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A review of the effect of the energy situation on rural area indicated that energy changes since 1973 have not derailed nonmetropolitan economic growth. Analysis of the 1967 to 1972 period and of the 1972 to 1975 years showed rapid growth in nonmetropolitan areas, with growth accelerated during the latter three years. Barring extreme, and at this time unforeseeable, events, there was no reason to believe that the energy future will put nonmetropolitan areas at a disadvantage compared with metropolitan areas. (Author/SC)

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COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

B-178205

JULY 18, 1978

The Honorable James Pearson  
United States Senate

Dear Senator Pearson:

This letter is in response to your inquiry of March 3, 1978, requesting that GAO look into the impact of the present and probable future energy situation on rural economic growth and development. We had several discussions with your staff in April with the object of designing a research plan which could be of maximum use to you and be done in the shortest practical time. We agreed to limit our inquiry to a survey of available data, a review of past and ongoing research work in the area, and a series of contacts with experts to elicit their opinions. We also agreed to limit our inquiry to non-farm economic development since nonmetropolitan development outside agriculture is needed for balanced national growth. The product of the inquiry--this letter and enclosure--summarizes the experts' and our own views on the extent of the problem and makes recommendations for further work in the area.

As the enclosure to this letter shows, you were correct in your original feeling that little attention has been paid to this question. Consequently, the conclusions we have come to by synthesizing our information are highly tentative. Nevertheless, the best information we can gather leads us to the following conclusions:

--Energy changes since 1973 have not derailed nonmetro economic growth. Our analysis of the 1967-1972 period and the 1972-1975 years shows rapid growth in nonmetropolitan areas. In fact, growth accelerated during the latter three years.

--Barring extreme--and at this time unforeseeable--events, there is no reason to believe that the

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energy future will put nonmetro areas at a disadvantage compared to metro areas.

While this is the overall consensus, it was by no means unanimous, especially on specific questions we asked concerning the effects of price increases, embargoes, coal conversion, environmental policy, and renewable energy.

Our analysis is based on the latest data from the Bureau of Economic Analysis, Department of Commerce, which were refined and furnished to us by the Department of Agriculture. While we have confidence in their accuracy, the fact that the data cover only two years of the "energy crisis" limits the conclusions we can draw. What we can say is that both the movement to the Sunbelt and to nonmetro areas generally has, if anything, accelerated since 1972. What we cannot say, is that we are certain the trend will continue in just the same way. It was for this reason that we consulted a wide range of experts. As we noted above, there was a general consensus but a good deal of variation in the answers to our specific questions.

Because of the wide range of expert opinion, the fact that important data are available only through 1975, and the lack of effort which has been spent on the question of rural economic development and energy; we feel that emerging data should be closely monitored and analyzed over the next several years to give policy makers a better understanding of nonmetropolitan economic growth and energy problems, in order to promote balanced national growth. We also note that the Department of Energy is developing a mathematical model which will have the capability to analyze this question, and we recommend that DOE utilize the model when it becomes available. A draft report was furnished to Department of Energy officials for their comment. These officials had no substantive comments on our conclusions and recommendations. Our full report on our independent analysis of employment trends, survey of expert opinion, and detailed conclusions and recommendations follows as an enclosure to this letter.

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As agreed with your office, copies of this report are being sent to the Chairmen, House and Senate Committees on Appropriations; House Committee on Government Operations and Senate Committee on Governmental Affairs; the Director, Office of Management and Budget; Secretary of Energy; and other interested parties.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "James B. Stacks". The signature is written in dark ink and is positioned below the typed name.

Comptroller General  
of the United States

Enclosure

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RECENT TRENDS IN NONMETROPOLITAN EMPLOYMENT

Nonmetropolitan\* economic development and job creation in the Nation's various regions comes from two sources. Some regions are growing faster than others and this causes more job creation in both metro and nonmetro areas within those regions. Other regions are experiencing a "non-metropolitanization" or "ruralization" of jobs as relatively more are created in the country than the city. Both processes do, of course, occur simultaneously. The following pages will briefly lay out both trends along with information on specific industries. The data reflect the 1967-1975 period and are the latest available. Our analysis uses nine standard U.S. Bureau of the Census regions. These are New England, (NE); Mid-Atlantic, (MA); East North Central, (ENC); West North Central, (WNC); South Atlantic, (SA); East South Central, (ESC); West South Central, (WSC); Mountain, (MTN); and Pacific, (PAC); divisions. A map showing the states making up each region is included on page 21.

There were nearly 10 million jobs created between 1967 and 1975, an increase of 13 percent. The number of jobs in only three regions--New England, Mid-Atlantic, and East North Central--grew less than that. The lowest growth was in the Mid-Atlantic region (1 percent), and the highest growth was in the Mountain region (36 percent) (See Table 1). The table also points up the well known fact that the number of jobs grew faster in nonmetro than in metro areas. While this is true overall, the three fastest growing regions (South Atlantic, West South Central, and Mountain) saw their metro employment increase at significantly faster rates than their nonmetro development.

