Niagara Mohawk Power Corp. Subscriptive Service

Profile #122

Principal investigators: Kate McMordie and Ted Flanigan

The Subscriptive Service program is one of North America's most controversial energy services programs and stands as a potentially powerful model for the future and as such was selected for inclusion in the Series 4 Profiles by The Results Center Board of Advisors. The Results Center salutes Niagara Mohawk Power Corporation for its innovative program design; and for its success in providing customer satisfaction while garnering significant and unforeseen levels of savings. In particular, we wish to thank Lynne Hogeland, Michael Kelleher, and John Brandimarte of Niagara Mohawk; Shirley Anderson of the New York Public Service Commission; K. Huene Lee of Research Triangle Institute, and David Wooley of Pace University Center for Environmental Legal Studies.

This Profile is part of a collection of Profiles researched and published by The Results Center over the past four years. It is intended to provide a thorough understanding of the program and its unique elements. This Profile can also be used to compare this program with other programs documented by The Results Center. For a complete listing of the Profile Library see the Appendix. For additional information please contact The Results Center.

Executive Summary

Niagara Mohawk Power Corporation's (NMPC) Subscriptive Service represents an intriguing, albeit highly controversial, model for customer energy efficiency programs. Responding to large customers' needs for choice and rate relief while maintaining an emphasis on achieving prescribed energy savings goals, NMPC designed a new energy services concept by unbundling its services. The Subscriptive Service provides an option for large customers that are committed to efficiency but elect to cover the costs of such upgrades on their own. Concurrently, NMPC continued to provide rebates to customers that determined that the Subscriptive Service was not economically feasible or who were pleased with prior DSM offerings.

The Subscriptive Service pilot program tested a new means of giving customers the incentive to invest in energy efficiency. Those that agreed to complete comprehensive energy audits which recommended energy conservation measures (ECMs) for their facilities were given a rate discount. The discount represented the costs they would have paid to be eligible for the utility's traditional DSM incentives. Through this program mechanism the Subscriptive Service provided increased flexibility for customers to mine and pay for efficiency upgrades.

As with any test, measuring the effect of the program has been a major program emphasis and challenge. What was the direct program affect? Which recommended measures were installed? And most importantly, how effective was this program design compared to more traditional models? Unfortunately, there was no clear control group with which to measure savings, determining the quality of the audits was complex, as was ascertaining the effect of the program within a changing regulatory context. Nevertheless, by tieing NMPC's shareholder incentives to the program's energy savings goals, the Subscriptive Service earned requisite utility attention and resulted in nearly 50 GWh of energy savings.

While many efficiency advocates have been alarmed by the Subscriptive Service, claiming that it is simply a means for industrials to "opt-out" of paying their fair share of system efficiency costs, the model may have greater transferability and applicability than first meets the eye. The Subscriptive Service not only provides for customer choice but is an exciting model of how a utility can form a bond or contract with customers to be efficient. Rather than offering rebates and other direct incentives to garner utilities' least-cost resource, the Subscriptive Service represents a new construct in which customers pledge to consider certain efficiency steps in the absence of incentives. The model, rather than the "death of DSM," may actually provide for a new, perhaps very resilient and logical means for the capture of energy efficiency.

NIAGARA MOHAWK POWER CORPORATION
Subscriptive Service

Sector:	*Large Commercial and Industrial*
History:	*Pilot program launched in 1993 to provide new energy services option for bereaved customers; full-scale implementation 1994; terminated year-end 1995*
Mechanism:	*Participants conduct their own comprehensive audits to identify efficiency opportunities and to get a rate decrease equivalent to what NMPC would have paid them in DSM incentives*
Measures:	*Wide variety of measures identified through audits; lighting and motor improvements dominate actual retrofits*

1994 PROGRAM DATA

Energy savings:	*48,175 MWh*
Lifecycle energy savings:	*776,100 MWh*
Nominal Cost:	*$304,938*
Levelized Cost:	*$267,794*

CONVENTIONS

All Series 4 Profiles will report nominal dollar values except where expressly stated as levelized. Levelized figures, used for comparative purposes, are based on 1990 U.S. dollars. Inflation and exchange rates were derived from the U.S. Department of Labor's Consumer Price Index and the U.S. Federal Reserve's foreign exchange rates.

The Results Center uses three conventions for presenting program savings. ANNUAL SAVINGS refer to the annualized value of increments of energy and capacity installed in a given year, or what might be best described as the first full-year effect of the measures installed in a given year. CUMULATIVE SAVINGS represent the savings in a given year for all measures installed to date. LIFECYCLE SAVINGS are calculated by multiplying the annual savings by the assumed average measure lifetime. CAUTION: cumulative and lifecycle savings are theoretical values that usually represent only the technical measure lifetimes and are not adjusted for attrition unless specifically stated.

Niagara Mohawk's Perspective

BY MICHAEL KELLEHER

As part of its 1993 rate case settlement Niagara Mohawk implemented a three-year trial DSM Subscriptive Service program. The Subscriptive Service program unbundles NMPC's demand-side management services for its largest 330 commercial and industrial customers, allowing them the opportunity to choose between two types of demand-side services: one with utility financial incentives, the other without. Approximately 60% of Niagara Mohawk's eligible customers chose to remain eligible for DSM rebates and continued to contribute to the costs of providing those rebates.

The other 40% chose the non-subsidized option and were offered non-subsidized DSM services where each participant paid 100% of their individual project costs. These customers were required to complete a detailed energy survey of the facilities. Then they reported on an item-by-item basis what efficiency measures they planned to implement as a result of the audit. The utility then discussed the options with the customer and in some cases put the industrial in touch with an energy service company as well as lenders to finance the retrofits.

Thus, unlike the popular perception of the program, the Subscriptive Service did not create a situation where large industrials were not exposed. They paid their share of NMPC's DSM costs for administration, support projects, and information programs, estimated to be about 60% of the total DSM costs, a cost that one could consider a requirement that all customers pay for their fair share of the conservation resource being purchased.

NMPC views the Subscriptive Service program as an alternative to traditional incentive-based DSM. Calculations show that the provision resulted in rate relief of about 0.5% for those customers choosing to opt-out of incentive eligibility. The substantial portion of customers choosing each option indicates that offering both choices is an appropriate approach to DSM for the utility and its customers. And NMPC was committed to industrial DSM in both forms. Niagara Mohawk planned to obtain incremental energy savings above its 1993 Long Range DSM Plan based on the program and placed its shareholder earnings at risk for 1994 and 1995. Shareholders could only earn an incentive if incremental energy savings were obtained from the non-subsidized customers, and as this Profile reports, the Subscriptive Service exceeded its 1994 energy savings projections.

The Subscriptive Service, coupled with our conventional DSM offerings, allows us to provide our customers with what they have been asking for, lower prices, while concurrently helping the utility manage its load and optimize operations. It also calls on power companies to step up to the plate and to adapt themselves to what the market is requesting. I believe we have done this and that the program can be modified in time to further our three-fold objectives with the provision of customer satisfaction, benefit to society and the environment, and secure shareholder returns.

Program Context

UTILITY OVERVIEW

Niagara Mohawk Power Corporation is an investor-owned utility serving the largest area of any utility in New York State. NMPC's service territory covers over 24,000 square miles extending from Lake Erie to the borders of New England, Canada, and Pennsylvania. NMPC serves electricity to over 1.5 million residential, commercial, and industrial customers, supplying power generated in hydroelectric, coal, oil, natural gas, and nuclear power plants. NMPC also supplies natural gas to over 500,000 residential and business customers on a retail basis. NMPC headquarters are located in Syracuse, New York.[R#3]

NMPC is a winter peaking utility due to the notoriously severe winters of upstate New York. In the winter of 1994, NMPC's electric demand peaked at 6,458 MW. NMPC's 1994 total capability was 8,026 MW representing a 24% reserve margin. NMPC generates 54.6% of its total capacity derived from coal (16%), nuclear (13.1%), hydro (8.7%), duel fuel, oil/gas (8.7%), and oil (8.1%). NMPC purchases the remaining 45.4% or 1,374 MW from the New York Power Authority and unregulated generators also known as independent power producers (IPPs) which provide 2,273 MW to the system.[R#3]

NMPC has three subsidiaries. The Canadian-based Opinac Energy Corporation operates two companies: Opinac Exploration Limited and Canadian Niagara Power Company Limited. These two companies are involved in exploration in Alberta and power generation at the Niagara Falls hydroelectricity plant in Ontario. NMPC also owns NM Suburban Gas, a gas utility, and NM Uranium, a mining company. Prior to 1995, NMPC also owned an independent power production company, Hydra-Co Enterprises, which some analysts believe the company sold to avoid conflicts of interest regarding IPP contracts in its service territory.[R#3]

In 1994, NMPC had 1,559,000 electric customers made up of 1,405,343 residential customers, 144,249 commercial, 2,187 industrial, and 2,318 others. Total electric sales in 1994 increased to 41,499 GWh from the previous year total of 37,724 GWh. Electric sales were fairly evenly distributed among the residential, commercial, and industrial sectors at 25%, 28%, and 28% respectively.[R#3]

The number of gas customers served by NMPC in 1994 was 512,000, made up of 463,933 residential, 40,256 commercial, 256 industrial, and 644 transportation customers. The total gas revenue in 1994 was $623,191 million representing a total sale of 85.6 million dekatherms. NMPC's gas sales have increased since 1992 by 8.1%.[R#3]

