EVALUATION OF STATE TAXES AND TAX INCENTIVES AND
THEIR IMPACT ON THE DEVELOPMENT OF GEOTHERMAL
ENERGY IN WESTERN STATES

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OF GEOTHERMAL ENERGY IN WESTERN STATES

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ABSTRACT

The economic impact of existing and prospective state taxes and tax incentives on direct thermal applications of geothermal energy are evaluated. Study area is twelve western states which have existing and potential geothermal activities. Economic models representing the geothermal producer and business enterprise phases of four industrial/commercial uses of geothermal energy are synthesized and then placed in the existing tax structures of each state for evaluation. The four enterprises are a commercial greenhouse (low temperature process heat), apartment complex (low temperature space heat), food processor (moderate temperature process heat), and small scale energy system (electrical and direct thermal energy for a small industrial park). The effects of the state taxations on net profits and tax revenues are determined. Tax incentives to accelerate geothermal development are also examined. The magnitudes of total state and local tax collections vary considerably from state to state, which implies that geothermal producers and energy-using businesses may be selective in expanding or locating their geothermal operations.

1.0 INTRODUCTION

The accelerated utilization of geothermal energy resources for direct thermal applications can greatly enhance the energy and economic development of the Western States. Economics and/or profits for the energy producer or user are a key factor in the implementation of direct thermal applications. State, local and federal taxes all significantly influence the cash flow and profit percentages of geothermal operations. Several published and unpublished studies have been carried out on the quantitative effects of the applicable federal tax laws, particularly those encompassed in the Energy Tax Act of 1978.¹⁻⁸ This study addresses the economic impact of state and local taxes and tax incentives on future geothermal developments in several western states. The primary objectives are to determine the variability in cash flow and net profit after state and local taxes for the geothermal producer and/or user and to estimate the tax revenues generated by geothermal developments for different taxation levels and various tax incentives. Both existing and prospective taxation and tax incentives are examined.

1 _____, "Tax Information Papers Nos. 1-5," Geothermal Resources Council, Davis, California.

2 _____, September 1978, "Report of the Institutional Barrier Panel to the Interagency Geothermal Coordinating Council," Randall Stephens, Chairman, Institutional Barrier Panel, U.S. DOE, Washington, D.C.

3 _____, November 1978, "The National Energy Act," U.S. DOE Office of Public Affairs.

4 _____, 1979 "Geothermal Energy Omnibus Legislation - Recommendations of the Institutional Barrier Panel to the Interagency Geothermal Coordinating Council," Randall Stephens, Chairman, Institutional Barrier Panel, U.S. DOE, Washington, D.C.

5 Samuel M. Eisenstat, November 1978, "Federal Tax Treatment of Geothermal Exploration and Production," Paper presented at Conference on Commercialization of Geothermal Resources, Geothermal Resources Council, San Diego, California.

6 John T. Nimmons, November 1978, "1978 National Energy Act Applications to Geothermal Development," Earl Warren Legal Institute, Berkeley, California.

7 Sharon C. Wagner, November 1977, "State Taxation of Other Energy Minerals Compared with State Taxation of Geothermal Resources," Special Report No. 4, Geothermal Resources Council, Davis, California.

8 Sharon C. Wagner, June 1979, "Taxation of Geothermal Energy," Paper presented at Special Short Course No. 8, San Francisco, California, Geothermal Resources Council, Davis, California.

2.0 TECHNICAL APPROACH

Principal components of this state tax study are the existing (1979) state and local tax structures of each of twelve western states, realistic business economic models of four types of direct thermal applications, computer simulations of cash flows and tax payments, evaluation of selected tax incentives on profitability, and aggregations of prospective state tax revenues for three scenarios of future geothermal activity. The state and local tax structures have been compiled from the study by Wagner (1977), state tax statutes and regulations, and interviews with state tax officials. The four geothermal business economic models consist of the following: low temperature process heat for a greenhouse for wholesale flower production; space and hot water heating for an apartment complex; process heat for a food processing industry; and small-scale electrical power generation plus cascaded direct thermal heat for a small industrial park. The economic models have been composed from commerce, industry and DOE data. The computer simulations are performed using the System for Economic Evaluation under Risk (SEER) program of Science Applications, Inc. (Grange et al., 1978).¹ The selected tax incentives are those being utilized or considered by certain state governments and others available to state taxing authorities. The geothermal growth scenarios are strictly hypothetical; but are based indirectly upon recent hydrothermal market analyses by EG&G Idaho, Inc. (1979)² and by New Mexico Energy Institute (1979).³

¹ Grange, F. E., Roberts, S. G. and Kriz, T.A., 1978, A user's manual for the System for Economic Evaluation under Risk (SEER), Science Applications, Inc.

² EG&G Idaho, Inc., and University of Utah Research Institute, 1979, Regional hydrothermal market penetration analysis (appendices).

³ Cunniff, R., 1979, New Mexico Energy Institute, Personal communication.

3.0 STATE TAX STRUCTURES

All relevant state and local taxes for both the geothermal energy production operation and the energy-using business operation have been considered and compiled for this study. This approach has been used, since, in numerous direct thermal applications, the energy producer and user may be one and the same party for taxation purposes. Nevertheless, tax computations for an integrated operation require a distribution of the capital investment, operating expenses, and incomes between the distinct economic phases of the total operation.

3.1 Theories and Practices of State Energy Resource Taxation

Taxation without a theoretical structure is almost as repugnant as taxation without representation. In either case, arbitrariness is an ever-present threat. Good tax policy will emanate from legislation, court decisions and administration underpinned by rational tax principles.

The basic principles of taxation are simple and yet have been ignored many times in setting state or federal tax policy. A tax system should have the virtues of adequacy, convenience, simplicity, equity and economy. In brief, adequacy means that the taxes should raise an amount of revenue commensurate with the need of the governmental unit. Convenience refers to the need that taxes should be easily paid insofar as the place, the kind and manner of payment is concerned. A tax should be simple to understand so as not to confuse the taxpayer or require undue assistance in understanding it. Economy means that the cost of collecting a tax should not be excessive in regard to the yield from the tax either to the governmental unit or to the taxpayer. Equity refers to the principle that individuals or companies in similar activities or similar means should pay like amounts of taxes. In other words, a producer of cigarettes should pay a similar amount of taxes as a producer of cigars or smoking tobacco.

There are other less recognized principles of taxation. Included among such canons is that the tax should be neutral in its effects and thereby not distort optimal economic decision making. Tax policy may at times endorse the use of taxation in a non-neutral manner by intentionally overtaxing "undesirable" activities such as smoking, drinking, gambling or the excessive use of some goods or services (e.g. the war-time cabaret tax or a high energy fuel tax to force conservation). Furthermore, small or new industry may be encouraged to expand as an infant industry by a conscious lightening of the tax burden of the industry.

These considerations are the backbone of a sound tax system. The courts may strike down a tax which is arbitrary or capricious or that violates due process of law. The legal doctrine against taking of property without due process of law has protected countless taxpayers.

Taxes are used to redistribute wealth and income as in the case of inheritance levies, progressive tax rates, and excess profits taxes. And tax policy is used in conjunction with monetary policy to influence the behavior of the national economy.

As pointed out by Professors William J. Shultz and C. Lowell Harris in American Public Finance, Seventh Edition, 1979, pages 143-4:

"One clause of the Fourteenth Amendment provides that no state shall deprive any person of his life, liberty, or property "without due process of law." In its application to taxation, many lawyers are inclined to regard this broad language as a blanket injunction against excessive exercise of state tax powers. As Judge Cooley said, "In tax cases, especially those carried to the Supreme Court of the United States, it is customary, it seems, to add to other constitutional objections, for good measure, the contention that the tax law violates the due process of law provision."¹ This "due process of law" clause has three specific

¹ T. M. Cooley, The Law of Taxation (Callaghan and Co., Chicago, 4th Edition, 1924).

applications to state tax statutes: (1) It constitutes an injunction against the levy of a tax beyond the territorial jurisdiction of the state or local taxing government; (2) it may be interposed to check extreme or confiscatory state or local taxes; (3) it prohibits a state from utilizing any forms of assessment or review which are essentially arbitrary, unjust, or unfair or which deny the taxpayer a fair opportunity to assert his substantive rights before a proper judicial tribunal."

Commerce Clearing House, a leading tax service, states,:

"United States Constitution provides (Amendment XIV, Sec. 1):
"***No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any state deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.

While the Fifth Amendment also requires due process of law, and has the same meaning in this respect as the Fourteenth, the former is clearly a limitation only upon federal action and no such restriction upon state action enforceable by the federal courts exists except by virtue of the Fourteenth Amendment, adopted in 1868."¹

¹ All States Tax Guide, CCH, 1979, page 425.

It is tempting to achieve goals by taxation which would be less acceptable if sought in a direct manner. Tax laws have been used to subsidize or aid specific individuals, firms or associations throughout history. However, the enactment of special legislation itself through direct subsidy requires a degree of decorum by specifying the special parties to be aided.

In summary, the imposition of taxes which are arbitrary, capricious or confiscatory are shortstopped by tradition, the Constitution, court decision and rational tax policies. Not always, but often enough to be a source of strength, legislators addressing tax questions are aware of these guidelines and constraints even when they are not explicitly discussed.

The tax administrator operates in a similar context. In setting rules and regulations, the administrator must avoid capricious guidelines or incur the wrath of certain taxpayers. In fact, the authors find the most acute sensitivity among tax administrators to the "rules of the game", perhaps because they meet the taxpayers eyeball to eyeball almost daily. Good administration can make bad drafting of law more equitable and more palatable.

What does this have to do with the taxation of geothermal energy and other types of energy? It is important to recognize there are only a few major sources of energy and the substitution of one type for another often is impractical. Electricity for motors and lighting and gasoline for motor vehicles are examples. Furthermore, the demand is usually inelastic as for space heating, transportation or process heat in industries such as aluminum and glass making. The supply may be inelastic for the short and the long run for a particular source of energy within rather wide price bands.

Also, for some sources of energy, the price is administered as in the case of public utility commissions. In any case, a tax would be passed through to the final consumer and producer quite easily because of the inelastic demand and supply situation. Despite sharp increases in crude oil prices, domestic production has not risen markedly. While drilling activity has risen lately, major fields have been difficult to locate. Higher gasoline prices have not reduced sharply consumption for transportation which indicates an inelastic demand at least for the near term.

It appears that the established traditional sources of energy are affected by taxation in the long run much more than in the short run. Consumer demand is slow to react in the short run because demand is rather inelastic and therefore responds slowly to price changes. In the longer run the general public and industry are adopting conservation measures for several reasons including savings in costs.

The newer sources of energy may be affected by tax policy. On the consumer side, the newer energy sources such as solar and geothermal are not well established with a known track record; consequently, a tax may deter the consumer who has a space heating need or a producer who supplies the resource to a greenhouse or a district heating system. The market for geothermal is most pronounced in an urban area where the market is sizeable enough for cost effective use. The cost of drilling a well often precludes small scale usage. However, the availability of conventional fuel is greatest in urban areas where the delivery systems have been developed.

In addition, the geothermal producer's economic relationship to the user is less flexible than in the case of conventional fuel. This energy source in direct (non-electrical) use requires a fixed pipeline to a user at a nearby location. Long distance transmission requires an excessive investment for the typical situation although a 70-mile transmission line is being evaluated for a linkage of the geothermal resource in the Mt. Hood region of Oregon to the City of Portland.

The attitude of investors is important to geothermal projects because of the large capital investment required. This results in high fixed costs and low variable costs (operating). Being fixed, the producer's costs cannot be reduced proportionately if a reduction in demand for output takes place. Another inflexibility or locked-in effect is a result of a limited number of potential users. Natural gas and electricity, for examples, can adjust to a decline in user demand by channeling the output through other market areas.

These production and consumption features argue for encouragement of the nascent geothermal industry. Investors and users must be made aware of the desirable features of geothermal energy, namely that it is non-interruptible service, relatively non-polluting and to a large extent, renewable. Also the sizeable fixed investment means that the user is relatively immune to the inflationary affects of rising labor and other variable costs. The fixed investment in the reservoir and pipeline will see capital appreciation to the owner, but will not experience the great pressures of rising annual operating costs that occur with other energy sources. Investors are interested in viable economic projects and will

therefore be evaluating the economics of geothermal versus conventional fuel using the concepts outlined above.

Geothermal is a capital intensive activity as evidenced by the enterprises referred to in Section 4.2. If it is agreed that this type of energy production should be encouraged because of its renewable and non-polluting nature, it follows that taxes based upon fixed investment should be moderate. Therefore the state and local property tax is ill suited to this type of energy resource. The property tax liability is commonly not variable with the ups and downs of production. A fixed tax coupled with heavy debt service payments requires a fixed cost burden each year regardless of the demand for output.

The recent incentives to geothermal energy are almost totally a result of the linkage of state tax systems to the federal system. Therefore, the incentives have been almost entirely in the field of income taxation whereby the deduction of intangible drilling and development costs and percentage depletion allowance are now allowed for state income taxation. The recently enacted alternative energy tax credit by Congress does not allow the energy tax credit to be refundable for geothermal while it does for solar energy. In state taxation, Arizona recently enacted a 35 percent income tax credit for solar energy which is not extended to geothermal. Admittedly solar and geothermal are not strictly analogous. Geothermal often involves an off-site energy generation, while solar energy is, as a rule, generated as an integral part of a building. When geothermal system is integrated into the enterprise as in the illustrations in this report, the

distinction is not marked between solar and geothermal energy usage. It appears that some state tax incentives which have been extended to solar energy have not been extended to geothermal because it was overlooked in the design of the tax program. Geothermal energy has not received the attention that solar energy has received and has not been an important element in the typical state's energy picture.

The theory of equity in taxation argues that the preferences extended to solar energy should be extended to geothermal energy. The tax benefits extended to conventional fuels and energy should be extended to geothermal. This has been done insofar as geothermal energy is concerned. However, there is some catching up because of the past, tax and non-tax incentives provided to conventional fuel developments. Aside from tax equity or subsidies, tax policy should be designed to encourage domestic, relatively non-polluting energy resources such as our geothermal resources. A recent research report indicates that tax incentives and other incentives which have been given to conventional sources of energy are estimated to be over \$200 billion during the past five decades in the United States.¹

¹Report by Battelle Memorial Institute as reported in Solar Age, May, 1979, page 16.

3.2 Identification and Analysis of Geothermal-Related Tax Laws Regulations and Practices

3.2.1 General Practices

Taxation of geothermal energy has not been addressed as a separate and distinct activity insofar as taxation policy is concerned in most of the western states. Geothermal energy has been a minor element in the energy activity in these states and, therefore, has not been a major focus in the legislative halls nor in the executive or administrative departments of government. As geothermal activity burgeons, the legislatures may be expected to turn specific attention to the taxation of this energy source. In contrast, solar energy has recently received attention and most of the state legislatures have enacted tax incentives and other program incentives to accelerate the development of this source of energy. Some legislative committees have begun consideration of geothermal energy in the context of the taxation of alternative energy sources. As this source of energy becomes more important economically, other legislatures will unquestionably focus on the tax issues involved with this element of the state tax structures.

The most important incentives in the past year or so have emerged because of the linkage of state income taxation to changes in the federal tax code. State income taxation is frequently keyed to the federal tax structure and therefore the liberalization of federal tax policy permitting percentage depletion and the expense deduction for development and intangible drilling costs have been translated into like changes among the states. The recent changes in federal taxation of geothermal are depicted in Figures 3.1 and 3.2 which serve as a basis for understanding the income taxation by the several states. Several distinctions must be kept in mind in evaluating the state income taxation as compared to the federal structure. The federal 15% minimum preference tax which is applicable to income when and after depletion equals the adjusted basis of property is not applicable among the western states. Also, the states do not commonly offer an investment tax credit, either the regular tax credit or the additional 10% alternative energy credit, which are now

Figure 3.1 Geothermal Reservoir
Computation of Federal Depletion Allowance for

Figure 3.2 Computation of Federal Income Tax
for Geothermal Reservoir

¹Limits on Excess Over 25,000
are 60% of excess in 1979
70% of excess in 1980
80% of excess in 1981
90% of excess in 1982
and forward

Figure 3.3

**Computation of Federal Income Tax for
Business, Enterprise and Transmission System**

part of the federal structure. Furthermore, the states often do not allow the deduction of the federal taxes in arriving at taxable income for state purposes and, as a rule, do not allow a deduction of state income taxes paid as is allowed by the federal code.

The several types of existing state and local taxes and tax incentives among the western states are listed in Table 3.1. The actual tax structures are set forth in the following regional groups: Four Corner Regional States, Tables 3.2 - 3.4; Old West Regional States, Tables 3.5 - 3.7; and Pacific Northwest Regional States, Tables 3.8 - 3.10.

3.2.2 Four Corners Regional States

3.2.2.1. Corporate Income Taxes

The Four Corners States, namely Colorado, Utah, New Mexico, Arizona and Nevada, impose an income tax on geothermal as well as other economic activity, with the exception of Nevada which has no income tax. In analyzing the state taxation of income there are two important facets, namely the tax rate and the tax base. The tax rate on taxable income varies from 4% in Utah to a high marginal rate on income above \$6,000.00 of 10½% in Arizona. The taxable base for geothermal production activity, namely the geothermal reservoir and the transmission of the energy to the enterprise, has the following distinctions among the four states which have the income tax. The federal income tax is deductible in Arizona but not in the other states, namely, Utah, New Mexico and Colorado. State income and other taxes are deductible in Arizona and New Mexico, but the state income tax is not deductible in Colorado or Utah. Colorado and New Mexico follow the federal definition of depletion which is 22% of gross income less rents and royalties to a maximum of 50% of taxable income; Utah provides that percentage depletion shall be one-third of net income which is less liberal than the federal definition and Arizona provides 27½% of gross income (not to exceed 50% of net income) which is more liberal than the federal definition. The states follow the federal deductibility of development in intangible drilling costs and will require the capitalization of exploration expenditures with the exception of Arizona which permits a deduction of exploration expenditures

TABLE 3.1 State and Local Taxes and Tax Incentives

State and Local Taxes	Tax Incentives
Corporate Income	Exploration/Development Deductions
Sales/Gross Receipts	Depletion Allowance
Property/Ad Valorem	Depreciation
Severance/Resource	Operating Expenses
Occupation	Investment Credit
Personal Property	Energy Credit
Franchise	Loss Carry Back/Forward
Privilege	Wage Credits
Production/Conservation	Business Incentive Credit
Public Utility/Electricity	Property Tax Exemption

State Tax Structures Compiled:

FCRC: AZ, CO, NV, NM, UT
 OWRC: MT, ND, SD, WY
 PNRC: ID, OR, WA

State Taxes Evaluated:

AZ, CO, NV, NM, UT, MT, ND, ID

Table 3.2
FOUR CORNER STATES

STATE CORPORATE INCOME TAXES

Geothermal Activity	Arizona	Colorado	Nevada	New Mexico	Utah
Gross Income	Federal Code	Federal Code	No. Tax	Federal Code	Federal Code
Rents & Royalties	Federal Code	Federal Code		Federal Code	Federal Code
Operating Expenses	Federal Code	Federal Code		Federal Code	Federal Code
Depreciation	Federal Code	Federal Code ^{2/}		Federal Code	Federal Code
Interest	Federal Code	Federal Code		Federal Code	Federal Code
Intangible Drilling Costs	Federal Code ^{1/}	Federal Code		Federal Code	Federal Code
Exploration Costs	\$75,000 & under are expensed	Cost Depletion		Cost Depletion	Cost Depletion
Depletion	27-1/2% of gross income	Federal Code		Federal Code	One-third of net income or cost depletion
State Income Taxes	Deducted ^{1/}	Not Deducted		Deducted	Not Deducted
State Taxable Income					
Tax Rate	10-1/2% Range from 2-1/2% of 1st \$1,000 to 10-1/2% on net income over \$1,000	5%		5%	4%
Investment Tax Credit	None	Business incentive credit of \$100 per \$100,000 investment & \$100 per employee in cities under 50,000 pop. for 10 years.		None	None

^{1/} Arizona allows deduction of Federal income taxes

^{2/} Full first year deduction for reservoir and transmission investment.

Table 3.3

FOUR CORNER STATES

STATE SALES, GROSS RECEIPTS, BUSINESS

UTILITY AND SEVERANCE TAXES

Taxes	Arizona	Colorado	Nevada	New Mexico	Utah
Sales and Gross Receipts	Transaction privilege taxes on mining at 4% not applicable to geothermal. Tangible property & contracted work taxed at 4%. Utilities taxed at 1-1/2%.	Tangible property purchases: 3% + various local rates. Denver rate is 6.5%. Utility services rate taxed if for processing or manufacturing.	Tangible property purchased: 3.5% of sales price. Geothermal: sales of output exempt. Other energy sales exempt.	Tangible property purchased and energy sales including geothermal: 3.75%.	Tangible property purchased: 4.75% (including typical local tax). Greenhouse & food processor purchase of energy exempt. Apartment house purchases at 2% rate.
51 Business and Utility	None applicable	None applicable	Local option tax up to \$5.00 per \$1,000 of revenue of utility in some localities.	None applicable	None applicable
Severance	None applicable	None applicable	None applicable	Conservation tax on gross production value less royalties. Rate: 19/100%.	Ore occupation tax: 1% of gross value. Geothermal as a natural resource is exempt.

Table 3.4
FOUR CORNER STATES
PROPERTY TAXES

	Arizona	Colorado	Nevada	New Mexico
Reservoir	Gross production less 40% is taxed at the local tax rate which averages \$12.50 per \$100 of value. This is in lieu of property of reservoir & transmission facility.	Full value of well real estate determined by local assessor based upon costs & capitalized income flows. Equipment separately valued, based upon depreciated historical costs on staggered basis lagged every 4 years.	Net proceeds taxed at local property tax rate. In addition, machinery & equipment are assessed at 35% of original cost less depreciation.	Real property value created by drilling & costing is valued & assessed at full original cost. Equipment valued at original cost less straight line depreciation to 12-1/2% of cost as floor. Assessed at 1/3 of depreciated value.
Transmission	See above.	Procedure is same as reservoir equipment & machinery valuation methods. Rather than original costs, Colorado uses cost levels several years prior to current year.	Pipeline & equipment are assessed at 35% of original cost less depreciation.	Pipeline & equipment are valued at straight line depreciation to 12-1/2% of original cost. Assessed at 1/3 of depreciated value.
Business Enterprise	Real property valued at depreciated amount from original cost. Personal property including machinery is valued at original cost less depreciation according to type of property. Level of assessment 21%-27% of value. Tax rate: \$12.50 per \$100 of assessed value (typical) or about 2.625% of full value.	Land at original cost & value structures depreciated at state manual rates based upon costs of several years prior. Assessed at 30% of full value or 2% of full value. Tax rate: \$8.00 per \$100 on assessed value or 2% of full value.	Land valued at original cost. Structures are assessed at 35% of original cost less depreciation. Machinery & equipment are assessed at 35% of original cost less depreciation. Tax rate: \$2.50 per \$100 of assessed value which equals 0.875% of full market value.	Land valued at original cost. Structures valued at full original cost (no depreciation). Equipment & machinery valued at straight line depreciation of original cost. Assessed at 1/3 of depreciation value. Tax rate: \$4.50 per \$100 of assessed value or 1.5% of full value.

to a limit of \$75,000. All of the states permit a carrying back of losses and a carry-forward of losses similar to the Federal code. Since the states follow the Federal code for depreciation, there would be allowed accelerated depreciation, with the exception of Arizona which provides that depreciation shall be reasonable.

