Long-Range Ammonia Future Bright

Continued high level of technological skill will help carry the industry through. Here's a look at some factors favorable to demand in the coming decade in several of the world's important regions.

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The winding down of the Southeast Asia war and the results of the 1972 election in the United States made it seem that a more stable period was developing. But, a new burst of inflation, the energy crisis, and the Watergate explosion upset the applecart; and now fruit is rolling in every direction. Everyone is caught in the middle of it trying to sort out his own list of priorities.

As we enter Phase IV, the current economic situation as delineated by the Cost of Living Council is less predictable than Missouri weather. The best you can say is if you don't like it today, tomorrow it may change.

An observation of current economic controls in the U.S. includes the following:

1. They stifle profit-induced incentive.
2. They do not encourage new plants and facilities.
3. They do not account for the interplay of forces always at work in such commodity industries as fertilizer, grain, and oil.
4. They have not permitted the flexibility needed for effective regulation.
5. They ignore international pricing and demand.
6. Economic controls are so complex and varied in interpretation that they will likely crash under their own weight. Some people believe this is desirable, pointing to what the freeze did to food supplies.

A quick look at this past fertilizer year will be useful. In the U.S., an estimated 45 million tons of material had been delivered as of June 30, 1973, about a 6% gain over last year. Considering the power and gas shortage, the transportation debacle, and the weather, the industry should be proud of its effort. In areas that had decent weather, gains were 10% or higher.

The United States Dept. of Agriculture Crop Production Report for July shows the 1973 total acreage for harvest at 312 million acres. This is an increase of almost 29 million acres, or 10%, above 1972. With no restraints forecast in 1974 for feedgrains, soybeans, wheat and cotton, we believe some 10 million more acres will be returned to production. This should require an additional 2+ million tons of fertilizer. The industry can look toward wide open operation with only supply and logistics as the limiting factors.

This was the year that nitrogen came into fairly close balance on supply and demand. In fact, at this point in time, nitrogen fertilizers have joined phosphate products in a tight supply situation.

The United States has an effective ammonia operating capacity slightly over 15 million ton/yr. With gas curtailments this past year, this was cut to 14 million, which about equaled demand. The world nitrogen capacity (for fertilizer use) is in the order of 32 million metric ton/yr., and demand is in balance. Closing the demand/supply gap has been noted in the "free" market of world competition. Export ammonia prices have risen in less than a year from $25.00/short ton *f.o.b.* Gulf Coast plants to $65.00/short ton in August. Present average domestic price is less than $64.00 *delivered* to the dealer and is equivalent to about $41.00 *f.o.b.* the Gulf Coast.

It must be agreed that this past year was the best the industry has enjoyed for some time. Inventories are down and plants are running at good rates. With farm income up, farmers were planning heavy fertilizer plowdown for fall of 1973. And the two-year forecast shows no decrease in output volume.

These are pleasant facts—but what about profits? Profit is not a dirty word. Profit—the whole system of profits—is a scorekeeping device for a society. Profit tells society which goods and services to produce more of and which to produce less of.

Whatever the motive of the profit seeker, the function of profits is to tell which goods and services are adjudged by people in the market place to have a value worth the resources used to organize their production, distribution, and sale.

If markets are competitive, then profits attract more producers. Even Soviet Russia had to reinvent profits as soon as it allowed any consumer choice.

How big should profits be? Nobody knows in particular cases. But they should be big enough to draw forth resources for production.

"Fair" profits are elusive, like "just" wages. If wages and prices are regulated long enough, the economy falls into a straight-jacket. Decisions become political. Economic growth slows down. That's the message of history. Today in the U.S., we are proving this again.

Profit calculations should be made properly

There are pitfalls in the profit system—especially for the profit seeker. The fertilizer industry is a good example. Many in the industry have gone without profits for a long time and even though this past year was great for tonnage

volume, it will not turn out to be a bumper profit year.

Most companies are organized in divisions, or so-called profit centers. However, many unfortunately do not always recognize the *real* net profit but instead look at a gross figure before investment and operating capital costs have been deducted. Recently, I heard of a case in which a fertilizer division with a capital outlay of $300-million reported an income contribution of $10-million. But, if proper interest expense had been deducted, the *real* figure would have been a *loss* of nearly $14-million.

This type of book-keeping is detrimental to any industry and disastrous for one that has the opportunity of returning to reasonable and fair profits.

