

# JOINT ON-SITE AUDITS: GETTING MORE FROM LESS WITH COLLABORATIVE FIELD VISITS

*Lisa A. Skumatz, Ph.D., Skumatz Economic Research Associates, Inc. (SERA), Seattle, WA*  
*Hans P. Van Dusen, Skumatz Economic Research Associates, Inc. (SERA), Seattle, WA*

## Abstract

The authors conducted surveys of collaborative utility audit programs, including various combinations of electricity, gas, water, wastewater, and solid waste services. Both residential and I/C/I (industrial/ commercial/ institutional) audit programs were included. The programs have shown significant benefits for both participating utilities (leveraging scarce resources, diversifying conservation programs, reaching more customers) and utility customers (comprehensive and integrated information, service convenience, and financing flexibility). Collaborative audits have proven to be a cost-effective approach during both initial inspection visits to identify potential savings and during evaluation visits to measure program impacts. Challenges include program facilitation, coordination, and administrative issues, as well as some difficulties caused when both private and municipal utilities (or potentially competing utilities) are involved. The case studies were reviewed to gather information on benefits, savings, evaluation, training, funding options, and lessons learned.

## Summary Findings

Skumatz Economic Research Associates, Inc., (SERA) surveyed almost two dozen communities with active programs offering joint utility (resource) audits, including various combinations of gas, electricity, water, wastewater, and solid waste services. The surveyed programs included residential and I/C/I (industrial/ commercial/ institutional) buildings. In a number of areas in the U.S. and Canada, local power, water and waste utilities have formed collaborative partnerships to provide customers with joint conservation audits under arrangements that offer the utilities efficient use of resources and expanded markets for their conservation services. Most of the surveyed programs have used joint-audit inspections for only front-end measure identification, rather than on-going monitoring and evaluation. However, the collaborative field inspection model is also transferable to on-site surveying and auditing for impact and process evaluation after resources changes have been made. The benefits and efficiencies of joint auditing before measure and behavior change are also applicable on evaluation re-visits.

SERA's review of these joint audit programs reveals several key advantages. Both utilities and customers have benefited from getting more conservation opportunities:

- **More service to customers:** Decreased time commitments are required from customers while more services are offered (e.g., a single visit may be required instead of four visits). Customers receive better, more integrated information.
- **More integrated information:** With joint audits, all resources and media are addressed jointly. All consequences and overall impacts on are considered for each firm (e.g., eliminating the possibility that a customer receives information on energy savings that adversely affects the waste stream).
- **Utilities have cost-effective means for reaching more customers:** Utilities can reach beyond just the customers and measures with biggest potential resource savings. Joining with other partners allows utilities to reach customers they might not be able to target and support measures they previously could not justify on their own.
- **Utilities have access to improved customer base information:** Joint-auditing provides an opportunity for utilities to gather improved information on customers and resource use. Shared customer marketing and businesses contacts allows utilities to improve effective outreach and successful customer penetration.
- **Comprehensive evaluation monitoring and surveying:** Collaborative projects have allowed utilities to provide comprehensive evaluation monitoring, follow-up surveys and impact audits.

In addition, the utilities and collaborative agencies have realized these advantages with only limited time and resources:

- *Improved implementation efficiency and streamlined costs:* Efficiencies gained at multiple stages of the process, including co-

ordinated and less costly audit outreach and promotion efforts, a broader package of services is available to entice customers; reduced multiple customer visits, and streamlined staffing per visit with cross training.

- *Leveraging scarce resources:* Most importantly in a period of budget constraints and deregulated competition, joint audits can lead to leveraging of staffing, marketing and budgetary resources. The program gains a larger customer base over which to offer services. Data collection and monitoring for evaluation can be collected once with shared resources.
- *Diversified funding:* The successful joint-audit programs have relied on diverse and innovative revenue generation to minimize utility costs. The attractiveness of comprehensive multi-resource audits have allowed a number of programs to charge customers to cover some audit costs. Financing institutions and other third parties have contributed to complex revenue packages.

