ENERGY DEVELOPMENT, LOCAL GROWTH, AND THE FEDERAL ROLE

Staff Working Paper

June 1980

CONGRESSIONAL BUDGET OFFICE
U.S. CONGRESS
WASHINGTON, D.C.

ENERGY DEVELOPMENT, LOCAL GROWTH, AND THE FEDERAL ROLE

Staff Working Paper

The Congress of the United States
Congressional Budget Office

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

PREFACE

The Congress has considered several proposals to provide financial assistance to state and local governments to minimize the economic effects associated with the development of new energy resources and facilities. One such proposal, the Energy Impact Assistance Act of 1979 (S. 1699), was reported by the Senate Energy and Natural Resources Committee in December of 1979. The Subcommittee on Energy, Nuclear Proliferation and Federal Services of the Senate Governmental Affairs Committee is currently considering the bill.

This paper was prepared in response to several questions asked by the subcommittee during its consideration of the bill. The paper does not represent a comprehensive analysis of the issue and has not undergone the external review customarily done for published CBO papers. Its purpose is to provide basic background on the need and magnitude of the energy-related development problem, the degree to which this need is currently being met by existing governmental resources, and other technical questions specifically related to the proposal. In keeping with the Congressional Budget Office's mandate to provide nonpartisan and objective analysis, this paper offers no recommendations.

The paper was prepared by Mark Berkman of CBO's Budget Analysis Division under the supervision of Raymond C. Scheppach and Robert Sunshine. Linwood Lloyd, Linda Alperin, Blaire French, and Sophie Korczyk made significant contributions. Johanna Zacharias edited the manuscript, and Dorleen Dove typed it for publication.

Alice M. Rivlin
Director

June 1980

CONTENTS

TABLES

TABLES (Continued)

63-559 O - 80 - 2

SUMMARY

Dramatic changes in energy markets resulting from steep rises in oil prices, as well as changes in federal policies, are likely to spur widespread development of U.S. energy resources over the next decade. Many state and local governments will therefore have to accommodate the effects of rapid energy-related development, by providing public services for new populations. Such accommodation may be difficult for several reasons. In particular, rapid growth is likely to occur in areas that are now rural or only sparsely settled, which will become the sites of boom towns. In addition, state restrictions on borrowing and the risks of failure associated with new energy technologies may make it difficult for local governments to finance public service needs. Finally, interjurisdictional problems may result if the costs fall to states and localities other than those that benefit directly from energy production.

The Congress is now considering legislation--the Energy Impact Assistance Act of 1979 (S. 1699)--to assist state and local governments facing these problems. The bill would provide financial assistance for planning and public infrastructure such as schools and recreation facilities. Several questions will arise in considering such legislation:

- How great is the ability of state and local governments to finance the public service needs that arise as a result of energy-related development?
- How much assistance is already available through existing federal, state, and industry sources?
- Will further federal aid be needed and if so, what form and magnitude should it take?

THE ABILITY OF STATE AND LOCAL GOVERNMENTS TO FINANCE PUBLIC SERVICES

Although there is considerable uncertainty about the speed at which new energy resources will be developed, this analysis is based on the assumption that development will proceed quite quickly. In 1979, U.S. coal production totaled some 770 million tons. It is assumed that annual

production will increase to 1.0 billion tons by 1985 and 1.3 billion tons by 1990. In addition, construction is assumed to begin on as many as 20 commercial-size synthetic fuel plants and 10 to 15 power plants at mine sites ("mine-mouth" plants) during the next decade.

Under these assumptions, an additional 72,000 jobs directly related to energy production will be created by 1990 in the 10 states expected to account for most of the growth.1/ The operating or noncapital costs of providing public services for these increased populations would be approximately $330 million in 1985 and over $950 million in 1990, assuming a 9 percent inflation rate. The capital costs of roads, sewers, firehouses, and other structures would be about $275 million in 1985 and more than $400 million in 1990. If the capital requirements are amortized over a 20-year period, the total annual cost to state and local governments, including operating and debt service costs, would be about $425 million in 1985 and $1.2 billion in 1990.

Development will also produce additional tax revenues for states and localities. With existing tax rates assumed to remain constant, energy development is projected to generate revenues in excess of $500 million in 1985 and about $1.3 billion in 1990, from severance and production taxes as well as state and local income, sales, and property taxes. In the aggregate, therefore, it appears likely that the additional operating and infrastructure costs of state and local governments would be more than offset by the additional tax revenues over the next decade.

A number of financial problems remain, however:

- State and local governments must finance expanding public services before the tax base can raise tax revenues. They will therefore turn to the capital markets to borrow these funds. Given the risks in some types of energy development (for example, some synfuels), some communities may find it difficult to borrow;

- Although most of the costs will fall on local governments, most of the revenues will go to state governments through production and severance taxes. Consequently, it is critical that states make these revenues available to the affected local regions;

1/ Alabama, Colorado, Illinois, Montana, New Mexico, North Dakota, Texas, Utah, West Virginia, and Wyoming.

- Interjurisdictional problems may arise in places where most of the energy-related revenue occurs in one state or locality while most of the services are needed in an adjoining state or locality; and

- In the aggregate, states appear to be able to cover costs; on a state-by-state basis, however, those states that have low energy-related tax rates may not be able to cover the costs without raising rates.

EXISTING FORMS OF ASSISTANCE

There are existing state, federal, and industrial programs that do or could assist local communities. The form and level of state assistance varies considerably among states. Some states allocate a significant share of severance tax revenues to local communities and offer planning and other technical help. Others do not give special assistance, though, and in certain instances actually restrict the abilities of local governments to finance additional services.

Industrial assistance, for the most part, has been voluntary, prompted by the fact that operation or construction usually cannot begin without a work force. There are numerous examples of the willingness of industry to underwrite and thereby to incorporate in the costs of its products some of the indirect costs of energy development. Few jurisdictions, however, require any direct form of industrial assistance.

Despite certain limitations, existing federal programs could provide significant assistance to states and localities. For example, grants are available from the Environomental Protection Agency for waste water treatment projects, from the Department of Housing and Urban Development for housing and community development projects, and from the Farmers Home Administration for planning. Access to these and other programs may be constrained, however, because of limited information at the state and local level, or because of narrow eligibility requirements.

THE NEED FOR FEDERAL ASSISTANCE

Because in the aggregate, the state and local revenues generated by accelerated energy development are likely to be even greater than the costs, the need for continuing federal subsidies for public services--either through outright grants, lower-than-market interest rates or loans, or loan forgiveness provisions--is uncertain. Federal aid in obtaining financing for

roads, sewers, schools, and other infrastructure might prove useful, given the potential lag between initial public service costs and ensuing revenues. A federal role may also exist where the interjurisdictional problems mentioned above occur. Finally, federal aid might be desirable to assist the states in making full use of existing grant and loan programs.

The Energy Impact Assistance Act of 1979

Two versions of the Energy Impact Assistance Act of 1979 (S. 1699) have recently been reported in the Senate. The Senate Governmental Affairs Committee version would authorize $750 million for direct financial assistance between fiscal years 1981 and 1985 ($150 million per year); the version of the Senate Energy and Natural Resources Committee authorizes $2.0 billion over the same period ($400 million per year). The former version would limit grants to $15 million per year for planning, and the latter would permit 40 percent of the funds to be distributed as grants. Both versions also provide for loan guarantees of as much as $1.5 billion. The funds needed to finance the expected infrastructure requirements of states and localities are estimated to total roughly $1 billion by 1985 and $2.6 billion by 1990. Of this total, a significant share (10 to 20 percent) would most likely be financed through existing federal programs or by the private sector. In addition, costs may be lower if production increases less quickly than is assumed for this study. The authorization levels stipulated in the bills may therefore be higher than necessary. Moreover, because projected aggregate revenues generated by energy development will more than offset the costs, the need for interest rate subsidies, grants, and loan forgiveness provisions is open to question. If the assumptions of this analysis are correct, grants could be limited to development costs in areas with interjurisdictional problems and for purposes of economic planning.

To help states and local governments cover the lags between costs and revenues, some form of loan program could prove effective. The financing mechanism could be either a loan or a loan guarantee. If budgetary control is a concern, however, the loan guarantee suffers from the major disadvantage that it is outside of the budget and appropriation process. The federal government now has more than $300 billion in loan guarantees outstanding. These are not included in the budget, and the Congress therefore has very little control over them. Federal government loans, on the other hand, require a direct appropriation, and the budget authority and loan outlays are reviewed in the normal budget and appropriation process. Potential changes in the way the budget process accounts for loan guarantees may diminish the advantages of a loan program. Under most circumstances, though, a loan program affords greater federal control.

The most important federal role appears to be one that would encourage the efforts of state governments and industry. This would provide the least outside interference in development decisions. Such a policy would also avoid the indirect subsidy of energy prices. Because states generally have the ability to cover expanding public service costs over time, a federal loan program could prove an effective means of encouraging and assisting states and localities in meeting their development needs.

CHAPTER I. INTRODUCTION AND PLAN OF THE PAPER

For at least the remainder of this century, the United States will meet an increasing share of its energy demand by mining more coal and uranium, building more power plants, and constructing facilities to produce synthetic fuels from both coal and oil shale. When the development of these energy resources occurs in remote and sparsely populated areas, sudden influxes of workers and their families will create instant cities, or boom towns, which can give rise to significant economic and social demands. The populations concentrated at new energy-related communities will need expanded services such as police and fire protection, education, and health services, which are provided by state and local governments. In addition, a host of other services will be needed, such as roads and water and sewage systems, which require significant capital investment and long lead times to construct.

