Electric Marketing and Energy Efficiency: What Path for Shareholder Value?

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The changing energy and utility environment requires a new planning philosophy and integration of economic, environmental, financial, and regulatory considerations. In particular, how does future achievement of energy efficiency and marketing goals trade off with financial performance of a utility? (Marketing in this sense is wide scale expansion of electro-technologies and electric vehicles.) Furthermore, how will regulatory conditions expand (or limit) resource procurement, marketing, and energy efficiency options? This paper examines a set of large-scale marketing and energy efficiency options in the context of financial performance, regulatory conditions, and risks. Detailed financial implications are defined, based on end-use load shape aggregations and production costing for marketing and conservation scenarios. **The paper concludes that financial performance is maximized and financial risks are reduced under both a maximum Conservation and the Marketing scenario and a maximum Conservation scenario.** Thus, overall financial performance is superior and risks are reduced in all cases where maximum conservation is pursued.

Introduction

Current policy initiatives in many states promote environmentally sensitive, reliable, least-cost energy services. Utilities are encouraged to assist customers to use energy more efficiently and to provide customers with comparable or higher quality energy services. How does future achievement of energy efficiency and marketing goals trade off with financial performance of the Company? Furthermore, how will conditions imposed by regulators expand (or limit) utility marketing and energy efficiency options? First, a summary is presented of options to sustain utility earnings and regulatory conditions that are likely to bound utility actions. Second, the assumptions for resource plan, marketing, and financial assessments are presented under four scenarios. Third, results are presented from integrated resource plan and financial assessments in terms of earnings per share, net income, total capitalization, interest coverage, and simulated price of common stock. Fuel costs, revenue requirements and average costs are also summarized. And fourth, implications and conclusions of the assessment are presented. The paper concludes that overall financial performance is superior and risks are reduced in all cases where maximum conservation is pursued.

Options for Utility Earnings and Related Regulatory Conditions

The primary options to sustain utility earnings growth are to: (1) increase rate base (power generation, transmission, or distribution); (2) lower operating costs below authorized levels; (3) successfully achieve diversification;[1] and, (4) obtain shareholder incentives through regulation for energy efficiency investments.

Electricity marketing can increase rate base growth directly, spuring electricity demand and earnings growth. With a strong marketing push causing rapid electricity growth, however, there is a record of reduced earnings per share and increased financial risks. While increased utility growth may boost *gross* earnings, this results in a reduction in earnings per share and dilution of common equity.[2] High rates of electricity load growth will usually require issuance of common stock and debt to capitalize generation expansion. The lag in cash flow and long-term nature of the return on these investments generally result in greater financing costs and lesser shareholder value. "If low growth leads to better investment performance than high growth, stockholders should want the utility to control load growth . . ." (S. Kihm, at pg. 29) Thus, earnings growth of should not of itself be a goal; **earnings quality, risk, and common share value must each be considered.**

Currently, the most discussed option is to provide earnings growth through **shareholder incentives** for energy efficiency performance. While this may present immediate and medium-term gains, related is the need for more direct involvement with regulation. Utilities face increased levels of regulation if greater use of utility shareholder incentives is pursued, particularly if greater unbundling of electric utility services is also a priority.[3]

Traditional investment in electric generation is now conditioned by least-cost planning proceedings or through bidding processes. In some jurisdictions such as California, future ownership of utility power generation on the regulated side of the business is limited to combustion turbines (CT's) and potentially repowering because Qualifying Facilities (QFs) provide power at lower cost than utilities. Regarding **utility investments in distribution**, there are few barriers as yet, except the requirement to justify the distribution system budget in the general rate case or attrition filing. In general, regulatory commission staff have little or no expertise to evaluate distribution system investments. For the near future, plain "vanilla" distribution will probably not be seriously scrutinized, particularly if the capital budget follows a justifiable trendline.[4] Thus, **opportunities for utility generation investments have been reduced**, the exception being expansion of CTs. Repowering is a potentially viable investment if a utility can prevail in least-cost planning and power plant reviews. Utility distribution investments will be reviewed more carefully in regulatory proceedings in the near future.

