# Comprehensive Energy Services At Competitive Prices: Bundling Efficiency and Energy for Small Consumers Through A Retail Buyers' Cooperative

*John Plunkett, Optimal Energy, Inc., Middlebury, VT*
*Beth Sachs, Vermont Energy Investment Corp., Burlington, VT*[1]

## ABSTRACT

Electric competition should lower prices, at least for large users. Small consumers could miss out on lower prices. Deregulation has already set back energy efficiency and energy affordability efforts for low income consumers. The authors envision Consumers' Energy Cooperatives (CECs or "Consumercos") offering small users a complete menu of electricity, fossil fuel, and efficiency choices, including renewable energy options through a buyers' cooperative owned and controlled by its members. Now being pioneered in several northeastern states, CECs will offer competitive solutions otherwise available only to the largest consumers.

CEC markets and delivers full-service, fuel-neutral energy services. It competes on the basis of lower *bills,* not the lowest *price,* by integrating electricity aggregation, competitive fuel procurement, and comprehensive energy-efficiency, all with the optional convenience of consolidated billing. Energy efficiency adds value, both by lowering bills and by reducing environmental impacts. Integrating fossil fuels helps optimize both efficiency investment and energy mix, while overcoming individual energy supplier disincentives' to improve efficiency.

The authors analyzed the feasibility of a particular application of the Consumerco in a Northeastern state. Their analysis found that the energy co-op would be economically viable under moderate expectations if it provided a full complement of energy services to its customers. Energy efficiency was found to be vital to the economic success of the cooperative enterprise. Only under optimistic scenarios would electricity aggregation be viable without either efficiency or fuel oil. Not even optimistic expectations would make it viable if it omitted both fossil fuel and energy-efficiency services.

## Background

Retail competition is slowly but inexorably working its way into America's electricity markets. The opportunities electricity competition will open up are enormous. Most consumers will be able to choose their electric generation provider in three years, even though only a few states allow it now. The US electricity market is around $200 billion annually, the generation segment of which (around half) will be opened to competition. With natural gas and oil, the nation's buildings' total energy bills run over $300 billion. Electricity is the one energy source everybody uses. Retail deregulation lets competitors offer a complete menu for all consumers' energy-service "meals." Opening the

[1] The authors gratefully acknowledge the conceptual and analytical contributions of colleagues Rob Church and John Grant of Management Consulting Services, working with the authors on CEC development in the Northeast.

opportunity to fully integrate the supply of building energy services will lead to the re-bundling energy services marketing, pricing, and delivery.[2]

Economic theory says consumers should benefit from retail electricity competition, which should lower prices on the generation portion of their electric bills. It is by no means obvious that small consumers will benefit fairly if at all. Low-volume users involve higher marketing and transaction costs per unit sold, offering electricity suppliers much smaller profit potential. Prices could even increase for small users under competition if suppliers impose higher markups to cover higher costs and required return on risky investment. Such an outcome is particularly worrisome for low-income and other economically disadvantaged users.

At least at the start of competition, retail suppliers have appeared to actively compete for the business of small users. Connectiv (the retail arm of the merger between Delmarva plus Atlantic Electric) recently offered all customers of PECO a 10% rate cut — whether they stayed with Connectiv or not.[3] Such bold campaigns for carving out an early place in big markets take deep pockets. Competition is already so fierce and entry costs so high that many startup companies are finding it difficult to establish themselves.[4] Enron recently pulled out of the California residential market. These developments suggest that dramatic price breaks for small users could be short-lived.

Even before it arrives, competition has deprived many small consumers of the economic benefits of cost-effective energy efficiency investment, which many utilities had provided previously at the behest of regulators. The decline in utility DSM spending since 1994 has been significant. Cost-effective efficiency investment lowers small consumers' energy bills substantially, with the most comprehensive investment cutting consumption by 5-25%. Program spending combined with lower sales raise average costs per kWh. Regulators in many jurisdictions have allowed utilities to curtail or abandon demand-side management (DSM) investments, citing competitive pressures to keep rates to the absolute minimum.

It is already a truism that competitors must find ways to add value to the homogenous commodity of electricity. Volume alone is not enough to make money.[5] Margins in the retail electricity business are expected to be razor-thin, so competition on price alone is not viable for any but the largest, most horizontally and vertically integrated competitors.[6] Others must find strategies for differentiating themselves from the competition by adding real or perceived value. So far, the emphasis has been on the latter in offering services to small consumers.

Competition by itself is not going to make customers any more willing than they have been before to make the sizable capital investments required for comprehensive efficiency investment. Energy-efficiency is increasingly recognized as a critical ingredient in successful energy service offers to large customers.[7] A $120 million deal between PG&E Energy Services and Rite Aid provides a recent example.[8]

The economic impetus for bundling efficiency does not appear to be as strong for small users. The thin margins on low sales volumes deter retailers from offering the kind of comprehensive, whole-

---

[2] Edward P. Meehan, "Selling Electricity Online?," Public Utilities Fortnightly, April 15, 1998.