NMPC 1994 ELECTRIC STATISTICS

Number of Customers	*1,559,000*	
Number of Employees	*9,206*	
Electric Revenues	*$4,152*	*million*
Electric Sales	*41,599*	*GWh*
Peak Demand	*6,428*	*MW*
Generating Capacity	*8,026*	*MW*
Reserve Margin	*24*	*%*
Average Electric Rates		
Residential	*11.84*	*¢/kWh*
Commercial	*10.77*	*¢/kWh*
Industrial	*5.42*	*¢/kWh*

ENERGY SERVICES OVERVIEW

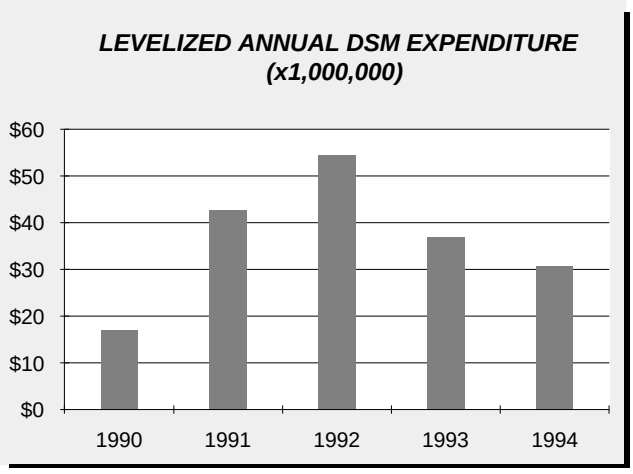
Niagara Mohawk launched its demand-side management initiatives in 1990 with 11 programs targeted at the residential, commercial, and industrial sectors. In 1991, Niagara Mohawk expanded its portfolio of customer energy efficiency programs with the "Niagara Mohawk Reducing Plan" to include farm and nonprofit and public sector operations. Over 400,000 customers (fully 25% of the utility's entire customer base) participated in these DSM programs in their first two years. In 1991, the annual savings were an impressive 211 GWh. DSM programs in 1992 peaked in savings and expenditures: annual savings grew by 48% over 1991 levels to 313 GWh while the DSM expenditure increased from just over $17 million in 1990 to nearly $59 million in 1992.[R#4]

After a dramatic ramp-up of customer energy efficiency services, with NMPC designing and delivering some very impressive programs (see Profiles #41,69), beginning in 1993 NMPC's corporate culture and specifically its DSM program planning began to reflect changes in the electric utility industry. In fact the competitive pressures in the industry – in part driven by some of NMPC's largest industrial customers concerned about DSM expenditures and "lavish" shareholder incentives for DSM activities – caused NMPC to gain regulatory approval to dramatically scale back its DSM efforts.

DSM OVERVIEW	ANNUAL DSM EXPENDITURE (x1,000)	ANNUAL DSM EXPENDITURE Levelized (x1,000)	ANNUAL ENERGY SAVINGS (GWh)	ANNUAL SUMMER CAPACITY SAVINGS (MW)	ANNUAL WINTER CAPACITY SAVINGS (MW)
1990	$17,026	$17,026	84	30.84	33.18
1991	$44,658	$42,779	211	94.98	111.45
1992	$58,572	$54,418	313	57.47	41.18
1993	$41,000	$36,952	285	52.60	39.97
1994	$34,872	$30,624	215	32.91	31.12
Total	$196,128	$181,799	1,108	269	257

In October of 1992, NMPC filed its "Revised 1993-1994 Integrated Demand-Side Management Plan" with the New York Public Service Commission (NYPSC). The plan called for a significant departure from its demand-side management emphasis, in fact significantly cutting back its programs while canceling others. NMPC found that some programs were no longer cost effective and that they would not bode well for the utility as competition looms large, exemplified in the cancellation of the Integrated Farmstead Program. In other cases, utility staff believed they had successfully transformed select markets, for instance with their introduction of eight-foot, T8 lamps, whereby NMPC canceled the High Efficiency Lighting Program component of the Integrated Residential Program.[R#27]

In 1993, total program participation levels were maintained from 1992 levels at 300,000. But in 1994, as the full effect of the ramp-down was felt, there was a sharp decrease in participation to only 100,000 participants. DSM expenditure levels also declined from 1992's peak level of over $58 million to a mere $41 million in 1993 and $35 million in 1994. Savings dropped 31% from 1992 to 1994 levels. Annual savings which were 313 GWh in 1993 fell to 215 GWh in 1994.[R#27]



In 1995, NMPC took significant steps to refocus DSM from impact programs to basic information programs that raise customer awareness of their own energy efficiency opportunities. Rather than providing a stream of direct incentives for customer energy efficiency, Niagara Mohawk like many other utilities nationwide is recrafting its energy service offerings to provide customer information and technical services, and then directing customers to third party lenders to finance retrofits shifting the costs of customer energy efficiency off the utility's balance sheet. Ironically, the only rebates offered by NMPC in 1995 were to Subscriptive Service Option A customers as rebate programs are now practically non-existent at Niagara Mohawk.[R#32]

NMPC'S COMPETITIVE STRATEGY

The New York Public Service Commission has made clear strides in the past two years in directing New York State's electric utility industry towards a competitive environment. NYPSC is in the process of refining a set of principles for competition for both the wholesale and retail markets. These principles emphasize the importance of both economic and environmental stability in New York State within the competitive scenario. The goal for energy services is to replace traditional DSM with market-based programs by generally moving the pursuit of energy efficiency from the utility domain into the energy service company (ESCO) arena. Also included in the

Commission's restructuring guidelines is a provision which allows utilities to offer flexible rates to large customers.[R#3,5]

The competitive pressures of utility restructuring in New York have not only changed the complexion of demand-side management at NMPC. Other major corporate initiatives such as major staff cut-backs are also underway to position the company for the future. In addition, NMPC's aggressive PowerChoice proposal calls for sweeping restructuring of the utility. PowerChoice addresses DSM but its far broader agenda – including dramatic divestiture – provides an indication of NMPC's strategic agenda, a direction which in turn will certainly affect the corporation's provision of energy services.

In 1994, NMPC initiated a voluntary employee reduction program to reduce staffing levels in an effort to cut costs to become more competitive. In that year alone nearly 1,400 employees took advantage of the plan and another 650 employees were laid off reducing the total workforce from 11,263 to 9,206. NMPC anticipated that it would have a further reduction of over 450 employees in 1995, representing a 27% decrease in work force since early 1993. The estimated savings due to labor-related and operation cost reductions are expected to reach nearly $100 million annually.[R#3]

POWERCHOICE

Recently, Niagara Mohawk presented a bold restructuring plan to the New York Public Service Commission called "PowerChoice." Under PowerChoice, NMPC would be completely restructured and ultimately all customers would have direct access to any supplier of their choice. If approved, PowerChoice would accelerate the transitions that both Massachusetts and California regulators have begun in gradual, phased-in processes. Within three years from PowerChoice's implementation, NMPC would allow all customers to choose their electricity supplier by opening up competitive power generation. In addition, NMPC expects to provide a price freeze or decrease for all customers over the next five years through PowerChoice.

PowerChoice is based on at least three major tenets. First and most importantly, the utility seeks to break uneconomic IPP contracts. NMPC seeks relief from these contracts and regulatory approval for breaking their prior commitments. Federal regulations required NMPC to purchase power under long-term contracts from IPPs. These contracts now force the utility to buy power at above-market prices. NMPC sees this policy as unfair especially due to the fact there was no need for the demand in the first place.[R#16]

> *"We will continue to aggressively pursue changes in state policy that will reduce our obligation to purchase unneeded electricity at above-market prices from unregulated generators."*
>
> NMPC Chairman and Chief Executive Officer
> William E. Davis

Second, the utility seeks state assistance with its uneconomic nuclear plants. NMPC wants New York State to either take over or refinance the two nuclear power plants at Nine Mile Point on Lake Ontario. And third, through divestiture, transmission, distribution, and energy services would become subsidiaries under separate ownership from generation. The New York Public Service Commission has opened hearings on the sweeping PowerChoice proposal.[R#16]

Thus the Subscriptive Service emerged within a very dynamic utility context. Not only was the program implemented at a time that energy services were being redefined and recrafted, but precisely at the time that the entire utility structure was being questioned and sweeping regulatory changes stole center stage. In retrospect, the Subscriptive Service represents an important part of the transition, serving to define an appropriate utility role to provide for customer satisfaction while maintaining system and societal benefit.

PROGRAM OVERVIEW

Niagara Mohawk Power Corporation initiated the Subscriptive Service as a pilot program in 1993. The program was offered to all large commercial and industrial (C&I) customers with time-differentiated electric rates, customers which together represent approximately 25% of the utility's total sales. These qualifying customers had the choice of either remaining eligible for demand-side management rebates through NMPC's existing programs, referred to as "Option A" customers, or electing to join the Subscriptive Service program, referred to as "Option B" customers. Option B customers helped NMPC to forge a new path in DSM. Through the new program model, Option B customers were partially relieved of the utility's DSM costs as charged in their rates, agreeing to put forth their best efforts in implementing efficiency initiatives on their own instead of through DSM programs. Out of a total of 295 eligible customers, 178 chose Option A and 117 chose Option B.[R#14,24]

One of the popular misconceptions of the Subscriptive Service is that Option B customers were immediately exempt from paying DSM costs. This is why the program's original name, Subscription Option, was changed to Subscriptive Service, lessening the emphasis on participants' choice to "opt-out" of DSM. Option B customers, in reality, were specifically exempted from paying incentive (rebate) costs, which represented about 40% of the utility's total DSM costs, but were still required to pay for the remaining 60% DSM costs such as administrative costs. Technically, Option B customers avoided paying the "DSM Investment Recovery Adjustment Mechanism (DIRAM)" charges; the financial incentives portion of NMPC's DSM program costs, including shareholder incentives. During the program, the average DIRAM cost for Option B customers was $0.00028/kWh. Thus Option B customers' rate relief was 2.8 tenths of a mil or just under a third of a mil. Option B customers' rates, however, still included DSM information program costs, administrative costs, and lost revenues associated with DSM which together accounted for about 60% of NMPC's DSM costs.[R#15]

Those customers that elected to sign up for the Subscriptive Service did so with the intention of taking their own action steps regarding energy efficiency. A requirement of the Subscriptive Service was that a facility would conduct a comprehensive energy audit within six months of choosing to participate in the program. There were also specific guidelines for the audits that include recommendations of energy conservation measures (ECMs) and potential energy saving estimates. However, there was no contractual agreement between the customer and NMPC for ECM implementation. As part of the understanding Option B customers were requested to submit implementation progress reports to the Niagara Mohawk staff at the end of each calendar year. Originally, annual implementation plan updates were intended to be mandatory, but were changed to be only "requested documents" in the final agreement with the customers.

