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Economic Considerations Relating to the Sale of Municipal Utilities

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INTRODUCTION

Today approximately 3,500 electric utility systems in the United States are owned by investors, cities, and consumers, such as rural electric cooperatives. About 2,000 of these electric systems are municipal (city-owned) and serve 13.5% of the consumers in the United States, while the investor-owned utilities total around 480 and serve 79.0% of the customers. The remaining 1,000 systems are rural cooperatives which serve 7.5% of the consumers. [1]

This publication concerns a study of the 2,000 electric systems that are municipally owned. They constitute more than half of the electric systems in the United States but serve only 13.5% of the consumers, thus most of them are smaller than the investor-owned systems.

Statement of Problem

Some cities with municipal systems are questioning the desirability of such ownership as opposed to selling these facilities to investor-owned utilities. Currently a municipality considering sale of its electric system usually has no guide as to the factors that should be evaluated in connection with such a transaction. Since previous research was found to be incomplete, inadequate, or inapplicable for making this decision, this study was undertaken to develop a framework which will be useful to municipalities in delineating the factors, and their significance, which should be considered in making this decision.

The question of whether or not a municipality should own its electric system frequently becomes involved with political and philosophical values. This study does not consider these aspects of the arguments in favor of, or opposed to, municipal ownership. It is confined to the economic aspects of a change in ownership for an individual community. This does not imply that these political and philosophical considerations are unimportant. They are important and must be considered along with the economic factors. Thus, it is not the intent of this paper to show that all or any municipalities

[1] Federal Power Commission, National Power Survey, U. S. Government Printing Office, Washington, D.C., 1964, Part I, pp. 15-26.

should or should not own their electric systems. That decision must be left to the individual municipalities to consider in light of their values and their particular economic situation.

A city should weigh both the cost and benefit to the governmental units and to its residents when considering the sale of its electric system to an investor-owned utility. Not all the costs and benefits are explicit to a city as there may also be implicit costs and benefits to electric consumers.

An example of an explicit cost to a city upon a sale is the loss of revenue or profit to the city government as well as possible increased cost of electric service for the functions of street lighting and water pumping.

Also significant to a city are the implicit costs and benefits of a change to investor ownership. By "implicit" is meant the costs and benefits which do not directly affect the city government but rather those costs and benefits that accrue to residents or electric consumers. The most likely form of an implicit cost or benefit is a change in the electric rates. However, changes may also occur in employment opportunities and wage rates in the community. Thus, a decision-making framework that includes the explicit and implicit costs and benefits is necessary for a city to make a rational economic decision to retain or sell its electric system.

Objectives

In general, the objective of this study is to devise an economic model which will offer guidelines for cities considering the sale of their municipal electric systems.

Specifically, the research in this study has the following objectives:

(1) To determine the factors that communities should evaluate if they are considering the sale of their electric system.
(2) To measure, where feasible, the dollar amount of changes in factors that significantly vary with ownership.
(3) To apply these factors and their measurement (as an example) to the Municipal Electric System of Brookings, South Dakota.

Procedure

The study was conducted using Brookings, South Dakota as a focal point. Data were obtained from private and public power companies, from city and other public officials and from various secondary sources such as governmental agencies regarding:

(1) costs of operation
(2) capitalization
(3) rate schedules and revenue
(4) taxes and taxation policy
(5) net margins and their disposition
(6) other factors that may change with ownership

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External factors as well as internal factors enter into the decision of whether or not a city should sell its electric utilities.

Thus, any municipality considering the ownership status of its electric utility must take into account the structure of the electric power industry (both public and private) in the surrounding region. This becomes important in identifying potential purchasers for the system and in identifying alternative sources of power in the event the city decides not to sell the system but to purchase power from other sources.

For purposes of this study the Missouri River Basin is the relevant geographic area in which Brookings is situated. Along the Missouri River in North Dakota, Montana, and South Dakota are a number of power producing dams with total generating capacity of slightly over 2,000,000 kilowatts.[2] These dams and the power destination points are interconnected by the Bureau of Reclamation's high voltage transmission lines.

Facilities of the Bureau of Reclamation are of particular significance because municipalities are "preference customers." This designation means that municipalities have the first option to purchase power from the Bureau. Any power not purchased by preference customers is offered to investor-owned companies. The opportunity to obtain low-cost power from the Bureau of Reclamation has enabled many municipalities in the region to achieve lower operating expenses by curtailing or ending local generation.

Brookings Municipal System

The Brookings Municipal Electric System is described here in some detail since it is used in an application of the economic model. The characteristics of the Brookings system have undergone definite change since power became available from the Bureau of Reclamation. Previous to 1952 Brookings generated all power needed within the city. However, in 1952 the city began power purchases from Otter Tail Power Company; and in 1954, as power became available from the dams being constructed on the Missouri River, the city purchased power from the Bureau of Reclamation. This power is currently supplied to the city at a cost of about 5 mills per kilowatt-hour (K.W.H.). This is lower than the marginal cost of generation associated with the facilities in the Brookings plant. Therefore, the city has placed its electric plant on a stand-by basis and has contracted with the Bureau of Reclamation to supply the electric power for the city. This contract guarantees that 6,798 kilowatts will be available to Brookings for the life of a 20-year contract signed in 1966. Furthermore, since a number of the preference customers, especially rural electric cooperatives, are not using their full allotments, the Bureau expects that it will be able to supply all of Brookings' projected power needs through 1972.[3]

Current facilities of the Brookings System may be grouped into the categories of the transmission and distribution system, the power plant, and the steam heating system. The transmission and distribution system consists of the necessary lines, poles, transformers, switching gear, and other facilities needed to deliver the power to the consumers from the Bureau of Reclamation sub-station about 3 miles north of the city. The system is undergoing continuous expansion as additional distribution lines are installed to serve new homes and businesses and as new looped transmission lines are built to insure greater reliability of service.

The power plant in Brookings is now used for stand-by service and for steam heating of the downtown area. The plant contains as major equipment 3 boilers and 3 turbine-generator units that can produce a total of 5,250 kilowatts. The actual capacity of the plant depends on the outdoor temperature as wooden cooling towers of limited capacity are used in the condensation process. Lower outdoor temperatures

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[2] Martin Oleson, Jr. Project Manager, U.S. Bureau of Reclamation, interview on August 30, 1967.

[3] Ibid.

make the condensation process more efficient and permit the generation of electricity at levels closer to full capacity. In the event of interruption of power from the normal (Bureau of Reclamation) source, the power plant is able to carry at least part of the electrical load of the city which reached a high of 8,295 kilowatts on January 5, 1968.[4] If the power is off for an extended period of time, the limited power from the plant can be alternately supplied to the various sections of Brookings to prevent physical damage to buildings or contents.

The steam heat furnished by the power plant is distributed through tunnels and sold to schools and most business places in the downtown area. This method of heating is preferred by most businessmen as it eliminates the need for a separate boiler in each building and enables the firms to obtain some reduction in insurance costs.[5] The city is, of course, faced with the cost of maintaining the system and the cost of the fuel and labor to produce the steam. In previous years when the city was using its plant to generate electricity, the cost of producing the steam was attributed to the generation of electricity; and the steam could be sold as a by-product with the primary cost being its distribution. Now, however, generation of electricity is usually not conducted locally, and all costs of steam production must be attributed to the heating system.

THE ECONOMIC MODEL

An economic model is a device to show relationships between variables and their interactions with each other. In the case of an economic model of a municipal electric system, seven major variables may be identified. They are electric rates, taxation, finance, services, expansion, management, and employment. These variables are considerably interrelated and a change in one usually affects other variables in the model.

