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An Evaluation of the Federal Energy Management Program Technical Assistance Workshops: Results of a 1998 Customer Survey

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**An Evaluation of the
Federal Energy Management Program
Technical Assistance Workshops:
Results of a 1998 Customer Survey**

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Abstract

This report presents the results of a customer telephone survey of the participants of six workshops provided by the U. S. Department of Energy Federal Energy Management Program (FEMP) during calendar years 1995 and 1996. The primary purpose for the survey was to provide the Team Leader for FEMP Technical Assistance and members of the team with detailed customer feedback pertaining to how well selected FEMP workshops are doing and to identify areas for improvement. The information presented enables managers to see both the strengths of their workshops, as well as workshop components that can be improved. In addition, the report identifies the questions included in the survey that were the most productive for obtaining customers experiences, opinions and recommendations. The experiences gained during this survey provide a platform from which to launch an annual FEMP customer survey.

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An Evaluation of the Federal Energy Management Program Technical Assistance Workshops: Results of a 1998 Customer Survey

Introduction

This report presents the results of a customer telephone survey of the participants of six workshops provided by the Federal Energy Management Program (FEMP) during calendar years 1995 and 1996. The primary purpose for the survey was to provide the Team Leader for FEMP Technical Assistance (Ms. Anne Sprunt-Crawley) and members of the team with detailed customer feedback pertaining to how well selected FEMP workshops are doing and to identify areas for improvement. The information presented enables managers to see both the strengths of their workshops, as well as workshop components that can be improved. In addition, the report identifies the questions included in the survey that were the most productive for obtaining customers experiences, opinions and recommendations. This information will assist in the construction of future FEMP surveys and in the collection of customer information. The experiences gained during this survey provide a platform from which to launch an annual FEMP customer survey.

The survey was conducted during the fall of 1997 and consisted of over 350 questions. The survey measured customer's experiences and satisfaction, use and usefulness of FEMP acquired skills, tools and materials, customer networking and sharing FEMP information, the adoption and diffusion of FEMP promoted technologies, project activities and timing, and customer interactions with other FEMP offices. The 50-minute survey was comprehensive and addressed a wide range of customer issues, perspectives, and recommendations at a level of detail seldom performed by a telephone survey.

This survey also broke new ground in the survey research field. Specifically, the survey included a newly developed battery of questions enabling the identification and placement of customers into their pre-and post-workshop technology adoption stages. As a result, this report presents the movement of workshop attendees through the technology adoption cycle for each workshop. This aspect allows FEMP managers to see the stages of adoption of technology by their customers before they attend the workshops and again 1 to 2 years following participation.

The FEMP workshops included in this evaluation are the:

- Federal Re-lighting Initiative (FRI),
- Renewable Energy Workshop (REP),
- Energy Services Performance Contracting (ESPC),
- Federal Energy Decision Systems (FEDS),
- Life Cycle Costing (LCC), and the
- Operations and Maintenance (O&M) Workshop.

Executive Summary

This summary provides an overview of the findings and recommendations developed from a survey of attendees of six FEMP workshops held during 1995 and 1996. The workshops covered in this report include the:

- ✓ Federal Re-lighting Initiative, (FRI)
- ✓ Renewable Energy Projects, (REP)
- ✓ Energy Services Performance Contracting, (ESPC)
- ✓ Federal Energy Decision Systems, (FEDS)
- ✓ Life Cycle Costing, (LCC) and the
- ✓ Operations and Maintenance Workshop, (O&M).

Summary of Survey Findings

Overall customer satisfaction

- **Customers are satisfied with the workshops**

In general, FEMP workshop customers are very satisfied to extremely satisfied with the workshops they attend; workshops received an average score of 8.2 on a 10-point satisfaction scale. This is a strong satisfaction score that indicates the overall quality of the workshops. However about 20% of the attendees scored the workshop at 7 or less indicating that there is some room for improvement. Attendees are most satisfied with the knowledge of the instructors, quality and accuracy of materials and the facilities where the workshops are held. Attendees were least satisfied with the time to interact with others and the examples, anecdotes, and related stories presented during the workshops. By addressing these factors, program managers can increase satisfaction in a simple and cost-effective manner.

Workshop	Overall satisfaction
O&M	8.7
FRI	8.4
ESPC	8.4
FEDS	8.2
LCC	8.1
REP	7.9
Average	8.2

Overall workshop satisfaction scores

Program Impacts

- Attendees implement energy projects following participation**

Following the FEMP workshops almost all of the attendees, regardless of their earlier position on the product diffusion cycle, moved into the project implementation stage. It appears that the FEMP workshops are an instrumental tool for spreading the adoption of energy efficient technologies. The following figure summarizes the movement of workshop customers through the adoption process.

Movement of FEMP workshop customers through the technology adoption process

- Customers use information and skills on energy projects**

The majority (66%) of workshop attendees said that they have used their newly acquired FEMP skills, knowledge or tools on energy projects. On average, across all workshops, the attendees who report having used FEMP skills or materials report doing so on 30 projects since attending the workshop.