PROGRAM EVOLUTION

The Subscriptive Service program grew out of pressure large industrial customers were putting on NYPSC to eliminate what they believed to be the "inequitable distribution of DSM costs." They felt that they were shouldering an unfair share of DSM costs, which were embedded and hidden in their rates, by cross-subsidizing other commercial rebate programs. Many of these industrial customers had become familiar with re-negotiating rate contracts with gas suppliers as the gas industry became competitive in the past decade. This emphasis on outsourcing for gas services naturally led them to seek similarly competitive services from their electricity suppliers.[R#5]

NMPC worked with its largest industrial customers as well as NYPSC staff to develop the Subscriptive Service. The NYPSC's goal was to allow NMPC the room to experiment with a "direct cost recovery" approach for DSM, but not to undermine the principals of traditional DSM programs and least-cost planning. Niagara Mohawk's Subscriptive Service was intended to test the feasibility engaging large customers in cost-effective energy conservation in the absence of an incentive mechanism.[R#10]

The greatest difficulty in developing the Subscriptive Service was in negotiating its program design among various stakeholders. From the Commission's point of view the negotiating

process that ultimately led to a settlement was "painful." Two viewpoints were strongly pitted against one another comprising the opposite ends of the spectrum: the industrials versus the environmentalists.[R#5]

THE PROPONENTS' VIEW

Proponents of the Subscriptive Service program model included the utility and its large industrial customers. They contended that the program was a new form of DSM and not a way for major energy users to "opt-out" of DSM. From the proponents' perspective, this new model was in direct response to the new emerging competitive market for utilities, providing customers with an "energy service approach" to DSM. Under this approach, DSM customers that weren't taking advantage of rebates would have a choice of services, allowing them to avoid certain charges while agreeing to other expenditures. The program was intended to provide customers with an option for financing their efficiency upgrades, but still required them to address inefficiency for their own benefit and for the benefit of the utility system. Many utility programs are moving in the same direction, shifting the costs of energy service programs from being embedded and shared by all ratepayers to a situation in which direct beneficiaries pay for efficiency upgrades directly.[R#10]

In addition, the Multiple Intervenors (the association and voice of the large users) asserted that large customers that progressively implement energy conservation measures without the use of rebates should not be penalized for their "forward-thinking." The Multiple Intervenors cited the example of Camden Wire which received rebates of $740 between 1990 and 1992 but paid approximately $150,000 in DSM costs in a 12-month period. Camden Wire had little opportunity to implement further ECMs under the DSM program because they had already invested in many measures. (See also The Results Center Special Report, Industrial Efficiency Programs, Building Strategic Partnerships.)[R#10]

Industrial proponents of Subscriptive Service voiced their concern about Niagara Mohawk's higher-than-average electricity rates which they claimed placed large industrial energy users in a disadvantaged position. High electric rates, they argued, were threatening to drive them out of upstate New York and were discouraging them to engage in plant expansion. They contended that the rate decrease through the Subscriptive Service could be a way of maintaining and possibly attracting industry into the area, thereby boosting the economy.[R#10]

THE OPPONENTS' VIEW

While the proponents of the Subscriptive Service were a very strong voice in the proceedings, opponents delivered equally strong arguments against the program model. Environmental groups, the Pace University Center for Environmental Legal Studies Energy Project and the National Resource Defense Council in particular, asserted that the program was shortsighted and undermined DSM rebate programs' long-range goals related to integrated resource planning. In fact, the administrative law judge overseeing the proceedings gave a "Recommended Decision" that was in-line with the environmentalist perspective. The judge ruled that "the real point [of DSM] is to reduce future power requirements, with DSM measures constituting, effectively, another form of power supply; and of course, all customers properly share in the utility's costs associated with meeting overall power supply requirements." [R#10]

Another key issue from the opponents' perspective is the fact that in a free market economy too often business narrowly focuses on short-term economic goals that sacrifice future interests. DSM rebate programs have served to offset this tendency by catalyzing activity that would not otherwise take place in a free market. Energy efficiency measures with long payback periods, for example, have been promoted through utility incentives which serve to buy-down the payback period, spurring retrofits that otherwise would be neglected by customers. The opponents argued against the industrial's view that DSM hurts the economy, asserting that energy efficiency programs actually help to retain jobs, increase industrial competitiveness, and attract other industries.[R#10]

The opponents view of the equity or inequity of DSM charges was the opposite of the proponents view. The opponents of the program claimed that exempting a select group (the large commercial and industrial energy users) from paying DIRAM charges would effectively represent a bias toward large customers at the expense of other smaller customers that would be saddled with an undue share of DSM costs related to the utility's integrated resource plan.[R#10]

Interestingly and as an indication of the level of uncertainty surrounding the program, energy service companies were apprehensive about endorsing the program. While the Subscriptive Service would theoretically cause corporations to implement efficiency measures on their own once they had been identified through the required audit, ESCOs feared los-

ing business from key customers which had received and used rebates as incentives for their energy efficiency retrofits provided through traditional DSM rebate programs.[R#5]

THE SUBSCRIPTIVE SERVICE SETTLEMENT

After lengthy hearings NYPSC staff and Commissioners carefully weighed all the arguments and developed a concept that attempted to form solutions that addressed both sides of the issue. Essentially a compromise was drawn between the opposing positions. By requiring the comprehensive energy audit and that Option B customers pay 60% of DSM costs in their rates, these customers couldn't simply "opt-out." Instead they would be encouraged to take their own initiatives to capture efficiency opportunities while continuing to pay a portion of DSM program costs that benefit not only the utility system but society overall.

In addition to the program requirements, the NYPSC mandated NMPC to state and fulfill specific energy savings goals that were based on Subscriptive Service program success. A maximum energy conservation goal of 60,000 MWh was set for Option B customers in 1994 based on 100% participation of all eligible customers in Subscriptive Service. But because only 40% of the eligible customers chose Option B, the 1994 goal was prorated to 32,000 MWh based on the proportion of sales to Option B customers relative to all eligible customers. The cumulative program savings goal from December 1993 to the end of 1995 was set at 94,000 MWh. If the goal was met in 1995, NMPC would receive a cumulative $1 million bonus from MERIT awards, an incentive mechanism approved by shareholders whereby their incentive could be shared with top management for overall energy efficiency success.[R#10,13]

Another provision of the settlement was that Option B customers were eligible to switch back to Option A at any time during the subscription period as long as a 15-day notice was given and avoided DIRAM charges were repaid. Once Option A was chosen, however, customers could not switch to Option B. Furthermore, participating Option B customers were required to repay the value of all the DSM rebates they had received between September 1992 and the start of the Subscriptive Service.

The Commission also allowed NMPC to give additional incentives to Option B customers for ECM implementation. This ensured that cost-effective DSM opportunities from a utility perspective did not become lost opportunities because of Subscriptive Service's lack of financial incentives. NMPC brought in six ESCOs to assist Option B customers in financing audits' recommended ECMs. The financial assistance offered by NMPC was part of the Subscriptive Service package but was not officially required by the NYPSC. These ESCOs offered services to perform audits, identify ECMs, and finance their recommended ECMs or ones recommended by the customers' auditors. Ironically, not a single Option B took advantage of this utility-supported service.[R#10,26]

Another stipulation of the settlement was that NMPC was required to closely evaluate Option B customers' efforts in producing quality energy audits and ECM implementation plans. NMPC was required to report to the Commission on six-month intervals as to the degree to which the Option B customers were implementing recommended ECMs. The Commission retained the right to terminate the program if it determined that the Subscriptive Service was not achieving the DSM goals.[R#10]

AUDIT SPECIFICATIONS AND DETAILS

Option B customers had the option of performing either an in-house energy audit or bidding out the audit to a private contractor. Most of the Option B customers, 81%, chose outside contractors to perform the audits. It was discovered in the evaluation that the larger the company, the more likely they were to have funds and staff resources to pay for in-house energy audits. Option B customers estimated that the cost of the audits per customer ranged from $15,000 to $75,000. [R#2]

NMPC set specifications for the Option B comprehensive energy audit, under agreement with NYPSC, to ensure that Option B customers had a clear understanding of the requirements. In general, the audit required a detailed evaluation of facility systems and processes with regard to energy use and potential energy efficiency opportunities. The audit team had to include at least one person with a New York Professional Engineer's license and a person with at least two years experience in identifying and analyzing energy efficiency opportunities. Verification of the professional engineer's credentials was required. The audit was to investigate the existing conditions at the facility and to provide a "detailed system disaggregation" (or end-use breakdown) of electrical energy consumption. [R#12]

