

# The Economics of Electric System Municipalization

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# The Economics of Electric System Municipalization

## Introduction

The California energy crisis has prompted citizens and municipal officials to question whether local electricity service could be more effectively provided by local, publicly owned municipal utilities (**MU's**<sup>1</sup>) than by California's investor owned utilities (**IOU's**). With the public perception that citizens served by the State's existing MU's have been less adversely affected by the energy crisis than citizens served by IOU's, San Francisco and other cities in the state are exploring the possible creation of new local electric MU's.

Proponents for the creation of new MU's argue that local governance can provide municipal consumers lower, more stable energy costs through access to lower cost sources of supply, lower cost financing, greater operating efficiency, and reduced subsidization of rural consumers by municipal consumers. Opponents argue that municipalization will not fix supply shortages or moderate high wholesale electricity prices that were the cause of the energy crisis. Opponents also dispute the potential for reduced electricity costs through municipalization and argue that MU electric system ownership and operation would also subject municipalities to new and significant financial risk.

The objective of this report is to examine the issue of whether the conversion of IOU electric utility systems to new MU's will reliably reduce electricity cost and consumer financial risk. The focus of the report is on the historical and evolving changes in regional energy markets and the regulatory rules governing financial/cost structures of IOU's and MU's, and the implications of those changes in determining the relative IOU/MU costs of electric service. It therefore seeks to address, in a general framework relevant to any new municipal utility being considered, the economics of municipalization. The report does not attempt to address political and environmental considerations associated with local control that may also impact conversion decisions.

The following section of this report presents an historical review of the differing business structures and electric service cost performances of California's 3 largest IOU's and 21 largest MU's. The review reveals that on average, California MU's have delivered lower cost electric service to their customers than have IOU's. However, the range of cost performance across utilities has been so wide that the data do not unambiguously demonstrate the superiority of one form of utility ownership over the other. Moreover, the differences in cost performance have diminished as the proportions of federal power in MU resource bases have diminished.

The third section discusses state and federal policy related to public and private utilities. It finds that, it is unlikely that new MU's will share in access to the limited supply of low cost federal power, and that new federal regulations will restrict the use of tax exempt debt securities by MU's, thereby reducing two historically important MU economic advantages.

The fourth section discusses the key issues that will affect the future disaggregated cost structures for California's IOU's and MU's. A projected IOU cost of service table is developed as a base for comparing alternative MU cost structures. A somewhat detailed discussion is then presented on how each cost component and the distribution system valuation might differ for MU's.

The fifth section presents five scenarios or sets of assumptions about components of O&M costs that new MU's might realize, and for each scenario, shows the maximum amount that the new MU could pay for the IOU electric system assets without having to increase electric rates. The scenario results demonstrate that the economic viability of municipalization depends primarily on the ability of a new MU to recover the acquisition costs of the IOU electric system assets.

The sixth section summarizes the results, and the final section relates the results to the pending municipalization debate in San Francisco.

## **California Utilities in Historical Perspective**

Public policy has long given economic favor to public power agencies over IOU's through established subsidy programs. Existing MU's are exempt from paying federal and state income taxes, have rights to issue tax-exempt debt securities, have debt-only capital structures, and have preferential access to low-cost federal power from Federal Power Marketing Administrations<sup>2</sup>. A somewhat dated (1994) but often referenced study that was commissioned by the Edison Electric Institute suggests that absent these subsidies, MU electric rates would have been approximately 16% higher<sup>3</sup>. A more recent study (1997) concerning public power subsidies in Washington State estimated that the elimination of subsidies in Washington would cause public power rates to be increased by 38%<sup>4</sup>.

Differing capital structures between MU's and IOU's also have cost implications. The capital structure for IOU's is typically about 50% debt and 50% equity, while the capital structure for MU's is 100% debt. MU's pay only long-term interest charges and avoid paying shareholder risk premiums (profits). Therefore, a MU will have lower financing charges per dollar of invested capital than will an IOU.

It has been argued that this differing capital structure has implications for comparing electric rates between MU's and IOU's<sup>5</sup>. Since MU customers are also owners of

the electric system, they carry the same financial risk (without payment) that shareholders are paid for by IOU's. Therefore, MU rates should be adjusted upward to reflect the equity over debt risk premium when comparing MU rates to IOU rates. This argument is acknowledged here for completeness but no adjustments have been made to the data or analyses in this report to reflect this factor.

When comparing electricity costs across utilities, the broadest measure available is the **System Average Rate** or **SAR**. The SAR is the total electric revenue that the utility collects from its customers divided by the total volume of electricity delivered to its customers (kilowatt-hours or KWh). The SAR is the volume weighted average unit price paid by an electric utility's customers.

Historical SAR and cost of service statistics for IOU's and MU's are publicly available from the Federal Energy Regulatory Commission (FERC) and the Federal Energy Information Administration (EIA). The FERC Form 1 report contains detailed operating statistics for IOU's and, EIA Forms 412 and 861 provide comparable but less detailed information for MUs<sup>6</sup>. For this report, data from these forms was assembled for the years 1990 through 1999<sup>7</sup>. A complete data set for 2000 was not available.

A review of the historical SAR's for California IOU's and MU's (see Tables A & B, Appendix A for details) showed a wide range of cost performance across utilities (see footnote 6 for comment on data quality). The average IOU SAR was about 30% higher than the average MU SAR for the period 1990 through 1999. However, during the decade the rate differential between IOU's and MU's has narrowed. For 1999, the average IOU SAR was 23% higher than the average MU SAR. The data show a broad range of utility size (see Table B for 1999 MWh and Revenue) but no apparent pattern between size and SAR. Some MU's such as the Sacramento Utility District have consistently supplied their customers with relatively low cost electric service. However, several other MU's have had consistently higher cost operations than have the IOU's. In summary, the historical cost of service data for California simply do not give an unambiguous indication of superior cost performance by one form of utility (private versus public) over the other.

An examination of the detailed SAR cost-of-service components (Tables C through M in Appendix A) reveals that Power Production is generally the largest component of electric cost of service, typically making up at least 40-50% of the total cost. As would be expected, a comparison of Tables A and D shows a close correlation between the utilities with the lowest power production cost and the lowest SAR's. This can, at least partially, explain why the excessive power costs experienced during the energy crisis stimulated a renewed interest in municipalization. During the energy crisis, while the state's IOU's, under deregulation, were denied access to long-term contracts and had to buy power in the spot market, the established MU's that had low cost long-term contracts and/or generation resources, continued to experience stable, low electricity rates. In addition, some MU's with excess

generation capacity (which is a cost burden during normal times) were able to reduce their electric rates to retail customers by selling excess power into the wholesale market at high prices during the crisis. As will be discussed further below, the legacy assets of utilities may influence relative cost performance more than the form of utility ownership.

The cost advantages associated with owning legacy assets may be the main reason why the conversions of IOU electric systems to MU's (and vice versa), during the past two decades, have been rare and have involved only very small electric systems.

## **The Changing Energy Policy Environment**

Both state and federal energy policies are changing, but in apparently opposite directions. In the absence of a clearly defined strategy for reforming its power sector, California is drifting in the direction of public power, while the federal government is promoting competitive energy markets. Seeking more control over California's energy markets, the state has taken over the power purchasing functions of the bankrupt (and near bankrupt) IOU's, attempted to acquire the in-state transmission system, and has created a Public Power Authority. And, to promote local IOU to MU conversions, there is now an effort in the California Legislature, in the form of Senate Bill 23, sponsored by Senator Soto, to streamline and shorten the process of municipalization<sup>8</sup>.

These efforts to expand the role of public power are running counter to intensified federal policy aimed at the development of competitive energy markets. In attempting to "level the playing field", public policies that favor public power subsidies have come under increasing criticism and are gradually changing<sup>9</sup>. For example, The Electric Power Tax Modernization Act (sponsored by Representative Hayworth), recently passed by the House, significantly restricts the continued use of tax-exempt bonds by MU's<sup>10</sup>.

In addition to changing tax treatment, the benefits that existing MU's obtain from federal power preferences are gradually diminishing. The low cost federal power supply is not expanding while MU customer demand has continued to grow, forcing MU's to either buy incremental power in the wholesale markets in competition with IOU's, or to finance and build generation plants on a similar cost basis to that of IOU's. Going forward, it is not likely that new MU's will have the opportunity to share in access to the limited low cost federal power. This substantially eliminates a historically important cost advantage that could be obtained through municipalization.

## Future IOU and New MU Cost Structures

While historical (SAR) data shows that on average, the California MU's have delivered electricity to consumers at a lower cost than have IOU's, the relevant question going forward is whether a **newly** formed MU can capture future cost advantage for its customers. To answer this question requires projections of detailed cost structures for both IOU's and new MU's, and examination of the implications of changing public policy, of the conversion process, and of market conditions on the relative costs.

A simple analytic model for comparative cost analysis can be constructed by using the conventional cost-of-service formula that equates a utility's SAR to the sum of the utilities disaggregated component costs, expressed as costs per KWh. This formula facilitates the comparison of cost structure between publicly and privately owned utilities and provides a numerical measure of the relative importance of each cost component in determining the total SAR.

