Operations Resource Assessment Service

Process and Impact Evaluation

Evaluation Unit
Energy Management Services Division

May 2000

Seattle City Light

Seattle City Light

53542 (5-00)

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BRIAN COATES and DENNIS PEARSON
Seattle City Light

LISA SKUMATZ
Skumatz Economic Research Associates

Evaluation Unit

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Acknowledgements

The evaluation of the Energy Smart Design Program was completed through the joint efforts of Seattle City Light's Evaluation Unit and a consultant contract awarded by City Light to Skumatz Economic Research Associates, Inc. (SERA). We thank City Light's ORA team and the staff from SBW and Willis Consulting for planning and delivering the ORA service, and for the useful information and opinions they provided during the evaluation interviews. Thanks are also due to John Green, Skumatz Economic Research Associates Inc., for interviewing ORA participants and nonparticipants, and for developing and maintaining the survey database. We appreciate the support given to us throughout the evaluation by David Van Holde, ORA service coordinator, and for his useful comments on the draft report.

Executive Summary

Introduction

The Operations Resource Assessment Service (ORA) service has been offered since December, 1997, to City Light's commercial and industrial customers. ORA provides a free, multi-resource audit to help the customer manage their operating costs by identifying specific action items which can reduce electrical, natural gas, and water usage. A resource-use audit is conducted at each customer's facility to identify potential resource savings and associated cost reductions. An ORA report is then prepared for each customer which presents those actions that will reduce the customers' use of electricity, natural gas, and water. Seattle City Light staff discuss the report with the customer and an action plan is developed for implementing the recommended actions in the report.

There were several purposes for the process and impact evaluation of the ORA service. One purpose was to assess customer, City Light staff, and consultant opinions and satisfaction with several elements of the service. These elements include:

- planning and design;
- marketing;
- service delivery (audit, audit report, recommendations, and action plan);
- referral to other services;
- reasons for participating;
- obstacles to participation;
- barriers to implementation of the ORA recommendations;
- strengths and weaknesses; and
- suggested service improvements.

To assess opinions and satisfaction for each of the elements, telephone interviews were conducted with 73 customers who participated in the ORA service during 1998 and 1999. An additional 14 in-person interviews were conducted with City Light staff and ORA consultants who were involved with the service.

The second purpose of the evaluation was to assess the outcomes of the ORA service, including ORA recommended conservation measures that were implemented through City Light's conservation programs and by the customers themselves; electricity, water, waste water, and natural gas savings from recommended measures; and measure induced non-resource benefits (e.g., improved working conditions; productivity). Information on the conservation measures implemented and associated energy savings were obtained for

96 service participants from the database maintained by the ORA service. Additional conservation measures taken by customers were obtained in telephone interviews with 73 ORA participants.

The third purpose of the evaluation was to determine ORA cost-effectiveness, including levelized costs for the electricity savings from customer, utility, and service area perspectives; net present benefit-cost ratios from the three perspectives for the electricity savings and for the combination of electricity, water, and natural gas savings; and customer payback periods. The final evaluation purpose was to provide recommendations to improve ORA service delivery and benefits.

Evaluation Findings

The evaluation findings are summarized by six aspects of the evaluation: ORA service participation, customer satisfaction with the service, service strengths and weaknesses, resource savings, cost-effectiveness, and non-resource benefits. The findings are summarized below.

Service Participation

A large number of commercial and industrial customers participated in the ORA service during 1998 and 1999. Over this two-year period, the number of service completed for customers were: 129 facility audits, 110 ORA reports, and 123 action plans. Customers said in the interviews that their ORA participation resulted from telephone or personal contact with ORA staff. Their main reasons for participating included the free service, the identification of conservation measures in the audit, and viewing City Light as a trusted information source. Also, at the time of their participation in the service, most customers understood that they would receive a facility audit and an ORA report. Fewer than 20% of the customers, however, understood that the audit would cover non-electrical resources and that an action plan was part of the service requirement.

Customer Satisfaction

Telephone interviews revealed that customers were very satisfied with the skills of ORA staff and the principal service components. Specifically, customers were very satisfied with the ability of the ORA staff to explain the service and their awareness of and responsiveness to the customers' business needs. Customers were also quite satisfied with the three ORA services--the facility audit, the ORA report, and the action plan. On the five-point satisfaction scale, where 5 represents "very satisfied," the ratings for staff skills and the service components averaged 4.4.

Additional questions on the ORA report and action plan also indicated that the customers were quite satisfied with these two service components. These questions covered the extent to which the report and action plan were understandable, accurate and complete, and useful. On the five-point satisfaction scale, the ratings for the report and action plan ranged from 4.2 to 4.6.

Customers were also asked how satisfied they were with their energy and non-energy savings and with the cost reductions their company achieved as a consequence of the ORA service. In contrast to their ratings for ORA services, customers were merely satisfied (ratings averaged 3.3) with the savings and cost reductions they achieved as a consequence of the ORA service.

Service Strengths and Weaknesses

Service participants, City Light staff, and consultant were each asked about the strengths and weaknesses of the ORA service. Service staff, consultants, and ORA participants were quite satisfied with the audit, the report, and the recommended conservation measures. Participants were also quite satisfied with the staff's knowledge and the increased conservation awareness that they gained from taking part in the service.

Service weaknesses noted by participants, staff, and consultants included the timeliness of services and the extent to which resource savings and associated cost reductions were realized in the facilities. Additional weaknesses noted by staff and consultants included marketing efforts and the process by which customers were referred to other programs and services such as the Water Smart Technology Program offered by Seattle Public Utilities.

Resource Savings

Considerable success was achieved by the ORA service in identifying potential electrical savings in customers' facilities and in having customers take actions to obtain the savings. For the initial 96 projects served by the ORA service, ORA staff identified potential electrical savings of almost 23,000,000 kilowatt-hours (2.6 average megawatts). Of this potential, savings of more than 9,000,000 kilowatt-hours (1 average megawatt) were achieved by the taking of conservation actions in the facilities. Although most of the conservation actions were taken with partial financing from City Light's conservation programs, a sizable proportion of the savings (23%) were financed entirely by the customers.

The ORA service also achieved considerable success in identifying potential water savings in customers' facilities. For the initial ORA projects, the audit staff identified potential savings of more than 34,000,000 gallons. A smaller percentage of these savings were achieved by customers than was found for electricity, with the water savings being more than 5,000,000 gallons. Almost all of the conservation actions taken by customers to obtain these savings were financed by the customers themselves. Only one of the eight water projects received financing through a Seattle Public Utilities conservation program.

Substantial natural gas savings were also identified in the ORA audits, with the identified savings being almost 199,000 therms. Of this large potential, actions were only taken in three facilities and the resulting energy savings were approximately 5,000 therms. All of the natural gas savings were financed solely by the customers.

Cost-effectiveness of the Resource Savings

The ORA service was designed to identify conservation actions which, if implemented, would be cost-effective to both the customer and Seattle City Light. The ORA service was quite successful from the viewpoint of cost-effectiveness, as low levelized costs and positive benefit-cost ratios were found in both the electrical analysis and in the combined electrical and non-electrical analysis. For the electrical resource, the levelized costs per kilowatt-hour saved from the three perspectives were: 31 mills/kWh for the service area; 19 mills/kWh for the utility; and 13 mills/kWh for the customer. For the analysis which combined electrical and non-electrical costs and savings, the benefit-cost ratios for the three perspectives were: 1.7 for the service area; 2.6 for the utility; and 3.0 for the customer.

Recommendations

On the basis of the evaluation findings, seven recommendations are made to improve future ORA services for Seattle City Light customers. These recommendations are:

1. Provide staff and financial resources so that the ORA service can reach its full potential

The service has strong cost-effectiveness results, customers were very satisfied with the service, and the service provided extra customer value beyond the energy and cost savings. The service, however, has not reached its full potential in terms of customer participation, energy and non-energy (e.g., water) savings, and additional customer benefits. Strong management support and financial commitment – and emphasis of those priorities with service staff -- are needed to allow the service to reach its full potential. This service is quite progressive, and has unrealized potential from:

- better marketing to reach customers with the greatest potential value for both the customers and City Light;
- expansion to other City of Seattle services, including waste management/recycling and increased emphasis on water conservation measures;
- sharing of administrative costs through joint service delivery with other City of Seattle utilities; and
- greater dedication and focus from staff that are reassured that management values the service and that their efforts will be recognized within City Light's evaluation system.

2. Increase the number of ORA recommended conservation measures that are implemented in customers' facilities

A sizeable number of ORA recommended conservation measures were implemented in customers' facilities, producing both energy savings and associated cost reductions.

To increase further the number of implemented ORA recommendations, it is recommended that follow-ups be conducted with participants who have not subsequently participated in a conservation service or program offered by Seattle City Light or Seattle Public Utilities. In these follow-ups, staff could discuss current City of Seattle conservation program offerings and how ORA recommended conservation measures might be installed in customers' facilities through one of these programs.

3. Increase the number of ORA participants who participate in Seattle Public Utility services so that higher water savings are achieved

It was found in the evaluation that there were substantial differences between the electrical and water resource in the number of successful referrals to City Light and Seattle Public Utilities programs and in the savings achieved by ORA participants. To increase the number of successful referrals for ORA participants to Seattle Public Utilities and the associated water savings, it is recommended that staff in the Commercial/Industrial section coordinate these referrals. This coordination could consist of working with both the customers and Seattle Public Utilities to understand the customers' needs for the service, to ensure that Public Utilities staff understood these needs, and to facilitate customer/service provider meetings on both the customers' needs and the available services.

4. Improve the timeliness of services provided to ORA participants

Each of the groups interviewed--ORA participants, staff, and consultants--indicated some dissatisfaction with the timeliness of the services provided by the ORA service. These findings were reinforced by a processing time analysis, in which it was found that the median processing time for projects to move from the facility audit to the Action Plan meeting was about three months.

To improve the timeliness of the services offered through ORA, it is recommended that benchmarks be established by ORA staff for the maximum number of days that should elapse between each of the four service stages (i.e., audit, draft ORA report, final ORA report, and Action Plan meeting). Once these benchmarks are established, a monthly review could be done on each project to determine if the benchmarks had been exceeded for any of the projects. For those projects in which the benchmarks had been exceeded, steps could be taken to determine why the project was taking so long and necessary corrections made to ensure that the project was moving in a timely manner though the service stages.

5. Enhance ORA service potential and value by adding and/or better emphasizing non-electricity resources

Customers rated concerns about garbage, recycling, water, wastewater, and gas costs nearly as highly as electricity. Previous research indicates that providing an integrated service can provide important leverage in “selling” services and getting participation and entry to non-residential facilities. Participants and non-participants noted value from this enhancement.

The City is in a unique position to offer this enhancement because the City has control over many of the utility services of interest, and an expanded service would fit with the City's sustainability goals. It is recommended that City Light coordinate with SPU's funding of the non-residential garbage/recycling audit capabilities provided by the Chamber of Commerce's Business Investment Recycling Venture (BIRV). SPU's water department may also be ready to gear up with more audits and incentives, providing another way to share administrative costs, yet provide more service to the customers.

6. Conduct additional research to develop ways to improve the service's marketing and targeting

Both staff and consultants suggested that marketing and recruitment for the service were among its weaker areas. The service could potentially be made more cost-effective if it targets customers that can benefit most from the service. The utility has extensive databases on customer energy usage, and the data from this evaluation can be used to provide additional information about the types of customers that implemented the measures more fully than others. Market research, surveys, and focus groups can also be used to examine customer needs, identify barriers, and develop marketing approaches for targeting potential ORA participants.

7. Consider a variety of other service refinements to improve delivery, impact, and service to customers

Based on the interviews with participants, staff, and consultants, there are several modifications and refinements that can be made to the service to help deliver service more effectively. Recommendations to address these issues are summarized below:

- Continue referrals tracking, but limit it to high priority or specialized issues. Communicate referrals to other departments via email and include in follow-up procedures.
- Consider augmenting the ORA audits with checklists or other tools to help assure that operation and maintenance and non-energy measures receive sufficient attention in recommendations. Training, checklists, and careful personnel selection can help reduce variability in the quality of delivery of audits.
- Consider including all suitable operation and maintenance measures in the ORA report. Given that these measures have little to no capital cost, they may not need extensive investigation, and could be included to provide greater service to the customers. This strategy is also likely to increase the number of operation and maintenance measures implemented.

Introduction

Background

In early 1996 Seattle City Light's Energy Management Services Division (EMSD) began the delivery of several "value added services" to its commercial and industrial customers. These services were planned and developed through the combined efforts of EMSD staff and management, the Strategic Products and Services Group, and Account Executives. The overall purpose of these services is to provide new products and services designed to meet customer energy and operational efficiency needs. These value-added services reflect the new SCL commitment, as outlined in its *SCL Proposed 1996 Business Plan,* to design and deliver a wide variety of customer-focused services. These services supplement the commercial and industrial incentive's-based programs offered by EMSD since the 1980's.

The value-added services fielded to date include:

- Advanced Metering
- Air Compressor Efficiency Improvement (ACE)
- Utility Cost Watch
- Operations and Resource Assessment (ORA)
- Operation and Maintenance for Energy Efficiency (O&M Service)
- Building Commissioning

In 1998 customer and staff surveys were completed for the following services:

- ACE (including an energy savings assessment)
- Advanced Metering
- Building Commissioning
- Utility Cost Watch

In late 1998 the ORA service was selected to receive a comprehensive process and impact evaluation. This evaluation assessed the level of service participation; service administration; customer, staff, and consultant interviews on their satisfaction with the service; energy and non-energy savings; and service cost-effectiveness. The remainder of this report describes the ORA service, present in greater detail the purposes of the evaluation, and present the methods and findings for each of the evaluation purposes. At the end of the report, six recommendations are presented to enhance future ORA services for City Light's commercial and industrial customers.

ORA Service Description

The Operations Resource Assessment Service (ORA) is offered to City Light's commercial and industrial customers.[1] The service is provided at no cost to eligible customers and is designed to help customers manage their operating costs, improve productivity, and identify specific action items which can reduce both energy and non-energy (e.g., water) usage and associated costs. A visit is conducted at each customer's facility to identify their utility-related business needs. A resource-use audit is then conducted which focuses on potential energy and non-energy savings at the facility and associated cost reductions. A report is prepared for the customer that includes recommended actions that will reduce the customers' use of electricity, water, and other resources. These actions can be taken by the customer on their own or done in conjunction with conservation incentive programs offered by Seattle City Light and Seattle Public Utilities. Finally, City Light staff discuss the report with the customer and, together, they develop an action plan to implement the actions recommended in the report.

In addition, some ORA participants are referred to one or more non-ORA services to receive assistance not directly provided by ORA itself; such as Seattle City Light's Energy Smart Design and Energy Savings Plan programs, Seattle Public Utility's Water Smart Technology program, or Power Quality services.

Evaluation Purposes

There were several purposes for the process and impact evaluation of the ORA service. One purpose was to assess customer, City Light staff, and consultant opinions and satisfaction with several service elements. These elements include the following: planning and design; marketing; service delivery (audit, audit report, recommendations, and action plan); referral to other services; reasons for participating; obstacles to participation; barriers to implementation of the ORA recommendations; strengths and weaknesses; and suggested service improvements. To assess opinions and satisfaction for each of the elements, telephone interviews were conducted with 73 customers who participated in the ORA service during 1998 and 1999. An additional 14 in-person interviews were conducted with City Light staff and ORA consultants who were involved with the service.