While none of these states provides for a tax credit, Colorado does allow a deduction of any investment in geothermal energy resource delivery systems including drilling costs from income subject to tax. For a using enterprise, the deduction is limited to the difference between the alternative energy investment and a conventional energy investment. An additional credit which is extended by Colorado is a business investment credit of \$100 per employee plus \$100 per \$100,000 of real and personal investments in cities under 50,000 population for the first year of operation. The credit is \$50 per employee and \$50 for \$100,000 of investment for cities over 50,000. A strict reading of the act would include geothermal investment in an integrated operation where the enterprise owns and uses the geothermal energy.

3.2.2.2. Severance Taxes

There are no severance taxes imposed among the states. New Mexico, however, has a conservation tax on geothermal and other resource developments which is equal to 19/100% of gross production value excluding royalties to federal and state governments and Indian Tribes. Each of the states, except Nevada, has severance taxes on metals and on coal. Utah exempts non-metallic minerals from the severance tax.

3.2.2.3. Sales and Gross Receipts Taxes

A sales or gross receipts tax is imposed in Utah (4% plus local 3/4%),¹ New Mexico (3-3/4% plus local tax), Colorado (3% plus variable local taxes) and Arizona (2½%). Nevada does not apply the sales tax to electricity, gas and geothermal energy sales. The Nevada law is somewhat vague but has been interpreted by the Director of Taxation as to include geothermal energy in the exemption.

Local governments in Nevada impose a utility tax of up to \$5 per \$1,000 of gross revenue from energy sales with the current rate being \$4 per \$1,000.

¹ Park City and the counties of Salt Lake, Weber and Davis in Utah apply a sales or gross receipts tax of 5%; the figure of 4 3/4% has been used in the tax calculations of this report.

3.2.2.4. Property Tax

The taxation of property is basically a local tax for city, village, county, school and special district functions. If levied, the state property levy is commonly a minor part of the total state and local levy. The valuation of property is in general the function of the local county assessor with guidelines provided by the state property tax office. As shown in the state tax tables, the tax rates as a percent of full value after adjustments for local levels of assessment vary from about 1½% to 2% of full value. Full value in the case of real and personal property is the original cost or market value depreciated for functional and physical depreciation and, in some cases, adjusted for the effects of inflation. It is difficult to generalize concerning the establishment of values because the practices of the states vary considerably as indicated in the state tax tables. As a general practice, there will be taxable value presumed if the use of the real property - that is, land - is modified by the expenditure of capital investment including personal property such as machinery and equipment. The state of New Mexico does not tax geothermal energy as a mineral resource but does provide for taxation values due to intangible drilling expenditures. The states of Arizona and Nevada tax the production of the geothermal resource by applying the local levy for taxation to the gross production less certain costs. This is in addition to the real and personal property invested in the development in Nevada. The state of Colorado taxes reservoir and transmission facilities on the basis of the investment depreciated over future years. Utah taxes the reservoir by capitalizing a net amount arrived at by deducting allowable costs from gross income. The resulting net amount is capitalized at 20% (which means that it is multiplied by a factor of 5) to arrive at the market value of the reservoir. This value, derived by the state, is a minimum value which is used in lieu of the local assessor's valuation of the reservoir investment if the state-derived value exceeds the local assessed value. In this manner, some of the intrinsic value of the reservoir is captured in the assessment process; however, since rents and royalties are deducted in arriving at the net amount to be capitalized, a portion of the intrinsic value is eliminated from the total value.

3.2.3 Old West Regional States

Four of the Old West Regional States are included in the study: namely, North Dakota, South Dakota, Montana and Wyoming.

3.2.3.1. Income Taxation

The State of Wyoming has no income tax. South Dakota imposes a 4% tax on the net profit of businesses extracting minerals but the tax is not applicable to geothermal. The State of Montana taxes income from geothermal and other business activity at a rate of 6.75% of taxable income. The Montana tax law follows the federal definitions for depletion, depreciation in intangible drilling and development costs with no deduction for state income or federal income taxes. In addition, there is no tax credit, either investment tax credit or otherwise. North Dakota is similar to Montana, but allows a deduction of federal income taxes for the income tax and imposes a rate under a bracket system which has a marginal rate of 8.5% for income above \$25,000 a year. A credit of 1% of gross expenditures for wages and salaries is allowed for three years and $\frac{1}{2}$ % of gross expenditures for the fourth and fifth years of a new enterprise, or a complete exemption is allowed for the first five years of a new business when approved by local and state government.

3.2.3.2 Sales and Gross Receipts Taxation

South Dakota imposes a sales tax of 4% at the state level and typically 1% at the local level. Property such as machinery and equipment and supplies used in the developing geothermal resources would be subject to the tax as would the energy sold from the geothermal development. A sales tax at a rate of 3% plus local taxes which are commonly 1% in the state of Wyoming would be applicable to the pipes, pumps and machinery equipment for geothermal development. The sale of geothermal energy is not enumerated in the statutes and presumably would not be subject to the sales tax. The state of North Dakota imposes a sales tax of 3%, which would be applied to the tangible property purchased for geothermal development. The sales tax would be applied to geothermal energy for sale except the energy used for processing. Montana has no general sales tax and therefore the projected investments in geothermal would not be subject to tax nor would the geothermal energy output. However, electrical energy produced for sale is taxed at a rate of \$.002 KWHr. produced.

Table 3.5
OLD WEST COMMISSION STATES
STATE INCOME TAXES

Geothermal Activity	Montana	North Dakota	South Dakota	Wyoming
Gross Income	Federal Code	Federal Code	Tax on net net profit of extraction of \$100,000	No Tax
Rents & Royalties	Federal Code	Federal Code		
Operating Expenses	Federal Code	Federal Code		
Depreciation	Federal Code	Federal Code	(Not applied to geothermal)	
Interest	Federal Code	Federal Code		
Intangible Drilling Costs	Federal Code	Federal Code		
Exploration Costs	Federal Code	Federal Code		
Depletion	Federal Code	Federal Code		
State Income Taxes	Not Deducted	Not Deducted		
State Taxable Income				
Tax Rate	6.75%	3% of first \$3,000 4% of next \$5,000 5% of next \$7,000 6% of next \$10,000 8.5% on all above \$25,000		
Investment Tax Credit	None	1% of wage payments for 3 years & 1/2% 4th & 5th years or total exemption for 5 years subject to local government approval.		

Table 3.6

OLD WEST COMMISSION STATES
 STATE SALES, GROSS RECEIPTS, BUSINESS
 UTILITY AND SEVERANCE TAXES

Taxes	Montana	North Dakota	South Dakota	Wyoming
Sales and Gross Receipts	Electrical energy produced for sale:	Tangible property purchased: 3% of sales price including water. Electricity exempt.	Tangible property 5% (including 1% local). Geothermal energy subject to tax.	Tangible property and various services including gas & electric: 3% of sales price. Some local sales taxes.
Business and Utility	None applicable	None applicable	None applicable	None applicable
Severance	Gross value of minerals extracted: 1/2%. Geothermal may possibly be exempt, by exclusion from provisions (see text).	Coal and other minerals taxed.	None applicable	Gross product value: 2%. Geothermal exempt (apparently).

Table 3.7
OLD WEST COMMISSION STATES
PROPERTY TAXES

	Montana	North Dakota	South Dakota	Wyoming																								
Reservoir	<p>Completed well, equipment, & pipelines valued as follows:</p> <p><u>Market Value Calculation</u></p> <table><tr><th>Year</th><th>% of Original Cost</th></tr><tr><td>1st</td><td>93</td></tr><tr><td>2nd</td><td>91</td></tr><tr><td>3rd</td><td>87</td></tr><tr><td>4th</td><td>81</td></tr><tr><td>5th</td><td>81</td></tr><tr><td>6th</td><td>79</td></tr><tr><td>7th</td><td>65</td></tr><tr><td>8th</td><td>52</td></tr><tr><td>9th</td><td>44</td></tr><tr><td>10th</td><td>39</td></tr><tr><td>10th + beyond</td><td>39</td></tr></table> <p>Assessed at 11% of market value</p> <p>Same as above</p>	Year	% of Original Cost	1st	93	2nd	91	3rd	87	4th	81	5th	81	6th	79	7th	65	8th	52	9th	44	10th	39	10th + beyond	39	<p>Real property value of well valued at depreciated original cost. Pumps & other personal property are exempt. Personal property exemption not applicable to utility property.</p>	<p>Real property assessed at original cost less depreciation. Pumps & other personal property is exempt.</p>	<p>Land is exempt on production property. Mines which may include geothermal as taxed at gross product value. Local & state property levies are applied. Equipment & other personal property is valued at original cost less depreciation.</p>
Year	% of Original Cost																											
1st	93																											
2nd	91																											
3rd	87																											
4th	81																											
5th	81																											
6th	79																											
7th	65																											
8th	52																											
9th	44																											
10th	39																											
10th + beyond	39																											
Transmission	<p>Same as above</p>	<p>Same as above, corporative & cooperative except electric lines are treated distinctly.</p>	<p>Same as above.</p>	<p>Same as above.</p>																								
Business Enterprise	<p>Geothermal investment exempt on first \$100,000. Market value of equipment determined as above ^{1/}</p> <p>Building market value at original cost assessed 8.55%. <u>Food processing & industry at 3% for 3 years.*</u> Tax rate: \$190 per \$1,000.</p> <p>*Greenhouse not included</p> <p>^{1/}Apartment houses & homes apparently</p>	<p>Property exempt for first 5 years. After 5 years, structure is valued at original cost less depreciation. Assessment level is 12%. Tax rate: \$204 per \$1,000 of taxable valuation (50% of assessed value)</p> <p>Note: Five year exemption for real property must be approved by local and state governments and applies only to qualifying new corporate enterprises.</p>	<p>Structure valued at original cost less depreciation. Partial exemption for renewal energy resources including geothermal. Exemption applies to machinery, equipment & structures of an enterprise & to geothermal well & delivery system if under same ownership. If geothermal reservoir & transmission system is separately owned, exemption applies only to enterprise. Pumps may be included in real property class & not exempt. Exemption is:</p> <p>1st yr.-50% of installed cost 2nd yr.-50% of installed cost. 3rd yr.-50% of installed cost 4th yr.-37.5% of installed cost 5th yr.-25% of installed cost 6th yr.-12.5% of installed cost 7th yr.+ forward - none</p> <p>Tax rate: 3% of full depreciated value.</p>	<p>Structure & personal property valued at original cost less depreciation. Level of assessment is about 12% of depreciated value. Tax rate: \$80 per \$1,000 of assessed value.</p>																								

3.2.3.3 Severance Tax

A strict reading of the state statute indicates that geothermal is not subject to the 2% tax in Wyoming. Geothermal energy is not subject to the severance tax in North Dakota. There is no severance tax in South Dakota. Geothermal energy is not specifically included in the statute which provides for a tax of 1/2% for the gross value of any minerals extracted in Montana. However, it may be that geothermal energy is included in the severance tax statute, since the statute applies to "nonrenewable merchantable products extracted from the surface or subsurface of the state of Montana." For the tax calculations presented in this report, no severance tax was applied for Montana.

3.2.3.4 Property Taxes

In Montana a property tax would be imposed on machinery, equipment and buildings used in the development of the geothermal resource. The mineral resource is exempt from the proceeds tax applied to other minerals. The typical tax rate is about 2.0% of full value, with market value and assessed value computed as shown in the Montana tax table. Market value is depreciation applied to original cost decreasing from 93% in the first year to 39% in the tenth and following years, with the assessed valuation for tax purposes calculated by multiplying the resulting amounts of 11%. New industrial activity is assessed at 3% of original cost for the first three years.

The property tax in North Dakota is applied to 12 to 14% of the full value. The tax rate is \$204 per thousand dollars of taxable valuation, which is set at 50% of the assessed value (NDCC57-02-28). Two important property tax exemptions may possibly apply to utilization systems: 1) an exemption of real property for five years for a new enterprise when permitted by government and 2) an exemption of all personal property. According to the Office of the North Dakota State Tax Commissioner, the property tax exemption for new enterprises would not apply to geothermal energy production facilities *persay*; but a new business enterprise which used geothermal energy might well qualify for the exemptions on its own merits. The exemption of personal property is not extended to utility property which is, therefore, fully taxable.

In review of this report, the North Dakota Tax Commissioner's office requested a further definition of the property taxes on transmission lines, specifically electric transmission lines. Corporative owned transmission facilities of 230 KV or more are taxed at a rate of \$225 per mile. Industrial owned transmission facilities are taxed as operating properties in the assessment process. Small cooperative lines, those of less than 230 KV, are not specifically taxed, but the gross receipts tax which applies to distribution cooperatives would be in lieu of the specific tax on thos lines.

The state of South Dakota taxes real and personal property; however, under a recent statute, a partial exemption for renewable energy resources including geothermal has been enacted. The exemption is broader if the geothermal development and delivery system is part of the entire enterprise. If the geothermal development and delivery system is separate from the enterprise, the exemption only applies to the outfitting of the enterprise to utilize the energy resource. Furthermore, pumps may be included in real property and not exempt. The exemption as shown in the South Dakota tax table is 50% of installed

cost for the first year, and the second and third years declining by years to a complete phase out in the seventh year and subsequent years. The tax rate in South Dakota is typically about 3% of full value.

3.2.4 Pacific Northwest Regional States

3.2.4.1 Corporate Income Taxes

The state of Washington does not levy an income tax. The states of Idaho and Oregon impose income taxes with deductions from gross income similar to the Federal code. The federal income tax is not deductible in Idaho, nor is the state income tax. Oregon does not allow the deduction of state or federal income taxes in arriving at taxable income. There is no tax credit in the state of Idaho and the tax rate is 6 1/2% of taxable income. The state of Oregon allows a tax credit of 10% of investments in specified economically-lagging areas. There is also a tax credit equal to one-fourth of the geothermal installation by individuals to a maximum of \$1,000.

3.2.4.2 Sales and Gross Receipts Taxes

There is no sales tax in Oregon. The states of Idaho and Washington have sales taxes of 3% and 5% respectively (including the local 1% tax in most Washington localities). This would be applied to retail sales; the tax does not apply to the sale of geothermal energy to the final consumer in either state.

Washington has a business and occupation tax based on gross receipts. The tax of 0.44% for natural resource extraction exempts geothermal energy. The tax may apply to geothermal electrical uses since these are not direct uses of geothermal. There is a tax of 1%, however, for the sale of steam for heating and power uses, beginning July 6, 1979.

3.2.4.3 Severance Taxation

There is no severance taxation in Washington. The severance tax of 2% of net proceeds in Idaho exempts gaseous or liquid substances in a natural state. Oregon has a severance tax on timber production only.

3.2.4.4 Public Utility Taxes

The public utility tax of 3.6% of revenue is imposed on power and water distribution by the state of Washington and would apply for geothermal energy sold as a utility but not to district heating enterprises. The

Washington "in lieu" public utility tax of 3.6% of revenue applies only to the Public Utility Districts (i.e., publicly-owned and organized). Investor-owned utilities are not subject to this tax but to standard ad valorem. Since heating districts presently cannot be organized as a PUD, the in-lieu tax is unavailable.

Table 3.8

PACIFIC NORTHWEST STATES

STATE CORPORATE INCOME TAXES

Geothermal Activity	Idaho	Oregon	Washington
Gross Income	Federal Code	Federal Code	No Tax
Rents & Royalties	Federal Code	Federal Code	
Operating Expenses	Federal Code	Federal Code	
Depreciation	Federal Code	Federal Code	
Interest	Federal Code	Federal Code	
Intangible Drilling Costs	Federal Code	Federal Code	
Exploration Costs	Federal Code	Federal Code	
Depletion	Federal Code	Federal Code	
State Income Taxes	Not Deducted	Not Deducted	
State Taxable Income			
Tax Rate	6.5%	7.5%	
Investment Tax Credits	None	10% of investments in lagging economic areas	

Table 3.9

PACIFIC NORTHWEST STATES
STATE SALES, GROSS RECEIPTS, BUSINESS
UTILITY AND SEVERANCE TAXES

Taxes	Idaho	Oregon	Washington
Sales and Gross Receipts	3% on tangible goods purchases; geothermal output is exempt.	None	5% state & local rate on tangible goods purchases. Utilities taxes under business and occupation tax.
Business and Utility	One-half mill per KW Hr. on water power generation. Irrigation, manufacture and processing exempt.	None	Sale of steam taxed at 1%. Natural resource .44%. Geothermal exempt as water. Public utility power and water distribution taxed at 3.6% of revenue.
Severance	2% of net proceeds. Gaseous or liquids in natural state exempt.	Timber only.	None

Table 3.10
PACIFIC NORTHWEST STATES
PROPERTY TAXES

	Idaho	Oregon	Washington
Reservoir	<p>Completed well, equipment and machinery; straight line depreciation for 30 years to 20% floor. Tax rate: 2% of full value.</p> <p>Note: Net proceeds tax on mineral production at 2% not including geothermal.</p>	<p>Well valuation based upon local assessor evaluation using factors such as regional cost and capitalized income. Equipment values are depreciated about 6% per year and then factored up to reflect inflation. Tax rate: 2 to 2.5% of full value.</p>	<p>Well and pumps etc. taxed at 100% of full value based upon depreciated factors.</p> <p>Real estate excise tax at 1% of value upon sale of real property.</p> <p>Property tax rate: City average:\$9.24 per \$1,000 on full value (assessed). Outside cities; rate of \$8.86 per \$1,000 of full value (assessments at 100%).</p>
Transmission	<p>Equipment, machinery and pipeline; straight line depreciation for 30 years to 20% floor. Tax rate: 2% of full value.</p>	<p>Full value assessments based upon depreciation factor of 7 to 5% a year depending on age. An inflation factor is applied to reflect price changes each year. Tax rate: 2 to 2.5% of full value.</p>	<p>Same as above.</p>
Business Enterprise	<p>Buildings depreciated straight line for 30 years to a 30% floor. Machinery and equipment same as above. Inventories exempt. Tax rate: 2% of full value.</p>	<p>Building and structures depreciated at 3 to 5% a year and then factored to reflected inflation trends each year.</p> <p>Equipment valuations based upon depreciation at 7 to 5% trended upward for inflation.</p> <p>Inventories are exempt. Tax rate: 2 to 2.5% of full value.</p>	<p>Buildings valued at full value by local assessors. Depreciation, capitalized income and other factors used. Personal property including machinery and equipment assessed at original cost less depreciation and subject to rates above (\$8.86 to \$9.24 per \$1,000 of value).</p> <p>Note: Leases of public property are subject to excise taxes in lieu of property tax. Tax rate: 12% of rent (6% state & 6% local as a rule) not applicable for extraction (solely) without processing on premises.</p>

3.2.4.5 Property Tax

The property tax in the state of Oregon, as administered by local assessors, would tax the value of the mineral property and all machinery and equipment as well as the real property at approximately 2.5% of the full market value. Full market value is arrived at by depreciating value according to the state guidelines or local assessors' schedules from original cost of the property. Inventories are exempt in Oregon. The state of Idaho taxes minerals by applying the local assessment rate which is typically about 2.5% of full value to the net profit of a mine. Geothermal activities are included by the generic language in the law. In addition, machinery, equipment and buildings are assessed and taxed at the local tax rate. A recent Idaho statute requires that the property tax of 1980 and in subsequent years not exceed 1% of full value. The State of Washington stipulates that all real and personal property be subject to the property tax. The typical rate is about 1½% of full value as determined by the local assessor. Leases of public property are subject to an in-lieu of property tax at a rate 12% of the rent, but the in lieu tax does not apply to extraction activities when resource is not treated on the premises

3.3 Hypothetical State Tax Structures

In order to obtain an approximation of a sensitivity analysis of state taxes on the geothermal producer/business enterprises and to provide an examination of significantly different tax rates on business profits and state tax revenues, three hypothetical state tax structures have been created. The three state tax structures are intended to represent a low tax, high geothermal incentive state, a moderate tax state, and a high tax, low geothermal incentive state. Table 3.11 lists the assumed tax rates and tax incentives.

These tax structures are predicated on the western states' tax structures rather than on the tax structures of all 50 states. Recent legislation has been in the direction of reducing property taxes (e.g. the limitation of property taxes to not to exceed 1 percent of market value in Idaho). Consequently, the property taxes for the high tax state were assumed to be in the range of 1.2 to 1.5 percent of full market value. This more moderate level of tax on property is thought to be more representative of the prospective "high" tax level over the study period. The moderate property tax is taken to be one-half of the "high" state; the low property tax state is assumed to be the same as the moderate state less the tax on the reservoir and transmission system.

Table 3.11 HYPOTHETICAL STATE TAX PROVISIONS

<u>Tax</u>	<u>Low Tax</u>	<u>Medium Tax</u>	<u>High Tax</u>
Federal Income	Deductible	Non-Deductible	Non-Deductible
State Income	0	5%	10%
Sales	0	2.5%	5%
Property	Medium tax less tax on energy system	One-half of high tax	1.2 to 1.5% of real value
Severance	0	0	1% of gross production value
Capital Gains	0	0	0
Business Incentive Investment Tax Credit	10% of investment	0	0
Energy System Tax Credit	35%	15%	0
Depletion Allowance	27%	Federal Schedule (22% - 15%)	1/3 of net income
Carry-Over Loss	Indefinitely	Federal Code	Federal Code
Refundable Tax Credit	0	0	0

Federal income taxes, deductions, and credits are not varied but are assumed to be the existing 1979 tax provisions, shown in Figures 3.1 and 3.2. The deductibility of federal income taxes on state income tax returns, however, is varied from deductible to non-deductible.

State income tax rates are set at 0, 5 and 10 percent of net taxable income. State sales and gross receipts taxes span 0 to 5 percent, applicable to machinery and equipment investment purchases and to the sales of geothermal energy in the case of the small scale electrical/direct thermal industrial park.