While the growth in total metro and nonmetro employment is reflected accurately in Table 1, that table does not

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\* We use the term "nonmetropolitan" rather than "rural" because nonmetropolitan includes small cities and towns while rural does not. "Rural" also includes areas within Standard Metropolitan Statistical Areas which are sparsely populated. Since such areas relate economically to the large city they are near, such areas should be excluded from our analysis. The term "non-metropolitan or, more simply, "nonmetro" most closely approximates small town and rural America.

TABLE 1

Overall Sunbelt Employment Has Increased Faster than Snowbelt Employment, but Nonmetropolitan Areas in the Snowbelt have Grown Quickly Too.

Percentage Changes in Wage and Salary  
Employment for the U.S. and Nine Regions;  
Total, Metropolitan and Nonmetropolitan; 1967-1975

<u>Region</u>	<u>Percentage Change Total Employment</u>	<u>Percentage Change Metro Employment</u>	<u>Percentage Change Nonmetro Employment</u>
United States	13	12	18
Mid Atlantic	1	0	12
New England	5	4	7
East North Central	7	5	14
West North Central	16	12	23
East South Central	17	17	17
Pacific	19	18	30
South Atlantic	20	21	18
West South Central	23	26	15
Mountain	36	40	30

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Source: Calculated by GAO from U.S. Department of Commerce, Bureau of Economic Analysis Data.

tell the whole story. The nine regions have very different sized work forces, going from 2.7 million (MTN) to 15.7 million (ENC). Adding 100 jobs in the Mountain region causes the same percentage change as adding 424 jobs to the East North Central. To get around this problem, we recalculated the data in Table 1, weighting it to reflect the relative size of each region's work force in 1975. The results are shown in Table 2, and comparing the tables brings out some important facts.

Weighting the percentage changes makes less differences in metro than nonmetro employment growth. The Pacific and South Atlantic regions had more and the Mountain region somewhat less metro job growth relative to their population than when simple percentage changes are considered. This reflects the larger number of new jobs (1.5 and 1.6 million) created in the Pacific and South Atlantic regions than were created in the Mountain (.7 million) region.

There was much more change from absolute to weighted growth in nonmetro employment. The East South Central, West North Central, and Mountain regions grew more slowly relative to their work forces than absolutely. The Mid-Atlantic, East North Central, South Atlantic, and Pacific regions had faster nonmetro growth relative to their workforces. The first three regions have lower weighted nonmetro job growth because of their smaller workforces and because they already had larger than average proportions of jobs in nonmetro areas. Nearly the opposite is true for the Mid-Atlantic, East North Central, South Atlantic, and Pacific. Each has a large work force but relatively few nonmetro jobs; consequently, moderate nonmetro growth is unusual in these regions and shows up prominently.

What industries have been growing or declining fastest, and where have these changes taken place? As we have already pointed out, nonmetro jobs increased by 18 percent while metro jobs increased by 12 percent. These averages hide a great many variations, however. Table 3 shows how wage and salary employment in various industries has increased in metro and nonmetro areas. The experience is quite similar in most industries--nonmetro outpacing metro growth--with the exception of the service industry.

There is still greater variation in the growth and decline of these industries in the various regions. Table 4 shows the regions which had the largest and smallest increases in metro and nonmetro employment in



TABIE 2

When Compared to Total Work Force, Metro Employment Grew Fastest in the Plains, Far West, and South Atlantic. The Fastest Nonmetro Growth was Spread Through Parts of the Northeast, South, Midwest, and West.

Percentage Change in Wage and Salary  
Employment for the U.S. and Nine Regions;  
Weighted by number of Employed in 1975: 1/  
Total, Metropolitan and Nonmetropolitan;  
1967-1975

<u>Region</u>	<u>Weighted Percentage Change Total Employment</u>	<u>Weighted Percentage Change Metro Employment</u>	<u>Weighted Percentage Change Nonmetro Employment</u>
United States	13	12	18
Mid Atlantic	2	0	20
New England	3	2	4
East South Central	10	10	10
East North Central	13	10	27
West North Central	13	10	18
Mourtain	14	16	12
West South Central	25	29	17
Pacific	27	25	42
South Atlantic	32	34	29

1/ Weight was proportion of total employed in 1975. Numbers in the body of the table are Table 1's percentages multiplied by the weights.

Source: Same as Table 1.

each industry during 1967-1975. These results are given in both unweighted and weighted terms. While the Mountain region has led in all industries in metro job growth, the South Atlantic area had almost equally great success when its much greater labor force is taken into account. The nonmetro employment increases are split about evenly between the Mountain and Pacific regions, but the leading nonmetro regions are dominated by the South Atlantic and Pacific regions relative to total employment. The various industries have been growing most slowly--and at times actually declining--in the "snowbelt" of the Northeast and Midwest. This is true both on a percentage change and a weighted percentage change basis. These data are further confirmation of stronger economic development in the "Sunbelt", and this development is both urban and rural.