Workshop	Number of projects on which attendees report using FEMP skills or tools*
FRI	50
REP	7
ESPC	6
FEDS	14
LCC	72
O&M	4
Average	30

- **Customers share workshop information and tools with others**

A large majority of workshop attendees (80%) are actively sharing workshop information with others inside and outside of their organizations. Sharing practices include personally reviewing materials with others, copying and distributing materials, and asking others opinions about the material. The life of FEMP workshop materials goes beyond the attending customers and this extends the program impacts.

How FEMP workshop materials are shared by attendees

- **Respondents offer projects to showcase and to collect impact data**

Of the customers surveyed, 23 volunteered to use their projects as a FEMP showcase or case studies. These 23 individuals have conducted 339 projects since their attendance, providing an excellent source of real-life FEMP stories. However, the majority of customers who attended the FEMP workshops and who used their materials, tools or skills on energy projects do not know the energy or environmental impacts of those projects.

Who attends the workshops

- **Attendees are key energy decision makers and trainers**

Workshop attendees are key energy decision-makers in their organizations responsible for the evaluation, recommendation, purchase, and installation of energy efficient equipment and systems. Overall, attendees are also responsible for educating others on energy efficient systems and are responsible for reporting progress on their energy actions. However, very few attendees are responsible for environmental monitoring and except for the O&M workshop few attendees are responsible for operating or maintaining equipment.

- **Attendees are both novices and knowledgeable**

Forty percent of workshop attendees are customers who have already implemented projects using skills and information similar to that provided by the workshops. However 36% are customers who are unaware of the techniques and technologies presented and 17% had just become aware at the time of the workshop. Few (3%) of the workshop attendees were at the information gathering stage just prior to registering and attending the workshops and only 4% were ready to make a technology decision just prior to the workshop. This means that the workshops have the opportunity to significantly impact large segments of the market (56%) by exposing individuals to energy efficiency concepts and techniques, while helping the remaining market segments (44%) fine-tune or improve their knowledge or skills. However, this distribution is not consistent across workshops.

- **Customers are Federal employees or work on Federal projects**

Eighty percent of all surveyed customers work for the government. Ninety percent of this group work for the Federal Government. The remaining 20% of all attendees are private sector employees of which over half were working on a government project at the time of the workshop. However, there are large differences across workshops. For example, almost half of the LCC attendees surveyed are from the private sector while none of the FRI attendees surveyed are from the private sector.

- **Customers come from different size organizations**

Workshop attendees come from a wide range of different size organizations ranging from less than 100 employees to over 10,000. However, almost all of these same attendees come from business units or work groups with less than 100 interacting employees.

Customer value and satisfaction

- **What customers value most from the workshops**

The workshop attributes most valued by the customers include the:

- ✓ general skills and methods presented at the workshops,
- ✓ methods for comparing different products and services,
- ✓ methods for conducting financial comparisons, and
- ✓ the experience of the instructors, among others.

- **Satisfaction with FEMP office contacts is high for several items**

Customers who indicate they have contacted FEMP employees and offices in addition to their workshop contacts report being very satisfied with several aspects of these experiences. Customers report being very satisfied with:

- ✓ staff politeness,
- ✓ with the cost of obtaining assistance,
- ✓ the reliability of information, and
- ✓ the timeliness of staff response.

- **Ninety percent of attendees recommend workshops to others**

Overall, a very high level of attendees (90%) said they would recommend the workshop to peers with similar backgrounds and responsibilities. This score ranged from a high of 96% for the ESPC workshop to a low of 84% for the FEDS workshop, all good scores.

- **Many customers will pay for workshops, but often do not know how much**

Most customers (60%) said the workshops have monetary value and that they would pay for the workshops. The price attendees said they would pay range from a low of \$150-\$200 to a high of \$451-\$500 depending on the workshop. However, a very large group of customers (40%) said they did not know what they would be willing to pay.

Summary of Recommendations

- **Opportunities for improved customer satisfaction are identified**

Workshop components that can be improved are different for each workshop and their impact on workshop satisfaction will be different. Components which managers can examine for improvement include such items as the time to interact with others, the facilities where the workshops are held, the quality and accuracy of the materials, the comprehensiveness of the materials, workshop location, and others. More detailed recommendations can be found in the full report.

- **Attendees need extra workshop materials and tools**

Workshop managers will want to provide easy access to additional workshop materials and tools. These materials and tools are shared by attendees and there is strong evidence that this sharing leads to new projects.

- **Where customers want workshops**

Customers are very clear on where they want FEMP workshops provided. They want the workshops presented near their office or at their facilities so there are no travel costs. If this cannot be done, they want workshops held in conjunction with other travel.

- **Customers give their workshop recommendations**

About 40% of all attendees provided suggestions for improving the workshops. This indicates that workshop managers should review the recommendations to see how or if customer recommended changes can be incorporated into the workshops. Many of the recommendations appear to be excellent comments, which reflect careful consideration. For example, customers recommend:

- ✓ using better and real case studies and examples to demonstrate concepts,
- ✓ providing more time for computer training,
- ✓ providing more user-friendly materials,
- ✓ planning for different skill levels,
- ✓ dividing courses into multiple sessions,
- ✓ planning enough time to cover subjects,
- ✓ better preparation to minimize in-class problems,
- ✓ allowing for different specifications for different countries,
- ✓ providing more question and answer and attendee interaction time,
- ✓ keeping up-to-date on the newer technologies, and
- ✓ providing more hands-on learning, to name a few.