Joint audit programs have also had *challenges* in planning and implementation, including:

- *Facilitating a consortium of agencies:* Partnering competing utilities and private agencies can involve careful negotiations.
- *Overcoming logistics:* Administrative obstacles include cross training staff, coordinating decision-making and separation of responsibilities, organizing joint visits, and coordinating financing arrangements (including on-going funding).

More specific findings are described in the remainder of this paper, covering the variety of program designs and organizational structures, benefits and savings information, customer response, training issues, funding issues and options, and lessons learned by the programs in place thus far.

## Background

Joint auditing is part of the broader topic of collaborative conservation efforts, including planning, marketing, education, inspection (auditing), measure installation (including financing, distributing, and installing measures), and evaluating. The SERA research efforts revealed evidence of over 50 different collaborative audit or measure installation programs. We identified pockets of activity in the northeast, southeast, midwest, west, and Canada.

There are natural “matches” for some of these services; for instance, under hazardous waste and regulatory programs, it becomes nearly essential to consider joint solid waste and wastewater audits. Many simple collaborative joint efforts have had success -- especially for low cost measures for which there is clear overlap of benefits (e.g., hot water conservation measures -- such as low flow showerhead -- that reduce power and water use).

There is also growing evidence of success from more complex joint audits. These provide creative energy conservation opportunities, specifically audits that are cheaper and more effective for sponsors. These saving are especially welcomed as program and outreach budgets shrink while deregulated utility markets are more competitive. Different programs also lend themselves to different cooperative arrangements, management involvement, funding arrangements, and field staff. Examples of how some of these issues have been addressed in different communities in the U.S. and Canada are presented below.

Interest in joint services has risen recently with concerns over tighter utility and conservation budgets, growing concern over who will take over conservation efforts as energy utility responsibilities change under trends toward deregulation, and the desire to better serve crucial non-residential customers.

## Limitations to Separate Audit Programs

Energy utilities have been devoting substantial resources to on-site audits, particularly as they have turned their attention toward the commercial and industrial sectors. These field audits provide accurate, targeted information for the customer and utility, including information about conservation practices and equipment that can reduce the site’s operating costs and resource use. On-site customer audits are utilized by many utilities and agencies including electricity, gas, water, wastewater, and solid waste agencies. However, the project staff had several concerns regarding the traditional one-utility audit process.

For customers, separate and fragmented audit services from different utilities may not provide the greatest benefit, because customers must spend more of their own time and money and receive less customized and integrated information. For the utilities, duplicating on-site visits by different agencies is potentially inefficient and costly.

Separate audits conducted by each utility or agency might lead to more time (visits) and scheduling efforts for customers; inconsistent information for customers (that is, recommendation of separate utility audits could differ from recommendations of a joint utility audit); and a higher cost - and redundant tasks - for the utilities involved in the audits.

Presumably, auditing might be more effective and efficient when conducted jointly by multiple utilities: electricity, gas, water, wastewater, and solid (and hazardous) waste. This is especially true in the commercial and in-

dustrial sector, where a multi-media approach is appropriate in dealing with products and processes. However, benefits could also be realized in the residential sector, where cross training and joint delivery of services is fairly straightforward. The project was undertaken to identify programs, benefits, and experiences.

## Types of Joint-Audit Programs Surveyed

Among the programs we surveyed, we found programs covering all sectors -- residential, industrial, commercial, and institutional. In the non-residential sector, programs had reached a variety of business types, including municipal facilities, small manufacturing, lodging, restaurants, small offices, schools, hardware stores, metal manufacturers, software companies, food processors and a variety of others.

Programs ranged from over 50 years old to new programs just in development. Some programs were being delivered by city departments working together; others were very specific community-based efforts with special programs and staff established. Some of the programs with the community-basis believe this approach will also be helpful in developing and maintaining more diverse funding sources.

Most of the newer programs seem to be concentrating on business services. This may be because there is the potential for big savings, because it opens the door to a wider array of potential funders, and because there has been growing interest by energy utilities on the non-residential sector. Many of the programs said they tend to concentrate on smaller businesses. They indicate that big firms are often already doing conservation work on their own, have expertise/engineering staff capable of doing it, or that they've received much attention from utilities already. They note that conservation services may be missing from smaller firms and they really need and want assistance.