[3] "Connectiv Offers 10% Rate Cut to PECO Customers," Reuters News Service, March 1998,

[4] "California's Power Deregulation Isn't as Open as It Looks," Wall Street Journal, February 25, 1998.

[5] "Energy marketing Profits/Losses Not Necessarily Reflecting Volume," Utility Spotlight, March 23, 1998.

[6] Meehan, op. cit., pp. 56-58.

[7] "Efficiency Key to Lower Power Bills," Reuters, March 18. 1998, via Energy Central News.

[8] "Nation's Leading Drug Store Chain Signs $120 Million Agreement with PG&E Energy Services, via Energy Central News, May 7, 1998.

building energy-efficiency retrofits previously available through DSM retrofit programs from a few utilities. The additional capital investment required probably makes truly comprehensive efficiency prohibitive for competitors in small-user markets. Comprehensive energy-efficiency has not figured prominently in competitive offerings to small consumers to date. A few retailers have offered to sell piecemeal energy-efficiency measures along with electricity. More typical of retail product-differentiation strategies offered small users is "green" power options, for which customers have indicated and to some extent demonstrated some willingness to pay to pay a premium·

The authors are involved in a variety of efforts throughout the Northeast to develop full-service buyers' cooperatives that bundle electricity, fossil fuels, and energy-efficiency for small consumers. This paper explains the concept of consumers' energy cooperatives (CEC), and reports on analysis of a particular application of the concept in the Northeast.

## The Consumers' Energy Co-Op

### Conceptual Description

CEC is envisioned and analyzed as a full-service, consumer-owned energy cooperative, whose mission is to lower its members' energy bills by combining competitive energy pricing with comprehensive energy services. Competitive energy pricing would be accomplished through aggregation of comprehensive energy services, including electricity, fossil fuels, energy-efficiency investments, and renewable energy sources. CEC would offer a comprehensive array of services, available as a package or individually as selected by the consumer, including:

- aggregation of electric and non-electric customers;
- identification, specification, financing and installation of cost-effective energy-efficiency measures;
- two renewable electricity options:
    - optional "premium service" with renewable generation accounting for half the consumer's total electricity usage;
    - "ultra premium service", with on-site rooftop photovoltaic installation; and
- consolidated billing for all energy and efficiency services, possibly including other non-energy services such as telecommunications in the future.

CEC would use this full service approach and its customer ownership to differentiate itself from conventional energy retailers. Many retail competitors are expected to offer primarily a single energy source and compete primarily on the basis of *price.* By aggregating member demands, the CEC can gain enough market power to obtain and offer competitive prices for electricity, fuel oil, propane, and natural gas. Prices should be competitive in the sense that they would be on a par with the prices offered by other competitors in the marketplace. CEC would probably not be in a position to offer the absolute lowest prices for electricity. The field is likely to be too crowded with suppliers with access to large amounts of low-cost supply.

In addition to competitive prices, CEC would feature value-added services designed to lower members' total energy *bills.* Bill savings would be achieved attractive pricing of comprehensive energy-efficiency measures addressing all energy sources. CEC would also lower bills by helping

customers select the most cost-effective mix of energy sources for their individual energy service needs.

CEC would offer its members the optional convenience of a single bill for all energy services. Members , so they can consolidate all of their energy service with CEC, or to receive only those energy services they choose from the Co-op.

Members could opt for premium environmental quality in their power supply. Premium service would include direct installation of customized energy-efficiency measures designed to reduce total energy bills immediately, with follow-up technical, financial, and delivery services for further efficiency investment, and options for obtaining renewable energy supplies, by wire or on-site.

In addition to lowering its members' total energy bills, CEC would be committed to the principle of democratic member control and ownership of the enterprise. The cooperative nature of the business is expected to have both substantive and promotional advantages.

**Competitive Advantages**

CEC's unique attributes distinguish it from other energy retailers in a variety of target market segments:[9]

- *Security buyers* — by the locally-based cooperative as an alternative to large, out-of-state corporations; risk reduction from lowered consumption through energy-efficiency.
- *Bargain buyers* — by energy-efficiency; buying power of CEC.
- *Convenience buyers* — by consolidation of electricity and fuel-oil; comprehensive energy-efficiency solution.
- *Environmentally, socially-conscious buyers* — by energy-efficiency; renewable option; economic democracy of CEC.