- **Demand for additional FEMP services is identified**

When attendees were asked to indicate their demand for additional or support services of which they would take advantage, customers said they would be very likely to take advantage of one page flyers and case studies, easily downloadable software, FEMPTrack's stories, additional copies of workshop materials, additional user-friendly software programs, follow-up telephone support, and advanced level workshops. Demand for these services are in the 25% to 40% range depending on the service.

- **Customers identified FEMP office services which can be improved**

Customer satisfaction levels for some FEMP services were low enough that management attention should be applied to improving services in these areas, including:

- ✓ accessing information through the toll-free hotline,
- ✓ downloading information from the internet,
- ✓ the ability of FEMP staff to understand their needs,
- ✓ the range of services offered by FEMP offices, and
- ✓ the ease of obtaining answers to customer questions.

These aspects are low enough on the satisfaction scale to be appropriate for evaluation and strengthening.

Summary of Findings Regarding the Survey Process

- **Survey identified successful research techniques to evaluate FEMP workshops**

This survey specific batteries of questions which can be successfully used to conduct future evaluations of FEMP services. Likewise questions that did not work well were also identified. In general, questions pertaining to customer opinions, perspectives, experiences and recommendations worked well, as did questions pertaining to the general use and usefulness of workshop tools, materials and information. However, questions pertaining to specific projects or the energy and/or environmental impacts of specific projects did not work well. These types of detailed, project-specific questions need to be gathered through methods other than a telephone survey, such as on-site visits, or energy audits.

- **Survey research is able to map technology adoption segments**

It is possible to determine where customers are with respect to their positions in a technology adoption cycle through carefully constructed batteries of questions designed to identify stages of adoption.

- **More accurate customer contact information is needed**

A significant barrier to conducting this survey was the accuracy of the customer contact database. Because many of the clients served by the FEMP workshops have moved, changed jobs, or changed phone numbers, contacting workshop attendees was a significant barrier to the completion of this research. FEMP may want to routinely up-date their historic customer records every six months through customer mailings and verification calls. The ability to contact customers is vital to the process of documenting program accomplishments.

- **Expansion of survey hours and customer call-back lines are necessary**

Because of the difficulty contacting FEMP workshop participants survey researchers need to establish survey appointments beyond standard survey hours and also use customer call-back lines to overcome contact barriers. In addition, survey researchers will need to modify their customer contact protocols to allow for more aggressive contact procedures. This may include expanding the number of contact attempts as well as the contact methodology. Future survey protocols should plan for customers who work across global time zones and different hours of the day. Our surveyors were often advised to call back at non-traditional hours. In addition, the reliance of voice mail systems by targeted customers require the use of customer call-back lines so that customers can return our calls requesting survey appointments.

Overview of the Research Methodology

The evaluation used an expanded telephone interview technique with attendees of six different FEMP workshops to collect, analyze and report the information presented in this report. Surveys of 173 workshop attendees were conducted during the fall of 1997. The surveys lasted an average of 50 minutes and covered a wide range of issues, including satisfaction, process and impact topics. The development of the survey instrument was coordinated through Anne Sprunt-Crawley of the FEMP Technical Assistance Team located in Washington DC, with detailed reviews and recommendations from FEMP field managers responsible for workshop implementation. Surveyed customers were randomly targeted using a customer contact database provided by FEMP. A detailed presentation of the evaluation methodology is provided in the appendix.

The FEMP Workshop Customer

The survey included a number of questions designed to help FEMP managers better understand the organizational and operational environment of the workshop customers, including their energy related responsibilities and interests. This information allows workshop managers to examine their workshop materials, tools and presentations in relationship to the responsibilities of their customers and the organizations they represent.

Attendee employment

Eighty percent of all surveyed customers work for either state, local, or the Federal Government, with 90% of these employed by the Federal Government. Of the remaining governmental employees, 6% work for a state government and 3% for a local government. Most of the remaining participants (18%) work in the private sector and 1% are employed in the non-profit or not-for-profit sectors. The FEMP workshop market consists of Federal employees with a much smaller market consisting of private sector employees and employees of state or local governments. However, this general market characterization does not apply at the individual workshop level. For example, 96% of the ESPC attendees work for the government, while 51% of the LCC attendees work in the private sector. Workshop customers are not identical across the workshops. Table 1 presents the employer classifications for each of the workshops included in this study.

Table 1 Workshop attendee employment by sector

Workshop	Percent employment by sector			
	Government	Private sector	Non-profit/not-for-profit	Other
FRI	90		5	5
REP	81	19		
ESPC	96	4		
FEDS	88	12		
LCC	43	51	5	
O&M	100			
Average	80	18	2	1

Of the workshop attendees employed in the private or not-for-profit/non-profit sectors 55% were working on a government project at the time of their attendance. Conversely, a little less than half (45%) of the attendees were not working on a governmental project. We can sum the government (80%) and government related (10%) attendance figures and conclude that about 90% of the attendees of the FEMP workshops, regardless of their employer, were working on one or more Federal projects at the time of their attendance. It is clear that Federal projects, for both public and private sector attendees, account for the vast majority of projects influenced by the FEMP workshops, however some workshop benefits are making it to the private sector as well. More specifically, 100% of the private sector REP attendees surveyed were working on a Federal project at the time of their attendance, as were 67% of the private sector FEDS attendees, 50% of the FRI and ESPC attendees, and 44% of the LCC attendees.