Figure 1 delineates the variables and their major components. The diagram is not intended to be all inclusive of every possible interaction between variables, but it does indicate the major interactions between variables of a municipal electric system model.

While variables of this economic model may be examined in many possible orders, this report considers them as follows: electricity rates, taxation, finance, services, expansion, management, and employment. These variables or factors are of great significance for a city deciding to retain or sell its electric system. Some economic variables or factors may be positive to municipal ownership of the electric utility and others may be negative, thus, decision makers must balance and weigh the factors to arrive at an optimal economic decision for their community.

Electricty Rates

Rates for electricity are influenced by, and have a number of influences on, other variables. These rates, as well as the other variables, are connected with management because municipal officials determine rates to be charged. Electricity rates influence finance because they are a major determinant of the net revenues of the system. Rates charged the public may be important in the attraction of new industry to the community. Rates which the city charges itself for electricity affects the amount of property taxes that it must

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[4] Elmer Thon, Jr., superintendent of Municipal Electric System, Brookings, S.D., interview on February 5, 1968.

[5] Earl L. Bullington, insurance agent for Fishback Agency, Brookings, S.D., interview on April 15, 1968.

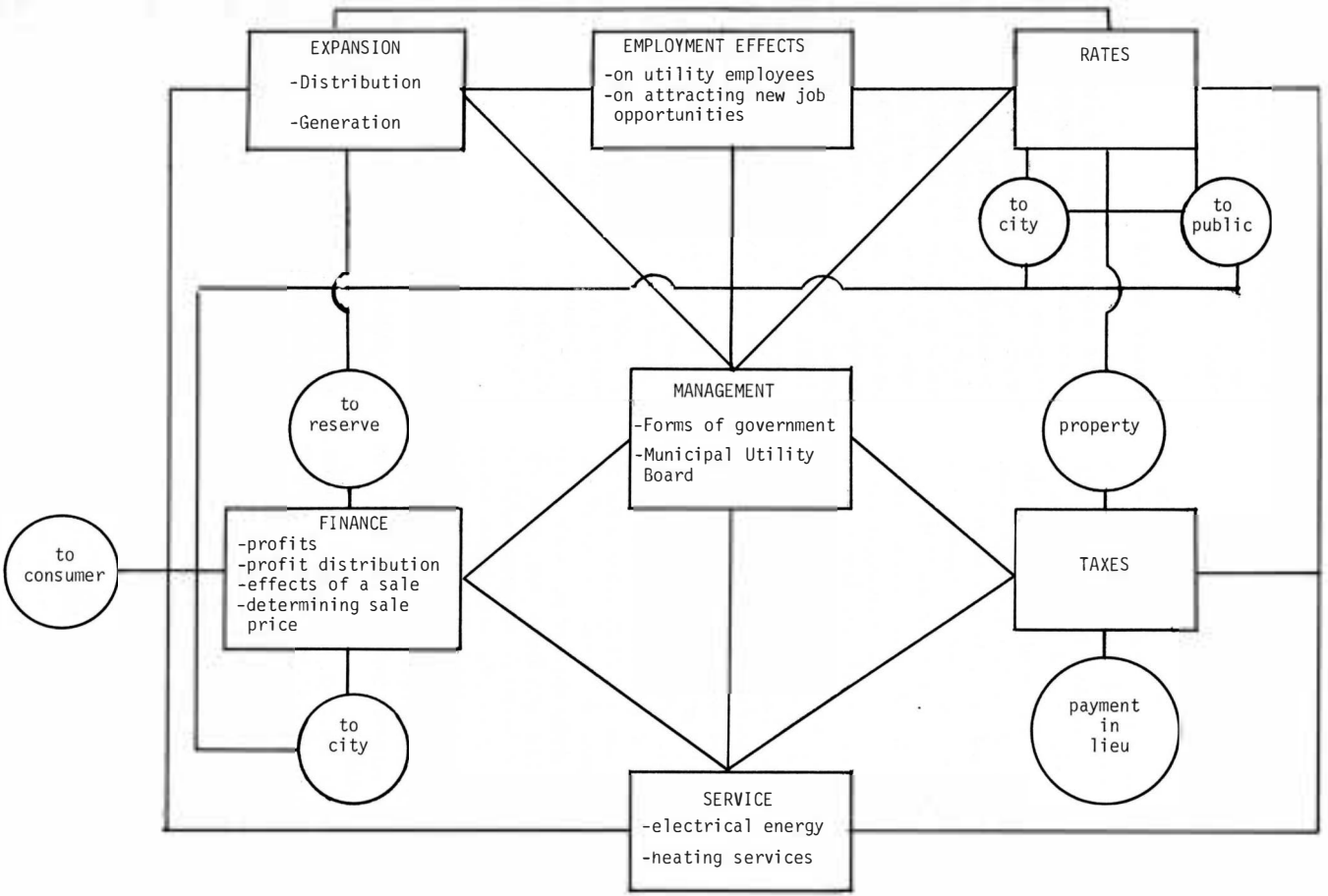

Figure 1 — The economic variables and their interrelationships.

levy to pay for the cost of operating the city.

Rates to the Public

Any difference between an investor-owned company and a municipality in rates charged for electricity can be quite significant to the consuming public and should be considered by any city contemplating sale of its electric system. Rates for electric service to the public are generally divided into three classifications: residential, commerical, and power or industrial.

To study the effects of rate changes, the municipality considering sale of its electric system should determine the cost of electricity to the various groups of consumers under the new ownership. This may be done by either of two methods. The first method involves an estimation of annual cost of electric service for each consumer under the schedule of rates of the prospective purchaser and then totaling the cost for all consumers for the year. Once the total cost to all customers under the rate schedule of the prospective purchaser has been obtained, it should be compared with the total cost to the consumers under municipal ownership to indicate which ownership constitutes the lower cost to the consumer. This method is the more accurate but also the more time consuming.

The second, but less accurate, method of estimating amount of rate changes involves average monthly consumption in K.W.H. of each class of consumers. Charges are computed by multiplying the K.W.H. by the appropriate rate. The difference in charges by the prospective purchaser to each consumer from those of the municipal system for the average monthly consumption may be multiplied by 12 to obtain the total difference in charges on an annual basis. This yearly difference is multiplied by the number of consumers in each classification; and if the resulting products are aggregated, the approximate total amount of changes in electricity cost to all consumers may be determined.

Rates to the City

Attention must also be given to the effect that a sale to an investor-owned company would have on the costs of power to the municipality. Usually considerable electricity must be purchased by the municipality for city buildings, such as a hospital if municipally operated, for city hall, water pumping stations, and sewage plants. Another major electrical expense is street lighting which frequently includes installation and maintenance expenses. To best estimate these costs to the city under an investor-owned utility, detailed rate sheets for municipal services should be obtained from prospective buyers. From the city's known usage of electricity in the last year for each function, it is possible to make a reasonable estimate of the cost of electricity and then contrast that with the amount presently charged by the municipal system.

TAXATION

Taxes are another economic variable or factor that should be examined by any community considering sale of its municipal electric system. The amount of taxes collected has a direct bearing on city finances, as this is the major source of revenue for most cities. The local property taxes, over which the city has some control, may also have an employment effect as low levies might help attract new industry.

Income Tax

Federal and state laws in regard to income tax place a burden on the in-

vestor-owned utilities that is not shared by the municipal utilities. The federal corporation tax rate is as high as 48% and in addition many states also impose a tax on the net income of investor-owned utilities.[6] The intergovernmental immunities doctrine exempts municipalities from paying income tax on income derived from municipal investments.[7] Thus, a municipality does not face any income taxes on the operation of its electric system.