CEC would attract members by differentiating itself from the competition on non-price attributes. It would do so by emphasizing what it is — an entity locally-owned and-controlled by its members — and by the comprehensive value-added energy services it offers. This full-service approach enables CEC to focus on the customer s total energy bill, not just the *electricity* bill. It creates the opportunity for CEC and consumers to optimize the mix of energy services, that is choose the combination that would be most beneficial to the consumers. The bundled services add real value to an otherwise homogeneous commodity distinguishable almost entirely by small price differentials.

The CEC will compete directly with providers claiming socially responsible or environmentally beneficial features by offering more tangible and definite economic benefits (i.e., lower bills), environmental benefits (certifiably green power, energy efficiency), and social benefits (e.g., local and democratic controlled-governance) directly to its member-consumers.

**Energy Efficiency in Market Positioning**

Energy-efficiency is pivotal to the CEC's differentiation strategy and thus its economic viability. Experience proves that energy efficiency by itself is difficult to market to large numbers of

---

[9] See, for example, Prindle, William, *Can Efficiency Keep the Rustler Out? Energy Efficiency as a Customer Retention Tool*, Proceedings of 1996 ACEEE Summer Study, p.7.135.

customers. The most basic impediment to choosing efficiency improvements is that consumers must commit capital to efficiency, whereas they can "pay as they go" for inefficiency. All the widely recognized market barriers to energy efficiency — capital access, split incentives, risk perception, and information problems — originate from this pricing discrepancy.[10] Consumers generally lack the time, interest and expertise to learn the value of energy efficiency and make decisions based on that knowledge, let alone commit capital and take risks.

The emergence of retail electricity competition essentially forces consumers to make new choices and decisions — even if the decision is merely to choose not to change. Consumers may be more willing to make a decision about energy-efficiency when it is part of another energy decision they must confront, i.e., the choice of electricity supplier. Choosing energy efficiency would become still easier if it is attractively priced. And consumers do actually make choices which have energy implications, such as purchase of appliances, building remodeling or addition, and choice of fuel source, and are unaware of the energy implications. The CEC can help its members make *informed* choices in these areas.

Contradictory experience suggests that this approach holds promise for small users. Limited experience to date suggest that comprehensive service is offered only to large users by large energy-service providers. On the other hand, energy service companies (ESCos) find that the bigger consuming entity, the longer and more lengthy and complex their decision-making. On still another hand, long-distance phone competition demonstrates that smaller customers make a decisions to change more readily than large users.

Utility DSM program experience proves that an overwhelming majority of residential and small commercial and industrial customers will accept attractive offers of substantial, directly-installed energy-efficiency measures.[11] Such an aggressive strategy succeeds in overcoming practically all the market barriers that prevent customers from investing in energy-efficiency on their own. Limited experience also indicates that energy efficiency is attractive when priced in a manner similar to energy use, i.e., if it is paid for over time and requires minimal effort on the customer's part.

An attractive offer of lower bills through comprehensive energy efficiency creates a powerful competitive edge for CEC in the retail energy market. It would clearly differentiate CEC's service from the service provided by either new electricity suppliers or the incumbent electric utility. Energy efficiency would prompt some consumers to choose CEC as their energy supplier in the following ways:

- *Free efficiency investment.* Some efficiency investment would be provided free of charge as an inducement to become a member/or/sign on with CEC. More substantial efficiency investment would be offered to customers making a long-term membership commitment. Offering efficiency at commencement of service is also analogous to free cellular equipment provided to customers enrolling in new service plans. The cost of such equipment often equals or exceeds the minimum service contract fees. Such offers have been pivotal marketing tools in a fiercely competitive business.

---

10 "Lost Revenues and Other Issues in Demand-Side Resource Evaluation: An Economic Reappraisal" (with P. Chernick), *1988 Summer Study on Energy Efficiency in Buildings*, American Council for an Energy Efficient Economy, Pacific Grove, California, September 1988.

11 Nadel, Steven, Miriam Pye, and Jennifer Jordan. 1994. *Achieving High Participation Rates: Lessons Taught by Successful DSM Programs.* Washington: American Council for an Energy-Efficient Economy

- *Attractive pricing and delivery of energy-efficiency.* Margins on energy sales would not be high enough to allow CEC to provide all cost-effective efficiency investment at no direct charge to members. However, further investment beyond an initial level can be attractively priced if customers can pay for it out of bill savings.
- *Synergy with supply.* Energy efficiency is more likely to be noticeable to customers when it is offered in the context of a new supply offer. Conversely, adding energy supply especially at reduced cost to the efficiency offer makes the latter more appealing.
- *Bill reduction.* Energy efficiency is critical to focusing customer attention on their total energy bills. But energy prices (rates) are anticipated to be the primary marketing message promoted by competing retailers. Yet how many utility customers really know what *rate* they pay for electricity, especially while rates are being restructured? The answer is probably far fewer than the number who know the amount of their typical monthly electricity *bill.*
- *Risk mitigation.* Energy efficiency lowers real and perceived risk for the customer, appealing directly to security-conscious buyers. While competition may lower electricity prices in the near term, price levels and volatility may increase in the future. Lowering consumption through energy efficiency lowers consumers' exposure to these risks in the future. The benefits of consumption reductions would last long after the "teaser" price discounts offered by aggressive marketers disappear.
- *Environmental benefits.* No power is cleaner or greener than the power you don't use.