While the foregoing described job growth by industry and region in general terms for both metro and nonmetro areas, it did not fully answer the question of which industries are "going nonmetro" and where that is happening. Nationwide, seven of our eight industry groups have "ruralized" over the eight-year period. The only exception being services which "urbanized" slightly. Overall, the proportion of jobs located in nonmetro areas increased about one percent or 825,000 jobs more than if metro and nonmetro employment had grown at the same rate. In fact, exactly one percent more of all wage and salary employment could be found in nonmetro areas in 1975 than in 1967. This does not sound like much, but there are a number of industries and regions where the trends were very much stronger.

The West North Central, West South Central, and East North Central regions saw the largest overall shifts toward nonmetro employment. Their ratios of nonmetro to metro jobs grew by 9, 12, and 8 percent, respectively. In the West North Central, more jobs were created in nonmetro areas (499,000) than in metro areas (401,000). The other two regions saw more jobs created in metro areas, but the rate of growth in nonmetro employment was sufficiently high to cause a change in the proportion of jobs found in nonmetro areas. Certain regions had particularly strong nonmetro development trends for specific industries. The West North Central saw the number of nonmetro to metro manufacturing jobs climb from 41 nonmetro jobs per 100 metro jobs to 56, while the numbers for nonmetro construction jobs climbed from 67 to 78 per 100 metro jobs. This represented a gain of 83,000 manufacturing jobs in nonmetro areas while metro areas lost 85,000 manufacturing jobs. In construction, nonmetro

TABLE 3

With One Exception, Nonmetro Outpaced Metro Employment Growth in all Industry Groups.

Percentage Changes in Wage and Salary  
Employment for the U.S. and Eight Industry Groups;  
Metropolitan and Nonmetropolitan;  
1967-1975

<u>Industry Group</u>	<u>Percentage Change Metro Employment</u>	<u>Percentage Change Nonmetro Employment</u>
United States	12	18
Finance, Insurance, and Real Estate	26	46
Retail Trade	23	29
Wholesale Trade	17	28
Government	19	22
Services	24	21
Construction	3	17
Transportation, Communications, and Public Utilities	5	13
Manufacturing	-9	6

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Source: Same as Table 1. Source of Table 4 also same as Table 1.

TABLE 4

The Largest Metro and Nonmetro Employment Increases are Almost All in the Sunbelt; The Smallest Employment Increases are Nearly All in the Snowbelt.

Regions with Largest and Smallest Percentage Increases or Declines  
in Wage and Salary Employment,  
by Industry and Metropolitan and Nonmetropolitan Location; 1967-1975

<u>Industry Group</u>	<u>Region With Largest Percentage Increase</u>	
	<u>Metro</u>	<u>Nonmetro</u>
Finance, Insurance, and Real Estate	Mountain (65)	South Atlantic, East South Central (58)
Retail Trade	Mountain (55)	Pacific, Mountain (41)
Wholesale Trade	Mountain (40)	Mountain (55)
Government	Mountain (29)	Pacific (33)
Services	Mountain (49)	Pacific (35)
Transportation, Communications, Public Utilities	Mountain (29)	Pacific (22)
Manufacturing	Mountain (27)	Mountain (40)
Construction	Mountain (50)	Mountain (58)
	<u>Region With Smallest Percentage Increase (or largest decline)</u>	
	<u>Metro</u>	<u>Nonmetro</u>
Finance, Insurance, and Real Estate	Mid-Atlantic (11)	Mid-Atlantic (31)
Retail Trade	Mid-Atlantic (8)	East North Central (21)
Wholesale Trade	Mid-Atlantic (2)	Mid-Atlantic, West South Central (19)
Government	Pacific (14)	New England (5)
Services	Mid-Atlantic (14)	West South Central (9)
Transportation, Communications, Public Utilities	East North Central (-1)	East North Central (4)
Manufacturing	New England (-17)	New England (-16)