The second purpose of the evaluation was to assess the outcomes of the ORA service, including ORA recommended conservation measure that were implemented through City Light's conservation programs and by the customers themselves; electricity, water, waste water, and natural gas savings from recommended measures; and measure induced non-resource benefits (e.g., improved working conditions; productivity). Information on the conservation measures implemented and associated energy savings were obtained for 96 service participants from databases maintained in the Energy Management Services

[1] The initial planning for the ORA project can be found in the following document: **Retail Services Project Operations and Resource Assessment**. Seattle City Light, March, 1997.

Division. The telephone interviews with 73 service participants revealed the conservation measures customers had taken themselves.

The third purpose of the evaluation was to determine ORA cost-effectiveness, including levelized costs for the electricity savings from customer, utility, and service area perspectives; net present benefit-cost ratios from the three perspectives for the electricity savings and for the combination of electricity, water, and natural gas savings; and customer payback periods for the savings. The final evaluation purpose was to provide recommendations to improve ORA service delivery and benefits.

Process Evaluation

Service Processing Time

Evaluation Purpose

One purpose of the ORA process evaluation was to examine the number of days that elapsed between each of the various service steps, from the time that the audit was conducted in the building to the time that City Light and the customer agreed on the action plan. This examination took part in three steps. In the first step, five key stages in the service process were identified for ORA projects. These stages were determined through discussion with ORA staff and examination of the service database. The stages included:

Seattle City Light and/or a consultant conduct an ORA audit in the customer's facility;

- The consultant completes a customer "intelligence" report on who to contact in the business, the health of the business and how decisions are made, their past experience with City Light, and potential conservation opportunities;
- The consultant completes an ORA report on the customer's energy use characteristics and actions the customer can take to improve the energy and non-energy efficiency of their facility;
- Seattle City Light staff review and approve the ORA report;
- The approved report is sent to the customer; and;
- Seattle City Light and the customer meet to review the ORA report and to identify specific conservation actions that the customer can take to improve the efficiency of their facility. Seattle City Light sends a follow-up letter to the customer on the identified conservation actions.

In the second step for the evaluation, completion dates for the five service stages were gathered for 91 projects. The ORA reports for each of these projects were completed prior to June 30, 1999, and the project had usable completion dates for the processing time analysis. The completion dates were gathered from an ORA service database. With these dates, the number of days required for each of the projects to move from one stage to the next stage was calculated. The number of days between each of the service stages for the 91 projects was summarized by calculating the mean and median number of elapsed days.

In the final evaluation step, problem areas, such as long delays between service stages, were identified and the reasons determined for the problems. These reasons were gathered though discussions with ORA staff.

Evaluation Findings

Table 1 and Figure 1 show the mean number of days between each of the five stages in the ORA service. As shown in the table, the mean total number of days from the initial audit of the customers' facilities to the action plan meeting was 133 calendar days, a little over four months. Of this total, it took about three to four weeks for each of the report stages—intelligence, draft ORA report, and approved ORA report—to be completed. Less than a week elapsed from the time that the ORA report was approved to the sending of the report to the customer. The final and longest stage was from the report being sent to the customer to the date that the action plan meeting was held. The mean number of days for this final stage to occur was 57 days, almost two months.

As shown in Table 1 and Figure 2, the median number of days that elapsed between each of the service stages was less than the mean number of days between the stages. The smaller number of days for the median than for the mean was due to a few projects in which a large number of days elapsed between the service stages. Using the median statistic, it took about three months, 95 days, for the customer to proceed from the ORA audit to the action plan meeting. Of this total time, about two to three weeks was required for each of the three report stages to be completed. Only two days were needed to move from the report approval step to the report being sent to the customer. The final stage, moving from the report being sent to the action plan meeting, required an additional 45 days.

The median number of days, 51, for a project to move from the audit to the report being sent to the customer was somewhat longer, about two weeks, than benchmarks established by City Light and the ORA consultant for commercial projects. The benchmarks established were 34 days for standard ORA projects and 48 days for complex projects. More difficulty was experienced, however, in meeting the benchmarks for a project to progress from the report being sent to customers to the action plan meeting. These benchmarks, 49 days for standard projects and 64 days for complex projects, were exceeded by several weeks. As noted above, the median number of days from the audit to the action plan meeting was about three months, 95 days.

Discussion with ORA staff indicated that the long time period between the sending of the final report and the action plan meeting was due to both the service staff and the customer. ORA staff viewed the action plan as a less integral part of the ORA service than the audit or ORA report, and thus would sometimes delay setting up the action plan meeting for several weeks. Also, staff sometimes experienced difficulty in setting up an action plan meeting with the customer, thus further delaying the time at which the meeting could be held.

Figure 1. Mean Processing Time

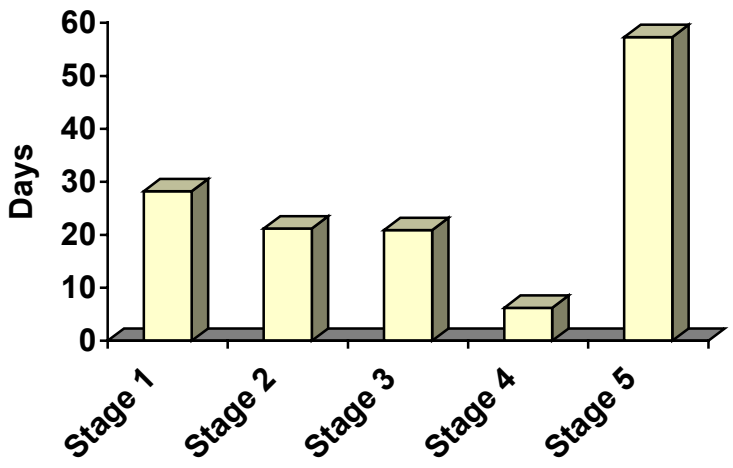
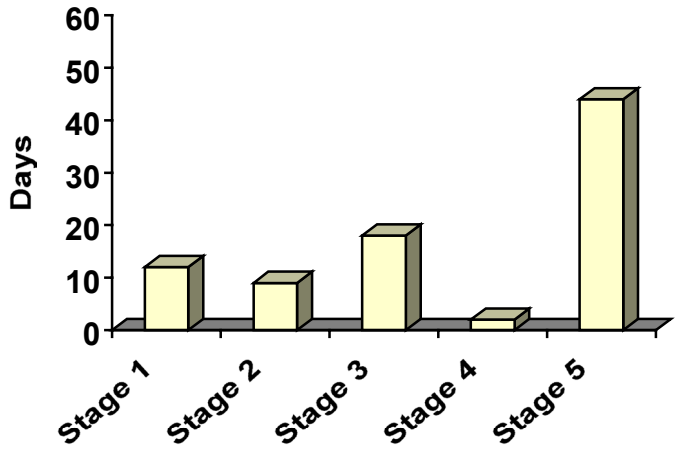


Table 1. Mean and Median Number of Processing Days by Service Stage

Service Stage	Mean	Median
Audit to Intelligence Report (Stage 1)	28	12
Intelligence Report to Draft ORA Report (Stage 2)	21	19
Draft ORA Report to Report Approved (Stage 3)	21	18
Report Approved to Report Sent (Stage 4)	6	2
Subtotal: Audit to Report Sent	76	51
Report Sent to Action Plan (Stage 5)	57	44
Total: Audit to Action Plan	133	95

Figure 2. Median Processing Time



Conducting Service Interviews

To conduct the evaluation of Seattle City Light's (SCL) Operations Resource Assessment (ORA) service, the consultant conducted interviews with service and other SCL/SPU staff, participating customers, and a sample of customers that elected not to participate in the service. For each group, we were targeting different types of information about the service. To try to elicit candid and complete responses, respondents were promised confidentiality in association with the interviews.

ORA Service and Consultant Staff Interviews

SERA conducted a total of 14 interviews with ORA and consultant staff associated with the service. We conducted structured interviews with SCL staff that were involved in planning or implementing the service, and with consultant staff from the three key firms involved in designing and delivering the ORA services – SBW Consulting, Willis, and BRACO. The questions addressed a variety of issues including:

- Their role in the service
- Satisfaction with (and comments on) an array of the service's stages and products
- Strengths and weaknesses of the service
- Suggestions for improvements or enhancements to the service
- Follow-up on referrals made and outcomes, as known

Participant Interviews

We also interviewed a sample of 73 commercial and industrial buildings that had participated in the service. We were very interested in getting feedback on the service, and whether they had implemented any of the ORA-recommended measures, to see how

well the service was working and whether it had had a significant impact. The types of questions asked are listed below.

- Contact information and business type
- Importance of utility costs relative to operating cost
- How they found out about the service, and understanding of the services
- Reasons for service participation
- Satisfaction with stages of the service, products/deliverables, and staff capabilities
- Service strengths and weaknesses, and suggestions for service modifications or enhancements
- Review of each of the measures recommended – which were implemented or not and why, along with updates on costs, savings, and incentives, and assessments of any non-resource benefits from the measure
- Information on any other (non-ORA) measures they may have implemented since July, 1998
- Barriers to implementing measures
- Relative value of the service and deliverables
- Satisfaction with the report and action plan
- Whether questions they asked during the on-site audit (and then referred to other groups within SCL, hence "referrals") were followed up on, recollections of the services provided, obstacles to receiving or implementing the referred services, and actions from referrals

Non-participant Interviews

We interviewed a sample of commercial/industrial customers that had been contacted for the ORA service, but elected not to participate in it at this time. We were particularly interested in feedback on why they didn't participate in the service, and whether there were aspects of the service that could be refined to make it more attractive. A total of 13 of these interviews were fully completed. The questionnaire asked about the following topics.

- Contact information and business type
- Importance of utility costs relative to operating cost
- How they found out about the service, and understanding of the services
- Reasons for not participating
- Service changes that would have made it more attractive
- Energy and water measures or changes implemented (or definitely planned) since July 1998.

Referral staff

We also interviewed 12 SCL staff that were designated as contact persons for "referred" questions in particular service areas within the utility. For example, contacts related to Y2K questions, rate questions, billing issues, metering, and a variety of other areas were included in the contact list. These contacts were sent lists of the companies that referrals contact sheets indicated had asked questions in the referrals staff's area of expertise. For each of these companies, we asked the referral staff a number of questions, summarized below.

- Whether they were contacted by the customer or contacted by an EMA regarding the customer's question
- What services were asked for or provided
- The date service started and ended
- If no service was provided, why not
- What actions were recommended to the customers, actions taken, and when
- Obstacles to delivering or to implementing the recommendations
- Benefits or improvements, if known

In addition, we queried ORA service staff that provided facility audits for information on specific customer referrals. Copies of all the survey instruments used are included in the appendices. The results are summarized in the remainder of this report section.

ORA Service Feedback from Participating Commercial/Industrial Customers

Service Outreach, Expectations, and Reasons for Participating

The vast majority of customers heard about the ORA service from utility staff that called or spoke with them directly. Phone or personal contact, sometimes through continuations of on-going relationships with City Light, was the most common methods recalled for hearing about the service. A small fraction heard from brochures, presentations, or word of mouth. Table 2 shows the share of participants hearing about the service through a variety of methods.

Participants were asked to recall their understanding of ORA services. First, we asked for unprompted responses; then we asked whether they recalled specific steps or deliverables as part of the service.

We found that more than one-third of the participants had thought that the service was an energy-only audit. Another one-fifth mentioned that it was some kind of audit, but didn't seem to know more. Only about one-sixth seemed to understand that the audit involved multiple utilities. The percentage responses are provided in Table 3 below.

Table 2. How Participating Customers Heard about the ORA Service

Way in Which Customers Heard about ORA Service	Percent
Utility staff called them	46%
In-person conversation with City Light staff	15%
Customer called City Light	8%
Continuation of previous relationship / communication	4%
Business associate called/ told them	6%
Presentation or article	3%
Via a letter	3%
Doesn't recall / wasn't at company then	14%

Table 3. Service Expectations for ORA Participants

Initial Service Expectations	Percent
Service Steps Expected (Unprompted)	38%
Energy audit only	21%
Vague audit	17%
Multi-resource audit	10%
Something to help them save money	4%
Incentives	4%
Not there when it was described / staff change	6%
Other	
Service Steps Expected (Prompted)	
Audit	63%
Report	51%
Action Plan	18%

When asked whether they recalled expecting an audit, a report or an action plan, almost two-thirds recalled the audit, and half the action plan. Only a minority recalled the action plan as part of the service.

Feedback and Satisfaction with Service and Deliverables

The ORA report and the action plan both received very high scores from participants. On a scale of 1-5, where 5 indicated very satisfied, the report scored at least a 4.4 on all characteristics – understandability, accuracy, completeness, and usefulness. The action plan also scored between 4.2 and 4.6 on the same characteristics. Seattle City Light ORA participants were highly satisfied with the reports. Some of the lower scores occurred because customers had not yet implemented recommended measures. These results are displayed in Table 4.

Participants were asked how highly they would rank the value they received from participating in the service. On a scale of 1-5, where 5 meant very valuable, they scored the knowledge gained through the service especially highly. The results are shown in Table 5 below. The scores for savings and cost reductions were affected by the fact that some of the measures had not yet been implemented. We also probed to identify participant satisfaction with the various phases of the service. Participants were most satisfied with the staff's explanation of the service, the audit itself, and the staff's knowledge (see Table 6). The scores were also very high for the report, the staff's responsiveness to the participating company's needs, and the overall service. Somewhat lower scores were given for the action plan, and for timeliness of the service.

Reasons for Participating, and Feedback on Service Strengths and Weaknesses

When the customers were asked to identify the reasons they decided to participate, half of the customers, 51%, reported that the service was free, and nearly half, 45%, said they were interested in having efficient measures identified. Fully one-third of the participants also said that Seattle City Light is a trusted source for information about their energy use. City Light is viewed as knowledgeable, and customers trust that the City won't be providing the service in order to "sell them something". This is a very valuable asset for City Light. The reported reasons for participating are shown in Table 7.

The customer perceptions of the service's strengths fell into three major categories – awareness or information that they gained, savings from the service, and the knowledge of the staff that were involved. These three reasons represented about two-thirds of the comments on strengths that were received. A more detailed list of the strengths that participants reported is provided in Table 8.

Table 4. Average Participant Satisfaction with ORA Report and Action Plan

Satisfaction Category	ORA Report	Action Plan
Understandable	4.5 (range 2-5)	4.6 (range 1-5)
Accurate	4.5 (3-5)	4.4 (1-5)
Complete	4.5 (2-5)	4.4 (1-5)
Useful	4.4 (1-5)	4.2 (0-5)

Table 5. Average Participant Value from Being in ORA Service

Value Category	Rating
Knowledge gained	4.2 (range 1-5)
Energy savings	3.6 (0-5)
Non-energy (water) savings	3.3 (0-5)
Cost reductions	3.1 (1.5)

Table 6. Average Participant Satisfaction with Service Elements

Service Element	Rating
Staff's explanation of the service	4.5
Audit	4.5
Report	4.4
Action plan	4.2
Responsiveness to company's needs	4.4
Timeliness	4.1
Staff knowledge	4.5
Overall service	4.4

Table 7. Reasons for Participating

Reason	Percent
ORA is a free service	51%
Participant want to identify efficient measures	45%
City Light is viewed as a trusted source	33%
Participant wants information on energy usage	23%
Customer is interested in the Action Plan	14%

Table 8. Service Strengths

Strength Categories	Percent
Awareness	28%
Savings	20%
Staff Knowledge	16%
Environment	6%
Rebate	6%
Free service	5%
Seattle City Light involvement	5%
Don't know	4%
Audit	3%
Customer contact, helps non-profit, report, service	each 1%
None reported	1%

Participants did not see major weaknesses with the service (see Table 9). In fact, the most common weakness reported was "no weakness". Timeliness issues were reported as a weakness by about one-firth of the participants. However, other weaknesses were varied, and none were frequently mentioned by respondents.