### IOU Projected Cost of Service

To illustrate the IOU/MU conversion issues, Table 1 shows 1999 historical and 2004 projected cost of service estimates (by major cost component) for Pacific Gas and Electric Company. These estimates were developed from available information concerning PG&E's rate base, generation facilities, state requirements for PG&E to purchase QF and DWR<sup>11</sup> power, and trends in non-power O&M costs. In developing these estimates, the focus was not on producing a refined forecast for PG&E, but rather to produce a reasonable IOU base case for illustrating the relative cost of service components, and for identifying the key issues related to municipalization. All estimates are presented on a per KWh basis in 1999 dollars.

**Table 1**  
**Electric Municipalization Comparative Cost Analysis**

**Cost of Service Estimates, IOU**  
**1999 vs 2004**  
**(Cents Per Kwh)**

	1999	2004	Difference
1 <b>O&amp;M Expense</b>			
2 <b>Power Production</b>	3.31	6.56	3.25
3 <b>Transmission</b>	0.11	0.14	0.03
4 <b>Distribution</b>	0.42	0.49	0.07
5 <b>Customer Services</b>	0.33	0.40	0.07
6 <b>A &amp; G</b>	0.62	0.68	0.07
7 <b>Depreciation</b>	1.83	2.50	0.67
8 <b>Amortization of Dev. Costs</b>	0.00	0.00	0.00
9 <b>Income Taxes</b>	0.76	1.30	0.54
10 <b>Non-Income Taxes</b>	0.25	0.37	0.11
11 <b>Capital Costs</b>	1.38	1.91	0.53
12 <b>Total SAR</b>	<b>9.01</b>	<b>14.35</b>	<b>5.34</b>

### **Cost of Service Projections for New MU's**

The similarities and differences between the cost structures of IOU's and new MU's provide a basis for developing the assumptions needed to project the relative cost advantages or disadvantages that might be obtained through municipalization<sup>12</sup>. The following discussion is keyed to line numbers and cost components shown on Table 1.

#### **Power Production Cost - Line 2:**

Power production is the largest component of electric cost of service, typically making up 40-50% of the total cost. Due to the relatively large contribution that power costs make to SAR's, the power supply arrangements of new MU's relative to those of incumbent IOU's, will be critical determinants of whether municipalization will lead to electricity cost savings or added cost burdens to consumers. However, given the uncertain state of California and federal energy regulation and of energy markets, it is unclear whether new MU's will be able to secure lower cost power supplies than their IOU counterparts. A discussion of power cost issues follows:

First, it is reasonable to assume that as part of the acquisition terms, a new MU would be required to assume a prorated portion of the IOU's long term QF contracts. These are generally high cost contracts that could represent about 1/3 of the new MU's load requirements.

Second, the cost of power for new MU's will depend heavily on whether the California Legislature passes Senate Bill 23, or an equivalent bill, that will prevent new MU's from avoiding payment for the high-cost power contracts negotiated in 2001 by the Department of Water and Power (DWR). The DWR's portfolio includes more than 40 long-term power purchase contracts to buy power up to 20 years in the future, representing approximately 15% of California's peak demand in 2001, and an estimated 21% in 2004. DWR-negotiated prices are currently twice market rates (\$123/MWh for 2001 vs \$61/MWh for the period June-August), and for 2002 are 187% of forward market rates (\$135/MWh versus \$47/MWh). The DWR obligation could represent approximately 1/3 if the new MU's load requirements<sup>13</sup>.

To summarize, SB 23 could have the following implications:

- a) If SB 23 passes then the new MU would be required to buy its prorated portion of the DWR power contracts.
- b) If SB 23 does not pass and, in the unlikely case that the new MU is not obligated to buy DWR power as a result of other regulations (which is difficult to determine at this time), then some power cost advantage is possible. The new MU would continue to buy its share of the QF power and replace the DWR power with lower cost power. However, even if SB 23 does not pass, it is reasonable to expect that the CPUC would require an exit fee or payment of a stranded asset amount to cover the prorated share of the DWR costs.

Third, assuming that QF and DWR contracts cover about 2/3's of the new MU's load, the new MU could cover the remaining 1/3 of its load requirements by building generation facilities or purchasing power. However, the new MU would be replacing the IOU's retained hydro and nuclear generation, the lowest cost generation available. Even the best new efficient gas fired generation units will not produce power cheaper than the hydro and nuclear units retained by the IOU's. And, it will be a risky challenge for new MU's to buy cheaper power in the wholesale market (lessons from the DWR's expensive rush into the wholesale markets should be heeded). It is therefore most likely that, the MU's blended power cost will be higher than the IOU's. However, this prospect could change for northern California if the Court accepts PG&E's newly announced workout plan, which calls for sales from its nuclear and hydro plants to be priced at 5 cents per KWh for five years, and then be sold at market prices thereafter. Under the workout plan, it is more likely that the new MU could achieve power costs no higher than the IOU's. It should be noted, however, that the CPUC has announced its opposition to the PG&E workout plan.

Fourth, the specific location of a city considering the creation of a MU could affect the power cost advantage or disadvantage of the conversion. This is because of differences between city load shapes and IOU system load shapes combined with the area cost averaging policies of the CPUC, and because of transmission capacity constraints. Coastal cities have less extreme weather and, therefore flatter load shapes (that can be supplied with lower average cost power) than the interior

areas of California that are included in the IOU system load. This implies that the area cost averaging policies of the CPUC subsidize interior area consumers at the expense of coastal city consumers. Coastal city conversion to a MU could eliminate this subsidy and lower the power supply costs of the coastal city consumers. Evaluation of the extent of the power cost differences among cities and the IOU system would be a data intensive process, requiring examination of hourly load shapes and power prices by city and area.

And in addition, the CPUC area cost averaging policies related to transmission congestion costs (applied to electricity commodity charges) could also affect the power cost advantage or disadvantage of new MU's depending on location. New MU's served by congested transmission lines could experience power cost increases relative to the existing IOU, while new MU's served by non-congested lines could experience power cost decreases. The extent of this cost impact will depend on how the new DWR/ISO arrangements will deal with congestion.

**Transmission - Line 3:**

Transmission expense (the cost of transporting power over high voltage lines) represents only about 1% of the total cost of electricity. These costs should not be expected to change substantially when converting from an IOU to a MU.

**Distribution - Line 4:**

Distribution expenses represent only about 3.5% of the total cost of electricity. Both IOU's and MU's make claims of greater efficiency in distribution operations and maintenance in the debate about municipalization. It is also argued that concentrated city distribution systems are less expensive to maintain than rural systems. Therefore, CPUC income averaging may cause city consumers to subsidize rural consumers and municipalization would allow the city consumers to recapture that subsidy. Whatever the truth might be, however, the potential difference in distribution costs is not large enough to be determinative in the debate over municipalization. For example, a ten percent reduction or increase in distribution O&M costs would only change the SAR by about one half mill per KWh.

**Customer Services - Line 5:**

Customer services expenses represent less than 3 % of the total cost of electricity. As with distribution charges, arguments about relative efficiency are not significant determinants of the value of MU conversion.

**Administrative and General - Line 6:**

Administrative and General expenses represent about 5% of the total cost of electricity and are not a significant determinant of the MU conversion value.

**Depreciation - Line 7:**

Depreciation charges represent about 20% of the total cost of electricity. The magnitude of depreciation charges can vary across utilities because of the adoption of different depreciation methodologies. Therefore, to assure comparability, it is

assumed for this analysis that common rules are applied and the only differences in depreciation between IOU's and MU's result from changes in rate base that occur because of the sale of the electric system. For example, if a new MU acquires electric distribution assets owned by an IOU, at a price that is 50% higher than the IOU's book value for the asset, then the MU's depreciation charges will be 50% higher than the IOU's depreciation charges for the same assets.

**Amortization of Development Costs - Line 8:**

The costs of developing the MU such as study costs, litigation costs and the costs of severing the MU system from the IOU system should be amortized and added to the MU revenue requirements.

**Income Taxes - Line 9:**

IOU's pay state and federal income taxes while MU's do not. Income taxes for PG&E for 1999 represented almost 8.5 % of the cost of electricity so tax rules give MU's a significant cost advantage over IOU's. The conversion of a portion of an IOU's electric system to a MU will shift a similar portion of the IOU's state and federal income tax burden from the MU consumers to taxpayers at large.

**Non-Income Taxes - Line 10:**

IOU's also pay local property taxes and franchise fees while MU's do not. Equivalent funds must be provided for locally, either by the MU or from other local taxation. Therefore, it is reasonable to assume that there is no real MU cost advantage related to non-income taxes and for this analysis non-income taxes are retained as a part of the MU cost of service.

**Capital Costs - Line 11:**

The capital costs associated with an electric system asset will change as a result of municipalization because of differences in capital structure and because of changes in rate base. Since the capital structure of IOU's is typically about 50% debt and 50% equity, while the capital structure of the MU is 100% debt, the IOU will have a higher average cost of capital (the average of the long-term interest rate and the return on equity). Therefore, (assuming equal credit standing for the IOU and the MU) the MU should have lower capital costs per dollar of rate base. However, any premium over book paid by the MU for the assets, will increase the rate base. Capital costs will be reduced or increased depending on the asset acquisition price.