Organizational size

On average, workshop attendees come from organizations with from 200 to 500 people working at their location with less than 100 people working in their individual business units. However this data is distributed across a wide range of organizational sizes such that the averages do not reflect the nature of the organizations. For example 57 percent of attendees come from organizations with less than 500 people employed at their locations and an equal amount come from organizations with 200 or more employees. While these data overlap, the amount of overlap and the distribution across the organizational size means attendees come from a wide range of organizational sizes and workshops do not seem to attract employees from only small or large organizations. Table 2 presents a more detailed distribution of the size of the attendee's organization at the location where they work and demonstrates the wide distribution of organizational size.

Table 2 Size of the attendee's organization at the location where they work

Workshop	Percent of people employed at current location					
	Less than 100	100 to 200	200 to 500	500 to 1,000	1,000 to 10,000	10,000 or more
FRI	30	10	25	0	30	5
REP	31	13	13	19	25	-
ESPC	22	7	19	7	41	4
FEDS	29	5	19	12	28	3
LCC	38	11	22	3	8	3
O&M	23	8	8	8	30	15
Average	30	8	19	8	26	4

While the FEMP workshop attendees come from a wide range of organizational sizes, the work units or business units in which they work are much smaller in size and typically employ less than 100 people. A total of 83% of all attendees work in sections or business units of less than 100 people. However, 17% of attendees work in larger sections having more than 100 people, with 6% having more than 500 people. Table 3 presents the distribution of the size of the attendee's section or business unit.

Table 3 Size of the business units in which attendees work

Workshop	Percent of people employed in your section or business unit			
	Less than 100	100 to 200	200 to 500	500 and larger
FRI	85	5	5	5
REP	81		13	6
ESPC	89	7		4
FEDS	86	10		3
LCC	72	6	6	17
O&M	77	15		8
Average	83	8	3	6

Energy budgets

The average annual non-transportation energy budget for their organization, as reported by workshop attendees, is between \$2,000,000 and \$10,000,000 a year. However the distribution of energy budgets is not uniform across the workshops indicating that some workshops draw attendees with larger or smaller energy budgets than other workshops. The workshop where attendees reported the largest energy budgets is the REP workshop, with average budgets the \$10,000,000 to \$50,000,000 range while the ESPC attendees report average annual budgets in the \$500,000 to \$2,000,000 range. The remaining workshop reported average energy budgets in-between these ranges. Table 4 presents the non-transportation annual energy budgets as reported by workshop attendees.

Table 4 Annual non-transportation energy budgets for workshop attendees

Workshop	Annual organizational non-transportation energy budget in thousands of dollars – percent by group							
	Less than \$50	\$50 to \$250	\$250 to \$500	\$500 to \$2,000	\$2,000 to \$10,000	\$10,000 to \$50,000	\$50,000 to \$100,000	More than \$100,000
FRI	0	8	8	15	31	8	8	23
REP					43	43	14	
ESPC	6	13	6	31	25	19		
FEDS	11	7		11	30	26	11	4
LCC	33			20	7	20	7	13
O&M		14		28	28	28		
Average	11	7	2	19	26	22	7	7

Job responsibilities

This section of the report looks at job responsibilities of workshop attendees and provides an in-depth look at how the attendees share responsibilities across a wide range of tasks. This information allows FEMP managers to compare their workshop information, materials and tools with the distribution responsibilities in order to link presentations to attendee responsibilities. This data will help managers verify that workshop presentations and material directly relate to attendee responsibilities.

A total of 17 different job tasks were included in the workshop survey. Each attendee was asked to rank each task according how responsible they were for each task within their organization. The survey asked for a 1 to 10 score. A score of 1 means they have no responsibility for that task while a score of 10 indicates the task is a very large and significant part of their responsibilities. These scores were then averaged across the data to arrive at a mean job responsibility score for each workshop. Mean scores of 7.0 or higher were coded as "high" on a responsibility scale, mean scores between 4.5 and 6.9 were coded as "medium," and scores below 4.5 were coded as "low" responsibility scores. This produced a comparative ranking of job responsibilities that can be compared across each workshop.

The FEMP workshop attendees are heavily involved in the evaluation and recommendation of energy efficient equipment and systems leading to their purchase and

installation. There is a lesser degree of involvement in the installation and maintenance of these systems, however many attendees are involved in cross organizational communications and training with respect to energy equipment and systems. The FEMP workshops are reaching more of the technology evaluators and decision makers than the actual people responsible for system installation and maintenance with the exception of the O&M workshop.

What is also interesting is that while the FEMP workshops are reaching the energy and energy systems decision makers and advisors, the workshops do not appear to be reaching people responsible for environmental monitoring. It may be that the FEMP workshops are viewed as energy workshops rather than environmental workshops by the attending organizations and, as a result, do not attract attendees with environmental monitoring responsibilities.

