality lubricating oils. So, they formed regional cooperatives to pool their purchasing power.

The first wholesale cooperative to handle petroleum was Farmers Union State Exchange, Omaha, NE. It began buying lubricating oil and grease in 1914 and refined fuels in 1924. Seven others began handling petroleum during 1926-29 and 16 more started by 1939. In the 1930s, several regional cooperatives formed National Cooperatives, Inc., Chicago, to negotiate a contract with a refiner for a year's supply of fuels. Three regionals pooled their supply requirements under a master contract through United Cooperatives, Inc., Alliance, OH. Both fuel operations were discontinued a few years later.

In the early years, wholesale cooperatives purchased fuels from other oil companies under contract on a brokerage or commission basis. Later, they purchased, stored, and distributed fuels, lubricating oils, and greases at prevailing market prices like other oil jobbers. Still later, several acquired refineries and storage terminals. Most did not take all the fuel their plants produced, but developed exchanges with other companies to reduce transportation costs. Some regional cooperatives also purchased part of their needs from other companies that were better located to serve some affiliated local cooperatives. Also, some smaller wholesale cooperatives purchased petroleum products from larger ones.

Many local petroleum cooperatives have merged with grain marketing associations in the Midwest and small farm supply cooperatives with large ones in other areas. In the past 30 years, many regional cooperatives handling petroleum products have merged:

- Grange Cooperative Wholesale, Spokane, WA; Utah Cooperative Association, Salt Lake City; Pacific Supply Cooperative, Portland, OR; and Western Farmers Association, Seattle, WA, merged and became CENEX, Inver Grove Heights, MN.
- Central Cooperative Wholesale, Superior, WI, merged into Midland Cooperatives, Inc., Minneapolis, MN. Midland subsequently merged with Land O'Lakes, Inc., Minneapolis, MN. In a joint venture, CENEX/Land O'Lakes Ag Services now has CENEX supplying petroleum products to Land O'Lakes locals.

- Farm Bureau Service Company, Des Moines, IA; Wisconsin Farmco Service Cooperative, Madison, WI; and Illinois Farm Supply Company, Bloomington, merged to become FS Services, Inc., Bloomington, IL. Later, FS and Illinois Grain Corp. merged to form GROWMARK, Inc.
- Consumers Cooperative Association, Amarillo, TX; Farm Bureau Service Company of Missouri, Jefferson City; and Minnesota Farm Bureau Service Company, St. Paul, merged and became Farmland Industries, Kansas City, MO.
- Cooperative GLF Exchange, Ithaca, NY; Eastern States Farmers Exchange, West Springfield, MA; and Pennsylvania Farm Bureau Cooperative Association, Harrisburg, merged to become Agway, Inc., Syracuse, NY.
- Central Carolina Farmers, Raleigh, NC, merged with FCX, NC. Later, FCX went out of business. Some operations were absorbed by Southern States Cooperative, Richmond, VA, and Gold Kist Inc., Atlanta, GA.
- MFC Services, Madison, MS, and Delta Purchasing Federation, Greenwood, MS, merged with Southern Farmers, Little Rock, AR, and became SF Services, Little Rock.
- Landmark, Inc., Columbus, OH, merged with Ohio Farmers and became Countrymark, Inc. Later, Countrymark, Inc. and Indiana Farm Bureau Cooperative Association, Indianapolis, IN, merged and became Countrymark Cooperative, Inc., Indianapolis.

Current Status

By 1993, 14 regional cooperatives were providing wholesale petroleum products and services for locals (table 3). Wholesale petroleum sales of regional cooperatives in 1993 were about $3.8 billion. They provided about 87 percent of the petroleum products sold by local or regional farmer cooperatives. Some wholesale cooperatives serve one State while the trade areas of the multi- State cooperatives overlap, especially in the Corn Belt, Northern Plains, and Lake States.

Wholesale cooperatives supplied 4.3 billion gallons of liquid fuels to cooperative and noncooperative outlets in 1993. They distributed 31 percent of their gasolines and 11 percent of their distillate fuels to private dealers and public institutions (table 4). They also distributed about 28 million gallons of lubricating oil, 12,000 tons of grease, and 1 billion gallons of propane, primarily to cooperative outlets.