**Distribution System Valuation and the New MU Rate Base:**

In setting electric rates, regulators normally set charges for the use of the IOU electric system assets on the basis of a "rate base" that is valued at the net book value (or simply book) of the assets (original cost less accumulated depreciation). Over time, excluding new investment, rate base will decline according to the depreciation schedule adopted by the regulators. While the rate base will gradually decline, the market value of the electric system assets will vary according to changes in various market factors such as, the income potential of the assets and the cost of replacing the assets. In recent years, the market value of electric

system assets has generally been above book and consumers have been shielded from paying rates on the basis of the higher market value. However, when assets are sold, they are re-valued at market (the transaction price). In other words, the rate base of the new owner will be higher than that of the original owner.

The magnitude of the transaction premium over book for the IOU electric system assets that is negotiated or set by the court in the process of municipalization, is one of the key determinants of the economic viability of a newly created MU. As will be discussed below, unless the IOU/MU conversion asset transaction price is held below 160% of book, it will be very difficult for a new MU to offer rates lower than the incumbent IOU. In other words, increases in rate base by more than 60% must be offset by reduced power production costs and other O&M expense, or the new MU will have higher rates than the incumbent IOU.

Since there have been few IOU/MU conversions during the past two decades, relevant data on electric system valuations for such transactions is scarce. Electric utility merger and acquisition transactions data (1995-1999) show electric system valuations in the range of 121-134% of book, with an average of about 127%<sup>14</sup>. However, these data refer to voluntary transactions. In the event of an involuntary conversion, it can be expected that the transaction valuation will be higher. The price generally discussed in the California's aborted attempt to take over the Southern California Edison Transmission lines was over 200 % of book<sup>15</sup>. The most recent actual conversion from an IOU to a MU is the small city of Hermiston, Oregon, which will begin operations as a MU during October this year. In the Hermiston case, Pacificorp and Hermiston agreed on a distribution system valuation at 222% of book<sup>16</sup>.

As a part of its long-standing deliberations about municipalization of the local electric system, the City of San Francisco commissioned a feasibility study that was completed by the Economic and Technical Analysis Group (ETAG) in 1997. As a part of the study, ETAG estimated the cost of acquiring PG&E's San Francisco electric distribution system, using three different methodologies (in addition to book) and calculated valuation estimates from 160% to 317% of book. A review of the ETAG valuations by Stone & Webster (commissioned by PG&E) estimated the acquisition cost to be higher than the ETAG figures, in the range of 367% to 455% of book<sup>17</sup>.

The magnitude of the system acquisition cost is a major component of a new MU's cost structure and determines both the level of depreciation charges and interest payments.

## Scenario Analysis

The primary source of MU cost advantage is a combination of the income tax exemption and capital structure. The primary source of MU cost disadvantage is a combination of the premium over net book value that the MU must pay to acquire the distribution assets, and the higher cost of power production that the MU will most likely face. Other differences in O&M costs that may be realized by the MU will most likely have a small effect on the overall economics of the MU conversion. Five scenario calculations have been developed to explore the trade-offs among the various cost of service components for IOU's versus MU's. The assumptions and results for each scenario are discussed below, and the results are shown on Table 2 and on Chart 1. For each scenario, based on each set of cost assumptions, the cost of service model calculated the maximum price (as a percent of IOU Rate Base) that the new MU could pay for the electric system without increasing electric rates. The data columns on Table 2 and the stacked bars on Chart 1 show the changing composition of electric service costs for the incumbent IOU and for the new MU across the five scenarios. The last row of Table 1 and the single bar at the right of each stacked bar on Chart 1 show the highest electric system acquisition price (expressed as a percent of the IOU rate base) that can be paid without increasing rates above that rates charged by the IOU. The scenarios are as follows:

### Scenario MU A:

Assumption - Total MU O&M costs are exactly the same as the IOU O&M costs.

Results - The new MU could pay up to 163% of the IOU's net book for the IOU distribution assets without increasing electric rates. As shown on Table 2 and Chart 1, the new MU can bid for the IOU assets (and the new MU rate base) up to the point that the increased depreciation charges and capital costs offset the savings from the income tax exemption and lower average cost of capital.

### Scenario MU B:

Assumption - The new MU's power production costs are **10% higher** than the IOU's power production costs, but all other MU O&M costs are exactly the same as the IOU O&M costs.

Results - The new MU could only pay up to 136% of the IOU's net book for the IOU distribution assets without increasing electric rates. As shown on Table 2 and Chart 1, the relatively small increase in power production costs severely reduces the MU's options for bidding on the IOU assets.

### Scenario MU C:

Assumption - The new MU's power production costs are **25% higher** than the IOU's power production costs, but all other MU O&M costs are exactly the same as the IOU O&M costs.

Results - The new MU could only pay up to 96% of the IOU's net book for the IOU distribution assets without increasing electric rates. As shown on Table 2 and Chart 1, the larger, but not unreasonable, increase in power production costs prevents the new MU from even bidding at book for the IOU assets, unless the community is willing to pay more for public power than for private.

### Scenario MU D:

Assumption - The new MU's power production costs are **25% lower** than the IOU's power production costs, but all other MU O&M costs are exactly the same as the IOU O&M costs.

Results - With big production cost savings, the new MU could pay up to 231% of the IOU's net book for the IOU distribution assets without increasing electric rates. As shown on Table 2 and Chart 1, this possible but unlikely reduction in power production costs gives the new MU much greater flexibility in bidding for the IOU assets. Note that this figure is close to the percent of book paid by Hermiston, Oregon for its rate base.

### Scenario MU E:

Assumption - The new MU's distribution O&M expenses are **10% lower** than The IOU's distribution O&M, but all other MU O&M costs are exactly the same as the IOU O&M costs.

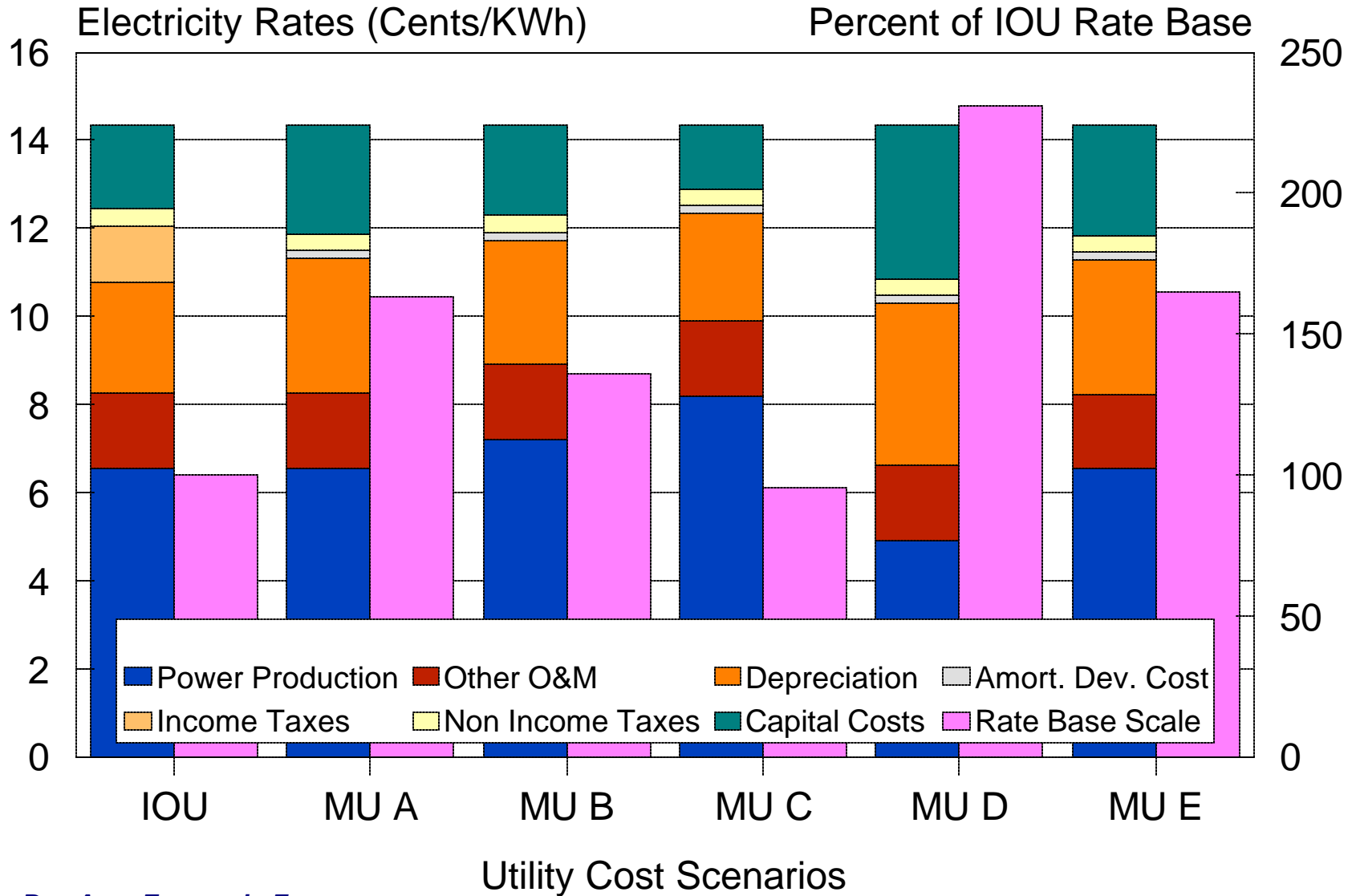
Results - The new MU could only pay up to 165% of the IOU's net book for the IOU distribution assets without increasing electric rates. This result is virtually the same as for Scenario MU A, which demonstrates that variations in the efficiency of distribution operations has very little effect on the economics of the municipalization decision.

