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HOW HIGHER FUEL PRICES AFFECT RURAL DEVELOPMENT

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For a society that has become as dependent on fossil fueled energy as our own, a significant rise in the price of those fuels is likely to bring about a reordering of the way we live and work.

I propose to examine the situation in its longer-term perspective—where we can step back to size up the central forces at work and consider what the citizenry has to say about how the problem should be handled.

TAKING THE LONG VIEW

Of the countless studies, prognostications, and crystal-ball gazings I have reviewed in recent months, I find myself referring back to a study by William Nordhaus. Using a linear programming model and making conventional assumptions regarding a competitive market including free trade, Nordhaus allocates the world's energy resources under an objective of minimizing discounted costs. Beyond use of a 200-year time horizon the study has the added advantage of allowing technology to change through time. And, even better, predicting when economic forces will trigger such changes.

The findings of the study offer a useful reference point for considering economic implications of the issue. The time path of energy technology predicted by Nordhaus would have the United States relying very heavily on existing reserves of petroleum and natural gas in the near term. By the end of the first decade, domestic reserves of these fuels would be virtually exhausted, leading to large increases in the importation of petroleum and liquified natural gas. The result would be a substantial deficit in the U.S. energy trade account for the remainder of the century. Around the year 2000, however, the United States would become a major exporter of coal and by 2020 or so would be in a very large surplus trade position.

According to these results, the United States would not become heavily dependent upon nuclear power until sometime after 2000. The breeder reactor would not come into play in a major way

until even later, though at some point in that period it would become the principal source of energy for the United States.

In comparison with prices predicted under a competitive market, all fuels with the exception of natural gas are found to be overpriced at present, and petroleum substantially so. The model predicts a gradual increase in energy prices over the remainder of this century and well into the next for certain uses. As the breeder reactors come to supply a major share of our energy, prices for heat and electricity would stabilize at levels ranging from marginally higher (38 percent above the 1970 price for electricity) to substantially higher (over 11 times higher) for industrial heating. For "nonsubstitutable" transportation users (essentially air transport), prices in 2070 would be around 15 times the 1970 level.

Nordhaus concludes that "the current stage of history is a transitory phase between dependence on cheap but scarce resources and dependence on more costly but abundant resources." He argues against "a long-run policy based on the premise that energy resources are the Nation's most precious resources." Instead, he interprets the findings to suggest "that the current crisis should be viewed as the temporary effect of critical bottlenecks . . . and that stress should be laid on expansion of capacity in those areas where resources are abundant—intensified drilling for oil and gas and heavier use of coal; and that greater attention should be paid to perfecting processes for producing clean synthetic fuels—particularly shale oil and liquified coal."

BUT WHAT DO THE PEOPLE THINK?

Let us turn now to the "man in the street." How does he perceive the issue? How does he see it affecting his daily life? And what, if anything, does he feel his government should be doing about it? A continuous national survey was conducted by the National Opinion Research Center for the Department of Transportation.

Most people feel the issue is "very important" and have felt that way for several months. Little wavering of opinion is apparent. A majority feel the shortage has changed their way of living. More feel the change has been for the worse, and they are generally annoyed by it. They have reacted to the higher prices by cutting back on their driving, particularly for recreation and shopping.

Though the public has been uncertain about whom to blame, most recently the oil and gas companies have headed the list. In-

terestingly, of those held most responsible for the shortage, the Arab nations are well down the list and environmentalists are at or near the bottom. People are generally unhappy with the federal government for its handling of the problem, though their rating of its performance has tended to improve through time. State governments, on the other hand, have been given fairly high marks for the way in which they have dealt with the situation.

Support for gasoline rationing has fallen over the past few months to the point that very few now feel it is necessary. Nonetheless, the volatility of opinion over time suggests this attitude could change quickly if supplies were to tighten or prices were to rise sharply.