Recent state regulatory decisions on demand-side management and competitive procurement, such as in California, also place conditions on utility investment in DSM, making the longer-term future less than clear. Utility implementation of particular energy efficiency programs may qualify for shareholder incentives. Utility DSM programs that qualify as load-building, load retention, or fuel switching, on the other hand, do not generally qualify for shareholder incentives. Regulators seem inclined to apply a set of conditions on a utility's use of shareholder incentives, as follows: (1) *energy efficiency programs must pass the Total Resource Cost* (TRC) test of cost-effectiveness (with non-price factors included); (2) to qualify for shareholder incentives, *lost opportunities are a priority*; (3) programs considered to be *load building, load retention, or fuel substitution will not qualify for shareholder incentives*; (4) *shared savings may be used* in order for future energy efficiency programs to qualify for shareholder incentives; (5) *shareholder incentives must balance risk and reward* to include minimum performance as well as penalty requirements; (6) future energy efficiency programs will *require a comprehensive and aggressive measurement plan* if shareholder incentives are requested, and measurement of energy efficiency gains must be demonstrated; (7) *for shareholder incentive based programs, the utility is to define rate effects, define net program savings, and define the timing of both rate effects and resource savings.*

Even if such conditions are met, a number of utility risks remain with reliance on shareholder earnings, including: (1) that the savings from energy efficiency programs be clearly demonstrated through measurement; (2) nonperformance penalties may be levied for failure to achieve particular levels of energy savings; (3) reasonableness reviews may be used where there are perceived problems in management if DSM programs; (4) shareholder incentives may be eliminated when DSM bidding is used, allowing third-party ESCOs to reap all the profits from energy efficiency; and (5) more stringent cost-effective tests may be imposed.

Roles for Utilities in Marketing? Under What Regulatory Conditions?

Some state regulators have allowed utilities to implement load building programs that meet other policy objectives, such as environmental mitigation. While load building programs may be allowed, a strong burden has been placed on utilities to prove that significant environmental and societal benefits will result. Where load building is allowed, utilities are encouraged to avoid frustrating commission goals to encourage energy efficiency.

The regulatory **conditions for greater expansion of utility electrification programs** are currently unclear and have been stated only as general pronouncements. Yet, the implicit conditions for more rapid expansion of electric vehicle use appear to be as follows: (1) *clear demonstration of environmental benefits* from implementation and (2) *continuation of extensive investment in energy efficiency* programs.[5]

Regarding **fuel substitution**, regulators and utilities have failed to define a clear methodology that identifies the tradeoffs between gas and electric DSM programs. We suggest a set of conditions that form a *middle ground* between regulators and utilities, as follows: (1) fuel substitution programs should pass the joint fuel TRC test of cost-effectiveness; (2) fuel substitution programs should reduce the utility's need for electric generation without degrading environmental quality; (3) fuel substitution programs should not be predominantly utility load building in character; (4) fuel substitution programs designed to retain load should demonstrate that benefits of the program justify relaxing the focus on energy efficiency.

The regulatory conditions for **load-retention**, unrelated to fuel substitution, also need to be clarified. In California, a relatively clear policy has evolved that allows utilities to

use DSM, RD&D, and other administrative funds to combat threats to load loss. A key question is the magnitude of utility expenditures that should be allocated for load retention.

The foreseeable condition on **utility EV and ET expansion**--electric marketing--is that *power generation requirements be reduced at the same time that system load factor be significantly increased.* An attribute of EVs is use for valley filling to increase load factor.[6]

Earnings Growth With Marketing and Energy Efficiency

The overall method to derive financial results is as follows. The beginning point is a Consensus Base Case for resources, demand forecast, and financial assumptions. Standard production cost simulation and financial models are used.[7] Energy and capacity demands are calculated using a comprehensive market planning and analysis system.[8] The Total Resource Cost test was uses to define the cost-effective basis for the 15 billion Kwh energy efficiency scenario, using the same comprehensive system. The integration linkage between supply and demand-side assessments is accomplished with a software package linking the supply and demand-side models.[9] Thus, the integrated supply-demand-financial analysis directly incorporates differences in future electric generation and conservation assumptions.

The Consensus Base Case resource assumptions are based on demand growth in the planning area of 16,898 MW in 2001 and 19,446 in 2009 and energy generation is 87,814 GWh in 2005 growing to 92,921 GWh in 2009.

The Conservation Scenario (15 billion Kwh) assumes generation is 96,739 GWh in 2009 and direct shareholder incentives (earnings) from energy efficiency increase from $19 million in 1991 to $138.75 million in 2009.