Many of the older programs included joint energy and water services (especially in areas with water shortages or water table issues); newer programs are adding wastewater and solid waste/recycling. In solid waste, some concentrate on recycling recommendations; another points out their solid waste generation reduction/materials-oriented approach.

Some programs have used fairly simple methods with walk-through audits and extensive discussions to develop recommendations. Others use complicated flow diagrams noting materials and flows through the building and/or processes. Similarly, some use complicated computer models to develop detailed savings and cost estimates; others use simpler methods.

In terms of penetration, the programs show varying degrees of progress. One program is underway in 19 communities, others report 2-3 communities. In single community programs, completing about 30% of buildings

in a small town was cited; another cited their progress as reaching 67% of eligible buildings in an area.

## Program Initiation

When asked what caused the organization to begin their joint audits/conservation services program, several different reasons were given. A few examples are described below.

- *Public/private conservation services program at community level:* These programs mostly involve independent providers, coordinating conservation services, outreach, and financing for many local partners. In some programs, this arrangement was initially established because the agencies wanted to meet local green initiatives through expanding multi-resource conservation and encouraging environmental behavior, while creating jobs in the local economy.
- *Single town program:* A few communities wanted to implement customer one-stop shopping for all utilities (for all utility services including credit, walk in, levelized bills, meter reading, disconnects, auditing, etc.). They cross train the auditors and customer service staff. The joint services approach to their work has been going on for years, because all were municipal enterprise utilities (electricity, gas, wastewater, and water). They expect to add recycling to the mix soon.
- *State and provincial grant funding:* A few states or provinces have provides start-up funding to initiate collaborative conservation programs to help meet a variety of state goals and management objectives. Programs have achieved mixed success in securing alternative revenue and funding after initial grant funding ended. One state program was concerned with increasing solid waste generation and recycling and both increasing. The State wanted to develop a program that would help address generation, and viewed it as a materials conservation and broader conservation problem. They developed a program with a materials and conservation focus, recognized that firms see garbage, energy, and water bills, and that a cross media approach would be the best way to provide service. They started demonstration/ development programs, and are working to refine them and spread them throughout the state.

## Measures and Services

The programs often reminded us of their “tailored approach” to dealing with the customers. Many also state that their goal is not so much recommending every possible thing, but dealing with some of the simpler, more obvious, easily remedied, and “big bang” items. They say their focus tends not to be the latest high-cost technology.

Each differed in services, but most included several similar elements for the key resources for the residential sector including:

- *energy*: pipe wrap, water heater blankets, changing furnace filters, socket gaskets (but only recommendations for weather-stripping), literature on energy conservation.
- *water*: low flow showerhead, kitchen/bath aerators, toilet dams, literature on lawn care, pesticides, xeriscaping.
- *solid waste*: promoting hazardous waste days, identifying troublesome products, promoting alternative products (less waste, less hazardous, more recyclable), and leaving brochures that deal with behavioral practices for solid wastes management.

The commercial sector services were more varied (tailored) and less easily listed. Examples of recommended commercial modifications include:

- *energy*: efficient lighting fixtures, lighting automation, changes in lighting use, operational modifications, boilers, heat pumps, HVAC distribution insulation and refrigeration insulation and replacement.
- *water*: low-flow toilets, water recycling, operational changes, and horizontal axis washers.
- *solid waste*: cardboard recycling, food composting, excess materials re-use, reduced packaging, and reduced paperwork.

One program was particularly proud of its approach in the solid waste management area. Rather than stressing recycling, their approach is better materials management and working on reducing generation. They use a flow diagram approach and try to determine where waste occurs, and correct that. They provide recycling recommendations only at the end, after working to reduce inputs and waste.