**Table 2**

**Electric Municipalization Comparative Cost Analysis**  
**Cost of Service - Test Year 2004**  
**(Cents Per Kwh)**

	NEW MU SCENARIOS					
	IOU	MU A	MU B	MU C	MU D	MU E
<b>O&amp;M Expense</b>						
<b>Power Production</b>	6.56	6.56	7.21	8.19	4.92	6.56
<b>Transmission</b>	0.14	0.14	0.14	0.14	0.14	0.14
<b>Distribution</b>	0.49	0.49	0.49	0.49	0.49	0.44
<b>Customer Services</b>	0.40	0.40	0.40	0.40	0.40	0.40
<b>A &amp; G</b>	0.68	0.68	0.68	0.68	0.68	0.68
<b>Depreciation</b>	2.50	3.05	2.80	2.43	3.66	3.07
<b>Amortization of Dev. Costs</b>	0.00	0.20	0.20	0.20	0.20	0.20
<b>Income Taxes</b>	1.30	0.00	0.00	0.00	0.00	0.00
<b>Non-Income Taxes</b>	0.37	0.37	0.37	0.37	0.37	0.37
<b>Capital Costs</b>	1.91	2.47	2.06	1.45	3.49	2.50
<b>Total SAR</b>	<b>14.35</b>	<b>14.35</b>	<b>14.35</b>	<b>14.35</b>	<b>14.35</b>	<b>14.35</b>
<b>Acquisition Price (% IOU Rate Base)</b>		<b>163</b>	<b>136</b>	<b>96</b>	<b>231</b>	<b>165</b>

# Chart 1 Municipalization Comparative Cost Structures



## Summary

The California energy crisis has prompted new interest by citizens and municipal officials in exploring whether local electricity service can be more effectively provided by converting local IOU electric systems to new MU's. While there are political and environmental issues to be considered in assessing the advantages and disadvantages of electric system conversion, the key economic issue is whether the conversion will reliably reduce electricity costs (SAR's) to consumers, and mitigate the financial risk associated with public ownership and operation of the electric system.

Established MU's have been endowed by public policy with significant economic advantages over IOU's, such as: exemption from paying federal and state income taxes, rights to issue tax exempt debt securities, debt only capital structures, and preferential access to low cost federal power. Historical data show a broad range of results in the ability of California MU's to use this endowment to deliver lower cost electric service than IOU's, with some performing better than others. On average, over the last decade, California MU's have had lower SAR's than the state's IOU's but the differences have narrowed over time as the role of low cost federal power in the MU resource mix has diminished.

Going forward, it is unlikely that low cost federal power will be available to any new MU, which significantly reduces the cost advantage expected for new MU's relative to that enjoyed by existing MU's. Since California IOU's have retained their most efficient generation facilities (hydro and nuclear), power production cost advantage now appears to belong to the incumbent IOU's relative to new MU's. In addition, changing federal policy favoring the development of competitive markets, will significantly restrict future MU use of tax exempt financing. The principal remaining cost advantages that will continue to be available to newly formed MU's are exemptions from income taxes and a debt only capital structure.

Partially or fully offsetting these MU cost advantages are, the depreciation charges and the cost of capital payments associated with the premium over book value that a new MU may have to pay to acquire the electric system assets from the incumbent IOU. The IOU has the advantage of having a legacy rate base that is valued at original cost less accumulated depreciation, or net book. The new MU must acquire the asset and put it in rate base at market value. As shown by scenario MU A, assuming the new MU can hold power purchase costs and all other O&M expense at the level of the IOU, then the new MU can not pay more than 163% of book for the electric system assets, without increasing consumer rates. And, as shown by scenarios MU B and MU C, if the new MU's power production costs can not be held to the level of the IOU, then the amount of premium over book that can be paid for the assets (without increasing rates) will be reduced.

From the analysis developed in this paper, it is not clear that municipalization, under current regulatory and energy market conditions, will reliably yield reduced electric service costs to consumers. Whether lower costs will be realized for any specific community depends primarily on the ability of municipalization organizers to develop a firm plan for securing low cost power supplies and obtaining electric system assets as close to book value as possible. The cost of service formula presented in this report provides a simple test for determining whether any specific municipalization plan will reduce consumer electricity costs. Pursuing municipalization without detailed examination of these factors and performing the necessary financial analysis could add yet another unnecessary energy cost burden on California consumers.

### Footnotes:

- 1) Both "municipal utility" and "MU" are intended here to be inclusive of the various legal/administrative structures of local public utilities. It is expected that the economics of converting IOU electric systems to public ownership will be similar whether the new utility is a municipal department, an independent municipal utility district, or some other form of public entity.
- 2) See, **Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets**, EIA Special Report,, SR/EMU92-02, U.S. Department of Energy, 1992.
- 3) See, **Subsidies and Unfair Competitive Advantages to Publicly-Owned and Cooperative Utilities**, Putnam, Hayes & Bartlett, Inc. for Edison Electric Institute, 1994.
- 4) See, Elaine R. Davis, **Paying For Power: The Challenge of Municipalization**, Washington Policy Center, 1997.
- 5) See, **Final Report on the Feasibility of Electric System Municipalization in San Francisco**, Economic & Technical Analysis Group (ETAG), February 1997
- 6) Some caution should be exercised in using and interpreting the data from these sources. As can be seen from the data tables, some municipal utilities have not been consistent in reporting data for some line items on the reports, and some have not filed reports for all years. Some of the figures reported by a few of the smaller MU's are outside the range of normal expectations. It should also be noted that the FERC Form 1 and EIA 861 data are reported on a calendar year basis while the EIA 412 data are reported on a fiscal year basis.
- 7) Data were extracted from the UQAR Database, Economic Sciences Corporation
- 8) See, Ed Fletcher, *Bill Would Streamline the Path to Local Power: More Cities, Including Davis, are Taking a Look at Creating Municipal Utility Districts*, **Sacramento Bee**, July 31, 2001.
- 9) See, Elaine and Richard Davis, *Municipalization and Subsidized Utility Competition: The Taxpayers Perspective*, **Cal-Tax Digest**, California Taxpayers Association, 1997. See also, Dennis Zimmerman, **Restructuring Electricity Markets, Public Power, and Tax-Exempt Bonds: An Economic Analysis**, Congressional Research Service, 1998.
- 10) See, *Public Power Interests Express Concern Over Recently Passed House Package, Bond Buyer*, September 27, 2001.
- 11) IOU's have been required under the Public Utility Regulatory Policy Act, to acquire power from Qualifying Facilities (QF's) - small power producers that meet certain conditions concerning the use of alternative and renewable energy sources, etc. When the California IOU's lost credit worthiness, the state Department of Water Resources (DWR) began buying power for the IOU's customers. In addition to its spot

market purchases, the DWR purchased large quantities of power under long-term contracts extending out 10 to 20 years, at prices that are now well above forward market prices. The IOU's are required to pay for the DWR contracts.

- 12) This discussion has drawn extensively from the **ETAG Report** cited in footnote 5.
- 13) The extent of the DWR burden is also uncertain at this time. The CPUC has asked the FERC to nullify some of the contracts.
- 14) Utility merger & acquisition data, 1995- 1999, provided by McKinsey & Company, Inc., EPNG M&A Database
- 15) See, Will McNamara, *Hermiston, Oregon Municipalizes Electric System*, **Energy Info Source: Industry Commentary: Issue Alerts**, September 24, 2001.
- 16) See David Lazarus, *Davis Seals Power Deal With Edison to Buy Power Lines*, **San Francisco Chronicle**, April 10, 2001.
- 17) See review submitted in letter form to Pacific Gas and Electric from Stone & Webster, dated May 15, 1997.