Table 3-Regional and interregional petroleum cooperatives' structure and type of operations, 1993

Cooperative and Headquarters	Operations		Refining		Crude oil production	
	Retailing	Wholesaling	Own facilities	Through interregional	Own facilities	Through interregional
FEDERATED COOPERATIVES:						
CENEX, Inver Grove Heights, MN[1,2]	•	•	•	•	•	•
Countrymark Cooperative, Inc., Indianapolis, IN[2]		•	•	—	•	—
Delta Purchasing Federation, Greenwood, MS[2]	—	•	—	—	—	—
Farmland Industries, Kansas City, MO[2]	*	*	•	—	—	—
GROWMARK, Inc., Bloomington, IL[1,2]	—	•	—	•	—	•
SF Services, Little Rock, AR[2]	—	•	*	*	—	—
South Dakota Wheat Growers, Aberdeen, SD	—	•	*	*	—	—
Tennessee Farmers Cooperative, LaVergne, TN[2]	—	•	*	*	—	—
Waterloo Service Company, Waterloo, IA	—	•	*	*	—	—
CENTRALIZED COOPERATIVES:						
Agway Inc., Syracuse, NY[2]	•	•	*	*	—	—
Maine Potato Growers, Presque Isle, ME[2]	•	•	*	*	—	—
MFA Oil Company, Columbia, MO[1]	•	•	—	•	—	•
MIXED COOPERATIVES:						
Farmers Petroleum Cooperative, Lansing, MI[2]	•	•	—	—	—	—
Southern States Cooperative, Richmond, VA[2]	•	•	—	—	—	—
INTERREGIONAL COOPERATIVES:						
National Co-op. Refinery Assn., McPherson, KS	—	•	•	—	•	—
Universal Cooperatives, Inc., Minneapolis, MN	—	•	—	—	—	—

* Cooperative involved in this activity.

— Cooperative not involved in this activity.

1 Members of National Cooperative Refinery Association: CENEX, GROWMARK, and MFA Oil.

2 Members of Universal Cooperatives, Inc.: Agway, Alabama Farmers, CENEX, Countrymark Cooperative, Inc., Delta Purchasing Federation, Farmers Petroleum Cooperative, Farmland Industries, Gold Kist, GROWMARK, Maine Potato Growers, SF Services, Southern States Cooperative, and Tennessee Farmers Cooperative.

Table 4-Quantity of petroleum products sold or transferred by cooperative wholesalers to cooperative and noncooperative outlets

Petroleum product	Total deliveries	Type of outlet	
		Cooperative	Noncooperative
	1,000 gallons	*Percent*	
Gasolines:			
Unleaded and leaded gasolines	2,135,330	68	32
Ethanol blended gasoline	154,025	88	12
Ethanol (for blending)	35,826	91	9
Total gasolines (ex. ethanol):	2,289,355	69	31
Distillate fuels:			
Premium diesel fuel	672,948	97	3
No. 2 diesel fuel	761,445	86	14
Home heating oil	573,078	83	17
Total distillate fuels:	2,007,471	89	11
Other fuel oils and residual oil	277,581	1	99
Kerosene	48,259	83	17
Propane	1,075,600	98	2
Lubricating oil	28,173	95	5
	Tons		
Grease	11,979	76	24

Facilities and Operating Practices

Operations of ‘regional cooperatives in wholesale petroleum distribution depended heavily on highway transports to haul refined fuels to local bulk plants. They operated 460 highway transports for liquid fuels and 221 for propane. In owned or leased transports, regional cooperatives delivered 23 percent of the volume of motor gasolines, 33 percent of the distillate fuels, and 44 percent of the propane to their final outlets. The average highway transport traveled 45,000 miles delivering liquid fuels to cooperative outlets.

Cooperatives prepared for seasonal demands on their wholesale petroleum distribution systems by operating storage terminals for motor fuels for heavy farming seasons and home heating oil for winter. Some terminals were operated at refineries; others were on

pipelines or along rivers. Regional cooperatives operated 26 terminals for storage and distribution of liquid fuels and 5 terminals for propane. Motor gasoline storage of 116 million gallons would provide an 18–day supply for cooperative wholesale operations. Distillate storage of 180 million gallons would provide a 28-day supply.

Most wholesale petroleum cooperatives now handle several major types of farm supplies and departmentalize their operations. Many also have large farm product marketing programs. Most declare patronage refunds at one rate on total business done with the cooperative. Some have special refund rates for total farm supply or total petroleum purchases. A few declare separate refunds on individual petroleum product purchases.

Retailing

Early Developments

The first petroleum products that farmer cooperatives handled were kerosene or "coal oil," lubricating oil, harness oil, and axle grease. When tractors were introduced, local bulk plants began to stock liquid fuels that farmers could pick up in barrels. Soon after, cooperatives began delivering fuel in tank trucks.

Cooperative distribution began in the Midwest. The first oil cooperative was organized in 1921 at Cottonwood, MN. Such activity soon spread, reaching the East by the late 1930s.