The federal income tax laws also give an advantage to municipalities as opposed to investor-owned utilities in the issuance of bonds. The federal government does not tax interest received by investors from bonds issued by another level of government. However, the interest received on bonds issued by investor-owned utilities is taxable. Therefore, a municipality finds that it can borrow money for its electric system at a much lower rate than can an investor-owned utility.

Sale of a municipal system to an investor-owned utility would provide additional income tax revenue for the federal and possibly state governments. However, this additional revenue would be so small in relation to the total governmental revenues that the community making the sale would not experience any significant reduction in the income taxes that its residents would have to pay. Moreover, income taxes that the investor-owned utility would have to pay might be reflected in higher electricity rates for the consumers.

Property Tax

While the foregoing differences exist with regard to income taxation, the local property tax changes are likely to be of the most interest to a community considering sale of its electric system. The change to investor ownership means the addition of the property of the system to the tax rolls. Under municipal ownership it is, of course, not necessary to make property tax payments because property of units of government is not subject to taxation. The tax payment required from the investor-owned utility is distributed to the city, school district, county, and sometimes the state. While the city does receive a tax payment on the utility property of the investor-owned utility, the tax reductions to others could be entirely offset by other factors such as higher rates charged the city or other consumers. Other units of government, however, are likely to find the tax payment received by them to be greater than any additional costs from higher rates due to a change in ownership. For individuals, if the costs of local government remain unchanged the tax bills of individuals would probably be reduced.

A community can determine the property taxes that it would receive as a result of a change to investor ownership by evaluating the property it is selling and applying the current tax levies to the assessed value. Frequently the state department of taxation evaluates all utility property in the state and provides the best assistance in determining the assessed value of a municipal system.

In-Lieu-of-Tax Payments

Since local units of government do not receive property tax payments under municipal ownership, one solution is for the electric system to make voluntary contributions to the units of government. These contri-

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[6] Luman H. Long, *The 1968 World Almanac,* Newspaper Enterprise Association, Incorporated, Cleveland, Ohio, 1967, p. 886.

[7] Graves, W.B., *American Intergovernmental Relations,* 1964 Charles Scribner's Sons, New York, p. 446.

butions may or may not be equal to the taxes that would have been paid if the system were privately owned. These in-lieu-of-tax payments are usually regulated by state law. For example, in the state of South Dakota such payments can be made only to the city and school district but not to the county.

In-lieu-of-tax payments are likely to insure greater equitability in the treatment of taxpayers and electricity consumers within a city. As an illustration, consider a situation where a municipal utility, that does not make any in-lieu-of-tax payments to the units of local government, sells electricity near cost to a user who is also paying property taxes. This difference in electricity costs between municipal and investor ownership for the user is paid by taxpayers in the form of higher property taxes. If the property tax payment of the user is relatively small in relation to electricity purchases, it is likely that the user receives a hidden subsidy from other taxpayers due to the absence of any in-lieu-of-tax payments by the municipal utility. On the other hand, if tax payments are large relative to the electricity purchases of the user, then he is subsidizing those in the community who pay out relatively more for electricity than they pay in property taxes.

Furthermore, in-lieu-of-tax payments that go to the school districts operate more to the benefit of those people in the community who have children in school and who pay taxes than to those who do not own property, have children in school, and purchase electricity. In a society such as ours everybody subsidizes everybody else in some way, thus under either arrangement of electrical utility ownership, certain groups in the community receive more benefit than other groups relative to their costs. Certain taxes fall more heavily on one group than on another. Ideally the aim must be for a system of taxes that balances tax advantages and disadvantages and results in equitable treatment when all taxes are considered. Thus, the community should consider the effects of the sale or continued operation of the utility on the total tax system in the community.

Finance

The variable of finance and its components are interconnected with many other variables of the model, including management, service, rates, taxes, and expansion. In turn finance exerts a major influence on rates for both the public and city, on property taxes, and on expansion of the physical facilities of the system.

In this section attention is focused on: (a) profits and their disposition under municipal ownership, and (b) the methods of valuation for determining the sale price of the system.

Profit

The decision makers under municipal ownership, the city council or commission or utility board, have great latitude in determining the net margin or profit of the electric utility system. The prime mechanism available to them to determine the profit level is the rate schedule for sale of electric energy. Most municipalities generally are able to set their electric rates below those charged by investor-owned companies and yet are able to achieve a satisfactory profit level.

This is possible because municipal systems have a number of advantages over investor-owned systems. One major advantage is that municipal systems are not required to pay income or property taxes. Also, municipalities are able to borrow money at a rate about 2% below that paid by investor-owned companies. This difference exists because interest from

municipal bonds is not subject to federal income tax. A final significant advantage for municipalities in some areas is the availability of low cost power from public projects.

Profit Disposition

When a municipality has profits available from its electric system, city officials must make a decision regarding their disposition. Basically, there are three choices for disposing of the profits: (1) transfer to other city funds, part or all of which may be in lieu of taxes, (2) accumulation of reserves which may be used for future expansion of the system, (3) rebates to the consumer.

Choices made by the city officials are influenced by their concept of the ideal capital structure of the electric utility. The capital structure refers to the relationships between liabilities, net worth, and total assets. There are the two extreme positions of either (a) liabilities being equal to assets and net worth equal to zero, or (b) liabilities being zero and net worth equal to assets. Between these positions there are, of course, an infinite number of variations of the relative size of net worth to liabilities.

Once city officials decide what the capital structure should be, the disposition of profits is simplified. If it is decided that liabilities should be large relative to assets, there is no need for large reserves for capital investment since expansion would be financed through the sale of bonds. Profits can then be transferred to the general fund of the city or returned to the consumers. If the decision by the city officials is to have liabilities low relative to assets, it is then necessar to use the profits for current capital investment and accumulation in a reserve fund for future expansion projects.

Part of the problem regarding disposition of profits from municipal enterprises stems from uncertainty of ownership of the enterprise. One group argues that the city is the owner and is therefore deserving of receiving all profits. It is true in the legal sense that a city owns the enterprise. However, others contend it was not the city—through the taxpayer—that paid for the enterprise and built up its net worth. Rather, the consumers of the service have paid over the years somewhat more than the actual expense and through the resulting net revenues the consumers thereby paid off the liabilities and raised the net worth. Thus, the city is only deserving of an amount in-lieu-of-taxes comparable to the property taxes that would be paid by an investor-owned utility on the same property with the remaining profits being returned to the consumers who paid for the system. This latter is difficult to carry out because of population mobility etc., so a common compromise is to return the profits to the present consumers. In many cases these are the same people who paid for the system in previous years. If the return of profits would be attempted through lower tax rates, those who do not pay taxes but do purchase electricity, such as home renters, churches, and schools, would not be receiving any refund of the profits. Thus, a more equitable method is a direct return of cash to the consumers.

Sioux Center, Iowa, is a city that makes an annual cash refund to its electricity and gas consumers each December. It returns at least a portion of the profit to the consumers each year which serves as a reminder of the benefits of municipal ownership.[8]

Effects of a Sale

The major effect on municipal finances due to the sale of a municipal

[8] Maurice A. TePaske, mayor of Sioux Center, Iowa, interview on September 28, 1967.

electric system is, of course, the loss of profits for both the present and the future. In the infrequent case where money is being lost with a municipal system, a sale would mean the end of a drain on the city treasury.