**CEC's Public Policy Advantages**

As currently envisioned, CEC will provide a number of public benefits that ordinary market competitors will not. These benefits offer CEC marketing and regulatory advantages over competitors. The CEC serves the public interest in several areas, including:

- Energy and regulatory policy
- Environmental improvement
- Low-income consumer protection.
- Economic development

**Energy And Regulatory Policy.** Federal and state governments are working to ensure that public benefits under utility regulation are either preserved or expanded. Utility DSM programs have been designed to overcome market barriers that prevent consumers from investing in energy-efficiency measures costing less than utility supply. Utility market intervention will continue to be a major instrument of energy and regulatory policy. Market barriers to consumer investment in energy efficiency will persist under retail electricity competition. Regulators in many jurisdictions will require continued investment in DSM by distribution utilities, funded through "system benefits" charges. During and after the transition, regulated DSM investment will be directed toward:

- Lost-opportunity resources (new construction, equipment replacement);
- Market transformation; and
- Disadvantaged customers (e.g., low-income residential customers).

Except as part of distributed utility planning, most utility regulators will no longer require discretionary retrofit efficiency investment opportunities. In all likelihood, retailers will not offer comprehensive retrofits to small users. CEC therefore fills the growing gap in utility DSM programs left by continuing cutbacks in such programs due to deregulation.

**Environmental Improvement.** CEC will advance environmental policy objectives in two ways. First, comprehensive energy-efficiency investment will reduce energy consumption and thus production. Lower energy output will lead to lower emissions of a number of pollutants, including greenhouse gases. Second, CEC will reduce environmental impacts associated with energy use by helping transform the market for renewable supply. Market transformation will be reinforced by elevating and meeting the demand for green electricity supply.

**Low-Income Consumer Protection.** CEC will specifically target low-income households as one of the populations which it seeks to serve. In doing so, CEC will provide several services which directly address low-income concerns, including:

1. *Aggregating* the market power of low-income customers into larger groups for the purpose of negotiating better prices — Through a variety of public assistance programs, low-income consumers have already been "aggregated" into larger groups. CEC will provide an opportunity for agencies delivering fuel assistance (i.e. LIHEAP); child care (e.g. Head Start), and others to gain membership to CEC on behalf of their constituents.
2. *Delivering* energy efficiency to reduce bills — The tendency of low-income people to live in older, less energy-efficient homes is well documented. CEC will allow these homes to be treated with energy efficiency measures and will thus improve shelter affordability by reducing energy bills.
3. *Bill minimization* — Low-income customers will benefit more than other customers by CEC's "bill minimization" (rather than price minimization) philosophy. CEC will, for example, provide services to switch low-income members from electric space heat to another fuel source.

**Economic Development.** Energy efficiency investments by CEC will create jobs directly because energy-efficiency investment employs more local resources capital and labor than the energy production it displaces. Reductions in energy bills through competitive prices and comprehensive energy services will reduce the cost of living and doing business where CEC operates. These cost reductions will act as an economic stimulus, generating additional economic activity that in turn creates jobs. This indirect effect has been shown to be at least as strong as the direct creation from more labor-intensive energy-efficiency investments.

## Feasibility Analysis

The authors were engaged to analyze the economic and financial feasibility of the CEC, as applied to a particular set of circumstances involving target market (geographic and customer segments) and product mix. The analysis is presented because certain results may be generally applicable to CEC in other places and configurations.

## Method

**Scope of Analysis.** The analysis focuses on two metropolitan areas in a single state. It assumes a start-up on January 1, 1999 and provides projections for ten years. It assumes that maximum market penetration is reached in year three, resulting in the total customer base remaining constant from year five through year ten. CEC membership would consist of residential customers; both low-income and non-low-income, and including environmentally-conscious consumers; and small and medium non-profit organizations. CEC would offer bundled purchased power, fuel oil, energy efficiency services, on-site photovoltaic generation, consolidated billing for all its services, extensive information and educational services. The analysis does not consider other non-residential, customers (commercial, industrial or large non-profits). For a variety of reasons unique to our clients situation, CEC as modeled would not sell either natural gas or propane.