TABLE 4 continued

<u>Industry Group</u>	Region with Largest		
	<u>Weighted Percentage Increase</u>		
	<u>Metro</u>	<u>Nonmetro</u>	
Finance, Insurance, and Real Estate	South Atlantic (74)	South Atlantic	(93)
Retail Trade	South Atlantic (58)	Pacific	(57)
Wholesale Trade	South Atlantic (54)	South Atlantic, Pacific	(50)
Government	South Atlantic (37)	East North Central	(53)
Services	South Atlantic, (46) Pacific, East North Central	Pacific	(49)
Transportation, Communications, Public Utilities	South Atlantic (30)	Pacific	(31)
Manufacturing	West South (21) Central	West South Central	(25)
Construction	West South (30) Central	Pacific	(57)
	Region with Smallest		
	Weighted Percentage Increase		
	(or largest decline)		
	<u>Metro</u>	<u>Nonmetro</u>	
Finance, Insurance, and Real Estate	New England (14)	New England	(19)
Retail Trade	Mid-Atlantic (14)	Mountain	(16)
Wholesale Trade	Mid-Atlantic (3)	New England	(14)
Government	New England, Mountain (12)	New England	(3)
Services	East South Central (11)	East South Central	(7)
Transportation, Communications, Public Utilities	East North Central (-2)	New England	(6)
Manufacturing	Mid-Atlantic (-34)	Mid-Atlantic	(-17)
Construction	East North (-25)	East North	(-10)

areas gained 18,000 jobs while metro areas gained only 1,000. The other region where particular industries have developed extraordinarily fast in nonmetro areas is the East South Central. Manufacturing and Finance, Insurance and Real Estate increased their proportions of nonmetro to metro jobs from 109 per 100 up to 120 per 100 and from 35 to 42 per 100, respectively. These changes in the proportion of nonmetro to metro jobs represent 91,000 new nonmetro versus 29,000 new metro manufacturing and 22,000 new nonmetro versus 35,000 new metro finance, insurance, and real estate jobs.

Those industries undergoing rapid nationwide non-metro growth are Construction, Manufacturing, Insurance and Real Estate, and Wholesale Trade. In the case of Construction, 121,000 nonmetro jobs and 88,000 metro jobs were created; for Manufacturing it was 271,000 nonmetro jobs created and 1,437,000 metro jobs lost;\* Finance, Insurance and Real Estate saw 174,000 new nonmetro and 776,000 new metro jobs; while Wholesale Trade expanded by 123,000 nonmetro and 519,000 metro positions. In the last two cases, even though there were more metro jobs created, the rate of nonmetro increase was much greater.

#### SURVEY OF EXPERT OPINIONS

We surveyed expert opinion in the fields of demography and regional economic development to solicit views on the effect of energy problems and policies on nonmetropolitan economic growth. We contacted thirty-two professionals from Congressional agencies, the Executive Branch, and the Universities. Federal agencies surveyed included the Department of Agriculture, Department of Commerce, Department of Energy, and the Department of Labor. During our discussions with these professionals, we asked for

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\* This large job loss is somewhat exaggerated because 1975 was a serious recession year. Consequently, a number of these jobs have been regained since then. This does not damage the analysis presented here because what we are interested in are the trends in metro and non-metro areas. As the economy strengthens, job creation will pick up in both areas and there is no reason to believe that the trend will be any weaker in nonmetro than in metro areas. It may be stronger since so many nonmetro areas experienced rapid growth in spite of the recession.

their analyses and opinions on the following questions:

- I. How do existing energy policies and problems affect nonmetro development and economic growth? Is continued nonmetro growth realistic?
  - A. If energy prices continue to rise, as expected, then what effect will this have on nonmetro economic growth?
  - B. Will the increased cost of transportation encourage or discourage industry from locating in nonmetro areas?
  - C. Will possible fuel curtailments make nonmetro areas more or less attractive for development?
  - D. How would the shift by industry from oil and gas to coal affect growth prospects for these areas?
    1. Would conversion to coal make nonmetro locations close to coal supplies more desirable?
    2. Would conversion result in a net increase or decrease in the number and types of jobs in nonmetro areas?
  - E. Do the non-degradation air pollution regulations inhibit or encourage industry decisions to locate or remain in nonmetro areas?
- II. Since non-depletable energy sources must eventually furnish a large portion of our energy needs, is it likely that these sources can be used more efficiently in nonmetro than in metro areas?

## SURVEY RESULTS

The questions we used in our survey which relate energy to nonmetro growth and job creation fall into five subject areas. These are: the effects of rising energy prices, problems due to curtailed fuel availabilities (especially gasoline), effects of coal conversion, impacts of environmental controls, and possible uses of renewable energy sources (solar and wind). Our interviews revealed two striking facts--there has been little or no rigorous analysis of these questions, and opinions of the experts we consulted vary widely. In other words, not much has been done and the right answers are not obvious.

Individuals within the executive agencies were unable to comment on specific questions from completed economic analyses and felt they had to confine their remarks to generalizations based on personal opinion. This was also true of other government and academic professionals. The lack of comprehensive work obviously lessens the weight or authority which one can put on such comments. We feel, however, that these views are representative of the analysis and opinions presently available. Specific reasons suggested for the lack of in-depth analysis were that, so far, the debate on energy policy has been concerned primarily with national and international issues and there is also a lack of adequate data to perform analyses on a disaggregated basis.