The major beneficial effect on municipal finances of a sale is the receipt of the sale price from the buyer of the system. The benefit of this sum can be best evaluated in terms of the earnings it can produce each year when invested in some alternative opportunity. By this means there would be a steady income each year from the invested proceeds of a sale just as profits would have probably continued each year if the system would have not been sold and comparable rates had been charged.

To make an accurate comparison between municipal and investor ownerships the investment of the proceeds of a sale should be made in a form that has risks about equal to that of the utility sold. The city can choose, if it wishes, to keep its funds in safer investments such as government bonds and may be required by state law to do so. Once the form of investment is determined, an estimate of the percentage return may be made and multiplied by the sum invested. The gain to the city from this investment and other possible benefits of investor ownership should be compared with any additional costs that may result from a change of ownership.

Determining Sale Price

Valuation of a utility by a prospective purchaser is of definite importance to the seller as it determines the price to be offered. Value in the broadest sense connotes the measure of the desirability of ownership of the property. On this basis it can be said that the measure of value is the present worth, to the present owner and the would-be purchaser, of the probable future incomes expected from the property including the value of the franchise, during its probable future productive life in service.[9] Since it is frequently difficult under the earnings approach to make good estimates of future income, professional appraisers often turn to other indicators or evidences of value. In particular these are (1) cost evidences, and (2) market evidences. These may also be used in combination when the appraiser feels that this method better determines the true value.

The earnings approach to the determination of value of a utility requires the assessment of the present worth of costs and revenues projected over the life of the enterprise. Once these have been determined then the basic formula is the sum of the present worth of the future annual net incomes over the life of the venture and the present worth of the net revenue from the disposal of property not needed to produce the preceding income. Mathematically it may be expressed as follows:

$$\text{Value} = \frac{\text{Disposed}}{\text{Property}} + \frac{\text{Profit}^1}{(1+i)\,1} + \frac{\text{Profit}^2}{(1+i)\,2} + \ldots + \frac{\text{Profit}^n}{(1+i)^n}$$

Where i is the rate of return desired by the purchaser and the *subscripts* on profit refer to specific future years.

The cost evidences of value method involves not only the appraisal of physical assets of the utility but also the appraisal of the intangible and liquid assets assocaited with the property. The value of the physical assets may be based on original cost, replacement cost, or reproduction cost with

[9] Harold A. Cowles, *Valuation of a Utility by a Prospective Purchaser,* A report presented at the National Conference of Electric and Gas Utility Accountants, Washington, D.C., April 5-7, 1965.

an adjustment to reflect the service that has been already consumed. After a cost basis has been determined for each item among the physical assets, it is only necessary to aggregate them to obtain a valuation of the physical assets through the cost approach. The appraiser must then determine the value of intangible assets such as franchises, easements, and goodwill. This is generally done by determining the cost of acquiring these assets or by making an estimate of the present worth of future earnings that can be attributed to these assets. Finally, an enumeration of the liquid assets that are being sold must be made and combined with the previous totals for physical and intangible assets to obtain a total valuation for the utility.

Market evidences of value are principally used for those properties which are exchanged in an open market at frequent intervals. The market provides little indication of value of electric utilities directly as they are infrequently sold. In some cases the market value of a firm's stocks and bonds is used to determine the value of a firm. However, this approach is of no value for a municipal utility as there are no shares outstanding.

In summary, the valuation of a municipal utility is likely to be accomplished by earnings or cost evidences. Use of the earnings approach usually indicates a higher valuation for a municipal electric system particularly in those situations where a large capital investment has been made very recently but little return is being received on it by the present municipal owners.

SERVICE

Service is defined for this section as the supplying of electrical energy of proper quality to consumers and the performing of other functions that would, in the absence of the utility, have to be performed by others.

The level and type of services depend on decisions made in the management sector, and service in turn influences other variables. A high quality of service helps to promote increased electricity consumption and thereby influences the finance variable through the profit function and the expansion variable through the need for increased distribution facilities. The expansion of distribution facilities in turn might result in an improvement in service.

Electrical Energy

Foremost among the service considerations is that of the quality of the electrical energy supplied to the consumer. The electricity should be furnished to the consumer at the proper voltages and quantities with a minimum of outages. For this to be accomplished the distribution system must be maintained about the same under either ownership. If a municipality's present maintenance is poor and results in low voltages and numerous outages in comparison with that of an investor-owned company, then this must be taken into account when the costs and benefits of changing to private ownership are considered. Under these circumstances probably the best way to determine the dollar value of the maintenance improvement is for the municipality to determine the additional annual cost needed to bring its service up to the standards of the investor-owned utility. This requires an estimation of the cost of the additional labor and supplies needed along with a depreciation schedule for estimating the yearly cost of capital expenditures necessary to improve the system. On the other hand if the municipality presently provides service superior to the investor-owned utility the community must consider the cost of the lower quality service.

Other Services

Many municipal systems also provide other services besides electrical energy to the city and to consumers. Examples include steam heat for downtown businesses, installation of city Christmas decorations, and monitoring of city equipment. These services may change with different ownership of the system. The costs and benefits of these changes need to be evaluated and considered in monetary terms where possible.

EXPANSION

Expansion of a community's electric system influences the variable of finance through the additional revenues and probable profits from furnishing more electricity. The degree of readiness for expansion depends in part on the availability of reserves or a bond issue to finance the program. The need for expansion can be produced by the employment variable through the attraction of additional firms or the expansion of existing industries in a community. Need for expansion can also be indicated by poor service such as low voltages and frequent outages. The management sector, of course, plans and carries out the expansion projects.

Expansion may involve generation of additional power as demand grows and/or construction of additional distribution facilities to bring it to the consumer. Ownership—private or public—of a city's system has a definite effect upon the importance local officials and residents must attach to expansion of electric facilities. If investor-owned, officials of the company make decisions regarding expansion of their electric system. They need to include in evaluation of expansion potential the alternative sources of power available and the needs for additional distribution facilities.

A municipality that has decided to retain its electric system usually has several sources of electric power available for expansion. The three most usual sources of power are: (1) local generation in the municipal plant, (2) power purchased from a public power source, and (3) a large plant owned by a number of municipalities with transmission over high-voltage lines to the various cities.

Local Generation

Generally, the outlook is dim for use of the electric plant in each municipality to produce the additional energy needed each year. It is economically rational to use local generation to meet the additional demand only when the marginal cost of generation is less than the marginal cost of power from other sources. In the Missouri River Basin Area the marginal cost of local generation must be less than about 5 mills per K.W.H. because power generally can be purchased from the Bureau of Reclamation for that marginal cost.[10]

If capacity is not available in the present generating equipment of the city to meet the growing demand, it is usually unwise to make an addition to the local plant. This is because the technology of power production permits the lowest construction costs and operating expenses per kilowatt when units of 400,000 kilowatts or larger are erected.[11] Most municipal systems do not require nearly that large a unit. Thus, a municipality frequently finds it financially advantageous to purchase

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[10] Martin Oleson, Jr., project manager, U.S. Bureau of Reclamation, Huron, S.D., interview on August 29, 1967.

[11] Federal Power Commission, *Steam Electric Plant Construction Cost and Annual Production Expenses-1965,* U.S. Government Printing Office, Washington, D.C., 1966.

power from a large plant and pay the necessary transmission costs rather than add to existing facilities.

Purchased Power

Many municipalities have found it advantageous to purchase power from publicly or investor-owned systems rather than use local generation. It may be economically feasible in some instances for a municipality to purchase power only beyond the capacity of the local plant. In other instances the operating costs of the local plant may be so high that it is best to purchase all the power needed by the municipal electric system. In this case a potential source of power for the municipal system may be an investor-owned system. If the wholesale power cost is lower than any alternatives, it would be advantageous for the municipal system to purchase power from the investor-owned system.