No severance tax is applied in the low and moderate tax states, but a tax rate of 1% of gross production value proceeds less rents and royalties is assumed for the high tax state.

A business incentive type of investment tax credit is created for the low tax, high incentive state. A tax credit of 10% of the new capital investment is allowed for the year of the investment only.

A special renewable/alternative energy system tax credit, patterned after the federal energy tax credit, has been created for the hypothetical states. Tax credits of 35% and 15% are allowed for the low tax and moderate tax states, respectively.

Depletion allowances are provided for all three hypothetical states. A fixed 27% depletion allowance based on remaining reservoir energy value is assumed for the low tax state. The federal schedule of decreasing rates is applied to the moderate tax state. For the high tax state, an allowance equal to one-third of net income is assumed.

The carry-over provision for net taxable losses is varied from indefinitely forward or back until fully utilized for the low tax, high incentive state to three years forward or back for the high tax state. No refundable tax credits are allowed in any of the hypothetical states for the assumed business enterprises.

The results of the application of these hypothetical state tax structures to the four geothermal producer/business enterprises are presented and discussed in Sections 6.0, 7.0 and 8.0

3.4 Federal Tax Provisions

The federal tax provisions are important in the analysis of the taxation and business profitability of geothermal operations and related business enterprises. Federal income tax rates range from 17% on the first \$25,000 of taxable income to 46% on income of corporations in excess of \$100,000 a year. Therefore, depletion allowances, accelerated depreciation, investment tax credits and the expensing of intangible drilling costs are important tax savings provisions. Furthermore, the federal tax provisions are adopted almost universally by the states.

An outline of the federal tax structure is shown in Figures 3.1 and 3.2. The critical features for geothermal business activities are depletion, expensing of intangible drilling costs and the investment tax credit. A 15% preference tax is applicable on accelerated depreciation in excess of straight line depreciation and on the excess of depletion over the cost basis of capital investments. Preference taxes are not applicable to the excess of intangible drilling costs as compared with capitalization insofar as corporations other than holding companies and Subchapter S corporations are concerned.

Cost or percentage depletion may be used with the option that the taxpayer may switch from one basis to the other from year to year. Percentage depletion, which is limited to 50% of taxable income, is almost always preferred following the early start-up years of an operation because positive taxable income is generated after the early years. Until the time that net income is generated, cost depletion is preferable.

The regular 10% investment tax credit is applied to depreciable machinery and equipment. A special tax credit of 10% is allowed for alternative energy investments, including geothermal. It applies even when the investment is a structural component of the operation. Therefore, the energy credit may apply even when the regular credit does not apply. Investment tax credits are a dollar for dollar reduction in income taxes and are therefore more beneficial than deductions in arriving at taxable income. An unused portion of the investment tax credit may be carried forward and used in later years. The tax credit is refundable in the case of solar energy investments, but not in the case of geothermal.

4.0 Geothermal Energy Producer/Business Enterprise Models

4.1 Basic Features

Four hypothetical but realistic business enterprises based upon geothermal energy use have been created for the purposes of this project. The basic physical and operational features of the four business economic models are listed in Table 4.1. The business enterprises include: (1) a moderate size greenhouse for wholesale flower production, which uses low temperature process heat; (2) a large-scale food processing industry, which uses moderate temperature geothermal energy for process heat and for space heating; (3) a 500-unit apartment complex, which uses low temperature energy for space and hot water heating; and (4) a small-scale electric and thermal energy producer for a small industrial park. Three of the enterprises, excluding the small-scale electric/thermal energy producer, are assumed to be integrated business activities; that is, the geothermal energy producer component and the business operation component are owned and operated by one party with respect to federal and state tax considerations. The small-scale energy producer is a self-contained business operation which supplies energy to one small industrial park; it is not established or regulated as a public utility. The four business economic models are intended to represent a cross-section of prospective small-scale geothermal producer/business enterprises for the future; however, they do not constitute a comprehensive sampling of direct thermal or small scale electric geothermal applications, and they deliberately do not include large-scale electrical power plants.

Table 4.1 Basic Features of Geothermal Producer/Business Enterprise Models

Model	Physical Size (sq. feet)	Land Area (acres)	No. of Wells	Well Depth (feet)	Geothermal Energy Requirement (10 ⁹ Btu/Yr)
Greenhouse	100,000	60	2	1,500	27
Apartment Complex	300,000 (500 units)	20	2	1,000	23
Food Processor	200,000	80	3	7,000	346
Small Scale Energy Producer	(5-10 Small Plants)	100	4	2 @ 10,000 and 2 @ 5,000	150 + 1000 KWe

Table 4.2 Summary Statement of Capital Investment Factors

	Greenhouse	Apartment Complex	Food Processor	Small Scale Energy Producer
<u>Geothermal Producer Statement</u>				
Reservoir Investment	\$203,700	\$138,000	\$4,536,993	\$7,998,300
Transmission Investment	100,000	219,500	804,000	1,176,500
Power Conversion System	-----	-----	-----	1,131,400
Direct Thermal Transfer System	-----	-----	-----	549,100
Total Capital Investment	\$303,700	\$357,500	\$5,340,993	\$10,855,300
<u>Business Enterprise Statement</u>				
Land	\$ 40,000	\$500,000	\$ 400,000	Not Applicable
Buildings	294,000	10,500,000	3,000,000	
Personal Property	-----	500,000	-----	
Heating & Cooling System	120,000	1,000,000	800,000	
Machinery/Plant Equipment	120,000	-----	6,000,000	
Inventory/Working Capital	50,000	-----	19,332,000	
Total Capital Investment	\$624,000	\$12,500,000	\$29,532,000	

4.2 Capital Investments

The four business economic models have been constructed from cost data available as of mid-year 1979. The capital investments have been derived from several sources including the DOE geothermal PON demonstration projects, economic feasibility studies by the Oregon Institute of Technology, the experience of EG&G Idaho, Inc. with the Raft River Geothermal Demonstration Facility, and several private industry sources.

Table 4.2 defines the four business enterprises in terms of the capital investments for both the geothermal energy production component and the business operation component. The geothermal producer statement itemizes the separate investments for the reservoir system (tangible and intangible costs), the transmission system, and the power conversion and transfer systems (applicable only in the case of the small-scale energy producer). The geothermal producer statement includes all investment costs up to the energy hook-up/connection point with the building(s) that contain the business operation. A more detailed itemization of the equipment and construction costs is provided in Appendix A.

The business enterprise statement of Table 4.2 itemizes the capital investments for land, buildings, personal property, heating and inventory and working capital. For the food processing industry, the investments for machinery/plant equipment and for inventory/working capital are estimated from industry data reported in the U. S. Census of Manufacturing (1972).

The total geothermal producer capital investments range from \$304 thousand to \$10.5 million; the business enterprise investments range from \$624 thousand to \$29.5 million for the four models. These total investment costs are intended only to be representative of the 1979 entry costs into the geothermal producer and business operations for the purposes of computing and analyzing the state tax impacts. They should not be construed to be precise estimates for basic economic analyses.

4.3 ANNUAL OPERATING AND MAINTENANCE EXPENSES

A reasonable set of operating expenses for each geothermal/business enterprise was specified in order to calculate business economic simulations and calculate state and federal taxes. The several information sources listed in Section 4.2 were the principal basis for the selected operating expenses. Table 4.3 lists the non-tax expenses and identifies expenses such as depreciation and depletion which vary from year to year. The computer simulation calculates the taxes other than property taxes and sales taxes as well as items such as depreciation and depletion.

Double declining balance depreciation has been assumed and both real and personal property are depreciated over a 15-year period for all four geothermal/business enterprises. It is realized that the 15-year period may be too short for some capital investments and too long for others and hence represents a compromise among standard I.R.S. lifetime guidelines. New capital equipment purchases are made for geothermal delivery systems in the case of the apartment complex and the food processing plant in the 15th year of the period. These are then depreciated over the remaining 15 years of the assumed life which is 30 years for each project.

The operating and maintenance expenditures for geothermal producer components are based upon either two or three percent of the capital investment which includes an estimated cost for necessary electrical power. The rather high expenditures for the small scale electrical producer includes regular reservoir maintenance programs, well equipment replacement purchases and installing new wells for the reservoir system as well as regular maintenance and equipment replacement for the power conversion system.

Table 4.3 Summary of Gross Revenues and Annual Operating and Maintenance Expenses

Item	Greenhouse	Apartment Complex	Food Processor	Small Scale Energy Producer
Gross Revenue	\$ 620,000	\$ 2,265,000	\$ 79,000,000	\$ 3,050,000
Annual Expenses (excluding taxes)				
Inventory/Materials	74,000	-----	44,776,800	-----
Management/Labor Payroll	166,000	280,700	8,791,200	-----
Interest on Debt*	12%	12%	12%	-----
Conventional Utilities	91,500	8,400	794,500	-----
Other Operating Expenses	92,000	399,800	16,910,000	-----
Depreciation, Depletion, and Royalties*	Double Declining Balance	Double Declining Balance	Double Declining Balance	Double Declining Balance
Subtotals	423,500	688,900	71,272,500	N/A
Operating Costs:				
Reservoir System	3,880	8,966	14,000	535,900**
Transmission System	2,910	10,069	6,000	21,100
Power Conversion System	-----	-----	-----	550,600
Direct Thermal Transfer System	-----	-----	-----	14,000
Subtotals	6,790	19,035	20,000	1,121,500

* Variable in Cost by Year

** Includes Repair and Maintenance

4.4 GROSS REVENUES

The annual gross revenues as well as the annual operating expenses for the four business enterprises are shown in Table 4.3. A simulation of year to year revenues and expenditures as well as taxes are shown in Appendix C. The dollar amounts are derived from a series of SEER computer simulations in which several measures of business profitability are examined. In order to show business scenerios which are viable business operations, the revenue and cost inputs were formatted for the geothermal/business enterprises in a manner which would make them viable operations.

The SEER computer program will be described in more detail in Section 5.1. For present purposes, it is sufficient to indicate that SEER is a generalized life-cycle investment analysis system that can be applied to any investment that generates future cash flows over time. The state and federal tax structures are included in the model together with the special tax provisions pertaining to mineral and energy resource investments. The model computes the following measures of profitability: discounted cash flow rate of return; net present value for a specified minimum rate of return; payback period - both discounted and non-discounted; and revenue requirements to meet a specified minimum rate of return.

The profitability for the three major components of each of the four geothermal producer and business enterprises were separately examined in sequence in order to generate a total business enterprise that was profit-making. SEER analyses were performed on the reservoir system, the reservoir and transmission systems combined, and the reservoir, transmission and business systems combined. The combined business system was specified to have a target rate of return of 16% on equity while the delivery systems were specified to have a target rate of return of 30% on equity. The deviation from the target rate of return would be shown as a positive or negative net present value in the analyses. Table 4.4 lists the gross revenues for the three combinations of operating activity as derived after several SEER iterations. These gross revenues do not necessarily generate the target rates of return in each state because of significant impacts that the various state taxes as well as the state and federal tax system interactions have on profitability. The latter subject will be discussed in detail in subsequent sections of the report.

The profitability of the reservoir and transmission systems as a separate entity was derived from capital and operational costs including taxes given the revenues from required outputs. Revenues or receipts, which are the same in each case, were generated from several computer runs to derive a realistic level of revenue which was held constant from state to state.

TABLE 4.4. ANNUAL GROSS REVENUES FOR MAJOR COMPONENTS OF GEOTHERMAL PRODUCER/BUSINESS ENTERPRISES

<u>Operational Activity</u>	<u>Greenhouse</u>	<u>Apartment Complex</u>	<u>Food Processor</u>	<u>Small Scale Energy Producer</u>
Reservoir System Only	\$ 25,893	\$ 26,500	\$ 850,000	\$1,710,000
Reservoir and Transmission Systems Combined	\$ 84,000	\$ 77,600	\$ 1,340,000	} \$3,050,000
Reservoir, Transmission and Business Systems Combined	\$620,000	\$2,265,000	\$79,000,000	

5.0 Computer Simulated Case Studies of State Taxation on Business Enterprises

5.1 SEER Program

The computerized economic evaluation program calculates the business profitability including the yearly cash flows and net income for the life cycle of the enterprise. The gross annual revenues for each year of the life cycle were generated by the program given the yearly operating costs and the rate of return on equity and the interest rate for debt service. It was assumed that the target rate of return would be 16% after taxes for the total enterprise including reservoir and transmission system. The rate of return after taxes for the reservoir and transmission system alone was assumed to be 30% on the equity investment. In both cases, the interest for debt service was assumed to be 12%.

If the rates of return were achieved given the revenues, operating costs and debt service, the net present value over the life cycle of the enterprise would be zero. When the net present values are positive, the operation exceeded the target rate of return. The net positive values were discounted back to present day values using a discount rate of 16% or 30%, depending upon whether the total business enterprise or the reservoir and transmission systems were being analyzed. Calculated negative net present values indicated a short fall in the discounted net present values from the target rates of return. A computer simulation could be run indicating what the rates of return actually were rather than reflecting the net present value of the excess or deficit.

An example of the output of the program is shown for a food processing enterprise in Appendix C. An important objective in completing the research project was to develop computerized programs for the eight states which will allow decision makers to calculate the effects of changes in the tax structure in any one of the states. For example, a decision maker can postulate an investment tax credit, a change in percentage depletion, a reduction in property tax assessments or property tax rates, a change in the sales tax structure, or a change in the income tax structure of the state and the program would reflect the impact of these changes on the profitability of the enterprise. A complete sensitivity analysis would require holding various elements in the tax system constant while the element under investigation would be varied. A complete sensitivity analysis among the eight states was beyond the scope of the present research project because of the magnitude of the computer programs and the multitude of variations which would have to be examined.

The outputs of the various states are a form of sensitivity analysis because of the variation in the state and local tax structures. For example, the state of Nevada has no income tax and a very low property tax and the state of Montana has no sales tax. Furthermore, the three hypothetical states which were run under the computer routine, give insights as to the impacts of three distinct tax structures on the business profitability of the greenhouse, apartment complex, food processing and small scale energy systems. The SEER program was developed by Science Applications, Inc. and a full description of the program is available from them.¹

5.1.1 Business Profitability Measures: Explanation

It was assumed in calculating the life-cycle net income and cash flow of the reservoir and transmission systems that the target yield on equity is 30 percent after taxes. Debt capital investment required an interest rate of 12 percent in all cases.

The enterprise was assumed to have a target yield on equity of 16 percent and debt capital was obtained at an interest rate of 12 percent.

The payback period was calculated by relating the net cash flow to the equity investment. Payback is the length of time for the aggregate net cash flows to equal the equity investment. Net cash flow basically is the net income plus the deductions made for depreciation and depletion which are accounting deductions and not a reduction from the cash remaining after cash expenses. The cash flows are discounted to present values by reducing the values of future years cash amounts to reflect the lesser value of future amounts. For example, at 10 percent interest a dollar to be received in one year hence is worth 90 cents today.

Net present value after the target 16 percent (or 30 percent) rate of return on equity shows whether the operation equalled, exceeded, or undershot the target rate. An operation which had an assumed rate of return of 16 percent but was more successful than this target would be shown as having a positive net present value. The net present value is the value of the residual over or under the target rate over the life-cycle of years discounted to present values (because future dollars are worth less than present dollars). The discount rates used are the target rates of return which are assumed to reflect the returns needed for the risk of investment involved.

¹Grange, F. E., Roberts, S. G. and Kriz, T.A., 1978, A User's Manual for the Economic Evaluation Under Risk (SEER), Science Applications, Inc.

5.2 Case Studies of Geothermal Taxation: General Methodology and Assumptions

The four geothermal/business enterprises have been characterized in Section 4.0. The income expense and investment information for the geothermal and business components are hypothetical but are based upon realistic information from past or potential users of geothermal energy.

Each operation was placed on a "magic carpet" so to speak, and located in eight different western states. State and local taxes were calculated for each major tax source. In general, the sources were: income taxes; property taxes; and sales or gross production taxes. Some of the minor taxes such as corporation license fees were not considered. Federal income taxes were calculated at the same time as the state taxes were simulated in order to incorporate the effects of federal tax deductions on taxable income and return on investment after taxes. Also, in some states, federal taxes are deductible for state purposes.

Taxes were calculated for each year on a life cycle of 30 years for each business operation. The taxation of reservoir and transmission systems were calculated separately from the total business enterprise. In order to compute the taxes applicable to the reservoir, including provisions for depletion allowances, exploration costs and intangible drilling costs, the reservoir was first analyzed separately and then integrated with the transmission system and the energy-consuming business enterprise. An exception was the small scale energy producer, which was established as a separate energy enterprise.

It is important to realize that a unitary operation consisting of a reservoir and transmission system would not be able to take full advantage of the tax benefits which have resulted from recent tax legislation. A new enterprise will ordinarily experience losses rather than net profits in the early years of operation. Tax features such as expensing intangible drilling costs, depletion allowances, accelerated depreciation and investment tax credits create potential tax benefits. The benefits create some large deductions or tax credits in the early years of a business which may be postponed, at best, because there are not sufficient profits or at worst, are lost because of the limitation on years of carrying forward of losses or credits.

In order to handle this issue most realistically, the geothermal activity of the reservoir and transmission were assumed to be owned by a larger operation. The larger operation is in a financial position to utilize the benefits of the deductions and credits partially if not in full. Economically it is not only important to use the benefits but also to use them in a timely manner. If the utilization of the benefits are delayed to future years, their value is reduced because of the time value of money. Obviously, a thousand dollars which is realized today is worth more than a thousand dollars to be received five or ten years hence.

Life-cycle analysis of the reservoir and transmission activities indicates that a potential operator should approach these activities as a sole operation with caution. Unless the profitability is sizeable during the early years of the business, substantial tax benefits could not be fully used.

The geothermal operations are similar insofar as they are capital intensive. Labor and material and supply purchases are a minor input compared to the cost of capital investment. Therefore, taxes which are based upon capital investments such as the property tax are more likely than income or sales taxes to benefit the activity and serve as an incentive. Investment tax credits are useful as an income tax incentive because the credits are predicated upon the size of the capital investment. In order to maximize this incentive, the credit should be made refundable as the federal government did for solar and wind power energy investment tax credits.

As noted above, the states have not extended the investment tax credit to geothermal energy. An exception among the western states is Colorado; although Colorado does not allow an energy tax credit, it does allow a full deduction of an alternative energy investment in computing the state income tax. South Dakota provides a partial exemption for renewable energy resources including geothermal as shown in Table 3.7. The exemption applies to machinery, equipment and structures of an enterprise and to the geothermal well and delivery system if it's under the same ownership. The exemption does not apply to equipment which is considered to be real property.

5.3 State Taxation and Business Profitability

5.3.1 Food Processing Enterprise

5.3.1.1 Food Processing Enterprise - Taxes

A food processing enterprise was the largest business operation included in the present study. As shown in Table 4.4, the revenues were determined to be \$79 million per year and were not inflated over the 30-year period. Also, operating costs and tax rates were not escalated for future price inflation. This procedure avoided the complication of first inflating the revenue and cost data and then deflating the data in order to analyze the yearly calculations in constant dollars.

The food processing enterprise has a more pronounced investment in machinery and equipment than the apartment complex or greenhouse. Among the tax consequences of this investment profile is a more substantial investment tax credit for federal income tax purposes and a more rapid depreciation of values for property tax purposes in most states.

The taxes for state and local government were highest in Montana, Arizona, Colorado and North Dakota for the total food processing enterprise. (See Tables 5.1 and 5.2.) Arizona ranked next to Montana in total taxes, and Nevada ranked lowest. The disparity in state and local taxes is great with the average annual tax in Montana of \$731,000 a year versus \$83,000 a year in Nevada.

Property Tax

One reason for the higher tax in Arizona, Colorado and Montana is the property tax which is levied on a portion of value of gross production in Arizona and is based on rather slow depreciation from original cost in Montana and Colorado. Real estate values are not depreciated in New Mexico and hence the tax on real property remains level during the early and later years. Values created by intangible drilling costs are not assessed for property tax purposes in Nevada. A ruling by the State Board of Equalization is a basis of this tax feature. Utah uses an optional property tax procedure. In effect, the total allowable costs of the reservoir are the basis of the assessment by the state. If the local assessor places a lower value than the state does, the higher state value is used. The difference is held to be a result of the tangible values not recognized by the assessor at the locality.

TABLE 5.1

FOOD PROCESSING ENTERPRISE AND RESERVOIR - TRANSMISSION

TAXES AND BUSINESS PROFITABILITY

	Avg. Annual State Taxes	Enterprise			Reservoir and Transmission		
		Net Present Value (\$000)	Payback Period (Yrs)	DCFROR (%)	Net Present Value (\$000)	Payback Period (Yrs)	DCFROR (%)
Colorado	\$670,000	1.1	10.3	17.4	-428	4.8	21.8
Arizona	\$718,000	-.058	10	16	-109	3	28
North Dakota	\$602,000	2.5	5.2	19.5	-226	3.9	25.3
Idaho	\$580,000	1.8	10.2	18.4	-302	4.0	23.9
Montana	\$731,000	2.1	10.1	18.9	-182	3.6	26.3
New Mexico	\$476,000	2.5	6.0	19.1	+ 38	2.9	30.8
Utah	\$310,000	3.1	5.4	20.0	+152	2.8	33.2
Nevada	\$ 83,000	3.8	4.8	21.1	+167	2.4	34.5

TABLE 5.2
FOOD PROCESSINGAVERAGE STATE AND FEDERAL TAXES PER YEAR
FOR ENTERPRISE INCLUDING RESERVOIR AND TRANSMISSION (in \$ thousands)

	Federal	State and Local				Grand Total
		Income	Property	Sales	Total	
Colorado	\$2,657	\$287	\$369	\$14	\$670	\$3,328
Arizona	2,375	313	391	13	718	3,093
North Dakota	2,556	461.7	128.3	13	602	3,158
Idaho	2,550	393	175	12	580	3,130
Montana	2,517	397.7	333.9	0	731	3,249
New Mexico	2,554	305	157	14	476	3,031
Utah	2,652	184	107	19	310	2,963
Nevada	2,815	0	68	14	83	2,899

Income Tax

Arizona, Montana, Colorado and North Dakota have higher total taxes for another reason. Arizona has an income tax which has the highest top bracket rate (10½%) among the states studied. North Dakota imposes a graduated state income tax with a rate of 8½% in the top bracket on income in excess of \$25,000 a year. Colorado has tax credits which help a new enterprise insofar as the income tax is concerned; but the property tax, under a complicated index system, produces higher taxable values than in most of the other states.

While Arizona has the highest nominal state income tax rate, the tax is lessened by liberal percentage depletion allowances as well as a deduction for exploration costs and federal income taxes. Therefore, while the tax rates are the highest, the income tax liabilities are lower than in Montana, North Dakota and Idaho.