After discussing strengths and weaknesses, we asked participants whether they could suggest any enhancements that would improve the service. Almost half were satisfied enough with the service to say that they couldn't think of any specific improvements.

The other suggestions were mentioned only by small numbers of participants. These suggestions included outreach, incentives, other utility services, and timeliness, among others. Table 10 shows the percentages of responses on suggested improvements.

Decisions about Implementing Measures

We queried the participants about each of the measures that were recommended and also asked about other measures that might have been implemented after July 1998. In all, we gathered information on more than 280 specific measures. Information on the date of implementation, as well as updated cost, benefit, and incentive information was requested. This feedback was used in the energy savings and benefit cost analyses described elsewhere in the report.
One of the key pieces of information we requested in association with each of the recommended measures was whether or not it had been implemented, and if not, why not – what had held up implementation of the ORA measure.

We found that the most common answer was that the measure was still under consideration or that they may implement the measure in the future. More than two-fifths of the measures not yet implemented fell into that category. About half each said they were still considering it and the other half said they planned to implement the measures. Note that 3% reported that they were currently filing for incentives. This represents a additional potential resource for City Light from the ORA service that has not yet been captured, but shows promise for being realized.

For those that are not still under consideration, the major reasons for not implementing the measures were economics, or low priority within the company. Several noted that investments in conservation needed to have rapid paybacks to compete with other opportunities for investment within the company. Others implied that in these booming times, interrupting business to modify "equipment that works" was not a priority. Detail on these responses is shown in Table 11. One important issue identified during the interviews was that many of the participants seemed to be unaware that the service had incentives to offer. This has important implications in terms of getting measures installed especially because 21% are still considering implementing the measure and another 15% reported the economics or payback as the barrier for not implementing the measure.

Table 9. Service Weaknesses

Weakness Categories	Percent
None reported	44%
Timeliness	18%
Lack of financial incentives for conservation measures[2]	11%
Staff did not have specific knowledge on their types of operations	7%
Cost estimates used were inaccurate	4%
Follow-through was missing, dropped	4%
Contractors	3%
Report was not understandable	3%
The suggested improvements were not sensitive to the importance of aesthetics in the business,	1%
Concerns about slowness / hassles of getting involved with government services	1%
Better outreach and promotion would help	1%
Personnel issues were mentioned	1%

Table 10. Service Improvements Suggested by Participants

Suggested Improvements	Percent
No improvements needed	45%
Advertise the service more	9%
Increase the incentives available	7%
Service timeliness	7%
Involve other utilities and services (e.g., gas through PSE)	7%
Make the service cheaper or simpler to participate in	7%
Update the estimated costs used in the report – they are not accurate	4%
Add financing or lending assistance as part of the service	3%
Other suggestions (total)	8%
"Other" suggestions detail: more flexible scheduling, make coordination easier, add services, listen to the businesses better, provide referrals for firms that can do the work, and look harder for measures.	

[2] Surprisingly, a significant number of respondents seemed unaware of the financial incentives offered by Seattle City Light for conservation measures.

Customers seemed to recall that funding was not available a few years ago, and the message that funding is available in association with this or sister services did not get through to quite a few customers.

Non-Participant Feedback on the ORA Service

We were interested in three key pieces of information from non-participants:

- How they heard about the service,
- Why they elected not to participant in the service, and
- What measures they had implemented on their own since July 1998.

This information provides a comparison to see if outreach methods were similar between those who did or did not participate, and provided a baseline for the types of equipment upgrades (and associated savings) that might have been seen without the ORA service. Information on why eligible customers elected not to participate in the service provides feedback that could improve targeting for participants, or provide suggestions for service modifications to make it more attractive and effective.

From a list of 22 non-participants, we were able to contact 15 of them, and completed interviews with 13. These firms included offices, manufacturing, hotels, public facilities, and other business types. When asked for the method that had been used to contact them about the service, the majority recalled that they heard about the service from a City Light phone call. This corresponds with the major method used to contact participants as well. However, for non-participants, almost one-fourth couldn't recall the method or weren't there when the contact was made. Seven percent of respondents couldn't recall the service at all.

In addition, we asked non-participants what they recalled regarding the description of the service. Unprompted, over one-third recalled it being an energy-only audit, and others recalled that it had something to do with an audit. Unlike the participants, none of these non-participants recalled that multiple utility services were to be audited. Over one-third reported they could not remember the service description at all. When we asked about the three major service steps or deliverables, the numbers recalling an audit and report were not very different than the participant recollection, but none of the non-participants recalled the action plan phase of the project. These figures are detailed in Table 12 below.

Table 11. Barriers to Implementing ORA Recommendations

Barriers	Percent
Still considering or planning to implement[3]	21%
Payback / Return on Investments, Economics	15%
Not an internal priority, didn't get management approval	15%
Didn't make sense, didn't agree, or already had implemented the measure	10%
Decided against the measure, wasn't sure why it wasn't implemented	8%
Remodeling, poor timing for business, or moving locations	4%
Currently filing for incentives	3%
Replacing the measure(s) gradually, as they burn or wear out	2%
Doesn't have time to install, internal hassles involved / no time	2%
Other reasons	20%
Detail on "other": Not sure why (most common), not running the fans, we rent the place, aesthetics come first, employees work at night so we can't turn off the lights, we do thermostats manually, we just bought the equipment so we're not going to throw it away, we're looking at replacing the laundry equipment with gas, it is as cheap to buy a new thermoformer machine as to convert it, or we can't find replacement lights we like	

We also queried non-participants about their reasons for not participating in the service. These results are shown in Table 13. We found that a bad fit or bad timing was an important factor, representing about one-fourth of those turning down the assistance. Fourteen percent noted that they had already upgraded equipment, and another 14% noted they were moving or changing buildings, making upgrades useless to them. As with the participants, information was seen as an important benefit of the service, and 14% noted that they had already gotten sufficient information on energy use previously or had internal sources for this information. Time and money considerations made up the biggest remaining reason. Better information on incentives might be useful in getting participation by some of this 14% of non-participants. In a few cases, they note that they didn't think they refused to participate, but merely deferred it, and another said they were awaiting metering results before going forward with a service like this.

[3] The percentage of measures that were reported as "still considering, may implement" was 11%; the percentage responding "planning to implement" was 10%.

Table 12. ORA Non-Participant Service Outreach and Expectations

	Percent
How they heard about the service	
Utility staff called them	70%
Doesn't recall / wasn't there then	23%
Doesn't remember the ORA service	7%
Service expectations – unprompted	
Energy only audit	38%
Vague audit	23%
Doesn't know or remember	38%
Service expectations – prompted	
Audit	60%
Report	30%
Action plan	0%

Two non-participants reported some discomfort with an aspect of a previous encounter with City Light. The more major of the two had previously participated in a service, and found that City Light did not follow through getting lighting equipment for a project, and it was a problem. In another case, the firm has participated in services and will likely again, but they had participated in an information gathering / interview project about new services, but "never saw anything come out of it", and wondered why they had wasted their time.

A number of secondary reasons for not participating in the ORA service were also mentioned. These included: they have their own in-house electricians or auditors; they didn't have enough information on the ORA service; they weren't interested; or they didn't have enough time to participate.

Service Staff and Consultant Feedback

Service and consultant staff provided a great deal of feedback and suggestions regarding the service. We interviewed a total of 14 people to obtain feedback from several perspectives—those involved in planning, overseeing, and delivering the range of the ORA services.

Table 13. Reasons for Not Participating in the ORA Service

Reasons	Percent
They had already upgraded their facilities / measures	14%
They already have sufficient information on energy use	14%
They did not have the time or money to participate	14%
They were moving or changing buildings / locations	14%
They'd previously had a bad experience with City Light	7%
They don't feel they refused to participate in the service	7%
They didn't know about the service	7%
The wrong person at the firm was contacted	7%
They were awaiting metering results prior to participating	7%

Table 14. Average ORA Staff and Consultant Satisfaction

Service Stages	SCL Staff	Consultants	Combined
Planning process for the service	4.1	2.5	3.6
Design of the ORA service	4.0	3.5	3.8
Marketing of the ORA service	2.9	2.5	2.7
Recruitment of firms to find participants	3.3	-	3.3
Audit and delivery of the audit at the facility	3.6	3.9	3.8
Report template	4.0	4.0	4.0
Report content	4.0	4.0	4.0
Joint process of preparing/delivering the action plan	2.9	3.8	3.3
Timeliness of the service	2.9	2.7	2.8
Partnership between the consultants and SCL in delivering the service	3.5	3.4	3.5
Energy measures recommended	3.4	4.2	3.7
Non-energy measures recommended	4.0	3.3	3.8
Cost-effectiveness of the measures recommended	3.2	3.7	3.4
Implementation of the measures	2.6	-	2.2
Referrals process	2.5	2.6	2.5

Staff Satisfaction with the ORA Service

We asked respondents to "score" their satisfaction with a detailed list of the service's stages on a scale of 1 to 5, where 5 indicated "very satisfied". These scores are listed in Table 14. We provide columns showing the SCL scores, the consultant scores, and the combined satisfaction levels.

Scores were quite high on the service's design, the delivery of the audit (the on-sites), the reports, and the measures recommended. These are certainly the key aspects of the service, and high satisfaction levels with these phases indicate that the customers were receiving a good service.

Those aspects or phases of the service that were less satisfactory to the staff involved included:

- Timeliness of the service
- Implementation of the measures – mainly because they did not know what or how many measures had been implemented
- Referrals process
- Marketing of the ORA service

Although timeliness is a concern, the referral process is not as central to the delivery of satisfaction service to the customers. This service, when it erred, erred in areas that would not be likely to be as visible to customers as the areas where it succeeded. Of course, the uncertainty about what measures had been implemented had the potential to be a problem. However, as noted in another section of this report, the implementation of measures was, in fact, fairly high.

Staff and consultants had different degrees of satisfaction with a few of the ORA service stages. Staff were considerably more satisfied with the planning process than the consultants, and consultants were more satisfied with the action plan process than SCL staff. Interestingly, SCL staff were more satisfied with the non-energy measures recommended (not as central to their area of expertise), and less satisfied than the consultants with the quality of the energy measures recommended – their area of expertise. Some of the detailed interviews indicated that staff had hoped consultants would bring more creativity, more expertise in specialized areas, and better cost information for the energy measures recommended.

Strengths, Weaknesses, and Suggested Service Changes

Staff and consultants were asked in detail about their perceptions of the service's strengths and weaknesses. These are highlighted in Tables 15 and 16 below.

The service's strengths, as perceived by the SCL staff and consultants focused on several key areas:

- It provides an opportunity and entrée to contact customers and gather useful information on customers to help serve them better (34% total).
- ORA is a customer-focused service and helps provide savings (16% total)
- It provides services in multiple utility areas in a one-stop shopping format (15%)
- The service is flexible in design (10%)

We also asked about the weaknesses they saw with the service. The large number of infrequently mentioned comments indicates that there is not one or two major problems associated with the service that need solving. Rather, a few could be called out for comment, but otherwise, each person saw a few things that concerned them. The most frequently-mentioned weaknesses identified by service and consultant staff included:

- The marketing and recruiting process did not work very well (15%)
- There was variation in the quality of the consultant staff that was sent out for interviews (10%)
- The priority of this service with management wasn't clear to staff, and they weren't sure how much time to dedicate to it, given the utility's evaluation structure (10%, or 16% when added with the staff enthusiasm issue).

Staff and consultant provided a number of suggestions for improving the ORA service. These are highlighted in Table 17.

Table 15. Service Strengths Noted by Staff and Consultants

Service Strengths	Percent
Customer contact	19%
Service / assistance covering multiple utilities	15%
Customer intelligence information	13%
Providing customer value, customer savings	12%
Flexibility of the service's design	10%
Staff training and outreach opportunity	6%
Customer focus	4%
Opportunity for SCL to "shine"	4%
Opportunity for useful internal dialog and communication	4%
Provides an entrée into customer facilities	3%
Good marketing opportunity	3%
Other	4%

Again, no universal suggestions were made to improve the service – indicating no significant problems with the service, but also making it difficult to point out one or two things that will dramatically improve the service. Fairly common suggestions included:

- Expanding the service, both to provide service to more customers and to add other more water or other utility services, and bringing in other agencies to help deliver the expanded services (27% total)
- Expand the customer base and improve marketing and outreach (13% total)
- Be clearer on follow-up procedures for the service (8%)

Feedback from Detailed Staff / Consultant Interviews

Detailed discussions with the consultants and SCL staff on each phase of the service led to a number of themes that were repeated with many of the interviewees.

Variability of on-site auditor capabilities:

Both City Light staff and consultants mentioned that there was a problem with some of the audit staff or firms. Some of the audits and reports were described as very high quality, while the products from some of the other auditors were considered much lower quality – and the reports consequently needed much more editing and reworking. This led to some limited concerns about the professionalism shown to customers, but larger concerns were the perceived technical abilities, experience, and quality of the reports and recommendations. While the service was being delivered, this was handled mainly by City Light staff trying to get the auditors that were perceived as "better" assigned to their audits. To some degree, it also appeared that the consultants reduced assignments to those auditors they thought were lower quality.

Service focuses mainly on energy and lights: Many of the utility and consultant staff mentioned that the service's recommended measures focused mainly on energy measures and gave little attention to water measures. A number also thought a high proportion of the recommended energy measures focused on lighting, and thus, it seemed the delivery of the ORA was similar to "traditional" conservation measures. Similarly, the measures were also largely capital, not O&M. There was disappointment that the service didn't end up with greater emphasis on O&M and non-energy measures.

Uncertainty regarding goals and priority of the ORA service at SCL:

The status and priority of the ORA service within the SCL structure was unclear to many of the SCL staff assigned to ORA responsibilities. A number of staff felt that the employee reward system and the management review process was focused on delivery of savings (through ESP and ESD programs) and not on ORA services delivered. They were not sure how much time to spend on the service, and that may have led to less enthusiastic follow-up contacts than might have been realized had it been made clear to

Table 16. Service Weaknesses Noted by Staff and Consultants

Service Weaknesses	Percent
Marketing and recruitment process	15%
Variation in the quality of the consultant staff sent out for audits	10%
Goals and prioritization of this service with management was unclear	10%
Coordination with other departments	6%
Timeliness	6%
Getting staff to take on the ORA assignments / lack of enthusiasm for the service at the staff level	6%
Measures recommended, the depth of the on-sites, and weaknesses in the cost data used in computing measure paybacks	5%
Uncertainty and/or quality surrounding follow-up procedures	4%
Process for setting the audit "level" (standard, premium, etc.)	3%
Referrals process	3%
Content of the reports and the editing process	3%
Other (total)	30%
Detail on "Other": uneven workload, delays led customers to lose enthusiasm for the service, data and record keeping procedures, the cost data for the measures was poor, not enough non-electric measures, rough spots in the procedures were seen by some customers, annoying software template caused problems sometimes, O&M measures never took off, cumbersome service to deliver savings to the site, trying to shoehorn all businesses into the same package didn't work well, not a "hard" enough service, quicker and more streamlined service would better serve customers, hard to know what programs were really available in SCL's toolkit.	