It should also be noted that job responsibilities change significantly when examined at the workshop level. Each workshop reaches a somewhat different group of people that are more aligned with the specific training being offered. Table 5 shows several tasks are a major responsibility for the attendees of all or most workshops. These include responsibilities, such as evaluating and recommending the purchase or installation of energy consuming equipment, educating others on energy efficient systems or technologies, and reporting progress pertaining to energy actions. Other responsibilities have a medium responsibility level for all or most workshops, such as managing construction or renovation projects, coordinating with ESCOs, tracking consumption, keeping facilities up-to-date, designing energy systems or improvements, and demonstrating technologies. However, some responsibilities apply mostly to a few workshops and lesser to others. For example, responsibilities regarding the purchase, installation and maintenance of energy equipment is a major responsibility for O&M workshop attendees but a minor responsibility for REP and LCC attendees. Table 5 allows FEMP managers to scan the different job responsibility levels for each workshop and see if the specific responsibilities are, on average, a major part of the average attendee's responsibilities (H), a medium level responsibility (M) or a minor responsibility (L). This table is ordered with the highest task responsibilities presented first.

Table 5 Summary job responsibility comparisons across workshops

Energy related responsibilities	Degree of job responsibility					
	FRI	REP	ESPC	FEDS	LCC	O&M
Recommend purchase or installation of equipment	H	H	H	H	H	H
Evaluate cost or savings of energy equipment	H	H	H	H	H	H
Educate others on energy efficient systems/technology	H	H	M	H	H	M
Report progress of energy or environmental actions	H	M	H	H	M	H
Evaluate energy technologies for your organization	H	M	M	H	M	H
Manage new or construction or renovation projects	H	M	M	M	M	H
Coordinate contacts with utilities or ESCOs	M	M	M	H	M	H
Track or measure energy consumption or pollution	M	M	M	H	M	H
Keep facilities up-to-date with current technology	M	M	M	H	M	H
Design energy consuming system or improvements	M	M	M	M	M	M
Demonstrate new or improved energy technologies	M	M	M	M	M	M
Develop or direct policy change about energy mgmt	M	L	M	M	M	M
Purchase or install energy equipment or services	H	L	M	M	L	H
Install equipment or energy management systems	M	L	L	M	L	H
Evaluate environmental impacts of equipment	M	L	L	M	M	M
Maintain equipment or energy management systems	L	L	M	L	L	H
Evaluate energy technologies for other organizations	L	L	L	L	M	L

H = Major, M = Medium, L = Minor

This table may not meet the evaluation needs of all FEMP managers. Some managers will want more detailed information regarding the distribution of job responsibilities for attendees of specific workshops. These tables (table 38 to 43) are included in the appendix.

Personal or professional characteristics

In summary, FEMP workshops are reaching energy professionals who are interested in energy related aspects beyond their daily responsibilities.

Included in the workshop survey was a small number of questions that were designed to examine attendee's energy related personal or professional characteristics. Because the distribution of the responses to these characteristics did not change significantly from workshop to workshop they are presented in Table 6. The results to these questions indicate that attendees have a strong interest in staying up-to-date on energy technologies, and reading about the development and use of energy technologies, and a lesser interest in having a network of peers to discuss energy issues or having associates who rely on them for advice. Table 6 presents the results of this effort.

Table 6 Personal and professional characteristics of attendees

Personal or professional characteristics	Percent degree of interest				
	Very large	Large	Medium	Small	None
Enjoy staying up-to-date on energy technologies and issues	55	31	11	1	2
Enjoy reading about the development and use of energy technologies	51	34	11	1	3
Having a network of peer with whom you discuss energy issues or projects	35	38	16	7	4
Having associates who rely on your for energy advice	33	38	16	5	7

Adoption of Workshop Technologies and Practices

One of the primary purposes of the FEMP workshops is to encourage the adoption of new energy efficient and environmentally friendly practices and technologies.

In order to measure the influence of the workshops on customer adoption rates, we asked a battery of questions pertaining to the customer's knowledge and use of the recommended practices or technologies presented during the workshops. Table 7 presents the battery of questions that were used for the LCC Workshop. A similar battery of questions was developed for each of the other workshops. Customers were asked about their knowledge and use of recommended practices and technologies prior to their attendance and then a similar set of questions pertaining to their knowledge and use at the time of the survey. The responses to these questions allow us to map where customers were in the product diffusion cycle prior to the workshop compared to their position in the cycle 1 to 2 years after participation. A more detailed explanation of this process is presented in the appendix. (*see: The adoption and diffusion of innovations*)

Table 7. Questions used to assess the stage of adoption prior to the workshop

Question	Stage of Adoption
Just prior to the workshop had you:	
Heard the term "life cycle costing"	Awareness
Heard of the term energy efficient life cycle costing	Awareness
At any time prior to registering of the workshop, had you tried to find information about energy efficient life cycle costing by . . .	Information seeking
• Seeking publications	
• Discussing the pros and cons with a colleague	
• Attending an internal or external workshop	
• Looking for guidance, regulations or cased studies, or	
• Searching for information on the internet	
Did you ask someone in your organization to look for information about energy efficient life cycle costing?	Information seeking
Just prior to attending the workshop, had you...	
Decided whether energy efficient life cycle costing would be a good idea for your organization	Decision stage
Recommended that your organization use energy efficient life cycle costing	Decision stage
Decided that energy efficient life cycle costing was something that your organization should try	Decision stage
Deferred or postponed a decision to use energy efficient life cycle costing	Decision stage
Tried to use data to factor lie-time energy costs into a purchase decision	Implementation stage
Developed or used spreadsheets or other tools to maker energy efficient life cycle costing decisions	Implementation stage
Used information or software to implement energy efficient life cycle costing	Implementation stage