The state and local tax disparities are not as great for the reservoir and transmission system as for the total enterprise. The range in annual taxes for this energy system ranged from \$31,000 per year in Nevada to \$153,000 a year in Arizona. Arizona property taxes are the principal reason for the higher state and local taxes on the geothermal delivery system. Local property taxes for the reservoir and transmission system are based upon the local levy applied to the gross production value less 40%. The next highest tax states on the reservoir and transmission system were North Dakota, Colorado and Montana. Taxes were lowest in Nevada, Utah and Idaho as shown in Appendix B-3.

The federal tax burden was higher, generally, in the states with the lower state and local taxes. This results from the deductibility of state and local taxes in computing taxable income. A significant point which has not been examined because of lack of research time is the effect of integrating the reservoir and transmission operation into the business enterprise. The tax benefits from percentage depletion, investment tax credits and the expensing of intangible drilling costs for federal and state tax purposes cannot be used effectively by a separate reservoir and transmission operation. This occurs because tax credits and deductions must be utilized against the net income. The net income is not high enough in the early years of the operations to utilize all of the advantages, or, at least, not to use them in a timely manner. Therefore, to use the investment tax credit effectively as an incentive, it should be made refundable or provide no limit on the carry over time for use of the credit in future years.

Sales Tax

A sales tax is imposed by seven of the eight states studied. Montana does not levy the tax. The sales tax is a minor element in the food processing annual tax bill with payments ranging from \$13,000 to \$19,000 per year. The tax is imposed on the tangible machinery purchased as well as a portion of the construction costs of buildings. A larger tax would prevail if the reservoir and transmission systems were sellers of energy in non-integrated enterprises rather than being integrated into the total enterprise as assumed in this research report.

In the non-integrated case, the sales tax can affect the price of geothermal energy by raising the cost of equipment, machinery and materials purchased to establish the reservoir and delivery system as well as by directly raising the energy costs by means of a tax on final sales. For example, New Mexico would tax the energy in this case, under the gross receipts (sales) tax. The tax importance of a sales tax, when imposed on yearly output, is reflected in the small scale energy enterprise in those states which tax electrical energy.

5.3.1.2 Food Processing Enterprise - Profitability

The effects of variations in the state and local taxes on the food processing operation are determined by means of the business profitability measures. As mentioned in the study assumptions, the revenues, operating costs and investments are identical in each state. And, of course, the federal tax structure is a constant. Consequently, the variations in state and local taxes is the element responsible for variation in business profitability. Lower taxes, for example, will raise the net present value of future net income or raise the yield on the owner's investments, shorten the pay-back period and raise the discounted cash flow rate of return (DCFROR).

The states are ranked from high tax to low tax states in Table 5.1. The ranking by average annual state and local taxes is accompanied by three measures of profitability. The measures are, in general, similar in importance although the DCFROR is the most widely used in decision-making. Because this measure is influenced by yearly changes in cash flow patterns from positive to negative amounts, this analysis will focus on the net present value assuming a 16% rate of return on equity and on the pay-back period. The DCFROR must be subjected to further analysis when negative and positive cash flows are experienced over a life cycle which is beyond the scope of this analysis. Nevertheless, the reader's attention is directed to this measure as well as the other measures of profitability.

The effects of variations in state and local taxes on the business profitability measures, are shown in Figure 5.1. Before analyzing the figure, it is well to look at a polar case. Montana's reservoir and transmission has a net present value of a negative \$181,600 with an annual rate of return on equity of 30% after taxes while in Nevada the net present value is +\$166,500. Therefore, the investor is \$347,000 better off on the Nevada investment in the reservoir and transmission system in today's dollars. The total state and local enterprise taxes are \$731,000 a year in Montana and only \$83,000 a year in Nevada. The net present value in Nevada after a 16% rate of return on equity for the entire system is \$3.8 million while in Montana, the net present value is \$2.1 million or \$1.7 million less. In Arizona, the net present value is a negative \$58,000 or \$3.8 million less than in Nevada. Disparity between the net present value in Arizona and Montana and the other higher tax states deserves explanation. Arizona's relatively poor performance insofar as the enterprise is concerned, is apparently a result of the pattern of tax payments annually. Arizona's tax structure stresses the property tax which by nature

FIGURE 5.1
Food Processing

RELATIONSHIP OF AVERAGE STATE AND LOCAL TAXES
TO NET PRESENT VALUE AFTER 16% ROR

Net Present Values
(in

millions of
dollars)

48

$$Y_c = 4.365 - .0043\text{mil } X$$

X = state and local taxes

(for each \$100,000 change in taxes
there is a \$430,000 change in NPV)

is higher in the early years for depreciable property and requires a payment from the first year of operation regardless of profitability. Because the net present value is a result of a discounting of net income, the effects of the taxes in the early years of the life cycle of the enterprise are far more powerful than is the case of taxes paid in the later years which are postponed tax liabilities. For example, a \$100,000 tax burden in the initial year is much more burdensome than the same payment falling due ten years later.

Disparity is similar when the pay-back period and DCFROR are examined. The Nevada operation has a pay-back period of 4.8 years and a DCFROR of 21.1% compared with a 10.1 year pay-back period and a 19% DCFROR for the same operation in Montana.

A relationship between average state taxes and the net present value (after a 16% ROR) is shown in Figure 5.1 for the total food processing enterprise. The curve on the chart shows the relationship between the average state taxes and the net present value; therefore, every point on the chart represents a particular state. The general conclusion is that for each \$100,000 less in state and local taxes annually in a particular state, the net present value is increased about \$430,000.

The relationship is similar for the reservoir and transmission system. A smooth and stable pattern is not to be expected in either case although the deviations from the curve in the figure are not very marked. As has been mentioned, the yearly pattern of tax payments is important and must be considered along with the total taxes paid. Also, for the reservoir and transmission system, there is established for research purposes, a greater return after taxes of 30% on the equity investment. If the rate of return had been reduced to a more moderate level, the net present values would become larger and more positive than is true with the rate of return established in the research report as the target level.

5.3.2 Apartment Complex Taxation and Profitability

5.3.2.1 Apartment Complex-Taxes

The apartment complex represents an investment of \$12.5 million in the building and grounds and an investment of \$357,500 in the reservoir and transmission system. An additional investment for the reservoir and transmission system of \$168,500 was assumed to be made in the 16th year for the repair and replacement of worn out equipment.

Annual gross revenues were estimated at \$2.4 million for the 500 unit apartment complex. The operating costs were set at \$680,500 a year, not including debt service and energy costs. A yield of 16% per year(after taxes) on the equity investment and an interest rate on the debt of 12% was assumed. Equity was preset at an amount equal to 30% of the total investment and debt was set at 70% of the total investment.

Total taxes per year including federal taxes range from \$720,000 in Colorado to \$538,000 per year in Nevada. State and local taxes ranged from \$392,000 a year in Colorado to \$92,000 a year in Nevada. Therefore, state and local taxes represented 16% of annual gross revenues in Colorado and 3.8% of yearly revenues in Nevada. (See Tables 5.3 and 5.4).

Federal taxes are inversely related to state and local taxes because of the deductibility of state and local taxes in computing federal taxable income.

Sales Taxes

The sales taxes are a minor portion of the total state and local taxes. Among the states sales taxes range from \$8,000 to \$13,000 per year. A sales tax is levied on the personal property investment in the first year and the sixteenth year and to a portion of the building constituting tangible material and equipment investments in the initial year. The state of Montana does not levy the sales tax.

Income Taxes

The state income tax is not nearly as significant a portion of the total taxes as are the state and local property taxes and the federal income tax. For example,

Colorado, the state with the highest total taxes, has an annual income tax on the apartment complex of \$36.9 thousand per year compared with a property tax of \$344.9 thousand and a federal income tax of \$328 thousand per year. The income tax at the state level was most significant in North Dakota which has a marginal rate of 8.5% on income in excess of \$25,000 a year. The state income tax was about equal to 50% of the property tax in North Dakota.

TABLE 5.3

APARTMENT COMPLEX AND RESERVOIR AND TRANSMISSION
TAXES AND BUSINESS PROFITABILITY

	Avr. Annual State Taxes	Enterprise			Reservoir and Transmission		
		Net Present Value (\$000)	Payback Period (Yrs)	DCFROR (%)	Net Present Value (\$000)	Payback Period (Yrs)	DCFROR (%)
Colorado	\$392,000	- 4.1 mil	18.4	5.3	- 71	12	11.7
Arizona	\$342,000	- 4.4	18.	5.4	- 85	13	5.4
North Dakota	\$337,000	- 4.0	17.	6.	- 3	14.4	Indeterminate
Idaho	\$246,000	- 3.8	16.9	6.4	-101	16.	6.4
Montana	\$251,000	- 3.2	16.1	7.1	- 56	11.	14.
New Mexico	\$239,000	- 3.6	16.4	6.6	- 49	11.	16.
Utah	\$196,000	- 3.6	16.2	6.9	- 48	10.	16.
Nevada	\$ 92,000	- 3.1	15.1	7.9	- 32	6.5	20.

TABLE 5.4
APARTMENT COMPLEX

AVERAGE STATE AND FEDERAL TAXES PER YEAR
FOR ENTERPRISE INCLUDING RESERVOIR AND TRANSMISSION (in \$ thousands)

	Federal	State and Local				Grand Total
		Income	Property	Sales	Total	
Colorado	\$328	\$ 37	\$345	\$10	\$392	\$720
Arizona	340	47	284	11	342	682
North Dakota	361	103	226	8	337	699
Idaho	384	59	177	8	246	629
Montana	375	60	191	0	251	626
New Mexico	376	44	185	10	239	614
Utah	407	28	155	13	196	603
Nevada	446	0	83	10	92	538

The lower relative income taxes for the apartment complex stem in large part from the low profitability of the enterprise as reflected in the business profitability measures which are taken up in the following section. The large negative net present value figures after the 16% ROR indicate the lower profitability and hence less exposure to income taxes than is true in the other enterprises studied. The income taxes for the reservoir and transmission system related to the apartment complex were minor compared to the property tax and the federal income tax as well. For example, in Colorado, the annual average income tax on the reservoir and transmission were \$1,000 a year while the property tax was \$6,000 a year and the total state and federal taxes were \$12,000 per year.

Property Taxes

The property tax was far and away the most significant tax at the state and local level. The tax exceeded the federal income tax in Colorado and in several of the states was equal to about 50% of the federal tax payment. The importance of the property tax is shown in Table 5.4 which reflects all the taxes at average annual rates. The property tax on the reservoir and transmission system was on the order of one-fifth of the total property tax on the enterprise, including the reservoir and transmission operation. The geothermal delivery system in the apartment buildings themselves is not shown separately. However, a tax policy which favored geothermal heating systems, would make the \$920,000 for the heating system eligible for special consideration.

5.3.2.2 Apartment Complex - Business Profitability

Nevada, once again, registered the most favorable business profitability. In the case of the business enterprise including reservoir and transmission, a net present value of a negative \$3.1 million was calculated for the apartment operation when located in Nevada or \$1 million greater than the minus \$4.1 million calculated for the Colorado location. The reason for the difference is not difficult to trace. In Colorado, the property taxes averaged \$344.9 thousand per year - more than the federal income tax. Nevada property taxes on the apartment complex were only \$83 thousand per year. The more limited deduction for state and local taxes in Nevada caused the federal income tax to be \$446 thousand, or about \$100 thousand greater than Colorado.

The pattern was distinct among the states as shown in Figure 5.2. . As the annual state and local taxes rise, the net present value, after 16% ROR, is a smaller amount. The differences among the states is not as marked as in the other business enterprises surveyed. This would be expected because the variations in property, assessments and taxes are less for buildings than for personal property. Other business enterprises had a larger proportion of personal property investment. Personal property assessment policies and practices are more varied among the states than is true for real estate. Some of the differences are caused by differing tax rates, but the major differences are in the valuations themselves. As already mentioned, the state income and sales taxes were not significant compared with the property taxes in affecting the profitability measures.

Needless to say, the other profitability measures display similar patterns as net present value as reflected in Table 5.3. The payback period varied from 18.4 years in Colorado to 15.1 years in Nevada. The payback periods were somewhat more favorable for the reservoir and transmissions systems alone. In Nevada, the payback period was 6.5 years and the DCFROR was 20%; in the other states the payback periods ranged from 11 to 16 years.

FIGURE 5.2

Apartment Complex

RELATIONSHIP OF AVERAGE STATE AND LOCAL TAXES
TO NET PRESENT VALUE AFTER 16% ROR

Net Present Values

(in
millions of dollars)

5.3.3 Small Scale Energy Enterprise

5.3.3.1 Small Scale Energy Enterprise - Taxes

small scale energy
The/ enterprise differs from the other business enterprise because the entire operation is predicated upon energy production. The reservoir system represents 73 % of the total investment and is treated separately. Transmission operation is integrated into the small scale energy output system. The total output is estimated to be 180 billion BTUs in electrical and thermal equivalents. The annual revenues are \$3 million a year. The range of total state and local taxes as shown in Table 5.5 was from \$306,000 per year in Arizona to \$79,000 a year in Nevada for the entire energy system.

Sales Taxes

Sales taxes are levied on the machinery and equipment and materials at the time of purchase. A sales or utility tax is also levied annually by several states on the final energy output. Table 5.5 shows the sales taxes annually together with the initial tax on purchased tangible goods. These sales taxes are often equal to or exceed the state income tax. The taxes are based upon gross business revenue except in Montana where a kilowatt basis is used for the utility tax.

The highest sales tax on energy revenue, \$100,000 per year, was levied in Utah which has a 4-3/4% tax in the typical locality. Next is New Mexico with a tax of \$79,000 per year. Some Nevada localities have a local utility tax of up to \$5.00 per thousand dollars of revenue and it was assumed that such a tax was applied in the example.

Income Tax

In general, the state income tax was higher than the sales tax and on the order of one-third as large as the property tax. State and federal income taxes were diminished by virtue of the double investment tax credit, regular and energy. A large part of the small scale energy system was eligible for both the investment tax credits.

Nevertheless, the federal income tax represented over one-half of the total taxes in each state. The deduction of state and local taxes caused federal taxes to be somewhat higher in the low tax states.

Arizona has the highest income tax rates. However, the income tax was significantly less than in three other states. This resulted from the liberal percentage depletion, a deduction for exploration costs and the deduction allowed for federal income taxes in Arizona.

TABLE 5.6

SMALL SCALE ENERGY SYSTEM

TAXES AND BUSINESS PROFITABILITY

	Avr. Annual State Taxes	Enterprise			Reservoir and Transmission		
		Net Present Value (\$000)	Payback Period (Yrs)	DCFROR (%)	Net Present Value (\$000)	Payback Period (Yrs)	DCFROR
Colorado	\$222,000	-1.5	14	9.4	18	12.5	
Arizona	\$362,000	-2.0	15	7.9	12	12.3	
North Dakota	\$211,000	-1.2	13	10.4	87	12.1	
Idaho	\$173,000	-1.3	13.1	10.4	38	11.8	Indeterminate
Montana	\$211,000	-1.1	13	11.1	90	12.0	
New Mexico	\$212,000	-1.3	13	10.3	30	11.9	
Utah	\$167,000	-2.1	14.1	8.7	105	11.3	
Nevada	\$ 79,000	-0.72	12	12.7	-24	11.5	

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TABLE 5.5

SMALL SCALE ENERGY SYSTEM

AVERAGE STATE AND FEDERAL TAXES PER YEAR

FOR ENTERPRISE INCLUDING RESERVOIR AND TRANSMISSION (in \$ thousands)

	Federal	State and Local				Grand Total
		Income	Property	Sales	Total	
Colorado	\$431	\$48	\$167	\$ 8	\$222	\$652
Arizona	382	43	228	35	306	688
North Dakota	410	85	119	7	211	621
Idaho	422	66	101	6	173	595
Montana	407	66	128	18*	211	618
New Mexico	416	39	93	79	212	628
Utah	415	33	34	100	167	582
Nevada	459	0	55	23+	79	539

*Utility tax

+Includes utility tax of \$15,000 per year

Property Taxes

The property tax was the most significant state and local tax. Average annual property taxes were about one-half or more of the state and local taxes. Arizona had the highest property tax on the small scale energy system of \$228,000 per year; Nevada, again was lowest, \$55,000 per year. In only three states were the annual average property taxes under \$100,000 per year. Arizona taxes the energy output in lieu of some of the taxes on tangible property. This particular tax was reduced by 40% in 1979.

5.3.3.2 Small Scale Electric Enterprise - Business Profitability

The states are arrayed from the state with the highest taxes to the state with the lowest state taxes in Table 5.6. An arrangement by federal taxes reveals a much lower disparity in federal taxes among the states. The narrowing in the federal tax payment and therefore in the total federal, state and local tax payments has the effect of lessening the differences in business profitability after taxes among the states.

Net present value of life cycle net income after the assumed ROR of 16% after taxes are shown in the second column of Table 5.6. In Arizona, the small scale energy system has a net present value of a negative \$2 million; in Nevada, the system has a net present value of a negative \$721,000, or \$1.3 million more. The pattern is distinct as the net present values are greater (or less negative) as the state and local taxes are lower. Utah is an exception which is due apparently to the high sales tax reducing net income in both the early and later years. However, the \$150,000 decline in yearly taxes in Montana compared with Arizona resulted in \$100,000 increase in net present values. (Also see Figure 5.3.)

The DCFROR was 12.7% in Nevada compared with 7.9% in Arizona. This finding coupled with the decline in the payback period to 12 years from 15 years in Arizona, indicates that the operation is distinctly more profitable in Nevada.

A similar pattern was reflected by the reservoir alone. The net present value rose from \$12,000 in Arizona to \$105,000 in Utah. The payback period is nearly the same as the payback period for the total enterprise. The investment in the reservoir is a substantial proportion of the investment in the total system. Property taxes are more substantial on the reservoir operation than is true in the case of the other business enterprises examined; therefore, the net present values and the payback periods are compressed among the states. As shown in the tax tables in the Appendix, property taxes on the reservoir element range from 50% to 70% of the property taxes on the total small scale energy enterprise.

FIGURE 5.3

Small Scale Energy System

RELATIONSHIP OF AVERAGE STATE AND LOCAL TAXES

TO NET PRESENT VALUES AFTER 16 % ROR

Net Present Values
(in millions of dollars)

5.3.4 Greenhouse Enterprise

5.3.4.1 Greenhouse-Taxes

The greenhouse is the smallest business operation among the four studied. The greenhouse enterprise, excluding the reservoir and transmission systems, had an investment profile of \$454,000 in building and land, \$120,000 in machinery and equipment and \$50,000 in working capital. An investment of \$203,700 in the reservoir and \$100,000 in the transmission system was determined to be realistic. Annual operating revenues for the greenhouse were estimated to be \$630,000 a year, or about equal to the enterprise investment alone.

Total Taxes

Federal, state and local taxes varied from a high of \$69,000 per year in Colorado to \$50,000 per year ⁱⁿ Nevada as shown in Table 5.7. The disparity in total taxes among the states is much less than for state and local taxes. A reason for this phenomenon is the deductibility of state and local taxes in arriving at the federal income tax liability.

State and local taxes represent about 50% of the total taxes in high tax states and only about 25% of the total taxes in low tax states. The federal income tax, as well as the state income tax, is moderated by another aspect of tax policy, vis-a-vis greenhouses. This policy allows a special investment tax credit of 10% of the greenhouse investment in addition to the regular and energy investment tax credits for the geothermal reservoir and delivery systems. The latter tax credits are a combined whole of 20% of the investment in machinery and equipment and are a dollar for dollar reduction in the income taxes which may otherwise have to be paid. These investment tax credits reduce the federal and state income taxes during the early years of the life cycle of the enterprise.

The investment tax credit, regular, energy and special, coupled with the expensing of intangible drilling costs and the percentage depletion allowances reduced the total income taxes in the early years of the life cycle. These tax provisions increased the after-tax net income particularly during the early years and result in an improved yield on the investment and higher net present values than would otherwise be the case.

Sales Taxes

The sales taxes are a minor element for the total greenhouse enterprise. These taxes are levied on the original investment and not on yearly revenues. A sales

TABLE 5.8

GREENHOUSE ENTERPRISE AND RESERVOIR AND TRANSMISSION
TAXES AND BUSINESS PROFITABILITY

	Avr. Annual State Taxes	Enterprise			Reservoir and Transmission		
		Net Present Value (\$000)	Payback Period (Yrs)	DCFROR (%)	Net Present Value (\$000)	Payback Period (Yrs)	DCFROR (%)
Colorado	\$35,000	64.8	6.2	19.4	15.2	2.7	37.1
Arizona	\$31,000	72.6	6.2	19.6	5.7	3.1	32.1
North Dakota	\$20,000	154	4.2	24.9	20.6	2.6	38.1
Idaho	\$20,000	141.6	4.1	24.8	13.8	2.5	36
Montana	\$20,000	150.8	4.3	24.8	20.9	2.6	39
New Mexico	\$16,000	157	4.3	24.7	19.7	2.7	37.6
Utah	\$12,000	164	4.3	24.9	20.6	2.7	37.5
Nevada	\$10,000	174	4.3	25.7	18.5	2.8	36.9

TABLE 5.7
GREENHOUSE

AVERAGE STATE AND FEDERAL TAXES PER YEAR
FOR ENTERPRISE INCLUDING RESERVOIR AND TRANSMISSION (in \$ thousands)

	Federal	State and Local				Grand Total
		Income	Property	Sales	Total	
Colorado	\$33.5	5.4	29.4	0.6	35.4	68.9
Arizona	33	8	22.0	1.0	31	64
North Dakota	37	10	10	0.5	21	58
Idaho	32	7	12	0.4	20	52
Montana	39	8	12	0.0	20	59
New Mexico	38	6.1	9.6	0.5	16	54
Utah	41	4	7	1	12	53
Nevada	43	0.0	9.2	0.6	10	53

tax is levied on the final consumer. However, in the business model for this research report, the greenhouse output is sold to retail distributors and is not taxed at that level.

Property Taxes

State and local property taxes exceed the state income taxes by a factor ranging from 5-fold to 1½-fold. The property taxes approached the federal income tax payments in Colorado and Arizona. Property taxes have a significant effect on business profitability because they are due and payable from the first year of operation and are highest during the early years of the enterprise's life cycle. A factor in the property taxes being higher in the early years is that the allowance for depreciation for wear and tear reduced the taxable values over a period of years.

On the other hand, income tax liabilities are delayed because of the investment tax credits, depletion allowances, accelerated depreciation and expensing of intangible drilling costs. Property taxes varied markedly as results of the assessed valuation practices of the states. Colorado levied property taxes equal to 29.4 thousand dollars a year compared with 6.5 thousand dollars per year in Nevada and 7 thousand dollars per year in Utah. The median states property tax was about 1/3rd of the federal income tax but half again higher than the state income tax.