# **Appendix A**

## **System Average Rate Data**



**SYSTEM AVERAGE RATES**

**1999**

	<b>REVENUE</b>	<b>MWh</b>	<b>SAR Cents/KWh</b>
Santa Clara Mun Electric Dept	193,285,316	11,091,626	1.74
Merced Irrigation District	9,468,476	480,149	1.97
Seattle City of	367,934,881	9,511,271	3.87
Vernon City of	63,898,162	1,121,052	5.70
Modesto Irrigation District	150,897,979	2,526,022	5.97
Redding City of	105,358,913	1,691,100	6.23
Palo Alto City of	78,970,000	1,124,025	7.03
Turlock Irrigation District	109,807,674	1,562,869	7.03
Sacramento Municipal Util Dist	775,496,370	10,532,311	7.36
Imperial Irrigation District	213,014,046	2,868,796	7.43
Roseville Electric Department	63,133,281	807,683	7.82
Glendale City of	135,166,000	1,665,164	8.12
Los Angeles Dept of Wtr & Pwr	2,203,363,903	27,067,270	8.14
Azusa City of	30,117,994	366,024	8.23
Anaheim City of	254,521,000	3,038,042	8.38
Pacific Gas & Electric	7,132,547,820	79,376,077	8.99
Southern California Edison	7,069,163,595	78,601,926	8.99
San Diego Gas & Electric	1,425,365,948	15,101,690	9.44
Pasadena City of	136,500,546	1,440,971	9.47
Burbank Public Service Dept	98,446,000	1,033,345	9.53
Riverside City of	172,133,726	1,797,524	9.58
Lodi City of, CA	37,222,762	383,333	9.71
Colton Electric Utility Dept	29,045,608	280,668	10.35
Alameda City of	39,185,527	370,560	10.58

Source: FERC Form 1, EIA Form 412

# **Appendix B**

## **Cost of Service Data**

**TOTAL ELECTRIC O&M EXPENSE PER MWh (\$/MWh)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Palo Alto City of	44.504	40.251	36.383	35.343	37.855	41.022	33.153	34.826	41.296	36.297
Vernon City of	57.614	51.027	47.884	48.002	44.313	39.110	31.232	31.705	38.074	42.639
Sacramento Municipal Util Dist	51.688	51.203	48.831	47.423	50.530	50.659	44.612	43.917	45.179	45.793
Santa Clara Mun Electric Dept	61.064	63.874	66.537	61.739	69.708	66.962	67.315	NA	59.603	50.706
Pacific Gas & Electric	52.482	56.045	57.538	57.338	60.523	50.643	55.410	54.803	53.968	53.016
Roseville Electric Department	57.064	59.047	63.484	64.684	65.990	59.671	57.037	54.483	51.464	55.991
Turlock Irrigation District	56.054	58.187	63.221	63.145	69.268	58.909	63.204	58.298	55.592	56.634
Modesto Irrigation District	48.602	51.540	48.866	53.515	59.194	61.766	60.680	64.334	56.507	59.890
San Diego Gas & Electric	51.488	51.536	52.006	53.793	52.261	51.878	49.183	46.064	56.419	62.079
Southern California Edison	62.559	69.195	67.233	62.167	66.021	64.301	63.983	68.910	69.590	64.625
Merced Irrigation District	NA	NA	NA	NA	NA	NA	98.066	70.133	64.504	67.461
Imperial Irrigation District	54.516	52.427	60.594	65.082	64.673	62.524	59.520	62.789	66.470	69.339
Los Angeles Dept of Wtr & Pwr	66.320	66.792	66.749	72.265	72.107	71.054	65.681	58.978	68.159	75.832
Anaheim City of	70.664	76.345	78.044	99.806	80.289	81.659	79.002	79.482	80.564	80.293
Pasadena City of	83.235	76.491	77.287	81.926	78.957	76.578	76.502	79.566	82.983	85.370
Burbank Public Service Dept	67.055	74.450	73.759	80.636	82.717	84.636	81.207	79.402	87.206	85.726
Alameda City of	67.277	82.980	71.462	75.705	73.851	84.161	87.331	87.356	87.658	87.921
Riverside City of	82.569	81.876	80.587	84.346	79.589	84.274	81.495	84.682	88.937	89.854
Redding City of	45.896	48.540	58.080	57.506	71.015	82.710	82.036	96.975	105.218	97.420
Lodi City of, CA	76.491	79.814	84.642	82.425	86.514	79.416	95.898	94.890	92.808	97.478
Glendale City of	64.602	68.243	67.537	71.266	74.640	72.321	72.850	82.570	95.889	102.866
Azusa City of	65.550	56.531	66.103	62.024	87.201	94.564	90.384	101.612	109.548	104.492
Colton Electric Utility Dept	73.343	76.364	65.080	81.178	76.500	98.100	104.387	125.251	106.448	106.519
Lassen Municipal Utility Dist	NA	NA	NA	97.304	82.288	69.818	60.334	52.475	NA	NA

**POWER PRODUCTION O&M EXPENSE (\$/MWh)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Santa Clara Mun Electric Dept	49.872	48.968	49.549	50.520	53.608	NA	50.138	NA	17.129	9.813
Merced Irrigation District	9.705	NA	NA	5.076	7.993	4.568	5.152	4.573	4.943	10.201
Palo Alto City of	31.589	29.024	25.782	25.488	28.289	27.979	22.229	22.741	28.101	21.817
Sacramento Municipal Util Dist	38.884	39.450	35.958	33.739	35.595	33.775	27.298	22.555	23.702	23.141
Redding City of	33.349	37.382	37.542	35.399	39.895	36.617	30.992	27.861	31.766	31.893
Vernon City of	44.362	39.127	39.992	38.502	33.565	29.159	22.924	21.929	27.065	32.525
Pacific Gas & Electric	34.677	36.950	37.132	34.405	37.777	31.730	33.508	35.070	35.547	33.086
Turlock Irrigation District	39.236	39.267	41.331	43.470	41.533	33.521	40.677	38.213	32.773	37.732
San Diego Gas & Electric	36.067	35.699	35.627	36.258	34.751	33.830	30.409	31.851	35.199	38.165
Los Angeles Dept of Wtr & Pwr	42.188	41.331	41.661	43.176	43.466	44.045	42.632	42.438	42.659	38.657
Modesto Irrigation District	37.373	37.782	35.926	39.717	43.317	41.421	38.825	44.895	37.328	40.714
Imperial Irrigation District	38.115	35.879	41.207	37.876	34.159	37.227	46.499	42.462	46.340	42.048
Roseville Electric Department	41.061	47.289	48.563	49.250	51.514	45.078	47.115	43.126	43.230	42.920
Lodi City of, CA	55.478	62.176	69.147	66.784	70.967	65.276	71.608	71.608	71.608	47.851
Southern California Edison	44.426	48.318	47.982	42.347	44.655	43.821	44.528	48.269	50.816	48.475
Glendale City of	44.379	44.413	45.761	44.737	48.771	49.023	49.722	44.479	45.404	48.745
Pasadena City of	52.514	53.109	55.775	56.954	57.959	59.575	55.213	53.739	58.756	49.338
Azusa City of	51.318	45.347	46.822	42.916	39.196	44.956	37.737	65.146	45.569	53.208
Riverside City of	53.765	50.580	49.736	53.138	51.597	59.226	52.802	57.998	56.709	53.864
Anaheim City of	45.984	51.385	54.041	51.290	49.328	55.672	55.576	60.188	61.168	55.073
Burbank Public Service Dept	50.288	54.764	57.501	60.331	64.351	58.606	56.623	59.131	66.119	66.119
Colton Electric Utility Dept	49.196	54.864	41.330	57.675	50.111	70.463	42.610	49.892	49.892	66.326
Alameda City of	53.215	66.327	57.101	58.717	60.126	63.318	65.190	63.522	65.929	67.089
Lassen Municipal Utility Dist	NA	NA	NA	69.166	60.323	42.820	32.040	28.798	NA	NA

**TRANSMISSION O&M EXPENSE (\$/MWh)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Colton Electric Utility Dept	2.277	NA	NA	NA	NA	0.376	NA	NA	NA	NA
Lassen Municipal Utility Dist	NA	NA	NA	0.073	0.233	0.060	0.137	0.125	NA	NA
Alameda City of	0.250	0.161	0.092	0.043	0.029	0.103	0.083	0.075	0.026	0.045
Modesto Irrigation District	0.110	0.193	0.118	0.077	0.133	0.199	0.274	0.110	0.129	0.185
Turlock Irrigation District	0.884	0.807	0.909	0.674	0.299	0.272	0.382	0.301	0.300	0.297
Pasadena City of	0.917	0.875	1.195	1.161	1.029	0.951	0.958	1.421	0.542	0.361
Santa Clara Mun Electric Dept	0.023	0.035	0.048	0.039	0.080	0.016	0.023	NA	1.395	0.726
Imperial Irrigation District	0.994	1.045	1.541	1.557	1.106	1.461	0.742	0.395	0.585	0.789
Pacific Gas & Electric	0.753	0.888	0.870	0.784	0.788	0.984	1.067	1.040	1.152	1.267
Burbank Public Service Dept	1.395	1.727	1.721	1.992	NA	6.966	8.016	4.751	1.305	1.283
Anaheim City of	0.002	0.134	0.124	0.310	6.362	2.972	2.661	2.701	2.036	1.440
Los Angeles Dept of Wtr & Pwr	1.572	1.334	1.338	1.696	1.415	1.691	2.231	1.761	2.282	1.803
Glendale City of	0.624	0.691	0.839	0.998	1.144	1.257	1.096	0.962	1.302	1.897
Vernon City of	1.544	2.776	2.193	0.897	1.797	2.261	2.000	2.374	2.105	2.404
Sacramento Municipal Util Dist	1.289	1.246	1.825	1.715	2.645	2.643	2.443	2.385	2.635	2.547
Southern California Edison	1.106	0.983	0.961	1.073	1.025	1.091	0.900	0.932	2.511	2.604
Merced Irrigation District	NA	NA	NA	NA	NA	NA	1.440	1.533	4.132	4.021
San Diego Gas & Electric	1.126	1.143	1.139	1.519	1.534	1.573	1.301	1.259	1.236	4.764
Redding City of	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.711
Azusa City of	NA	NA	NA	NA	NA	NA	NA	5.590	6.632	7.606