Table 17. Suggested Service Improvements by Staff and Consultants

Suggested Improvements	Percent
Expand and refine service	11%
Link agencies / share staff	11%
Improve follow-up procedures	8%
Improve marketing	7%
SCL should lead more than consultants	7%
Expand the customer base offered service	6%
Address demand (charge) issues	5%
Improve the tracking for the service	5%
Increase water's priority	5%
Provide more feedback to the consultants	4%
More feedback from the consultants	4%
Increase the priority of the ORA service at the utility	4%
Provide additional training	4%
Increase the service's budget	2%
Screen for more dedicated customers for participants	2%
Utilize customer knowledge in marketing and targeting	2%
Increase the flexibility (especially in audit level)	2%
Reduce the bureaucracy	2%
Add an additional site visit	1%
Establish a complaint mechanism for the service	1%
Develop fixed consultant rates	1%
Offer a deliverable up-front at the time the audit is performed	1%
Establish better relations between City Light and the consultants	1%
Standardize procedures	1%
Better define a "successful" ORA	1%
Improve timeliness of the service	1%
Use the web more in delivering the service	1%

staff the relative importance of ORA and how they would be counted toward evaluations. This feeling of uncertainty may have carried over to attitudes and willingness to take on ORA audit projects. The consultants noted the reluctance on some staff's parts, and found it difficult at times to get a staff person assigned or scheduled for the audit.

Lack of knowledge about whether the measures were implemented: Many of the staff did not know which measures had actually been implemented by customers, and could not speak to issues such as their satisfaction with the service's impact. They also weren't sure whether the service was cost-effective and how important the service would be at SCL.

Uneven workloads:

A number of the consultant comments centered on the uneven workloads associated with the ORA service. For instance, they'd expect a moderate flow of ORAs to be completed throughout the year, but instead, they'd be just a trickle, but then, as the end of the year approached and SCL staff had to meet goals of a certain number of completed ORAs, there would be a scramble to get them in the field, and they would be short-staff – even though they had been readily staffed throughout the year to handle the service. This exacerbated the problem of the variation in the abilities of the staff, because lower quality staff had to be used during the peak service periods. Consultant staff were also concerned about the fact that they would complete draft reports and they would be delayed by editing at City Light – except as the end of the year approached, the delays and red tape would be significantly reduced. This unevenness in workload was difficult for them to handle.

Process suggestions:

Some suggestions regarding service operations were made in four main areas.

Improve marketing, targeting, and recruiting of participants:

Both consultants and City Light staff noted that the customers called to participate in this service seemed to be selected from those customers that the ORA staff were comfortable talking to and those that had participated in previous programs. These may or may not have been the most appropriate to recruit for the ORA service. In addition, some of the staff were not very comfortable "selling" the service, and preferred to concentrate on tasks other than marketing services. Consultant staff were sometimes more comfortable with this task, but there reportedly was some reluctance to have consultants take on this duty; others thought the consultants were not very strong at this task. In either case, the process for marketing (beyond phone calls) and recruiting customers was not the service's strongest element. Changes in the delivery of this part of the service might very well lead to improvements in cost-effectiveness of the ORA, and even in the flow of the audit workload.

Follow-up procedures:

Many of the City Light staff wanted clearer guidelines on specifically what was expected as follow-up procedures or steps. They weren't sure if they were doing a good job or not because they were uncertain what was expected.

Training issues:

Some of the City Light staff was under the impression that the ORA service was going to provide them with training to make them better auditors and learn something about other measures. Others did not have that expectation. Little training of this type occurred, leaving some staff disappointed.

Software and working relationship issues.

Some SCL staff had problems getting the data and report templates to work well. Others felt that the variation in quality of audit staff spilled over into more- and less-effective working relationships between the consultants and SCL staff. In addition, some felt that

City Light should more clearly be in the "lead" in the customer's mind in delivering the service.

Referrals Process

We gathered feedback from City Light and Seattle Public Utilities to determine how specific customer questions and referrals from ORA participants were handled. SCL was interested in tracking whether this service provided a useful conduit for additional services that the utility might be able to provide for customers. Questions were asked of the ORA staff responsible for the ORAs, the customers, and the staff within City Light that might have received these referred questions and contacts.

According to City Light ORA service records, there were almost 170 "referrals" in 14 possible areas, including: advanced metering, billing problems, electronic commerce, ESP and ESD projects, non-incentive savings, power factor correction, power quality, rate information, SPU water conservation, voltage control problems, utility cost watch, Y2K questions, and other areas.

Several problems arose. First, the term referrals was not widely understood, and was confusing to staff. Second, most were unable to sort out which referrals were from this ORA service, versus which customer contacts were due to other sources or their normal contact with customers. Finally, the records for many of the referral sheets in the ORA documents were reconstructed after the fact, and the specific questions asked in a topic area were not listed, so we could not "jog" memories of either the customers or the SCL contacts via the questions.

Despite many calls and contacts, we did not receive much quantitative feedback regarding the disposition of these referrals. Staff could not remember specific customers or how they were handled in most cases. In many cases, they said they never got a request, or weren't sure if the things they answered came from ORA or ongoing customer relationships. We received some feedback on about 50 of these referrals. For others, the service providers generally reported that they did not recall receiving the names or a call from those customers, or they got calls from customers 'all the time' and couldn't determine calls that might have come from the ORA service.

More than half of the 50 for which we received some specific feedback regarded the SPU water (incentive) referrals, and records and memory indicated about 10 resulted in a specific contact from either the customer or the EMA to the service provider. In about half those cases, the customer had on-going relationships with SPU, for instance, for other projects. The types of services provided included discussions with the customer about the program, copies of previous water audits, and SPU staff either sat in on presentations or accompanied on audits in three cases. One of the customers received incentives through the SPU water program.

For about three-fourths of the other referrals, we received comments including: don't recall getting that customer's name, we have ongoing projects with them or contacts were all "pre-ORA". A few did receive identified follow-up services. These included:

- Checking / installed metering for customer
- Exchanging existing meters for three new meters
- Called in a response to their question on the issue
- Called them and the customer didn't call back
- Gave a presentation and presented them with the literature on the program / issue; have received no follow-up from customer yet
- Tested incoming voltage, analyzed charts, investigated customer reports of past trouble, discussed with customer
- Letters were sent regarding Y2K to a couple of customers

However, in an effort to get an even more useful understanding of feedback on this topic, we asked participant customers whether they recalled asking questions in a particular area, and whether they were answered, and if they couldn't remember by question area, if they believed that anything had fallen between the cracks – that is, if they still thought that they were yet expecting something from the City. The nearly universal answer was that ORA participants were not left with the impression that their questions hadn't been answered; actually, quite the contrary. Generally, they thought they had gotten their questions answered, either during their audit or through follow-up afterward.

Although it was a good idea to try tracking referrals due to the service, the confusion about where a particular referral came from, and which contacts were part of the normal course of business for staff in the areas of billing, Y2K, and other areas make it impossible to provide useful quantitative feedback on referrals. Instead, it is probably most important to:

- Track special or priority questions,
- Provide all requests for SCL follow-up by other departments in writing (email, for instance), and
- Check to make sure that follow-up happened.

Importance of Energy Costs and Fit with ORA Measures Recommended

In the interviews with both participant and non-participant customers, we added a question to gauge how important energy vs. non-energy costs were relative to their other operating costs. What we found led the evaluators to believe that the ORA service has a potential to become an even more valued service to City Light customers.

We found was that both groups of customers ranked electricity costs as very important relative to their operating costs on the five-point scale, but that they also ranked water, wastewater, and garbage/recycling costs as very important. Non-participants also ranked water and wastewater costs very highly. These rankings are shown in Table 18 below.

Table 18. Average Importance of Energy and Non-energy Costs

Resource	ORA Participants	ORA Non-participants
Electricity	4.05	4.20
Gas	1.89	3.10
Water and Wastewater	3.46	3.95
Garbage / Recycling	3.42	3.30

These results imply that energy is important to commercial and industrial customers, but not much more important than other utility services. Joint utility audits – including an emphasis on services like water, wastewater, and garbage – are a significant opportunity for Seattle City Light, for the other City utilities (SPU), for the City and for the customers. Other research conducted by the evaluation consultant shows that joint audit programs provide significant opportunities to reduce costs by sharing overhead. Further, joint audit program management report that customers are more "willing to let them in the door" if they come with a package of multiple utility services than if they bring only one focus to the audit. They find customers are harried and that they prefer services that will be able to take the impacts of one recommendation on another service into account and provide an integrated set of recommendations that make sense for the firm.[4] This result, and the implications for refining the design of the ORA service, fit very well with the City's sustainability goals.

As part of the evaluation of the ORA service's design and delivery, we assessed the types of measures recommended for the interviewed firms. The focus here was to identify the way in which the service was delivered – which would have direct implications on the universe of measures that might be implemented by customers. The counts that follow are based on the number of recommendations of a particular type and do not focus on the relative "sizes" (in kWh, gallons, etc.). We found that:

Most of the recommendations focused on electricity, not water or gas: Over 85% of the recommended measures were electricity-related; only 10% were water, and 4% were for natural gas.

[4] Skumatz, Lisa A., and Hans P. Van Dusen, "Joint Resource Audit / Conservation Programs: Providing Customers with Better, More Cost-Effective Service", Skumatz Economic Research Associates, Inc. (SERA) research paper number 9699-1, October 1996. Also extracted in ACEEE proceedings, 1996.

Only a minority of the measures recommended were O&M:
Only 16% of the recommended measures were O&M; the remaining 84% were capital measures.

A high percentage of the recommended measures were for lighting, but other end-uses were also included:
Lighting and HVAC measures dominated the recommendations, representing a total of 60% (38% and 22%, respectively) of the 279 measures included in the study. Water measures accounted for another 18% of the recommendations. Table 19 shows the distribution of the types of measures recommended through the service.

We examined the types and number of recommended measures by audit type. There were too few "mini" audits included in the interviews to examine these closely, but we found that the distribution of types of measures recommended through both the standard and premium audits were virtually the same.

We also examined the number of recommendations presented by audit type, and the number that was implemented. The auditors were asked not to come up with a "laundry list" of recommendations, even for the more extensive premium audits, so the numbers recommended will not differ dramatically. The average number of recommended and implemented measures is shown in Table 20.

Finally, we found that a large share of customers undertook actions that were not among the recommendations from the ORA service. More than one-third (38%) of the non-participants have implemented measures since mid-1998. In addition, 12% of the ORA participants implemented additional measures that were not recommended as part of the ORA service. These 15 measures represented a total of 5% of the total measures (recommended and non-ORA measures) studied in the evaluation.

Customer Value from ORA Measures: Non-resource Benefits

Elsewhere in this report, we have summarized the results for savings in terms of dollars, kilowatt-hours, therms, gallons, and other measures. However, there are other benefits that commercial and industrial customers realize from implementing capital or operational changes in their place of business.

Estimating Participant Side Benefits

Based on work the evaluation consultant had previously conducted in Non-Energy Benefits (NEBs) -- or Non-resource Benefits (NRBs) as we designate them here to distinguish them from the water resource benefits -- SERA determined that the participant-side benefits were an area that had significant potential for additional benefits. However, this area had been virtually unstudied. Although a number of researchers hypothesized the various types of benefits that might be experienced, the literature search turned up virtually no quantitative work in this area. This lead to potential undercounting of the program's benefits and, most importantly fails to inform the utility about value that participants place on the program.

Table 19. Percent of ORA Recommended Measures by Type

Measures Recommended	Percent
Percentage of measures recommended by type of resource	
Electricity	86%
Water	10%
Gas	4%
Percent of measures recommended by O&M vs. Capital	
Capital / measures	84%
O&M measures	16%
Percent of measures recommended by end use	
Lighting	38%
HVAC	22%
Water	10%
Refrigeration	5%
Other	7%
Water	18%

Table 20. Average Number of Recommended Measures by Audit Type

Audit type	Number recommended	Number implemented
Mini	3.0	0.0
Standard	3.5	0.8
Premium	4.5	0.9
Average	3.6	0.8

Developing Innovative Alternatives to "Willingness to Pay"

Arguably the most direct method of assessing the value of non-energy benefits to customers would be to ask them directly. However, the most direct form of the question (e.g., "what is the dollar value of the reduction in drafts in your building after it was insulated") can be difficult for service participants to answer and can lead to unreliable results. This is a "willingness to pay" approach, and there is considerable literature on the validity and constraints of this approach.

However, for this project, SERA, Inc. developed an innovative approach for obtaining customers' self-reported valuation of non-energy benefits, and found promising results. This is an approach we pioneered in residential program applications,[5] and determined to test for the commercial / industrial sector for this project. Our basic idea was to ask customers to characterize the value of the non-energy benefits *relative to* the energy savings expected from the measure.

We found that customers were quite willing to talk about these benefits and able to answer our questions about relative values. Because we had estimates of the average bill savings from each of the measures, we could then attribute a dollar value to the non-energy benefits after the fact.

Data Gathering and NRBs for Participant Benefits

To gather the quantitative information on customer value of NRBs, participants were asked to enumerate the non-energy benefits they recognized from the measures they implemented, then asked whether they valued these benefit *more than or less than* the bill savings benefit from the measure. Then, we asked respondents to tell us *"how much more [less] valuable"* they felt the benefits were to them than the bill savings they experienced (or expected) from the measure. These answers gave us a specific value multiplier to use in the non-resource benefits calculations (e.g., "about half as valuable as the bill savings," or "about three times as valuable as the calculated savings," "about the same as the bill savings," etc.) The survey gave us a chance to illustrate some of the benefits that non-residential customers recognized from these measures and from the ORA service, and provide preliminary quantitative estimates of participant-side benefits.

Data Collection Efforts and NRB Categories

For each measure installed, we asked the participant to:

- List the non-energy benefits they felt they received/ realized in association with each measure, and
- Tell us whether the sum of the non-energy benefits for that measure was more valuable or less valuable to them than the energy savings from the measure. We

[5] See Skumatz, Lisa A., and Chris Ann Dickerson, "What do customers value? What benefits utilities? Designing to maximize non-energy benefits from efficiency programs in the residential sector", 1999 International Energy Program Evaluation Conference Proceedings, August 1999, Denver, Colorado.

then asked them to assess how much more or how much less valuable the NRBs were, using multipliers.

Of course each participant had relatively reliable and convenient estimates of the level of energy benefits expected with each measure. This was provided in the detailed report each participant received enumerating expected costs and savings for each recommended measure. Therefore, the link between value of the energy savings and the NRB value would be even closer to the respondent's consciousness than previous work we conducted generating the residential estimates.

Commercial and industrial participants were surprisingly willing to provide feedback on the non-resource benefits that they received from the variety of operational and capital measures implemented over the course of the last two years. These results are summarized in Table 21.

Other measures were also addressed, but fewer were installed, so their results are not separately reported here. However, many of the same types of benefits were mentioned for variable speed drives and other equipment.

We used the feedback and estimates of multiplier effects from the participants to develop estimates of the participant valuation --beyond the energy savings--for the ORA measures and service. These results are shown in Table 22.