Most municipal systems in the Missouri River Basin currently purchase needed power from the Bureau of Reclamation. Basically, this is because the Bureau offers to supply power at a price lower than charged by investor-owned systems. Since demand for power by the preference customers, those that are publicly owned such as municipal systems, is greater than the supply available for sale by the Bureau, each preference customer is given an allotment based on the power usage and the requests of each community. The Bureau guarantees to supply an amount of power up to the allotment of the preference customer for the life of the contract, which is usually 20 years. Since not all preference customers are taking their full allotments, the Bureau is able to supply additional power until about 1972 to those municipalities that desire power beyond their allotments. However, by 1972 the load growth of the various customers is expected to allow the Bureau to supply only the basic allotment of power to each community.

Possible developments that may enable the Bureau to satisfy all the power needs of its preference customers beyond 1972 include erection of transmission lines to other systems from which additional power may be secured during the peak winter demand. Another development would be the construction of additional lignite or atomic power facilities in the region to supply power to systems and thereby free or increase allotments for municipalities. These developments depend on the attitude toward public power of the political administration in Washington.

Group Municipal Power

A possible alternative to local generation or purchased power is for municipalities to join in erection and ownership of a common generating plant. This action allows municipalities to reap some of the economies of scale of electricity generation. However, intercommunity cooperation of this nature is not legally possible in all instances. A number of states do not have laws permitting cooperation between communities, but many states are working to establish such laws. For example, the 1965 legislature in Iowa passed a law not only permitting but encouraging cooperation between communities especially in regard to utilities. Minnesota has done likewise but has restricted municipalities by permitting them to enter into agreements only with other Minnesota municipalities or those of bordering states. Thus, it would not be legal for a Minnesota municipality to purchase power via a transmission network from one in Montana while an Iowa municipality could do so.[12]

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[12] Maurice A. TePaske, mayor of Sioux Center, Iowa, interview on September 28, 1967.

In the Missouri Basin area an existing organization, the Missouri Basin Systems Group, is currently active in promoting orderly planning for expansion by public power groups. Its membership consists of about 120 cooperative and municipal electric systems in the Missouri River Basin. The organization seeks to plan and develop efficient generation and transmission facilities in conjuction with those of the Bureau of Reclamation. The cost of membership for a municipality is 0.1 mill per K.W.H. sold. If the group succeeds in providing low cost power to its members, this of course could be an economical investment.[13]

Distribution System

Another aspect of the expansion variable is expansion of local distribution facilities to maintain and possibly improve the quality and reliability of service. With the increased consumption by each household, it may be necessary to install larger transformers and lines of greater capacity. Since the investment is smaller and more gradual, the expansion of the distribution system is probably not of as much concern to city officials and residents as the acquisition of additional power sources. However, the distribution system cannot be neglected without a detrimental effect upon the quality of electric service to the consumers.

One form of expansion which improves the reliability of the service is the erection of a power loop around the city. It requires a substantial expenditure but does insure greater continuity of electric service. For example, the power loop being erected around Brookings cost about $330,000 but if a break should occur at any place in the loop power would automatically be routed from the opposite direction and no user would be without power. Of course, some outages could yet occur with breaks on lines from the loop to the individual customers, but at least the entire city would not be without power.[14]

In summary, if a community chooses to retain its electric system it may be necessary to expand the distribution system, possibly including such improvements as a loop system, as well as provide for a source of additional electric energy.

MANAGEMENT

Management of the electric utility is another factor that may undergo definite change if the municipal system is sold to an investor-owned company. Management includes all decisions regarding other variables of the model such as those on the level and quality of service, rates, and profits. A number of management decisions may be significant for the electric consumer. For example, management makes decisions on the level of maintenance and electric rates that affect the consumer through both the quality and cost of electric service. Management influences other variables through its decisions on financing of expansion, investment of reserve funds, level of contributions to the city's general fund, and promotion of new industry.

If a city does sell its municipal electric system, the present management would probably be replaced with men transferred from other cities where the investor-owned utility currently operates. The municipality

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[13] Arie M. Verrips, secretary of the municipality sub-division of the Missouri Basin Systems Group, Sioux Center, Iowa, interview on September 28, 1967

[14] William Gamble, commissioner of utilities, Brookings, S.D., interview on February 8, 1968.

would be relieved of its supervisory functions over the electric system, and this would probably enable the elected and appointed officials to devote more attention to other functions of the municipality.

If the municipality decides that it does not want to sell its electric system, it must then concern itself with management. The success that the city achieves in operation of the system depends to a large degree on the form of government and the selection of competent men to manage it. The major forms of city government today are mayor-council, commission, and council-manager. Each has various advantages and disadvantages with respect to the city and the management of a municipal electric system.

The mayor-council form of government has been longest established and features a chief executive, the mayor, separate from the legislative branch, the council. This form of government usually permits the greatest participation of citizens through voting in the selection of city officials. This is especially true when most administrative officers of the city are elected rather than appointed. The mayor frequently serves as the leader of the community and the chief administrative officer of the city. This position enables the mayor to exercise power in management of the electric utility. The extensive powers of the mayor are criticized sometimes on the basis that a person with popular appeal to be elected may not have sufficient administrative ability. This lack of administrative ability could be to the detriment of the city departments.[15]

Another form of city government is the commission plan. The commission usually has five elected members and each exercises administrative control over certain city activities such as police and fire protection, water supply, electricity generation and distribution. This system permits a commissioner to concentrate his attention on the city departments that he controls. The commission system can also result in city departments working quite independently of each other, and commissioners may compete against each other for improvements in their own respective departments. This may be good or bad. Both the commission plan and the mayor-council form of government face the problem that elected commissioners may not be good administrators of their departments.[16]

The third major form of city government is the council-manager plan. Under this plan the city council appoints as city manager an individual who usually has had experience and training in public administration. Thus, the chief administrative officer of the city is chosen not on political considerations but rather on ability, training, and experience. This form of government may well promote better management of the electric system through use of appointed professional personnel instead of elected officials. Opponents of the council-manager system claim it is less democratic because the manager is not elected and that it is difficult to secure a good manager without paying a high salary.[17]

Municipal Utility Board

A means by which professional rather than elected personnel may manage the electric utility is through

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[15] Russel W. Maddox and Robert F. Fuquay, *State and Local Government,* D. Van Nostrand Company, Princeton, New Jersey, 1962, pp. 468-471.

[16] Charles R. Adrian, *State and Local Government,* McGraw Hill Book Company, New York, New York, 1960, p. 226.

[17] Russel W. Maddox and Robert F. Fuquay, *State and Local Government,* D. Van Nostrand Company, Princeton, N.J., 1962, pp. 480-484.

establishment of a municipal utility board. This board may exist in conjuction with any of the three major forms of government.