Respondents replied to each question with a "yes," "no," or "don't know." We then scored each respondent for each stage of adoption. If the respondent answered "yes" to any question assigned to a specific stage of adoption, that respondent was assumed to have reached that stage of adoption and was assigned a "yes" for that stage. For example, if a respondent answered either of the two questions about prior knowledge of life cycle costing with a "yes," they were assigned to the "aware" category. If they answered "no" or "don't know" to both questions they were assigned to the "unaware" stage. All other stages were handled in the same way. The respondent had to provide a positive response for at least one question representing a stage of adoption in order to be recorded as having reached the stage or answer all questions for the stage negatively to be recorded as not having reached the stage.

We then scored each person for the most advanced stage of adoption that they had reached. Since the theory suggests that stages are successive, we imposed the requirement that no stage could be skipped. For example, a person who was classified as being in the decision stage also had to be scored as having reached the awareness and information seeking stages. Persons who had skipped a stage were coded as being misclassified and were excluded from further analysis. We had sufficient data to attempt to classify 173 people. Of this group, we were able to classify 92%.

We followed a very similar procedure for determining stage of adoption following workshop attendance. Because people had participated in the workshop and were obviously aware, the unaware and aware categories were no longer included. However, people could still be searching for information or in the process of formulating a decision. In most cases, the survey was conducted at least a year and in most cases 2 years after workshop attendance so that there was time for people to make decisions and take actions. Table 8 illustrates the adoption questions that were used following the LCC Workshop. Questions for the other workshops are variants of these.

A similar procedure was used for assigning stages following the workshop. However, we assumed that the workshop might be sufficient as an information seeking stage and that people might not engage in further search if their need for information was addressed during the workshop. Likewise, the workshop may have helped people through the decision stage so that people can move directly to implementation. Thus, we expected that the number of misclassifications might actually increase for the post workshop classifications. In fact, this turned out to be the case.

Table 8. Example of a battery of questions to assess stages of adoption

Question	Stage of Adoption
Previous questions deal with the period of time before your attendance at the workshop. Now we would like to ask you about your current situation regarding energy efficient life cycle costing. The following questions apply to the period of time starting just after the workshop through today.	
Has your organization. . .	
Continued to look for or acquire information on energy efficient life cycle costing, through publications, meetings, workshops, conferences, the internet or through other means?	Information seeking
Made a policy decision <u>not</u> to use energy efficient life cycle costing on some or all of your energy consuming purchases?	Decision stage
Made a policy decision to use energy efficient life cycle costing on some or all of your energy consuming purchases?	Decision stage
If your organization currently in the process of making a decision to use or not use energy efficient life cycle costing?	Decision stage
Has your organization . . .	
Developed internal plans or procedures for using energy efficient life cycle costing?	Implementation stage
Calculated the total energy costs of a product or service over its lifetime?	Implementation stage
Calculated the total energy costs of a product or service over its life time and used these calculations to finalize a purchase decision?	Implementation stage
Begun using energy efficient life cycle costing and, as a result, decided that you will continue to use it?	Implementation stage

For the post workshop period, we assigned people to the most advanced stage of adoption that they had achieved irrespective of not having completed the previous stages. We took this approach because attendees can move through the intermediate stages between the time of the workshop and the survey. Thus, if a respondent indicated a "yes" to any of the implementation stage questions, the respondent was assigned to the implementation stage even if they did not indicate additional information search. That is, if the workshop provided information for the customer to move to the next stage, there is no need for the customer to continue to look for additional information. As a result, they may or may not still be looking for additional information.

Stages of adoption before the workshop

Figure 1 shows the distribution of workshop attendees by stage of adoption prior to their registration and attendance. Attendees were placed in the unaware stage if they reported not being aware of the subject of the workshop prior to their hearing about the workshop. The distribution of attendees is bi-modal. People who have already adopted the innovation or are from organizations that have already implemented the innovation are the largest single group (40%). However, if the participants in the unaware and the aware stages are combined, they represent the largest combined group (53%). Implementers and those who are unaware or newly aware are at the opposite ends of the stages of diffusion. Very small percentages of workshop attendees, under 5 percent, are in the information seeking or decision stages. What this tells us is that workshop attendance is split between those who know very little about the subject matter and those who probably know a great deal about it. Those who have implemented the innovations are probably attending as a way of refining their understandings or increasing their skill.

Figure 1. Percentage of workshop attendees by stage of adoption

It is instructive to look at the differences in participant's stage of adoption across the workshops (see Figure 2). The ESPC Workshop had the largest percentage of participants who were in the two earliest stages of adoption, the unaware or aware stages. The FEDS Workshop had the largest number of people who were unaware. By contrast, the O&M Workshop had the largest number of people in the implementation stage, followed by the Federal Re-lighting Initiative and LCC Workshops. The REP Workshop had the most even distribution of people with roughly equal numbers at the early and late stages of adoption.