The programs are trying to provide high-quality, well-rounded, but also implementable recommendations through a convenient, integrated program. Many suggest that the best approaches are not always the most complicated, and that it is crucial for the information to be deliv-

ered in a way that is accessible to the user. In addition, they feel *listening* is one of their key jobs. The program staff recognize that for businesses, some of these resources are not key to their everyday output of product/production and the businesses have neither the expertise or mind-set to be able to take care of it themselves. The joint audit programs are successful at providing an appropriate level of service conveniently. In fact, the program staff found that when single-utilities had already delivered programs, many of the recommended capital items hadn't yet been implemented. Joint program staff found that customers were much more willing to implement straightforward behavioral and small capital items. [Definitely less than 3-4 year payback is the limit most customers will even consider. They found most measures needed to show much shorter paybacks.]

## Evaluation and Monitoring

Many joint-audit programs included some form of collaborative resource-use (customer billing) monitoring. Utility billing information was collected and merged in these programs for most initial audits, with some programs tracking use for follow-up monitoring. Unfortunately, not all these programs have used the monitored billing data to measure impact. However, the coordination of the resource use (billing) data from different utilities has been a valuable by-product by itself of joint-audits.

Structured impact and process evaluation has not been a consistent component in joint-audit programs. The most developed collaborative programs continually monitor both customer resource use (billing) and aggregate community resource use. However, evaluation contact with customers has been minimal:

- one program, with state grant funding, has follow-up evaluation audits as part of the program structure.
- a few other programs had selective evaluation auditing.
- a annual phone survey of customers is conducted by one collaborative agency.

In these few cases, collaborative programs have been able to collect a broad array of impact and process information with one party conducting the follow-up. Similar to the initial audits, more comprehensive and customized information can be retrieved with less time and resources from the utilities and customers.

In most cases, funding has not been available for extensive evaluation activities. For single-owner (municipal) multi-utility programs there are fewer obstacles to joint-monitoring. In programs run by other “third-parties”, there is less success in securing funding for evaluation work. Utilities have been supportive of in-kind contribu-

tions of providing customer billing information to the independent joint-audit conservation services. Combined monitoring of joint-auditing programs has enhanced the leveraging of utility resources, and supported justification of each utility's individual conservation components and financing. These programs note that demonstrating the connected conservation savings amplifies the value of each conservation measure.

## Program Savings

With only limited evaluation plans, few programs have developed measures of the amount of savings realized from providing services jointly -- especially considering costs related to training, administration, etc. Many have been collecting data, but fewer have not assembled or analyzed. Several are just beginning detailed evaluations to assess and refine their programs. Others have been conducting joint audits among their municipal utilities for so many years that costs for the uncombined audits no longer exist to compare.

Some information is available on the amount that the programs have been able to reduce resource use and customers' bills. Logically, programs report that savings vary by businesses type (intensity of resource usage); savings also vary by the intensity of the previous penetration for independent water, electricity, and other audits and retrofit. In developing estimates, the programs differ widely. The level of detail or sophistication of the estimates and techniques differs widely. Some programs tend to use checklists or simple calculations; the other extreme is represented by one program that is very model-intensive, and uses a detailed computer model of equipment, processes, uses, etc. Results from some of the programs that have been measuring customer and program benefits have shown:

- One program estimates ICI savings from behavioral and operation/maintenance programs (no capital measures) on the order of 10-15% of resource costs. Adding capital measures (equipment upgrades or changes) increased savings to the 25% to 50% range, with, for instance, businesses realizing \$3K to \$6K savings on \$12K of resource use/bills.
- Another small scale joint-audit program produced commercial energy savings of 11,400 kwh per year per serviced site and 68,600 gallons of water per year per serviced site.
- One residential joint program produced first-year resource use reductions of 3-5% in electricity and over 5% in gas and water access serviced households.

- One program that offered gas, water, and electric measures and was willing to share information estimated annual savings to households in the range of \$50 per household. Another covering a broader array of resources mentioned savings of \$100 per household annually.
- As far as overall savings, one program in operation a number of years, estimates that in their work in 19 municipalities, they have saved customers a total of \$4 million and have caused \$8 million in economic development in the area.