Areas that were to be covered in the audit included lighting systems, electric motors and drive systems, energy manage-

ment systems, mechanical systems (HVAC and water heating), heat recovery opportunities, air and steam systems, building shell improvements, detailed process analysis for each electrical process, operation and maintenance procedures, and all other processes and technologies that present opportunities for electrical efficiency. Areas recommended but not required in the audit included furnace and boiler systems, heat balance analysis, and renewable and alternative energy applications. At the conclusion of the audit and analysis, the auditor was required to make a detailed presentation of audit results to the Option B customer.[R#12]

Along with the audit, all Option B customers were required to complete Niagara Mohawk's End-Use Survey. NMPC held regional energy audit and survey training sessions to help ensure Option B customers had clear understanding of the requirements.[R#14]

ENERGY CONSERVATION MEASURES AND IMPLEMENTATION PLAN

As a part of the energy audit, Option B customers had to submit an implementation plan to NMPC for recommended ECMs with a detailed description of each measure. A prioritized list of ECMs was required to be produced in the plan including the energy savings estimate, cost estimate, and simple payback. The plan also had to identify other related benefits (for instance reduced operations and maintenance costs, increased productivity, reduced waste), of the ECMs. Specific aspects of implementation such as recommended ECM implementation feasibility and market barriers (critical payback, equipment replacement policy, etc.), and probability and time frame of implementation were also included as reporting requirements.[R#14,15]

Each customer was requested to give an update of ECM projects to NMPC on an annual basis. This included information such as installation date, equipment type, and projected energy savings for each ECM. Option B customers were also asked to participate in periodic surveys conducted by NMPC. Most Option B customers failed to send in these implementation plan updates so information was mainly gathered by NMPC through follow-up surveys.

MARKETING AND DELIVERY

Subscriptive Service's marketing and delivery proved to be arduous due to the lengthy and complex negotiations with the Commission. Because Subscriptive Service was an entirely new DSM construct, NMPC was clearly headed into unfamiliar territory! Given the pressure from large industrials for rate relief, NMPC staff worked hard to keep these customers informed of the regulatory proceeding surrounding the new program model, in some cases suggesting its likely outcome. While necessary communication in many cases, the signals that NMPC sent its customers proved to complicate the program's delivery in the long run. As the program model jelled, additional PSC requirements had to be relayed to key customer accounts who were often not pleased with the developments.

In November 1992 and in advance of the formal program approval, an informative letter was sent out to all qualifying customers to familiarize them with the Subscriptive Service model. Shortly after the letter was sent, NMPC's field representatives had one-on-one meetings with each qualifying customer to further review the program. Each of the 70-80 field representatives provided customers with a tool in spreadsheet form that presented financial scenarios to help them determine their best options. Many of the customers had already begun making preliminary decisions even though the final program design had not been approved by the NYPSC. The spreadsheet which was designed to assist customers in weighing their options, unfortunately, did not include the energy audit cost because at that time the energy audit was not a part of the Subscriptive Service.[R#26]

January 6, 1993, the date that the Commission had been expected to make a final ruling on the program came and went without a ruling. Therefore, a second letter was sent to all customers informing them that no final agreement had been made. Because the contract negotiations were lengthy and complicated, Gary Dembkowski, NMPC's Subscriptive Service Marketing Manager, gave three presentations in Albany, Syracuse, and Buffalo to update customers on the regulatory proceedings and negotiations in early February. At that point it was still not clear to NMPC that there would be an energy audit requirement.[R#26]

Finally on February 17, 1993, the NYPSC officially approved the Subscriptive Service. That same day, NMPC sent out letters to all qualifying customers formally offering them the program option. And for the first time, NMPC informed customers of the energy audit requirement for Option B. This news angered some customers because their preliminary financial analyses did not include the audit cost.[R#26]

On March 3, 1993, NMPC sent out specific audit requirements to its eligible customers. During March, NMPC gave two audit training sessions to review the mandates. NMPC contracted ADM Associates to assist in the training sessions and for audit quality control. At this point, NMPC's deadline for

joining the Subscriptive Service was March 15, but because many customers complained about timeline brevity for audit quotes the deadline was extended to April 12, 1993.[R#26]

After officially choosing Option B in April of 1993, the customers had six months to complete the comprehensive energy audit. NMPC gave three more audit training sessions in April 1993 which provided additional detail for the audit requirements. During the six month period for audit preparation, all Option B customers had the choice to re-elect Option A with no penalty, except to repay all retroactive DIRAM charges. This gave customers more flexibility in analyzing the financial pros and cons of the program. Some felt this ruling was partial to Option B participants because it allowed these customers to essentially get a six-month interest-free loan from NMPC. (The "loan" represented the value of these customers' unpaid DIRAM charges.)[R#26]

NMPC established three key actions steps for 1993: 1) The required energy audit was to be completed by all Option B customers. 2) NMPC established an understanding with Option B customers that they would do their best in implementing ECMs, however this understanding was not contractual. 3) All Option B customers, along with a select number of Option A customers, were to complete the Industrial Market End-Use Survey. After these three initiatives had been accomplished, in December 1993, NMPC began the evaluation process for the program.[R#18]

MEASURES INSTALLED

The energy audits performed by Option B customers identified a total of 1,001 energy conservation measures. A total of 957 ECMs were electrical technologies, 7 were cogeneration options, and 37 were fuel switching ECMs. It was estimated through the evaluation process that 60% of all 957 electrical ECMs were determined to be completed, scheduled to be implemented, or scheduled to be replaced on failure. Identified ECMs were broken into the following categories: lighting, motors and drives, HVAC, process, and other. The most common ECMs identified to be implemented were traditional lighting and motor/drive retrofits. However, it was found that unique process changes were not evaluated in detail nor a priority for Option B customers.[R#23]

Motors replacements included high efficiency motors and variable speed drives. Lighting ECMs included technologies such as electronic ballasts, energy-efficient fluorescent lamps, compact fluorescent lamps, occupancy sensors, and reduced lighting levels. HVAC ECMs were generally upgraded temperature controls and chiller upgrade/replacement. Common process changes included high efficiency process equipment, improved process control systems, and upgraded processes. Other ECMs covered changes such as power factor correction capacitors, domestic hot water improvements, building weatherization, and air compressor improvements.[R#13]

STAFFING REQUIREMENTS

The NMPC staff requirement for the Subscriptive Service was minimal. NMPC estimates that only two to three full-time equivalent employees were needed to run the planning, marketing, and evaluation of the program. Michael Kelleher, John Hartnett, and Steve Molodetz developed the Subscriptive Service model. Kelleher and Molodetz negotiated the program with NYPSC. Once the program was approved, Kelleher directed evaluation and Molodetz managed the planning and marketing of the Subscriptive Service. Because of NMPC's broader restructuring and reorganizations, the Subscriptive Service management changed often. In 1994, Molodetz took over the management of the program and in 1995 this authority was turned over to Hartnett. Dave Stone originally undertook the early stages of Subscriptive Service marketing and delivery, coordinating field representatives. Marketing and delivery then switched three more times from Gary Dembkowski in late 1993, to Dennis Trepanier in early 1994, and Terry McHugh in 1995. Program evaluation was adopted by Tim McClive and Lynne Hogeland in 1994 and 1995. Additional staff members were needed in the initial marketing phase of the project. It was estimated by NMPC that 70-80 field representatives informed qualifying customers of the Subscriptive Service. Each field representative was responsible for no more than five customers.[R#24,26]

Monitoring and Evaluation

Two contractors performed monitoring and impact evaluations of the Subscriptive Service: Research Triangle Institute (RTI) and Hagler Bailly, Inc. RTI was hired under two contracts to perform program evaluations. RTI was contracted by New York State Energy Research and Development Authority (NYSERDA) cofunded by NMPC to evaluate audit quality and develop estimates of program energy potential savings for Option A and B customers. NYSERDA also contracted Strategic Energy Resources to serve as an independent technical advisor on the project with RTI. The relationship between NYSERDA and NMPC was unique in that the utility secured an outside agency (which also provided additional funding) to conduct the extensive program evaluations. RTI's other contract was exclusively with NMPC to estimate the gross impact savings of Subscriptive Service.[R#8,13]

Hagler Bailly's performed a net impact evaluation for NMPC which compared the level of energy savings achieved by Option B customers relative to Option A customers and also compared energy use of eligible Subscriptive Service customers to energy use of a control group which were not offered the program. Hagler Bailly's analysis complemented RTI's study, however NMPC did not use these projections in their final program savings estimates.[R#13,33]

MONITORING

Niagara Mohawk and RTI performed several surveys to assist in monitoring the development of Subscriptive Services:

Industrial Market End-Use Survey: All 117 Option B customers and 41 Option A customers responded to an Industrial Market End-Use Survey (IMEUS) during the first six months of the program in 1993. The surveys were filled out by each customer detailing facility energy use. Telephone assistance was provided by NMPC. The IMEUS uncovered information on energy use by end-use (lighting, motors and drives, heating and air conditioning, air compression, and process uses), facility characteristics (operating hours, facility size, and heating and cooling sources), ECM implementation plan, and financial decision criteria.[R#13]

RTI Option A Survey: RTI contacted 40 Option A customers by telephone who did not participate in the IMEUS to develop information on business operation changes, existing and planned ECMs, and critical payback for ECMs. This information was used to develop an understanding for differences in Option A and B customers.[R#14]

RTI On-Site Surveys: In late 1993 RTI conducted surveys for 34 Option A and 65 Option B customers that helped RTI determine participation decisions, DSM rebate information, and ECM implementation verifications.