**Determining Economic Feasibility.** In order to be economically feasible, an enterprise must be expected to generate enough sales revenue to meet and exceed its costs and other financial obligations. To do that, it must generate sufficient benefits to consumers to attract and retain customers.

This analysis captures both aspects of business viability. CEC can attract customers only if it can provide them energy services for less than what they would have paid otherwise. The analysis therefore starts with estimates of prices potential members would be likely to pay for retail electric and fuel oil in competitive markets and the quantities of energy they would consume otherwise. Analytically, energy bills that customers would have paid absent joining the co-op are treated as its sales revenue. CEC's costs are the costs of acquiring electricity and fuel oil for its customers, the costs of energy-efficiency, and its operating costs.

Also reflected are the economic savings from energy-efficiency. Energy efficiency savings have two distinct components. One is from reduction in the consumption of electricity and oil sold to members. Efficiency benefits also include the value of energy sources the co-op saves for but does not sell to its members — that is, the natural gas and propane savings from efficiency measures installed for members who buy electricity and/or oil. Saved energy not sold also includes electricity and oil savings to customers who choose not to buy either of these energy sources from the co-op.

This analytical convention is consistent with the premise that the business is owned by its customers. Any net income realized by the business becomes the property of its owners — i.e., its members. If CEC can achieve bill reductions through competitive prices and comprehensive energy services, its members are theoretically indifferent to whether these benefits are flowed through as lower monthly bills or in the form of periodic "refunds", or some combination of the two. The fundamental point is that the if the co-op generates net income, it is economically viable. It covers its costs and it benefits its customers.

**Financial Analysis.** This conceptual analytical approach is implemented through an elaborate electronic spreadsheet. The economic feasibility analysis was performed with a set of over seventy-five linked electronic worksheets. Each aspect of energy service is modeled in its own set of financial statements, which are in turn combined into a set of consolidated financial statements for CEC. The financial forecast models show each separate sub-module as it own profit center. This structure shows how each sub-module contributes toward the overall performance of the co-op.

**Assumptions**

These findings depend on a wide variety of assumptions about future market conditions and market acceptance. Answers to the following questions were required to analyze the CEC:

- *Customer acceptance*: How many people will take which energy services offered with the package and the pricing modeled?
- *Competitive electricity supply*: What is the spread between the competitors' prevailing retail selling price and CEC's wholesale acquisition cost to obtain electricity for the customers it aggregates?
- *Competitive oil supply*: How much over wholesale will it cost CEC to deliver fuel oil to its members?
- *Energy-efficiency*: How many targeted customers will accept some combination of energy-efficiency measures, and how much do those measure combinations save for each customer group targeted?
- *Renewable electricity*: How many customers will purchase premium renewable supply, and how much of their total annual consumption will this represent, under each service offering (by wire and on-site)? How many customers will choose to pay the significantly higher costs of on-site photovoltaic electricity generation?
- *Fixed costs*: How high are the numerous fixed costs that CEC will have to incur to attract and serve its customers, including general and administrative (G&A) and financing costs?
- *Financing*: While a non-profit cooperative is not required to pay a return to shareholders, it must cover financing costs. CEC may raise capital on favorable terms from one or more cooperative financing institutions. Member equity contributions must also be modeled.

Many of these assumptions vary according with the cases and scenarios analyzed. Of course, the analysis is only as good as the numbers chosen. Picking the right numbers requires judgment, market knowledge, and experience. Major assumptions behind the feasibility analysis are highlighted in Table 1.

**Table 1.** Summary of Varying Assumptions

| Case | Variables Between Scenarios | Scenarios | | |
|---|---|---|---|---|
| | | **Conservative** | **Expected** | **Optimistic** |
| 1 | **Electricity, Oil, & Efficiency** | | | |
| | # of customers in year 5 | 13,794 | 68,521 | 148,327 |
| | % of customers choosing efficiency | 15%-60% | 30%-80% | 50%-90% |
| | Total G&A budget in year 3 | $ 1,379,722 | $4,096,075 | $7,748,537 |
| 2 | **Electricity & Efficiency** (No Oil) | | | |
| | # of customers in year 5 | | 56,743 | 119,164 |
| | Total G&A budget in year 3 | | $3,514,005 | $6,181,923 |
| 3 | **Electricity & Oil** (No Efficiency) | | | |
| | # of customers in year 5 | | 68,521 | 148,327 |
| | Total G&A budget in year 3 | | $3,906,779 | $7,506,242 |
| 4 | **Electricity** (No Oil or Efficiency) | | | |
| | # of customers in year 5 | | 56,743 | 119,164 |
| | Total G&A budget in year 3 | | $3,327,911 | $5,951,831 |

**Assumptions for all cases:**

| | |
|---|---|
| Inflation | 3.0% |
| Discount rate for cash flows | 15.0% |
| Interest rate for borrowing | 7.5% |

## Cases and Scenarios Analyzed

Four cases were developed for detailed analysis, and each case was examined using 3 scenarios — expected, optimistic, and conservative. The base case (Case 1) is the full-service cooperative offering a combination of electricity (with a choice of traditional and two renewable options), fuel oil, and energy-efficiency, with CEC offering consolidated billing for all services. Case 2 omits fuel oil from Case 1, considering only electricity and energy-efficiency. Case 3 omits energy-efficiency from Case 1, i.e., considering electricity with oil. Finally, Case 4 omits both fuel oil and efficiency, considering electricity alone (still including renewable options).