This extra analysis provides some of the first quantitative information on the value of non-energy, non-resource value for key types of measures implemented in the commercial/industrial sector. Specifically associated with the ORA service, we find that the values that participants gain from the measures installed are significantly higher than that traditionally counted by the utility in benefit cost analysis. The results here indicated that the paybacks would be reduced (overall) by about one-third and the mills per kilowatt-hour figures could be reduced also by one-third, significantly increasing the service's performance statistics. However, potentially more important is the usefulness that these customer estimates of non-energy benefits provide for marketing the service to customers and targeting those of greatest potential value.

Table 21. Commercial/Industrial Participant-Side Non-Energy Benefit Categories by Type of Measure

Lighting measures	HVAC measures	Water measures	Refrigeration
• Better lighting • Safety/security • Lower maintenance • Improved work environment • Better aesthetics • Reduced glare, eyestrain • Improved productivity • Better control • Other • No extra benefits	• Lower maintenance Longer equipment lifetimes • Greater comfort • Better air quality, airflow, quality • Better productivity • Higher tenant satisfaction • Better aesthetics • Better control • Environmental benefits • No extra benefits	• Reduced water losses and bills • Greater efficiency and control of water use • Reduced over watering of landscaping • Labor savings • Better aesthetics • Greater tenant/ guest satisfaction • Better water flow	• Lower maintenance • Longer equipment lifetimes • Reduced noise • Greater control of equipment, temperatures, etc. • Greater product life, lower losses of product • Reduced water use • Better aesthetics

Table 22. Estimated Value of Non-utility Benefits to ORA Participants

End use	Participant valuation
All end uses	50% of the value of energy savings
Lighting	40%
HVAC	100%
Water	60%
Refrigeration	25%
Other	Small
Potential total Extra Dollar Value for ORA Participants	$170,000 per year or $2.7 million over the measures lifetimes

Impact Evaluation

Service Participation

Data on the number of audits, reports, and action plans completed through the ORA service were collected from the service database. Table 23 shows the number of completed projects in each of the three categories for 1998 and 1999. As shown in the table, the number of completed audits and especially the number of ORA reports declined from 1998 to 1999. Audits done in 1999 are 68% of the number of 1998 audits, whereas 1999 ORA reports are only 41% of the number of 1998 reports.

Table 23 also shows the number of action plans completed during 1998 and 1999. The number of completed plans is somewhat higher in 1999, 66 projects, than in 1998, 57 projects. The higher number of projects in 1999 than in 1998 is due in part to 26 projects that had audits and reports done in 1998, but had action plans completed in 1999. Compared to the action plan goals for the two years, 100 in 1998 and 65 in 1999, the number of completed action plans is substantially below the goal for 1998 and surpassed the goal in 1999. Overall, 123 action plans were completed during 1998 and 1999, or 75% of the two-year goal of 165 action plans.

Three audit service levels--mini, standard, and premium--are provided to ORA participants. Through the third quarter of 1999, 91 standard audits were completed. The remaining 28 audits completed by that time, which were either more (or less) comprehensive and complex than the standard audits, consisted of 23 premium audits and 5 mini audits.

Conservation Measures

Energy and non-energy savings for Seattle City Light and the customer are achieved by installing conservation measures in the customers' facilities. This section presents information on the number of conservation measures recommended through the ORA service, the number of measures installed in customers' facilities, and the percentage of the recommended measures that were installed. Data on the recommended conservation measures were obtained from the ORA reports prepared by the ORA service consultants and by service staff. Data on the number of installed conservation measures were gathered through the 73 interviews that were conducted with service participants.

Table 23 shows the recommended and installed conservation measures by measure type. Relative to the total number of recommended measures, 79% of the measures recommended through the ORA service were for lighting, HVAC, and water. The measures recommended were also generally capital measures, 82%, rather than operation and maintenance measures (18%). Similar to the findings for recommended measures, most of the measures installed through the ORA service, 78%, were for lighting, HVAC,.

Table 23. Number of Projects Completed by Service Stage

Service Stage	Service Goal	Completed Projects[6]
Audits		
1998		77
1999		52
Total		129
Reports		
1998		78
1999		32
Total		110
Action Plans		
1998	100	57
1999	65	66
Total	165	123

and water. Capital measures were installed much more frequently, 82%, than operation and maintenance measures.

The percentage of the measures installed is shown in Table 24 by each of the measure types. As shown in the table, with the exception of water and refrigeration, between 20% and 30% of each measure type were installed in the customers' facilities. For refrigeration, 33% of the 12 measures recommended were installed in the customers' facilities. For water, 8 of 48 recommended measures, 17%, were installed in the facilities.

[6] Number of projects completed as of December 31, 1999. The source for these data are the ORA program database.

Table 24. Conservation Measures Recommended and Implemented by Type

Measure Type	Number Recommended	Number Implemented	Percent Implemented
Lighting	98	25	26
HVAC	57	13	23
Refrigeration	12	4	33
Motors	15	3	20
Controls	27	6	22
Water	48	8	17
Total	257	59	23
Capital	202	40	20
Operation and Maintenance	43	13	30
Total	245	53	22

Energy Savings

A primary purpose of the evaluation was to determine the energy savings for the 96 projects which had received an ORA audit, report, and action plan meeting by July 1, 1999. The conservation recommendations in the ORA report covered both energy and non-energy resources, including electricity, natural gas, oil, water, and solid waste. Once the recommendations were made and the ORA action plan was completed, it was the customer's decision on when and how to both finance and install the measures. For electricity measures, the customers could take them on their own or share the costs with City Light by participating in two conservation programs: Energy Smart Design and the Energy Savings Plan. For water measures, the customers could also take the measures on their own or receive financing through Seattle Public Utilities. Seattle Public Utilities offers financing to commercial customers for installing water measures through its Water Smart Technology Program. For natural gas, the customer could again take the conservation measures on their own or receive financing through conservation programs offered by Puget Sound Energy. Finally, for both oil and solid waste, the customer could take recommended conservation actions.

An additional purpose of the ORA energy savings analysis was to obtain information on conservation measures taken and associated energy savings for a small group of 13 nonparticipants. The nonparticipants' actions provide an indication of what service participants would have done on their own if they had not taken part in the ORA service. To obtain the desired information on conservation actions taken and the energy savings, telephone interviews were conducted with each of the nonparticipants. ORA staff had originally contacted each of the nonparticipants and asked them to participate in the service. Each nonparticipant had declined service participation.

Method

Several sources were used to gather data on the energy and non-energy savings realized by City Light customers from installing ORA recommended conservation measures. For conservation measures financed through City Light's commercial and industrial conservation programs, the type of measures installed and the associated kilowatt-hours savings were gathered from the Commercial/Industrial Tracking System. Tracking system information was collected for all projects receiving services as of December 31, 1999. The electrical conservation actions taken by customers on their own and the related savings were gathered during the ORA participants interviews, which were completed in the fall, 1999. For natural gas and water resources, the type of conservation measures taken by customers and the energy savings were also collected during the customer interviews. For water measures which had been financed through the Seattle Public Utilities Water Smart Technology Program, this information was also available in the program files.

The method used in calculating the energy and non-energy savings varied by the source of the savings. For electrical and water measures funded through utility conservation programs, the savings were simply the savings for each measure as reported in the program databases. For ORA recommended actions that customers took on their own, whether it be for electricity, water, or natural gas, the savings reported here are the percentage of the ORA recommended savings that were realized by the customer. For example, if the customer reported that they had installed 50% of the measure, then the savings were the ORA recommended savings times .50.

A transmission and distribution adjustment was applied to all electricity savings, regardless of whether they were obtained from the program databases or the customer surveys. This adjustment, which increased the savings by 5.2%, reflects transmission and distribution savings for energy that would be lost through power line resistance if hydroelectric resources had produced it.

Telephone surveys were also completed for 13 customers who did not participate in the ORA service. In these surveys, the nonparticipants were asked whether they had taken conservation measures in their buildings during the past two years and what the energy and non-energy savings were for these measures. The number of measures installed by nonparticipants and the energy and non-energy savings were totaled by type of measure and type of resource.

Evaluation Findings

Electricity.

Seventeen of the ninety-six projects had ORA recommended conservation measures contracted to be installed or actually installed through two City

Table 25. Evaluation Savings by Primary Financing Source and Resource

Resource	Electric Utility Conservation Program[7]	Customer Financed Conservation Measures
Electricity (kWh)		
Unadjusted kWh	6,771,045	2,144,951
Adjusted kWh	7,123,139	2,256,488
Contracted	4,486,453	
Completed	1,967,692	
Non-incentive	668,994	
Natural Gas (Therms)		5,149
Water (Gallons)		5,067,038

Light conservation programs: the Energy Smart Design Program and the Energy Savings Program. For each of these 17 projects, contracting to install the conservation measures or actual installation occurred following the ORA audit. An additional three ORA participants had received technical assistance from City Light's conservation staff and, as a consequence, had installed conservation measures in their facilities. The savings for these three customers are called non-incentive savings.

A total of 22 ORA recommended conservation measures were installed through City Light's energy efficiency programs or counted as non-incentive savings. There were 16 lighting measures installed, 3 HVAC[8] measures, 3 refrigeration measures and 1 motor measure. Table 25 shows that the unadjusted energy savings were 6,771,045 kilowatt-hours for ORA recommended conservation measures installed through the ESD program. When the savings were adjusted by the 5.2% factor for transmission and distribution losses, the adjusted energy savings total was 7,123,139 kilowatt-hours (Table 25 and Figure 3). Of this total, most of the savings were from contracted projects. The savings for contracted, completed, and non-incentive projects were, respectively, 4,486,453, 1,967,692, and 668,994 kilowatt-hours

Customers also used their own monetary funds to install a substantial number of ORA recommended conservation measures. The total number of customers participating in the City Light's conservation programs or taking conservation actions on their own was 49, 51% of the customers in the evaluation. Of the 51 ORA recommended conservation actions taken by customers, the number installed by measure type was: lighting (25 measures), HVAC (13), refrigeration (4), motors (3), and controls (6).

[7] For Seattle City Light electrical conservation measures were financed through the Energy Smart Design Program and the Energy Savings Program.
[8] Conservation measures for the heating, ventilating, and air conditioning system.

Table 25 shows that customers who installed conservation measures on their own achieved sizable energy savings. These energy savings, which are based on the projected energy savings calculated by ORA energy management analysts and the percentage for each of the measures installed by customers, were 2,256,488 kilowatt-hours.

The energy savings achieved by service participants varied by the type of measures installed in the facilities. Table 26 presents the kilowatt-hour savings for all conservation measures, regardless of whether the measures were financed by both the ESD program and commercial/industrial customers or by customers only. As shown in the table, nearly one-half of the savings were from lighting measures and one-fourth were from HVAC measures. The remaining savings were distributed among the refrigeration, motor, and other measures.

The savings obtained by ORA service participants also varied by the type of audit provided to the customer. Table 27 shows by audit type the relationship between the projected energy savings for ORA recommended conservation measures and the energy savings achieved by service participants. As shown in the table, there was a strong relationship between audit type and the extent to which the projected savings were realized in the customers' facilities. The percentage of the projected savings realized was quite small for the mini audits, was about one-third of the projected savings for the standard audits, and was nearly three-fifths of the projected savings for the premium audits.

Table 28 shows the relationship between the projected energy savings for all ORA recommended conservation measures and the savings achieved through both City Light conservation programs and the customers installing measures on their own. As shown in the table, 41% of the projected energy savings were achieved through installation of the measures.

Water.

ORA participants also financed the installation of seven service recommended water conservation measures. An additional measure was financed through the Water Smart Technology Program, Seattle Public Utilities. Examples of these measures include replacing bathroom fixtures with low-flow models in a science center and modifying the laundry rinsewater reuse system in a large hotel. The annual water savings for these measures, with most of the savings being in the hotel, were 5,067,038 gallons (Table 25 and Figure 1).These savings are a small fraction of the

Figure 3. Resource Savings by Financing Source

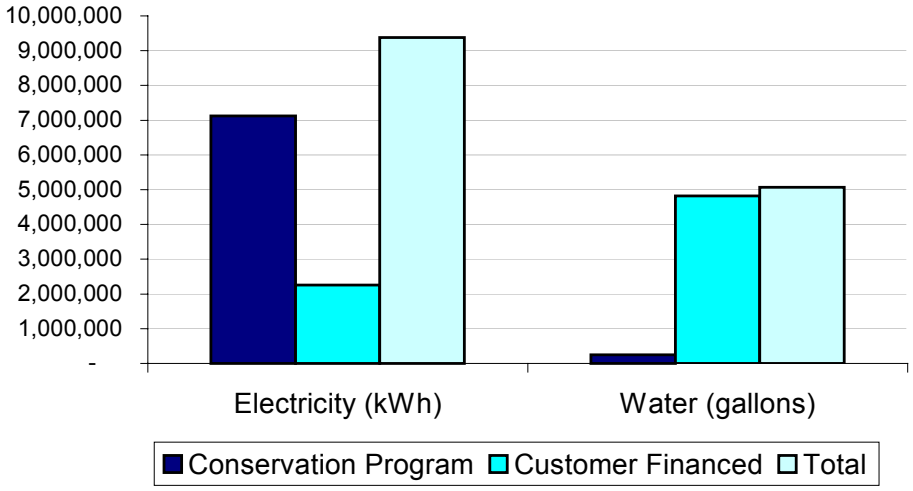


Table 26. Electrical Energy Savings by Measure Type

Measure Type	Utility Financed Conservation Measures (kWh)	Customer Financed Conservation Measures (kWh)	Percent Savings For all Measures
Lighting	3,408,237	845,223 kWh	45%
HVAC	1,203,829	1,324,231	27%
Refrigeration	1,709,323	6,163	18%
Motors	801,750	0	9%
Other	0	80,730	1%
Total	7,123,139	2,256,488	100%

Table 27. Projected and Evaluation Savings by Audit Type[9]

Audit Type	Projected Savings	Evaluation Savings	Percent Savings
Mini	77,534	6,629	9%
Standard	14,339,743	4,610,079	32%
Premium	8,493,091	4,762,919	56%
Total	22,910,368	9,379,627	41%

projected energy savings for water measures recommended in the ORA audits. As shown in Table 28, 15% of the projected savings were achieved by the ORA participants.

Natural Gas.

Three customers financed ORA recommended natural gas measure following participation in the service. The three measures were estimated to save 5,149 therms annually (Table 25). These savings are 3% of the projected savings for natural gas measures recommended to the customer by ORA analysts.

Nonparticipants.

Telephone interviews were completed with 13 nonparticipants on whether they had installed conservation measures in their facilities since July,1998. The taking of conservation actions by the nonparticipants provides some indication of what service participants would have done on their own if they had not taken part in the ORA service. Four of the thirteen nonparticipants interviewed reported installing 14 conservation measures in their facilities. Of these 14 measures, 11 were for electricity and 3 were for water. The number of measures done for each of the electrical end-uses was as follows: lighting (4 measures); HVAC (5); building envelope (1); and motors (1).

The nonparticipants had reliable information on the costs and energy savings for only four of the conservation measures, three with the HVAC system and one with lighting**.** The lighting measure consisted of installing new fixtures and T-8 lamps in remodeled warehouse and office space. The HVAC measures consisted of variable frequency drives on the main supply fan, new condensing units, a DDC[10] control system, and a chiller energy management control system. Three of these measures had received partial financing from a utility conservation program, whereas one measure was financed solely

[9] The number of projects by audit type for this table were: mini (2 projects); standard (70); and premium (18).
[10] DDC is a Direct Digital Control system.