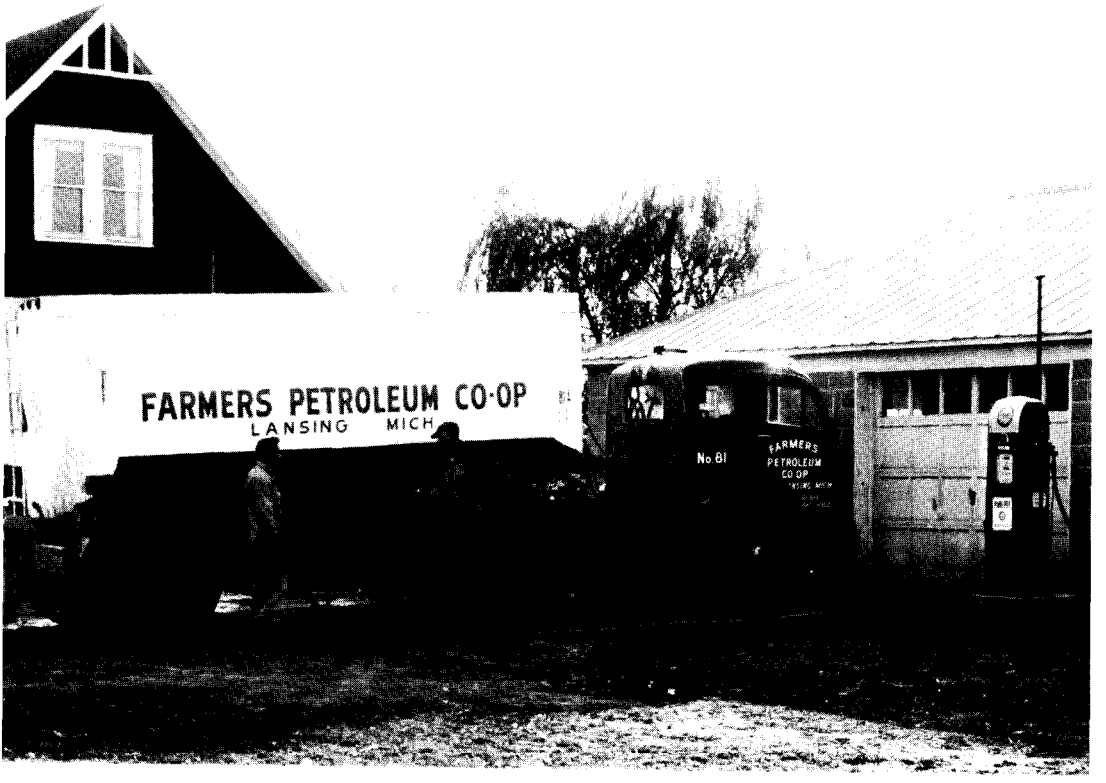
Cooperatives began purchasing petroleum fuels primarily to obtain substantial savings for members. At the time, gross margins often were 6 to 9 cents a gallon, or 30 to 40 percent of sales. Improved service was an important cooperative goal, especially to small farms some distance from bulk plants. Cooperatives also found bulk distribution to be a good sideline to their grain marketing operations, especially during slack marketing seasons.