## Findings And Conclusions

### Results

Analysis results for the various cases and scenarios examined are summarized in Table 2 and depicted in Figure 1. Table 2 presents the present worth of cash flows from operations, the year in which the cooperative business breaks even, and the level of cash flow at maturity. Figure 1 plots annual cash flows for each case under the expected scenario for the five year period analyzed. The pattern of cash flows within each case is driven by the expenditures and sales for quickly ramping up to full operation, and achieving mature market share after three years. Thereafter, new customers to replace dropouts, based on marketing, service, and pricing efforts projected.

**Table 2.** Summary of Results for Different Cases and Scenarios

| | | Case 1 | Case 2 | Case 3 | Case 4 |
|---|---|---|---|---|---|
| | **Scenarios** | **Electricity, Oil, & Efficiency** | **Electricity & Efficiency** (No Oil) | **Electricity & Oil** (No Efficiency) | **Electricity** (No Oil or Efficiency) |
| **Present Worth of Free Cash Flows** | **Conservative** | $ (8,412,325) | NA | NA | NA |
| | **Expected** | $ 31,656,982 | $ (5,850,480) | $ 1,296,255 | $(31,770,201) |
| | **Optimistic** | $134,494,246 | $34,731,686 | $ 52,864,307 | $(29,834,335) |
| **First Year of Positive Net Income** | **Conservative** | Never | NA | NA | NA |
| | **Expected** | 3 | Never | 5 | Never |
| | **Optimistic** | 1 | 4 | 2 | Never |
| **Net Income in Year 5** | **Conservative** | $ (942,851) | NA | NA | NA |
| | **Expected** | $ 1,319,646 | $ (1,400,906) | $ 354 | $ (2,701,533) |
| | **Optimistic** | $ 6,631,472 | $ 424,558 | $ 3,523,801 | $ (1,966,847) |