These data make sense at the workshop level. Performance contracting is relatively recent and it is not surprising that most people are just becoming aware of it. The same is true of FEDS. Conversely, those involved with operations and maintenance may believe that they are already improving the energy efficiency of their operations through the O&M procedures that they have been using prior to the workshop. Life cycle costing is also a concept that has been around for many years although energy life cycle costing may be fairly recent

Figure 2. Stage of adoption by workshop type

If we analyze the workshops from the stages of adoption perspective, the workshops are clearly effective. Figure 3 shows participants' stage of adoption prior to the workshops and their stage of adoption following the workshop. This graphic clearly shows that nearly all participants have moved to the implementation stage following their participation in the FEMP workshop.

Figure 3. Stage of adoption before and after workshop

Customer Satisfaction

This section presents the results of the customer satisfaction questions and includes information on overall and component satisfaction and identifies workshop components that “drive” satisfaction responses.

Before reviewing the results it is important to understand the significance of different satisfaction scores. In this evaluation, satisfaction was measured using a 1 to 10 point scale, where 1 means extremely dissatisfied and 10 means extremely satisfied. However, this relationship is not linear. In general, survey respondents tend to give high satisfaction scores, even when there are significant levels of dissatisfaction. As a result a score of 10 typically means the participant is extremely satisfied and has few, if any, problems with the aspects of the workshop being measured. A score of 8 to 9 typically means participants are very satisfied, but there may be one or two minor issues that participants would like to see addressed. A score of 6 or 7 usually means there is some level of dissatisfaction with the component being measured. Scores of 5 to 6 typically indicate significant dissatisfaction with the components being measured and scores of 4 or less indicate very strong dissatisfaction.

Satisfaction scores need to be evaluated differently than other survey responses. On a linear 10 point scale a score of 5 means that the customer is neither satisfied nor dissatisfied, but is somewhere in-between, however on a satisfaction scale a score of 5 typically indicates significant dissatisfaction. A rule-of-thumb for establishing satisfaction goals is to set the threshold at 80% of the customers rating satisfaction with the workshop or workshop components at 8 or higher. Management attention can be focused on improving workshop characteristics that fall below this criteria. However, attention can be focused toward improving satisfaction in one of two methods. The first and most common method is to concentrate improvements on the components with low satisfaction scores in order to improve both component satisfaction and, hopefully, overall satisfaction. The second method is to concentrate improvements on the components that are known to “drive” overall satisfaction and focus less attention on lower component scores if those components have little or no effect on overall satisfaction. A combined approach for improving or maintaining high levels of customer satisfaction is better than a single method approach. Component satisfaction scores can help identify specific areas for targeting improvements with the understanding that the goal is to improve the quality, understanding, use or satisfaction with the specific component. These improvements may not be accompanied by a corresponding increases in overall workshop satisfaction. At the same time improvement efforts can target the drivers of satisfaction so that overall workshop satisfaction scores can be improved. The key to understanding and focusing management attention on workshop improvements is to understand that some improvements will help the component being addressed, while others will help both the component being addressed and overall satisfaction. The key is to understand which improvements will effect overall satisfaction and which will not. These issues will be addressed later in this section.

Overall workshop satisfaction

Overall, attendees of the FEMP workshop are very satisfied to extremely satisfied with the workshops they attend. Eighty percent of attendees report overall satisfaction scores in the 8 to 10 range with the largest group of attendees (40.4%) reporting satisfaction at 8 on the 10 point scale. The mean satisfaction score for all workshops combined is 8.2, a very good satisfaction score. These scores demonstrate strong levels of overall satisfaction with the FEMP workshops. However, about 20% of attendees reported overall satisfaction scores of 7 or less, indicating there is a potential for making workshop changes that will increase both component satisfaction and overall satisfaction. However, from an overall FEMP perspective, the workshops enjoy a strong customer satisfaction score that reflects positively on the workshop services and on the FEMP in general.

Table 9 presents the distribution of the overall workshop satisfaction scores for all six workshops combined.

Table 9 Overall workshop satisfaction scores

Overall score	Percent	Cumulative percent
10	16	16
9	23	39
8	40	80
7	11	91
6	5	96
5	3	99
4	1	100
1-3	0	100

Scale 1= extremely dissatisfied, 10= extremely satisfied,

Individual workshop overall satisfaction

Satisfaction scores for each of the six workshops examined in this study have a mean score of from just below 8 for the REP Workshop to 8.7 for the O&M Workshop. This range of mean scores for the six programs is a typical distribution for workshops that have high proportions of satisfied customers. However, because these scores are mean scores, many of the actual scores fall below the mean. The participants with satisfaction scores falling below the mean provide opportunities for improvements and allow managers the ability to fine-tune their workshop presentations, materials, and tools to improve these scores. Table 10 presents the mean overall satisfaction scores for the six FEMP workshops.