Program cost information is very sketchy thus far. One program in the initial stages found that at start up, including program development, their costs were about \$130 per audit. This cost was shared between local utility partners, and the government capturing the rest. Note again, that most programs have not started, or are just starting evaluations that should provide considerably more information on these costs and savings.

## Funding

The earliest programs tended to be funded by the utilities jointly offering the service, and this funding is raised through the rates from customers. Early state agency sponsored programs tended to be funded by the states or province. However, these funding sources involve finite revenue pools and do not guarantee longer term funding. In many programs, state or provincial grant funding has subsidized kickoff and development of local programs, but required that programs eventually need to become self-sustaining.

The successful programs have relied on a diverse array of funding and revenue options to sustain joint-auditing programs, including:

- A few programs have successfully begun charging both residential and business customers for audits and conservation services. Based-on the breadth and custom fit of the joint audits, programs have been able to market the advantages of joint audits joint-audits. Generally, these customer fees do not cover the full cost of the audit, but are a valuable revenue source. Customers have been charged between \$40-150 for comprehensive audits in two programs.
- A shared savings approach has been implemented in one program, working with the customers on agreements to receive some share of the "found" savings, and

feeding those revenues back into the salaries of the auditors.

- Community-based programs are developing a wide-variety of co-sponsors for the programs. These co-sponsors have included: Chamber of Commerce, local utilities, City, Business Development Groups, local haulers, local universities, Kiwanis and Rotary clubs, state agencies and grants. One program has brought in 50 partners up from 8 initial partners
- Financing institutions (such as banks and home lenders) have been included as partners in some programs to finance measures based on shared conservation savings.
- Some programs are taking in-kind services. Examples include training from utility experts, willingness of utility staff to come on-site for more difficult applications, technical information and publications, shared outreach marketing, customer billing records, office space (and support) at the local utility or Chamber of Commerce, etc. Others have found sources of donations of equipment, etc.
- One program has a major contract with the wastewater utility to do residential site engineering of surface water drains (downspout disconnections). The contract provides a vehicle for funding and customer contact to promote the agencies conservation services.

For most joint-audit programs, sustainable joint-auditing depends on diversifying revenues. No individual sources can be expected to be the primary long-term funding source.

## Training

The intensiveness of training varies widely -- from about three one-half day sessions up to 35 training days per year in one program. Almost all of the programs include on-site visits with new trainees and experts from utilities as part of the training. Many programs also have on-call arrangements with utilities to call in experts for more complicated projects or equipment. A two-week program covered a range of important topics, including all resources, auditing, dealing effectively with customers, looking for equipment and behavioral opportunities, green lawn care/xeriscaping, process issues, etc.

One concern that was expressed was whether high quality services could be offered when you were working with “generalist” auditors, rather than “experts”. Several

programs thought that this was actually a benefit. They noted some of the following as advantages:

- easily-recognized behavioral changes and fairly low-tech capital recommendations are very welcomed by firms and customers.
- the staff concentrates on listening, and works hard to talk to the customers in terms that are the most appropriate level and communicate best. Rather than providing “form sheets” for all firms, they work on tailoring recommendations, which they say the firms really like.
- providing all services at once (for both convenience and for the integrated information) is definitely preferred by the customers.
- providing joint services helps make it more effective to deliver services to small and medium ICI firms, who may have been underserved in one-utility programs. They really need and want the help.

Most importantly, the program staff (“generalists”) felt they knew experts they could call when the equipment was complicated, and that this was a good and cost-effective use of expertise.

The training programs have developed manuals, models, checklists, outreach materials, and a variety of other program information for use in training and implementation/delivery of the programs. We have collected examples from the variety of programs surveyed and have found excellent pieces that could be modified for other programs and communities.

## Program Successes

All the programs surveyed by SERA staff were generally satisfied with the collaborative efforts, reflecting a few notable universal benefits across programs.

Marketing benefits. The utilities and agencies felt that the collaborative audits -- with a broad assortment of conservation information and services -- provided expanded channels or opportunities to interest customer in audits and conservation measures. They repeatedly stated it was easier to get their foot in the door with a program that presented a coordinated full plate of options. For many utilities, this provides a valuable marketing tool for maintaining the strength of their conservation programs in an increasingly competitive market of utility deregulation. In addition, customers could self-select their audit needs, to some degree, ensuring that they would receive the services they really need. The attractiveness of these comprehensive and custom audits has enabled some programs to

successfully charge in customers between \$40-\$150 for audits services.