Officials of the Department of Energy (DOE) pointed out that the agency is constructing a simulation model which can address the type of questions we have been asking. The R.E.A.D. (Regional Energy Activity and Demographic) model has been under development for two years and is being designed to analyze interactions among energy policies, the location and amount of economic activity and population. The system will not be completely operational until early or mid-1979, and DOE will not have the capability to respond to our questions until then.

We found that most professionals in population, migration, and regional economics we contacted perceived the energy problem in terms of changing economic relationships rather than as a barrier to nonmetropolitan growth. These changing relationships include gradual conversion to coal and electricity, a long term trend away from energy intensive products and processes, more use of labor, a shift to renewable energy sources, and various others. While some evolutionary change could be negative, some--and possibly most--would be positive. In short, most of them believed that industrial growth would continue except under very dire circumstances such as war or depression. Many felt that government policy, both on energy and the environment, had more potential for arresting nonmetro growth than anything related to energy itself. Part of this problem is the uncertainty presently surrounding policy in both areas. Once energy and environmental policy become reasonably settled and predictable, firms will be more willing to commit their funds to investments in whatever areas are most promising.



## Effects of Rising Energy Prices

Increasing energy prices can affect nonmetropolitan industry in two ways. The price per BTU may increase more in the country or more energy may be needed per unit of output and so higher energy costs will drive the prices of nonmetro-made goods up faster than those made in metro areas. Several experts pointed out that the U.S. has an efficient energy distribution system, so there is little fear that the price of a BTU will escalate significantly faster in nonmetro areas. And while there is no reason to expect a production process to require more energy per unit of product because of nonmetro location, the same cannot be said for transportation. The cost of bringing raw materials to the factory and the cost of distributing products to market could conceivably be higher for nonmetro based firms and these higher costs could put them at a disadvantage. The economists we consulted did not see this as a serious problem. They pointed out that transportation is a relatively small part of total production costs and could easily be outweighed by other considerations. If a firm distributes its products nationally, or even to several states, transportation costs would be similar no matter where the firm was located.

A recently published GAO report\* pointed out that energy has had relatively little to do with industry movements toward nonmetro areas and the Sunbelt in particular. Industries have been attracted to the growing regions because of lower land, labor and construction costs, right-to-work laws, lower tax rates, and aggressive recruiting efforts which may include publicly supported construction bonds, labor training programs and tax exemptions.

Labor supplies could be reduced if gasoline prices rose sharply. Commuting costs would be higher and workers living far from the plant might choose not to pay out a large part of their wages just to get to and from work. This is potentially more serious than the cost of product transportation since a superior labor force is so important to firms' locational decisions. Workers are not totally at the mercy of higher gasoline prices. They may buy smaller cars or make carpooling arrangements. However, if gasoline prices were to jump radically,

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\* Better Planning Needed to Deal With Shifting Regional Energy Demand, (EMD-78-35; 2/22/78).

there could very well be a considerable number of people who choose to stay home or settle for a less appealing job rather than bear the commuting cost. Since so much depends on how great gasoline price increases will be, firms must make some assessment of their chances for reduced labor recruitment caused by a smaller commuting range. While each firm will make its own assessment, the data we have reviewed show nonmetro growth continuing after the 1973 oil embargo. If firms were willing to locate in nonmetro areas during those shaky years after 1973, the prospect of more gradual price increases in the 1980's should not scare many off.

### Effect of Fuel Curtailments

In extreme situations, fuel may be unavailable, or at least in very short supply, at any price. The two fuels most susceptible to sudden supply disruptions are natural gas and petroleum. Natural gas has been curtailed in varying amounts for several years with the winter of 1976-77 seeing the most drastic cutbacks.

Because of the relative abundance of gas in intrastate markets, gas-using industries in producing states were much less likely to be cut off than those in consuming states. The lower probability of curtailment may lead some industries with rigid gas requirements to open plants in the producing states. The major producing states are in the West South Central region which is one of only three regions whose metropolitan employment growth is greater than their nonmetropolitan employment growth. If any firms decide to move to the West South Central, and if they distribute themselves as other industries in this region do, about 25 percent of the new jobs will be located in nonmetro areas. This assumes that intrastate natural gas remains unregulated. The Administration is trying to extend regulation to the intrastate market; and if this effort is successful, the incentive will no longer be present.

The other fuel which may be unavailable is oil. The Department of Energy has developed a plan for gasoline rationing in the event of a severe supply interruption such as an oil embargo. This rationing plan will be submitted to Congress soon. Rationing planners feel gasoline is likely to be in shorter supply than other petroleum products because those products are more crucial in maintaining employment and human health. Since gasoline is so important for employee commuting, and since commuting distance and cost is important to nonmetro firms, gasoline rationing will most likely have the largest effects on

nonmetro firms.

Although rationing could be temporarily disruptive, it will only be implemented under emergency conditions. These conditions should be short lived, especially in relation to business locational decisions which reflect long term commitments. Because an embargo is a short range phenomenon and plant location decisions are long range, embargoes and rationing should have relatively little effect on the overall trend of nonmetro economic development.