Property taxes on the reservoir and transmission system ranged from \$1,000 to \$6,000 per year. This was equal to nearly one-fourth of the total property tax for the entire enterprise, including the geothermal delivery system. Total taxes for the reservoir and transmission systems ranged from \$13,000 to \$19,000 per year among the eight states.

Income Taxes

State income taxes ranged from 0 in Nevada to \$9.4 thousand per year in North Dakota. Arizona had a higher tax rate than North Dakota but has a more liberal deduction for depletion and exploration costs as well as allowing a deduction for federal income taxes. In general, the state income tax was equal to one-fourth of the federal income tax. The reservoir and transmission system income taxes were about one-half to one-third as large as for the entire business enterprise, including the geothermal delivery system. In a relative sense, the reservoir and transmission systems were more profitable than the total business enterprise. This, no doubt, stems from the special deductions and investment tax credits which are not extended to the business enterprise alone.

5.3.4.2 Greenhouse - Business Profitability

The bottom line is business profitability. It should be remembered that the business enterprise is identical within each state. The federal tax structure is the same everywhere; therefore, the differences in business profitability stem from the variations in state and local taxation.

The variations among the states was less for the reservoir and transmission element than for the total greenhouse operation. (See Table 5.8.) As a result, the net present value and payback periods were not markedly different. An exception is Arizona, which, no doubt, had net present value depressed by the property taxes as well as the higher income taxes. The net present value, of course, would have been much higher if the after-tax 30% ROR for the reservoir and transmission systems had been reduced.

The relationship between average state taxes and net present values are graphed in Figure 5.4. Approximately each \$10,000 reduction in yearly state taxes was reflected in a \$50,000 increase in the net present value for the total enterprise. Relatively speaking, the effects of tax differences had a greater impact on the three other enterprises. The ratio of tax increases to decreases in net present values ranged from 1 to 4 for the apartment complex to 1 to 4.4 for the small scale energy system. The ratio for the greenhouse enterprise is 1 to 5; a \$1 change in average yearly taxes results in \$5 change in net present values.

FIGURE 5.4

5.4 Summary of Findings

The research project had a twin focus. One focus was to produce realistic simulations of geothermal energy production and related businesses which would use geothermal energy in whole or in part. The economics of these operations were to be analyzed in the context of different state and local tax structures. Among the questions addressed were the influence of the different tax structures and tax administration as a deterrent or encouragement of geothermal energy development and related energy consuming enterprises.

A second focus was to develop state by state energy producer and user business models resulting in a series of computer programs which would be used now and in the future to evaluate the effects of changes in the state structures.

The research goals were fulfilled as shown in the tables and the analyses of the four business enterprise simulations in eight states and three hypothetical states. For each state the business models encompassed a 30-year life cycle simulation with a year to year printout of revenues, operating costs, capital costs, taxes, net income and cash flows. A variety of business profitability measures were calculated for the reservoir, reservoir and transmission system, and the total enterprise including the reservoir and transmission.

A computer program has been established which incorporates the state tax structure of each state and the federal tax structure. A representation of the effects of proposed changes in tax policies in the states can be calculated in a very short period of time. The computer calculations require only a few seconds after the information has been introduced into the system.

The calculation of the large number of tax policy alternatives was not undertaken. Effects of diverse tax structures were, however, generated by placing the various business enterprises in the eight states. Furthermore, tax effects have been deduced from the computer simulations of the three hypothetical states reflecting a set of high, medium and low tax structures.

It is expected that the policy variables such as depletion, tax credits, tax rates, property tax exemptions, etc. would be introduced for analysis by state administrators. An overwhelming magnitude of information would have been generated if the many combinations of policy variables had been explored for each of the states. A surrogate was the computer simulations of the three hypothetical state tax structures.

Certain observations may be derived from the calculated business taxes & profitability. State and local tax payments do have a significant effect on business profitability. The variations in net present value, discounted cash flows and payback periods were diverse among the states depending upon the magnitude and types of tax liabilities.

Sales taxes are important tax variables when an energy tax is applicable. This was not the case in the four business enterprise examples addressed in this report with the exception of the small scale energy system. The initial year sales taxes, in effect, increased the cost of the investment and personal property and a portion of the real estate. Since the sales taxes range between 3% and 5%, the effect of the sales tax is to increase the investment by the same amount. In some states, the yearly energy output from the geothermal reservoir and transmission enterprise would be subject to a yearly energy tax. In our simulations, this was not the case because the geothermal delivery system was integrated into the business enterprise.

The state and local property taxes and the state income taxes had a significant effect on the business profitability as evidenced by the results of the business simulations. There is no need to review these findings in detail.

As has been explained in this section, the state income tax is more significant in some of the business operations and in different states depending upon the net income generated by the enterprise and the investment profiles. The magnitude and hence the deterrent effects of the state income taxes have been mitigated by adoption of federal tax policies such as depletion allowances, accelerated depreciation and the expensing of intangible drilling costs. These provisions are instrumental in reducing the income taxes in the early years of the life cycle and therefore have a pronounced effect on the discounted rates of return of the enterprise. The benefits are even more marked if the enterprise is restricted to reservoir development and transmission alone.

As has been cited in the case by case studies, the property tax is an important factor in reducing business profitability. The property tax is imposed and payments are required from the inception of the enterprise and may be required even though the enterprise is not yet profitable, or even generating gross income. Property taxes are higher in the early years than in the later years of the business life. This is a result of depreciation being applied to the assessed valuations to reflect physical and technological depreciation and obsolescence. Because personal property is depreciated more rapidly than real property, the enterprises which have a larger proportion of personal property such as machinery and equipment, are less impacted by the property tax.

The reservoir and transmission systems are very capital intensive and the enterprises which have been reviewed in this study are also capital intensive. It is the capital intensive businesses which are most decisively impacted by the property tax. For a lightening of the tax burden on geothermal development and business activities, the property tax has to be modified in the direction of reducing the tax burden.

The graphic analyses of the effects of the taxes on business profitability summarize the financial effects. For each dollar changed in the average state tax, the net present value changed by \$4 to \$5 assuming a basic rate of return of 16% after taxes on the equity investment. This means that for every dollar increase in the average state and local tax, the net present value declined by \$4 to \$5. The greenhouse enterprise was most affected, since it had a ratio of \$1 to \$4.9. The apartment complex was least sensitive with the ratio of \$1 to \$4. The relationship for small scale energy systems was \$1 to \$4.4 and for food processing, \$1 to \$4.3

Lastly, the federal tax structure is, of course, the same among all the states. There is, however, an interrelationship between the federal and state tax structures. This interrelationship mitigated the impact of the differences in state and local taxes among the states insofar as the business enterprises were concerned. Due to the fact that the state and local taxes are deductible in computing the federal taxes, the low tax states had a markedly higher federal tax liability because the deductions were less. In this sense, the federal tax structure mitigated the differences among the states.

6.0 HYPOTHETICAL STATE CASE STUDIES

The SEER computer routine was applied to the three hypothetical state tax structures, as set forth in Section 3.3, in the same manner as it was applied in Section 5.0 to the eight western states. The impacts of the hypothetical state taxes on the four geothermal/business enterprises are discussed below.

6.1 Hypothetical State Tax Computations

The calculated state (and federal) taxes for the four geothermal/business enterprises (total enterprise) and for the associated reservoir and transmission system are summarized in Tables 6.1 to 6.4; more detailed tax data are provided in Appendix B-5. The tax data tabulated in Tables 6.1 to 6.4 are the yearly averages for thirty years of cumulative taxes, thirty years being the chosen life of the enterprises for the SEER life cycle investment analyses. Also listed in the second column of each table is the sum of the state business incentive and energy tax credits which are applicable in the first and sixteenth years. These tax credits have been directly incorporated into the computations of the state income taxes for the appropriate years, including carryover to future years where allowed. Similarly, the payment of sales taxes on purchases of equipment and machinery in the first and fifteenth years have been incorporated into the computations and are included in the tabulated thirty-year average values for the sales taxes.

6.1.1 Greenhouse

The average yearly total state and federal tax for the first five years of the total greenhouse enterprise is always less than half of the 30-year average tax for all three hypothetical states, so the greenhouse operation does not experience any unusually high initial tax burden. Over thirty years, the state income taxes and the local property taxes remain approximately equal to each other and constitute almost the total of the state taxes; the sales taxes and severance taxes for the medium and high tax hypothetical cases are really minimal.

Increasing the state taxes from the low to the high tax hypothetical cases leads to a reduction of the federal tax. The federal tax is clearly the dominant tax for both the total greenhouse enterprise and the reservoir and transmission system. In the high tax hypothetical case, the total state taxes approximately equal the total federal taxes. In other words, the state tax burden is as heavy as the federal tax burden.

TABLE 6.1
HYPOTHETICAL STATE TAXES (DOLLARS)
GREENHOUSE

<u>Hypothetical State</u>	<u>Business & Energy Tax Credits*</u>	<u>State Taxes (average over 30 years)</u>					<u>Total State</u>	<u>Total Federal</u>	<u>Total Fed & State</u>
		<u>Income</u>	<u>Property</u>	<u>Sales</u>	<u>Severance</u>	<u>Utility</u>			
<u>Total Greenhouse Enterprise</u>									
Low Tax State	(198.)	0	3.	0	0	0	3.	45.	48.
Medium Tax State	(52)	5.9	4.8	0.4	0	0	11.	40.	51.
High Tax State	0	11.	9.6	0.8	0.3	0	22.	37.	59.
<u>Reservoir and Transmission Systems</u>									
Low Tax State	(103)	0	0	0	0	0	0	10.8	10.8
Medium Tax State	(34)	2.2	0.9	0.1	0	0	3.2	9.6	12.8
High Tax State	0	4.	3.	0.3	0.3		8.	9.	17.

*Total of 1st year and 16th year credits, not averaged over 30 years.

TABLE 6.2
HYPOTHETICAL STATE TAXES (\$ THOUSANDS)
APARTMENT COMPLEX

<u>Hypothetical State</u>	<u>Business & Energy Tax Credits*</u>	<u>State Taxes (average over 30 years)</u>					<u>Total State</u>	<u>Total Federal</u>	<u>Total Fed & State</u>
		<u>Income</u>	<u>Property</u>	<u>Sales</u>	<u>Severance</u>	<u>Utility</u>			
<u>Total Apartment Enterprise</u>									
Low Tax State	(300)	0	77.	0	0	0	77.	442.	519.
Medium Tax State	(91)	46.	93.	7.	0	0	146.	412.	558.
High Tax State	0	81.	184.	14.	0.3	0	280.	362.	642.
<u>Reservoir and Transmission Systems</u>									
Low Tax State	(166)	0	0	0	0	0	0	5.	5.
Medium Tax State	(55)	1.	1.	0.4	0	0	2.8	5.	7.8
High Tax State	0	2.	3.	0.8	0.3	0	6.	4.	10.

*Total of 1st year and 16th year credits, not averaged over 30 years.

TABLE 6.3
HYPOTHETICAL STATE TAXES (DOLLARS)
FOOD PROCESSING

<u>Hypothetical State</u>	<u>Business & Energy Tax Credits*</u>	<u>State Taxes (average over 30 years)</u>					<u>Total State</u>	<u>Total Federal</u>	<u>Total Fed & State</u>
		<u>Income</u>	<u>Property</u>	<u>Sales</u>	<u>Severance</u>	<u>Utility</u>			
<u>Total Food Processing Enterprise</u>									
Low Tax State	(1,671.)	0	33.	0	0	0	33.	2,861.	2,894.
Medium Tax State	(335)	262.	110.	10.	0	0	382.	2,754.	3,136.
High Tax State	0	495.	157.	19.	8.5	0	680.	2,485.	3,165.
<u>Reservoir and Transmission Systems</u>									
Low Tax State	(644)	0	0	0	0	0	0	321.	321.
Medium Tax State	(215)	26.	42.	2.	0	0	70.	300.	370.
High Tax State	0	62.	64.	4.	8.5	0	138.	274.	412.

*Total of 1st year and 16th year credits, not averaged over 30 years.

TABLE 6.4
HYPOTHETICAL STATE TAXES (DOLLARS)
SMALL SCALE ENERGY SYSTEM

<u>Hypothetical State</u>	<u>Business & Energy Tax Credits*</u>	<u>State Taxes (average over 30 years)</u>					<u>Total State</u>	<u>Total Federal</u>	<u>Total Fed & State</u>
		<u>Income</u>	<u>Property</u>	<u>Sales</u>	<u>Severance</u>	<u>Utility</u>			
<u>Total Small Scale Energy System</u>									
Low Tax State	(2,870)	0	4.	0	0	0	4.		
Medium Tax State	(803)	50.	47.	44.	0	0	141.	434.	575.
High Tax State	0	86.	90.	87.	17.	0	280.	385.	665.

Reservoir and Transmission Systems

Low Tax State

Medium Tax State

High Tax State

*Total of 1st year and 16th year credits, not averaged over 30 years.

6.1.2 Apartment Complex

The state sales and local property taxes constitute a significant tax impact on the total apartment enterprise, but not on the reservoir and transmission system, during the first five years of operation. There are no federal taxes payable during the first five years for the assumed business economic model. However, the average state taxes for the first five years amount to approximately 15%, 25% and 42% of the 30-year averages of the total state and federal taxes for the low, medium and high hypothetical states, respectively.

Over the thirty year period, the property taxes by far dominate the state taxes for the total enterprise and constitute a significant component of the total state and federal taxes. For the high tax case, the property tax is a major tax element for the total enterprise, equaling about one-half of the federal tax and one-third of the total taxes.

The state and federal taxes associated with the reservoir and transmission system are almost inconsequential relative to the total taxes for the total apartment enterprise. The total taxes for the high tax case amount to only 1.6% of the total taxes for the entire enterprise. However, the total state taxes do exceed the federal taxes in this case.

6.1.3 Food Processing Plant

Federal income taxes during the first five years of operation of the food processing plant overshadow the state taxes by margins of 27 to 1, 8 to 1, and 2 to 1 for the low, medium and high hypothetical state tax cases, respectively. As a consequence, the average total taxes in the first five years amount to 50% of the average yearly total taxes over the thirty year life.

With the exception of the low tax case, the state income taxes dominate over the local property taxes and other state taxes for the total enterprise. Because of the high level of geothermal energy extraction for the food processing plant, the state severance tax becomes a measurable quantity in the high tax case. The total state taxes increase in a major way, from \$33 thousand to \$680 thousand, from the low tax to the high tax case. However, because of the deductibility of state taxes, the total state and federal taxes only increase by \$271 thousand.

Federal taxes again dominate the average of thirty-year taxes for the reservoir and transmission system. The state income and local property taxes are roughly equal in magnitude and make up the total state taxes with small contributions from the sales and severance taxes. Overall, the total state and federal taxes for the reservoir and transmission represent about 10% of the total taxes for the total food processing enterprise.

6.1.4 Small Scale Energy Plant

The yearly average total taxes for the first five years of operation of the small scale energy plant equal about 20% of the yearly average total taxes over the total thirty year period. Federal and state income taxes are zero for the first five years; the state sales and severance taxes and the local property tax account for the taxes in that period.

Over the thirty year period, the state income and local property taxes are approximately equal and constitute the major contributions to the total state taxes. The severance tax is a significant tax in the high tax case because of the large quantity of geothermal energy extracted for the energy plant. While the state taxes are deductible for the federal tax computation, the total state and federal taxes do increase significantly from the low to high tax case.

The medium tax hypothetical state generates an enormous state tax increase over the low tax state: \$102 thousand vs. \$4 thousand. The state income and local property taxes equally account for this increase.

6.2 Business Profitability Measures

Table 6.5 tabulates three business profitability measures for the assumed business economic models for the four geothermal/business enterprises. The profitability measures include the net present value calculated for a 16% minimum rate of return (NPV @ 16%), the undiscounted payback period in years (Payback), and the discounted cash flow rate of return (DCFROR). All measures must be used in a relative context within each business model only; the measures cannot be compared either in the absolute sense or between the four operations.

The most drastic of impacts in increasing state taxes from the low to high tax cases occurs with the small scale energy plant. The net present value for this plant records a \$1.6 million decrease on the \$10.5 million investment. The undiscounted payback period increases from 10.5 years to 13.9 years.

The lowest impact of state tax changes occurs with the greenhouse. The greenhouse operation exhibits a decline in net present value of \$89 thousand on a \$624 thousand total investment. The payback period increases from 3.49 years to 4.54 years.

The net present value for the apartment complex declines by \$1 million on a \$12.5 million investment from the low to high tax cases. The net present

TABLE 6.5

BUSINESS PROFITABILITY MEASURES FOR TOTAL BUSINESS ENTERPRISES

<u>Hypothetical State</u>	<u>Greenhouse</u>	<u>Apartments</u>	<u>Food Processing</u>	<u>Small Scale Energy</u>
<u>Low Tax State</u>				
NPV @ 16% (\$)	228,000	(2,740,000)	5,690,000	88,006
Payback (years)	3.9	14.7	3.39	10.5
DCFROR (%)	29.9	8.48	26.2	16.5
<u>Medium Tax State</u>				
NPV @ 16% (\$)	196,000	(3,060,000)	4,630,000	(690,000)
Payback (years)	3.84	15.2	3.80	12.0
DCFROR (%)	27.4	7.80	24.2	12.7
<u>High Tax State</u>				
NPV @ 16% (\$)	139,000	(3,780,000)	2,990,000	(1,550,000)
Payback (years)	4.54	16.7	5.70	13.9
DCFROR (%)	23.4	6.36	20.9	9.40

value for the food processing plant declines by \$2.7 million on a \$79 million investment. Both operations record increases in the payback period of 2 years.

The investors in a small scale energy plant are likely to consider state taxes very critically in selecting a state in which to make such an investment. However, greenhouse investors can choose almost any state for their operations with only minimal variations in the state tax impacts on their business profitability.

Figure 6.1 further illustrates the direct dependence of business profitability, measured in terms of net present value (for a 16% minimum rate of return), upon total state taxes for the four enterprises. While the net present values cannot be used in an absolute sense, the changes in net present value for a given business enterprise which occur with changes in total state taxes can be interpolated. Once again, the major impact of state taxes on the profitability of the small scale energy plant is vividly proven.

Figure 6.1 Relationship of Business Profitability to Total State Taxes
For Total Enterprises

6.3 Other Energy and Economic Measures of Hypothetical State Tax Impacts

Two other perspectives on the impacts of the hypothetical state taxes are important in today's world of tight business profits and rising energy costs. The two perspectives are provided by computations of dollars of state taxes paid per dollar of gross revenues earned and paid per million Btus of energy consumed. These two items represent measures of the earnings turned over to state government for the privilege and costs of doing business within the state and of the costs for the energy needed to carry out the business operation. Tables 6.6 and 6.7 tabulate these computed figures for each integrated geothermal/business enterprise and for each associated reservoir and transmission system.

Table 6.6 demonstrates the high tax burden of the apartment complex relative to the other total integrated enterprises for all three hypothetical state tax structures. More specifically, the apartment enterprise would pay twelve cents of every dollar of revenue to the high tax state. However, the high tax state would present a tax burden to the other enterprises as well, collecting from 3.6 to 9.2 percent of every revenue dollar. The state taxes on the reservoir and transmission systems are more uniform for the four energy delivery systems; nevertheless, the taxes for both the medium and high hypothetical states constitute significant economic factors for the operation of the energy systems.

Costs of energy continue to increase and become a major cost factor in commercial and industrial operations. Geothermal energy has been touted as a lower cost form of renewable energy in many economic analyses. However, Table 6.7 illustrates clearly the impact of high state taxes on the total enterprises and the reservoir and transmission systems. In the context of present tax structures, apartment complexes would pay the highest state taxes for using the lowest amount of energy; the tax rates for all three hypothetical states exceed the current price of natural gas. Apartment complexes are given the least tax incentive to convert to geothermal energy and greenhouses are given the highest tax incentive.

The effective state taxes on the energy produced by the reservoir and transmission systems alone are certainly more reasonable, but must be compared

Table 6.6 Total Hypothetical State Taxes Computed Per Dollar of Gross Revenues for the Geothermal/Business Enterprises (\$/dollar)

Hypothetical State	Greenhouse	Apartments	Food Processing	Small Scale Energy
<u>Total Enterprise:</u>				
Low Tax State	0.0048	0.034	0.00042	0.0013
Medium Tax State	0.018	0.057	0.0048	0.046
High Tax State	0.036	0.12	0.0086	0.092
 <u>Reservoir and Transmission System:</u>				
Low Tax State	0	0	0	0.0013
Medium Tax State	0.012	0.036	0.052	0.046
High Tax State	0.095	0.077	0.10	0.092

Table 6.7 Total Hypothetical State Taxes Per Million Btus of Geothermal Energy Produced/Consumed (\$/10⁶ Btu)

Hypothetical State	Greenhouse	Apartments	Food Processing	Small Scale Energy
<u>Total Enterprise:</u>				
Low Tax State	0.11	3.35	0.10	0.02
Medium Tax State	0.41	5.65	1.10	0.78
High Tax State	0.81	8.48	1.97	1.56
 <u>Reservoir and Transmission System:</u>				
Low Tax State	0	0	0	0.02
Medium Tax State	0.12	0.12	0.20	0.78
High Tax State	0.30	0.26	0.40	1.56

with the current price of natural gas and other fuels and with the other investment and operational costs. The high tax state would impose a geothermal energy add-on cost amounting to 10 to 20 percent of the current cost of natural gas. In today's economy, an effective state tax of \$0.30 to \$0.40 per million Btu is definitely high.

6.4 Summary of Findings

During the first five years of operation of the four business models, it is the food processing plant which bears a very considerable state and federal tax burden. However, that tax burden derives from the food processing portion of the operation rather than the geothermal reservoir and transmission system. In general, the state tax burdens associated with the reservoir and transmission systems for all four business applications are minimal during the first five years.

Local property taxes are consistently the largest state tax element over thirty years for the total business enterprises and for the associated reservoir and transmission systems. Since the property tax becomes due immediately upon placement of those physical facilities classified as real property, it provides a critical early tax burden on a new business enterprise. In the case of the high tax hypothetical state, the property tax constitutes significant fractions of both the total state taxes and the total state and federal taxes.

State income taxes rank close to local property taxes in magnitude, but generally are slightly lower than the property taxes for the three hypothetical states. State sales taxes are definitely factors in the total state taxes for the medium and high tax cases. State severance taxes become significant only with high quantities of geothermal energy extraction in the high tax case.