Local governments may not be able to provide these services and facilities as quickly as they are needed. Rapid population growth may cause overcrowded housing and overburdened waste disposal systems, and it may exceed the capacities of medical facilities, schools, transportation systems, and law enforcement institutions. Sometimes booms turn into busts--as, for example, when a coal reserve is depleted or synthetic fuel technology fails. A reversal in economic fortunes may leave a community with an excess of facilities and services, as well as with the burden of paying for them.

This paper evaluates the need for a federal program to assist state and local governments in providing public services to areas affected by major energy developments over the next decade. Four basic issues are considered:

- The local economic problems that are expected to accompany accelerated energy development;
- The ability of state and local governments to finance the public services needs that accompany the development;
- The assistance provided through existing governmental and industrial programs; and

63-559 O - 80 - 3

- The need for additional federal aid and whether that need would be appropriately addressed by the current Senate proposal, the Energy Impact Assistance Act of 1979 (S. 1699).

Chapter II describes the nature of the problems confronting local governments and identifies the potential federal role in mitigating such problems. Chapter III assesses the need for federal financial assistance, based on estimates of the costs and revenues resulting from projected energy development. Chapter IV identifies existing and potential state and local programs and procedures available to mitigate adverse economic effects. Chapter V summarizes the results of the analysis, identifies existing federal programs, and discusses the nature of additional federal aid that could be incorporated in the proposed legislation. The Appendix summarizes the major assumptions used to develop the estimates used in the text chapters and gives cost and revenue estimates by state.

CHAPTER II. THE NATURE OF THE PROBLEM

Economic development is generally not only welcomed but encouraged by state and local governments. Development related to energy production, however, has been a subject of serious concern among such governments. Although energy production and related economic growth are likely to bring prosperity to many areas, local governments may have trouble accommodating rapid growth in the short term. Such difficulty may be particularly acute where development occurs in areas that are now rural or sparsely settled.

Limited planning abilities and financial constraints are the two major problems facing local governments. Local governments' abilities to plan for fast growth may be inadequate for several reasons. Many small towns have insufficient planning and administrative staff. Some of the items that must be planned for are not under local government control--for example, transportation is typically a state function. Local control is also limited because much of the land in the Western states is owned by the federal government. Furthermore, information needed for planning may not be readily available. In many cases, for example, only the energy company involved in a project will know how much growth to expect and at what rate.

Major financing problems occur because state and local governments must finance at least part of the expansion in public services before the increased tax base raises local revenues. Governments will therefore be forced to look to capital markets to borrow these funds. Given the risks inherent in some types of energy development (for example, in some synfuels), some communities may find borrowing difficult. These financing difficulties are exacerbated because, while most of the costs will fall on local governments, most of the additional revenues will go to state governments through production and severance taxes. Furthermore, interstate jurisdictional problems may arise: there are cases where most of the energy-based revenue occurs in one state, while the related need for services is in an adjoining state. Finally, existing state and local tax rates may not be sufficient to cover costs, and rate increases may be difficult to obtain.

A great deal of anecdotal evidence exists regarding the boom town phenomenon. Examples such as Craig, Colorado, where the population increased sixfold over a four-year period, are often cited to document the adverse conditions caused by rapid growth. In Craig, rapid growth resulted

in serious social and economic disruption. Demands for public structures such as schools, a recreation facility, and a jail have put a sizable burden on the community's financial resources. A shortage of social service workers such as teachers is also a serious problem.

Although such effects may also be associated with other forms of economic development, there are four factors that distinguish the problems of energy-related development. First, dramatic changes in energy markets resulting largely from steep oil price increases, as well as from federal policies such as oil price decontrol and promotion of synthetic fuels, are likely to lead to more widespread and rapid development of domestic energy resources. Second, most of this development will occur in rural areas requiring substantial new public infrastructure. Third, particularly in the case of new energy technologies, there is a significant risk of failure. And fourth, because development of domestic energy resources is a national priority, local development constraints may be considered a national concern.

Rapid energy-related development, however, is not always an insurmountable problem for localities. There are also examples of communities that were able, through efforts by local governments in cooperation with industry and state governments, to accommodate quick growth without adverse consequences like those in Craig.

The federal role in mitigating these problems must be evaluated in terms of the magnitude of the problems and the extent to which industry, state governments, and existing federal programs can or could provide the assistance needed.

CHAPTER III. THE MAGNITUDE OF THE PROBLEM

This chapter provides estimates of the potential financial burdens state and local governments may face as a result of increased domestic energy production. Assumptions were made regarding coal production, power plant construction at mine sites ("mine-mouth" plants), and synthetic fuel plant construction over the 11-year period 1980 through 1990. Population increases were projected and public service costs estimated on the basis of these assumptions. State and local tax revenues were also estimated based on these assumptions.

PUBLIC SERVICE COST PROJECTIONS

Projections of public service costs were based on assumptions about the growth of domestic energy production and related population increases. The analysis only considers the effects of coal production and related construction of power and synthetic fuel plants. Although production of domestic oil, natural gas, and uranium is also expected to increase, no significant population growth in currently undeveloped rural areas is expected to result.

Domestic Energy Production

In order to give an approximation of the overall operating and capital costs to state and local governments of accommodating energy development, it is first necessary to develop some assumptions regarding coal demand and the construction of synthetic fuel and power plant facilities over the next decade. The speed at which these resources will be developed is uncertain; but for the purpose of this analysis, a relatively high growth rate was assumed. In 1979, U.S. coal production was approximately 770 million tons. The rate is assumed to rise to 1.0 billion tons by 1985 and to 1.3 billion tons by 1990. These projections are based on an average annual increase of 5 percent between 1979 and 1990, which is similar to rates projected in several recent studies.1/

1/ A number of these projections are contained in President's Commission on Coal, Coal Data Book (February 1980).

Projections of production increases were developed for 10 states in which major growth is anticipated, based on available studies and estimates of coal production. The states are Alabama, Colorado, Illinois, Montana, North Dakota, New Mexico, Texas, Utah, West Virginia, and Wyoming. These states are expected to account for most of the increase in coal production between 1979 and 1990. (Detailed coal production figures for these states are provided in the Appendix.) It should be emphasized that these figures represent one possible scenario and are not a definitive state-by-state projection of coal production. The production levels assumed, however, are intended to approximate, in the aggregate, the potential costs and revenues that will occur because of increased domestic energy production. On the basis of several projections, the states selected appear to be most likely to experience significant energy development. Consequently, the major variations by state in terms of type of mining, government operating costs, and tax structure are accounted for in the aggregate calculations of costs and revenues made here.

In addition, it is assumed that construction will begin on roughly 20 commercial-size fuel plants and from 10 to 15 mine-mouth power plants during the decade. The number of commercial-scale synthetic fuel plants under construction or in operation is based on a recent assessment by Cameron Engineers for the Senate Budget Committee 2/ and on the expected enactment this year of legislation establishing the proposed Energy Security Corporation. Seven plants are assumed to be under construction by 1984, 15 by 1987, and 20 by 1990. Based on a seven-year construction period, four plants will be in operation by 1990.

The projection of mine-mouth power plants is based on a recent National Coal Association survey of utility construction plans.3/ These power plants would account for some 11,250 megawatts of additional capacity. All plants are assumed to be under construction by mid-decade. The first plants are projected to come on line by the mid- to late-1980s, based on a seven-year construction schedule.

No attempt was made to locate the projected synthetic fuel and mine-mouth power plants by state. Because these facilities will be closely associated with increased coal production, they will presumably be constructed in the same 10 states.

2/ U.S. Senate Committee on the Budget, Synthetic Fuels (September 1979).

3/ National Coal Association, 1979 Survey of Electric Utility Capacity Additions 1979-1988 (December 1979).

Population Projections

The estimates of additional population resulting from energy development in major growth states are summarized in Table 1. Direct employment in these states from coal mining and energy production facilities is estimated to increase by approximately 38,100 by 1985 and 72,000 by 1990. Total population increases including direct workers, secondary (meaning nonenergy) workers, and families will be about 146,000 by 1985 and 291,000 in 1990.

TABLE 1. PROJECTED INCREASES IN EMPLOYMENT AND POPULATION RESULTING FROM NEW U.S. ENERGY DEVELOPMENT: 1985 AND 1990

	1985	1990
Employment Increases		
Coal Miners	15,850	32,500
Energy Facility Workers	22,250	39,500
Total	38,100	72,000
Population Increases		
Coal Mining	78,850	161,300
Energy Facilities	66,750	130,000
Total	145,600	291,300

These figures are based on several assumptions regarding miners' productivity, work force requirements in energy facilities, and the numbers of dependents associated with these work forces. Miners' productivity assumptions ranged from approximately 20 miners per million tons of coal per year for Western strip mines to 280 miners per million tons for Eastern deep mines. Construction work forces were assumed to peak at approximately 4,000 workers for a commercial-scale synthetic fuel plant and approximately 1,000 workers for each 1,000 megawatts of power plant capacity. Operating work forces were assumed to be 1,000 workers for synthetic fuel plants and 200 workers for each 1,000 megawatts of power plant capacity.

The resulting increase in the total permanent work force was estimated to be 1.5 times the increase in direct employment, not counting temporary construction workers. The total permanent population increase,

including family members, was estimated to be 3.3 times that of the work force. A multiplier of three was used to estimate the number of secondary workers and family members associated with the temporary construction workers. These assumptions are explained in further detail in the Appendix.

Estimated Public Service Costs

The public service costs associated with the projected population increases during times of economic expansion fall into three categories:

- Increased annual state and local operating expenses for police, schools and other service sectors. (These costs are closely related to population size, assuming services are maintained at a constant level. For example, one policeman per 2,000 people, one teacher per 30 pupils, and so forth.)

- Capital costs associated with new capital infrastructure required by larger populations (for example, schools, libraries, sewer systems, and so forth.)