Two other provisions of the rationing plan may mitigate the impact rationing would have on nonmetro commuting. These are the "white market" and the proposed "state adjustment factor." The white market will allow those firms and individuals who have more ration coupons than they need to sell the excess to the highest bidder. The price of white market coupons will be set by the supply of and demand for them so what they will cost cannot be foreseen. Presumably the price will be high; but for those who need the gasoline and are willing to pay the going price, it will be available. DOE may include a state adjustment factor which will tie the amount of gasoline made available to the average miles travelled per auto.\* If this is part of the final plan, states with many long distance commuters will have more gasoline made available per car.

Natural gas and gasoline curtailments are serious matters which may disrupt economic activity and social life nationwide. Most of the experts we contacted, however, saw little reason to believe that such curtailments would have an important long term effect on non-metropolitan economic development, and our data do not show any significant effect.

### Coal Conversion

A major goal of the Administration's National Energy Plan (NEP) is a substantial increase in the amount of coal consumed by both industry and electric utilities. Most of

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\* As of May 1978, DCE decided to solicit public comment on whether to include a state adjustment factor in the final rationing plan. Since the hearings will be taking place this summer, a final decision on whether to include the state adjustment factor or not is obviously some time away.

the increase above previous industry plans will come from converting plants currently using natural gas and oil to coal in the industrial sector. A series of tax provisions and a revised regulatory program will be the conversion catalysts. This program could impact on nonmetro job development and growth in several ways.

The NEP projects overall growth in coal production to be from 671 million tons in 1976 to 1.2 billion tons in 1985. Previous GAO reports\* have expressed serious doubts that production greater than 1 billion tons could be achieved by 1985. On the other hand, year 2000 production of 1.5 billion tons may be achievable. Even the lower level of expansion indicated by our analysis will have positive effects on employment levels in major coal producing areas due to the additional labor required by the coal industry. We estimate a coal production level of 988 million tons by 1985 would mean 157,000 new employees. To produce 1.5 billion tons by the year 2000, 374,500 new employees would be required. The largest number of new coal industry jobs will be in the Eastern United States because underground mining with its large labor requirements predominates there. Western states, however, will have the largest percentage growth in jobs reflecting the small base and large increases in surface mine production needing less labor. The majority of individuals commenting on the impact of coal conversion expressed views similar to those outlined above. Most felt that increased demand for coal will have a positive economic impact on job creation in coal production States.

A second phenomenon related to the overall growth in coal production is the impact such expansion will have on economic activities not directly related to coal mining. A given increase in expenditure in the coal mining sector will result in a multiplier effect on the overall level of expenditure. For example, if the coal mining industry in a particular region realizes a substantial increase in demand, it will hire more workers to increase production. As the number of employees in those industries both directly and indirectly related to coal mining increase, the demand for other goods and services in the region will also increase. This in turn will result in more noncoal jobs and a continuation of the process.

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\* U.S. Coal Development--Promises and Uncertainties, (EMD-77-43; 9/22/77) and An Evaluation of the National Energy Plan, (EMD-77-48; 7/25/77).

The final question, and perhaps the most difficult to answer with any degree of certainty, is the effect that the coal conversion program will have on the decision of individual firms not related to the coal industry to locate or remain in nonmetropolitan areas. The views expressed from surveyed professionals varied from conversion promoting increased nonmetro growth to having negative effects on industrial development. Those believing coal conversion would benefit nonmetro areas cited lower coal transport costs from siting near coal fields and the fact that installations built expressly to use coal would be more efficient than converting older city plants. Those believing in negative impacts cited the large minimum size of coal boilers which would exceed the needs of many small nonmetro plants and the lack of facilities to receive and handle large amounts of coal. Also, those nonmetro areas far from coal fields would face increased transportation costs.

Our own analysis revealed that the complexity of economic factors involved along with the uncertainty of future government regulations make any forecast or conclusion highly tentative. This uncertainty is reflected in the inability of those surveyed to reach a consensus on the issue. We believe, however, that three factors argue against coal conversion acting as an incentive for greater industrial development in urban areas.

First, the vast majority of coal production and processing occur in nonurban areas. If the conversion to coal resulted in fuel availability and transport costs becoming the primary consideration when deciding where to locate, firms would most likely choose rural areas.

Second, due to the larger size of coal-fired boilers and the need for storage and handling facilities, the conversion to coal will require a substantial increase in the amount of land needed for an industrial site. Given the limited availability and higher costs of urban real estate, such requirements would increase the cost and difficulty of locating in urban areas.

Third, Federal, State, and local environmental regulations make it increasingly difficult for firms to burn coal in highly populated urban areas.

Whether or not coal conversion will have a positive or negative impact on nonmetropolitan industrial development, will depend on both conversion programs and environmental regulations. The points outlined above, however, do not

indicate any disadvantages for nonmetro areas.