Total state taxes for the reservoir and transmission systems generally are minimal, but do constitute a significant fraction (up to one third) of the total state taxes for the total business enterprises for the greenhouse and food processing operations.

When state taxes are computed in terms of dollars of gross revenues earned and millions of Btus consumed by the total integrated enterprises, the tax burdens imposed by the high tax state and, to some degree, the medium tax state become disincentives for conversion to or utilization of geothermal energy. Apartment complexes, in particular, carry an exorbitant tax burden in both economic and energy perspectives of taxation, whereas greenhouses are highly favored.

7.0 GEOHERMAL UTILIZATION SCENARIOS

In order to project the economic impact of state taxation on future geothermal/business operations including the gross revenues and the tax revenues generated by these energy use activities; three geothermal utilization scenarios based upon the four business models have been established for the years 1985, 2000 and 2020. These utilization scenarios are placed within the hypothetical state tax structures, outlined in Section 3.3, in order to calculate and evaluate the aggregated total annual state taxes. Several energy and economic features of the utilization scenarios are then compared with the magnitude and impact of the total state taxes.

7.1 Hypothetical Arrays of Direct Thermal Applications

Several arrays of the four geothermal/business models in various multiple units have been arbitrarily constructed for an unspecified state to generate aggregated tax revenues and gross revenues for the future years of 1985, 2000, and 2020. The arrays are tabulated in Table 7.1. Separate arrays have been assumed to represent three distinct geothermal utilization scenarios: business-as-usual; accelerated growth; and maximum growth. The three scenarios have no basis in fact or in any energy supply/demand projection. The arrays are strictly hypothetical and only for the purposes of demonstrating an aggregation of tax revenues and economic activity in future years. It should be recognized at the outset that the projections of geothermal energy use, embodied in the number distributions and energy consumptions of the four assumed geothermal/business enterprises, are intended primarily to reflect future levels of energy and economic activity. In actuality, many other classifications of commercial and industrial activity will make up the aggregated totals of geothermal energy produced and consumed and the aggregated totals of gross revenues, employment and state and federal taxes.

Table 7.1 provides the number of units of each of the four hypothetical geothermal/business enterprises which are assumed to constitute each of the three scenarios in 1985. The total geothermal energy produced and consumed by the aggregation of business enterprises is also listed. The assumed distribution of business units emphasizes the use of low temperature geothermal energy for process and space/water heating of greenhouses and apartments, or similar such uses of geothermal energy are viewed as likely to lead the initial number of commercial and industrial applications in the years between now and 1985.

Table 7.1 Hypothetical arrays of direct thermal applications

Scenario	GH	APT	FP	SSPE	Total Energy (10 ⁹ Btu/Yr)
<u>Year 1985</u>					
Business-As-Usual	3	2	1	0	473
Accelerated Growth	5	5	3	1	1438
Maximum Growth	8	8	5	3	2580
<u>Year 2000</u>	Eight times the 1985 level for total energy.				
<u>Year 2020</u>	Thirty times the 1985 level for total energy.				
• GH = Greenhouse, APT = Apartment Complex, FP = Food Processor, SSPE = Small Scale Energy Producer					

Table 7.2 State-by-state geothermal utilization scenarios - industrial use only*

State	Year 1985 (10 ¹² Btu/Yr)		Year 2000 (10 ¹² Btu/Yr)		Year 2020 (10 ¹² Btu/Yr)	
	Potential Geothermal Use	Forecast Geothermal Capture	Potential Geothermal Use	Forecast Geothermal Capture	Potential Geothermal Use	Forecast Geothermal Capture
Arizona	33.31	8.31	102.16	66.05	376.50	286.40
Colorado	4.72	1.05	15.84	10.36	54.49	41.43
Idaho	31.57	6.64	86.24	53.32	269.07	200.56
Montana	1.86	0.47	6.97	4.71	29.60	22.86
Nevada	5.96	1.64	21.19	14.25	93.70	72.40
New Mexico	2.62	0.64	9.30	6.20	36.92	28.37
North Dakota	0.75	0.16	2.39	1.54	8.51	6.46
South Dakota	1.64	0.40	5.86	3.91	23.31	17.92
Utah	18.84	4.88	64.46	42.83	272.43	209.70
Wyoming	1.07	0.25	3.72	2.46	14.95	11.48
Regional Subtotal	102.34	24.44	318.13	205.63	1179.48	897.58
Industry Relocating to Geothermal Areas	296.73	0	523.49	209.40	1473.10	589.24
Grand Total -	399.07	24.44	841.62	415.03	2652.58	1486.82
Industry Only	*Source: EG&G Idaho, Inc., 1979.					

* EG&G Idaho, Inc. and the University of Utah Research Institute, 1979,
Regional Hydrothermal Market Penetration Analysis (Appendices).

The food processing industry has been included to represent the use of a moderate temperature resource for a substantial quantity of direct thermal geothermal energy in a moderately large size industry. While the assumed numbers of food processing plants for the three scenarios in 1985 are viewed as not unrealistic, the multiplication factors of 8 and 30 applied for the year 2000 and 2020 scenarios may be disputed easily on the basis of how many food processing facilities any single state can sustain. Once again, however, the projection is intended to reflect energy and economic activity, not the specific kinds of commercial and industrial growth. Other mining, manufacturing and industrial activities clearly could make up the level of energy and economy represented by the assumed multiplicity of food processing plants.

The small scale energy producer for a non-integrated industrial park and equivalents are viewed as increasing in importance with time but being of limited placement by 1985, because of the capital investment required, the needs for long range integrated planning by the energy producer and the industrial site developer, and the potential for regulation of the facility as a public utility.

The total amounts of geothermal energy produced and consumed in the three growth scenarios for the hypothetical state for the years 1985, 2000 and 2020 may be compared with state-by-state geothermal utilization scenarios created by EG&G Idaho, Inc. in their "Regional Hydrothermal Market Penetration Analysis" (1979). Table 7.2 presents the energy use projections for the industrial sectors of ten Rocky Mountain Basin and Range Region states. The "potential geothermal use" is the total of all existing and future industrial energy consumption that could theoretically be replaced by that quality of geothermal resource energy available in the counties where the industries could be colocated. The "forecast geothermal use" is based upon an estimate of the percentage of existing and future industries that might actually elect to convert to geothermal energy.

A comparison of the EG&G market penetration analysis with the present hypothetical geothermal utilization scenarios for the hypothetical state

can be made, but it must be recognized as having a value limited to the objectives of this study of state taxation. The grand totals for each year in Table 7.2 can be divided by ten to obtain average values for the ten states. For example, the grand total forecast geothermal capture for 1985 is 24.44×10^{12} Btu/yr for ten states, or 2.444×10^{12} Btu/yr for the average state; this number is approximately equal to the hypothetical state maximum growth scenario in 1985 of 2.580×10^{12} Btu/yr. The year 2000 forecast geothermal capture averages at 41.5×10^{12} Btu/yr per state; while the maximum growth scenario assumes 20.64×10^{12} Btu/yr, or one half the EG&G projection. Similarly, the year 2020 forecast geothermal capture of 265.3×10^{12} Btu/yr is approximately twice the maximum growth scenario of this study, 77.4×10^{12} Btu/yr. Hence, the accelerated growth and business-as-usual scenarios are both more conservative than the EG&G market penetration analyses.

It should also be observed here that the EG&G projections are based only on a technological and locational matching of the geothermal resources and the industrial energy consumption; no economic evaluations are included. Currently, the New Mexico Energy Institute at the New Mexico State University is conducting an economics-based market penetration analysis. Preliminary results provide the following values for the economically-possible industrial usage of geothermal energy in selected states by the year 2020 (units of 10^{12} Btu/yr): Colorado - 13.1; Idaho - 55.4; Montana - 8.2; and New Mexico - 8.8. The Colorado and Idaho industrial usage values are within the range of the three scenarios (year 2020) of the present study, but the Montana and New Mexico values are lower.

7.2 Evaluation of Aggregated Hypothetical State Taxes

The hypothetical state taxations, which were defined in Section 3.3 and calculated in Section 6.1 for the four geothermal/business enterprises, have been aggregated in Tables 7.3 and 7.4 to obtain the total state taxes for the year 1985 geothermal utilization scenarios; the totals of state taxes for years 2000 and 2020 will be presented below in the discussion of Table 7.6.

Tables 7.3 and 7.4 separately tabulate the state taxes associated with the total geothermal/business enterprises and with the reservoir and transmission systems. For the total enterprises, it is to be expected that

TABLE 7.3

TOTAL ENTERPRISE: TOTAL STATES TAXES FOR ASSUMED GEOTHERMAL UTILIZATION SCENARIOS: YEAR 1985

(\$ thousands)

<u>Hypothetical State & Scenario</u>	<u>Greenhouse</u>	<u>Apartment</u>	<u>Food Processing</u>	<u>Small Scale Energy</u>	<u>Total State Taxes</u>	<u>Total Gross Revenues</u>	<u>Savings of Conventional Energy (10¹² BTU/yr)</u>
<u>Low Tax State</u>							
Business-As-Usual	9. (3)	154. (2)	33. (1)	0. (0)	196.	85,390.	0.473
Accelerated Growth	15. (5)	385. (5)	99. (3)	4. (1)	503.	254,475.	1.438
Maximum Growth	24. (8)	616. (8)	165. (5)	12. (3)	817.	427,230.	2.580
<u>Medium Tax State</u>							
Business-As-Usual	33. (3)	260. (2)	382. (1)	0 (0)	675.	85,390.	
Accelerated Growth	55. (5)	650. (5)	1,146. (3)	141. (1)	1,997.	254,475.	
Maximum Growth	88. (8)	1,040. (8)	1,910. (5)	423. (3)	3,461.	427,230.	
<u>High Tax State</u>							
Business-As-Usual	66. (3)	560. (2)	680. (1)	0 (0)	1,306.	85,390.	
Accelerated Growth	110. (5)	1,400. (5)	2,040. (3)	280. (1)	3,830.	254,475.	
Maximum Growth	176. (8)	2,240. (8)	3,400. (5)	840. (3)	6,656.	427,230.	

TABLE 7.4

RESERVOIR AND TRANSMISSION SYSTEMS: TOTAL STATE TAXES FOR
ASSUMED GEOTHERMAL UTILIZATION SCENARIO: YEAR 1985

(\$ thousands)

<u>Hypothetical State & Scenario</u>	<u>Greenhouse</u>	<u>Apartment</u>	<u>Food Processing</u>	<u>Small Scale Energy</u>	<u>Total State Taxes</u>	<u>Total Gross Revenues</u>
<u>Low Tax State</u>						
Business-As-Usual	0 (3)	0 (2)	0 (1)	0 (0)	0	
Accelerated Growth	0 (5)	0 (5)	0 (3)	4. (1)	4.	
Maximum Growth	0 (8)	0 (8)	0 (5)	12. (3)	12.	
<u>Medium Tax State</u>						
Business-As-Usual	9.6 (3)	5.6 (2)	70. (1)	0 (0)	85.	
Accelerated Growth	16.0 (5)	14. (5)	210. (3)	141. (1)	381.	
Maximum Growth	25.6 (8)	22.4 (8)	350. (5)	423. (3)	821.	
<u>High Tax State</u>						
Business-As-Usual	24. (3)	12. (2)	138. (1)	0 (0)	174.	
Accelerated Growth	40. (5)	30. (5)	414. (3)	280. (1)	764.	
Maximum Growth	64. (8)	48. (8)	690. (5)	840. (3)	1,642.	

the apartment complexes and the food processing plants generate the largest shares of the aggregated taxes, associated with the state income and property taxes for those high revenue and high investment enterprises. For the reservoir and transmission systems, the bulk of the taxes originate with the food processing and small scale energy facilities, because of the relatively large scale of the geothermal energy production systems.

It is important to examine the relationship between the total state taxes and the hypothetical taxation levels with respect specifically to the numbers of total enterprises producing the taxes. Observe first that the low tax state under a maximum growth scenario can generate more state taxes (\$817,000) than the medium tax state under a business-as-usual scenario (\$675,000). Observe next that the medium tax state under both accelerated and maximum growth scenarios can generate more taxes (\$1,992,000 and \$3,461,000 respectively) than the high tax state under a business-as-usual scenario. Approximately the same qualitative results are found with the reservoir and transmission systems. Once again, this result is to be expected. Lower state taxes generally favor industrial and economic growth. A multiplicity of industries can generate more total taxes under a low tax environment than a few industries can generate under a high tax environment. A state can readily encourage geothermal/business enterprises by offering tax incentives for growth and still achieve high total tax collections.

Table 7.5 presents the year 1985 scenario results in terms of total state taxes (in dollars) per quantity of geothermal energy consumed (in 10^6 Btu) for the aggregations of total enterprises and of reservoir and transmission systems. Energy produced and consumed is the one common denomination for all of the energy and business systems, for the three growth scenarios, and for the three hypothetical states. Since it is also becoming a common denominator for the national economy (GNP) and for international trade (balance of payments), it may be instructive to examine total state taxes in terms of dollars per million Btu.

Very clearly, the total state taxes on geothermal energy increase sharply from the low tax to the high tax state, almost eight-fold for the total enterprises and about fifteen-fold for the reservoir and transmission systems. For the total enterprises, the total state tax rates overlap with the range of current natural gas prices, with the high tax state having taxes equaling

**Table 7.5 Aggregated Total Hypothetical State Taxes Per Million BTUs
of Geothermal Energy Produced/Consumed ($\$/10^6$ Btu) for
Year 1985 Utilization Scenario**

Hypothetical State	Geothermal Utilization Scenario		
	Business-as-Usual	Accelerated	Maximum
Total Enterprise:			
Low Tax State	0.41	0.35	0.32
Medium Tax State	1.42	1.39	1.34
High Tax State	2.76	2.66	2.58
Reservoir and Transmission System:			
Low Tax State	0	0.003	0.005
Medium Tax State	0.18	0.26	0.32
High Tax State	0.38	0.53	0.64

the regulated cost of new gas. With the nation having just experienced first-hand the economic impacts of OPEC price increases on imported oil, state taxes of the magnitude of the high hypothetical state - particularly any sizable increases in state taxes - need to be carefully avoided. The state taxes on the production of geothermal energy (reservoir and transmission system), which more realistically represent an actual tax on energy, would also constitute major consumer cost items in the cases of both the medium and high tax states (\$0.18 to \$0.64 per million Btu). The significant increase taxes observed in moving from the business-as-usual scenario to the maximum growth scenario is primarily due to the aggregation of taxes on the increasing number of apartment complexes, each of which requires a tax susceptible investment for a relatively small quantity of produced energy.

By most measures of state and local economic health, it can be concluded that the state taxes of the high hypothetical tax state not only would be detrimental to the growth of geothermal energy utilization but also might constitute an enormous burden on the local, state and national economy. The taxes of the medium hypothetical tax state are more reasonable and acceptable, but tax rates and incentives tending toward the low hypothetical tax state would probably provide a compromise between stimulating economic development and generating an adequate flow of tax revenue for the state.

7.3 Energy/Business Taxation and Economic Development

The topic of economic development and energy taxation, originating in Section 7.2, is expanded upon in this section to provide a comparison of gross revenues, employment, amount and cost of conventional fuel saved (natural gas is assumed), and total state taxes. Table 7.6 summarizes the above factors for the three growth scenarios in each of the three future years for the total geothermal producer/business enterprises. All dollar amounts are 1979 dollars.

At stake for the state governments are additional gross business revenues and increased employment versus state and local tax revenues. At stake for the business enterprises are business profitability versus energy and state tax costs. At stake for the citizen are employment and energy savings versus

benefits from state tax revenues. What is ultimately desired is a compromise which provides the business enterprise with an energy source and an economic incentive, the citizen with employment and reasonable governmental services, and the state with a healthy economy and sufficient tax revenue to provide the necessary governmental services.

Table 7.6 presents two new column entries, not previously documented in this report --- namely, total employment and cost of natural gas saved. Total employment has been estimated from the management/labor payroll amounts of each of the enterprises from Table 4.3. An average annual salary of \$15,000 per worker was assumed. Therefore, the estimated number of employees per geothermal/business enterprise are as follows: greenhouse - 11; apartment complex - 19; food processing plant - 532; and small scale energy producer - 6 (estimated independently from O & M costs). For present purposes, it is assumed that the use of geothermal energy would be saving or replacing natural gas; in actuality in the western states, the geothermal energy will be saving or replacing wood, fuel oil, propane, oil distillates, electricity, and natural gas. The assumed cost of natural gas is an estimated deregulated price expressed in 1979 dollars and held constant for future years --- namely, \$4.00 per million Btu.

Table 7.6 reveals dramatic prospective growths in gross revenues, employment and cost savings in natural gas if geothermal energy is produced and used by new commerce and industry. Total additional gross revenues in the state's economy in the year 1985 could range from \$85.4 million under a business-as-usual scenario to \$427.2 million under a maximum growth scenario, which would be accompanied by employment increases of 603 and 2918 persons, respectively. By year 2020, a maximum growth scenario could yield \$12.8 billion in additional gross revenues and 87,540 new jobs.

If the geothermal energy use is primarily by existing commerce and industry which converts from other energy sources, then the increase in gross revenues and employment are proportionately diminished. Then the energy cost savings from the replacement of natural gas and other fuels with geothermal energy becomes the dominant value to the state and nation. The annual value of

Table 7.6 Comparison of Economic, Employment, and Energy Factors Governed by Hypothetical State Taxes for Geothermal Utilization Scenarios in Future Years

Year & Scenario	No. of Units	Total Gross Revenues (million \$)	Total Employment (no. of employees)	Total Geothermal Energy Produced (10 ² Btu/yr)	Value of Natural Gas Saved (million \$)	Total State Taxes (million \$)		
						Low Tax	Medium Tax	High Tax
<u>Year 1985:</u>								
Business-as-Usual	6	\$ 85.4	603	0.473	1.892	\$0.196	0.675	1.306
Accelerated Growth	14	254.5	1,752	1.438	5.752	0.503	1.992	3.830
Maximum Growth	24	427.2	2,918	2.580	10.32	0.817	3.461	6.656
 <u>Year 2000:</u>								
Business-as-Usual	48	683.2	4,824	3.784	15.14	1.568	5.400	10.45
Accelerated Growth	112	2,036.	14,016	11.50	46.00	4.024	15.94	30.64
Maximum Growth	192	3,418.	23,344	20.64	85.56	6.536	27.69	53.25
 <u>Year 2020:</u>								
Business-as-Usual	180	2,562.	18,090	14.19	56.76	5.880	20.25	39.18
Accelerated Growth	420	7,635.	52,560	43.14	172.6	15.09	59.76	114.9
Maximum Growth	720	12,816.	87,540	77.40	309.6	24.51	103.8	199.7

natural gas savings can increase from as little as \$1.89 million in 1985 to \$310 million in 2020. Since many western states do not now produce enough natural gas within their own boundaries to fill their demands, large sums of money flow out of states through the purchases of interstate gas. Millions of dollars could be saved for the economy of each state by the conversion of commerce and industry to geothermal energy.

Figure 7.1 displays the relationship and magnitude of total annual state taxes to the cost of natural gas saved and to the quantity of geothermal energy produced for the three hypothetical state tax structures. It is most important to observe that state taxes in the high tax case would absorb about two-thirds of the energy cost savings from the replacement of natural gas with geothermal energy. Even the medium tax state would take a significant fraction, approximately one-third, of the energy cost savings. Only the low tax state, collecting some 8 to 10 percent of the energy cost savings, appears reasonable and acceptable from this perspective. There certainly would not be any incentive for commerce and industry to locate in a state for purposes of using that state's geothermal resources if the level of state taxation on the integrated geothermal/business enterprise consumes a significant fraction of the expected savings in energy costs.

In view of the premises, a state would be advised to lighten the taxes on geothermal reservoirs and delivery systems as well as to reduce the tax burden on new enterprises. North Dakota, Montana and Colorado have some tax incentives for new job-creating businesses to enhance their competitive posture. These are steps in the right direction.

Figure 7.1 Relationship of Total State Taxes to Value of Natural Gas Saved and Amount of Geothermal Energy Produced

8.0 State Tax Policies and Recommended Changes

State by state tax comparisons of the state and local taxes levied on geothermal reservoir and transmission systems and related using enterprises have revealed wide differences in total tax bills. There are few states which impose specific energy taxes such as severance taxes on geothermal energy. By and large specific energy taxes levied by the state are directed toward oil, gas, coal and uranium at this time. Therefore the report was directed at the major taxes levied by the states on geothermal and related developments namely income taxes, property taxes, sales taxes and taxes on electrical output.

Alternative energy sources such as solar have received special benefits including investment tax credits and preferential property tax assessments. By and large these preferences have not been extended to geothermal. The apparent reason geothermal has not been blanketed in these preferences results from an absence of legislative pressure and a lack of knowledge about geothermal as a source of energy in legislative halls. The present study of state by state geothermal taxation certainly leads to this conclusion.

The tax liabilities among the states on geothermal enterprises varied largely as a result of the income and property taxes. Sales taxes were not a sizeable factor unless the output was subject to a yearly tax as in the case of a small scale energy system. Production taxes are not applicable when the reservoir and transmission are integrated into a using enterprise as is the case in the business scenarios.

State and local taxes had a significant effect on net present values, payback periods and discounted cash flows. While the economics of decision making were not examined, the differences appear large enough to be a factor in whether to go forward with an investment or decide against it. If there were flexibility in the location of the operation, the differences among the states as far as taxes were concerned would appear high enough to be a factor in the location.

Nevada's total taxes were lowest among the eight states. The state does not impose an income tax and there is a low property tax. Nevada does not impose a property tax on the values created by drilling the reservoir. The state also has low property tax levies. Nevada serves as a polar low tax state for comparison purposes.

Among the states, the state income tax has been mitigated by the adoption of the provisions of the federal tax code. Depletion allowances, expensing of intangible drilling costs and accelerated depreciation has reduced the impact of the state income tax. A feature not adopted by the states has been an investment tax credit for alternative energy investments. Arizona recently adopted an investment tax credit of 35% for solar energy but geothermal was not included. The 35% credit

in this case means, in effect, that an investment in the alternative energy source is 35% less expensive than otherwise.

Property taxes are burdensome on geothermal energy because of the capital intensity of such developments. There has not been a great deal of attention given to geothermal energy insofar as property taxation is concerned. The Nevada exemption of intangible drilling investments deserves attention elsewhere. The taxation of the resource in situ has not been an issue in most of the states. Therefore, the taxation of geothermal before development actually takes place has not been a problem.

There does not appear to be an exemption of geothermal resources in situ under the property tax statutes or state constitutions of the western states studied. Tax assessors could actively assess these resources prior to production. This issue can be resolved by legislation providing for exemption of resource at least until production has been initiated.