- The interest costs associated with borrowing money needed to pay for capital construction.

These three costs, along with those for upgrading state highways to carry the increased industrial traffic in coal-producing areas, account for the fiscal burden on state and local governments resulting from energy development. This study, however, does not consider transportation costs other than local streets and roads. Although preliminary results from a Department of Transportation study indicate that such costs could be significant, they are excluded here because the estimates available are inconclusive and because existing or proposed federal highway programs could fund a significant share of such costs.

The public costs associated with energy development are estimated by relating each of these cost factors to the population projections described above. For this analysis, it has been assumed that each new resident brought to each of the 10 states by energy development would necessitate public sector operating expenses equal to the average per capita operating expense experienced in each state prior to new energy-related development. This per capita expense was assumed to start in the first year of new production or construction and to continue being incurred annually for all new residents, with adjustments for inflation. Each new resident was also assumed to require $7,125 (at fiscal year 1980 cost levels) in new local capital expenditures for schools, roads, and sewage and water systems. This estimate is derived from data provided in a 1974 study prepared for the

Environmental Protection Agency,4/ updated to reflect cost increases since that time. It is assumed that local governments would borrow money to cover the capital costs, with repayments to be made over a 20-year period at the prevailing municipal bond rate at the time of issue.

Because of the temporary nature of population influxes while facilities are under construction, it is not appropriate to assume the same level of capital costs associated with permanent new residents. Consequently, the costs used in this study include only operating costs for construction workers. This assumes that local governments face temporary costs for the temporary residents and are unlikely to make significant capital investments for short-term requirements. Private industry, because it often faces such transient problems, in many instances provides major services--including housing, transportation, and recreation--to its temporary work force. Industry-provided services partly offset the need for major publicly financed capital investment. In this study, capital costs are included for the population level assumed to remain once the facilities are in operation. Further details on these assumptions are provided in the Appendix.

Several factors could significantly reduce the costs projected by this methodology. A high local unemployment rate would mean that local workers could fill available jobs, moderating the assumed population increase and, in fact, reducing the social and governmental costs associated with unemployment. Similarly, these estimates do not account for spouses of workers who themselves hold jobs generated by the new economic activity. By disregarding working spouses or other local persons who might take service jobs during a boom, these estimates may somewhat overstate the net new population influx. In addition, excess infrastructure capacity may exist in some areas, which would reduce some of the costs of accommodating the new population. Some portion of any anticipated increase in coal production will come from existing mines; in places where this is the case, the costs of expanding local public services should be less than it would be for building new facilities in now undeveloped areas. Thus, the assumptions for this study have been selected to arrive at cost projections at the high end of the range of possible governmental costs, to create a "worst case."

Under these assumptions, the annual expenditures, including operations, maintenance, and debt service for capital investments, are projected to total approximately $1 billion between 1980 and 1985 and $5.5 billion between 1986 and 1990. On an annual basis, these costs are expected to reach over $400 million in 1985, increasing to over $1.2 billion per year by

---

4/ Environmental Protection Agency, Costs of Sprawl (1974).

63-559 O - 80 - 4

1990. Capital investments are estimated to total $1.1 billion by 1985 and $2.6 billion by 1990.

STATE AND LOCAL TAX REVENUE PROJECTIONS

Although energy development will inevitably increase government costs, it will also generate additional tax revenues. Energy production taxes on additional coal production alone will bring annual revenues of more than $340 million by 1985 and $755 million by 1990. Other tax revenues resulting from increased population and related economic activity will total an additional $175 million in 1985 and $535 million in 1990.

Tax Revenues from Energy Production

The energy production tax revenue projections are based on a tax simulation model developed by Department of Agriculture economists at the University of Minnesota.5/ To determine tax revenue multipliers, the model applies 1979 state tax rates per ton of production to prototypical mining operations. For this analysis, taxes are estimated only for coal mines, and they include severance or other energy extraction taxes, as well as property and corporate income taxes. For these projections, the tax multipliers are increased by 2 percent annually to yield a conservative estimate of coal price rises and property appreciation.

Tax revenues from synthetic fuel and mine-mouth power plants are not included in this analysis. Although such revenues will be significant, most of these facilities will not be operating until near the end of the 1980s or later. Consequently, little revenue is expected by 1990. Simulations accounting for such facilities, however, have shown that, over time, tax revenues are likely to cover additional costs.6/ These simulations also showed that the lag in revenues will be less significant for those governments that rely on sales and income taxes rather than on property taxes.

5/ U.S. Department of Agriculture, State Taxation of Mineral Deposits and Production (September 1978), and a memo from Dr. Thomas Stinson, USDA, March 1979.

6/ U.S. Department of Agriculture, Local Impacts of Coal Gasification and Liquefaction Plants in the Northern Great Plains, Draft (August 1979).

Tax Revenues from Population Growth

Revenues from taxes resulting from increased population are based on average tax revenue per capita for the 10 states previously identified. This covers state and local income, property, and sales taxes. Existing tax rates are assumed to remain unchanged over the decade, with receipts estimated to increase by 8 percent per year as a result of increases in income, property values, and prices.

These projections may in fact understate revenues over the period for several reasons. First, state tax structures and rates can be changed to accommodate higher costs. Second, the use of average per capita revenue is likely to understate the tax revenues that can be attributed to new residents, because a relatively high proportion of the new residents is likely to be employed, compared to the current state averages.

FINANCIAL CAPABILITIES OF STATE AND LOCAL GOVERNMENTS

In the aggregate, the costs of building and operating additional infrastructure will probably be more than offset by tax revenues over the coming decade (see Table 2). Cumulative revenues will exceed costs by approximately $400 million by 1985 and $700 million by 1990, with total revenues exceeding total costs in every year. The difference between revenues and costs is projected to increase through 1985, peaking at $100 million. Between 1986 and 1988, this difference will decline, then begin to increase again, to $90 million by 1990.

This pattern is primarily the result of the growth of synthetic fuel plant construction assumed to take place in the latter part of the decade. The significant population growth and resulting costs from these construction activities are not expected to be offset by increased revenues in the short term, as is the case for coal mining. Once the plants are operating, however, revenues would increase significantly. Altogether, the levels of coal mining revenues are projected to offset public costs related to synthetic fuel plant development.

As pointed out in Chapter II, however, a number of financial problems remain. Capital investment will total more than $1 billion by 1985 and $2.6 billion by 1990. These requirements exceed the projected revenue surpluses, suggesting that there will be an initial need for borrowing, although over time, state and local governments will be able to cover costs. Second, most of the costs will fall on local governments, while most of the revenues will accrue to states. Consequently, adequate distribution of revenues within states is critical to local governments. Third, interjurisdictional problems

TABLE 2. PROJECTED ENERGY DEVELOPMENT COSTS, REVENUES, AND NEW DEBT ISSUES OF STATES: 1980-1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
						COSTS					
Operations and Maintenance											
Coal Population	15	35	60	90	130	175	220	280	345	425	525
Power Plant Population	1	4	10	20	30	45	55	60	75	65	60
Synthetic Fuel Plant Population	---	2	10	25	60	105	170	245	310	360	385
Subtotal	(16)	(41)	(80)	(135)	(220)	(325)	(445)	(585)	(730)	(850)	(970)
Debt Service											
Coal Population	---	8	20	30	45	60	80	95	115	135	160
Power Plant Population	---	---	2	5	10	10	15	15	15	15	15
Synthetic Fuel Plant Population	---	---	5	10	15	20	30	35	40	50	55
Subtotal	---	(8)	(27)	(45)	(70)	(90)	(125)	(145)	(170)	(200)	(230)
Total	16	49	107	180	290	415	570	730	900	1,050	1,200
						REVENUES					
Coal Mining	35	80	130	190	255	340	405	475	560	650	755
Coal Population	10	20	35	50	70	100	125	160	195	230	295
Power Plant Population	---	2	5	10	15	25	30	30	35	35	30
Synthetic Fuel Plant Population	---	1	5	10	25	50	60	120	155	185	210
Total	45	103	175	260	365	515	620	785	945	1,100	1,290
						REVENUES LESS COSTS					
	29	54	68	80	75	100	50	55	45	50	90
						NEW DEBT ISSUES					
Population	70	85	105	125	155	190	165	190	240	275	330
Power Plant Population	---	20	20	25	25	30	---	---	---	---	---
Synthetic Plant Population	---	30	45	50	50	55	60	65	70	75	80
Total	70	135	170	200	230	275	225	255	310	350	410

make equitable distribution of revenues difficult. Production and the resulting revenues may occur in one state, while the burdens of increased population are felt in another. Finally, although all 10 states together appear to be able to cover costs, those with low tax rates and more labor-intensive development may have difficulties. The state-by-state comparisons in the Appendix indicate that Alabama, Illinois, Texas, Utah, and West Virginia may be in such positions because of low tax rates on energy production and/or the labor requirements of deep mining. While these states may face costs greater than revenues, the other five states will not.

The analysis suggests that most states can meet the costs of energy-related development over time, although changes in tax rates or other policies may be required. In fact, if the five states just listed facing energy-related costs in excess of revenues were to raise their tax rates on energy production to the average level of other five states, revenues would equal or exceed costs for all except West Virginia, based on the assumptions used in this analysis.7/ Further, the Western states where the boom town phenomenon is most likely to occur (Colorado, Montana, North Dakota, New Mexico, and Wyoming) appear able to cover the costs of coal-related development with existing tax rates. In addition, although the location of synthetic fuel plants was not assumed for this analysis, most of the initial plants are likely to be sited in the Western states projected to experience revenue surpluses from increased coal production. Consequently, the financial lags resulting from synthetic fuel plant construction could be managed by these states.