### Effects of Environmental Regulations

The professionals we consulted were not of one mind on the influence environmental regulations would have on nonmetropolitan growth. Since a great deal of air pollution comes from industrial fuel burning and since the Nation's final environmental policy toward areas above current air quality standards is still undecided, air quality regulations have the potential to limit nonmetro and metro economic growth. Regulations on "Prevention of Significant Deterioration" (PSD), in air quality were proposed in November 1977. The final regulations will be promulgated shortly. After publication in the Federal Register, the States will have nine months to submit their implementation plans and EPA will have four months to respond. Since the PSD program will be administered by the States, and since it will be a complex and controversial program, the amount of time before final policy is established for each State will probably be longer, at least in some cases, than 13 months.

The entire nation except national parks over 6,000 acres, wilderness areas over 5,000 acres and a few other small areas will be denoted "Class II" which will permit only moderate air quality deterioration. It will be up to each state\* whether to declare any of its land to be "Class III", meaning areas where more air quality deterioration--roughly double--will be permitted. Those states wishing to attract industry will be at a competitive advantage by giving certain areas Class III status. However, since this process has not yet begun, we cannot predict how many or which States will designate any Class III areas.

The cost of meeting environmental requirements in city and country locations will obviously play a role in siting decisions, particularly if some locations are made significantly more expensive by pollution standards. While the possible effects are conceptually straightforward, the lack of an established policy by each State on nondegradation makes it impossible to foresee the effects that the final policies will have.

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\* This also applies to Indian Tribes.

## Renewable Energy Sources and Nonmetro Development

Opinions we solicited on whether renewable energy sources would contribute to or detract from nonmetro job creation also varied considerably. None of our interviewees felt that using solar or wind power would hurt chances for continued nonmetro growth, but several expressed the opinion that we should not expect renewable energy to make much difference in either a rural or urban setting. Thus, in this case the range was from positive to little, but not negative, impact.

The diffusion of renewable energy depends on developing reliable technologies at competitive costs. Without both conditions being met, solar and wind power will not make appreciable inroads anywhere. If acceptable technologies and costs are achieved, however, nonmetropolitan areas have two factors working in their favor. These are open space and high construction rates. Open space is an obvious advantage for solar and wind energy. "Sun rights" are more secure where building heights and densities are low. Large windmills will take up considerable amounts of land, and less expensive, more readily available land in rural areas will help hold wind power costs down. The higher rate of both residential and business construction in nonmetro areas is favorable because the cost of originally installed solar equipment is much lower than the cost of retrofitted equipment. Thus, the opportunities for economical use of solar power are greater as more new building takes place. If the economic and technical problems of solar and wind energy can be solved, nonmetro areas should benefit at least proportionally from their use.

### Conclusions

The most basic conclusion we have to report is the nearly complete lack of analysis to date on the relationship between energy and nonmetro economic development. The lack of knowledge is distressing and without better data and research our conclusions are only tentative. However, there are some things we know. We know that jobs were created 50 percent faster in nonmetro than in metro areas between 1967 and 1975, and this movement accelerated between 1972 and 1975. Thus, the traumatic events after October 1973 have not stopped this trend. We also know that there has also been a strong trend in wage and salary employment toward the South and West.

While we can hardly speak with certainty, we have reached some tentative conclusions about energy and nonmetro

development. These propositions should be regarded as hypotheses to be tested, but as of now, they distill what we believe are the thoughts of many experts and our opinions as well.

- Energy price increases, if they are not precipitous, should not be a significant barrier to nonmetropolitan economic expansion.
- Embargoes and other supply curtailments, while disruptive to the entire economy, should not affect nonmetropolitan growth appreciably more than metropolitan growth.
- Coal conversion will have a positive economic effect on the several large regions that produce coal; the effects elsewhere are not obvious but should not be particularly negative.
- Environmental standards could become a constraint on economic development in the country, city, or both; it is simply too soon to tell.
- The near to medium term impact of renewable energy development on nonmetropolitan growth will probably be minor, and most likely positive.
- Overall, we believe that rural and small town America will not stop growing because of the present and probable future energy situation in this country. As long as change is reasonably gradual, the dynamic processes of growth and change taking place outside the great cities should be able to adapt.

### Recommendations

We recommend that the Secretary of Energy direct the Department to take two steps in order to assist policy makers to better understand the interrelationships between energy and nonmetropolitan economic growth.