With regard to present allocations, nearly all feel they are getting their fair share of fuel. In the allocation of fuel supplies by use, people assign agricultural production one of the highest priorities, even higher than national defense. Only the heating of homes receives as high a priority. Furthermore, most people feel that those living in outlying suburban or rural areas not served by public transportation should be granted extra fuel if gasoline rationing is ever adopted.

The public shows little apprehension concerning use of nuclear power. Most feel it should be used to produce electricity. About twice as many people favor having an electric plant fueled by nuclear energy located in their city as favor having a plant fueled by coal.

Let us now consider some implications of this for rural people.

RURAL AREAS AS SITES OF FUEL EXTRACTION

Some rural areas are going to undergo substantial socio-economic change over the coming two or three decades as a result of the sharp rise in fuel prices. There are, of course, many unknown factors. For example, we cannot foretell the future level of fuel prices with much certainty. They are highly dependent on foreign and domestic political decisions. State environmental and land use legislation will have varying effects too, as will federal strip mining legislation now pending.

Despite these unknowns, we can make some informed guesses about the location, scale, and timing of fuel extraction activities on the basis of what we know about: our reserves of coal, oil, oil shale, natural gas, and uranium; the economic feasibility of extraction; the properties of the fuels themselves (for example, BTU and sulphur content); the operational status of the extractive and pro-

cessing technologies; and private investment decisions already made.

Much of the increase in fuel extraction activity will involve the stripping of low sulphur deposits. Though such deposits exist in each of the three major coal producing regions—the Appalachian fields, the Illinois-Missouri fields, and the Northern Great Plains—far and away the largest of these reserves is in the Northern Great Plains. Because of this and because the region has been the focus of recent study, I will illustrate with information pertaining to this region.

The magnitude of effect in the Northern Great Plains—which principally involves the states of Montana, North Dakota, Wyoming, and Nebraska—has been estimated by the Northern Great Plains Resources Program. Their “most probable” estimate is that by the year 2000 the region will have an additional 44 coal mines, 13 electrical generating plants, and 16 gasification plants in operation. Associated with such activity would be an estimated increase of almost half again (46 percent) the area’s population and an even greater relative increase in employment (62 percent). In absolute terms, these are comparatively small numbers. The rates of growth translate to about 200,000 more people and 100,000 more jobs. And, this to occur over a thirty-year period.

Put another way, this population increase is only 20,000 short of the growth that occurred over a single decade (1960–1970) in Fairfax County, Virginia, where I reside. And, the latter growth occurred within an area of 399 square miles, while that in the Northern Great Plains will be scattered in selected locations over an area of about 143,000 square miles.

Despite the relatively small numbers involved, this growth would represent a substantial shock to the communities in the region. They are neither accustomed to nor equipped for such inflows. Between 1960 and 1970, the area’s population barely held its own, increasing less than 2 percent. The nature of the shock would take several forms. Area labor markets would become substantially tighter. In some areas, such as the Powder River Basin area of Wyoming, the growth in demand for labor would outpace local availability to the point of requiring net in-migration. In the affected areas of Montana, on the other hand, increased employment opportunities are likely to reduce net out-migration but not eliminate it. Of course, the presence of underutilized labor will not in itself eliminate the need for in-migration. Many of the jobs will require skills that are not locally available. The new activity will

bring with it much higher wage scales. For those local employers dependent upon low-wage labor, this spells higher operating costs.

Beyond the rapid growth this development is likely to bring on, it will also cause large fluctuations in population as the plants move from construction to operational phases. For example, Campbell County, Wyoming, had less than 5,000 employed in 1970. Within three to five years, during the construction of mining facilities, electrical plants, and gasification plants, employment might double and then drop back to little or no increase over current employment after a decade or so.