7/ Despite a relatively high tax rate applicable to energy production facilities, West Virginia is projected to experience energy-related costs in excess of revenues over the decade. The projected costs may be overstated, however, because currently unemployed miners rather than new miners are likely to meet some of the projected labor requirements.

CHAPTER IV. ASSISTANCE FROM STATE SOURCES AND INDUSTRY

State governments and energy companies now aid areas with energy development in various ways. This chapter describes the more significant forms of such assistance.

STATE ASSISTANCE

State assistance to local governments includes planning help, removal of institutional constraints, and financial aid. The extent and range of state assistance varies widely, as discussed below.

Planning and Technical Assistance. Many local governments lack adequate planning staffs to deal with rapid growth. Even fewer have knowledgeable negotiators or managers experienced in dealing with the several levels of government that have to interact during periods of rapid local growth.

States can help minimize the public costs arising from rapid growth with a broad range of assistance. Several states have in the past created agencies or offices to provide planning and technical assistance to local governments. These agencies offer an assortment of services, ranging from information distribution to temporary assignment of state personnel.

Direct Financial Aid. States provide direct assistance to local governments in the form of tax revenue distribution grants, loans, or through revenue sharing mechanisms. Clearly, a state's ability to extend such assistance is constrained by its own financial condition. The previous chapter indicates that states, especially those expected to experience significant energy development, would receive substantial revenue through severance and other taxes that could be distributed to affected areas. In addition, overall state financial conditions have been good in recent years. Over the five-year period 1972-1976, 30 states, including the 10 analyzed, showed budgetary surpluses. None incurred deficits in 1978, the last year for which complete information is available.1/ State fiscal conditions are difficult to assess because of state budget balancing requirements and the

---

1/ Office of Management and Budget, Energy Impact Assistance Needs, Staff Paper (March 1978), and U.S. Department of Commerce, State Finances, 1978.

variability of state finances. From reviews of state operating balances as a percent of expenditures, a measure used by the National Governor's Association (NGA) to evaluate state finances, seven of the 10 states evaluated here appeared to have balances of 5 percent or more (the level judged reasonable by the NGA) in 1979. Five of these states also lowered or limited state taxes during 1979.2/ Future financial conditions are uncertain, however. Economic conditions and federal budget reductions may constrain state budgets over the next several years.

A state's willingness to give energy-related development aid is also critical to the ability of local governments to meet development needs. Several states require local governments to exhaust all outside sources--particularly federal funds--before making state aid available. Some states have also maintained that severance tax and federal lease revenues must be allocated to the needs of all citizens of the state, not only those directly affected by energy development. In addition, some state officials have asserted that, since most energy development is the result of federal policy and is not designed to meet local energy demands, the federal government should be responsible for aiding local communities.

Examples of State Financial Assistance

In practice, the range of state efforts varies considerably. The efforts made by energy-producing states are reviewed in a recent report issued by the Economics, Statistics and Cooperatives Service of the U.S. Department of Agriculture.3/ This report shows, for example, that Montana, the Western state that imposes the highest average energy-production tax, earmarks a fixed percent of all severance tax revenue to be used for grants and loans to affected areas. The revenue allocated to the Montana Coal Board for distribution to such areas reached $8 million in 1979, approximately 18 percent of the annual severance tax revenue. An additional $21 million was placed in a trust fund to serve as insurance against potential economic downturns. (It is interesting to note that an applicant for aid from the Montana Coal Board must show that federal funds have already been sought.) In addition to this financial aid, Montana allows county commissioners to require the prepayment of property taxes by new

---

2/ National Governors Association, Fiscal Survey of the States 1979-1980 and Understanding the Fiscal Conditions of the States (December 1978).

3/ U.S. Department of Agriculture, State Taxation of Mineral Deposits and Production (September 1978).

energy facilities as a source of capital. This authority, lacking in many states, not only increases the capital available during the early, critical stages of development, but also reduces both the need for borrowing and the commensurate costs of servicing and retiring that debt in later years.

In Colorado, the energy-production tax rate is only two-thirds that of Montana, but like Montana, the state targets a fixed percentage of severance tax revenues for use by affected local governments. In 1977, the Colorado state legislature broadened the scope of its severance tax and established a formula that distributed revenues between state and local governments. The legislation created a local government trust fund that receives 45 percent of coal severance revenues and 20 percent of oil shale revenues. Local governments may use most of these funds at their own discretion to cover the capital and operating costs of public services.

In contrast to Montana and Colorado, the state of Utah imposes a relatively small tax on energy production. All revenues from these taxes go into the general state fund. Furthermore, Utah law limits the type of aid the state can give to local governments--for example, the state can only aid school districts, not general governments. On the other hand, the state permits the creation of special districts to solve jurisdictional mismatches. In addition, Utah allows energy developers to prepay sales and use taxes. These revenues are placed in a special account used to finance schools and highways. However, because all projects funded from this account must be approved by the state legislature, local governments may experience considerable delays in receiving state assistance.

Wyoming's severance tax and revenue distribution system has several unique features specifically designed to assist affected local communities. The state legislature has created the Wyoming Community Development Authority to extend loans to mitigate the local impacts of energy-related projects. The agency is empowered to issue up to $100 million in revenue bonds to finance the loans. Since such loans are not tied to severance tax revenues, funds are available to local governments before any actual energy production takes place. The availability of assistance in the initial phases of the energy development would allow local governments to prepare in advance for the anticipated population boom and its consequences. In addition, the Wyoming Farm Loan Board collects revenues from a special coal severance tax and distributes the funds to areas affected by coal development. The legislature has earmarked at least 50 percent of the revenues for highways and roads and the remainder for sewer and water projects.

In West Virginia, taxes on coal production fall into the category of business and occupation taxes. Since July 1, 1975 a portion of this revenue

returns to local government treasuries. Current law specifies that $3.85 on each $100 of value shall be paid by businesses to the state. Of that money, $3.50 goes to the state's general revenue fund. The remaining 35¢ returns to local units of government. The coal-producing counties share three-fourths of the money in amounts proportional to their production. The remaining one-fourth goes to all cities and counties in the state in amounts proportional to population. In fiscal year 1979, the amount returned to local West Virginia governments totaled $9.9 million. Of that sum, coal-producing counties received $7.4 million. All West Virginia cities and counties, including coal-producing counties, divided the remaining $2.5 million based on population. The state does not specify how these funds may be spent except in stipulating that no more than one-fourth of the amount received by local governments may be used for salaries.

Alabama takes 20¢ per ton from the amount it collects in coal severance taxes and redistributes the money to the coal-producing areas. If the coal is mined within the limits of a city, half of the 20¢-per-ton amount goes to the city, and half returns to the county. For coal mined outside city limits, the county retains the full amount. In fiscal year 1979, $4.7 million was redistributed to Alabama cities and counties.

State Imposed Constraints. Although in many instances, state governments provide significant assistance, they do not always use the maximum available resources. In addition, state policies and laws may actually create barriers to local governments' abilities to respond to adverse impacts of energy-related development. For example, a state may prohibit localities from issuing bonds or deny localities taxing authority. All 10 of the states highlighted in this analysis have some form of constitutional or legislative limitations on local financing. States may also limit the establishment of special districts or other government entities empowered to help to alleviate jurisdictional problems.

State limitations on local indebtedness range from 2.9 percent of assessed property value in Illinois to 18 percent in Montana. In general, states have imposed ceilings based on 3 to 5 percent of the assessed value of local property. Of the 10 states studied, only Texas has a constitutional restriction against incurring debt at the local government level.

In many cases, local borrowing for sewer, water, road, or utility projects is exempt from debt limitations. For example, Wyoming and Colorado have no limit on borrowing to finance water supply projects, and New Mexico has no ceiling on financing for sewer and water projects. Alabama, however, continues to limit local indebtedness for water and sewer projects but sets higher borrowing ceilings for these uses. Similarly,

most states examined in this study make special provisions for local borrowing to build schools. The limit is generally established at 5 to 10 percent of assessed property value, although in Colorado the debt limitation for school districts is 20 percent of the assessed value of taxable property.

Requirements for voter approval of local borrowing vary widely among the states. In North Dakota, for example, local governments have authority to incur debts up to an established ceiling without voter approval. The consent of the electorate is required, however, if local governments want to exceed the mandated debt ceiling. In contrast, West Virginia and Colorado require local governments to secure voter approval before any general obligation bonds can be issued.

A report prepared for the Senate Subcommittee on Energy, Nuclear Proliferation and Federal Services includes an examination of the debt limitations and provisions in the constitutions and laws of 12 states.4/ The researchers found that all 12 states have some form of restriction on the ability of state, county, or local governments to incur general obligation debts. However, the two recommendations included in the report suggest that there are ways to accommodate the financing needs of communities affected by energy developments. One is for state legislatures to exempt energy impact loans from statutory limitations. The other is for the federal government to make loans to state or county governments for specific construction projects that would then be leased to local governments. Most state debt limitation restrictions would not apply in these cases. In addition, of course, states have the option of amending their statutory restrictions through established procedures to augment the financing capacity of local governments.

Clearly, some states are attempting in various ways to assist local governments in solving the initial financing problems that often result from new energy-related activity. As the Department of Agriculture study concludes, some state assistance programs may prove more successful than others in distributing aid in a timely fashion, but information about the relative effectiveness of these programs is limited.

4/ U.S. Senate Committee on Governmental Affairs, Subcommittee on Energy, Nuclear Proliferation and Federal Services, "Information on State and Local Financing Mechanisms Concerning S. 1699," prepared by Merrill, Lynch, White, Weld Capital Markets Group (March 1980). The report covered the following states: Alabama, Colorado, Kentucky, Louisiana, Montana, New Mexico, North Dakota, Ohio, Texas, Utah, West Virginia, and Wyoming.