The Marketing Scenario is the result of extensive implementation of EVs and ETs and resulting changes in resource mix. The load shape derived for ETs is assumed to be tempered by price signals and customer education. Contribution of marketing programs to summer peak in 2009 is estimated to be 2,196 Mw.

The Combined Conservation and Marketing Scenario is based on combining the 15 billion kWh and marketing assumptions. Total administrative costs for the combined conservation and marketing scenario increase to $305.4 million.

Quantitative Assessment of Financial Implications

The key indicators assessed and summarized are: fuel costs; earnings per share; revenue requirements; total capitalization and liabilities; book value per share; average costs; interest coverage ratio; and simulated market price of common stock.

Fuel Costs, Cash Earnings Per Share, and Revenues

As an introduction to this assessment, we summarize in Table 1, the net present value of fuel costs, cash earnings per share (EPS) of common stock, and revenue requirements are presented to summarize the overall impacts in terms that more generally can be considered operation costs, shareholder earnings, and total revenue requirements. Cash earnings per share are pay-outs to shareholders, as distinguished from earnings per share from common-stock that include a portion of retained earnings.

Table 1. NPV, Fuel Costs, EPS and Revenues

	Net Present Value (88$)		
Scenarios	Fuel Cost	Cash EPS	Revenue Requirements
Consensus Base Case	26,271.00	14.41	54,075.75
Conservation	25,538.25	17.07	52,824.00
Marketing	29,532.00	15.75	57,147.00
Conservation and Marketing	28,179.00	17.09	56,037.75

Comparison of Earnings Per Share

The differences in earnings per share (EPS) are substantial between the scenarios, as shown in Table 2. In 2005 the assessment shows EPS to be the lowest in the Consensus base case ($2.52) and highest for the conservation and combined conservation and marketing scenarios ($3.47). The rank order of EPS performance for the scenarios in NPV terms is: (1) conservation and marketing; (2) conservation; (3) marketing; and (4) base case. The clear result is that the conservation and marketing scenario and conservation scenario provide superior shareholder value.

Comparison of Total Capitalization and Liabilities

The results on total capitalization and liabilities is consistent with the logic of capacity expansion. The summary is presented in Table 3. Annual figures in each scenario reflect the capital added for generation and DSM as the cost of capital requirements. In 2005 the rank order of total capitalization and liabilities is: (1) Consensus Base Case; (2) Marketing; (3) Conservation and Marketing; and (4) Conservation.

Comparison of Book Value Per Share

The comparison of book value per share (BVPS) is presented in Table 4. Changes in BVPS indicate the quality of earnings and can be used to understand stock dilution. The results here show that in 2005 BVPS is greatest under the Conservation and Marketing and the Conservation scenarios. These results generally confirm the earnings per share and NPV of cash EPS results above; shareholder value is increased when generation expansion is moderated by substantial conservation. In the Conservation Scenario, shareholder incentives contribute significantly but not overwhelmingly to EPS and BVPS. When book value and total capitalization are considered together, the conclusion is again consistent; demand growth tempered by energy efficiency provides for less overall capital cost, reduced financial risk and liabilities, and higher shareholder earnings.

Interest Coverage Ratio

Interest coverage ratios for each scenario are summarized in Table 5. The differences in results are intuitively consistent with the conservation related scenarios requiring less extension of capital and borrowing and lower interest costs. The results show that the four scenarios are reasonably close in result. After 1995, the two supply-oriented scenarios, Consensus Base Case and Marketing have interest coverage ratios that are fully 8 to 12 percent lower than the two conservation related scenarios. These results are entirely consistent with the results of other indicators discussed above. A basic conclusion is that extensive conservation acts to mitigate effects on interest costs and the need for interest coverage, regardless of the marketing or supply investment strategy chosen.

Simulated Market Price of Common Stock

Results for simulated market price of common stock are summarized in Table 6. These results show that both the Conservation and Marketing and the Conservation scenarios presents the best results overall.

Implications and Conclusions of Resource and Marketing Strategies

The implications of these results, in terms of earnings per share, book value per share, and simulated market price of common stock, all point to the conclusion that earnings and common stock value are superior with some combination of the marketing and maximum conservation scenarios, or maximum conservation by itself. Regarding credit rating, results show that total capitalization and liabilities are highest and interest coverage ratios are lowest in the base case and marketing scenarios.