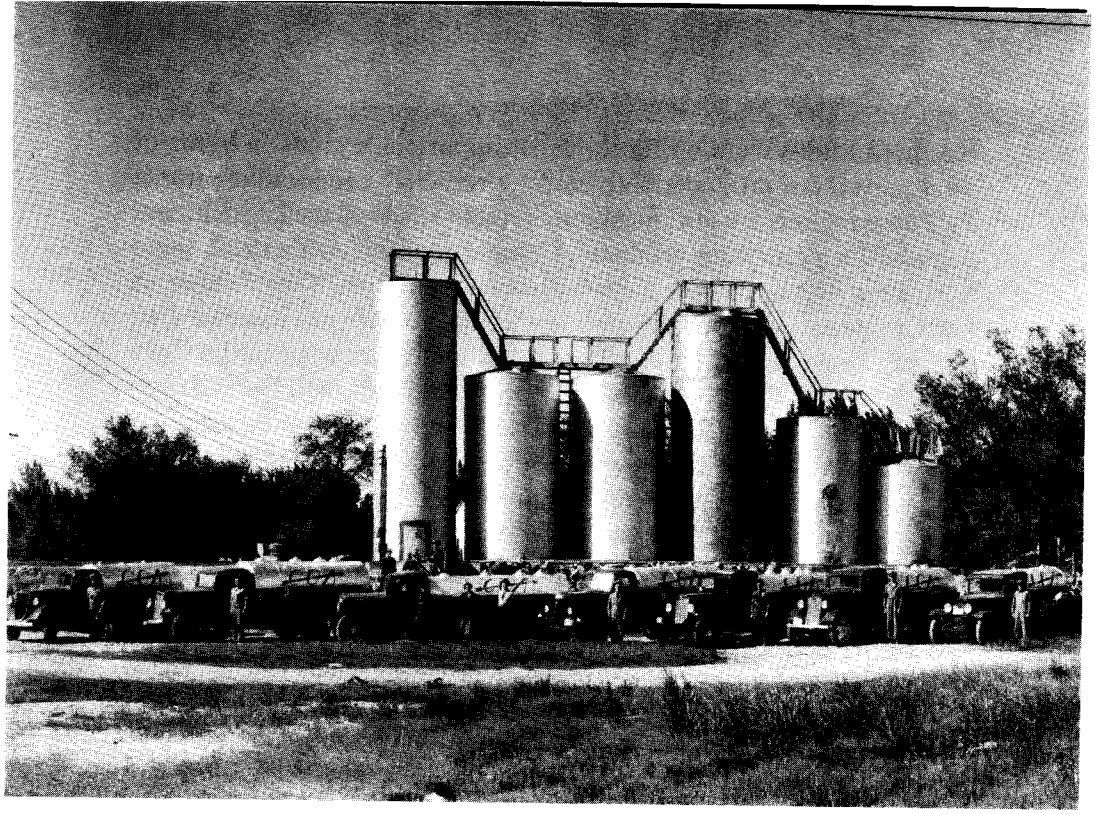
Current Status

In 1993, 7 regional and 2,500 local farmer cooperatives were distributing petroleum products to farmers. Regional cooperatives had retail petroleum sales of $1.2 billion while locals had sales of $3.3 billion. At the retail level, cooperatives sold more than 3.4 billion gallons of refined fuels, 1 billion gallons of propane, 27 million gallons of lubricating oil, and 9,000 tons of grease. Of the locals that sold petroleum products, about 90 percent delivered fuels to farms.

The Corn Belt, Lake States, Mountain and Pacific, and

Cooperatives were innovators in bulk delivery of petroleum to their farmer members all across the country, beginning in the 1930's.





Examples were in Winamac, IN (top left); Lansing, MI (bottom left); Caldwell, ID (top right): and Lebanon, MO (bottom right).

Northern Plains were by far the most important regions in terms of total petroleum products delivered by regional cooperatives (table 5). These regions are also most important in terms of total agricultural demand for petroleum products. Comparing 1993 with 1982, there have been some shifts in regional fuel distribution. Distribution of both propane and lubricating oil in the Lake States has increased 10 percent, but distribution of all fuels declined somewhat in the Corn Belt, Northern Plains, Appalachian and Southeast, and Delta States and Southern Plains. The largest increase in liquid fuels distribution was in the Mountain and Pacific regions. Motor gasoline was up 10 percent and distillate fuels up 7 percent.

Cooperatives have served farmers well, often being the only source of delivered petroleum products. Cooperatives' share of petroleum sold for use in farm production increased from 14 percent in 1942 to 41 percent in 1993, continuing the long-term growth trend in the important role of cooperatives in providing fuels to U.S. farmers. Cooperatives sold an estimated 46 percent of total gasoline purchases by farmers for use in farm production in 1993. Cooperatives provided 37 percent of total diesel fuel used for farm production and 49 percent of propane.

Table S-Distribution of cooperative wholesale petroleum deliveries by region, 1993 and 1982

Region'	Motor gasoline		Distillate fuels		Propane		Lubricating oil	
	1993	1982	1993	1982	1993	1982	1993	1982
				Percent				
Northeast	7.4	11.7	20.0	18.0	9.5	5.3	13.4	17.4
Lake States	18.6	16.9	18.1	16.1	31.3	19.2	23.7	12.4
Corn Belt	28.2	30.0	21.6	28.8	30.6	37.6	18.3	17.1
Northern Plains	16.7	19.4	13.7	17.2	14.7	25.9	15.8	17.2
Appalachian and Southeast	4.6	6.6	5.7	6.6	3.8	4.1	3.6	4.7
Delta States and Southern Plains	4.4	6.0	6.5	5.9	2.4	3.1	7.2	24.1
Mountain and Pacific	20.1	9.4	14.4	7.5	7.7	4.9	18.0	7.0

[1]Northeast: ME, NH, VT, NY, MA, RI, CT, PA, NJ, DE, MD, and DC. Lake States: MI, WI, and MN. Corn Belt: OH, IN, IL, IA, and MO. Northern Plains: ND, SD, NE, and KS. Appalachian: VA, WV, KY, TN, and NC. Southeast: SC, GA, AL, and FL. Delta States: MS, LA, and AR. Southern Plains: OK and TX. Mountain: MT, ID, WY, CO, UT, NV, AZ, and NM. Pacific: WA, OR, CA, HI, and AK.