**DISTRIBUTION O&M EXPENSE (\$/MWh)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Southern California Edison	2.390	3.088	2.354	2.435	2.568	2.385	2.140	2.304	2.660	2.285
Santa Clara Mun Electric Dept	1.100	1.382	1.580	1.523	1.460	1.470	1.442	NA	2.242	2.496
Vernon City of	2.443	3.259	2.090	3.551	3.956	3.566	3.453	3.275	3.838	2.556
Modesto Irrigation District	3.301	3.543	3.335	2.998	3.297	3.045	2.854	2.822	2.596	2.568
Anaheim City of	6.131	7.188	9.983	13.891	3.628	6.023	5.312	4.544	2.832	2.934
Merced Irrigation District	NA	NA	NA	NA	NA	NA	2.050	4.027	0.854	3.470
Pasadena City of	3.413	3.679	3.904	4.419	4.503	4.188	4.034	4.719	4.006	3.547
Redding City of	NA	NA	6.953	6.469	6.024	6.102	7.694	7.582	9.521	3.701
Alameda City of	2.637	3.281	2.969	2.986	2.646	2.745	3.580	4.054	4.769	3.859
San Diego Gas & Electric	1.987	2.282	2.166	2.255	2.089	2.229	2.323	2.224	4.045	4.238
Riverside City of	3.390	4.349	3.683	3.539	3.810	4.178	3.794	4.068	4.206	4.292
Sacramento Municipal Util Dist	2.303	2.559	2.836	2.959	2.912	3.254	3.360	3.707	4.265	4.397
Turlock Irrigation District	5.105	4.962	5.922	7.350	5.746	5.598	5.388	5.164	5.035	4.502
Pacific Gas & Electric	3.199	3.306	3.281	3.551	3.447	3.734	4.881	4.838	5.263	4.615
Glendale City of	3.915	4.768	5.106	5.994	5.020	5.360	5.157	5.302	5.250	6.094
Burbank Public Service Dept	4.948	5.418	4.896	5.395	7.057	7.336	5.879	5.830	6.509	6.398
Lodi City of, CA	3.386	3.372	3.968	3.675	3.978	5.072	6.014	5.951	5.820	6.677
Imperial Irrigation District	3.541	3.716	4.741	4.678	3.835	4.584	4.382	4.484	5.449	7.437
Azusa City of	5.716	5.473	8.286	8.597	7.940	7.709	8.001	8.921	10.272	7.903
Los Angeles Dept of Wtr & Pwr	6.089	6.598	6.705	7.346	7.191	6.058	9.968	8.856	9.729	7.980
Palo Alto City of	2.814	NA	4.754	5.516	5.862	8.751	6.737	6.697	7.246	8.288
Roseville Electric Department	11.201	10.603	9.808	9.905	11.282	10.945	9.545	9.885	7.922	9.972
Colton Electric Utility Dept	NA	2.726	2.314	2.885	7.754	6.278	8.518	13.344	11.341	24.328
Lassen Municipal Utility Dist	NA	NA	NA	6.735	5.261	5.620	6.448	7.778	NA	NA

**CUSTOMER ACCOUNTS O&M EXPENSE (\$/MWh)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Lassen Municipal Utility Dist	NA	NA	NA	2.253	2.248	2.022	2.028	2.343	NA	NA
Lodi City of, CA	3.362	3.816	3.759	3.779	3.575	2.135	2.879	2.849	2.786	NA
Roseville Electric Department	1.800	1.765	1.733	1.732	1.754	1.720	NA	NA	NA	NA
Vernon City of	0.055	0.620	NA	NA	NA	NA	NA	NA	NA	NA
Colton Electric Utility Dept	NA	NA	NA	NA	NA	0.408	0.857	0.217	0.185	0.055
Merced Irrigation District	NA	NA	NA	NA	NA	NA	NA	NA	0.208	0.201
Azusa City of	2.967	3.219	4.178	4.884	5.491	5.201	3.508	3.736	2.965	0.214
Santa Clara Mun Electric Dept	0.379	0.003	0.004	0.004	0.004	0.004	0.004	NA	0.729	0.741
Anaheim City of	1.852	2.116	1.576	2.666	2.601	2.323	1.263	1.569	1.618	1.268
Turlock Irrigation District	NA	NA	NA	NA	NA	NA	NA	NA	1.701	1.521
Redding City of	NA	NA	1.708	2.124	1.611	1.665	1.794	2.276	2.020	1.657
Alameda City of	1.893	1.609	1.988	2.081	1.980	2.344	3.125	3.525	2.082	1.825
Pasadena City of	0.822	NA	0.939	0.955	0.840	1.007	1.039	0.955	2.005	1.884
Imperial Irrigation District	1.260	1.335	1.928	1.468	1.619	1.780	1.335	1.558	1.809	1.974
San Diego Gas & Electric	1.651	1.866	1.885	2.046	1.955	2.005	1.951	1.734	2.784	2.251
Pacific Gas & Electric	1.605	1.448	1.633	1.636	1.835	2.314	2.958	2.705	2.398	2.407
Southern California Edison	1.796	1.999	2.016	2.404	2.086	2.131	2.068	2.381	3.151	2.703
Burbank Public Service Dept	1.012	1.118	1.125	1.185	1.101	2.386	2.538	2.495	2.787	2.740
Sacramento Municipal Util Dist	1.982	2.478	2.432	2.915	3.069	2.688	3.070	3.331	2.959	2.801
Riverside City of	1.844	1.830	1.814	2.708	1.860	2.769	3.289	3.070	3.138	3.134
Modesto Irrigation District	1.046	1.550	1.546	2.027	2.090	2.037	1.979	1.888	1.753	3.224
Glendale City of	2.334	2.669	3.087	2.968	3.122	2.958	2.815	2.712	2.653	3.362
Los Angeles Dept of Wtr & Pwr	2.364	2.428	2.773	3.036	2.639	2.800	3.944	3.415	3.056	4.232

**CUSTOMER SERVICES AND INFORMATION O&M EXPENSE (\$/MWh)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Colton Electric Utility Dept	NA	NA	NA	NA	NA	0.708	NA	NA	NA	NA
Lassen Municipal Utility Dist	NA	NA	NA	0.804	0.814	1.097	1.089	0.731	NA	NA
Santa Clara Mun Electric Dept	0.011	NA	NA	NA	0.000	NA	NA	NA	NA	0.102
Anaheim City of	0.023	0.002	0.012	0.005	NA	NA	NA	1.610	0.192	0.153
Modesto Irrigation District	0.239	0.638	0.715	0.580	0.663	0.263	0.277	0.207	0.251	0.189
Azusa City of	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.272
Redding City of	1.803	1.583	NA	NA	NA	NA	NA	NA	NA	0.274
Riverside City of	0.321	0.389	0.502	0.828	0.656	0.978	0.592	0.528	0.209	0.375
Vernon City of	0.205	0.314	0.343	0.389	0.366	0.326	0.354	0.355	0.509	0.426
Pasadena City of	NA	1.062	0.840	NA	NA	NA	NA	0.265	0.667	0.499
Alameda City of	0.352	0.415	0.358	0.411	0.379	0.483	0.733	0.943	0.867	1.070
Pacific Gas & Electric	1.203	1.752	2.031	1.725	1.932	1.611	1.370	1.406	1.458	1.237
Southern California Edison	1.042	1.460	1.697	2.023	2.251	1.019	1.296	1.270	1.279	1.291
Los Angeles Dept of Wtr & Pwr	0.431	0.645	0.841	1.117	1.250	1.095	1.090	0.496	0.512	1.367
San Diego Gas & Electric	0.849	2.011	2.242	1.968	2.225	2.807	3.057	1.453	1.811	1.761
Lodi City of, CA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.573
Sacramento Municipal Util Dist	0.419	0.609	0.501	0.723	0.869	1.337	1.044	4.091	2.647	3.124