RTI Option B On-Site Surveys: RTI conducted on-site surveys in the last quarter of 1994 to verify the energy audits' quality and implementation of the proposed ECMs. The survey's goal was to identify ECMs that had been implemented due to recommendations by the energy audits and gather information on further proposed ECMs. The surveys also pointed out the audit's key assumptions and oversights that possibly led to miscalculation in energy savings potential. RTI did not recalculate energy savings potentials.

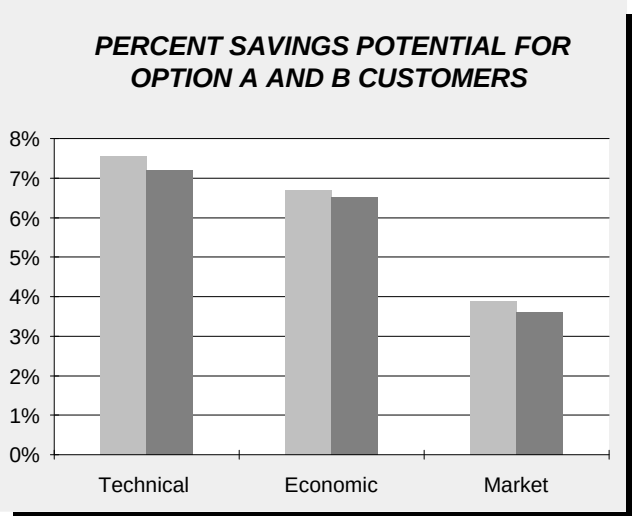
A total of 28 Option B customers were chosen for on-site evaluations. RTI reported that it was careful in choosing a diverse group of customers which represented the full range of industries. RTI chose an average of 26% from the total number of Option B customers of each SIC business type. Option B customers which performed both in-house and contracted-out audits and industries with both high and low energy saving potentials were selected for on-site surveys. RTI's intention was also to represent a wide range of attitudes toward energy efficiency.[R#2]

NMPC Option B Survey: A mail/telephone survey for all Option B customers was performed in early 1995 by NMPC. The survey's goal was to update ECM implementation plans and facility characteristics. The customers were requested to submit a survey that updated information on their initial ECM implementation plan. A total of 52% of the Option B customers responded to at least portions of the survey. RTI used this updated survey as its main source of information for market potentials and gross impact savings, projecting the results over the entire Option B group.[R#14]

Implementation Plan and Updates: Each Option B customer was requested to send in annual reports updating its progress on ECM implementation. Initially, only 59% of Option B customers provided implementation plans included in their energy audits. Thereafter, only a few updates were received.[R#9,18]

RTI'S EVALUATION

RTI was contracted to evaluate Subscriptive Service energy audits and develop estimates of technical, economic, and mar-



ket potential of energy conservation measures for Option A and B customers. RTI has completed two reports for NYSERDA: "Evaluation of Subscriptive Services: Task 1 Report," evaluating energy audit quality, and "Evaluation of Subscriptive Services: Task 2 Report," estimating Subscriptive Service energy savings potential. In addition, RTI completed a report, "Impact Evaluation of Subscription Service Program," for NMPC which determined the gross program savings. RTI is presently working on a 1995 final report which will be completed and available in July of 1996. This report will be a compilation of Task 1 and Task 2 reports and a series of technical briefs which summarize energy efficiency opportunities for standard industrial groups.[R#8]

Through NMPC and RTI surveys information was gathered on baseline energy use, ECM implementation, technical features, energy saving potentials, and lifecycle costs and benefits to assist RTI in estimating program savings potentials for Option B customers. Because Option A data was insufficient for calculating potentials RTI developed transfer functions from Option B data to estimate Option A customers' technical, economic, and market potentials.

RTI's evaluation of energy conservation potentials helped to estimate the magnitude of program savings by identifying the technically and economically feasible ECMs. In addition, RTI estimated the market potential by characterizing the ECMs which were actually implemented by Option B customers so that electric utilities, C&I customers, and other interested parties would have an understanding of the program effectiveness and "real" savings opportunities of the Subscriptive Service.

The technically feasible ECMs identified in the original energy audits performed by Option B customers were used to estimate the technical potential. Out of the 956 electric ECMs identified in the audits RTI screened 869 ECMs for developing the technical potential; 88 ECMs did not have sufficient information in the audits. The technical potential for Option B customers was estimated to be 441 GWh annually or 7.2% of their total electricity use. Option A customers' technical potential was calculated to be approximately 500 GWh annually or 7.5% of their total electricity use.[R#14]

Questions have been raised concerning limitations in this methodology. A more traditional definition of technical potential examines all technically feasible ECMs regardless of cost and commercial availability. RTI's method examined only technically "practical" ECMs identified by the energy auditors. This may have led to a lower-than-average technical potential than if all technically feasible ECMs had been considered.[R#8,14,35]

The economic feasibility was then established by determining if the payback of each ECM met the customer's critical payback. RTI estimated an annual economic potential for Option B customers to be 400 GWh (6.5% of total electrical use); Option A customers' economic potential was estimated at 443 GWh/year (6.7% of their total electrical use).[R#14]

RTI narrowed the feasibility of ECM implementation further by determining the market potential of the economically feasible ECMs. ECM implementation data was gathered from NMPC's 1995 follow-up survey based on whether the ECM had been already installed, partially installed, scheduled to be installed, or would be replaced on failure. Option B customers had a market potential of 221 GWh accounting for 3.6% of total electrical use. Transferring this information to Option A customers, a total of 258 GWh/year (3.9% of the total electrical use) in market potential was calculated.[R#14]

It is important to note that in the final analysis of technical, economic, and market potentials for Option A customers, RTI decided to eliminate Option A's largest customer. This customer was more than three times the size of the second largest Option A customer and twice the size of the largest Option B customer, accounting for 23% of the total electricity use of all Option A customers. RTI excluded this customer from Option A results because of insufficient information for analysis and because the Option B group did not have a facility of similar size. RTI felt the data from this large Option A cus-

tomer would distort the results of Option A savings potential. A comparison of Option A and B percent savings potentials is shown in the chart on the previous page. The chart depicts the percent of total electricity use.[R#14]

IMPLEMENTED ENERGY CONSERVATION MEASURES

To properly estimate the actual energy savings RTI determined the ECMs that were installed through the same NMPC survey used to determine market potential. Out of the 61 customers who completed the surveys 12% of the ECMs were completed, 17% were partially completed, 13% were approved or scheduled, 16% were deemed as "replace on failure," and 42% were unlikely to be implemented (representing 47% of the corresponding energy use of these Option B customers). RTI projected these implementation rates onto the entire Option B population to estimate the overall savings potential. The most common reasons for not implementing ECMs were poor payback and unavailability of capital; these accounted for 56% of all market barriers identified. Of the measures that were determined to be completed or partially completed, motors and drives accounted for 25% of the savings, lighting accounted for 22%, and process uses (excluding compressed air and process refrigeration) accounted for another 22% of the savings. The savings attributed to these process changes also include motors and drives associated with process changes.[R#13,14,23]

GROSS AND NET IMPACT SAVINGS

RTI estimated the gross impact for 1994 of energy savings to be 56,565 MWh (0.9% of total electrical use) based on the ECMs that were completed or partially completed by Option B customers. This information was gathered in the NMPC Option B survey described above. NMPC also calculated the net impact savings from the gross impact by adjusting gross savings for free ridership of 23%, and increasing the net savings by an 10% to account for avoided line losses. The net value of 48,175 MWh was the official 1994 program savings reported to the NYPSC.[R#13]

HAGLER BAILLY EVALUATION

Hagler Bailly was contracted exclusively by NMPC to examine the net impact savings of the Subscriptive Service. Hagler Bailly took a different approach in analyzing energy savings potential than RTI, an approach known as "econometric analysis" or net impact estimate. Hagler Bailly used mathematical models which compared the energy use of Subscriptive Service Option B customers, Subscriptive Service Option A customers, and a control group. The control group was comprised of large C&I customers of New York State Electric and Gas, an adjacent utility to NMPC, who were not offered a program model akin to Subscriptive Service but who did have access to DSM rebates. Hagler Bailly analyzed the energy use of Option A and B customers before and after the Subscriptive Service offering. Also, the study compared the savings all Subscriptive Service customers (both Option A and B) to savings achieved by the control group during the same time period. This type of net impact analysis helped to identify savings of Option B participants and to identify general trends in energy use with customers offered the Subscriptive Service.[R#13]

Through analyzing billing data, Hagler Bailly discovered a clear indication of significant energy savings through the Subscriptive Service. Hagler Bailly analysts expressed that the savings were achieved because the required comprehensive energy audits revealed neglected ECMs to Option B customers. Hagler Bailly's examination of energy savings indicated a net reduction of about 183 GWh/year for Option B customers. The high levels of savings, compared to RTI's net impact analysis, was possibly due to the fact that Hagler Bailly's analysis utilized a broader base of assumptions than RTI that included not only adoption of recommended ECMs but recommended cogeneration and self-generation, changes in equipment usage, and changes in operation and maintenance practices. Niagara Mohawk did not use Hagler Bailly's findings in Subscriptive Service's savings projections and therefore Hagler Bailly's results will not be presented in Program Savings.[R#13,34]