Other studies have examined current state efforts to provide assistance and have made general recommendations about how those efforts can be improved. For example, the Western Governor's Regional Energy Policy Office study of May 1977 concluded by proposing methods that states could use to broaden and improve their assistance to affected areas.5/ The study encouraged the expansion of state aid and the imposition of added taxes to equalize state tax efforts. In a similar study by the National Association of Counties (NaCo) that focused on county level impacts in Appalachia, similar conclusions were reached.6/

ASSISTANCE FROM ENERGY INDUSTRIES

Industrial assistance to communities affected by energy development has been identified mostly with energy development in the West, where a limited labor force has required companies to be reasonably innovative in order to attract the labor needed for the construction and operation of new facilities. The town of Colstrip, Montana, for instance, was planned, financed, and developed with the assistance of Western Energy Company to solve the public and private infrastructure needs resulting from Western Energy's coal mine in Rosebud County. The White Mountain Village Project near Rock Springs, Wyoming is another example of a new town that was sponsored by an energy developer (Pacific Power and Light) to help solve the public facilities problem generated by energy-related growth.

These and numerous other examples point to the willingness of industry to underwrite and, consequently, to subsume in the cost of its products some of the indirect costs of energy development. To date, such efforts have generally occurred where companies faced significant problems in developing a local labor force because of sparse indigenous population and lack of basic facilities.

In one different and very significant case, Highland County, Virginia was able to force Virginia Electric Power Company (VEPCO) to help pay for a wide range of social services provided by the county to new residents attracted by VEPCO's hydroelectric power facility construction in a neigh-

---

5/ Western Governor's Energy Policy Office, Financial Strategies for Alleviation of Socioeconomic Impacts in Seven Western States (May 1977).

6/ National Association of Counties Research Inc., Coping with Growth (January 1979).

boring county. Highland County, through the Federal Power Commission's 7/ licensing procedure, was able to require the developer to mitigate some of the socioeconomic impacts of such a project, even though the community affected was not in the same county as the development site. This precedent could have a significant influence on the distribution of public sector costs. But its successful application depends heavily on knowledgeable, aggressive leadership at the local level while early site planning and licensing is evolving.

Much industrial assistance has been voluntary, however. In many instances, construction or operation simply cannot begin without a work force, and many companies find that start-up costs are recouped very early in the form of low personnel turnover, high productivity, and smooth community relations.

The power to mandate industrial cooperation most often lies with state governments, and states have begun to require more private assistance at all stages of new energy development. The energy-facility siting laws of several states require specific forms of corporate cooperation. For example, the Wyoming Industrial Development Information and Siting Act requires projects with construction costs of $50 million or more to provide long-term plans for impact management. In addition, Wyoming's industries are required to identify funding mechanisms for providing public services.8/ Montana has similar requirements.

Many states, however, focus primarily on environmental effects rather than economic development ones and have been slow to develop laws and procedures that would help local communities mitigate the boom town effects of energy development. The focus of these states has therefore been on energy-producing facilities themselves, such as power plants, uranium enrichment facilities, and other fuel processing plants; they have not, to date, directly addressed the problems of mining facilities and their ancillary growth.

7/ Now the Federal Energy Regulatory Commission of the U.S. Department of Energy.

8/ Western Governor's Regional Energy Policy Office, Western Boomtowns: Part I: Amended: A Comparative Analysis of State Actions (October 1976).

CHAPTER V. FEDERAL ASSISTANCE

State and private sector assistance to local governments facing rapid energy-related development is already significant. The potential levels of assistance from these sources in the future appears even greater. The need for additional federal aid may therefore be limited.

Most states appear able to provide substantial financial aid to communities affected by energy development. This observation is supported by evidence of the amounts of state aid given in the past and by projections of ample future state revenues. To the extent that states and localities do have financing problems, they result primarily from the need to cover the costs of expanding public services before tax revenues are available to pay for them. In addition, states may actually constrain local government efforts to accommodate growth. Changes in state taxing methods, laws, and regulations can often remove these constraints.

Industrial assistance has been significant too, although it is rarely required by state or local governments. Some degree of mandatory cooperation might be appropriate. Industries are often the best source of information necessary for planning. Requirements would also cause industries to take over responsibility for some costs of development, resulting in more efficient pricing of the energy produced.

In addition to state and industrial assistance, there are already existing federal programs that can be used to meet the needs of energy-related community growth. This chapter reviews these existing federal programs and discusses the need for the proposed Energy Impact Assistance Act of 1979.

EXISTING FEDERAL ASSISTANCE

The federal government, through its various programs to aid state and local governments, can play a critical role in managing the problems of energy-related economic development. There are several programs underway that are specifically targeted toward energy development for which local governments are eligible. Several major programs, including the Environmental Protection Agency's grant program for the construction of wastewater treatment facilities, the Department of Transportation's state aid programs, and Farmers Home Administration assistance to rural areas,

can provide significant funding for a number of the costlier services state and local governments must provide.1/

One of the most significant forms of energy-related federal assistance comes from state shares of leasing revenues from federal lands. Under the Mineral Leasing Act, as amended (30 U.S.C. 181, 191), the federal government shares with the originating state the revenues from mineral leases made in that state. Payments to states in fiscal year 1979 totaled some $210 million and are projected to reach $450 to $500 million by 1985.

In 1979, $14.1 million of the total came from coal leases on federal lands in the Western coal states; the balance came from oil and gas leases. The amount of future payments from coal leases is extremely hard to estimate, since it will depend to a great extent on the demand for coal over the next few years, and on federal leasing policy. A preliminary estimate of state resources from federal coal leases would place state mineral lease revenues from coal at or above $65 to $85 million by 1985.

Although most mineral lease receipts are now allocated by states to a variety of state programs, the additional revenues that would accrue from coal development could be set aside for impact-area assistance without jeopardizing these established funding allocations. Thus, by 1985, the mineral leasing revenue-sharing program alone could add roughly $75 million a year in revenues to state resources. Since federally owned coal reserves are located primarily in five Western states, the bulk of these funds will go, under existing law, to Wyoming, Montana, New Mexico, Utah, and Colorado.

The Mineral Leasing Act also authorized the states to borrow anticipated mineral lease receipts from the federal government for a prospective 10-year period. This provision met with initial objections from the Executive Branch because of the subsidized interest rates the act provided. In 1978, the bill was amended to allow higher interest rates, thus removing the Administration's major objection. A total loan level of $212 million has been authorized through fiscal year 1982 for this program, although no funds have been appropriated, and $40 million of the authorization expired in fiscal year 1979.

1/ Several studies have compiled lists of federal programs available to states and localities. These studies include U.S. Department of Energy, Report to the President, Energy Impact Assistance (March 1978); Office of Management and Budget, Energy Impact Needs Staff Paper (March 1978); and U.S. Department of Housing and Urban Development, Rapid Growth from Energy Projects (March 1976).

The only other local assistance program targeted toward energy-affected areas is the 601 program established by the Powerplant and Industrial Fuel Use Act of 1978 (Public Law 95-620). The program is funded through the Department of Energy and administered by the Farmers Home Administration. This program authorizes grants to states to cover up to 100 percent of the costs of developing energy-impact plans for areas affected by uranium and coal production activities. Funds from this program may also be used to acquire land for public use. To date, the program has received $70 million in appropriations ($20 million in fiscal year 1979 and $50 million in fiscal year 1980).

Although existing economic development and planning programs seem to hold promise as a source of local assistance, in reality significant mitigation assistance may be limited. Many programs are funded at levels that fail to meet existing demand and are controlled by eligibility criteria that give little or no weight to socioeconomic factors common in boom town situations. Several studies have indicated that many federal programs have been most useful to communities with two assets: experienced grantsmen and planners, or access to cooperative state planning agencies.2/ In any event, applying for aid requires lead time, which is not abundant in boom town situations.

THE ENERGY IMPACT ASSISTANCE ACT OF 1979

Two versions of the Energy Impact Assistance Act of 1979 (S. 1699) have been reported in the Senate. One version, formulated by the Senate Governmental Affairs Committee, would authorize direct financial assistance totalling $750 million between fiscal years 1981 and 1985 ($150 million per year). A version approved by the Senate Energy and Natural Resources Committee would authorize $2.0 billion over the same period ($400 million per year). The latter version would allow for 40 percent of the funds to be issued as grants. The former version would allow for loans only. Both versions also provide for loan guarantees of up to $1.5 billion.

The capital investment necessary to finance the expected infrastructure needs of state and local governments over the next five years is

---

2/ National Association of Counties Research Inc., Coping with Growth (January 1979), and Western Governors' Regional Energy Policy Office, Western Boomtowns: Part I: A Comparative Analysis of State Actions (October 1976).

estimated to be approximately $1 billion. Of this total, a significant share (10 to 20 percent) would most likely be financed through existing federal programs or by the private sector. In addition, costs may be lower if production increases at a less rapid rate than is assumed for this study. For this reason, the $750 million to $2 billion authorized in the bills for direct aid may be more than is necessary. Further, because state and local revenues generated by projected energy development will more than offset the aggregate costs, the value of interest rate subsidies, grants, and loan forgiveness provisions is debatable. All these provisions represent a direct taxpayer subsidy for state and local government services.

Although, as was pointed out earlier, significant lags may occur between public service costs and energy-related revenues, most states will ultimately be able to cover the costs. If the assumptions of this analysis are correct, grants could be limited to two uses: to cover development costs in areas with interstate jurisdictional problems, and for economic planning.