**ADMINISTRATION AND GENERAL O&M EXPENSE (\$/MWh)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Roseville Electric Department	3.019	2.444	2.168	2.278	2.146	2.170	1.114	1.223	1.284	1.226
Anaheim City of	2.753	2.277	2.678	1.942	0.477	1.850	2.101	NA	2.902	2.483
Santa Clara Mun Electric Dept	6.739	9.940	12.351	4.865	10.119	10.266	7.929	NA	1.299	2.551
Vernon City of	2.857	1.339	1.496	2.795	3.333	2.434	2.022	2.899	2.645	2.681
Los Angeles Dept of Wtr & Pwr	8.332	9.048	9.138	9.498	10.816	11.452	1.803	0.883	3.585	3.352
Palo Alto City of	6.165	6.543	2.333	2.138	1.484	3.514	3.442	2.057	2.346	3.424
Modesto Irrigation District	4.342	6.152	4.555	4.942	4.944	4.601	4.404	4.638	3.721	3.722
Imperial Irrigation District	4.679	5.566	5.629	5.660	5.738	6.465	5.065	6.233	4.769	4.773
Azusa City of	2.252	2.032	1.481	1.641	5.513	0.729	3.845	2.391	2.483	4.954
Sacramento Municipal Util Dist	4.240	3.341	2.730	2.964	3.374	4.270	4.697	5.860	4.895	4.959
Burbank Public Service Dept	5.003	6.468	6.466	7.266	7.237	6.388	5.523	4.944	5.194	5.106
Riverside City of	5.436	6.303	7.162	7.050	6.905	6.922	5.901	5.327	5.512	5.410
Pasadena City of	6.684	6.302	6.452	7.783	7.231	7.113	7.534	7.597	7.172	6.264
Turlock Irrigation District	7.466	10.106	11.268	7.746	8.577	7.726	7.817	7.844	6.301	6.492
Pacific Gas & Electric	7.697	8.578	8.894	12.412	10.762	7.589	8.129	6.335	6.949	6.814
Southern California Edison	6.368	8.256	7.040	7.357	8.471	8.686	7.805	7.392	7.114	6.901
Redding City of	10.315	8.907	9.683	11.276	16.620	16.854	13.325	18.480	18.157	7.049
Colton Electric Utility Dept	14.878	14.507	16.995	16.154	15.869	17.503	21.596	21.948	18.653	7.214
Glendale City of	8.174	8.664	8.978	9.112	9.978	8.646	9.780	9.072	8.653	9.353
San Diego Gas & Electric	6.880	6.079	6.209	7.159	7.404	7.083	8.009	5.542	10.479	9.863
Alameda City of	6.472	6.885	7.848	8.656	8.700	8.852	7.693	9.594	10.738	10.515
Merced Irrigation District	NA	NA	NA	NA	NA	NA	11.669	25.077	9.639	14.124
Lodi City of, CA	7.053	5.277	5.587	5.294	4.514	4.625	16.094	15.925	15.575	36.202
Lassen Municipal Utility Dist	NA	NA	NA	13.604	10.686	10.793	10.298	11.270	NA	NA

**DEPRECIATION EXPENSE PER MWH (\$/MWh)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Lodi City of, CA	2.13	2.18	2.16	1.29	1.33	1.44	1.35	1.34	1.31	1.07
Azusa City of	1.35	1.35	1.88	2.08	2.28	0.41	1.75	1.90	2.09	1.93
Vernon City of	0.99	1.40	2.23	2.57	3.84	3.07	3.06	3.21	2.21	2.15
Colton Electric Utility Dept	2.76	2.18	2.18	2.36	2.73	2.49	1.99	3.67	3.12	2.93
Palo Alto City of	2.81	2.93	2.90	3.74	3.31	3.59	3.67	3.73	3.73	3.78
Santa Clara Mun Electric Dept	1.48	1.72	2.24	2.37	3.21	3.85	3.58	NA	3.90	4.11
Roseville Electric Department	2.99	2.78	3.44	3.87	3.88	3.87	3.79	3.83	5.44	4.27
Modesto Irrigation District	2.90	3.59	3.74	3.99	4.99	5.35	5.14	5.34	3.93	5.29
Burbank Public Service Dept	3.60	4.53	4.67	4.66	4.92	5.13	5.21	5.43	5.50	5.41
Merced Irrigation District	NA	NA	NA	NA	NA	NA	18.91	10.89	9.08	5.82
Alameda City of	2.68	3.04	3.01	3.20	3.31	4.26	5.29	5.91	6.21	6.09
Turlock Irrigation District	5.23	5.58	5.79	6.07	6.13	6.47	5.77	7.39	7.37	7.28
Southern California Edison	9.90	10.63	10.21	10.66	10.00	11.32	12.94	15.55	10.74	7.45
Pasadena City of	4.68	4.69	5.05	5.57	5.80	5.69	6.82	7.02	7.15	7.60
Riverside City of	5.52	6.04	6.54	6.17	6.09	7.51	6.49	6.67	6.91	8.02
Anaheim City of	4.11	4.61	4.85	6.83	6.20	6.93	7.24	7.32	7.93	8.10
Glendale City of	6.69	7.75	7.68	8.07	8.63	8.57	9.07	9.00	8.65	8.95
Sacramento Municipal Util Dist	9.51	9.96	4.89	5.31	5.77	6.43	7.59	9.69	10.58	10.43
Imperial Irrigation District	6.05	6.71	6.91	7.82	7.91	8.81	8.64	8.76	9.45	11.25
Los Angeles Dept of Wtr & Pwr	6.39	7.09	7.24	8.11	9.41	9.67	10.25	9.85	11.30	12.82
Redding City of	6.51	6.95	6.94	7.54	8.01	9.05	11.26	17.90	19.84	19.72
Pacific Gas & Electric	13.27	14.09	14.27	15.31	16.33	16.86	15.78	22.43	27.04	24.33
San Diego Gas & Electric	11.69	12.54	12.29	12.73	13.46	14.23	17.19	14.50	30.21	34.32
Lassen Municipal Utility Dist	NA	NA	NA	5.60	5.64	6.08	6.10	6.45	NA	NA

**TOTAL TAXES PER MWH EXPENSE (\$/MWh)**

	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Colton Electric Utility Dept	3.00	3.33	6.99	8.40	6.92	2.29	NA	NA	NA	NA
Lodi City of, CA	NA	NA	NA	NA	NA	2.88	0.06	0.06	0.06	NA
Pasadena City of	0.01	0.01	NA	NA	0.00	0.02	0.00	0.01	0.00	0.01
Sacramento Municipal Util Dist	0.14	0.11	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Modesto Irrigation District	1.91	2.45	NA	NA	NA	NA	NA	0.01	0.03	0.04
Imperial Irrigation District	0.08	0.08	0.08	0.17	0.19	0.64	0.56	0.21	0.18	0.32
Los Angeles Dept of Wtr & Pwr	0.64	0.82	0.89	0.92	0.86	0.87	0.62	0.47	0.59	0.55
Alameda City of	NA	NA	NA	NA	0.64	0.74	0.86	0.97	1.01	0.99
Vernon City of	1.93	1.67	1.61	1.63	1.57	1.46	1.38	1.40	1.47	1.48
Roseville Electric Department	2.34	2.80	3.44	4.28	4.36	3.22	2.70	2.55	2.62	2.67
Redding City of	1.21	1.27	NA	NA	NA	NA	NA	NA	NA	3.00
Santa Clara Mun Electric Dept	3.22	3.66	4.01	4.23	4.18	3.81	4.11	NA	3.79	3.86
Merced Irrigation District	NA	NA	NA	NA	NA	NA	20.09	3.14	6.64	4.15
Burbank Public Service Dept	4.91	5.65	5.54	6.06	6.03	5.92	5.96	5.83	5.97	5.87
Southern California Edison	9.12	8.77	9.95	7.63	9.70	12.55	8.00	8.96	10.00	6.50
Palo Alto City of	NA	NA	9.07	8.37	9.09	5.90	NA	6.88	6.57	6.60
Azusa City of	1.79	1.79	9.21	9.23	8.96	9.06	9.32	9.23	9.94	9.04
San Diego Gas & Electric	11.18	12.74	13.05	11.18	16.63	16.40	11.75	12.07	7.58	15.53
Pacific Gas & Electric	13.23	14.35	13.13	13.53	15.38	18.50	14.63	15.43	16.23	18.99