PARTICIPATION

Option A and B customers differed largely as shown in the table on the next page. Option B customers generally were large industrial manufacturers accounting for 82% of the total 117 participants; where 52% of all 178 Option A customers were manufacturers. On average, Option A customers are smaller energy users than Option B. Almost half of Option A customers use less than 10 GWh annually while less than 20% of Option B customers are this small. Option B's dominant energy users were chemical, rubber and plastic, the primary and fabricated metals, and the paper and allied products industries accounting for 65% of all electricity use. As for Option A customers, the dominant energy users were the non-manufacturing, primary and fabricated metals, and chemical, rubber and plastic industries accounting for 61% of their total electricity use.[R#14]

RTI researched possible influences on participation and found that participation was generally based on the option which provided the best economic scenario for the customer. On

BUSINESS TYPE DETAIL	CUSTOMERS		ANNUAL ELECTRICAL CONSUMPTION (GWh)	
	OPTION A	OPTION B	OPTION A	OPTION B
Chemical, Rubber, and Plastic	15	17	1,126	1,963
Paper and Allied Products	13	18	281	1,084
Primary and Fabricated Metal Products	12	20	1,246	922
Other Non-Manufacturing	67	15	1,385	672
Food and Kindred Products	8	18	253	534
Stone, Clay, and Glass Products	12	6	789	500
Machinery & Electronic, Electric Equipment	24	11	1,013	280
Medical Service	18	6	300	110
Other Manufacturing	9	6	238	66
Total	178	117	6,631	6,131

Note: The largest Option A customer has been excluded for this analysis.

average, Option A customers had received more rebates than Option B customers during the time period they were required to pay retroactive charges to qualify for Option B. In addition, more Option A customers were planning "rebate-eligible" ECMs than Option B customers (75% compared to 50% respectively). It is clear that most of the customers that chose Option A felt they could recover the cost of the DIRAM charges through the DSM rebates.[R#1]

AUDIT QUALITY

One of RTI's main tasks was to evaluate the quality of the energy audits. The audits themselves proved to be one of the more controversial issues surrounding the Subscriptive Service program because environmentalists demanded them over industrials' objections. Just as the environmental organizations strongly believed that the energy audit requirement coupled with ECM implementation plans was the only way to ensure energy efficiency was not completely ignored, many of the program participants argued that the audit requirement was cost-intensive and ineffective in implementing ECMs because energy efficiency had already been addressed. Given the disparity in these positions, a detailed independent analysis of audit quality was vital to gauge the audits' accuracy and comprehensiveness.

RTI developed a rating methodology which examined audits' comprehensive level. Criteria for audit quality was based on completeness, technical quality and level of detail/effort devoted to process energy usage. This rating system investigated the auditor's attention to simple energy savings such as lighting and motor retrofits, but also noted the audit's consideration of more complex processes improvements unique to the particular facility. In this way, the survey attempted to take into account the vast differences between customers' facilities.

On a scale from 1 to 5 (where 1 was "poor" and 5 was "excellent"), RTI discovered that Option B customers typically scored a three or an "average" rating in all three categories. An average rating indicated that the customer addressed all required issues stated in the audit guidelines and investigated obvious savings opportunities including process energy use but did not investigate any retrofit opportunities in great detail. Most of the Option B customers did not examine process changes in detail but mainly investigated more conventional ECMs such as high efficiency lighting and motors.[R#23]

However, there were a few discrepancies in audit quality when different aspects were examined more closely such as business type, auditor type, and annual energy use. For example, technical quality and detail devoted to process usage for contracted audits scored about 14% higher than in-house audits. When compared on the basis of annual energy use, larger energy users' (greater than 50 GWh/year) audit quality was rated 40% more superior than smaller energy users' audits (less than 10 GWh/year). Similarly, large energy users' examination of process usage was rated 85% higher than that of smaller energy users.[R#2]

Program Savings

SAVINGS OVERVIEW	ANNUAL ENERGY SAVINGS (GWh)	LIFECYCLE ENERGY SAVINGS (GWh)
1994	48.18	776.10

DATA ALERT: The program savings presented and reported to the NYPSC reflect a derating for free ridership as well as credit for avoided line losses.

The Subscriptive Service resulted in total annual energy savings of 48,175 MWh in 1994. This equates to 0.8% of the total electricity use for Option B customers. Based on an estimated average measure lifetime of 16 years the Subscriptive Service will result in lifecycle energy savings of 776,100 MWh. NMPC has not attempted to determine program capacity savings.

END-USE SAVINGS

Option B customers saved nearly three-quarters of their total gross impact from lighting, motors and drives, and other process uses as shown in the accompanying table. Process use savings represented a large portion of the savings not because Option B customers implemented unique process changes, but because motor and drive replacements associated with each process were included in the savings projections.[R#23]

PARTICIPATION RATES

Out of a total of 295 eligible customers, 117 or 40% elected to participate in the Subscriptive Service program. Option B customers tended to be large manufacturing facilities with high energy use. Option B customers' annual energy use represented 48% of a total of 12,762 GWh for all eligible customers.[R#14]

FREE RIDERSHIP

As required by the NYPSC, NMPC staff evaluated free ridership among the Option B customers. This was difficult because there was no specific information on planned ECMs prior to the program's offering. Therefore NMPC used the weighted average of prior free ridership rates from the traditional DSM programs for each measure type, which resulted in an estimated 23% free ridership rate. NMPC adjusted the RTI's gross impact savings to account for free riders. Inversely, the Subscriptive Service audit requirement will likely result in "free drivership," a program's ability to further influence and drive efficiency without explicit inducements.[R#13]

MEASURE LIFETIME

NMPC estimated measure lifetime for Option B ECMs from NMPC's other large C&I DSM programs. The measure lifetimes were weighted by the percent of energy savings contribution associated with each ECM. The overall average lifetime for Subscriptive Service ECMs used to calculate lifecycle energy savings and the cost of saved energy presented later, was estimated to be 16 years. Lighting measures' average lifetime was estimated to be 13.2 years, motors and drives' lifetime was 15 years, HVAC's life was estimated at 17 years, and processes were estimated to have an 18-year lifetime.[R#13]

PROJECTED SAVINGS

The NYPSC set a cumulative savings goal for the Subscriptive Service for the end of 1995 of 94 GWh. Taking into account the savings up to 1994 of 48 GWh, Subscriptive Service will have to save 46 GWh in 1995 to fulfill the NYPSC target. The Subscriptive Service did exceed its 1994 savings goal of 32 GWh by 36%.[R#13]

SAVINGS BY END-USE	GROSS IMPACT (GWh)	(%)	FREE RIDERSHIP	NET IMPACT* (GWh)	LIFETIME MEASURE (YR)
Motors and Drives	14.3	25%	21%	12.4	15
Lighting	12.6	22%	24%	10.5	13.2
Other Process Uses	12.3	22%	25%	10.1	18
Compressed Air	7.2	13%	25%	5.9	18
Other	4.7	8%	25%	3.9	18
HVAC	3.3	6%	14%	3.1	17
Process Refrigeration	2.5	4%	25%	2.1	18
Total	56.9	100%	23%	48.1	16

* Net impact accounts for avoided line loss credit of 10%

1994 COST OVERVIEW	UTILITY COST				PARTICIPANT COST	
	Evaluation	Staff	Total	Per Participant	Total	Per Participant
Nominal	$152,469	$152,469	$304,938	$2,606	$14,293,612	$122,168
Levelized	$133,897	$133,897	$267,794	$2,289	$12,552,543	$107,287

Niagara Mohawk spent a total of $324,938 from the beginning of the Subscriptive Service program in early 1993 to the end of 1994. The preliminary costs to market and deliver Subscriptive Service to qualifying customers in 1993 was approximately $20,000. In 1994, the total utility program cost was $304,938. [R#13]

COST EFFECTIVENESS

NMPC analyzed the cost effectiveness of Subscriptive Service by calculating several benefit-cost ratios. The benefit-cost ratio for the Utility was calculated to be an astoundingly high ratio of 82.61, reflecting the fact that NMPC had no rebate costs, small administrative costs, and high generation cost savings.[R#13]

BENEFIT/COST SUMMARY	RATIOS
Participant Test	4.24
Utility Test	82.61
Ratepayer Impact Measure Test	0.54
Total Resource Cost Test	1.73
Societal Test	2.19

Other benefit to cost ratios proved to be favorable, although less so of course. For example, the Participants Test value of 4.24 indicates that Option B customers saved $4 for every $1 invested. The Ratepayer Impact Measure test, the only test which scored lower than one, indicating that Option A customers' rates increased because lost revenues outweighed NMPC's decreased generating costs. All other benefit-cost ratios calculated by NMPC showed favorable results.[R#13]

The Results Center has calculated the cost of saved energy for the Subscriptive Service. Using a 16-year measure life the Subscriptive Service has resulted in the phenomenally low cost of saved energy 0.04¢/kWh at a 5% discount rate.[R#13]

COST PER PARTICIPANT

Since the program cost NMPC only $324,938 in total the average cost per participant paid by NMPC was only $2,606. On the other hand, and as a testament to the success of the program model, the total estimated cost which Option B customers incurred was $14,293,612. This included the cost of the energy audit and the implementation cost of energy efficiency measures installed and translates to a cost of approximately $122,167 per participant. The rate impact for program participants was only 0.028¢/kWh, or just under three-tenths of a mil. The average savings incurred by Option B customers due to this rate decrease was a little over $13,000 per year.[R#13]

Based on the participants' estimated audit expenditure range, 34% of Option B customers' audits cost under $15,000, 41% ranged between $15,000 and $45,000, and 25% of the participants' audits cost over $45,000. NMPC also estimated the total cost paid by participants for energy efficiency measures to be approximately $9,933,534.[R#13]

COST COMPONENTS

NMPC has little information regarding the breakdown of program costs. However out of the total program cost of $324,938 approximately 50% was attributed to NMPC's consulting cost for program evaluation which included services such as on-site visits, surveys, and data analysis. The remaining cost was associated with NMPC labor required to ensure data quality and assist customers with program requirements.[R#13]

COST OF SAVED ENERGY (¢/kWh) Levelized	3%	4%	5%	6%	7%	8%	9%
1994	0.04	0.05	0.05	0.05	0.06	0.06	0.07

Additional Program Benefits

The Subscriptive Service program has resulted in a range of benefits. In addition to the direct energy savings presented in the previous section, Subscriptive Service has created non-energy related benefits including avoided emissions and direct benefits for both the utility and customers.