One superintendent of utilities has some interesting views on a utility board:

> "You will find some municipally operated utilities very successful and again you will find some that are not. This depends entirely on the personnel operating the utilities and whether or not politics can be kept out of the operation. In most cases a municipal system is operated by the city governing body and their main interest is the complete operation of the city and not enough thought is given to the operation of the electric utility. Therefore, the electric utility is not kept up-to-date and the service rendered is not satisfactory to most of the customers.
>
> "This situation can be corrected if the city governing body would place the operation of the electric utility system in the hands of a municipal utility board which should be composed of good business men of the city, who would have complete control of the operation and financing of the utilities. This is permitted by South Dakota Statute Chapter 221 (H.B. 661-1955). I believe that Watertown is the only city in South Dakota that is operated by a board and they are finding it very successful." [18]

In summary, management of the electric system should be of great concern to the city if it chooses not to turn management over to others as it would through sale to an investor-owned utility. If the city retains its electric system, it faces the problem of securing competent management. If it depends on the elective process for the selection of management of the electric system, it may find persons in that office who lack ability or qualifications to manage. The establishment of a municipal utility board and/or a merit system of promotion with competitive salaries may be the means by which the city can secure more competent management for the system.

EMPLOYMENT

One result of the decision to sell a municipal electric system to an investor-owned company may be a change in the number of workers employed in the community and their wages. There are direct effects of the sale on the salaries and the number of employees of the electric utility. Indirect effects on employment due to the sale of the utility may occur through changes in the level of local purchases by the utility and the success of efforts to attract new industries and businesses to the community.

Sale of a municipal electric system is likely to have an effect on the number of electric utility employees and their wages, but the magnitude of the change in employment depends on a number of considerations. If the purchaser of the municipal system discontinues operation of a local generating plant or steam heating system, the number of employees is likely to be increased.[19] The managerial and administrative staff is likely to be greater under private ownership. This

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[18] C. H. Sonnenberg, superintendent of utilities, Watertown, S.D., correspondence dated June 30, 1967.

[19] Wendell Wischer, Northern States Power representative, Sioux Falls, S.D., interview on March 1, 1968.

occurs because under municipal ownership elected or appointed city officials perform administrative functions for the electric department without being considered on the staff of the department.

Not only may the number of employees increase under private ownership, but the wages may be higher as well. This is the case because the employees of investor-owned utilities are generally unionized and have been able to secure a higher salary schedule. Municipal employees, on the other hand, are usually prohibited by law from joining a union that claims the right to strike. Without this means to secure a higher wage settlement, salaries are typically somewhat lower for municipal employees. Thus, if a change is made to investor ownership, the former municipal employees are likely to receive a wage increase since they (employees other than management) ordinarily retain their positions and are given seniority in the electric utility.[20]

Selling a municipal electric system to an investor-owned utility is not likely to change employment in local businesses due to increased sales of materials and supplies to the electric utility. It usually is not possible for an electric utility to increase its local purchases substantially because many items such as poles and transformers are not available in the community. Thus, other than for labor most local purchases made by electric utilities under either ownership are for office supplies and motor vehicles.

Employment in a community should increase if a change to investor ownership of the electric utility causes new industries which would not be attracted by the municipal utility to locate in the city. An investor-owned utility with its wider contacts may be especially helpful to small communities in this regard. Frequently a brochure is prepared by the utility company and distributed to interested parties which details the resources the community has to offer to a prospective industry or firm. In smaller towns that do not have a Chamber of Commerce or similar organization, the investor-owned utility may be the only group promoting industrial development. Also, the utility company frequently follows up leads on firms seeking a location for a new plant. For example, in South Dakota the Industrial Development Expansion Agency often contacts utilities to pursue leads on potential industry.[21] These same industrial promotion functions can be carried out by a municipally-owned system but frequently are not.

If the prospective industry is a large user of electricity, the rates for such energy are likely to be an important concern to officials of the company. It is likely to make little difference to them whether the electric system is publicly or privately owned. More important is cost to the firm of the needed electricity. Thus, if municipal rates are lower than those charged by investor-owned companies, the cities with a municipal electric system have that advantage over others in competition for the industries.[22]

In summary, the sale of a municipal electric system may have an effect on employment in a community, but the exact effects are impossible to predict. In general it can be expected that the number of electric utility workers may increase slightly if the same facilities are sold to and maintained by an investor-owned utility. Also, the salaries paid these workers may be higher due to their union membership. The level

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21 Wendell Wischer, Northern States Power representative, Sioux Falls, S.D., interview on March 1, 1968.

20 *Ibid*

22 William Gamble, commissioner of utilities, Brookings, S.D., interview on May 14, 1968.

of local purchases of materials and supplies is not likely to change, but employment in the community could be substantially increased if the private utility is successful in attracting new industries when the public utility would not have been successful.

AN APPLICATION OF THE MODEL

To illustrate application of the model data are used from the Municipal Electric System of Brookings. Primary attention is given to those variables that change in quantifiable monetary terms such as rates, taxation, finance, and service. The importance of the remaining variables of expansion, management, and employment in a change from municipal to investor ownership is a matter primarily of personal judgments that are difficult to present in quantifiable terms.

The partial budget is the appropriate economic tool to use for estimating financial changes that could be expected if the City of Brookings were to sell its electric utility. A partial budget estimates the effect of a change on the revenue and costs of an existing organization. It differs from a total budget in that a total budget would be used if the entire organization, in this case the city, were to be altered. Since only part of the organization is being changed the partial budget is appropriate. It necessarily includes only those costs and revenues attributable to those factors that can be quantified. The resulting figure from a partial budget must then be considered in light of the non-quantifiable changes that may occur with the change in ownership. This figure, positive or negative, can thus be considered an opportunity cost, the value of the alternative foregone.

Electricity Rates

Electric rates for consumers in Brookings would probably change considerably with sale of the municipal electric system. These rates are first considered with regard to the purchases by the public and secondly with regard to the purchases by the city.

Rates to the Public

Since most individuals purchase electricity only for their residences, they are primarily concerned with the cost of residential service. The residential electricity charges made by the Brookings Municipal Electric System and three investor-owned companies in the area surrounding Brookings are given in table 1. Since rates vary somewhat with the size of the community, all the rates in table 1 have been calculated for a city comparable in population to Brookings, or approximately 10,000 persons.

The table gives the total charge at four different levels of electricity consumption, but the 500 K.W.H. level is nearest the average monthly consumption for this area. It may be noted that at the 500 K.W.H. level the charge to a consumer in Brookings was $9.63 per month in 1967. At that consumption level the monthly charge by the city of Brookings was $3.37 below

Table 1. Residential electric charges at various usage levels by selected eastern South Dakota utilities, 1967

Company	K.W.H. Consumer per Month 250	500	750	1000
A	$8.52	$14.77	$19.64	$24.39
B	8.00	13.00	17.75	21.50
C	8.42	13.42	18.42	23.42
Brookings Municipal	6.50	9.63	12.75	15.78

Source: Federal Power Commission, *National Electric Rate Book* Washington, D. C., 1967.

that of the lowest investor-owned utility. This may not initially seem significant, but over the lifetime of an individual it can become a considerable sum. For example, if a consumer had to pay an additional $3.37 each month over a period of 50 years, his total extra cost including interest compounded annually at 4½% would be $7,218.66

As an illustration of the cost or savings to consumers due to a change of ownership, data was obtained on electricity consumption in Brookings (see table 2). The average monthly K.W.H. consumption in 1967 for each class was used as the basis for calculating the charge for such service by either the Brookings Municipal Electric System or Company B. The selection of Company B as a representative of the investor-owned utilities is due to the fact that it had lower rate schedules than Company A or Company C. Use of the rate schedules of Companies A or C would have presented a more unfavorable comparison of investor-owned utility rates with the Brookings Municipal Electric System.

The estimated additional amount over the present municipal charges that would have had to be paid by consumers in Brookings for service from an investor-owned company is included in table 3. Since it was not feasible to base them on the usage of each individual consumer, the calculations were based on the average number of K.W.H. used by each class. As indicated in the table, in 1967 it would have cost the consumers of Brookings $221,199.84 in addition to their present municipal rates to have been served by the investor-owned company that offered the lowest rates in eastern South Dakota.