Table 2. Earnings Per Share

Earnings per Share	NPV	1992	1995	2000	2005	2009
Consensus Base Case	16.98	2.09	2.15	2.22	2.52	2.77
Conservation	20.72	2.18	2.28	2.93	3.47	3.90
Marketing	18.46	2.17	2.28	2.56	2.75	2.79
Conservation and Marketing	20.77	2.18	2.41	2.95	3.47	3.88

Table 3. Total Capitalization and Liabilities

Total Capitalization and Liabilities	NPV	1992	1995	2000	2005	2009
Consensus Base Case	73,398.7	9,289.5	9,418.5	8,740.5	11,699.2	14,517.0
Conservation	64,314.0	9,282.0	9,147.7	7,949.2	7,108.0	7,142.5
Marketing	67,066.5	9,293.2	9,440.2	8,322.7	7,530.0	7,616.5
Conservation and Marketing	65,979.0	9,291.0	9,426.0	8,276.2	7,466.5	7,464.0

Table 4. Book Value Per Share

Book Value Per Share	NPV	1992	1995	2000	2005	2009
Consensus Base Case	132.00	16.19	16.76	17.00	21.38	27.77
Conservation	135.75	16.23	18.02	18.02	23.03	39.05
Marketing	132.00	16.24	16.99	17.48	19.81	27.91
Conservation and Marketing	137.25	16.24	17.14	18.25	23.14	38.82

Table 5. Interest Coverage Ratio

Interest Coverage Ratio	1992	1995	2000	2005	2009
Consensus Base Case	1.96	1.89	1.85	1.85	1.85
Conservation	2.00	2.00	2.14	2.21	2.17
Marketing	2.00	1.94	2.00	2.02	1.94
Conservation and Marketing	2.00	2.00	2.12	2.19	2.16

Table 6. Simulated Market Price of Common Stock

Market Price Common Stock	1992	1995	2000	2005	2009
Consensus Base Case	26.39	27.31	27.72	32.16	34.84
Conservation	26.46	27.56	29.37	33.24	37.53
Marketing	26.46	27.69	28.50	30.35	32.28
Conservation and Marketing	26.47	27.94	29.75	33.52	37.71

The following conclusions can be drawn from this assessment of resource options, marketing, and financial modeling: (1) large scale marketing programs that drive utility supply-expansion may significantly erode its credit rating and earnings quality; (2) shareholder earnings and earnings quality are maximized under the maximum conservation and conservation plus marketing scenarios; and (3) if utilities seek to substantially alter its portfolio of services, such as to pursue EVs and ETs more aggressively, it should establish acceptable and clearly understood regulatory conditions to reduce future regulatory risks.

Endnotes

1. In this paper, we ignore diversification. Whereas earnings from lowering overall costs below those authorized is limited, diversification presents substantial earnings opportunities, an overall track record on utility diversification presents general lessons learned. Diversification into unrelated businesses, however, makes the investment less attractive and usually presents increased risk.

2. Dilution of equity results from a stock split or issuance of additional stock shares without proportionate increase in stock value.

3. From the "regulated unbundling" scenario comes greater regulatory involvement and scrutiny. This reduces utility flexibility to respond to customer needs and rivals in niche markets.

4. Greater state regulatory review of distribution expense levels may be just around the corner. As a result of Pacific Gas & Electric's (PG&E) recent general rate case filing to expand its budget for DSM programs that avoid distribution investments, the California Public Utilities Commission (CPUC) will increase its scrutiny and probably ask for more detailed distribution marginal cost studies.

5. The recent state regulatory decisions seem to leave open opportunities for some significant expansion of electro-technologies (ETs) and electric vehicles (EVs), but this will depend on development of (1) a framework for assessment, (2) efforts to achieve the CPUC's energy efficiency objectives, and (3) clear demonstration of the achievement of environmental goals and policy. See, for example, the Cal. Pub. Util. Comm'n. Decision on its DSM OII/IOR, I. 91-08-002, August 1991, Appendix A, pp. 1-4,.

6. Large scale ET programs will probably fare better in the regulatory arena if explicitly bundled with load-management, peak-load pricing, and interruptable/ curtailable rates.

7. The ELFIN models were used for financial assessment and production costing model. ELFIN is owned by Environmental Defense Fund.

8. COMPASS is the comprehensive market planning and analysis system developed by Synergic Resources Corporation.

9. SUPPLINK is the model to integrate supply and demand-side analysis — in this case ELFIN production cost and COMPASS marketing and demand-side assessments — developed by Synergic Resources Corporation.

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