**CAPITAL COSTS PER MWH (\$/MWh)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Lassen Municipal Utility Dist	NA	NA	NA	15.72	15.04	15.31	13.59	9.33	NA	NA
Lodi City of, CA	NA	0.69	NA	NA	NA	NA	NA	NA	NA	NA
Glendale City of	1.88	1.89	1.58	1.58	1.21	0.96	0.72	0.45	0.25	0.09
Colton Electric Utility Dept	0.28	NA	0.25	0.22	0.20	0.18	0.79	0.78	0.66	0.21
Roseville Electric Department	1.86	1.48	1.23	1.23	0.92	0.77	0.59	0.21	0.45	0.60
Alameda City of	1.58	1.81	1.99	1.27	1.18	1.20	1.29	1.33	1.24	1.07
Burbank Public Service Dept	1.59	1.65	NA	2.38	2.01	2.10	1.89	1.69	1.60	1.58
Pasadena City of	2.42	3.47	3.45	4.47	4.10	3.72	3.68	3.39	3.26	2.65
Imperial Irrigation District	4.46	4.67	3.24	3.30	4.53	4.58	4.07	3.70	3.68	3.39
Santa Clara Mun Electric Dept	NA	NA	3.90	3.54	5.17	6.21	5.29	NA	4.97	4.59
Merced Irrigation District	NA	NA	NA	NA	NA	NA	23.82	11.86	10.26	6.17
Modesto Irrigation District	8.66	8.56	8.02	7.99	9.17	8.97	9.26	7.45	6.92	6.28
Riverside City of	7.03	7.22	8.84	8.36	7.22	7.08	6.58	6.30	6.69	6.77
Los Angeles Dept of Wtr & Pwr	5.43	6.34	7.17	8.23	9.31	8.84	8.49	7.38	7.77	8.11
Turlock Irrigation District	8.02	8.80	2.17	8.22	7.80	7.61	6.83	6.32	8.54	8.35
Anaheim City of	7.53	7.59	7.91	11.30	10.44	10.08	9.31	8.06	8.83	8.47
Southern California Edison	16.02	14.84	14.31	13.97	12.50	13.72	13.04	11.59	9.85	9.39
Redding City of	8.16	5.90	6.21	6.24	6.35	7.65	9.69	16.38	16.00	13.72
Pacific Gas & Electric	22.22	22.81	24.49	22.30	20.89	25.00	16.90	15.50	14.25	14.18
Sacramento Municipal Util Dist	17.71	17.19	16.88	16.74	16.39	14.72	14.95	15.86	15.49	14.36
San Diego Gas & Electric	19.98	20.36	19.55	18.39	13.95	19.86	17.92	14.21	11.65	16.45

# **Appendix C**

## **Scenario Worksheets**

**Table MU A**  
**Electric Municipalization Comparative Cost Analysis**  
**Cost of Service - Test Year 2004**  
**(Cents Per Kwh)**  
**Constant O & M**

		<b>IOU</b>	<b>New MU</b>	<b>Difference</b>
<b>1</b>	<b>O&amp;M Expense</b>	8.266	8.266	0.000
<b>2</b>	Power Production	6.555	6.555	0.000
<b>3</b>	Generation	1.225	1.225	0.000
<b>4</b>	Purchases	5.330	5.330	0.000
<b>5</b>	Transmission	0.140	0.140	0.000
<b>6</b>	Distribution	0.485	0.485	0.000
<b>7</b>	Customer Services	0.405	0.405	0.000
<b>8</b>	A & G	0.681	0.681	0.000
<b>9</b>	<b>Depreciation</b>			
<b>10</b>	On IOU Rate Base	2.500	2.500	0.000
<b>11</b>	On Premium Over Book		0.549	0.549
<b>12</b>	<b>Amortization of Dev. Costs</b>		0.200	
<b>13</b>	<b>Income Taxes</b>	1.303	0.000	-1.303
<b>14</b>	<b>Non-Income Taxes</b>	0.367	0.367	0.000
<b>15</b>	<b>Capital Costs</b>			
<b>16</b>	On IOU Rate Base	1.912	1.511	-0.401
<b>17</b>	On Premium Over Book		0.955	0.955
<b>18</b>	<b>Total Revenue Requirements (SAR)</b>	14.348	14.348	0.000
	Acquisition Price as Percent of Net Book (%)	163.2		

**Table MU B**  
**Electric Municipalization Comparative Cost Analysis**  
**Cost of Service - Test Year 2004**  
**(Cents Per Kwh)**  
**10% Increase Power Production Costs**

	<b>IOU</b>	<b>New MU</b>	<b>Difference</b>
<b>1 O&amp;M Expense</b>	8.266	8.921	0.656
<b>2 Power Production</b>	6.555	7.211	0.656
<b>3 Generation</b>	1.225	1.348	0.123
<b>4 Purchases</b>	5.330	5.863	0.533
<b>5 Transmission</b>	0.140	0.140	0.000
<b>6 Distribution</b>	0.485	0.485	0.000
<b>7 Customer Services</b>	0.405	0.405	0.000
<b>8 A &amp; G</b>	0.681	0.681	0.000
<b>9 Depreciation</b>			
<b>10 On IOU Rate Base</b>	2.500	2.500	0.000
<b>11 On Premium Over Book</b>		0.301	0.301
<b>12 Amortization of Dev. Costs</b>		0.200	
<b>13 Income Taxes</b>	1.303	0.000	-1.303
<b>14 Non-Income Taxes</b>	0.367	0.367	0.000
<b>15 Capital Costs</b>			
<b>16 On IOU Rate Base</b>	1.912	1.511	-0.401
<b>17 On Premium Over Book</b>		0.548	0.548
<b>18 Total Revenue Requirements (SAR)</b>	14.348	14.348	0.001
Acquisition Price as Percent of Net Book (%)	136.2		

**Table MU C**  
**Electric Municipalization Comparative Cost Analysis**  
**Cost of Service - Test Year 2004**  
**(Cents Per Kwh)**  
**25% Increase in Power Production Costs**

	<b>IOU</b>	<b>New MU</b>	<b>Difference</b>
<b>1 O&amp;M Expense</b>	8.266	9.905	1.639
<b>2 Power Production</b>	6.555	8.194	1.639
<b>3 Generation</b>	1.225	1.531	0.306
<b>4 Purchases</b>	5.330	6.663	1.333
<b>5 Transmission</b>	0.140	0.140	0.000
<b>6 Distribution</b>	0.485	0.485	0.000
<b>7 Customer Services</b>	0.405	0.405	0.000
<b>8 A &amp; G</b>	0.681	0.681	0.000
<b>9 Depreciation</b>			
<b>10 On IOU Rate Base</b>	2.500	2.500	0.000
<b>11 On Premium Over Book</b>		-0.069	-0.069
<b>12 Amortization of Dev. Costs</b>		0.200	
<b>13 Income Taxes</b>	1.303	0.000	-1.303
<b>14 Non-Income Taxes</b>	0.367	0.367	0.000
<b>15 Capital Costs</b>			
<b>16 On IOU Rate Base</b>	1.912	1.511	-0.401
<b>17 On Premium Over Book</b>		-0.066	-0.066
<b>18 Total Revenue Requirements (SAR)</b>	14.348	14.348	0.000
Acquisition Price as Percent of Net Book (%)	95.7		

**Table MU D**  
**Electric Municipalization Comparative Cost Analysis**  
**Cost of Service - Test Year 2004**  
**(Cents Per Kwh)**  
**25% Decrease in Power Production Costs**

	<b>IOU</b>	<b>New MU</b>	<b>Difference</b>
<b>1 O&amp;M Expense</b>	8.266	6.628	-1.638
<b>2 Power Production</b>	6.555	4.917	-1.638
<b>3 Generation</b>	1.225	0.919	-0.306
<b>4 Purchases</b>	5.330	3.998	-1.332
<b>5 Transmission</b>	0.140	0.140	0.000
<b>6 Distribution</b>	0.485	0.485	0.000
<b>7 Customer Services</b>	0.405	0.405	0.000
<b>8 A &amp; G</b>	0.681	0.681	0.000
<b>9 Depreciation</b>			
<b>10 On IOU Rate Base</b>	2.500	2.500	0.000
<b>11 On Premium Over Book</b>		1.164	1.164
<b>12 Amortization of Dev. Costs</b>		0.200	
<b>13 Income Taxes</b>	1.303	0.000	-1.303
<b>14 Non-Income Taxes</b>	0.367	0.367	0.000
<b>15 Capital Costs</b>			
<b>16 On IOU Rate Base</b>	1.912	1.511	-0.401
<b>17 On Premium Over Book</b>		1.978	1.978
<b>18 Total Revenue Requirements (SAR)</b>	14.348	14.348	0.000
Acquisition Price as Percent of Net Book (%)	230.9		

**Table MU E**  
**Electric Municipalization Comparative Cost Analysis**  
**Cost of Service - Test Year 2004**  
**(Cents Per Kwh)**  
**10% Decrease in Distribution Costs**

	<b>IOU</b>	<b>New MU</b>	<b>Difference</b>
<b>1 O&amp;M Expense</b>	8.266	8.217	-0.049
<b>2 Power Production</b>	6.555	6.555	0.000
<b>3 Generation</b>	1.225	1.225	0.000
<b>4 Purchases</b>	5.330	5.330	0.000
<b>5 Transmission</b>	0.140	0.140	0.000
<b>6 Distribution</b>	0.485	0.437	-0.049
<b>7 Customer Services</b>	0.405	0.405	0.000
<b>8 A &amp; G</b>	0.681	0.681	0.000
<b>9 Depreciation</b>			
<b>10 On IOU Rate Base</b>	2.500	2.500	0.000
<b>11 On Premium Over Book</b>		0.566	0.566
<b>12 Amortization of Dev. Costs</b>		0.200	
<b>13 Income Taxes</b>	1.303	0.000	-1.303
<b>14 Non-Income Taxes</b>	0.367	0.367	0.000
<b>15 Capital Costs</b>			
<b>16 On IOU Rate Base</b>	1.912	1.511	-0.401
<b>17 On Premium Over Book</b>		0.987	0.987
<b>18 Total Revenue Requirements (SAR)</b>	14.348	14.348	0.000
Acquisition Price as Percent of Net Book (%)	165.2		