AVOIDED EMISSIONS

As the accompanying Environmental Benefit Statement shows, electricity savings from the Subscriptive Service program resulted in significant avoided emissions. For example, depending on the location where a similar program was implemented, similar success with program implementation could cut carbon dioxide emissions by 110 - 140 million pounds per year.

ADDITIONAL UTILITY AND CUSTOMER BENEFITS

One of the most attractive aspects of the Subscriptive Service program was the synergy of benefits that it created. Because the program lowered electricity rates not only did the Option B customers become more competitive but the utility provided a mechanism to retain large customers and to potentially attract new industry to its service territory.

Customer satisfaction and retention: In the emerging competitive environment customer satisfaction is vital to customer retention. More and more, utilities are developing programs that provide customers with a variety of services to fit their needs. The Subscriptive Service program provided just that. As Carol Taylor of the NYPSC expressed, the program allowed NMPC to move beyond the "rebate debate" with their large C&I customers, expanding upon a traditional DSM program to an energy service related program without completely dropping an energy efficiency initiative. Subscriptive Service's most valuable role, from a utility perspective, may be its customer retention value created by giving customers choice in service instead of force-fitting them into one program.[R#5]

Productivity improvements: From an industrial participant's perspective perhaps more important than the direct energy savings that resulted from the implementation of energy efficiency measures are the overall facility improvements that the required audits clearly helped to identify. The Subscriptive Service's energy audit helped customers discover changes that boosted plant productivity. Some companies contacted by the evaluators were pleased with the audits because they pointed out process improvements that otherwise would have been neglected.[R#5,9]

Increased Competitiveness: The Subscriptive Service's rate decrease in turn will help to improve participants' competitiveness and will thus serve to indirectly support the economy within NMPC's service territory. Many of NMPC's large C&I customers felt the burden of DIRAM charges were weighing heavily on their economic development. Many of these customers had voiced concern about Niagara Mohawk's higher-than-average electricity rates, putting stress on their competitiveness. These high electric rates were threatening to drive out industry from upstate New York and to discourage plant expansion. The rate decrease through Subscriptive Service, small as it is, has provided a means for these large companies to pump more capital into economic development and to attract new industry to the area.

THE ENVIRONMENTAL BENEFIT STATEMENT:

The Environmental Benefit Statement is intended to provide approximations of avoided air emissions for the electricity savings from a particular program when applied to another region or service territory. To transfer Niagara Mohawk's program success to your own situation, first determine the representative marginal power plant for your situation by perusing the left hand column of the table. What type of generation will be avoided if you enjoy Niagara Mohawk's level of success with a similar program in your region or service territory? Once you have determined the proxy power plant based on fuel type, heat rate (the efficiency of the power plant), and sulfur content in the fuel, move to the right across the row selected to find approximations of avoided emissions should you enjoy NMPC's level of success. Note that the coefficients in each cell of the table contain a 10% credit for transmission and distribution losses avoided through energy efficiency.

*** TSP = Total Suspended Particulates**
NSPS = New Source Performance Standards
BACT = Best Available Control Technology

ENVIRONMENTAL BENEFIT STATEMENT

➥ ***Avoided emissions based on 48,175,000 kWh saved in 1994***

Marginal Power Plant	*Heat Rate BTU/kWh*	*% Sulfur in Fuel*	*CO2 (lbs)*	*SO2 (lbs)*	*NOx (lbs)*	*TSP* (lbs)*
Coal	***Uncontrolled Emissions***					
A	9,400	2.50%	103,865,000	2,464,000	498,000	50,000
B	10,000	1.20%	110,754,000	954,000	322,000	238,000
	Controlled Emissions					
A	9,400	2.50%	103,865,000	246,000	498,000	4,000
B	10,000	1.20%	110,754,000	95,000	322,000	16,000
C	10,000		110,754,000	636,000	318,000	16,000
	Atmospheric Fluidized Bed Combustion					
A	10,000	1.10%	110,754,000	291,000	159,000	79,000
B	9,400	2.50%	103,865,000	246,000	199,000	15,000
	Integrated Gasification Combined Cycle					
A	10,000	0.45%	110,754,000	196,000	32,000	79,000
B	9,010		99,626,000	71,000	24,000	5,000
Gas	***Steam***					
A	10,400		60,411,000	0	138,000	0
B	9,224		52,463,000	0	329,000	16,000
	Combined Cycle					
1. Existing	9,000		52,463,000	0	201,000	0
2. NSPS*	9,000		52,463,000	0	95,000	0
3. BACT*	9,000		52,463,000	0	13,000	0
Oil	***Steam--#6 Oil***					
A	9,840	2.00%	87,438,000	1,325,000	156,000	148,000
B	10,400	2.20%	92,737,000	1,314,000	197,000	95,000
C	10,400	1.00%	92,737,000	188,000	158,000	50,000
D	10,400	0.50%	92,737,000	551,000	197,000	30,000
	Combustion Turbine					
#2 Diesel	13,600	0.30%	116,054,000	231,000	359,000	20,000
Refuse Derived Fuel						
Conventional	15,000	0.20%	137,781,000	355,000	467,000	104,000

Lessons Learned

The Subscriptive Service allowed NMPC to move beyond the "rebate debate," to provide key accounts choice and to thus posture for the competitive electric utility industry future: Perhaps the most important lesson learned through the Subscriptive Service program is that Niagara Mohawk was able to respond to the concerns of its largest and most influential customers, carefully positioning the company for an increasingly competitive future. While designing a middle ground, an acceptable compromise between bereaved industrials and environmentalists keen on maintaining demand-side management programs, was far from easy, the net result has been an interesting experiment that appears to have been extremely valuable. In the short term NMPC developed a means to address industrials' concerns about rate impacts; in the longer term NMPC may have been instrumental in crafting a new approach to the delivery of customer energy efficiency services.[R#5]

In addition to this overarching lesson and program benefit, the Subscriptive Service has provided a host of pragmatic lessons learned reported by staff and those directly involved with the program:

Unclear program requirements created confusion among customers: In its initial development phases the NYPSC was slow in announcing all of the Subscriptive Service requirements, but in the meantime NMPC informed their customers of the potential program. There was nearly a four month gap between the time qualifying C&I customers received information on Subscriptive Service and the time they were actually offered the program with specific requirements. During this period customers had no idea that an audit requirement would be part of Option B. Not only did this cause great confusion among the Option B customers but it reportedly angered many because they had already performed financial analysis that did not include audit cost. Also, because NMPC informed large C&I customers of the Subscriptive Service before it was officially offered, some perceived Subscriptive Service as giving qualifying customers an unfair advantage by allowing them to take full advantage of DSM rebate benefits while planning on later circumventing the DSM surcharge.[R#25,26]

The narrow window of opportunity stipulated for the audit proved limiting for select customers: NYPSC's six-month timeline for the required energy audit was too short for some large institutional organizations. It was practically impossible for large customers, universities for example, to complete detailed energy audits in six months. They reportedly needed at least a year to complete this most basic program requirement. And even so, the expense that was required to complete an audit on an extensive campus would have cost over $100,000, beyond many of these customers' budgets.[R#5]

Consistent management is an important ingredient in an effective program: Analysts contacted by The Results Center from Multiple Intervenors and the New York Public Service Commission expressed their position that NMPC was ineffective in program management. They asserted that this led to inconsistency in program planning, marketing, and management and weakened NMPC's efforts in providing consistent support to Option B customers. Because of NMPC's internal reorganization the turnover rate was very high for program staff members and field representatives. This quite possibly impeded the program's affect and undercut its number one objective related to customer retention. However, NMPC Subscriptive Service program management disagreed. They claimed that the high turnover rate of top management did not weaken the program because it never filtered through to the field representatives or customers.[R#5,6,18,26]

The energy audit was successful in helping selected customers identify effective ECMs: Through the program evaluations there was evidence that the energy audits clearly identified ECMs which led to energy savings for Option B customers. An interesting perception which was noticed by RTI and NYPSC in the evaluation process, was that the more involved the customer was in the program the more likely the audits were used as helpful tools in identifying ECMs. Customers who were directly involved in the energy audit (e.g. energy managers) found the audit useful in long run, helping to identify neglected ECMs. However, people not directly associated with the audit (e.g. top management) generally felt it was not in line with the company's focus. Even though the audit identified traditional ECMs such as lighting and motor/

drive retrofits, Marsha Walton of NYSERDA, asserted that more explicit and comprehensive audit requirements could have encouraged auditors to consider electrotechnologies and efficient fuel switching opportunities on a consistent basis.[R#8,9,19,34]

Contractual arrangements could have further reinforced the program's impact: NMPC had a non-contractual agreement between Option B customers on ECM implementation or saved energy. ECM implementation was based solely on the participants' good faith. In addition, implementation plans were not a requirement as originally planned. Accounting of program savings would have been assured and more importantly, program savings would have been further strengthened if the Subscriptive Service had included a contractual arrangement with participants.[R#5,18]

Tieing program success with shareholder incentives gave the utility a direct financial incentive to make the program option succeed: While NMPC's program enforcement seems to be rather weak, a key attribute of the program design that appears to have worked well was tieing program success with shareholder incentives. If the utility did not achieve at least 80% of its overall DSM energy savings goals – which included goals for the Subscriptive Service – NMPC's shareholders would not earn incentives for NMPC's overall DSM program costs. This feature appears important for utilities with shareholder incentives; use of performance-based ratemaking may also provide a means of assuring utility commitment to the program in the future.