Program savings and efficiencies for utilities.

Utilities were pleased with the program efficiencies gained through collaborative efforts. In most programs, utilities were able to participate in comprehensive audit programs while only contributing a fraction of the program costs. For individual utilities, their share of the joint audit costs were below the costs of conducting their own audits, reflecting savings in the areas described below:

- Collaboration in the areas of program administration, advance assembly and review of customer resource use, and customer contact and scheduling;
- Effective targeting of staff -- experts in specific areas could focus on appropriate business types, while others could focus on other business types (divide and conquer). Even limited cross-training allowed auditors to market services for other utilities; and
- Greater potential for utilizing regional government grant and loan funding.

In most cases, managers felt that total joint audit costs including development and implementation will usually be greater than streamlined single-utility audits. However, the cost-share paid by each utility was always lower. The individual utilities only contribute between 10% - 50% of the joint audit costs, while receiving the added benefits of increased promotion and penetration. Most programs were not able to separate or compare the joint audit costs and savings against the costs for individual audit efforts.

Improved information on customers. Utilities were able to gain comprehensive information on their customer base and resource use through collaborative investigation. Regardless of the utility participation level, they gain improvements in accuracy of customer profiles for additional DSM (demand-side management, or energy conservation) planning at a reduced, shared cost.

Comprehensive monitoring for impact evaluation. Combining billing and resource use data across the different utilities provides customer and utilities with improved information on program impacts. Two programs have also conducted customer follow-up auditing (one on-site and one by phone) covering changes to many areas of customer resource use.

Savings for customers. Customers received comprehensive audits and measures, addressing multiple facets of resource use and providing potential savings in billing for electricity, gas, water, wastewater, and solid waste. The integration of the multiple services ensured that recommendations for conservation improvements in one resource area (such as wastewater) would not adversely impact other resources (such as solid waste).

Regional program success. Most of the joint audit programs proved to be successful on a regional basis, either by design or through local evidence of benefits. Some programs were intentionally promoted and funded for regional implementation by government agencies, while others were simply adopted by nearby communities with similar utility structures.

Regional job and business opportunities. Some joint audit programs were successfully used to spur local economic and job growth through both the actual audit activity and through the resulting demand for conservation services and products. In addition, businesses that received the services are often in a better long-term competitive position to reduce operating costs, maintain profitability, and maintain jobs.

## **Building on Previous Conservation Program Efforts**

Some programs were concerned about following other utility-specific audit/conservation delivery programs. As we mentioned, several programs said that in some cases, the realized savings varied based on whether there had previously been a strong local utility program offering conservation services. However, several programs stressed that even when the energy utilities had already conducted audits at some of the same facilities (especially I/C/I), they were still able to generate significant savings. In one case, the audit staff were advised by the local energy utility that it wasn't worth doing a number of specific buildings because "they'd been done". However, the joint audit staff discussed the buildings with the utility in a non-confrontational way, noting that there are always new "gadgets" coming out and the program benefitted from the interaction, the audits, and the utility's participation. Most utilities have done good work, but still there are benefits from looking for more, and from a change in focus from big to small, from capital to behavioral, and single service to joint. Joint program staff recommend including/working with the utilities in a cooperative way to get the greatest benefit.

However, the new programs and approaches tend to differ from previous programs. The new "joint" programs do not concentrate on high-end capital modifications -- instead, they have determined that they can find significant savings from a combination of behavioral and limited capital recommendations.

The program staff from the joint programs recommended that it was important to take care not to offend when interfacing with staff from whatever utility previously conducted audits. Try to include them in the program, try to get them to help in training, and make sure and mention issues of changing technology, different "joint" approach, etc. Also, the utilities no doubt recognize that all their recommendations did not get implemented the first time.