Table 2. 1967 average monthly consumption of electricity by consumers in Brookings and charges by Brookings Municipal and Company B

Class of Consumer	1967 Average Monthly K.W.H. Consumption	Monthly Charges by Brookings Minicipal	Company B
Residential	492	$ 9.53	$12.84
Commerical	1471	39.10	53.63
Power	1236	33.16	46.58

Table 3. Estimated additional cost to the public in Brookings if served by Company B at 1967 consumption levels.

Class of Consumer	Number of Consumers	Additional Charge Each Year By Company B	1967 Additional Cost To All Brooking Consumers
Residential	2,972	$ 39.72	$118,047.84
Commerical	478	174.36	83,344.08
Power	123	161.04	19,807.92
Total			$221,199.84

Rates to the City

A change from municipal to investor ownership is likely to change the rates charged the city as well as those charged the public. If the city had to pay higher rates, higher property taxes would probably have been necessary. Using Company B's rate schedules for cities, the cost of electrical service to the city of Brookings was calculated (see table 4).

The cost of street lighting under both municipal and investor service includes not only the electricity used but also the cost of the poles, fixtures, and maintenance. The total charge to the city that would be made by the investor-owned utility was $95,591.76 in comparison to the 1967 charge of $65,831.98 by the Brookings Municipal Electric System. Most of the difference was due to higher costs for street lighting under private ownership. Thus, a change to investor ownership

Table 4. Comparison of electricity costs in 1967 for Brookings if served by Company B or Brookings Municipal Electric System.

Service	Average K.W.H. Used Each Month*	Company B's Charge	Brookings Municipal Charge
Water Pumping	77,566	$10,598.64	
Sewage Plant	28,726	4,151.76	
City Buildings (19 Locations)	4,565 each	30,465.36	$37,756.98†
Street Lighting—Number and type			
27 Mercury Vapor			
80 4-Tube Fluorescent			
879 2-Tube Fluorescent		50,376.00	28,075.00‡
Total		$95,591.76	$65,831.98

*Data secured from Elmer Thon, Jr., superintendent of electric utilities, Brookings, S. Dak.
†Total charge for water pumping, sewage plant, and city buildings.
‡Data secured from Henry Shirkey, superintendent of electric line department, Brookings, S. D.

would have cost the city of Brookings at least an additional $29,759.78 in 1967.

If the rate schedules of Company B were applied to the 1967 electricity consumption by both the city and the public of Brookings, the total costs would have been $250,959.62, or 36% higher than those imposed by the Brookings Municipal Electric System.

Taxation

One of the often mentioned advantages of investor ownership is that taxes would be paid to the local units of government. Under municipal ownership, of course, the utility property is not subject to taxation; but the municipal utility often makes voluntary contributions to local government.

The property tax that would be paid on the Brookings Municipal Electric System if investor-owned can be determined by multiplying the assessed valuation by the mill levies. The assessed valuation for the system in 1967 is presented in table 5. The taxable value to which the levies are applied is 60% of the true and full value. The 1967 tax levies in Brookings were as follows: city, 9.48 mills; school district, 40.72; and county, 9.34 mills.[23] Therefore, the total property tax that would have been paid in 1967 on the electric utility in Brookings, if privately owned, would have been $46,040 of which the city would have been received $7,330 and the school district about $31,400.

Table 5. Taxation evaluation of the Brookings municipal electric system for 1967.

Facility or Property	True and Full Value	Taxable Value
Production	$ 489,023	$293,414
Transmission	175,688	105,413
Distribution	396,703	238,022
General (Less Transportation)	99,494	59,696
General (Heat)	42,130	25,278
General (Transportation)	27,228	16,337
Materials and Supplies	42,314	25,388
Fuel	16,197	9,718
Total	$1,288,777	$773,266

Source: Paul E. Schmitt, utilities valuation engineer, South Dakota Department of Revenue, Pierre, S. Dak.

[23] Office of the County Treasurer, Brookings County, Brookings, S.D., November 27, 1967.

The Brookings Municipal Electric System does make payments in lieu of taxes, however, most of it goes to the city general fund. In 1967 the payment made to the city in lieu of taxes was $64,500 while the total property tax that would have been paid if privately owned was $46,000. Until 1968 the school district did not receive any in-lieu-of-tax payment but it did receive a reduced rate on the electricity used in the schools. In 1968 the utility decided to charge the school district the normal rate and to give the district an in-lieu-of-tax payment of about $10,000. In the absence of these payments, the mill rate for the school district would have been higher. It is also likely the rate would have been higher than if the electric system had been investor owned. On the other hand since the city received a much larger payment than would have been the case under investor ownership, the city was able to set a lower mill rate than would have been possible had the school district been paid an amount equivalent to what it would have received from taxes under investor ownership. Thus, the taxpayers living in the Brookings School district but outside the city of Brookings did not share in the somewhat lower city tax rate which resulted from the city receiving the larger payment, but they did get the benefit of the payment to the school district. From the standpoint of equity to the property taxpayer outside of Brookings, it would probably have been better if the school district and county shared to a greater degree in the payment in lieu of taxes.

Finance

The major changes that would occur in the finance variable as a result of a sale of the Brookings Municipal Electric System would be the loss of municipal profits and the one time gain represented in the capital from the sale of the property. The profits from the Brookings system have been sizable for a number of recent years as shown in table 6.

The increase in operating revenue of the system occured despite rate reductions because electricity sales substantially increased due to the lower cost per K.W.H. and to population growth. The profit level increased noticeably in Brookings when local generation was reduced in 1952 and power purchases began from the Bureau of Reclamation in 1954. The percentage that profit is of operating revenue was quite comparable to investor-owned utilities. As shown in table 6 it has ranged during the past 5 years from 43.3% to 34.8%. In 1966 the profit as a percentage of revenue before any taxes was 41.4% for Company B and 33.2% for Company C as calculated from their 1966 annual reports.

The electric utility profits for the Brookings system since 1950 have been large enough so that not only have current capital investment requirements and the building of a reserve fund been met out of profits, but also 1,920,000 has been transferred to the water-sewer, telephone, street and general funds. This occurred primarily because the city was in need of funds for expansion and the electric department had money available. The transfer of funds and the alternative possibilities for transfer should be considered in the sale of the utility because they raise a question of equity. For example, a transfer of funds to the water-sewer and telephone departments is, in effect, a subsidy paid by the electric consumers to the users of these other services. Inequity arises because not all water-sewer and telephone users purchase electricity from the city. The most notable example in Brookings is South Dakota State University which receives the benefits of low water, telephone, and sewer

rental rates while it purchases no electricity from the city. In this case the net result of these transfers from the electric fund was that the electric consumers of the city subsidize the university. Another effect of such transfers was that they tended to reduce the reserve funds that would be available for future expansion of the system.

The major beneficial effect on finance due to a sale of the municipal system would have been the receipt by the city of the sum that was agreed upon as the sale price. In the absence of any actual bids for the system it is difficult to arrive at a realistic figure of the sale price for the system. For purposes of illustration, therefore, two sale prices were assumed. It was assumed first that the system sold for $2,163,309.38 which was the value of its total assets on December 31, 1967, and that the proceeds were invested at a long term rate of 4.5%. Under these assumptions the city would have received $97,447.92 annually as interest.[24] If the sale price were assumed to be $4,000,000 and the proceeds invested at 4.5% the annual return should be $180,000.