Table 28. Projected and Evaluation Energy Savings by Resource[11]

Resource	Projected Energy Savings	Evaluation Energy Savings	Percent Savings
Electricity (kWh)	22,910,368	9,379,627,	41%
Natural Gas (Therms)	198,878,	5,149,	3%
Water (Gallons)	34,167,077	5,067,038	15%

by the customer. The total installation costs for the measures were $343,287, with all but $10,000 of the costs being for the HVAC measures. The estimated savings for the measures installed was 1,192,662 kilowatt-hours. All but a small fraction of the savings, 63,042 kilowatt-hours, were for the HVAC measures.

[11] The percent savings realized were also calculated for only those projects with energy savings. By resource, the savings realization rates were: electricity (70%); natural gas (99.6%); and water (93%). Thus, the savings realization rates were quite high for those projects which had savings.

COST-EFFECTIVENESS

Purpose

The purpose of the cost-effectiveness analysis of the ORA service is to determine if the customer, the utility and the service area (customer + utility) are receiving positive economic value from ORA over the estimated life of the implemented measures.

Definition of Terms

Benefit-cost ratio: The ratio of the discounted dollar value of electricity savings or combined electricity and non-electrical savings over the expected 15-year average measure life of the measures, divided by the cost of delivering these savings (in 1998 dollars).

Levelized cost: The cost of producing electricity savings over the life of the measures expressed in mills or cents per kWh. The cost of delivery for these savings (in 1998 dollars) are divided by the present value (PV) of the lifetime kWh savings over a 15-year measure life.

Present Value: The value of energy savings or non-energy benefits discounted at a given rate (3% or 10% per year) over the life of the affected measures. This discounting of future value is done on the broadly accepted economic assumption that money available now is of more value than the same amount of money at some point in the future. This is due to the effects of inflation and the fact that money invested now can earn a positive rate of return.

Customer Payback Period: The time period needed for the economic value of electricity and/or non-electrical benefits to equal the customer's cost of obtaining those savings. The payback period is found by dividing the customer's total cost in current dollars by the annual value of the energy savings to the customer. Simple payback periods are calculated without discounting the value of the benefit stream over time.

Method

Three methods were used to gauge the cost-effectiveness of ORA:

1. Levelized costs from the customer, utility and service area perspectives, using electricity savings only
2. Benefit-cost ratios from the same three perspectives, including electricity savings alone and both electricity and other resource savings (water, wastewater, and natural gas).
3. Customer payback period, both with and without incentive payments to customers

Levelized Cost

Levelized costs are calculated by dividing the cost of the implemented measure savings by the discounted kWh savings over the life of the measures. The resulting levelized cost is expressed in mills/kWh (1 mil = 0.1 cents). The costs and benefits included in each of the three perspectives are listed in Table 29 below. Electricity savings have been increased by a factor of 5.2% to account for energy loss through its transmission and distribution (T&D adjustment). Lifetime electricity savings were discounted at the rate of 3% per year, utility and service area perspectives, and at both a 3% and 10% discount rate from the customer's perspective. The higher, 10% customer discount rate was used because customers often use higher discount rates in making financial decisions.

Table 29. ORA Service Costs and Benefits used in Levelized Costs

Costs [a]	**Benefits** [b]
Customer Perspective	
Customer share of incentivized measure costs	Present value (PV) of incentivized electricity savings in kWh;
Customer funded measure costs	PV of customer-funded electricity savings in kWh
Utility Perspective	
ORA administrative cost	PV of incentivized savings in kWh;
ESD/ESP administrative costs	PV of non-incentivized savings in kWh
ESD/ESP incentive costs	
Service Area Perspective	
All customer and utility costs above	Present value of incentivized and non-incentivized kWh savings

[a] ORA administrative costs include both City Light staff and consultant service delivery costs and exclude ORA developmental costs (service planning and training).

[b] The present value of kWh savings was determined by discounting the kWh annual savings over a 15-year measure life at a discount rate of 3% per year for the utility and service area perspectives and at both a 3% and 10% discount rate for the customer's perspective.

Benefit-Cost Ratio

The benefit-cost ratio is the sum of the present dollar value of the benefits over the life of the measures divided by the total costs from each of the three perspectives. Electricity savings have been increased by 5.2% to account for energy loss through its transmission and distribution (T&D adjustment). The costs and savings included in the benefit-cost ratio analysis are the same as those used in the levelized cost calculations, except for the inclusion of non-electricity savings to the customer. The value of non-electricity savings includes the present value of water, wastewater, and natural gas savings. The costs and benefits included in this analysis are listed in Table 30.

For the utility and service area perspectives, the Marginal Value of Electricity (MVE) with the environmental externality costs included were used to determine the net present value

Customer Pay-back

Customer payback was calculated from two perspectives:

- Including the incentives provided for those electricity savings and water savings provided by City Light or Seattle Public Utilities through the Water Smart Technology program, and
- Excluding these incentives

Cost Effectiveness Findings

Levelized Cost

Figure 3 shows the average levelized cost of delivering the ORA service. The levelized costs from each of the three economic perspectives indicate that ORA is providing a positive economic return to the customer, utility and the service area. From the service area perspective, the levelized cost was 31 mills/kWh. The utility levelized cost was 19 mills/kWh and the customer costs were 13 mills/kWh using a 3% discount rate and 20 mills/kWh using a 10% discount rate.

The customer's average levelized cost of electricity savings resulting from their ORA participation is well below the average cost of electricity to commercial rate customers. For 1998, the average commercial rate was 3.7 per kWh. Therefore, ORA participants are conserving electricity at a cost below commercial customer's electricity rates and are, therefore, gaining a positive economic return on their investment.

Table 30. ORA Service Costs and Benefits used in Benefit-Cost Ratios

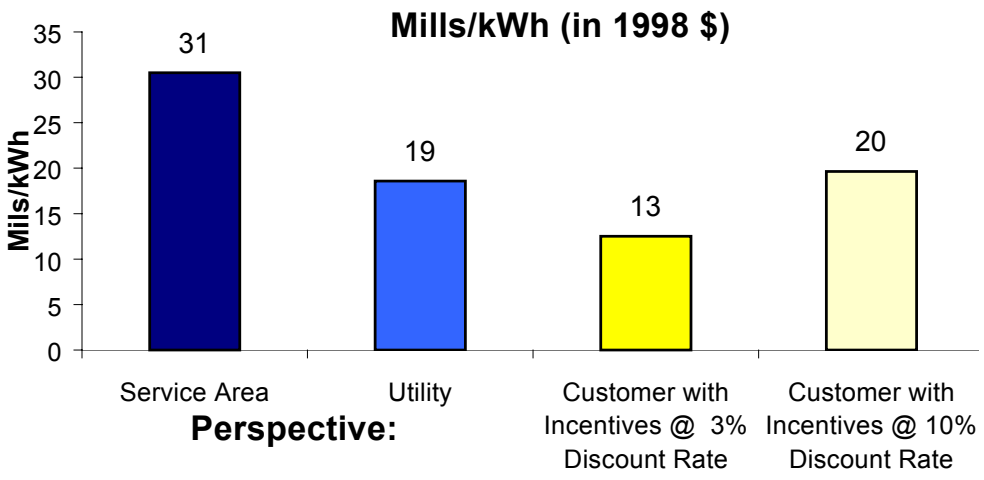
Costs [a]	Benefits [b]
Customer Perspective	
Customer share of incentivized measure costs	PV of customer's electricity saving
Customer funded measure costs	PV of non-electricity savings (water, wastewater, and natural gas)
Utility Perspective	
ORA & ESD/ESP administrative cost	PV of the marginal value (MVE) of incentivized and non-incentivized energy savings
ESD/ESP-funded administrative costs	
ESD/ESP incentive costs	
Service Area Perspective	
All customer and utility costs above	PV of the MVE of incentivized and non-incentivized energy savings
	PV of non-electricity savings (water, wastewater, and natural gas)

[a] ORA administrative costs include both City Light staff and consultant service delivery costs and exclude ORA developmental costs (service planning and training).

[b] The present value of kWh savings was determined by discounting the kWh annual savings over a 15-year measure life at a discount rate of 3% per year for the utility and service area perspectives and at both a 3% and 10% discount rate for the customer's perspective.

[c] The marginal value of energy (MVE) is the wholesale cost of energy plus its transmission and distribution cost and the estimated environmental "externality" cost. The externality costs include the estimated societal cost of the air, water, and soil pollution associated with the generation of purchased energy. (Source: City Light Rates Unit, Garry Crane, Mid-Columbia Price + Externalities Excel worksheet, May 1999).

Figure 4. ORA Levelized Costs



The utility and the service area levelized costs are all below the current MVE cost to City Light. [12] Consequently, City Light is yielding a positive economic return on its investment in the ORA service by providing energy savings at a cost substantially below the wholesale purchase price of electricity and its associated environmental costs.

Benefit-Cost Ratio

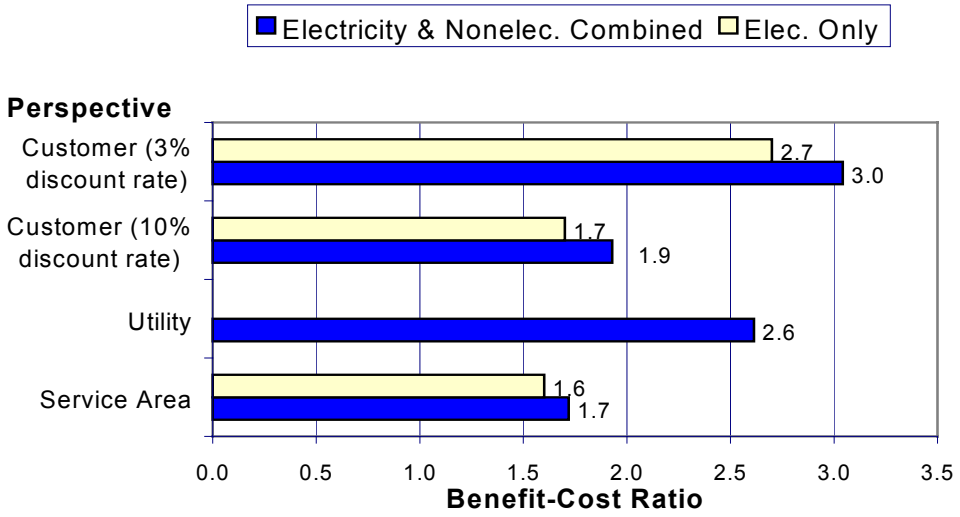
The benefit-cost ratios parallel the levelized costs (see Figure 4). All of the benefit cost ratios are positive and range from a low of 1.6 to a high of 3.0.

Using a 3% discount rate, customers will experience a benefit-to-cost ratio of 2.7 over the life of the installed energy conservation measures (EMC). This increases slightly to 3.0 when the present value of the non-electricity savings (water, wastewater, and natural gas) is included. At a more conservative discount of 10%, participating customer's benefit cost ratios are 1.7 for electricity savings alone and 1.9 if both electric and non-electric resources are included.

From the utility's perspective, City Light will experience benefits 60% greater than the combined incentive and administrative cost of delivering the ORA service. The combined service area benefit-cost ratio, using a 3% discount rate, is 1.6 using electricity savings only and 1.7 including both electricity and non-electrical savings.

[12] The 1999 average melded resource cost of energy to City Light was 18.8 mills/kWh and the externality costs were estimated to be an additional 29.8 mills/kWh, for a total MVE of 48.6 mills/kWh (Source: City Light Rates Unit, Garry Crane, Mid-Columbia Price + Externalities Excel worksheet, May 1999).

Figure 5. ORA Benefit-Cost Ratios

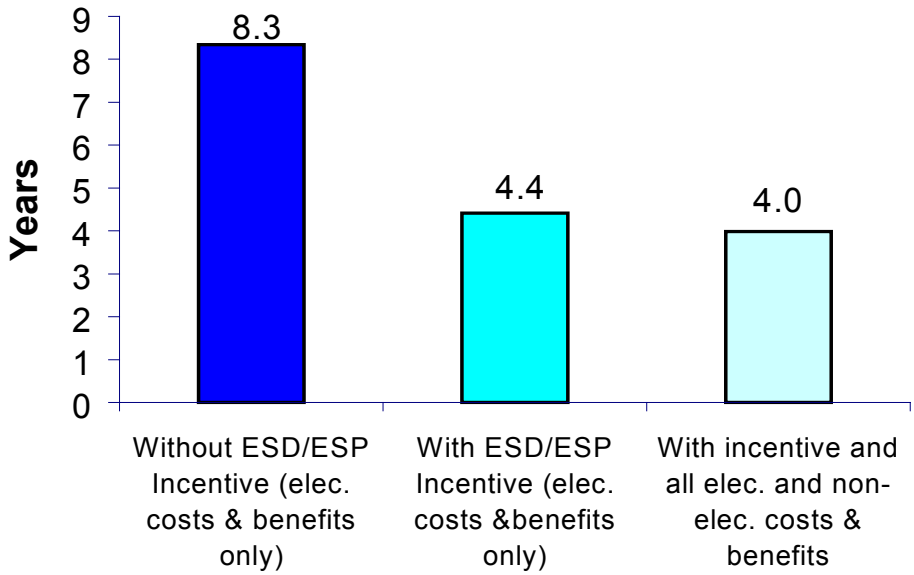


Customer Payback Period [13]

If customers had paid all of the purchase and installation costs of implemented ORA recommendations, the simple payback period would have averaged 8.3 years (see Figure 5). However, because of the ESD or ESP incentives that 17 of the ORA participants received, the average time to recover the customer's share of total installation costs was reduced by nearly half, to an average of 4.4 years. The payback period was reduced further, to 4.0 years after the annual value of energy and non-energy benefits to the customer were included.

[13] The costs and benefits were not discounted in the calculation of payback. The customer's cost in 1998 dollars were simply divided by the annual dollar value (1998 $) of the energy or energy and non-energy benefits combined.

Figure 6. Customer Payback Period



Conclusions

The ORA service has been offered since December, 1997, to City Light's commercial and industrial customers. The service is provided at no cost to eligible customers and is designed to help customers manage their operating costs by identifying specific action items which can reduce electrical, natural gas, and water usage. A resource-use audit is conducted at each customer's facility, which identifies potential resource savings and associated cost reductions. An ORA report is then prepared for each customer that presents those actions that will reduce the customers' use of electricity, natural gas, and water. Seattle City Light staff discuss the report with the customer, and an action plan is developed for implementing the recommended actions in the report.

Service Participation

A large number of commercial and industrial customers participated in the ORA service during 1998 and 1999. Over this two-year period, the number of services completed for customers were: 129 facility audits, 110 ORA reports, and 123 action plans. The number of completed audits and especially the number of ORA reports declined from 1998 to 1999. Audits done in 1999 were 68% of the number of 1998 audits, whereas 1999 ORA reports were only 41% of the number of 1998 reports. In contrast to the year-to-year pattern for audits and reports, the number of completed action plan was somewhat higher in 1999, 66 projects, than in 1998, 57 projects.

In the 73 telephone interviews, customers said that their participation in the ORA service had resulted from telephone or personal contact with ORA staff. Their main reasons for participating included the free service offered through ORA, the identification of conservation measures in the audit, and viewing City Light as a trusted information source. Also, at the time of their participation in the service, most customers understood that they would receive a facility audit and an ORA report. Fewer than 20% of the customers, however, understood that the audit would cover non-electrical resources and that an action plan was part of the service requirement.