Let's take a close look at what it takes for a reasonable profit in the U.S. domestic ammonia industry. Earlier, reference was made to a present day dealer delivered price of $64.00 compared to a price of $92.00 in 1967.

To build a 1,000-ton/day ammonia plant today, most companies would require a 15% return after taxes, which would be slightly under a five-year payout with an interest expense of 9%. If gas costs were $20.00/ton and all other costs (production, selling, distribution, overhead, depreciation and interest) $46.00/ton, the required profit to earn 15% on investment would be about $10.00/ton.

This would result in a delivered cost to the dealers of $76.00/ton, which is $12.00 above the current price. That is why one must say that although there will be some profit in ammonia this year, it will not be outstanding.

The U.S. industry is production limited in nitrogen products. Ignoring government controls, economics dictate an increase in production capacity. However, the question of expansion is clouded by the energy crisis.

It will be useful to look at what's happening in the world-wide food market with particular emphasis on protein. During the past 12 months, the productive ability of U.S. farmers, coupled with a market-oriented farm program, has resulted in:

1. The establishment of vital trade relations with Soviet Russia and mainland China.
2. The shifting of the U.S. balance of trade toward a more positive position.
3. A strengthening of the rural economy through increased farm income.
4. The elimination of commodity surpluses and costly taxpayer maintenance.

These achievements are the result of the growing world demand for protein; and whether it be in the form of red meat, poultry, soybeans, or grain, it is directly related to the input of nitrogen fertilizers. The time has been reached when consumer demand has caught up with the farm production revolution that occurred in the U.S. three decades ago. The developing affluency of other societies is rapidly expanding the demand for the protein products of our agriculture output previously enjoyed by the American consumer at relatively low prices.

Protein demand changing in character

The growing demand for protein products in the world market has begun to alter not only the volume of international trade, but its composition as well. Demand for meat is already greater than the supply. Projections indicate that the demand will outstrip supply for the next 10 years. Demand in 1980 for beef, veal, poultry and pork will be 35-million tons, or about 40%, above the 1970 actual consumption.

The present global demand for protein is but a drop in the bucket when compared with the demand expected in the coming decade. To illustrate:

Japan. Recent projections by the Ministry of Agriculture and Forestry of livestock and dairy product demands for 1982 called for a 100% increase in per capita mean consumption and a 50% rise in consumption of milk and dairy products. Demand by 125-million consumers will call for twice the present level of feedgrain and oilseed imports.

Taiwan and Korea. Already rapidly on the way to developing affluent economies comparable favorably with present-day Japan, these countries are expanding agricultural productivity: firstly, to assure meeting increasing demands of some 48 million consumers; and, secondly, to provide exports for balance of payment earnings. The historical dependency of Korea—and the recently illustrated desire for strengthened U.S. trade ties on the part of Taiwan—offer substantial export growth potential for U.S. agricultural commodities.

Southeast Asia. With a population of some 200 million, this region is only now beginning to show a demand for animal protein vs. its historic dependence on cereal protein, as demonstrated by growing expansion in the commercial feed and poultry industries.

Western Europe, and more specifically, the European Economic Community. Plagued with a deficit of some 700,000 metric tons of beef, the area recently approved a significant shift in cap pricing policies. Cereal price increases—for the first time in cap history—were held to 1% while intervention prices for beef were increased by 10.5%. Continued emphasis on the readjustment of price relationships for the next 3 to 5 years could result in a dramatic shift in marginal production land from cereals to livestock, thus re-establishing U.S. commodity demands in this area.

Eastern Europe. Shaken by the Polish worker's revolution of 1970 based on unsatisfied consumer demands, virtually every country in eastern Europe has given major attention to expanded animal protein production in their current five-year development plans.

Their commitment is illustrated by: (1) Yugoslavian ban on calf exports in an effort to expand both meat production and exportation; (2) Hungary's decision to abolish the dual-purpose breed approach to expanded meat and milk production, and to develop both specialized beef and dairy industries; (3) Poland's achievement of a 100% expansion in her swine industry in three years, two years ahead of five-year plan commitments.

As a result of these commitments, Yugoslavia—for the first time—became a net importer of feedgrains this year, Poland will purchase over $100 million worth of U.S. agricultural commodities this calendar year, and Hungary has already purchased nearly 3,000 head of U.S. breeding cattle.