Communities in the area will be hard pressed to take such growth and change in stride. Most local governments within the region are not equipped to deal with problems on anything approaching this scale. And even if they were, it is almost certain that public service requirements will outpace revenue collections in the early years, leading to sizable budget deficits. Furthermore, significant benefit-cost spillovers are expected between jurisdictions, state as well as local. The case of Big Horn County, Montana, and Sheridan County, Wyoming, is a dramatic example of what could occur. It is expected that many of the coal miners and plant personnel working in Big Horn County will select Sheridan for their place of residence. If this occurs, Big Horn County tax revenues will, after a lag of four or five years, outpace the predicted school budget by a significant amount. Sheridan County, on the other hand, will face quite the opposite situation in the form of a mounting school budget deficit.

The infusion of large quantities of investment capital from outside the community will lessen the community's economic independence and, therefore, the community's ability to determine its future course. For those who live in urbanized areas, this is nothing new. But for the small town in the Northern Great Plains it can be a disturbing prospect.

From a social viewpoint, this development will bring about drastic change in the composition of the population of the region. Much of the labor will be supplied by migrants. These migrants will be younger and higher paid. Their attitudes and tastes will be more urbane. They will have less attachment to the community and to the land. It seems to be this change and what it portends for the future pace and style of life in the region that is troubling the native population.

CONSUMPTION EFFECTS

As in the remainder of the nation, rural areas have become

highly dependent upon fossil fueled energy for both production purposes and for household consumption. The central question is whether the effect of higher fuel prices is different in rural areas than it is in urban areas and, if so, what the implications are for the future development of these areas. In addressing this, I will distinguish between the effect on the welfare of household consuming units and the effect on overall economic activity in rural areas.

On the household side, there are a couple of reasons to believe rural people will be more adversely affected than their urban counterparts. The proportion of a family's budget spent for energy (direct and indirect) is inversely related to level of income. Food, housing, and transportation account for about 75 percent of the energy consumption of a typical household. Since low-income families assign a significantly larger share of their income to these items, their dependence on energy is relatively greater. An increase in the cost of energy therefore has a relatively greater impact on lower-income families. Since rural incomes are somewhat lower than urban incomes, the effect on the rural population will be proportionately greater.

By one estimate, about 14 percent of all consumption expenditures of rural households is accounted for by direct and indirect energy costs. This is about one-eighth again the share of metropolitan area income devoted to energy consumption. Assuming a perfectly inelastic demand, this means a 50 percent increase in energy costs would result in an increase in household expenses of about 7 percent.

Beyond the effect associated with income, rural people seem more dependent on fuel for transportation and on more expensive heating fuels. A recent study conducted at the University of Virginia estimated changes in welfare associated with higher fuel prices by measuring the increase in per capita income required to maintain existing levels of personal consumption expenditures. Under varying assumptions of increases in fuel prices and the price responsiveness of industrial demand, the study findings show that the per capita welfare of rural residents declines about one-quarter more than that of urban residents. This is attributed largely to the greater dependence of rural people on the automobile for transportation and on fuel oil for home heating.

Rural employment effects at this stage are uncertain. During the period of shortages last winter, some rural industries experienced considerable hardship as the market sought to recover from the initial shock and as households reacted to a state of crisis. Now that the initial phase is over, we can expect economic forces to play

a more central role. It will take time, however, for the economic factors to work themselves through the market process. Because we are yet in the midst of this process, predictions are hazardous.

We do, however, have the benefit of early runs of an input-output model that predicts employment effects for the nonmetropolitan economy. Assuming a doubling of petroleum prices and using an 87 industry matrix, the model predicts a net loss of less than 0.3 percent in rural employment.

This, however, masks a slightly larger reallocation of jobs among rural industries. There is a predicted loss of 123,000 jobs matched by a gain of 70,000 jobs in other industries. Among the principal losers are services, plastic products, and motor vehicles. Major gainers include apparel, fabrics and yarn, mining, and agriculture.

Though these estimates are highly tentative, the industries affected and the relative incidence of effect seems to be borne out by other evidence. The seriousness of the disruptive influences will depend largely on whether they are spread widely or are concentrated within a few localities.

POLICY ISSUES

What are the principal policy issues we face, and what options do we have for dealing with them?