Some of the more recent growth in cooperative market share came from other distributors who abandoned rural markets. For instance, in 354 rural communities, or more than 5 percent of ones supplied by cooperatives, their outlets were the sole source of petroleum products. These outlets sold an estimated 242 million gallons of liquid fuels, or more than 5 percent of their total volume.

Facilities and Operating Practices

Some cooperatives handle petroleum products exclusively through customer-fill stations and card- or key-activated outlets. Others may only have a bulk delivery truck that makes onfarm deliveries. Many of the farm supply or grain marketing local cooperatives have petroleum sales in some form.

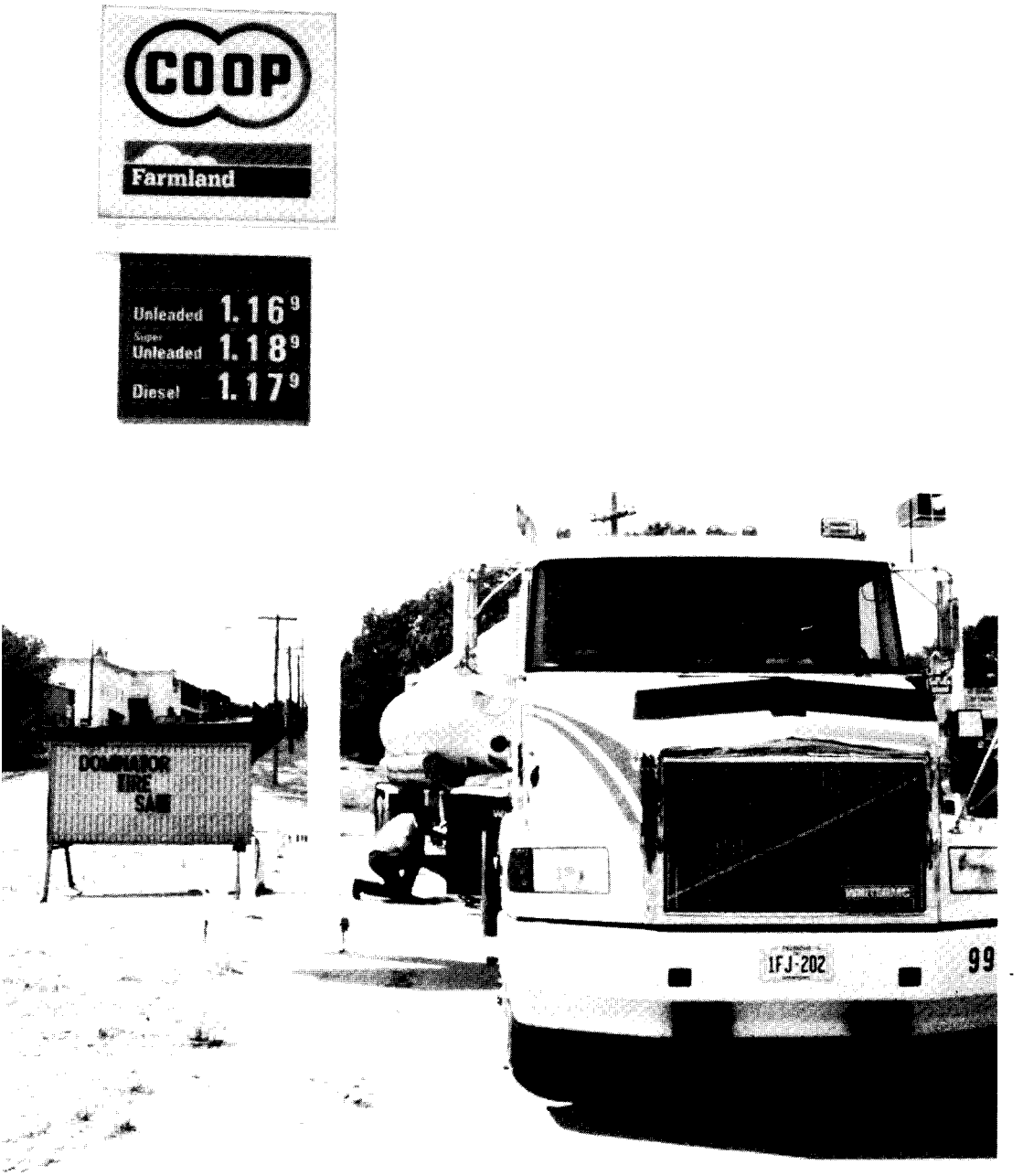
Cooperative retail facilities usually have a bulk tank area with several large storage tanks for different fuels. These tanks can accept transport truckloads from the wholesale supplier and are used to fill bulk delivery trucks. In 1993, cooperatives operated 3,416 bulk plants for the distribution of liquid fuels (table 6). In many cases, customer-fill stations are operated in conjunction with bulk delivery facilities.