## Customer Feedback

Customers were asked if they would have participated had the program been delivered in a less integrated way. In one case, they asked customers their willingness to participate if the program had been offered in the following form: on Monday, they'd be visited by the water experts; Tuesday the energy experts, etc. A high majority said it would have been too much. Interestingly, most businesses started out with one major interest (e.g. a water problem), but ended up being very interested in and implementing multiple recommendations dealing with other resources. Another survey has found exceedingly favorable response and satisfaction from customers.

## Summary of Program Challenges and Solutions

In implementing the joint audit programs, the program staff also faced many complications and challenges in developing collaborative structures.

Documenting program costs and savings. With constantly evolving programs, it has proven difficult in many cases to document program or utility labor savings. Individual utility savings from efficiencies gained through collaborative efforts were difficult to document and compare, especially where single-utility programs did not exist or were not tracked and staffed separate from the joint efforts.

Increased training. In most cases, the communities or agencies have done minimal cross training. Some agencies have conducted overview sessions to raise general awareness; the more detailed training is learned on-site during audits. In many cases, audit team personnel were focussed on specific customers. The team must consist of members with appropriate auditing expertise to serve these customer needs.

Program coordination and funding. In many of the most successful ventures, the program uses one agency to administer, coordinate and do advance work. Many started with some state/provincial coordination and start-up funding and then pursued different structures to support sustained programs. Measure financing was usually more straightforward with utilities sharing the cost of measures appropriate to their service. The programs have shown various levels of cooperation and funding coordination (including options for cost sharing, staff sharing, information sharing, coordinated marketing).

Program design. The program designs seemed to work best if it they were flexible but detailed. All parties must agree on specific responsibilities and actions, although these agreements have specified many different levels of combined efforts depending on specific needs and priorities. However, even if separate visits are required, coordinated scheduling is easier on the customer. Some

programs have been able to improve the message by reorganizing the information, auditing, and presentation into themes that are relevant to the client, rather than reflecting specific utility responsibilities.

## Lessons Learned and Recommendations

Program managers identified a number of lessons learned through the process of designing, implementing, and operating the program.

Assembling broad involvement is helpful. This includes getting utility experts to assist in training and occasional on-site visits; involving community organizations to help support (endorsement, funding, publicity or other methods); trying to get leaders or opinion leader firms to participate early to use as demonstration sites, etc. Community-based synergy can be generated through these programs, which can help in finding funds, in getting experts to help when needed, and in keeping the program in the public eye.

Remember that simpler is sometimes better. Effective, implementable recommendations don't have to be rocket science. In many cases, very significant savings can be identified without extremely detailed technical analyses. Behavioral changes can lead to significant savings without high investment. However, take care and realize that O&M recommendations can sometimes be more confrontational and put firms on the defensive because it appears to criticize the way they run their business. The way that you deliver the information (tone, level of detail) is crucial in getting things implemented. Realize also that for many firms, things that seem obvious to you may not be to them because the department that gets their bills may have no communication with the groups that use the resources. You may be one of the first to "integrate" information from the two (as an example, note one firm was paying for many more dumpsters than they were either getting or using -- no one had checked).

Remember to tread carefully to work out mutually agreeable arrangements, especially when working with private or competing utilities. For instance, one program found that the best way to keep both the gas and electric utility "on board" was to agree not to directly promote fuel switching. They did, however, leave literature that helped residents and/or businesses to carry out calculations themselves.

Benefits can still be found, even when utility programs have preceded you. As mentioned above, many of the programs did good jobs, but when looking at things from a multi-level, tailored, integrated resource way, you can still come up with new, useful suggestions. Work with the utilities if possible, and keep a non-confrontational tone.