National Policy

Most of the more serious problems brought on by higher fuel prices are national in scope. Everyone has a stake in the decisions that are made. Though some issues divide along something akin to lines between rural and urban, most do not.

1. **SHOULD THE PUBLIC SECTOR INTERVENE?** Though there is general agreement on the need for some form of public intervention in adapting to the higher prices, there is considerable difference of opinion over the extent of this intervention. Some have argued that within a rather short time, the market's "invisible hand" could well turn the current energy shortage into an energy glut. But if we do not take this optimistic view, there are several questions to be answered. How do we make best use of the market mechanism as part of an intervention strategy? What about the timing of the intervention? What criteria do we look to in deciding when to intervene and, perhaps more important, when to withdraw? How do we avoid the costs and inefficiencies that derive from replacing predictable market behavior with unpredictable political behavior?

We are not very favorably impressed with the past experience of our government and others in the use of centralized economic control. At the same time, the social and political costs of non-intervention are intolerable.

2. WHAT ARE THE ALTERNATIVE FORMS OF NATIONAL INTERVENTION? I would summarize the principal alternatives as follows: (a) the accelerated development of new technology, (b) reduced dependence on foreign fuel supplies, (c) improved efficiency of the present energy system, (d) a reduction or limitation of the growth in energy consumption. These are not mutually exclusive alternatives.

At present, our national policy is laying stress on the first two alternatives. The federal government's research and development budget has been quadrupled to a level of about \$2.2 billion for fiscal year 1975. "Project independence" is aimed at making the United States independent of foreign sources of fuel by the end of this decade. Alternatives (c) and (d) have been largely left to determination by market forces. Both actions—accelerated research and project independence—give rise to further questions. For example, are we devoting too much of our research budget to energy production and too little to conservation in use? Within energy production research are we allocating too much to nuclear power and too little to other energy sources? Is energy independence attainable by 1980? Do other approaches such as stockpiling offer a more cost effective way of dealing with the problem?

3. TRADE-OFFS BETWEEN ECONOMIC GROWTH AND ENVIRONMENTAL QUALITY. Efforts to cope with higher fuel prices directly conflict with many measures aimed at safeguarding environmental quality. Due in part to the difficulty of measurement and in part to its "public good" nature, consideration of the environmental quality issue too often suffers from an absence of objective fact. A principal challenge in the immediate future will be to frame the issues in an objective context for more meaningful assessment.

4. HOW ARE LOW-INCOME CITIZENS TO BE PROTECTED FROM THE ADVERSE EFFECTS OF HIGHER FUEL PRICES? As noted above, higher fuel prices hurt the poor proportionately more because they spend a larger share of their incomes on energy intensive goods. How is this impact to be eased? One option is to consider this effect in the choice of overall fuel subsidization policies. Low-income families are proportionately more dependent on natural gas than on petroleum. Thus, to the extent natural gas prices are restrained relative to petroleum prices, the poor would benefit, at

least in the near term. Another option is to issue "fuel stamps" in the same fashion we now use "food stamps." In effect, the fuel stamps would represent a price subsidy for the purchase of specified quantities of fuel by those individuals meeting specified eligibility criteria. Still another, and in my opinion more viable, option is to reform our present patchwork welfare program in such a manner as to augment the purchasing power of low-income citizens.

Rural Development Policy

From the standpoint of rural area development, higher fuel prices represent one more factor in a continuing adjustment process. But the implications for rural development policy are not unlike those we have faced over the past several years. At the national level, I see the following options (again, not mutually exclusive):

1. INTRODUCE A "RURAL TILT" TO NATIONAL ENERGY POLICY. This could be done in a variety of ways, depending on the circumstances and on the form this policy eventually takes. Its principal aim would be to intervene in such a way as to make energy comparatively cheaper and more readily accessible in rural locations. In the use of allocations or rationing, this could involve offering an advantage to rural users. Energy prices could be equalized geographically or even subsidized in selected rural growth centers. The leasing of subsurface rights of federal lands could even be tied to a requirement that energy users in selected rural localities receive preferential treatment.