Customer Satisfaction

Telephone interviews revealed that customers were very satisfied with the skills of ORA staff and the principal service components. Specifically, customers were very satisfied with the ability of the ORA staff to explain the service and their awareness of and responsiveness to the customers' business needs. Customers were also quite satisfied with the three ORA services--the facility audit, the ORA report, and the action plan. On the five-point satisfaction scale, ratings for staff skills and the service components averaged 4.4.

Additional questions on the ORA report and action plan also indicated that the customers were quite satisfied with these two service components. These questions covered the extent to which the report and action plan were understandable, accurate and complete,

and useful. On the five-point satisfaction scale, the ratings for the report and action plan ranged from 4.2 to 4.6.

Customers were also asked how valuable they found the energy and non-energy savings and the cost reductions their company achieved as a consequence of the ORA service. These value scores were somewhat lower than their rankings on service satisfaction. In contrast to their 4.4 ratings for ORA services, customers ranked the value of ORA induced savings and cost reductions about 3.3 on the five-point value scale. The level of these ratings reflect the fact that a number of respondents had not yet implemented conservation measures and, as a result, had not experienced these types of benefits or value from the ORA service.

Service Strengths and Weaknesses

Service participants, City Light staff, and consultants were each asked about the strengths and weaknesses of the ORA service. Questions for service participants were covered in the telephone interviews, whereas questions for staff and consultants were presented during the in-person interviews. Each of the three groups--service staff, consultants, and ORA participants--were quite satisfied with the audit, the report, and the recommended conservation measures.

Staff also saw customer contact and intelligence as important strengths of the service. Other strengths staff valued were the flexibility and multi-utility aspects of the service, and the service's customer focus and value to customers. Customers focused on the service’s strengths in terms of an opportunity to gain greater awareness of energy use in their facility, the ability to learn from knowledgeable staff, the savings and funding available, and the fact that the ORA services were provided for free.

Service weaknesses noted by participants, staff, and consultants included the timeliness of services and the extent to which resource savings and associated cost reductions were realized in the facilities. Additional weaknesses noted by staff and consultants included marketing and recruitment efforts, and the process by which customers were referred to other programs and services such as the Water Smart Technology Program offered by Seattle Public Utilities. Notably, almost half the participants could not name a weakness of the ORA service.

Resource Savings

Considerable success was achieved by the ORA service in identifying potential electrical savings in customers' facilities and in having customers take actions to obtain the savings. For the initial 96 projects served by the ORA service, ORA staff identified potential electrical savings of almost 23,000,000 kilowatt-hours. Of this potential, savings of more than 9,000,000 kilowatt-hours (41% of potential savings) were achieved through ORA-recommended conservation actions. Although most of the conservation actions were taken with partial financing from City Light's conservation programs, a sizable proportion of the savings (23%) were financed by only the customers. The ORA service

also achieved considerable success in identifying potential water savings in customers' facilities. For the initial ORA projects, the audit staff identified potential savings of more than 34,000,000 gallons. A smaller percentage of these savings were achieved by customers than was found for electricity, with the water savings being more than 5,000,000 kilowatt-hours, or 15% of potential savings. In addition to the water consumption savings, these participants also saw commensurate reductions in wastewater disposal and treatment costs. Almost all of the conservation actions taken by customers to obtain these savings were financed by the customers themselves. Only one of the eight water projects received financing through a Seattle Public Utilities conservation program.

Substantial natural gas savings were also identified in the ORA audits, with the identified savings being almost 199,000 therms. Of this large potential, actions were only taken in three facilities and the resulting energy savings were approximately 5,000 therms, 3% of potential natural gas savings. All of the natural gas savings were financed solely by the customers.

Cost-effectiveness of the Resource Savings

The ORA service was designed to identify conservation actions, which, if implemented, would be cost-effective to both the customer and Seattle City Light. To test this objective, cost-effectiveness analyses (i.e., levelized costs) for the electricity savings were performed from three viewpoints: the City Light service area, which combines the relevant benefits and costs for both the utility and the customer; the utility which looks at City Light as a business; and the customer. Additional cost-effectiveness analyses (i.e., benefit-cost ratios) from the three perspectives were performed which incorporated the benefits and costs for both electrical and non-electrical savings.

The ORA service was quite successful from the viewpoint of cost-effectiveness, as low levelized costs and positive benefit-cost ratios were found in both the electrical analysis and in the combined electrical and non-electrical analysis. For the electrical resource, the levelized costs per kilowatt-hour saved from the three perspectives were 31 mills for the service area, 19 mills for the utility and 13 mills for the customer. For the analysis which combined electrical and non-electrical costs and savings, the benefit-cost ratios for the three perspectives were 1.7 for the service area, 2.6 for the utility, and 3.0 for the customer.

The Value of Non-resource Benefits

The ORA service also delivers value to participants beyond simply the energy savings from the measures. Estimates indicate that additional benefits to the customers are approximately 50% of the value of energy savings, thereby providing a foundation for improved service cost-effectiveness and performance measures. The interviews with participants also showed that, while energy costs are very important to them, water, wastewater, garbage and recycling, and gas costs are almost as important in relation to their operating costs. When asked, the vast majority of customers were interested in

seeing the ORA service expanded to incorporate a multi-resource audit – providing additional services and emphasizing non-energy audit services.

Recommendations

1. Provide staff and financial resources so that the ORA service can reach its full potential

The ORA service has strong cost-effectiveness results, customers were very satisfied with the service, and the service provided extra customer value beyond the energy and cost savings. The service, however, has not reached its full potential in terms of customer participation, energy and non-energy (e.g., water) savings, and additional customer benefits. Strong management support and financial commitment – and emphasis of these priorities with service staff -- are needed to allow the service to reach its full potential. This service is quite progressive, and has unrealized potential from:

- better marketing to reach customers with the greatest potential value for both the customers and City Light;
- expansion to other City of Seattle services, including waste management/recycling and increased emphasis on water conservation measures;
- sharing of administrative costs through joint service delivery with other City of Seattle utilities; and
- greater dedication and focus from staff that are reassured that management values the service and that their efforts will be recognized within City Light's evaluation system.

These and other service modifications are discussed in the recommendations given below.

2. Increase the number of ORA recommended conservation measures that are implemented in customers' facilities

A sizeable number of ORA recommended conservation measures were implemented in customers' facilities, producing both energy savings and associated cost reductions. Despite this success for the ORA service, some ORA participants neither participated in conservation programs offered by Seattle City Light and Seattle Public Utilities nor took conservation actions on their own.

To increase the number of implemented ORA recommendations, it is recommended that follow-ups be conducted with participants who have not subsequently participated in a conservation service or program offered by Seattle City Light or Seattle Public Utilities. In these follow-ups, staff could ascertain whether the customers have taken recommended conservation measures on their own. If the customers have not installed conservation measures on their own, staff could discuss current City of Seattle conservation program offerings and how ORA recommended conservation measures might be installed in customers' facilities through one of these programs.

This recommendation on conducting follow-ups with ORA participants is being implemented as a part of staff work during 2000. Initial indications reveal some success in reestablishing a relationship with customers, having them consider conservation measures recommended in the ORA report, and, in some instances, participating in City Light commercial conservation programs.

3. Increase the number of ORA participants who participate in Seattle Public Utility services so that higher water savings are achieved

It was found in the evaluation that there were substantial differences between the electrical and water resource in the number of successful referrals to City Light and Seattle Public Utilities programs and in the savings achieved by ORA participants. For City Light's ESD/ESP programs, 17 of the 79 referred customers ultimately participated in the programs. For Seattle Public Utilities, only 1 of the 31 referrals resulted in a participant for the Water Smart Technology Program. Electrical energy savings were 41% of the recommended savings, whereas water savings were only 15% of the recommended amount.

To increase the number of successful referrals for ORA participants to Seattle Public Utilities and the associated water savings, it is recommended that staff in the Commercial/Industrial section coordinate ORA referrals. This coordination could consist of working with both the customers and Seattle Public Utilities to understand the customers' needs for the service, to ensure that Public Utilities staff understood these needs, and to facilitate customer/service provider meetings on both the customers' needs and the available services.

4. Improve the timeliness of services provided to ORA participants

Each of the groups interviewed--ORA participants, staff, and consultants--indicated some dissatisfaction with the timeliness of the services provided by the ORA service. These findings were reinforced by a processing time analysis, in which it was found that the median processing time for projects to move from the facility audit to the Action Plan meeting was about three months. Half of this elapsed time for projects occurred between the date that the customer received the ORA report and the date of the Action Plan meeting between staff and the ORA participants.

To improve the timeliness of the services offered through ORA, it is recommended that benchmarks be established by ORA staff for the maximum number of days that should elapse between each of the four service stages (i.e., audit, draft ORA report, final ORA report, and Action Plan meeting). Once these benchmarks are established, a monthly review could be done on each project to determine if the benchmarks had been exceeded for any of the projects. For those projects in which the benchmarks had been exceeded, steps could be taken to determine why the project was taking so long and necessary

corrections made to ensure that the project was moving in a timely manner though the service stages.

5. Enhance ORA service's potential and value by adding and/or better emphasizing non-electricity resources

Customers rated concerns about garbage, recycling, water, wastewater, and gas costs nearly as highly as electricity. Previous research indicates that providing an integrated service can provide important leverage in "selling" programs and getting participation and entry to non-residential facilities. Participants and non-participants noted value from this enhancement. The City is in a unique position to offer this enhancement because the City has control over many of the utility services of interest, and an expanded ORA service would fit with the City's sustainability goals.

It is recommended that City Light coordinate with SPU's funding of the non-residential garbage/recycling audit capabilities provided by the Chamber of Commerce's Business Investment Recycling Venture (BIRV). The audits are offered for a very cost-effective price. SPU's water department may also be ready to gear up with more audits and incentives, providing another way to share administrative costs, yet provide more service to the customers. The City might also consider investigating multi-resource auditing software[14] to enhance the ORA services. Training materials can be adapted from the dozens of multi-resource audit programs in place in the U.S. and Canada.[15] For smaller applications, cross training of audit staff will likely be necessary to retain cost-effectiveness.

6. Conduct additional research to develop ways to improve the service's marketing and targeting

Both staff and consultants suggested that marketing and recruitment for the service were among its weaker areas. The service could potentially be made more cost-effective if it is targeted toward customers that can benefit most from the service. The utility has extensive databases on customer energy usage, and the data from this evaluation can be used to provide additional information about the types of customers that implemented the measures more fully than others. Market research, surveys, and focus groups can be used to examine customer needs, identify barriers, and develop marketing angles to identify customers to target for the ORA service.

City Light can assemble useful data from its own records, from SPU, and information from the evaluation to study usage, business type, and customer intelligence information (and even participant value information). This information could be assessed to identify targets for marketing and recruitment for the service. The targeted customers should not necessarily be previous participants, but those with the greatest likelihood of

[14] For example, a product from the United Kingdom shows promise in this area.
[15] Skumatz and Van Dusen, op cit.

implementing measures. Consider using professional marketing consultants or low-pressure marketers to solicit participants that are passed along to the utility for audits. In marketing the service, be certain to explain the multi-utility aspects of the service, and make it clear that incentives are available. The information on participant value of non-resource benefits (NRBs) may also be used as a selling point from the participant perspective.

7. Consider a variety of other service refinements to improve delivery, impact, and service to customers

Based on the interviews with participants, staff, and consultants, there are a few modifications and refinements that can be made to the service to help deliver service more effectively. Recommendations to address these issues include:

- Develop a set of steps or checklists to outline the activities expected as part of the guidance for "follow-up" procedures for the service – but recognize that flexibility will be needed to meet needs of the wide variety of customers addressed by the service.
- Continue follow-ups for some time after delivery of the ORA to the customer. The evaluation showed that, after up to two years, fully a quarter of the measures are still being considered. These remain potential resources to the utility.
- Continue referrals tracking, but limit it to high priority or specialized issues. Communicate referrals to other departments via email and include in follow-up procedures.
- Consider augmenting the audits with checklists or other tools to help assure that O&M measures and non-energy measures receive sufficient attention in recommendations. Training, checklists, and careful personnel selection can help reduce variability in the quality of delivery of audits.
- Consider including all suitable O&M measures in the ORA report. Given the fact that these measures have little to no capital cost, they may not need extensive investigation, and could be included to provide greater service to the customers. This strategy is also likely to increase the number of O&M strategies implemented. By emphasizing multiple resources and enhancing the O&M measures, the service re-emphasizes its Operations Resource Assessment roots.

Appendix A

Operations Resource Assessment Service: Participant Survey

Hello, may I speak to (person listed on sheet or owner/manager)? My name is _____, and I'm calling on behalf of Seattle City Light about the Operations Resource Assessment Service, an energy service that is being offered by Seattle City Light. (Determine if this is the correct person; if no, try to determine who is and how to contact that person.)

Program Participants

Our records show that your business participated in the Operation Resource Assessment Service during _____ (year). (If not correct, try to straighten out confusion; if respondent doesn't remember the service, prompt with information below and circle if prompt was used. Terminate if respondent does not recall service.)

> The Operations Resource Assessment Service is designed to help customers manage their operating costs, improve productivity and safety, and identify specific action items that can reduce both energy and non-energy usage and associated costs. A resource-use audit is conducted at the customer's facility that focuses on potential savings and associated cost reductions. A report is prepared for the customer that includes recommended actions that will reduce the customers' use of electricity, water, and other resources. City Light staff discusses the report with the customer and, together, they develop an Action Plan to implement the actions recommended in the report.

Would you be willing to answer a few questions to help City Light evaluate how well the Operations Resource Assessment Service worked in your business? (If needed: City Light really needs your opinions and reactions to help improve customer services). Your opinions are completely confidential and this will take about 15 minutes. I can either ask you the questions right now, or we can arrange a more convenient time for me to call back.

Nonparticipants

Our records show that your business had contact with the Operations Resource Assessment Service during _____ (year). (If not correct, try to straighten out confusion; if respondent doesn't remember the service, prompt with information below and circle if prompt was used. Terminate if respondent does not recall service.)

> The Operations Resource Assessment Service is designed to help customers manage their operating costs, improve productivity and safety and identify specific action items that can reduce both energy and non-energy usage and associated costs. A resource-use audit is conducted at the customer's facility that focuses on potential savings and associated cost reductions. A report is prepared for the customer that includes recommended actions that will reduce

the customers' use of electricity, water, and other resources. City Light staff discusses the report with the customer and, together, they develop an Action Plan to implement the actions recommended in the report.

Would you be willing to answer a few questions to help City Light evaluate the Operations Resource Assessment Service? (If needed: City Light really needs your opinions and reactions to help improve customer services). Your opinions are completely confidential and this will take about 15 minutes. I can either ask you the questions right now, or we can arrange a more convenient time for me to call back.

Call Record:

Business Name:	Phone #:
Business Address:	Contact:
Date:	Result:
Date:	Result:
Date:	Result:
Date:	Result:

Questions 1 to 5 are for both Operations Resource Assessment Service (ORA) participants and nonparticipants.

1. What is your title or position with (name of business) _____?

2. Could you briefly describe what your business does?

   Interviewer: For the business being interviewed, circle one of the business categories listed below. Also, in the space provided give information on the specific type of business (e.g., grocery store) that they have. Note that eight of the nine categories are for commercial businesses. The last category is for industrial businesses.

   Office _____

   Retail food _____

   Retail nonfood _____

   Warehouse _____

   Health _____

Question 2 continued on this page.