USSR. A planned 25% increase in animal protein production, combined with poor crops in 1972, set the stage

for last year's historical sale of U.S. agricultural commodities to the Soviet Union. All indications point to a continued commitment on the part of the Soviet Union to maintain her animal protein expansion objectives as demonstrated by the purchase of breeding stock, feed mills, and commercial feedlot systems.

A bright future can be seen for agriculture, provided that the nitrogen fertilizer needed can be produced in spite of the energy crisis.

It has become very fashionable over the past year or two to worry about the energy crisis, including its component parts—the oil problem, the gas shortage, the nuclear delay, the licensing crisis, the environmental requirements, the capital crunch, public understanding, and so on. The worries are substantial and they are well founded.

It has become common to assign the blame for our energy ills, both real and imaginary, to someone else; in fact, to almost anyone and everyone.

We are told that the President could have solved the problems three years ago; or that Congress should have legislated a national energy policy; or that some 40-odd Government Agencies that deal with various aspects of energy "should get on the ball"; or that the courts have tied us in a knot. Oil companies are blamed for discouraging competition and withholding fuels. Electric utilities are criticized for lack of vision. They always seem to want to build the wrong kind of plant using the wrong fuel, in the wrong place, at the wrong time.

And now, even the environmentalists are beginning to draw fire as a minority which does not represent the public at large and may be risking economic decline and chaos for the sake of a pristine world that never really was.

Of course, *we* are the energy problem—all of us—and everyone of us has a vested interest because the supply of energy, its cost, its form, and its distribution are fundamental to our economy, to our society, to our political institutions, within the U.S. and among all nations.

About 30% of the U.S. energy is supplied by domestic oil, about one-third comes from domestic gas, another fourth comes from other domestic sources, and coal accounts for most of the balance, say one-eighth. The country currently imports about 12% of the BTUs it uses. This is changing rapidly, because of environmental restrictions and because of declining gas reserves. Thus, we are confronted in the near future with an increasing dependence on foreign oil.

U.S. energy consumption goes like this: one third to industry as fuel or raw material, one fourth for electric power; one fourth for transportation; and the balance is used by residential and commercial consumers.

Energy costs will change in the future

In the years ahead, costs will change quite markedly. Current coal costs range from 35 to 50¢/million Btu, and oil costs 50 to 90¢/million Btu. Existing nuclear reactors are in order of 15-20¢/million Btu. Fossil fuels are expected to increase by 50 to 80¢/million Btu by 1985. The breeder reactor has the potential of reducing fuel costs to the 5¢ range, and by the turn of the century, atomic fusion has a projected fuel cost of less than 1¢/million Btu.

On a long-range basis, one can project an abundant supply of electricity with the realization of the breeder and fusion reactors and also an abundant supply of liquid and gases from the vast shale oil and coal reserves. The lead time for bringing the technology for this abundance of energy to commercial use ranges from 15 to 30 years. This is a very long time for business planning, there is no real alternative.

The development of breeder reactors and fusion will not be a major factor until after 1990. Currently, 1% of our energy comes from nuclear stations.

From now through 1975, the only means of supplying the U.S. total energy demand will be through imports. During the 1975 to 1982 period, increased domestic production could be significant if the effort begins immediately on a major scale. Low-sulfur coal developments in the West and desulfurizing processes for Eastern coal would make substantial contributions.

By 1982, additional nuclear generating capacity could come into operation, coal gasification should be established, and there could be limited energy from oil shale. However, all these programs must be initiated on a significant scale in the immediate future to become effective supply sources in the early 1980s.

The key to long-term success, however, is a concerted effort to develop all domestic resources. Our own offshore areas must be opened for exploration and production. Substantial coal resources must be brought into use. Criteria must be established for the construction and operation of nuclear power plants. Research programs must speed the availability of synthetic energy from coal, oil shale, and tar sands. And we must all practice efficiency in consuming our energy sources.

As an example, the know-how and equipment is available today to cut heat requirements for manufacturing one ton of ammonia by at least one million Btu. In the U.S., this would be equivalent to 400,000 ton/yr., or the production of one new 1,200-ton/day plant.

The work the industry is now doing in making plants safer and more dependable will guarantee longer production runs which will help to improve Btu efficiency. The engineers and technologist are to be congratulated on their past work, and the discussions raised within this 16th Symposium will bring another long stride in progress. #

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