NA = Not Analyzed

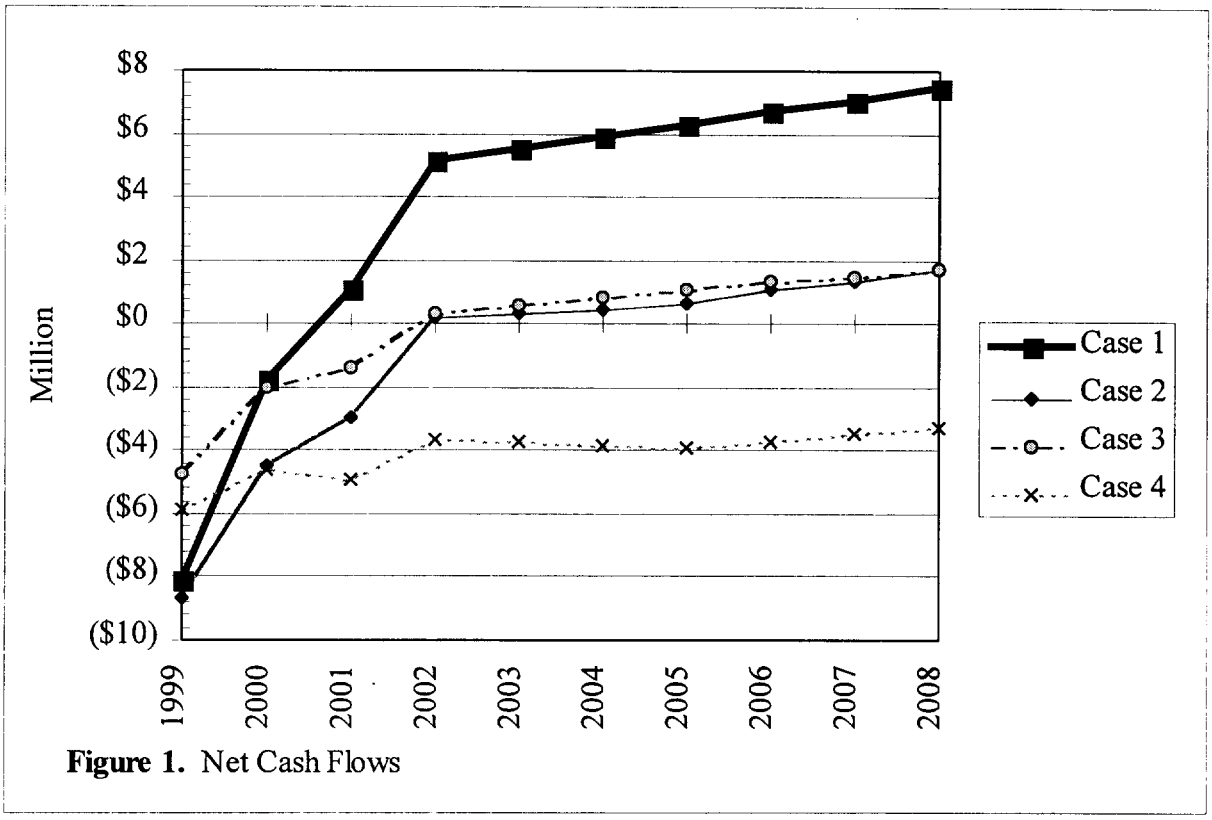


**Figure 1.** Net Cash Flows

## Findings

**Base Case (full energy services).** Case 1 shows economic feasibility under both expected and optimistic conditions. The business would break even by the third year of operation in the expected case, and would do so in the first year under the optimistic scenario. At maturity, it would produce between $1.3 million and $6.6 million in annual net benefits. Under conservative assumptions, the co-op is not viable, in which case it produces negative net benefits of $8.4 million and never breaks even.

The base case analysis of full energy services shows the cooperative energy-service enterprise is economically viable under expected and optimistic conditions. In its first ten years of operation, CEC in the base case would be expected to generate $32 million in discounted net benefits to its owner members. These benefits represent the value of the savings they would realize compared to what would be expected without CEC — i.e., if they took service from typical competitors at average retail prices expected to prevail over the period, and did not take advantage of the full set of energy-efficiency services considered. This value is not the difference between current regulated prices, rather, it represents economic savings in addition to the prevailing prices expected from competition.

The "optimistic" scenario for the base case offered significantly greater economic net benefits. As shown in Table 2, the optimistic scenario of the full base case projects four times the total net benefits of moderate expectations. Net benefits per customer are almost twice as high as under the moderate expectations. These more optimistic assumptions involve twice as many customers, deeper wholesale acquisition discount from prevailing retail prices due to aggregation, and even more widespread efficiency savings. This combination of assumptions produces more operating margin for

the business. Although the costs of running such a larger business are higher, they are spread more widely over greater sales.

**Electricity and efficiency (no fuel oil).** Without another source of sales margin, Case 2 indicates that CEC would only be economically viable under the optimistic scenario, Omitting fuel-oil reduces per-member net benefits in the moderate and optimistic scenarios, respectively. It can be inferred from this analysis that adding natural gas and propane to the base case would improve the economic viability of the CEC.

**Energy efficiency.** Energy efficiency provides two forms of benefits to members. It reduces the costs of serving them with energy sources they purchase from the co-op; and it saves them money on energy they buy elsewhere — either from electricity or fuel oil from competitors, or natural gas or propane, which the analysis does not include as a co-op service. These benefits are reflected as negative expenses on income statements of the analysis. The costs of energy efficiency are represented as a mix of relatively inexpensive, directly-installed measures, installed at no cost to the member, and more expensive measures which are financed by customers with funds provided by the co-op. The efficiency measures were carefully chosen in the analysis to be cost-effective. Consequently, efficiency enhances net benefits by lowering energy costs by more than it raises capital and operating costs.

Case 3 shows how significant energy-efficiency is to the overall net benefits of the co-op. Removing efficiency from the co-op entirely has a dramatically negative effect on net benefits to co-op members. Without the value added by energy efficiency, the expected scenario for Case 3 shows that the co-op would barely break even. The optimistic case performs somewhat better than the expected scenario for Case 1.

It should be noted that the no efficiency "expected" case is almost certainly too optimistic. Without the offer of comprehensive energy efficiency, it is reasonable to assume that the co-op will attract a much smaller market share. Without efficiency, it looks very much more like other competitors. It is doubtful that this combination of energy sources, even with renewable electric options and cooperative ownership, will generate the same market share as the full-service base case (Case 1).

**Electricity only (no oil or efficiency).** In Case 4, the co-op only markets electricity. The market share it manages to achieve is attributable only to its renewable offers and its cooperative structure. Given the economies of scale of operating an electricity business, electricity margins — even under the optimistic scenario — are never enough to cover costs. The per-member effect of removing fossil-fuel and efficiency is the difference in net benefits between the full-service base case (Case 1) and Case 4. It is highly significant that the optimistic scenario with electricity-only performs only marginally better than the expected scenario, indicating little advantage to increasing customer volume.