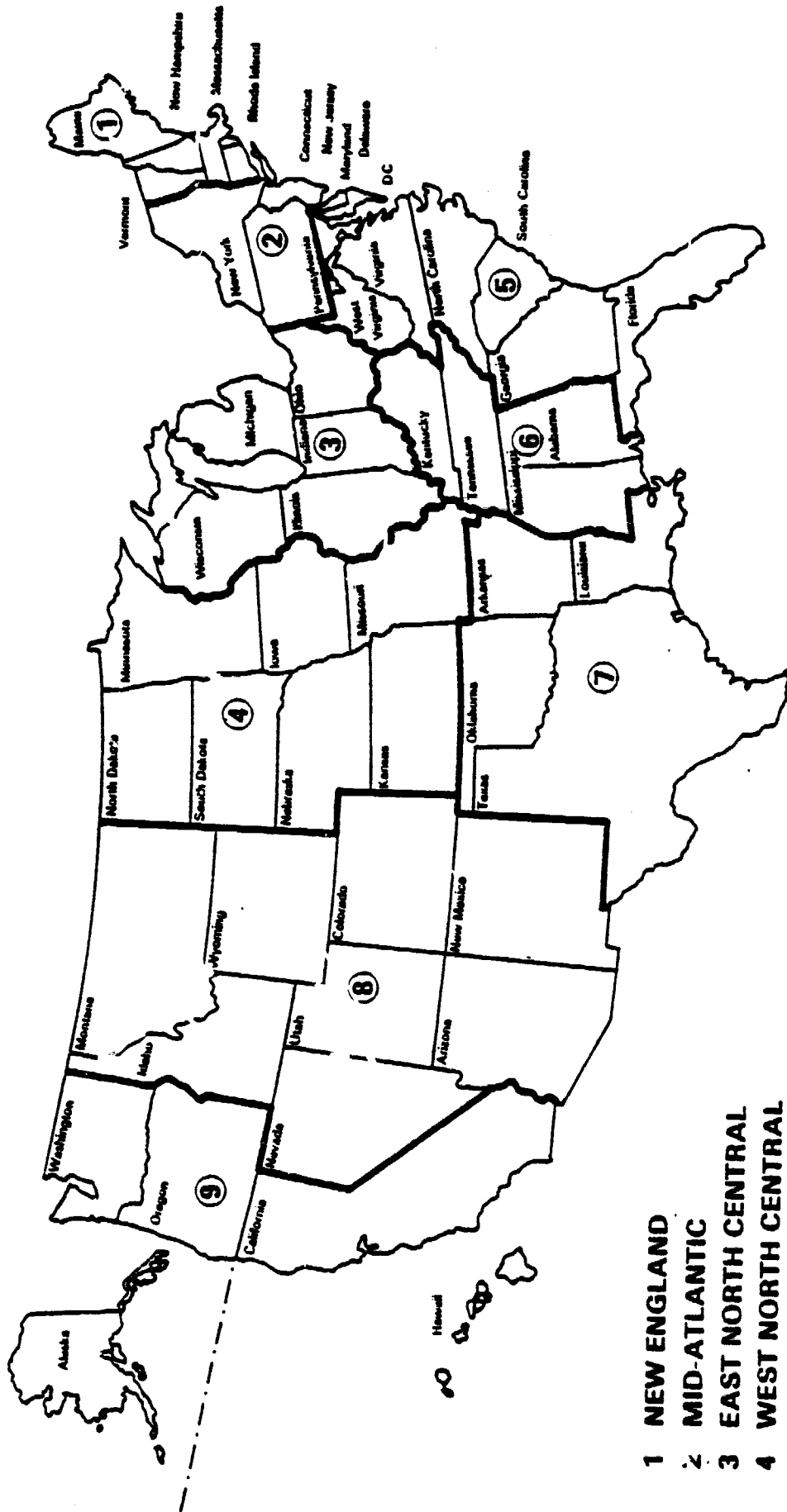
First, we recommend that DOE use the READ model to address this topic when that model becomes operational and reliable. DOE is charged by the Federal Energy Administration Act of 1975 (P.L. 93-275, Sec. 18), and the Energy Policy and Conservation Act of 1975 (P.L. 94-163, Sec. 364) with analyzing the economic impacts of proposed regulatory, conservation, and other actions on a national, regional, State, and local basis. The READ model is being developed to fulfill that mandate. Applying it to



study the effects of energy policy actions on nonmetropolitan growth and development is consistent with that mission, and we urge the Department to carry out such a study as soon as practicable.

Second, since only two years of post-oil embargo data are currently available, DOE should carefully monitor the Department of Commerce's Bureau of Economic Analysis's employment series as it appears. This series will shed considerable light on the energy and nonmetro growth questions, and DOE should keep abreast of it and any other sources to keep interested members of Congress informed on nonmetro trends.

# CENSUS DIVISIONS



- 1 NEW ENGLAND
- 2 MID-ATLANTIC
- 3 EAST NORTH CENTRAL
- 4 WEST NORTH CENTRAL
- 5 SOUTH ATLANTIC
- 6 EAST SOUTH CENTRAL
- 7 WEST SOUTH CENTRAL
- 8 MOUNTAIN
- 9 PACIFIC