Water rights are taxable in the twelve western states included in this report. An exception is made in Utah and Idaho which exempt water rights when used for irrigation purposes. In Montana, agricultural land is taxed for agricultural purposes only and hence the water rights may be exempt if the land values are unaffected by the water right.

Property taxes are burdensome not only because of the size of the tax payment but also as the result of the timing of the payments. A property tax is levied from the day the investment is made. The tax is due, whether or not gross or net income has been realized. As has been pointed out already, the early years of taxation in the enterprise's life cycle are the most burdensome. Property taxes are the highest when an operation is in its early years before depreciation is a significant factor in reducing assessed values.

Recommended Tax Policy Changes

Our analysis found that for each \$1 reduction in average state and local taxes, the net present value of future net income rose by \$4 to \$5. The amount of the tax savings needed to induce enterprise development was not within the scope of this report. Nevertheless, the net present value differences between the high and low tax states which were in the half-million or million dollar range are evidence that the tax situation could result in a location in one area versus another area. The deterrent effect of state and local taxes could mean that a development would be abandoned entirely.

In order to accelerate geothermal and related using enterprise developments, the following tax policy should be considered:

1. Investment tax credit should be allowed by the states for geothermal delivery systems. Tax credits should be applicable to the operation without any time restriction.
2. Exploration costs should be made deductible as an expense as are development costs.
3. Sales taxes should not be applied to geothermal developments either as an initial tax on tangible investments nor on the productive output on a yearly basis.
4. Severances taxes should not be applied to geothermal extraction.
5. Property taxes should be reduced by exemption of intangible drilling investments in the reservoir development as is now done in Nevada. In states where property is classified for taxation, alternative energy sources such as geothermal should be classified at a low percent of full value for property tax assessments. In order to accelerate alternative energy development, the states should consider exemption such as the five year exemption of property taxes allowed in North Dakota for certain job-creating businesses. The present methods of assessing and taxing geothermal energy should be examined to ascertain whether a capitalization of income approach would be more realistic or whether or not more rapid depreciation schedules should be used.

The thrust of the recommendations is to foster tax policies to accelerate geothermal development. At a minimum, the incentives adopted for solar energy should be extended by the states to geothermal energy. It is recognized that state and local tax systems have been created over the years within statutory and constitutional framework. In order to accelerate alternative energy development, there may be required some alteration of traditional tax structures. It is hoped that this study will provide an improved guideline as to what the necessary changes should be.

APPENDIX A

ITEMIZED STATEMENTS OF CAPITAL INVESTMENTS FOR GEOTHERMAL PRODUCER OPERATIONS

GREENHOUSE FOR FLOWER PRODUCTION

(10,000 square feet)

Reservoir investment:

Exploration.....	\$ 25,000
Intangible drilling.....	115,000
Tangible costs.....	43,700 ^{1/}
Working capital.....	20,000

Transmission investment:

Pipeline, pumps, etc.....	\$100,000 ^{2/}
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Reservoir operating costs:

General costs.....	\$ 3,074
Electric costs.....	807
	<u>\$ 3,881</u>

Transmission operating costs:

General.....	\$ 2,000
Electrical.....	142
	<u>\$ 2,142</u>

^{1/} Investment tax credit for federal purposes applicable for \$43,700 investment. Extra tax credit for geothermal.

^{2/} Investment tax credit for federal purposes and additional energy credit on a total of \$100,000 for pumps, etc.

APARTMENT COMPLEX

(500 units)

Reservoir investment:

Exploration costs.....	\$ 25,000
Intangible drilling costs.....	88,000
Tangible costs.....	25,000 ^{1/}
	<u>\$138,000</u>

Transmission investment:

Pipeline, pumps, etc.....	\$219,500 ^{1/}
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Reservoir operating costs:

General.....	\$ 6,266
Electrical.....	2,700
	<u>\$ 8,966</u>

Transmission operating costs:

General.....	\$ 9,968
Electrical.....	100
	<u>\$ 10,068</u>

Capital investment:

Equity (30%).....	\$107,250
Debt (70%).....	250,250
	<u>\$357,500</u>

^{1/} Eligible for regular and energy tax credit.

FOOD PROCESSING SIMULATION

Reservoir investment:

Exploration costs.....	\$ 131,000	
Intangible drilling costs.....	4,159,560	
Tangible costs.....	246,433	^{1/}
	<u>\$4,536,993</u>	

Transmission investment:

Total (pumps, pipelines, controls, etc.).....	\$ 804,000	^{2/}
--	------------	---------------

Reservoir operating costs:

General.....	\$ 10,000	
Electrical.....	4,000	
	<u>\$ 14,000</u>	

Transmission operating costs:

General.....	\$ 4,000	
Electrical.....	2,000	
	<u>\$ 6,000</u>	

^{1/} Eligible for federal investment tax credit for both regular and energy credit.

^{2/} Eligible for federal investment tax credit for both regular and energy credit.

SMALL SCALE ENERGY PRODUCER

Reservoir investment:

Exploration costs.....	\$ 915,000
Intangible drilling costs.....	4,588,200
Tangible costs.....	<u>2,495,080</u> ^{1/}
	\$7,998,280

Transmission System.....	\$1,176,500 ^{1/}
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Power Conversion System.....	\$1,131,400 ^{1/}
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Direct Thermal Transfer System.....	<u>\$ 549,100</u> ^{1/}
	\$10,855,280

^{1/} Eligible for regular and energy investment tax credit.

APPENDIX B

COMPILATION OF STATE AND FEDERAL TAXES FROM SEER ANALYSIS FOR EACH STATE AND EACH GEOTHERMAL PRODUCER/BUSINESS ENTERPRISE

- B-1: Greenhouse
- B-2: Apartment Complex
- B-3: Food Processing
- B-4: Small Scale Energy Producer
- B-5: Hypothetical States

B-1: GREENHOUSE

STATE: ArizonaENTERPRISE: Greenhouse

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years		Average Over	Years		Average Over
	<u>1-5</u>	<u>1-30</u>	<u>30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>30 Years</u>
Federal						
Income Tax	8	990	33	4	238	8.
Tax Preference	<u>102</u>	—	—	—	—	—
Total Federal	110	990	33	4	238	8.
State						
Income Tax	5	234	8	2	106	4.
Property Tax	126	675	22	31	189	6.
Sales Tax*	23	23	1	9	9	0.3
Severance Tax	—	—	—	—	—	—
Utility Tax	—	—	—	—	—	—
Total State	154	932	31	42	328	11.0
TOTAL STATE AND FEDERAL	264	1,922	64	46	566	19

*Includes the first year and 15th year sales taxes.

STATE: ColoradoENTERPRISE: Greenhouse

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	48	1,006	33.5	5	280	9.
Tax Preference	<u>4</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Total Federal	52	1,006	33.5	5	280	9.
State						
Income Tax	2	162	5.4	1	70	2.
Property Tax	126	882	29.4	19	148	5.
Sales Tax*	18	18	0.6	7	7	0.2
Severance Tax						
Utility Tax	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Total State	146	1,062	35.4	27	225	7
TOTAL STATE AND FEDERAL	198	2,068	68.9	32	505	16

*Includes the first year and 15th year sales taxes.

STATE: IdahoENTERPRISE: Greenhouses

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	1-5	1-30	Average Over 30 Years	1-5	1-30	Average Over 30 Years
Federal						
Income Tax	11	973	32	5	186	6.
Tax Preference	—	—	—	—	—	—
Total Federal	11	973	32	5	186	6.
State						
Income Tax	4	221	7.	2	87	3.
Property Tax	77	353	12.	24	110	3.7
Sales Tax*	12	12	0.4	4	4	0.1
Severance Tax	—	—	—	—	—	—
Utility Tax	—	—	—	—	—	—
Total State	93	585	19.5	30	201	7
TOTAL STATE AND FEDERAL	104	1,558	52	35	387	13

*Includes the first year and 15th year sales taxes.

STATE: MontanaENTERPRISE: Greenhouse

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	1,110	37	6	275	9.
Tax Preference	<u>59</u>	<u>59</u>	<u>2</u>	—	—	—
Total Federal	59	1,159	39	6	275	9.
State						
Income Tax	0	247	8	2	10	0.3
Property Tax	71	357	12	23	79	3.
Sales Tax*	0	0	0	0	0	0
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	71	604	20	25	89	3.
TOTAL STATE AND FEDERAL	130	1,763	59	31	364	12.1

*Includes the first year and 15th year sales taxes.

STATE: NevadaENTERPRISE: Greenhouse

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	<u>1-5</u>	<u>1-30</u>	Average Over 30 Years	<u>1-5</u>	<u>1-30</u>	Average Over 30 Years
Federal						
Income Tax	0	1,232	41	6	295	10.
Tax Preference	<u>59</u>	<u>59</u>	<u>2</u>	—	—	—
Total Federal	59	1,291	43	6	295	10.
State						
Income Tax	0	0	0	0	0	0
Property Tax	63	275	9.2	20	97	3
Sales Tax*	18	18	0.6	7	7	0.2
Severance Tax	—	—	—	—	—	—
Utility Tax	—	—	—	—	—	—
Total State	81	293	9.8	33	104	3
TOTAL STATE AND FEDERAL	140	1,584	53	39	399	13

*Includes the first year and 15th year sales taxes.

STATE: New MexicoENTERPRISE: Greenhouse

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	1,143	38	6	282	9
Tax Preference	58	—	—	—	—	—
Total Federal	58	1,143	38	6	282	9
State						
Income Tax	0	184	6.1	2	75	3
Property Tax	58	288	9.6	17	70	2
Sales Tax*	15	15	0.5	5	5	0.2
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	73	487	16	24	150	5.
TOTAL STATE AND FEDERAL	131	1,630	54	30	432	14.

*Includes the first year and 15th year sales taxes.

STATE: North DakotaENTERPRISE: Greenhouse

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years		Average Over	Years		Average Over
	<u>1-5</u>	<u>1-30</u>	<u>30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>30 Years</u>
Federal						
Income Tax	14	1,118	37	6	273	9.
Tax Preference	5	5	0.2	—	—	—
Total Federal	19	1,123	37	6	273	9.
State						
Income Tax	5	299	10	2	104	3.4
Property Tax	58	293	10	13	63.7	2.1
Sales Tax*	14	14	0.5	6	6	0.2
Severance Tax	—	—	—	—	—	—
Utility Tax	—	—	—	—	—	—
Total State	77	606	21	21	174	5.6
TOTAL STATE AND FEDERAL	96	1,729	58	27	447	14.9

*Includes the first year and 15th year sales taxes.

STATE: UtahENTERPRISE: Greenhouse

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	13	1,226	41	5	299	10.
Tax Preference	—	—	—	—	—	—
Total Federal	13	1,226	41	5	299	10.
State						
Income Tax	2	116	4	1	46	1.5
Property Tax	52	222	7	10	28	1.0
Sales Tax*	24	24	1	10	10	0.3
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	78	362	12	21	84	3.
TOTAL STATE AND FEDERAL	91	1,588	53	26	383	13.

*Includes the first year and 15th year sales taxes.

B-2: APARTMENT COMPLEX

STATE: ArizonaENTERPRISE: Apartment Complexes

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	10,211	340	0	106	4
Tax Preference	—	—	—	—	—	—
Total Federal	0	10,211	340	0	106	4
State						
Income Tax	0	1,409	47	0	49	1
Property Tax	1,637	8,519	284	48	291	10
Sales Tax*	324	330	11	12	18	0.6
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	1,961	10,258	342	60	358	12
TOTAL STATE AND FEDERAL	1,961	20,469	682	60	464	15

*Includes the first year and 15th year sales taxes.

STATE: ColoradoENTERPRISE: Apartment Complexes

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	9,845	328	0	121	4
Tax Preference	—	—	—	—	—	—
Total Federal	0	9,845	328	0	121	4
State						
Income Tax	0	1,108	369	0	33	1
Property Tax	1,171	10,348	344.9	24	175	6
Sales Tax*	290	295	10	11	17	0.6
Severance Tax	—	—	—	—	—	—
Utility Tax	—	—	—	—	—	—
Total State	1,461	11,751	392	35	225	8
TOTAL STATE AND FEDERAL	1,461	21,596	720	35	346	12

*Includes the first year and 15th year sales taxes.

STATE: IdahoENTERPRISE: Apartment Complexes

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	11,289	376	0	83	3
Tax Preference	<u>208</u>	<u>246</u>	<u>8</u>	—	—	—
Total Federal	208	11,535	384	0	83	3
State						
Income Tax	0	1,770	59	0	32	1
Property Tax	120	5,320	177	31	144	5
Sales Tax*	248	253	8	9	14	0.5
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	371	7,343	246	40	190	6
TOTAL STATE AND FEDERAL	576	18,878	629	40	273	9

*Includes the first year and 15th year sales taxes.

STATE: MontanaENTERPRISE: Apartment Complexes

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	10,996	367	0	124	4
Tax Preference	<u>208</u>	<u>233</u>	<u>8</u>	—	—	—
Total Federal	208	11,229	375	0	124	4
State						
Income Tax	0	1,800	60	0	49	2
Property Tax	666	5,739	191	20	81	3
Sales Tax*	0	0	0	0	0	0
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	666	7,539	251	20	130	4
TOTAL STATE AND FEDERAL	874	18,768	626	20	254	8

*Includes the first year and 15th year sales taxes.

STATE: NevadaENTERPRISE: Apartment Complexes

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	13,135	437	0	157	5
Tax Preference	<u>208</u>	<u>235</u>	<u>8</u>	—	—	—
Total Federal	208	13,370	446	0	157	5
State						
Income Tax	0	0	0	0	0	0
Property Tax	584	2,483	83	13	42	1
Sales Tax*	283	289	10	11	16	0.5
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	867	2,772	92	24	58	2
TOTAL STATE AND FEDERAL	1,075	16,142	538	24	215	7

*Includes the first year and 15th year sales taxes.

STATE: New MexicoENTERPRISE: Apartment Complexes

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	11,026	368	0	129	4
Tax Preference	<u>208</u>	<u>243</u>	<u>8</u>	—	—	—
Total Federal	208	11,269	376	0	129	4
State						
Income Tax	0	1,311	44	0	39	1
Property Tax	951	5,537	185	23	90	3
Sales Tax*	304	309	10	11	17	0.6
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	1,255	7,157	239	34	146	5
TOTAL STATE AND FEDERAL	1,463	18,426	614	34	275	9

*Includes the first year and 15th year sales taxes.

STATE: North DakotaENTERPRISE: Apartment Complexes

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	10,592	353	1	63	2
Tax Preference	<u>208</u>	<u>248</u>	<u>8</u>	—	—	—
Total Federal	208	10,840	361	1	63	2
State						
Income Tax	0	3,104	103	- 0.4	12	0.4
Property Tax	1,341	6,775	226	10	52	2
Sales Tax*	248	253	8	14	22	0.7
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	1,589	10,132	337	24	86	3
TOTAL STATE AND FEDERAL	1,797	20,972	699	35	149	5

*Includes the first year and 15th year sales taxes.

STATE: UtahENTERPRISE: Apartment Complexes

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	11,954	398.4	0	134	4
Tax Preference	<u>208</u>	<u>242</u>	<u>8.1</u>	—	—	—
Total Federal	208	12,196	407	0	134	4
State						
Income Tax	0	834	27.8	0	24	1
Property Tax	940	4,653	155.1	18	74	2
Sales Tax*	385	392	13	14	22	1
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	1,325	5,879	196	32	120	4
TOTAL STATE AND FEDERAL	1,533	18,075	603	32	254	8

*Includes the first year and 15th year sales taxes.

B-3: FOOD PROCESSING

STATE: ArizonaENTERPRISE: Food Processing

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	5,173	71,265	2,375	0	9,734	324
Tax Preference	—	—	—	—	—	—
Total Federal	5,173	71,265	2,375	0	9,734	324
State						
Income Tax	820	9,396	313	0	1,385	46
Property Tax	2,392	11,742	391	502	3,015	100
Sales Tax*	305	397	13	128	182	6
Severance Tax	—	—	—	—	—	—
Utility Tax	—	—	—	—	—	—
Total State	3,517	21,535	718	630	4,582	153
TOTAL STATE AND FEDERAL	8,690	92,800	3,093	630	14,316	477

*Includes the first year and 15th year sales taxes.

STATE: ColoradoENTERPRISE: Food Processing

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	1,913	79,737	2,657	0	8,920	297
Tax Preference	—	—	—	—	—	—
Total Federal	1,913	79,737	2,657	0	8,920	297
State						
Income Tax	659	8,623	287	0	1,017	34
Property Tax	1,592	11,065	369	380	2,429	81
Sales Tax*	345	423	14	82	108	4
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	2,596	20,111	670	462	3,554	118
TOTAL STATE AND FEDERAL	4,509	99,848	3,328	462	12,474	416

*Includes the first year and 15th year sales taxes.

STATE: IdahoENTERPRISE: Food Processing

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	6,013	76,496	2,550	0	7,857	262
Tax Preference	—	—	—	—	—	—
Total Federal	6,013	76,496	2,550	0	7,857	262
State						
Income Tax	901	11,797	393	0	1,258	42
Property Tax	1,388	5,256	175	75	350	12
Sales Tax*	296	362	12	70	93	3
Severance Tax	—	—	—	—	—	—
Utility Tax	—	—	—	—	—	—
Total State	2,585	17,415	580	145	1,701	57
TOTAL STATE AND FEDERAL	8,598	93,911	3,130	145	9,558	319

*Includes the first year and 15th year sales taxes.

STATE: MontanaENTERPRISE: Food Processing

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	5,208	75,507	2,517	0	9,714	324
Tax Preference	—	—	—	—	—	—
Total Federal	5,208	75,507	2,517	0	9,714	324
State						
Income Tax	808	11,932	397.7	0	1,587	53
Property Tax	1,613	10,019	333.9	470	1,753	58
Sales Tax*	0	0	0	0	0	0
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	2,421	21,951	731	470	3,340	111
TOTAL STATE AND FEDERAL	7,629	97,458	3,249	470	13,054	435

*Includes the first year and 15th year sales taxes.

STATE: NevadaENTERPRISE: Food Processing

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	5,698	84,478	2,815	0	11,094	370
Tax Preference	—	—	—	—	—	—
Total Federal	5,698	84,478	2,815	0	11,094	370
State						
Income Tax	0	0	0	0	0	0
Property Tax	508	2,061	68	171	819	27
Sales Tax*	345	423	14	82	108	4
Severance Tax	—	—	—	—	—	—
Utility Tax	—	—	—	—	—	—
Total State	853	2,484	83	253	927	31
TOTAL STATE AND FEDERAL	6,551	86,962	2,899	253	12,021	401

*Includes the first year and 15th year sales taxes.

STATE: New MexicoENTERPRISE: Food Processing

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	5,537	76,629	2,554	0	10,185	340
Tax Preference	—	—	—	—	—	—
Total Federal	5,537	76,629	2,554	0	10,185	340
State						
Income Tax	628	9,152	305	0	1,122	37
Property Tax	1,024	4,711	157	371	2,004	67
Sales Tax*	347	430	14	55	83	3
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	11,151	14,293	476	426	3,209	107
TOTAL STATE AND FEDERAL	16,688	90,921	3,031	426	13,394	446

*Includes the first year and 15th year sales taxes.

STATE: North Dakota ENTERPRISE: Food Processing

	(Amounts in Thousands)					
	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	1-5	1-30	Average Over 30 Years	1-5	1-30	Average Over 30 Years
Federal						
Income Tax	6,664	76,709	2,556	0	8,203	273
Tax Preference						
Total Federal	6,664	76,709	2,556	0	8,203	273
State						
Income Tax	0	13,851	461.7	0	1,720	57.3
Property Tax	0	3,850	128.3	0	1,933	64.4
Sales Tax*	288	376	13	63	106	4
Severance Tax						
Utility Tax						
Total State	288	18,077	602	63	3,759	125
TOTAL STATE AND FEDERAL	6,952	97,786	3,158	63	11,962	399

*Includes the first year and 15th year sales taxes.

STATE: UtahENTERPRISE: Food Processing

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	3,478	79,577	2,652	0	10,973	366
Tax Preference	—	—	—	—	—	—
Total Federal	3,478	79,577	2,652	0	10,973	366
State						
Income Tax	369	5,515	184	0	765	26
Property Tax	843	3,212	107	124	329	11
Sales Tax*	468	574	19	111	147	5
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	1,680	9,301	310	235	1,241	41
TOTAL STATE AND FEDERAL	5,158	88,878	2,963	235	12,214	407

*Includes the first year and 15th year sales taxes.

B-4: SMALL SCALE ENERGY PRODUCER

STATE: ArizonaENTERPRISE: Small Scale Energy

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	11,455	381.8	22	5,874	196
Tax Preference	—	—	—	—	—	—
Total Federal	0	1,455	381.8	22	5,874	196
State						
Income Tax	0	1,291	43	203	1,036	34
Property Tax	1,533	6,853	228	641	3,847	129
Sales Tax*	474	1,038	35	219	219	7
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	2,007	9,182	306	1,063	5,102	170
TOTAL STATE AND FEDERAL	2,007	20,637	688	1,085	10,976	366

*Includes the first year and 15th year sales taxes.

STATE: ColoradoENTERPRISE: Small Scale Energy

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	1-5	1-30	Average Over 30 Years	1-5	1-30	Average Over 30 Years
Federal						
Income Tax	0	12,919	431	-211	6,271	209
Tax Preference	—	—	—	—	—	—
Total Federal	0	12,919	431	-211	6,271	209
State						
Income Tax	0	1,452	48.4	- 23	681	23
Property Tax	1,168	4,967	166.5	834	3,471	116
Sales Tax*	227	227	7.6	127	127	4
Severance Tax	—	—	—	—	—	—
Utility Tax	—	—	—	—	—	—
Total State	1,395	6,646	222	938	4,279	143
TOTAL STATE AND FEDERAL	1,395	19,565	652	727	10,550	352

*Includes the first year and 15th year sales taxes.

STATE: IdahoENTERPRISE: Small Scale Energy

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	12,648	422	69	6,568	219
Tax Preference	—	—	—	—	—	—
Total Federal	0	12,648	422	69	6,568	219
State						
Income Tax	0	1,972	66	-11	967	32
Property Tax	761	3,030	101.1	545	2,231	74
Sales Tax*	195	195	6	109	109	4
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	956	5,197	173	643	3,307	110
TOTAL STATE AND FEDERAL	956	17,845	595	603	9,875	329

*Includes the first year and 15th year sales taxes.