To help tide states and localities over long financial lags, however, a loan or loan guarantee program might prove useful. The financing mechanism could be either a loan or a loan guarantee. If budgetary control is a concern, however, a loan guarantee suffers from the major disadvantage that it tends to circumvent the budget process. The federal government currently has outstanding more than $300 billion in loan guarantees. These are not governed by the budget and appropriation process, and the Congress therefore has very little control over them. Federal government loans, on the other hand, require direct appropriations, and the budget authority and loan outlays are reviewed in the normal Congressional budget and appropriation process. In addition, loans would encourage the continuation and expansion of aid from states and industries because the ultimate costs would fall to them.3/

OTHER POSSIBLE FEDERAL APPROACHES

Although a federal loan program could be created through the proposed legislation, similar goals could be achieved by modifying or making greater use of existing programs. For example, loan authority provided by the Mineral Leasing Act could be implemented. The authority could also be broadened to accommodate energy-related development that is not situated on federal land but that results largely from federal policy.

3/ Potential changes in the way the budget process accounts for loan guarantees may weaken the advantages of a loan program. Under most circumstances, however, a loan program affords greater federal control.

The Congress could take several other approaches to aid states and local governments. For example, assistance from other programs could be increased through improved access. A federal office to coordinate relevant programs and to provide information to state and local governments is a possible solution to the access problem.

Delays and funding limitations in existing programs, such as Farmers Home Administration assistance to rural areas and Environmental Protection Agency waste water treatment grants, could be reduced through the earmarking of funds for high-priority energy-related development.

Finally, program funding could be tied to an energy-related revenue source--such as the recently enacted Crude Oil Windfall Profit Tax Act (Public Law 96-223) or the proposed oil import fee. This would provide a direct link between federal programs, designed to reduce dependence on imported oil. If this linkage were made through a trust fund, however, the Congress could lose flexibility in allocating budgetary resources.

CONCLUSIONS

Despite certain limitations, existing federal programs can provide significant assistance to state and local governments. It may be desirable, however, for the federal government to improve state and local access to these programs. A federal coordination office might help accomplish this.

Another important federal role might be to encourage the efforts of state governments and industry in assisting energy-related boom towns. This would enable the federal government to serve a useful function without actually interfering in state and local, or industries', decisions. Such a policy would also avoid the risk of indirect subsidy of energy prices. Because states are generally able to draw from their own revenues to cover expanding public costs over time, a federal loan program could prove an effective interim means of aiding states and localities while they prepare to meet their development needs.

APPENDIX: COSTS AND REVENUES BY STATE

Alabama, Colorado, Illinois, Montana, New Mexico, North Dakota, Texas, Utah, West Virginia, and Wyoming were identified as having the greatest likelihood of rapid coal-related development by 1990. Although these states' actual production rates may vary markedly, the levels assumed for this analysis reflect relatively high production increases. Consequently, the projected rate of coal-related development is on the high side of the probable range.

MAJOR ASSUMPTIONS FOR COAL RELATED DEVELOPMENT

Coal Production. Domestic U.S. coal production has been projected to increase by roughly 5 percent a year between 1979 and 1990. For the 10 states included in the analysis, the average annual increase was assumed to be 9 percent between 1979 and 1985 and 7 percent from 1985 to 1990. Under these assumptions, the 10 states account for most of the growth in coal production in this decade. The proportion of deep and strip mining by state observed in 1979 was assumed to remain constant over time. (This is likely to overstate cost impacts, because the proportion of strip mining, which is less labor intensive, is likely to rise.)

Employment. The number of coal workers was based on productivity rates by mining method and location. The productivity rates applied are shown in Table A-1. They are based on a number of sources, including two recent Department of Energy studies.1/

1/ U.S. Department of Energy, Basic Estimated Capital Investment and Operating Costs for Underground Bituminous Coal Mines Utilizing a Continuous Mining System (March 1978).

U.S. Department of Energy, Basic Estimated Capital Investment and Operating Costs for Three Coal Mines (November 1977).

TABLE A-1. COAL MINER PRODUCTIVITY FOR WORKING STRIP AND DEEP MINES, BY REGION: WORKERS PER MILLION TONS PER YEAR

Region	Strip Mining	Deep Mining
West	20	135
Interior	30	280
East	100	280

Population Growth. Total population figures were calculated based on multipliers developed for secondary workers and workers' dependents. A secondary employment multiplier of 1.5 was used. Other studies have assumed multipliers of 1.25 to 2.0. The selection of 1.5 was thought to be conservative. The dependent multiplier assumed was 3.3, based on average family size. This multiplier was applied to the total work force (including primary and secondary workers) to determine total population.

Public Service Costs. Three separate cost components were calculated: operations and maintenance, capital investment, and debt service on capital investments. Annual state and local operations and maintenance costs were based on actual per capita costs by state.2/ These costs were inflated at 8 percent annually. Capital investment was based on a cost of $7,122 per capita in 1980,3/ inflated by 8 to 9 percent per year. This figure includes the capital costs for the following items:

Water systems
Sewage and storm drainage systems
Solid waste
Fire protection
Police
Recreation facilities
Education
Streets and roads (local)
Government administration
Land acquisition (for public use)

2/ U.S. Department of Commerce, Compendium of Government Finances, 1977 Census of Governments, Volume 4 (1978). These 1977 data were adjusted to 1980 assuming an annual 7.5 percent inflation rate.

3/ Derived from U.S. Environmental Protection Agency, The Costs of Sprawl (1974).

The debt service costs were calculated by amortizing the capital investment costs over 20 years. It was assumed that all new infrastructure would be financed by serial issue municipal bonds. The bond rate was based on projections Data Resources Inc. made for the bond buyer index; these projections range between 7 and 8 percent over the decade. For estimating purposes, investments were assumed to be made annually, based on the projected number of new residents.

Revenues. Revenues from coal production taxes and per capita taxes were estimated. Production tax revenues were based on a simulation model developed by economists at the University of Minnesota.4/ The model calculates state-by-state tax revenues per ton for prototypical mining operations. Severance, property, and corporate income tax revenues are included in this calculation. The tax-per-ton multipliers for the 10 states are listed in Table A-2. These tax rate multipliers were inflated at 2 percent per year. This relatively low rate was used to account for lags in property tax assessments and the uncertainty of coal prices over time. The result may understate revenues for states in which sales taxes are relied upon or if coal prices increase rapidly.

TABLE A-2. COAL PRODUCTION TAX MULTIPLIERS, BY STATE: IN DOLLARS PER TON, 1979

	Dollars per Ton
Alabama	0.77
Colorado	1.02
Illinois	0.55
Montana	1.51
New Mexico	0.63
North Dakota	1.00
Texas	0.08
Utah	0.70
West Virginia	1.64
Wyoming	1.40

4/ U.S. Department of Agriculture, Coal Development in the Northern Great Plains (January 1978) and a memo from Dr. Thomas Stinson, USDA, February 1980.

General tax revenues were based on actual per capita state and local tax revenues (not including those from severance and other energy taxes).5/ These revenues were increased at 8 percent per year to account for inflation. No changes in tax structure or rate were assumed, and revenues from other sources such as license fees were not included.

Tables A-4 through A-13 at the end of this Appendix summarize the projected costs and revenues by state. These state analyses indicate that five states (Alabama, Illinois, Texas, Utah, and West Virginia) are likely to experience costs in excess of revenues if existing tax rates are maintained and if coal production increases to the levels assumed.

The remaining five states (Colorado, Montana, New Mexico, North Dakota, and Wyoming) are likely to experience significant revenue surpluses if there are no changes in tax structures and if the coal production levels used for analytic purposes here do occur.

ENERGY FACILITY ASSUMPTIONS

No attempt was made to locate the synthetic fuel and mine-mouth power plants by state. It does appear, however, that most of these facilities will be constructed in the five states just mentioned found to be likely to earn revenues in excess of costs. The assumptions regarding the number of facilities and their employment and population impacts are described below.

Synthetic Fuel Plants

Approximately 20 commercial-scale synthetic fuel plants were assumed to be under construction or in operation by 1990. This projection was based on a survey prepared by Cameron Engineers and assumed enactment of major synthetic fuels legislation. For estimating purposes, 10 plants were assumed to be under construction by 1985 and four in operation by 1990. No more than three starts were assumed in any year.6/

5/ U.S. Department of Commerce, State Government Finances in 1978 (November 1979). The 1977 data was adjusted to 1980 assuming a 7.5 percent average annual rate of inflation.

6/ U.S. Senate Committee on the Budget, "Overview of Synthetic Fuels Potential to 1990," Cameron Engineers, in Synthetic Fuels (September 1979).

Employment. Estimates of construction employment were based on a hypothetical optimal plant employing 4,000 workers in the peak year of construction, which was assumed to be the fourth in a seven-year construction period. Upon completion, each plant was assumed to produce the equivalent of 50,000 barrels of oil per day and to require 1,000 workers for its operation.

Population. The number of secondary workers and dependents was calculated by the same methods used for coal production. A distinction was made, however, for temporary construction workers. To avoid the possibility of overstating the population effects of temporary construction workers, a multiplier of three was chosen to account for both secondary workers and their dependents. The analysis took into account that temporary workers are less likely to bring families or to create a market for significant secondary work. A study prepared for the Economic Development Administration used a similar multiplier for this purpose.7/ Permanent employees involved in producing synthetic fuels were assumed to result in the same proportion of secondary population as coal miners.

Public Service Costs. The methodology used for coal-related costs was also applied to synthetic fuel plant construction. The distinction between temporary and permanent residents, however, was continued in these calculations. No capital investment costs were assumed for the temporary residents. Only operations and maintenance costs were attributed to this group. It was assumed that major capital investments will not be made for temporary residents. Capital investment costs and the resulting debt service costs were calculated for permanent residents only.