Education _____

Utilities/communication _____

Other _____

Industrial _____

3. Using a scale from 1 to 5, where 1 means "not at all important' and 5 means "extremely important," How important are electricity costs to your company in relation to other operating costs?

1	2	3	4	5
not at all important				extremely important

3b: Using the same scale, how would you rank the importance of these other utility-type services?

Gas: _____
Water: ____
Garbage/Recycling: _____
Wastewater: _____

4. How did you first find out about the ORA service? (check all responses to this open-ended question)

Who:

ORA staff
ORA consultant
City Light Account Executive
Business associate
Other _____

How:

Telephone call
Letter
Program flyer
In-person conversation
Other _____

5. What is your understanding of the services offered through ORA? (check all responses to this open-ended question)

   A customer resource-use audit on potential energy and non-energy savings and associated costs
   A report that includes recommended actions for reducing the customers' use of energy and non-energy resources
   An Action Plan for implementing the actions recommended in the report
   Other _____

Questions 6 through 9 are for nonparticipants. For participants, skip to question 10.

6. What was the single most important reason you decided not to participate in the ORA service? And were there any other reasons why you decided not to participate? (Clearly indicate which of the following was the primary reason, "PR," for not participating and which were secondary reasons, "SR").

   Just not interested
   Not enough information on the service
   Already have sufficient information on use of energy and non-energy resources
   Likely cost savings from the service not significant
   Cost and use of energy not important to our business
   Someone else is responsible for our utility bills
   Don't trust government services
   Timing not good for our business
   Other _____

7. Could Seattle City Light have made any changes to the ORA service that would have persuaded you to participate?

   If yes, list changes that could be made:

   _____

   _____

   No
   Don't know

8. Using a scale from 1 to 5, where 1 means "not at all understandable" and 5 means "very understandable"

1	2	3	4	5
Not at all understandable				Very understandable

____ To what extent did you understand the ORA service after it was explained to you by the ORA representative?

9. I'm going to reach a list of energy and non-energy (e.g., water) resources. For each resource, what actions since July, 1998, have you taken or definitely plan to take to improve the efficient use of resources in your building and its operation and comfort.

   Interviewer: For those actions taken by the customer, give a description of the actions taken, the approximate action date, the estimated energy and non-energy savings, the cost of the action, and, if applicable, whether or not incentive money was or will be used to pay a portion of each implemented action (e.g., ESD/ESP, Seattle Public Utilities' program). Also describe any non-resource benefits that were obtained from the action and the monetary value, if known, of these benefits.

Actions taken for electricity end-uses (lighting, HVAC, building envelope, refrigeration, motors, and water heating):

Action 1 description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Action 2 description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Actions taken for natural gas, oil, and purchased steam:

Action description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Actions taken for water and sewer:

Action 1 description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Actions taken for recycling and refuse:

Action description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

The remainder of the questions is for participants in the Operation Resource Assessment Service.

10. Why did you decide to participate in the ORA service? (check all responses to this open-ended question)

    Obtaining information on energy and non-energy usage
    Identifying efficiency measures and cost savings
    Obtaining an Action Plan for implementing efficiency measures and cost savings
    Free service
    Trust Seattle City Light to provide unbiased energy information
    Other _____

Customer Satisfaction with the Service and Service Providers

11. Using a scale from 1 to 5, where 1 means “very dissatisfied” and 5 means “very satisfied,”

1	2	3	4	5
Very dissatisfied				Very satisfied

How satisfied are you with:

____ The ability of the ORA staff to explain the service to you?

____ The ORA audit,
____ the report, and

____ the Action Plan?

____ The ORA staff's awareness of and responsiveness to your company's needs?

____ The timeliness of the report / process?

____ The knowledge and expertise of the ORA staff who provided the service to your company?

____ Overall, how satisfied are you with Seattle City Light's ORA service?

Do you have any comments on the staff that visited on-site?

Other Comments:

_____

_____

_____

Value of Service to the Customer, Barriers to Implementation, and Service Improvements

12. Did your company experience barriers in implementing the ORA service recommendations made to it? If so, what were the barriers?

_____

_____

_____

13. Overall, what would you say are the greatest strengths of the ORA service?
Comments:

_____

_____

_____

14. And what would you say are its greatest weaknesses?

Comments:

_____

_____

_____

15. What improvements or additional features would enhance this service?

Comments:

_____

_____

_____

16. Using a scale from 1 to 5, where 1 means "not at very valuable" and 5 means "very valuable,"

1	2	3	4	5
Not at all valuable				Very valuable

____ How valuable is the knowledge you gained from the ORA service?

____ How valuable are the energy savings your company achieved as a consequence of the ORA service?

____ How valuable are the non-energy savings your company achieved as a consequence of the ORA service?

____ How valuable are the cost reductions your company achieved as a consequence of the ORA service?

Operations Resource Assessment Service Report and Action Plan

17. The ORA Service provides both an ORA Report and an Action Plan to each customer who participates in the service. The ORA Report describes the customer's business and energy usage, and provides recommendations on ways in which the customer can be more resource efficient and reduce their energy costs. The Action Plan summarizes the actions to be taken by the customer to realize the resource and cost savings. On the five-point rating scale used throughout this survey, what is your opinion of the ORA Report and Action Plan? First, for the ORA report:

_____ Was the report understandable? The rating scale is from not at all understandable (1) to very understandable (5)
_____ Was the report accurate ?
_____ Was it complete? The rating scale is from not at all accurate and complete (1) to very accurate and complete (5)
_____ Was the report useful? The rating scale is from not at all useful (1) to very

useful (5)

Comments: _____

_____

_____

The next part of this question is on the ORA Action Plan.

_____ Was the Action Plan understandable? The rating scale is from not at all understandable (1) to very understandable (5)
_____ Was the Action Plan accurate ?
_____ Was it complete? The rating scale is from not at all accurate and complete (1) to very accurate and complete (5)
_____ Was the Action Plan useful? The rating scale is from not at all useful (1) to very useful (5)

Comments: _____

_____

_____

18. I will read each of the recommendations that were made in the ORA Report and Action Plan to improve the efficient use of resources and business operations. Which of these recommendations have or definitely will be implemented in your business?

    Interviewer: Read each of the ORA recommended actions to the customer. For those actions taken by the customer, give a description of the recommendations implemented, the approximate action date, the estimated energy saving, the cost of the action, and, if applicable, whether or not incentive money was or will be used to pay a portion of each implemented action (e.g., ESD/ESP, Seattle Public Utilities' program). Also describe any non-resource benefits that were obtained from the action and the monetary value of these benefits.

Recommendations implemented for electricity end-uses (lighting, HVAC, building envelope, refrigeration, motors, and water heating):

Action 1 description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Action 2 description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Recommendations implemented for natural gas, oil, and purchased steam:

Action description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Recommendations implemented for water and sewer:

Action description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Recommendations implemented for recycling and refuse:

Action description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

19. We are also interested in resource and operational actions taken in your business that were not addressed by ORA. I'm going to read a list of energy and non-energy resources. For each resource, what actions since July, 1998, have you taken in your business or definitely plan to take?

ALSO NEBs: Ask for a list of non-energy benefits they receive from the measure / action. Then ask them to rate whether this list of NEBs is more valuable or less valuable to them than the (expected or actual) energy savings from the measure. Then probe to find out about how much more (or less) valuable (in multiples).

> Interviewer: For those actions taken by the customer, give a description of the actions taken, the approximate action date, the estimated energy and non-energy savings, the cost of the action, and, if applicable, whether or not incentive money was or will be used to pay a portion of each implemented action (e.g., ESD/ESP, Seattle Public Utilities' program). Also describe any non-resource benefits that were obtained from the action and the monetary value of these benefits.

Actions taken for electricity end-uses (lighting, HVAC, building envelope, refrigeration, motors, and water heating):

Action description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Action 2 description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Actions taken for natural gas, oil, and purchased steam:

Action description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Question 19 continued on this page.

Actions taken for water and sewer:

Action description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

Actions taken for recycling and refuse:

Action description _____

Date (mo/year) _____ Energy Savings: _____ Cost: _____

Source of project money (conservation program, own funds) _____

Non-resource benefit description _____

19b: I am interested in finding out some information about what happened with questions that you may have asked while the on-site team was visiting your property – or at other points in this program.
Do you recall asking questions or asking about particular City Light Services? Which ones?

Our records show that you may have asked some questions regarding (list services). Do you recall? Do you recall what happened out of that question? Did you recall whether you got a response? Was it answered on-site? Did you get a callback? Do you recall who followed up?

If you don't recall specifically, can you recall whether you felt that you had outstanding issues, or whether there are things you are still waiting for related to these question topics – or do you feel that the loop was closed?

Appendix B

Operations Resource Assessment Service: Staff and Consultants Questionnaire

Name of individual interviewed: _____

Name of their organization: _____

Job title: _____

Telephone number: _____

Date of interview: _____

Name of interviewer: _____

The purpose of this interview is to gather information about the experiences of Seattle City Light staff and consultants who provide services through the Operations Resource Assessment Service (ORA). Learning from the service providers will help City Light understand what worked with the ORA service, what didn't work, and how the service might be improved for future participants. Your comments will be treated confidentially.

In your opinion, using a scale from one to five, where "1" represents "very dissatisfied" and "5" represents "very satisfied", how satisfied are you with:

1. _____ The overall planning of the ORA service
1b. _____ The overall design of the ORA service

2. _____ The process of marketing the ORA service
2b. _____ The recruitment process used for the ORA service

3. _____ The delivery of the ORA audit to the customer

4. _____ The ORA Report for the customer on ways to conserve energy and non-energy resources (the content)
4b. _____ The template of the report provided to customers.

5. _____ The joint development by Seattle City Light and the customer of an Action Plan for implementing the report recommendations

6. _____ The timeliness of the ORA services that are delivered to the customer

7. _____ The City Light-consultant partnership for delivering ORA services
8. _____ The energy conservation measures that City Light recommends be implemented in the customers' facilities

8b. _____ The non-energy measures that were recommended by the ORA

8c. _____ The referrals and referrals process

9. _____ The cost-effectiveness of the energy savings that are obtained by installing recommended conservation measures in the customers' facilities

10. _____ The extent to which ORA participants have implemented, on their own or with utility financing, the recommended resource savings actions

Comments for Questions 1-10

_____

_____

_____

11. What is your perception of ORA participant's satisfaction with the value of the ORA service?

_____

_____

_____

12. What are the strengths of the ORA service?

_____

_____

_____

13. What are the weaknesses of the ORA service?

_____

_____

_____

14. What improvements or additional features would you like to see made to the design and delivery of the ORA service?

14b. What benefits do you think the program provides to SCL?

14c. Do you think the program / service should continue to be offered?

15. This question is only for the four ORA team members (Tawny Bates, Steve Jack, Robert Sawyer, and David Van Holde) in Seattle City Light's Energy Management Services Division. The question is as follows. As you know, ORA participants have been referred to a variety of other services offered by Seattle City Light and Seattle Public Utilities. For each of the services, briefly describe your reasons for referring ORA participants to the service. (Interviewer: Note that the question does not apply for a particular service if the energy management analyst has never referred a customer to that service).

Advanced Metering

Billing Problems

Electronic Commerce

ESP Project

ESD Project

Non-incentive Savings

Power Factor Correction

Power Quality

Rate Information

SPU Water Conservation

Voltage Control Problem

Utility Cost Watch

Y2K Questions

Other

Appendix C

Operations Resource Assessment Service: Referred Service Provider Survey

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Name of service provider (Seattle City Light, Seattle Public Utilities, other)

Type of service (i.e., advanced metering, power quality, etc.)

_____ _____
Name of contact person Telephone number

Seattle City Light is conducting an evaluation of their Operations Resource Assessment (ORA) service. During the course of providing this resource efficiency service to our customers, they may be referred to one or more services within or outside of City Light.

Our records show that (individual's name) _____ of (company name) _____ was referred to you (or your agency, unit, etc.) as a result of their participation in the ORA program during _____ (year of referral).

Would you be willing to answer a few questions to help City Light understand the services ORA customers are being referred to and the outcome of the referral? Your responses will help us make an accurate assessment of the ORA service. **Your opinions are completely confidential.** Please complete the following questions and return this questionnaire to:

Lisa Skumatz
Skumatz Economic Research Associates
1511 Third Avenue, Suite 1000
Seattle, WA 98101

Or FAX to Lisa Skumatz at (206) 624-2950

If you have any questions on the questionnaire, contact Lisa Skumatz or John Green at (206) 684-8508.

1. Was the above named company referred to you or did it contact you to receive services from you or some other representative from your utility or work unit?

Yes _____ (Go to question 2) No _____ (please stop, thank you for your cooperation)

2. If the above listed company was referred to (or contacted) you or your work unit for service, has one or more services been provided to this customer? (Note: this includes services not completed but are in the process of being provided).

   Yes _____ (Go to question 4) No _____ (Go to question 3)

3. If no services will be provided, why not? **Describe reason and stop. Thank you.**
   _____
   _____
   _____

4. What specific service(s) has (have) been provided to the ORA participant?
   _____
   _____
   _____

5. What was the month and year the service began to be provided?

   _____

6. If the service has been provided, what was the month and year the service was completed? _____

7. What obstacles, if any, were encountered in the *process of <u>delivering</u> this service*?
   _____
   _____
   _____

8. Describe the specific actions that were recommended to the customer as a result of your service.
   _____
   _____
   _____
   _____
   _____

9. Do you know which of these recommended actions were actually implemented by the ORA participant? If so, can you briefly describe these?
   _____
   _____
   _____
   _____

10. What obstacles, if any, were encountered in the *process of <u>implementing these recommendations</u>?*
    _____

11. If known, what improvements has the customer realized as a result of participating in your services? (Note: improvements will depend on the nature of the service provided, but can include both energy savings and other improvements in the operational efficiency of the customer's business).

12. Is there any other aspect of the provided service to this customer that you think is worth noting?

Thank you for you participation.

Please mail or fax the completed questionnaire to the address or fax number listed on the first page. If you have any questions, please contact Lisa Skumatz or John Green at (206) 684-8508.

Appendix D

Operations Resource Assessment Service: Referred Service Recipient Survey

Name of company receiving services

_____

Type of service (i.e., advanced metering, power quality, etc.)

_____ _____

Name of contact person Telephone number

_____

During the course of Seattle City Light providing ORA services, your company may have been referred to one or more services within or outside of City Light. Our records show that your company was referred to (name of organization, unit) _____ as a result of their participation in the ORA program during _____ (year of referral).

1. Were you referred to or contacted by the above named organization for the purpose of providing services?

   Yes _____ (Go to question 2) No _____ (please stop, thank you for your cooperation)

2. If the above listed organization was referred to (or contacted) your company to provide services, have you received one or more services from the organization? (Interview note: This includes services not completed but are in the process of being provided.)

   Yes _____ (Go to question 4) No _____ (Go to question 3)

3. If no services will be provided, why not? **Describe reasons and stop. Thank you.**
   _____
   _____
   _____

4. What specific service(s) has (have) been provided to your company?
   _____
   _____
   _____

5. What obstacles, if any, did you encounter in the *process of receiving this service*?

6. What actions were implemented as a result of receiving this service? Please briefly describe each action taken by your company or the service provider?

7. What obstacles, if any, did your company or the service provider encounter in the *process of implementing these actions?*

8. If known, what improvements has your company realized as a result of participating in the services? These improvements can include both energy savings and other improvements in the operational efficiency of your business.

9. Is there any other aspect of the service provided to your company that you think is worth noting?

Thank you for you participation.