From a recent CS study (Chesnick) where more than 700 local cooperatives responded, it was found that 90 percent delivered bulk petroleum products and 71 percent had a customer-fill station. Bulk delivery trucks are usually owned by the local cooperative and service personnel are employed on a salary or a salary-plus-commission or bonus basis. Some cooperatives own only the truck tanks and employ service personnel on a commission basis. The driver owns the truck chassis.

Most liquid fuel is distributed to farms in trucks carrying a 2,000– to 4,000–gallon load. Truck tanks have compartments for individual fuels and are equipped with dual meters and mechanical

Table 6-Cooperative owned petroleum final outlets supplied by regional cooperative wholesalers, 1993

Outlet	Refined liquid fuels	Propane or LP gas
	Number	
Bulk delivery centers	3,416	1,785
Card- or key-activated facilities	1,761	
Customer fill stations	1,642	1,322



Cooperatives used almost 500 highway transports to deliverfuels like this one at Farmers Cooperative Association, Red Cloud, NE.

Cooperative convenience stores with fuel stations, like this Ampride at Concordia Farmers Cooperative, Concordia, MO, are becoming increasingly common. Cooperatives also owned 1,600 customer fill stations like this Agway Energy Products station at Cortland,

unloading pumps. They usually unload into onfarm storage tanks holding 250 to 1,000 gallons. Larger farm operations have the capacity to purchase truckloads and thereby cut fuel delivery costs.

Distribution of propane requires a duplicate set of storage and delivery equipment. Cooperatives operated 1,785 bulk plants for propane and 1,322 customer-fill stations (table 6).

Delivery routes are arranged to end near a bulk plant to minimize travel of empty trucks. Routes are sometimes planned by computer programs. Portable computers are used by delivery salesmen for billing and maintenance of farm sales records. Also, in many areas, delivery trucks are scheduled on the principle of degree days for home heating oil and propane. Some routes operate on a "keep full" basis. Once farmers establish a consumption level, periodic refueling becomes routine and automatic.

Retail cooperatives generally sell petroleum products at competitive or going market prices in their communities. From profits, the board may declare a refund based on the amount of business each patron had with the cooperative. Some declare a rate as a percent of total sales while others use a per-gallon rate for individual fuels and lubricating oil.

Much of the petroleum sold to cooperative members is on a credit-available basis within terms of the cooperative's policy.

Seventy one percent of the cooperatives handling petroleum also operate service stations (Chesnick). Many of them stock automotive repair supplies such as tires, batteries, and accessories. In 1993, cooperatives operated 1,642 customer-fill stations selling gasoline and other fuels and often offering oil changes, greasing, and washing.

Card- or key-activated outlets are becoming more widespread and save on labor costs. Cooperatives had 1,761 of these outlets. Customers can pump their own gas at any time and even fill their own bulk tank trucks. The customer is billed through a credit card account.

Related Supplies

Petroleum Equipment

Most early local cooperatives that sold petroleum products also sold or loaned 55-gallon drums or barrels to farmers for storing fuels. As farm operations became larger, cooperatives sold, loaned, or rented 250-, 500-, and l,OOO-gallon farm tanks. Most tanks were mounted on overhead stands. In the East, many were placed under-

ground. Eastern cooperatives usually loaned tanks to farmers while cooperatives elsewhere sold them.

Wholesale cooperatives continue to sell an array of bulk storage tanks and pumping and metering equipment to local cooperatives or truck operators. Some wholesale cooperatives also provide facility engineering services to locals for service stations, convenience stores, and bulk plants and supply credit or financial assistance to purchase them.

Tires, Batteries, and Related Services

Cooperatives frequently supplement their petroleum lines with tires, batteries, and accessories (TBA) through service stations or farm supply stores. Volume of these items has grown in many cooperatives to where they are treated as a separate department of the cooperatives' supply operations. As new facilities are built, larger display areas for automotive supplies and equipment are often included.

Most locals obtain their tires, batteries, and some accessories through wholesale cooperatives. Many regionals, in turn, buy these supplies from Universal Cooperatives, Inc., Minneapolis, MN, a procurement and manufacturing interregional owned by 25 member regional cooperatives. In 1993, Universal's TBA volume exceeded $70 million.