Revenues. Because no more than four plants were assumed to be in operation by 1990, no production revenue was estimated. Revenues from general taxes were calculated based on an average per capita revenue for the 10 states. This revenue is calculated based on the total number of residents, including both temporary and permanent.

Mine-Mouth Power Plants

A total of 10 to 15 mine-mouth power plants yielding some 11,250 megawatts of generating capacity are expected to be constructed over the

---

7/ U.S. Department of Commerce, Draft Environmental Impact Statement for the Inland Energy Impact Assistance Act of 1979, Economic Development Administration (April 12, 1979).

coming decade. For this analysis, it was assumed that all plants will be under construction by 1985 and that most are in operation by 1990. The analysis rests on the assumption that these facilities would be situated in the 10 states examined.

Employment. Construction work forces were assumed to peak at approximately 1,000 workers for each 1,000 megawatts of generating capacity in the fourth year of a seven-year construction period. Operating work forces were assumed to be 200 workers for every 1,000 megawatts of generating capacity.

Population. Population estimates were based on the same methodology used for construction of synthetic fuel plants, including the distinction between temporary and permanent residents.

Public Service Costs. The methodology applied to synthetic fuel plants was also used here.

Revenues. No revenues from energy-related taxes were estimated because plant operations would not begin until the latter part of the decade. Revenues from general taxes, however, were calculated based on the average per capita tax revenue from the 10 states. Because significant tax revenues from large power plants are likely, revenues are probably underestimated for the latter part of the period.

Table A-3 summarizes the costs and revenues calcualted for synthetic fuel and mine-mouth power plants. While development costs exceed revenues, this is not likely to be the case once energy production begins.

TABLE A-3. PROJECTED COST/REVENUE COMPARISON FOR POPULATIONS ASSOCIATED WITH MINE MOUTH AND SYNTHETIC FUEL PLANT DEVELOPMENT: TO 1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
						COSTS					
Operations & Maintenance											
Power Plant Population	1	4	10	20	30	45	55	60	75	65	60
Synthetic Fuel Plant Population	---	2	10	25	60	105	170	245	310	360	385
Subtotal	(1)	(6)	(20)	(45)	(90)	(150)	(225)	(305)	(385)	(425)	(445)
Debt Service											
Power Plant Population	---	---	2	5	10	10	15	15	15	15	15
Synthetic Fuel Plant Population	---	---	5	10	15	20	30	35	40	50	55
Subtotal	---	---	(7)	(15)	(25)	(30)	(45)	(50)	(55)	(65)	(70)
Total	1	6	27	60	115	180	270	355	440	490	515
						REVENUES a/					
Power Plant Population	---	2	5	10	15	25	30	30	35	35	30
Synthetic Fuel Plant Population	---	1	5	10	25	50	60	120	155	185	210
Total	---	3	10	20	40	75	90	150	190	220	240
						REVENUES LESS COSTS					
	-1	-3	-17	-40	-75	-105	-180	-205	-250	-270	-275
						NEW DEBT ISSUES					
Power Plant Population	---	20	20	25	25	30	---	---	---	---	---
Synthetic Plant Population	---	30	45	50	50	55	60	65	70	75	80
Total	---	50	65	75	75	85	60	65	70	75	80

NOTE: Minus sign denotes a net deficit.

a/ Revenue estimates exclude revenues derived from the facility itself, traditionally an essential element in local budgets. The revenues from a facility are totally dependent on site selection and therefore beyond the scope of this analysis. In addition, these revenues will be limited because few power plant or synthetic fuel plants will be operating until late in the decade.

TABLE A-4. ALABAMA--PROJECTED ANNUAL BUDGET IMPACT FROM NEW COAL PRODUCTION: TO 1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New Coal Production (in Millions of Tons per Year)	1.0	2.1	3.2	4.4	5.6	7.0	7.9	8.6	9.6	10.5	11.5
New Residents	730	1,530	2,330	3,210	4,090	5,115	5,775	6,285	7,015	7,680	8,410
						COSTS					
Added Costs											
Operating Budget	0.9	2.2	3.6	5.4	7.4	10.1	12.3	14.5	17.4	20.6	24.4
Debt Service	---	0.6	1.3	2.1	3.1	4.1	5.4	6.1	6.8	7.8	8.8
Total	0.9	2.8	4.9	7.5	10.5	14.2	17.7	20.6	24.2	28.4	33.2
						REVENUES					
New Revenues											
Production Taxes	0.8	1.7	2.6	3.7	4.8	6.0	7.0	7.7	8.7	9.8	10.9
New Resident Taxes	0.5	1.0	1.7	2.5	3.5	4.7	5.7	6.7	8.1	9.6	11.4
Total	1.3	2.7	4.3	6.2	8.3	10.7	12.7	14.4	16.8	19.4	22.3
						REVENUES LESS COSTS					
	0.4	-0.1	-0.6	-1.3	-2.2	-3.5	-5.0	-6.2	-7.4	-9.0	-10.9
New Debt Issues	5.2	6.2	6.8	8.2	9.0	11.2	8.0	6.7	10.3	10.1	12.0

NOTES: Coal production and population figures are cumulative. Minus sign denotes a deficit.

TABLE A-5. COLORADO--PROJECTED ANNUAL BUDGET IMPACT FROM NEW COAL PRODUCTION: TO 1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New Coal Production (in Millions of Tons per Year)	2.4	5.1	8.2	11.7	15.6	20.0	23.3	27.0	30.9	35.3	39.9
New Residents	845	1,795	2,815	4,040	5,415	6,960	8,115	9,420	10,790	12,335	13,940
						COSTS					
Added Costs											
Operating Budget	1.4	3.1	5.4	8.4	12.2	17.0	21.4	26.9	33.2	41.1	50.1
Debt Service	---	0.7	1.6	2.6	3.9	5.5	7.5	8.9	10.7	12.7	15.1
Total	1.4	3.8	7.0	11.0	16.1	22.5	28.9	35.8	43.9	53.8	65.2
						REVENUES					
New Revenues											
Production Taxes	2.5	5.4	8.9	12.9	17.6	23.0	27.3	32.4	37.7	43.8	50.7
New Resident Taxes	0.9	2.0	3.3	5.2	7.5	10.4	13.1	16.4	20.3	25.1	30.6
Total	3.4	7.4	12.2	18.1	25.1	33.4	40.4	48.8	58.0	68.9	81.3
						REVENUES LESS COSTS					
	2.0	3.6	5.2	7.1	9.0	10.9	11.5	13.0	14.1	15.1	16.1
New Debt Issues	6.0	7.4	8.7	11.5	14.0	17.3	14.0	17.0	19.4	23.6	26.5

NOTES: Coal production and population figures are cumulative. Minus sign denotes a deficit.

TABLE A-6. ILLINOIS--PROJECTED ANNUAL BUDGET IMPACT FROM NEW COAL PRODUCTION: TO 1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New Coal Production (in Millions of Tons per Year)	2.5	5.1	7.9	10.8	13.8	17.0	19.1	21.3	23.6	25.9	28.3
New Residents	2,090	4,250	6,580	8,985	11,485	14,150	15,910	17,740	19,665	21,590	23,585
						COSTS					
Added Costs											
Operating Budget	3.1	6.9	11.7	17.3	24.0	32.1	39.0	47.9	56.1	65.6	78.5
Debt Service	---	1.8	3.8	6.1	8.7	11.6	15.0	17.1	19.4	22.1	24.7
Total	3.1	8.7	15.5	23.4	32.7	43.7	54.0	65.0	75.5	87.7	103.2
						REVENUES					
New Revenues											
Production Taxes	1.4	2.9	4.6	6.5	8.4	10.7	12.2	14.1	15.8	17.6	19.8
New Resident Taxes	2.2	4.9	8.2	12.0	16.6	22.1	26.9	32.3	38.7	45.9	54.1
Total	3.6	7.8	12.8	18.5	25.0	32.8	39.1	46.4	54.5	63.5	73.9
						REVENUES LESS COSTS					
	0.5	-0.9	-2.7	-4.9	-7.7	-10.9	-14.9	-18.6	-21.0	-24.2	-29.3
New Debt Issues	14.9	16.8	19.9	22.4	25.6	29.9	21.3	23.9	27.2	29.4	32.9

NOTES: Coal production and population figures are cumulative. Minus sign denotes a deficit.

TABLE A-7. MONTANA--PROJECTED ANNUAL BUDGET IMPACT FROM NEW COAL PRODUCTION: TO 1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New Coal Production (in Millions of Tons per Year)	3.5	7.4	11.7	16.5	21.8	28.0	32.4	37.1	42.1	47.5	53.3
New Residents	350	735	1,165	1,640	2,165	2,785	3,220	3,685	4,185	4,720	5,295
						COSTS					
Added Costs											
Operating Budget	0.6	1.3	2.2	3.4	4.9	6.8	8.5	11.6	12.9	15.7	19.1
Debt Service	---	0.4	0.8	1.3	1.9	2.6	3.3	3.9	4.6	5.3	6.2
Total	0.6	1.7	3.0	4.7	6.8	9.4	11.8	15.5	17.5	21.0	25.3
						REVENUES					
New Revenues											
Production Taxes	5.4	11.6	18.7	26.9	36.4	47.6	56.1	65.7	75.8	87.4	100.2
New Resident Taxes	0.3	0.7	1.2	1.8	2.6	3.6	4.4	5.5	6.7	8.2	9.9
Total	5.7	12.3	19.9	28.7	39.0	51.2	60.5	71.2	82.5	95.6	110.1
						REVENUES LESS COSTS					
	5.1	10.6	16.9	24.0	32.2	41.8	48.7	55.7	65.0	74.6	84.8
New Debt Issues	2.5	3.0	3.6	4.5	5.4	6.9	5.3	6.1	7.0	8.2	9.5

NOTES: Coal production and population figures are cumulative. Minus sign denotes a deficit.