Giving field representatives additional program responsibility would have eased participation requirements and enhanced the service provided rather than adding to the customer frustration related to post-installation monitoring and evaluation: Although field representatives were directly involved in the initial marketing phase of the Subscriptive Service they were not as actively involved in assisting Option B customers in implementation plans and reporting. Throughout the 1994 evaluation program, NMPC and RTI contacted Option B customers to update data on ECM implementation. In the process, Option B customers generally became frustrated with the barrage of phone calls and surveys. Monitoring and evaluation would have been much more successful if the field representative were informed of the necessity of data collection by upper management and provided tool that assisted in updating data. Therefore in 1995, field representatives will be the only contacts for Option B customers for data collection.[R#18,20]

Overall, the Subscriptive Service resulted in impressive energy savings, suggesting that the model not only provides customer value but can provide the least-cost resource: While critics continue to view the Subscriptive Service program as an "opt-out" and a symbol of the erosion of utilities' commitments to industrial energy efficiency, the program's savings have been quite substantial. In many cases the audits have reportedly raised the profile of efficiency options in senior managements' eyes,... retrofits that have been put on the back burner appear to be addressed through the program. So while in many cases rebates and other direct financial incentives have been key to motivating energy efficiency upgrades, in other cases – as the experience of the Subscriptive Service suggests – mandated audits and corporations' commitments to efficiency have worked, verifying the model as a powerful tool for fulfilling multiple objectives.

Transferability

The Subscriptive Service has provided many lessons that relate to its further applicability and transferability. Is it possible for a large user – or for that matter any electricity user – to lock into a form of contract with its utility to mine cost-effective energy savings independently? What makes such a construct attractive is the provision of choice to utility customers, especially for customers that have been outspoken in their discontent with traditional DSM offerings. Societally beneficial energy savings goals can be achieved while concerns of rate impacts associated with energy efficiency program costs – as well as issues related to cross subsidies, free ridership, unfair competitive advantages, etc. – can be ameliorated.

The theory of a contract or a bond with one's utility may be highly applicable to a reregulated environment. In the future, distribution utilities will likely be required to offer efficiency programs. The programs may be funded through the use of "wires charges" explicitly presented in an unbundled manner on customers' bills. If the distribution companies (or conservation companies) are mandated to provide efficiency services to a prescribed level of performance, measured in actual program savings, the Subscriptive Service option may be a quite attractive product offering. For customers that elect to participate perhaps the wires charge or a portion of it could be waived, lessening their power bills while providing a strong incentive to invest in efficiency independently.

The model exemplified by the Subscriptive Service could theoretically be applied to other customer segments as well, perhaps even for residential customers. As long as energy savings can be documented – the focus of a good deal of attention related to the Subscriptive Service program – such a customer option and program model may make sense. Furthermore, utilities can certainly support customers that elect to pursue efficiency independently by offering them access to capital, technical support, and even services such as building commissioning and recommissioning to make sure that measures installed are indeed functioning properly. In these ways utilities may be able to provide enhanced support services for their customers and/or for the services provided by energy services companies specifically selected and contracted by program participants.

The Subscriptive Service affords a glimpse at a radically different and intriguing model for the capture of efficiency. While it may be attractive in theory, implementing the Subscriptive Service provided a host of valuable lessons, many of which apply to its future transferability. Naturally the quality of the audits is an important program design parameter and perhaps one that can be refined to enhance the program in future applications. For future ongoing projects, David Wooley, of Pace University, suggests that facilities would have to re-audited periodically to take advantage of technological advances and to brush-up existing equipment and processes.[R#28]

Another key design parameter relates to the program's enforceability. NMPC lacked the ability to require the installation of measures. While Green Lights, for example, uses a fairly strong mechanism to elicit participation and to get its allies to fulfill their commitments, the Subscriptive Service lacks an effective means for participant follow-through. Subsequent programs may be even more effective by rounding out the program design to assure energy savings.

Perhaps the most appealing aspect of the program's transferability is the important message that it sends to customers. "It's the message, not the model," claims Barbara Brenner of Multiple Intervenors. She believes that the message – that the utility is willing to change and adapt and take heed of customer concerns – has been the most successful aspect of the Subscriptive Service and one that may well carry on to other utilities and subsequent programs. In fact, other more recent experiments in New York shed light on this model for customer choice and provide valuable experiences testing other design parameters.[R#6]

EXPERIMENTS AT ROCHESTER GAS & ELECTRIC

The Subscriptive Service program was in large part made possible by the open attitude of the New York Public Service Commission's Chairman Peter Bradford, a distinguished Commissioner with tremendous insight and flexibility (and height!). With Bradford at the helm of the NYPSC, New York was ripe for innovation. NMPC's Subscriptive Service experiment almost immediately led to another, this one implemented by Rochester Gas & Electric. From January of 1994 to December of 1995, RG&E implemented its Energy Services program, with goals similar to those of the Subscriptive Service.

RG&E rolled out its own alternative to funding industrial energy efficiency by setting aside and apportioning specific funding equivalent to the amount of money large customers would have contributed to DSM through their rates. For instance, if a customer's annual electricity bill included $50,000 to pay for the utility's DSM programs, $50,000 would be at that customer's disposal to fund energy efficiency projects. If customers did not access the fund, any unspent money would become available to other customers. Thus, the onus was shifted to the customers to find ways to use "their" money for their own benefit and for the benefit of the utility.

RG&E's innovative approach squarely addressed industrial customers' concerns about cross subsidies but its design had a fundamental flaw: Jim DiStefano of RG&E explained that since customers had specific amounts set aside based on the amounts they would have paid in associated rate impacts from general DSM programs, only the half dozen largest customers accrued enough money to do substantive retrofits. Smaller industrial customers, those with the greatest need for efficiency and the least access to capital to do so, didn't have enough money in their program accounts to engage meaningful retrofits. As a result, the NYPSC terminated the program.

While the initial program design failed, RG&E continued to seek alternative means of satisfying its DSM commitments and industrial customers alike. RG&E has initiated a new program model through the New York Public Service Commission settlement process called the Large Customer Credit program. (See Energy Efficiency News & Views, Issue #9, Program Snapshot.) Like the Subscriptive Service, customers that elect to participate in the program option receive a rate decrease of 0.03¢/kWh or three-tenths of a mil.

RG&E's credit program is less stringent regarding energy efficiency mandates than NMPC's Subscriptive Service. Unlike Subscriptive Service, RG&E's program does not require participants to perform an energy audit. As stated in the settlement that established the Large Customer Credit program, participants' only program requirement is that they explicitly document their energy efficiency upgrade costs and savings impacts for measures installed for the two years prior to the program and then prepare annual statements which will be submitted to the utility. The Large Customer Credit program does not have a contractual agreement with the customer to save a specific level of energy nor is there any savings goal associated with program. In fact, RG&E's DSM savings goals for 1996 exclude those savings accrued from customers participating in the Large Customer Credit program.[R#19,21]

An interesting sidebar to the Large Customer Credit program concerns capacity bidding. During the program's settlement negotiations, the utility was experiencing significant pressure to fulfill any needed capacity requirement through energy efficiency. In particular it was being directed to garner savings from its large industrial customer base. As part of the 1996 DSM settlement, to the extent that RG&E should require capacity during the term of a multi-year settlement agreement, RG&E is required to issue to its largest customers and energy service companies a request for DSM proposals to supply capacity through energy efficiency.[R#19,21,28]

BALANCING INDUSTRIAL & ENVIRONMENTAL AGENDA

The Subscriptive Service and the RG&E experiments reflect a fundamental tension between industrials' need for lower rates and society's need for energy savings and the multiple benefits that saved energy accrues. Essentially, "opt-out" programs provide a middle ground, a position where seemingly conflicting objectives can be addressed and compromise can be made.

In New York, large industrial users continue to push for lower rates and for the advent of full utility competition. Responding to continued pressure from large electricity users the PSC has convened "competitiveness opportunities proceedings" which have resulted in increased utility opportunities to offer large users flexible rates, essentially lower rates to alleviate their concerns about competitiveness. The Flexible Rates programs that New York's investor-owned utilities can now offer gives them the freedom to sell power at discounted rates to key customer accounts. This in turn gives utilities the opportunity to work with their large users, seeking to satisfy their needs and to thus retain them in an increasingly competitive environment.

On the other hand, environmentalists and other energy efficiency advocates are clearly concerned that utilities' offerings of flexible rates without incentives for energy efficiency will strip past efficiency initiatives and potentially result in increased electricity use. Just as industrials have clearly articulated their needs, the environmental community provides the long-term perspective, recognizing energy efficiency's role as a least-cost, societally beneficial resource. Thus maintaining "the energy efficiency component" in program and rate designs is at the heart of the Subscriptive Service, an intriguing model aimed to fulfill the needs to two traditionally diametrically opposed interests.

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