On-farm tire service has grown with the TBA business. Forty–seven percent of the surveyed cooperatives (Chesnick) provide an on-farm tire maintenance service using a mobile unit for tire repair, changing tractor and equipment tires, and tuneup services.

Other cooperatives have extended their automotive operations into car care service centers. Twenty-two percent of the local cooperatives operate car care centers with additional service bays and employ a mechanic for general maintenance and some major repairs. These centers provide numerous services such as wheel balancing and alignment, brake replacement, carburetor and minor motor repairs, and State safety inspections. Also, about 5 percent of the local cooperatives operated a franchise outlet that specialized in such items as mufflers, brakes, tires, and auto wheel alignment.

Convenience stores with fuel stations were operated by 42 percent of the cooperatives. CENEX Convenience Stores is a cooperatively owned chain of about 300 stores. Many cooperative convenience stores are open 24 hours and provide more employment opportunities than a customer fill station.

Challenges and Opportunities

Looking to the next millennium, petroleum cooperatives will face numerous challenges and opportunities as changes continue in their basic markets and ways of doing business. Some are unique to the petroleum industry and cooperatives' niche within it, some are common to all agribusiness concerns serving the American farmer, and others are endemic to the U.S. cooperative system.

For example, the industry was challenged by an Environmental Protection Agency (EPA) requirement that refineries produce low- sulfur diesel fuel for highway use by Oct. 1, 1993. This required investment in expensive additional equipment, such as a diesel hydrotreater. More than 34 percent of cooperative refinery production met this challenge and 51 percent of regional cooperative diesel sales were low sulfur. By the end of 1993, most cooperative refinery diesel sales were low sulfur.

The cooperative system, itself, is challenged by its farmer–members to sell ethanol-enhanced gasoline, a renewable resource fuel. About 29 percent of gasoline sold by regional- or local- owned petroleum outlets was probably ethanol or ethanol-enhanced. Ethanol is primarily produced from corn, so cooperatives have turned ethanol-enhanced gasoline sales into an opportunity to add value to their farmer-members' corn crop.

Challenges

With 187 refineries in the U.S. and many thousands of retail service stations and bulk delivery outlets as competitors, petroleum cooperatives face major challenges. Most of these cooperatives also sell a variety of other farm supplies, so their petroleum sales may be complementary to other farm supply sales and thus expose them to competition from other farm supply distributors.

Specific challenges listed on a survey of regional cooperatives that sold petroleum (Eversull and Dunn) will be presented in part in the following sections, ranked in order of importance by respondents. First though, a short discussion of the competition of local cooperatives can be assessed from a recent CS study (Chesnick).

More than 700 local cooperatives returned usable surveys on their petroleum operations. At least 80 percent of locals' supply of fuels, lubricating oils, and grease, was provided by regional cooperatives. Major oil companies supplied about 4 percent, and independent jobbers about 6 percent. Each local cooperative had at least

16 retail competitor service stations in its marketing territory, half representing major oil companies and half independents.

Legislative and Regulatory Concerns

Survey respondents said the major challenge facing petroleu cooperatives was the growing legislative and regulatory burden. regional cooperatives have at least a legislative and regulatory affairs person while refineries often have an entire department to keep abreast and comply with new laws and regulations. Since a 1988 study, petroleum retailers have instituted measures to control pump vapor pressure and continued efforts to replace leaking underground storage tanks. More recently, the sulfur content of diesel fuel has been lowered but the regional oxygen content of gas has come into question.

Public concerns over the quality and safety of the water supply, air, and other components of the environment will continue to affect the production, storage, transportation, and use of petroleum products. The net results affecting the industry are quite simple: decreased total use of petroleum and petrochemical-based products and more efficient and careful use of existing supplies.

For cooperatives involved in various aspects of the petroleum industry, the impact of these changes will take three general forms: (1) changes in the mix of products produced and raw materials used to produce them; (2) capital investments required to bring the physical plant and operating practices up to regulated specifications; and (3) changes in the agronomic and operating practices of petroleum product buyers.

Decreasing Number of Farms

The trend will probably continue toward an increasingly bimodal distribution of farms-marked by an increase in the number of very large and small farms while the number of medium- size operations declines steeply. Farm numbers have decreased by about 300,000 in the past decade to about 2 million. In some production sectors-red meats and poultry-independent producers will face especially intense competition from vertically integrated firms striving to dominate the market from farm to consumer. Surviving producers will be more technically sophisticated. They will be more focused on their individual profit and less on activities or groups not having a direct and immediate impact on their profitability.