TABLE A-8. NORTH DAKOTA--PROJECTED ANNUAL BUDGET IMPACT FROM NEW COAL PRODUCTION: TO 1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New Coal Production (in Millions of Tons per Year)	2.5	5.5	9.0	13.2	18.1	24.0	28.5	33.6	39.2	45.6	52.7
New Residents	250	545	895	1,310	1,800	2,385	2,830	3,340	3,895	4,530	5,235
						COSTS					
Added Costs											
Operating Budget	0.4	0.9	1.7	2.7	4.0	5.7	7.4	9.4	11.8	14.9	18.5
Debt Service	---	0.2	0.5	0.8	1.3	1.9	2.6	3.2	3.9	5.3	5.7
Total	0.4	1.1	2.2	3.5	5.3	7.6	10.0	12.6	15.7	20.2	24.2
						REVENUES					
New Revenues											
Production Taxes	2.6	5.7	9.5	14.3	19.9	26.9	32.5	39.3	46.7	55.2	65.3
New Resident Taxes	0.2	0.5	0.9	1.4	2.0	2.9	3.7	4.7	5.9	7.4	9.3
Total	2.8	6.2	10.4	15.7	21.9	29.8	36.2	44.0	52.6	62.6	74.6
						REVENUES LESS COSTS					
	2.4	5.1	8.2	12.2	16.6	22.2	26.2	31.4	36.9	42.4	50.4
New Debt Issues	1.8	2.3	3.0	3.9	5.0	6.6	5.4	6.6	7.9	9.7	11.6

NOTES: Coal production and population figures are cumulative. Minus sign denotes a deficit.

TABLE A-9. NEW MEXICO--PROJECTED ANNUAL BUDGET IMPACT FROM NEW COAL PRODUCTION: TO 1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New Coal Production (in Millions of Tons per Year)	2.1	5.5	8.2	11.3	15.0	19.0	22.1	25.6	29.4	33.5	38.1
New Residents	280	595	960	1,375	1,875	2,405	2,820	3,290	3,795	4,360	4,975
						COSTS					
Added Costs											
Operating Budget	0.4	0.9	1.6	2.5	3.8	5.2	6.6	8.3	10.4	12.9	15.9
Debt Service	---	0.2	0.5	0.9	1.3	2.0	2.6	3.2	3.8	5.3	6.1
Total	0.4	1.1	2.1	3.4	5.1	7.2	9.2	11.5	14.2	18.2	22.0
						REVENUES					
New Revenues											
Production Taxes	1.3	3.6	5.5	7.7	10.5	13.7	16.1	19.2	22.3	26.1	30.1
New Resident Taxes	0.2	0.4	0.7	1.2	1.7	2.3	3.0	3.7	4.7	5.8	7.1
Total	1.5	4.0	6.2	8.9	12.2	16.0	19.1	22.9	27.0	31.9	37.2
						REVENUES LESS COSTS					
	1.1	2.9	4.1	5.5	7.1	8.8	9.9	11.4	12.8	13.7	15.2
New Debt Issues	2.0	2.5	3.1	3.9	5.1	6.0	5.0	6.1	7.2	8.6	10.1

NOTES: Coal production and population figures are cumulative. Minus sign denotes a deficit.

TABLE A-10. TEXAS--PROJECTED ANNUAL BUDGET IMPACT FROM NEW COAL PRODUCTION: TO 1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New Coal Production (in Millions of Tons per Year)	2.5	5.2	8.2	11.5	15.1	19.0	21.8	24.8	28.0	31.3	34.9
New Residents	375	775	1,225	1,715	2,250	2,835	3,250	3,695	4,175	4,670	5,210
						COSTS					
Added Costs											
Operating Budget	0.5	1.1	1.8	2.8	4.0	5.5	6.8	8.3	10.1	12.2	14.7
Debt Service	---	0.3	0.7	1.1	1.7	2.3	3.0	3.6	4.2	4.9	5.6
Total	0.5	1.4	2.5	3.9	5.7	7.8	9.8	11.9	14.3	17.1	20.3
						REVENUES					
New Revenues											
Production Taxes	0.2	0.4	0.7	1.0	1.4	1.7	2.0	2.2	2.8	3.1	3.5
New Resident Taxes	0.3	0.6	1.0	1.5	2.2	2.9	3.6	4.5	5.5	6.6	7.9
Total	0.5	1.0	1.7	2.5	3.6	4.6	5.6	6.7	8.3	9.7	11.4
						REVENUES LESS COSTS					
	0	-0.4	-0.8	-1.4	-2.1	-3.2	-4.2	-5.2	-6.0	-7.4	-8.9
New Debt Issues	2.7	3.1	3.8	4.6	5.5	6.5	5.0	5.9	6.7	7.6	8.8

NOTES: Coal production and population figures are cumulative. Minus sign denotes a deficit.

TABLE A-11. UTAH--PROJECTED ANNUAL BUDGET IMPACT FROM NEW COAL PRODUCTION: TO 1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New Coal Production (in Millions of Tons per Year)	2.1	4.6	7.7	11.5	16.2	22.0	26.7	32.1	38.4	45.6	53.9
New Residents	1,410	3,090	5,170	7,720	10,875	14,765	17,915	21,540	25,770	30,600	36,170
						COSTS					
Added Costs											
Operating Budget	2.0	4.9	9.0	14.6	22.2	32.7	42.9	55.7	71.9	92.3	117.8
Debt Service	---	0.7	1.6	2.8	4.4	6.6	9.4	11.7	14.4	17.9	21.9
Total	2.0	5.6	10.6	17.4	26.6	39.3	52.3	67.4	86.3	110.2	139.7
						REVENUES					
New Revenues											
Production Taxes	1.5	3.4	5.7	8.7	12.5	17.2	21.4	26.0	31.9	38.3	46.4
New Resident Taxes	1.1	2.7	4.9	7.8	11.8	17.4	22.8	29.6	38.2	49.0	62.5
Total	2.6	6.1	10.6	16.5	24.3	34.6	44.2	55.6	70.1	87.3	108.9
						REVENUES LESS COSTS					
	0.6	0.5	0	-0.9	-2.3	-4.7	-8.1	-11.8	-16.2	-22.9	-30.8
New Debt Issues	10.1	13.1	17.7	23.8	32.3	43.6	38.2	47.4	59.7	73.7	91.8

NOTES: Coal production and population figures are cumulative. Minus sign denotes a deficit.

TABLE A-12. WEST VIRGINIA--PROJECTED ANNUAL BUDGET IMPACT FROM NEW COAL PRODUCTION: TO 1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New Coal Production (in Millions of Tons per Year)	2.2	4.4	7.7	10.0	12.4	15.0	16.6	18.1	19.7	21.3	22.9
New Residents	2,685	5,370	8,190	11,015	13,975	17,120	20,400	24,150	28,500	33,460	39,160
						COSTS					
Added Costs											
Operating Budget	3.3	7.4	12.2	17.8	24.5	32.6	41.9	53.6	68.3	86.7	109.6
Debt Service	---	2.3	4.7	7.5	10.6	14.5	17.9	22.2	27.5	34.1	41.9
Total	3.3	9.7	16.9	25.3	35.1	47.1	59.8	75.8	95.8	120.8	151.5
						REVENUES					
New Revenues											
Production Taxes	3.7	7.5	13.4	17.8	22.4	27.6	31.2	34.6	38.4	42.4	46.5
New Resident Taxes	1.8	3.9	6.4	9.3	12.7	16.8	21.6	27.6	35.2	44.6	56.4
Total	5.4	11.4	19.8	27.1	35.1	44.4	52.8	62.2	73.6	87.0	102.9
						REVENUES LESS COSTS					
	2.1	1.7	2.9	1.8	0	-2.7	-7.0	-13.6	-22.2	-33.8	-48.6
New Debt Issues	19.1	20.9	24.0	26.3	30.3	35.3	39.7	49.0	61.5	75.7	93.9

NOTES: Coal production and population figures are cumulative. Minus sign denotes a deficit.

TABLE A-13. WYOMING--PROJECTED ANNUAL BUDGET IMPACT FROM NEW COAL PRODUCTION: TO 1990, IN MILLIONS OF DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New Coal Production (in Millions of Tons per Year)	11.5	24.9	40.4	58.4	79.3	104.0	122.7	143.3	166.1	191.4	219.3
New Residents	1,145	2,475	4,015	5,805	7,880	10,340	12,160	13,870	15,695	17,520	19,340
						COSTS					
Added Costs											
Operating Budget	2.0	4.8	8.5	13.4	19.7	28.0	35.6	43.8	53.6	64.6	77.0
Debt Service	---	1.0	2.2	3.7	5.7	8.2	11.3	14.9	17.6	19.7	22.4
Total	2.0	5.8	10.7	17.1	25.4	36.2	46.9	58.7	71.2	84.3	99.4
						REVENUES					
New Revenues											
Production Taxes	16.4	36.4	60.2	88.8	122.9	164.3	197.5	235.0	279.0	327.3	381.6
New Resident Taxes	1.3	2.9	5.1	8.0	11.8	16.7	21.2	26.1	32.0	38.4	46.0
Total	17.7	39.3	65.3	96.8	134.7	181.0	218.7	261.1	311.0	365.7	427.6
						REVENUES LESS COSTS					
	15.7	33.5	54.6	79.7	109.3	144.8	171.8	202.4	239.8	281.4	328.2
New Debt Issues	8.1	10.4	13.1	16.7	21.3	27.5	32.1	22.4	25.8	27.8	30.1

NOTES: Coal production and population figures are cumulative. Minus sign denotes a deficit.