**Oil only (no electricity or efficiency)** No analysis of this option was performed. No study was required to determine that an oil-only energy co-op is economically feasible because small fuel oil co-ops already exist that are saving members money while covering costs. The optimal size of a fuel-oil only co-op was beyond the scope of our analysis.

## Conclusions

Under "expected" conditions, the full combination of electricity, fuel oil, and energy-efficiency, with (outsourced) billing services provided by CEC is economically viable. The analysis also indicates that omitting fuel oil (Case 2), efficiency (Case 3), or both (Case 4) is not likely to be economically viable under expected conditions. These findings confirm that multiple services are needed to generate sufficient sales margin to cover the substantial fixed operating costs of a retail electricity business.

All but one of the scenarios — Case 4 — are economically viable under optimistic assumptions. Three cases omitting oil, efficiency, or both from the full range of services were also analyzed under the optimistic scenario involving higher market share and larger spread between wholesale acquisition costs and retail selling prices for electricity and fuel oil. CEC would be economically viable under optimistic conditions if it omitted either fuel oil, or energy-efficiency, but not both. Total net benefits with optimistic assumptions in the no-oil or no-efficiency cases are comparable to those projected for the expected scenario for the base case. However, net benefits per member are smaller.

None of the cases are likely to be economically viable under conservative assumptions. In a conservative path for major assumptions, CEC would be unable to attract enough electricity consumers, electricity margins would be lower, and far fewer customers accept comprehensive energy-efficiency measures.

Even the full-service base case would sustain net losses of almost a million dollars in its fifth year of operation under conservative assumptions. The fixed costs of the business would overwhelm the modest operating margins generated by such a small customer base. Even with a minimal staff, the enterprise would sustain annual losses on the order of $1 million, losses from which it would never recover. With negative cashflow throughout the entire 10 years, CEC would not be viable under conservative projections. Since net benefits declined in all scenarios of the other cases, no additional analysis was required to determine that none of the other three cases would be viable under conservative assumptions.

Finally, providing only electricity (with renewable options) is not projected to be economically viable under any conditions. Significantly, the analysis also found that CEC would not be viable even under optimistic assumptions if it were confined exclusively to providing electricity.

The Consumerco will garner market share as a consumer-owned enterprise dedicated to minimizing total energy costs for those least likely to benefit from competition. The analysis presented here demonstrates not only that total energy service is economically viable, but that it is the economically optimal mix of energy services. Energy-efficiency is a key ingredient to the consumer appeal and the economic viability of the Consumerco. It is the product differentiation strategy that offers the most real economic and environmental value. Supplying multiple energy services provides CEC with more gross sales margin to cover fixed costs.

The authors are assisting in the development of business plans and energy-service offerings for consumer energy co-ops in several states. The tools and insights developed here are being applied in ongoing efforts. Ultimately, the enterprise must sustain itself in order to qualify for financing. Securing capital requires feasibility analysis and initial business development. National cooperative lending institutions have indicated their interest in considering solid business plans for new energy cooperatives.

Analysis and feasibility analyses require substantial resources. Lenders may be willing to advance some funds at financial closing to pay for final development activities. It may be possible to

obtain public or private funding to cover the initial activities needed to secure participation by lenders and other sources of startup capital.

**References**


Meehan Edward P., April 15, 1998 "Selling Electricity Online?," Public Utilities Fortnightly.

Nadel, Steven, Miriam Pye, and Jennifer Jordan. 1994. *Achieving High Participation Rates: Lessons Taught by Successful DSM Programs.* Washington: American Council for an Energy-Efficient Economy.

Plunkett, John and P. Chernick. 1988. "Lost Revenues and Other Issues in Demand-Side Resource Evaluation: An Economic Reappraisal" In proceedings of the *1988 Summer Study on Energy Efficiency in Buildings*, American Council for an Energy Efficient Economy, Pacific Grove, California, September 1988.

Prindle, William, *Can Efficiency Keep the Rustler Out? Energy Efficiency as a Customer Retention Tool*, Proceedings of 1996 ACEEE Summer Study, p.7.135.

Energy Central News May 7, 1998 "Nation's Leading Drug Store Chain Signs $120 Million Agreement with PG&E Energy Services."

Reuters, March 18. 1998 via Energy Central News "Efficiency Key to Lower Power Bills."

Reuters, March 19, 1998, via Energy Central News "Connectiv Offers 10% Rate Cut to PECO Customers.'

Utility Spotlight, March 23, 1998 "Energy Marketing Profits/Losses Not Necessarily Reflecting Volume."

Wall Street Journal, February 25, 1998 "California's Power Deregulation Isn't as Open as It Looks."