Cooperatives will be challenged to gain and hold the patronage and loyalty of these surviving farmers. New programs and

approaches will be required that are tailored to needs of individual patrons.

A reduction in farms alone means fewer customers and probably more intense competition for their accounts. Production agriculture is also changing, however, requiring fewer gallons of fuel. Fuel requirements will continue to fall as the products and methods of agriculture production change due in part to new crops developed from genetic engineering and reduced-use agronomic practices.

New commercial crops and different agronomic techniques will alter the location of production, the mix of supplies required, and the demographics of the farming sector.

Increasing Distribution Costs

Declining rural populations and fewer and larger farms have increased distribution costs due to longer distances traveled for the same sales volume. Environmental and safety concerns also have increased distribution costs. Many underground storage tanks have been replaced. The pump-to-vehicle tank delivery system has been upgraded to lower vapor emissions. Cooperatives have had to adopt new technology or adapt to changing marketing strategies. About 25 percent of their terminal distribution facilities have been consolidated or closed. More efficient fuel deliveries allow more shipments with fully loaded trucks.

Rural Transportation Infrastructure

The deteriorating rural transportation system is of great significance to U.S. farm supply and marketing cooperative activities.

The extensive transportation and distribution system of cooperatives depends on a well-maintained rural road, bridge, and transportation infrastructure that provides access to all areas. To minimize costs, larger delivery vehicles are required to transport supplies such as petroleum. Cooperatives must work with other involved public and private parties to ensure that improvement of the rural transportation infrastructure receives the appropriate attention.

Servicing Accounts

With fewer farms and farmers, petroleum cooperatives are increasingly competing for the same customers. Often, this competitor is another cooperative. Another CS study (Chesnick) found that local petroleum cooperatives, on average, have about two other cooperative retail service stations in their marketing territories and

vices increases cooperatives' cost in the petroleum sector.

Competition, technology, and changing farm demographics pressures will force cooperatives at all levels to restructure in search of greater efficiency, more responsiveness, and improved ability to compete. Serious efforts must be made to eliminate duplication of efforts and investments and to reduce overlap at all levels of the cooperative system.

Rural Nonfarm Markets

Respondents said retail pump sales to highway traffic and rural nonfarm markets have the greatest potential for increasing cooperative sales. Faced with falling demand for fuels for farm production, cooperatives need to expand their markets. They already have in place the infrastructure to deliver and sell petroleum products to rural America.

Unless cooperatives expand their potential customer base, more of their capacity will have to be idled in the future. Cooperatives could then spread their fixed costs over larger sales. Expanding their customer base addresses the need to compensate for high-cost, low-volume accounts.

Convenience Stores With Fuel Stations

Drastic reductions in availability of goods and services due to business closure have hit many rural areas. In some communities, the cooperative may operate the only service station. These commu-

nities may also be too small to have a grocery store. A convenience store with a fuel station may be an answer.

Although they offer a more limited line of food items than grocery store, convenience stores are a reasonable substitute when the nearest grocery store may be many miles away. Many convenience stores operate 24 hours and offer more employment opportunities than a self-service station. This is another way cooperatives can expand their petroleum sales to rural, nonfarm markets.

Card- or Key-Activated Outlets

Cooperatives were leaders in card- or key-activated petroleum outlets that allowed farmers 24-hour access. Several large cooperatives began using this concept about a decade ago. The petroleum industry has now widely adopted the automated- billing process which features use of a credit or debit card. Seventy one percent of the local cooperatives are using this service (Chesnick). The change, however, has been accompanied by higher costs. Pumps used in these systems cost more because of technology involved to process automated billing. Cooperatives also pay a small transaction fee on credit card sales. Some smaller cooperative outlets may not have these updated systems because of these additional costs.

U.S. cooperatives have served the petroleum needs of farmers and rural America for many years. By being innovative, flexible, and dedicated to serving the needs of their patron base, cooperatives will play a major role in rural petroleum markets for years to come.

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Rural Business/Cooperative Service (RBS) provides research, management, and educational assistance to cooperatives to strengthen the economic position of farmers and other rural residents. It works directly with cooperative leaders and Federal and State agencies to improve organization, leadership, and operation of cooperatives and to give guidance to further development.

The cooperative segment of RBS (1) helps farmers and other rural residents develop cooperatives to obtain supplies and services at lower cost and to get better prices for products they sell; (2) advises rural residents on developing existing resources through cooperative action to enhance rural living; (3) helps cooperatives improve services and operating efficiency; (4) informs members, directors, employees, and the public on how cooperatives work and benefit their members and their communities; and (5) encourages international cooperative programs. RBS also publishes research and educational materials and issues *Farmer Cooperatives* magazine.