There are numerous possible means of achieving such a "tilt." A couple of advantages of this approach are: (a) the impetus for program development is already present and (b) there appears to be general public support for (or, at least, tolerance of) favored treatment of rural areas. Yet two rather compelling disadvantages also come to mind: (a) the secondary effects of such market intervention would probably exceed acceptable limits and (b) though energy is an important and necessary factor in economic activity, it is rarely the only factor required.

2. FOCUS EXISTING RURAL DEVELOPMENT PROGRAMS ON SEVERELY AFFECTED RURAL AREAS. Some rural areas face the prospect of rapid growth as a result of the current situation, while others will encounter economic decline of varying magnitudes and duration. Both situations give rise to a need for outside assistance for many rural communities. A wide array of program assistance is presently available, ranging from loans for housing, businesses,

and community facilities to occupational retraining and employment services.

There are both advantages and drawbacks to this approach. On the plus side, it would involve programs that are already authorized and funded. A delivery mechanism is already operating. On the other hand, since these programs are already operational, they presumably have an established clientele and probably a backlog of unmet needs. Since the existing programs represent public response to earlier problems, their suitability for this set of problems is likely limited. Finally, the efforts required to coordinate such widely scattered authorities would be an ambitious undertaking.

3. **RECAST OUR PRESENT RURAL DEVELOPMENT POLICY.** One approach (turned down by the Congress two years ago) is to incorporate the funding for categorical assistance into a revenue-sharing program. At the opposite end of the ideological scale, a variety of infrastructure and business assistance could be channeled into a selected number of development centers or development areas. Though this approach was considered within the Executive Branch three or four years ago, it was rejected in favor of revenue sharing.

Still another and in its way more drastic alternative would be to depart from the present emphasis on industrialization and community infrastructure and concentrate instead on human resource development in combination with the modernization of local government. At its core, the adjustment problem facing rural America is a human adjustment problem. If the people who live in these areas could adapt to change, individually and collectively, the effectiveness of the market could be much enhanced. The means of adaptation I have in mind are basic human resource investments: education and training, health care, and mobility assistance. To these could be added some politically acceptable form of minimum income.

With the separation of the well-being of people from the well-being of places that this approach implies, a couple of results can be expected. First, as the individual's opportunity for adjustment improves, people can be expected to become more mobile. Areas of limited opportunity would probably depopulate more rapidly than otherwise. Second, from a political perspective, such change would likely lead to new political alliances. As an outgrowth of these changing political alliances, I would not be surprised to find the distinction between rural and urban further blurred as the narrower, functional interests separate and move toward alignment with their respective urban counterparts.

Local Community Issues

It is at the local community level that all these forces and effects eventually converge. The overriding local issue revolves around the management of change (whether it be growth or decline) and having the institutional capability to manage change in a way that is considered not only acceptable but also desirable by a majority of the local people. Here are some issues I suspect localities will encounter with greater frequency:

- In areas of rapid growth, how are people on fixed incomes to be protected from rapidly rising prices?
- How are the undesirable (social and economic) characteristics of the “company town” to be avoided or mitigated?
- How are the external costs and benefits associated with adjustment to be internalized to facilitate that adjustment? Some of these costs and benefits remain internal to the community but many spill over beyond. In the case of coal extraction, for example, should a tax be levied on the extraction to cover external costs? If so, who should levy the tax, and how should receipts be distributed?
- How do we build future adaptability into the boom towns now under construction? How do we avoid the construction of excess community infrastructure capacity?
- What are the secondary employment effects likely to be associated with fuel extraction and energy generation activities? Do they offer a basis for the development of a diversified economy that can maintain its viability beyond the boom period?
- A variety of internal community conflicts are likely to arise between those who stand to gain and those who stand to lose from the changes under way. Can local government provide an objective forum for consideration of all points of view, including resolution of the conflicts?
- Likewise, many conflicts will cross community and state boundaries. Again, how do we identify, consider, and resolve them?