[24] In reality this sale price would probably be much different since current assets (cash, investments, accounts receivable, etc.) which account for nearly $1,000,000 of the total assets probably would not be part of the sale, and it excludes the value that might be placed on the franchise, which conceivably could be several million dollars.

Table 6. Brookings Municipal Electric System operating revenue and profit 1950-1967.

Year	Operating Revenue	Operating Profit Before Transfer	Profit as a % of Operating Revenue
1950	$398,859.76	$ 39,123.65	9.8%
1951	408,458.22	1,622.26	0.3
1952	398,983.59	36,814.36*	9.2
1953	414,099.84	57,147.53	13.8
1954	435,978.92	75,780.35†	17.3
1955	494,432.13	204,344.54	41.3
1956	494,578.37‡	203,429.09	41.1
1957	523,967.30	218,975.66	41.7
1958	551,248.81	228,626.74	41.4
1959	589,766.93	286,091.73	48.5
1960	586,291.24§	295,645.28	50.4
1961	546,125.87	227,630.26	41.6
1962	568,709.56	244,682.84	43.0
1963	602,706.25	246,429.86	40.8
1964	614,754.09	266,783.73	43.3
1965	646,907.15‖	256,238.00	39.6
1966	683,953.90	239,545.56	35.0
1967	707,066.65	246,263.40	34.8
Total Profit		$3,375,174.94	

Source: Annual Reports of the City of Brookings, S. D., 1950-1967.

*Local generation reduced and power purchased from Otter Tail Power Company from 1952-1954.

†City began to secure power from the U. S. Bureau of Reclamation in late 1954.

‡Rate reductions made for all classes which amounted to a 24.8% decrease for a 500 K.W.H. per month residential consumer.

§Rate reductions which amounted to a 24.8% decrease for a 500 K.W.H. per month residential consumer.

‖Rate reductions of 24.4% for a residential consumer.

Service

Service may also change as a result of a change in ownership. In Brookings an increase in rates for steam heat would probably occur if an investor-owned utility purchased the system. The expenses of producing steam just for heating and not generation were greater than the revenue from the sale of the steam in 1967. The expenses of the steam heating system for 1967 are shown in table 7.

The expenses of steam production in table 7 are multiplied by 99.46% since that was the proportion of steam produced for the heating system only. The remaining 0.54% of the steam was used for generation of 47,000 K.W.H.[25] The resulting total operating expense of the heat system in 1967 was $107,109.77 while the revenue obtained from the sale of the steam was only $79,275.78, producing a loss of $27,833.99 for the year. Since the system failed to cover the operating costs without regard to depreciation or insurance by the amount of $27,833.99, revenue from the electricity consumers had to be used to compensate for the losses on the heating system in the downtown area. This was in effect, a hidden subsidy paid to the downtown users of city steam heat by the electric consumers of the city.

Expansion

This variable may change due to a sale of a municipal system to an investor-owned system, but its changes cannot be easily reflected in monetary terms. In general the expansion of the distribution system would perhaps be similar under either ownership. It may be however, that municipal systems would tend to rely more on smaller generating units than would the investor-owned company.

Management

Management would undergo definite changes with the sale of the municipal system, and the consequences of the change would be reflected

[25] Elmer Thon, Jr. interview on February 2, 1968.

Table 7. Operating costs for the steam heating system in Brookings, South Dakota for 1967.

Expense Item*	Generating and Heating	Heating System only
Operation Supervision	$ 4,294.39	
Station Labor	25,221.44	
Fuel Purchased	46,503.10	
Fuel Inventory Depletion	5,796.27	
Water	1,896.98	
Supplies	3,321.35	
Boiler Equipment	12,697.11	
Total	$99,730.64x99.46%†	=$99,192.09
Heat System Operating Expense		2,147.17
Heat System Maintenance Expense		3,270.55
Heat System Accounting and Collecting		1,899.96
Heat System Adminstrative and General Expense		600.00
Total		$107,109.77

*Elmer Thon, Jr., Municipal Electric Plant Operating Statement for 1967.
†Percentage that equipment was used for production of steam only for heating and not electricity generation.

in other variables of the model. A sale of the electric system in Brookings would make available somewhat more time to the city commissioners for consideration of other city affairs.

Employment

This variable may also change with a sale but its effects are difficult to evaluate. The number of electric utility workers might increase slightly as well as their wages, but this depends on the actions of the purchasing utility. Many claims tend to be made by each ownership on their ability to attract industry, but there is no clear evidence to indicate which ownership is more successful in attracting industry.

SUMMARY AND CONCLUSION

The quantifiable changes due to a sale appear in the variables of rates, taxation, finance, and service. These are summarized assuming two different sale prices, in the partial budgets presented in table 8. The table includes only the quantifiable variables, and one should bear in mind that changes in the other variables may also be of considerable significance.

As may be noted in table 8, if the electric utility system had been sold in 1967 for a price equal to the value of its total assets the city would have realized a net loss of $381,569.09, given the other assumptions made in the study. If the sale price had been $4,000,000 the loss to the city would have been $299,017.00, given the other assumptions. In either event the opportunity costs of selling the Brookings electric utility are quite high. Given the assumptions made with respect to the costs of electricity and taxes collected, it would take a sale price considerably higher than either of those assumed here or much higher return on the invested sale proceeds before these opportunity costs would become negligible.

These data were calculated with the assumption that Company B would be the purchasing utility since it charges the lowest rates of the investor-owned utilities in eastern South Dakota. The opportunity cost of a sale would likely be greater if either Company C or

Table 8. Expected change in net income of consumers and city as a result of the sale of the Brookings Municipal Electric System, 1967

	Selling Price I		Selling Price II	
Credits				
Added Receipts				
Taxes Collected	$ 46,040.00		$ 46,040.00	
Interest on Sale Sum	97,447.92*		180,000.00†	
Reduced Costs	0.00		0.00	
Total Credits		$143,487.92		$226,040.00
Debits				
Added Costs				
Electricity for the Public	$221,199.84		$221,199.84	
Electricity for the City	29,759.78		29,759.78	
Higher Steam Heating Rates	27,833.99		27,833.99	
Reduced Receipts				
Loss of Profits	246,263.40		246,263.40	
Total Debits		$525,057.01		$525,057.01
Change in Net Income		–$381,569.09		–$299,017.00

*Based on an assumed sale price of $2,165,509.38–total assets–earning 4.5% interest.
†Based on an assumed sale price of $4,000,000.00.

Company A were assumed to be the purchaser. It was also assumed that the purchasing utility would not want to bear a loss on the steam heating system and would set rates high enough to at least cover the operating costs. The opportunity cost was calculated on the basis of data for 1967 and is likely to change as electricity consumption changes in the years ahead or if Company B changes its rates over the 1967 level.

A most important point is that these opportunity costs must be considered in light of the values placed on the non-quantifiable factors. If, for instance, there were a strong political or philosophical feeling against continued municipal ownership, the community should realize that it would be placing a price of at least $299,017 on its political or philosophical desires if the system were sold. It would be willing to give up the added $299,017 of net income to the city in order to have an investor-owned utility.

It should be emphasized that Brookings electric system has been used only as an illustration of the application of the method outlined earlier. The results obtained would be altered, of course, if the assumptions made about costs, sale price, and interest rates were altered. Nevertheless, the procedure followed in arriving at this decision should be the same when applied to other communities. The outlined economic factors should be considered and where possible quantified. These quantified factors must be considered in light of the non-quantified economic and non-economic factors. Each individual case must be treated separately in this manner. A decision for or against investor ownership under one situation can not be generalized for other situations.

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