STATE: MontanaENTERPRISE: Small Scale Energy

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	12,209	406.9	8	6,348	212
Tax Preference	—	—	—	—	—	—
Total Federal	0	12,209	406.9	8	6,348	212
State						
Income Tax	0	1,989	66.1	-21	973	32
Property Tax	936	3,828	127.6	640	2,207	74
Sales Tax*	0	0	0	0	0	0
Severance Tax						
Utility Tax	88	526	18	—	—	—
Total State	1,024	6,338	211	619	3,180	106
TOTAL STATE AND FEDERAL	1,024	18,547	618	627	9,528	318

*Includes the first year and 15th year sales taxes.

STATE: NevadaENTERPRISE: Small Scale Energy

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	13,780	459	58	4,840	162
Tax Preference	—	—	—	—	—	—
Total Federal	0	13,780	459	58	4,840	162
State						
Income Tax	0	0	0	0	0	0
Property Tax	450	1,666	55	251	1,092	36
Sales Tax*	252	252	8	152	152	5
Severance Tax						
Utility Tax	<u>76</u>	<u>458</u>	<u>15</u>	—	—	—
Total State	778	2,376	79	406	1,244	41
TOTAL STATE AND FEDERAL	778	16,156	539	464	6,084	203

*Includes the first year and 15th year sales taxes.

STATE: New MexicoENTERPRISE: Small Scale Energy

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	12,480	416	59	6,550	218
Tax Preference	—	—	—	—	—	—
Total Federal	0	12,480	416	59	6,550	218
State						
Income Tax	0	1,168	39	-6	735	24
Property Tax	665	2,795	93	494	2,404	80
Sales Tax*	622	2,384	79	162	162	5
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	1,287	6,347	212	650	3,301	110
TOTAL STATE AND FEDERAL	1,287	18,827	628	709	9,851	328

*Includes the first year and 15th year sales taxes.

STATE: North DakotaENTERPRISE: Small Scale Energy

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	12,314	410	32	6,337	211
Tax Preference	—	—	—	—	—	—
Total Federal	0	2,314	410	32	6,337	211
State						
Income Tax	0	2,542	85	-30	1,237	41
Property Tax	1,035	3,583	119	738	2,554	85
Sales Tax*	195	195	7	109	109	4
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	1,230	6,320	211	817	3,900	130
TOTAL STATE AND FEDERAL	1,230	18,634	621	849	10,237	341

*Includes the first year and 15th year sales taxes.

STATE: UtahENTERPRISE: Small Scale Energy

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	12,460	415	182	7,447	248
Tax Preference	—	—	—	—	—	—
Total Federal	0	12,460	415	182	7,447	248
State						
Income Tax	0	985	33	16	642	21
Property Tax	357	1,035	34	163	501	17
Sales Tax*	756	2,988	100	173	173	6
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	1,112	5,008	167	352	1,316	44
TOTAL STATE AND FEDERAL	1,112	17,468	582	534	8,763	292

*Includes the first year and 15th year sales taxes.

B-5: HYPOTHETICAL STATES

STATE: Low HypotheticalENTERPRISE: Greenhouse

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	15	1,324	44	6	319	10.6
Tax Preference	<u>47</u>	<u>47</u>	<u>1</u>	<u>5</u>	<u>5</u>	<u>—</u>
Total Federal	62	1,371	45	11	324	10.8
State						
Income Tax	0	0	0	0	0	0
Property Tax	16	84	3	0	0	0
Sales Tax*	0	0	0	0	0	0
Severance Tax						
Utility Tax	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Total State	16	84	3	0	0	0
TOTAL STATE AND FEDERAL	78	1,455	48	11	324	10.8

*Includes the first year and 15th year sales taxes.

STATE: Medium HypotheticalENTERPRISE: Greenhouse

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	16	1,202	40	6	289	9.6
Tax Preference	<u>5</u>	<u> </u>	<u>—</u>	<u>—</u>	<u> </u>	<u> </u>
Total Federal	21	1,202	40	6	289	9.6
State						
Income Tax	0	178	5.9	0	67.8	2.2
Property Tax	28	144	4.8	86	25	0.9
Sales Tax*	11	11	.4	4	4	0.1
Severance Tax						
Utility Tax	<u>—</u>	<u> </u>	<u> </u>	<u>—</u>	<u> </u>	<u> </u>
Total State	39	333	11.1	90	96.8	3.2
TOTAL STATE AND FEDERAL	60	1,535	51.1	96	386	13.

*Includes the first year and 15th year sales taxes.

STATE: High HypotheticalENTERPRISE: Greenhouse

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>		<u>Average Over</u>	<u>Years</u>		<u>Average Over</u>
	<u>1-5</u>	<u>1-30</u>	<u>30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>30 Years</u>
Federal						
Income Tax	13	1,098	37	5	263	9.
Tax Preference	—	—	—	—	—	—
Total Federal	13	1,098	37	5	263	9.
State						
Income Tax	6	340	11	3	133	4.
Property Tax	400	288	9.6	19	79	3.
Sales Tax*	23	23	1	8	8	0.3
Severance Tax	—	—	—	4	25	1.
Utility Tax	—	—	—	—	—	—
Total State	429	651	22	34	247	8.
TOTAL STATE AND FEDERAL	442	1,749	59	39	510	17.

*Includes the first year and 15th year sales taxes.

STATE: Low HypotheticalENTERPRISE: Apartment Complexes

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	13,246	441.5	0	147	5
Tax Preference	—	—	—	—	—	—
Total Federal	0	13,246	441.5	0	147	5
State						
Income Tax	0	0	0	0	0	0
Property Tax	395	2,310	77	0	0	0
Sales Tax*	0	0	0	0	0	0
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	395	2,310	77	0	0	0
TOTAL STATE AND FEDERAL	395	15,556	519	0	147	5

*Includes the first year and 15th year sales taxes.

STATE: Medium HypotheticalENTERPRISE: Apartment Complexes

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	12,332	412	0	136	5
Tax Preference	—	—	—	—	—	—
Total Federal	0	12,332	412	0	136	5
State						
Income Tax	0	1,379	46	0	27	1
Property Tax	480	2,795	93	12	45	1
Sales Tax*	203	206	7	8	12	0.4
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	683	4,380	146	20	84	3
TOTAL STATE AND FEDERAL	683	16,712	558	20	220	7

*Includes the first year and 15th year sales taxes.

STATE: High HypotheticalENTERPRISE: Apartment Complexes

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	10,855	361.8	0	126	4
Tax Preference	—	—	—	—	—	—
Total Federal	0	10,855	361.8	0	126	4
State						
Income Tax	0	2,422	81	0	66	2
Property Tax	953	5,542	184.7	25	98	3
Sales Tax*	405	413	14	15	23	1
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	1,358	8,377	279	40	187	6
TOTAL STATE AND FEDERAL	1,358	19,232	641	40	313	10

*Includes the first year and 15th year sales taxes.

STATE: Low HypotheticalENTERPRISE: Food Processing

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	7,240	85,837	2,861	0	9,648	321
Tax Preference	—	—	—	—	—	—
Total Federal	7,240	85,837	2,861	0	9,648	321
State						
Income Tax	0	0	0	0	0	0
Property Tax	266	994	33.1	0	0	0
Sales Tax*	0	0	0	0	0.2	0
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	266	994	33	0	0	0
TOTAL STATE AND FEDERAL	7,536	86,831	2,894	0	9,648	321

*Includes the first year and 15th year sales taxes.

STATE: Medium HypotheticalENTERPRISE: Food Processing

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	7,034	82,610	2,754	0	9,010	300
Tax Preference	—	—	—	—	—	—
Total Federal	7,034	82,610	2,754	0	9,010	300
State						
Income Tax	0	7,888	262	0	775	26
Property Tax	674	3,312	110	288	1,257	42
Sales Tax*	231	286	10	43	62	2
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	905	11,486	382	271	2,094	70
TOTAL STATE AND FEDERAL	7,939	94,096	3,137	271	11,104	370

*Includes the first year and 15th year sales taxes.

STATE: High HypotheticalENTERPRISE: Food Processing

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	5,541	74,540	2,485	0	8,236	274
Tax Preference	—	—	—	—	—	—
Total Federal	5,541	74,540	2,485	0	8,236	274
State						
Income Tax	1,163	14,863	495	0	1,847	62
Property Tax	1,021	4,714	157	344	1,927	64
Sales Tax*	462	574	19	86	124	4
Severance Tax	42.5	255	8.5			
Utility Tax	—	—	—	—	—	—
Total State	2,668	20,406	680	430	4,153	138
TOTAL STATE AND FEDERAL	8,229	94,946	3,165	430	12,389	412

*Includes the first year and 15th year sales taxes.

STATE: Low HypotheticalENTERPRISE: Small Scale Energy

(Amounts in Thousands)

	Total Business Enterprise			Reservoir and Transmission System		
	Years			Years		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	12,724	424	172	7,868	262
Tax Preference	—	—	—	—	—	—
Total Federal	0	12,724	424	172	7,868	262
State						
Income Tax	0	0	0	0	0	0
Property Tax	50	114	4	0	0	0
Sales Tax*	0	0	0	0	0	0
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	50	114	4	0	0	0
TOTAL STATE AND FEDERAL	50	12,838	427	172	7,868	262

*Includes the first year and 15th year sales taxes.

STATE: Medium HypotheticalENTERPRISE: Small Scale Energy

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System -</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	13,025	434	167	7,074	236
Tax Preference	—	—	—	—	—	—
Total Federal	0	13,025	434	167	7,074	236
State						
Income Tax	0	1,497	50	-363	426	14
Property Tax	333	1,397	47	247	1,202	40
Sales Tax*	180	1,320	44	108	108	4
Severance Tax						
Utility Tax	—	—	—	—	—	—
Total State	513	3,074	141	- 8	1,736	58
TOTAL STATE AND FEDERAL	513	16,099	575	159	8,810	294

*Includes the first year and 15th year sales taxes.

STATE: High HypotheticalENTERPRISE: Small Scale Energy

(Amounts in Thousands)

	<u>Total Business Enterprise</u>			<u>Reservoir and Transmission System</u>		
	<u>Years</u>			<u>Years</u>		
	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>	<u>1-5</u>	<u>1-30</u>	<u>Average Over 30 Years</u>
Federal						
Income Tax	0	11,558	385	134	6,161	205
Tax Preference	—	—	—	—	—	—
Total Federal	0	11,558	385	134	6,161	205
State						
Income Tax	0	2,568	86	- 4	1,334	44
Property Tax	665	2,694	90	408	1,890	63
Sales Tax*	359	359	12	217	217	7
Severance Tax	85	513	17	85.5	513	17.1
Utility Tax	—	—	—	—	—	—
Total State	1,109	6,134	205	706	3,954	131
TOTAL STATE AND FEDERAL	1,109	17,692	590	840	10,115	336

*Includes the first year and 15th year sales taxes.

APPENDIX C

SAMPLE COMPUTER OUTPUT FOR SEER ANALYSIS OF
FOOD PROCESSING PLANT (TOTAL ENTERPRISE) FOR
NEW MEXICO

APPENDIX C - SAMPLE COMPUTER OUTPUT FOR SEER ANALYSIS OF FOOD PROCESSING PLANT (TOTAL ENTERPRISE), NEW MEXICO

YEAR		1	2	3	4	5	6
REVENUE	\$0	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000
ROYALTY	\$0	\$0	\$0	\$0	\$0	\$0	\$0
INTEREST	\$0	\$2,861,767	\$2,698,691	\$2,518,046	\$2,311,483	\$2,082,777	\$1,825,771
OPERATING COST	\$4,506,451	\$71,339,280	\$71,350,784	\$71,363,104	\$71,367,216	\$71,362,501	\$71,362,560
DEPRECIATION	\$0	\$1,446,724	\$1,253,828	\$1,086,650	\$941,764	\$816,195	\$717,369
BEFORE DEPLETION INCOME	\$4,506,451CR	\$3,352,229	\$3,696,698	\$4,034,200	\$4,379,537	\$4,738,771	\$5,114,311
DEPLETION	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TAXABLE INCOME	\$4,506,451CR	\$0	\$2,542,476	\$4,034,200	\$4,379,537	\$4,738,771	\$5,114,311
LOSS FORWARD	\$0	\$3,352,229	\$1,154,222	\$0	\$0	\$0	\$0
TAXES	\$0	\$222,344	\$1,382,042	\$2,084,937	\$2,222,226	\$2,393,629	\$2,566,609
INVESTMENT	\$0	\$0	\$1,052,065	\$518,021	\$0	\$0	\$0
TAX CREDIT	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NET INCOME	\$4,506,451CR	\$222,344CR	\$2,212,498	\$2,467,284	\$2,157,311	\$2,345,143	\$2,537,692
TAX REFUNDS	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DEPRECIATION	\$0	\$1,446,724	\$1,253,828	\$1,086,650	\$941,764	\$816,195	\$717,369
DEPLETION	\$0	\$0	\$0	\$0	\$0	\$0	\$0
LOSS FORWARD	\$0	\$3,352,229	\$1,154,222	\$0	\$0	\$0	\$0
CASH FLOW	\$4,506,451CR	\$4,576,609	\$4,620,547	\$3,553,934	\$3,099,075	\$3,162,037	\$3,245,661
CAPITAL COST	\$10,850,432	\$0	\$0	\$0	\$0	\$0	\$0
PRINCIPAL WORKING	\$23,848,064CR	\$1,358,966	\$1,522,642	\$1,704,687	\$1,909,250	\$2,138,761	\$2,344,963
CAPITAL NET	\$19,732,008CR	\$0	\$0	\$0	\$0	\$0	\$0
SALVAGE	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NET CASH FLOW	\$11,240,820CR	\$3,217,644	\$3,098,516	\$1,849,247	\$1,189,825	\$1,023,278	\$851,699

YEAR	7	8	9	10	11	12	13
REVENUE	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000
ROYALTY	\$0	\$0	\$0	\$0	\$0	\$0	\$0
INTEREST	\$1,538,374	\$1,216,491	\$855,982	\$452,212	\$0	\$0	\$0
DEPRECIATION	\$71,362,560	\$71,362,560	\$71,362,560	\$71,362,560	\$71,362,560	\$71,362,560	\$71,362,560
BEFORE	\$8,169,114	\$7,421,949	\$6,181,438	\$5,185,228	\$5,185,228	\$5,185,228	\$5,185,228
DEPLETION	\$5,486,012	\$5,889,636	\$6,288,096	\$6,691,866	\$7,144,078	\$7,144,078	\$7,144,078
TAXABLE	\$2,683,102	\$1,532,313	\$0	\$0	\$0	\$0	\$0
INCOME	\$5,486,012	\$5,889,636	\$6,288,096	\$6,691,866	\$7,144,078	\$7,144,078	\$7,144,078
LOSS	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FORWARD	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TAXES	\$2,748,355	\$2,940,902	\$3,130,313	\$3,322,552	\$3,541,530	\$3,531,027	\$3,531,027
INVESTMENT	\$2,748,355	\$2,940,902	\$3,130,313	\$3,322,552	\$3,541,530	\$3,531,027	\$3,531,027
TAX CREDIT	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NET INCOME	\$2,737,657	\$2,948,735	\$3,157,783	\$3,369,315	\$3,602,549	\$3,613,151	\$3,613,151
TAX	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DEFERRED	\$613,153	\$531,313	\$493,362	\$473,362	\$493,362	\$493,362	\$493,362
DEPLETION	\$0	\$0	\$0	\$0	\$0	\$0	\$0
LOSS	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FORWARD	\$0	\$0	\$0	\$0	\$0	\$0	\$0
CASH FLOW	\$3,350,710	\$3,440,047	\$3,651,145	\$3,862,676	\$4,095,910	\$4,106,413	\$4,106,413
CAPITAL	\$0	\$0	\$0	\$0	\$0	\$0	\$0
COST	\$2,682,350	\$3,006,242	\$3,364,751	\$3,768,436	\$0	\$0	\$0
PRINCIPAL	\$2,682,350	\$3,006,242	\$3,364,751	\$3,768,436	\$0	\$0	\$0
WORKING	\$0	\$0	\$0	\$0	\$0	\$0	\$0
CAPITAL	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NET	\$0	\$0	\$0	\$0	\$0	\$0	\$0
SALVAGE	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NET CASH	\$668,352	\$675,806	\$286,394	\$36,241	\$4,095,910	\$4,106,413	\$4,106,413

YEAR	21	22	23	24	25	26	27
REVENUE	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000
ROYALTY	\$0	\$0	\$0	\$0	\$0	\$0	\$0
INTEREST	\$219,633	\$185,061	\$146,339	\$102,971	\$54,399	\$0	\$0
OPERATING							
COST	\$71,362,560	\$71,362,560	\$71,362,560	\$71,362,560	\$71,362,560	\$71,362,560	\$71,362,560
DEPRECIATION	\$122,295	\$105,989	\$91,857	\$85,296	\$85,296	\$85,296	\$85,296
BEFORE							
DEPLETION							
INCOME	\$7,295,511	\$7,346,390	\$7,399,243	\$7,449,172	\$7,497,745	\$7,552,144	\$7,552,144
DEPLETION	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TAXABLE							
INCOME	\$7,295,511	\$7,346,390	\$7,399,243	\$7,449,172	\$7,497,745	\$7,552,144	\$7,552,144
LOSS							
FORWARD	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TAXES	\$3,610,734	\$3,534,357	\$3,658,952	\$3,682,015	\$3,705,317	\$3,731,003	\$3,731,545
INVESTMENT							
TAX CREDIT	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NET INCOME	\$3,684,778	\$3,712,034	\$3,740,291	\$3,767,157	\$3,792,429	\$3,820,342	\$3,821,599
TAX							
REFUNDS	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DEPRECIATION	\$122,295	\$105,989	\$91,857	\$85,296	\$85,296	\$85,296	\$85,296
DEPLETION	\$0	\$0	\$0	\$0	\$0	\$0	\$0
LOSS							
FORWARD	\$0	\$0	\$0	\$0	\$0	\$0	\$0
CASH FLOW	\$3,807,073	\$3,818,022	\$3,832,148	\$3,852,453	\$3,877,724	\$3,905,637	\$3,916,895
CAPITAL							
COST	\$0	\$0	\$0	\$0	\$0	\$0	\$0
PRINCIPAL	\$288,105	\$322,678	\$361,399	\$404,767	\$453,326	\$0	\$0
WORKING							
CAPITAL	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NET							
SALVAGE	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NET CASH							
FLOW	\$3,518,967	\$3,495,345	\$3,470,749	\$3,447,686	\$3,424,398	\$3,905,637	\$3,916,895

YEAR	14	15	16	17	18	19	20
REVENUE	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000	\$79,000,000
ROYALTY	\$0	\$0	\$0	\$0	\$0	\$0	\$0
INTEREST	\$0	\$0	\$344,260	\$324,642	\$302,671	\$278,063	\$250,572
OPERATING COST	\$71,362,560	\$72,832,240	\$71,362,560	\$71,362,560	\$71,362,560	\$71,362,560	\$71,362,560
DEPRECIATION	\$493,362	\$493,362	\$250,120	\$216,771	\$187,868	\$162,819	\$141,110
BEFORE DEPLETION INCOME	\$7,144,078	\$5,674,398	\$7,043,060	\$7,096,026	\$7,146,901	\$7,196,558	\$7,245,828
DEPLETION	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TAXABLE INCOME	\$7,144,078	\$5,674,398	\$7,043,060	\$7,096,026	\$7,146,901	\$7,196,558	\$7,245,828
LOSS FORWARD	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TAXES	\$3,531,027	\$2,781,491	\$3,523,638	\$3,518,502	\$3,542,629	\$3,564,584	\$3,587,764
INVESTMENT TAX CREDIT	\$0	\$0	\$140,690	\$0	\$0	\$0	\$0
NET INCOME	\$3,613,051	\$2,892,908	\$3,660,112	\$3,577,525	\$3,604,273	\$3,631,975	\$3,658,065
TAX REFUNDS	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DEPRECIATION	\$493,362	\$493,362	\$250,120	\$216,771	\$187,868	\$162,819	\$141,110
DEPLETION	\$0	\$0	\$0	\$0	\$0	\$0	\$0
LOSS FORWARD	\$0	\$0	\$0	\$0	\$0	\$0	\$0
CASH FLOW	\$4,106,413	\$3,386,269	\$3,910,232	\$3,794,295	\$3,792,740	\$3,794,393	\$3,799,174
CAPITAL COST	\$0	\$1,875,900	\$0	\$0	\$0	\$0	\$0
PRINCIPAL	\$0	\$2,868,833CR	\$163,479	\$183,096	\$205,068	\$229,676	\$257,227
WORKING CAPITAL	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NET SALVAGE	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NET CASH FLOW	\$4,106,413	\$4,379,202	\$3,746,753	\$3,611,199	\$3,587,673	\$3,564,718	\$3,541,937

YEAR	28	29	30	31	32	33	34
REVENUE	\$79,000,000	\$79,000,000	\$79,000,000				
ROYALTY	\$0	\$0	\$0				
INTEREST	\$0	\$0	\$0				
OPERATING COST	\$71,362,500	\$71,362,500	\$71,362,500				
DEPRECIATION	\$85,296	\$85,296	\$85,296				
BEFORE DEPLETION INCOME	\$7,552,144	\$7,552,144	\$7,552,144				
DEPLETION	\$0	\$0	\$0				
TAXABLE INCOME	\$7,552,144	\$7,552,144	\$7,552,144				
LOSS FORWARD	\$0	\$0	\$0				
TAXES	\$3,730,545	\$3,730,545	\$3,730,541				
INVESTMENT TAX CREDIT	\$0	\$0	\$0				
NET INCOME	\$3,821,599	\$3,821,599	\$3,821,603				
TAX REFUNDS	\$0	\$0	\$0				
DEPRECIATION	\$85,296	\$85,296	\$85,296				
DEPLETION	\$0	\$0	\$0				
LOSS FORWARD	\$0	\$0	\$0				
CASH FLOW	\$3,906,895	\$3,906,895	\$3,906,899				
CAPITAL COST	\$0	\$0	\$0				
PRINCIPAL	\$0	\$0	\$0				
WORKING CAPITAL	\$0	\$0	\$19,732,000				
NET SALVAGE	\$0	\$0	\$4				
NET CASH FLOW	\$3,906,895	\$3,906,895	\$23,638,896				

MEASURES SUMMARY

***** DISCOUNTED CASH FLOW RATE OF RETURN *****

THERE IS 1 CALCULATED RATE
DCFROR = 19.142 %

***** NET PRESENT VALUE *****

NPV = \$2,476,276
MINIMUM RATE OF RETURN IS 16.00 (%)

***** PAYBACK PERIOD-NOT DISCOUNTED *****

PROJECT PAYS OUT IN 6.0177 YEARS

***** PAYBACK PERIOD-DISCOUNTED *****

PROJECT PAYS OUT IN 14.8573 YEARS

***** REVENUE REQUIREMENT *****

REVENUE REQUIREMENT IS \$73,189,088