The programs are very people intensive and time intensive. To improve program success, don't waste time on uncommitted people/businesses. Programs also suggest



getting opinion leaders on-board early, and work with leader firms to get successful, local demonstration sites to discuss and show to other potential participants. To keep firms moving forward in the process, another program recommends rewarding firms at various stages in the process (e.g., a mug when they complete the on-site; a t-shirt when they complete a work plan, other prizes for completing quarterly reports/ updates, etc.) The recommend using as many methods as possible to recognize participants (ads, calendars for them to give away, etc.). Several programs strongly suggested not trying to “shoehorn” new joint audit duties onto existing full-time staff, unless you “offload” similar levels of duties. They determined it doesn’t work well. They also noted that personal contact is a key component of success, that it helps participants feel greater “ownership” and may lead to higher implementation (much better than programs with a “checklist” feel). Recognize also that follow up takes tremendous time and persistence. Tailoring takes more time, but gets greater benefits and participation. And recognize that in some cases you may have to offer confidentiality of the results, especially if there is a competing firm in the same business in the area.

Implementation can be frustrating, time-intensive, and “a dog”. Even if you can demonstrate phenomenal savings with great payback, you sometimes still can’t get them to move to the next step or to implement the changes. Some programs recommend rewards, etc. as listed above. Further, they stress that follow-up is crucial to keep things moving, and that program staff need to develop a method of delivering an “elegant nag”. Finally, they note you should be upfront with businesses or participants on what’s expected from them to participate in the program.

Measurement is a crucial component. Implement measurement and follow-up measurement as part of the program’s design so the program can be tracked and evaluated. Develop performance and measures of costs and effects.

Remember that the program is providing a valuable, appreciated service. Recognize that the small commercial/ industrial/ institutional sector may not have received as much attention as larger firms, but they can really use the assistance and appreciate the efficient/effective delivery of joint audits/conservation services.

## Summary and Conclusions

The SERA survey included a variety of programs and regions involved in joint auditing/ conservation services. Some common themes, however, were present in many of the programs. Most of the programs were initially supported by initiatives and funding from regional government agencies. Some programs then pursued opportunities for independent, sustained funding and delivery.

Programs have been successful in jointly addressing both residential and commercial conservation. Joint audit programs have included single cities, or between 3 and 60 collaborative partners from both public and private agencies. Certainly, communities with municipal services have a simpler task in establishing joint audits, and have often been the first to implement these services. The majority of programs, however, have included some private agencies or organizations. The most common resources covered included electricity, gas, and water, while some joint audits also covered wastewater, solid waste management, hazardous waste, and health.

The joint audit programs were generally highly valued by both customer and utilities. Initial program coordination and division of responsibilities and funding sources were challenges for each program. However, the collaboration of resources provided many attractive benefits to customer and utilities. Utilities were able to contribute only a portion of the joint audit costs, yet reach a wide audience with a broad variety of conservation services. Utilities were able to “piggy-back” and promote their conservation program with high penetration levels over broad customer base. In total, collaborative auditing may cost more per audit, but each utility share was generally far lower than single-utility auditing. Customers were able to receive comprehensive and integrated conservation recommendations through “one-stop shopping.”

The most important message from the communities is that joint audits and service delivery are not untested concepts. Joint audits make sense, help leverage scarce utility resources, expand service promotion, provide high quality service to customers, deliver cost-effective field services, and have been very successful under a variety of funding and organizational arrangements.

For information or assistance in feasibility assessment; or designing, setting up programs or training, funding, or evaluating a joint program, please contact SERA, Inc. at (206) 624-8508 or by FAX at (206) 624-2950. SERA staff have extensive experience in solid waste, energy, and water conservation work. SERA is a Seattle-based economics research and consulting firm serving a nationwide client base. Our areas of specialization are solid waste rates and finance, program planning/analysis, and evaluation/measurement. We are nationally recognized for our work in variable rates and “Garbage by the Pound”.

About the authors: The authors work for a Seattle-based research and consulting firm, Skumatz Economic Research Associates, Inc. (SERA). The firm specializes in rates, program evaluation and cost-effectiveness, and economic analysis in solid waste and energy. Dr. Skumatz, an economist, is best known for her work in measuring lifetime non-energy benefits, program evaluation, rate incentives/studies, and in the quantitative evaluation of recycling and green waste program efficiencies. Mr. Van Dusen, an engineer, has worked on “Garbage by the Pound”, and the evaluation of a number of hazardous waste and recycling programs.