Table 10 Mean workshop satisfaction scores

Worksh op	Overall satisfaction
O&M	8.7
FRI	8.4
ESPC	8.4
FEDS	8.2
LCC	8.1
REP	7.9
Average	8.2

Scale 1= extremely dissatisfied, 10= extremely satisfied,

While **Table 10** presents the mean workshop satisfaction scores, these scores are not meaningful until specific characteristics of the workshop are determined. **Table 11** presents a ranking of the component satisfaction scores using a high, medium and low rankings. Workshops appear in this table in the order of their overall satisfaction scores. (Mean component satisfaction scores for each workshop are presented in the appendix) For this table we have identified a score of less than 8.0 as a low score, from 8.0 to 8.5 as a medium score and scores above 8.5 has high scores. The range of scores established for this exercise are arbitrary and each manager can identify a different range of scores for the three satisfaction tiers. We recommend this range because they typically segment the components being measured into actionable categories. That is, it produces cells with a range of high, medium and low values across the measured components such that we can prioritize where we might can examine workshops for potential improvements.

For example, **Table 11** shows the O&M Workshop has high scores for instructor knowledge and the facilities where the workshops were held. However this workshop has lower scores for the time to interact with others. Likewise, the REP has high satisfaction scores for the facilities where the workshops were held and the location of the workshops, but low satisfaction scores for the comprehensiveness of the materials, quality and accuracy of materials, presentation skills of the instructor(s), the time available to interact with others, and examples, stories and anecdotes. **Table 11** identifies workshop components with both high and low satisfaction scores. This exercise provides some guidance in where managers can look for ways to increase satisfaction at the component level.

Table 11 Workshop component satisfaction

Workshop	Comprehensiveness of materials	Quality & accuracy of materials	Presentation skills of instructor(s)	Knowledge of instructor(s)
O&M	M	M	M	H
FRI	M	H	H	H
ESPC	M	H	H	H
FEDS	L	M	H	H
LCC	M	M	M	H
REP	L	L	L	M
Average	M	M	M	H

Workshop	Workshop location	Time to interact with others	Examples, anecdotes, stories	Facilities	Overall satisfaction
O&M	M	L	M	H	H
FRI	L	L	L	H	M
ESPC	M	M	M	L	M
FEDS	M	L	L	M	M
LCC	M	L	L	M	M
REP	H	L	L	H	L
Average	M	L	L	M	M

Scale L= low levels of satisfaction, M= medium levels of satisfaction, H= high levels of satisfaction,

Managers wanting to improve component satisfaction can review this table and target improvements where they believe improving the component can produce faster, cheaper or better results. There are no "magic bullets" with respect to increasing customer satisfaction. In many cases managers report the need for trial-and-error testing before they determine where to focus management attention.

Drivers of overall workshop satisfaction

Having discussed workshop and workshop component satisfaction it is appropriate to review components of the workshop that drive overall satisfaction; that is, the components for which changes to satisfaction scores directly track with overall satisfaction. As we discussed earlier, improvements to the drivers of satisfaction lead to higher overall satisfaction scores. In examining the FEMP survey data, each workshop had a somewhat different set of components that are directly linked to changes in the overall satisfaction. The comprehensiveness of workshop materials are strong satisfaction drivers for the FRI and LCC Workshops. However this same component is a weak driver for the REP Workshop and is not identified as a driver for the ESPC, FEDS or the O&M Workshop. As a result, improvements to the comprehensiveness of the materials for ESPC, FEDS and the O&M Workshop will not necessarily lead to improved overall satisfaction scores. On the other hand, improved material comprehensiveness for the FRI and the LCC Workshops will lead to improved scores. While managers for all workshops may want to improve the comprehensiveness of their materials, these changes will only improve the overall satisfaction scores for the FRI, LCC and to a lesser degree the REP Workshop.

Table 12 presents the primary and secondary drivers of overall satisfaction for the FEMP workshops surveyed. As shown in this table, the FRI Workshop has four primary drivers of satisfaction and no secondary drivers. This means that for the FRI Workshop four different workshop characteristics have component satisfaction scores that move in relation to the customer's overall satisfaction ratings. The REP Workshop has two primary drivers of overall satisfaction and three secondary drivers. In this workshop the knowledge of the instructor(s) and the location of the workshop have significant influence on attendees overall satisfaction scores while the comprehensiveness of the materials, the presentation skills of the instructor(s), and the stories and anecdotes shared during the workshop also drive overall satisfaction, but to a lesser degree. The ESPC workshop has one primary driver and no secondary drivers and the FEDS Workshop has two primary drivers. The LCC Workshop had three drivers of satisfaction and the O&M Workshop has no drivers.

Table 12 Primary and secondary drivers of satisfaction

Drivers of workshop satisfaction	FRI	REP	ESPC	FEDS	LCC	O&M
Comprehensiveness of materials	X	x			X	
Quality & accuracy of materials	X		X	X		
Presentation skills of the instructor(s)	X	x			X	
Knowledge of the instructor(s)	X	X				
Location of the workshop		X				
Instructor and attendee interaction						
Stories and anecdotes		x		X		
Facilities					X	

X= Primary driver, x= Secondary driver

A word of caution is appropriate for interpreting components identified as drivers of satisfaction. First, drivers of satisfaction can change as workshop characteristics change. For example if a workshop has an instructor that receives negative evaluations from the attendees, then changing the instructor or improving the instructor's presentation skills can effect the workshop's overall satisfaction scores. However, if the workshop instructor receives consistently high evaluations such that all attendees think the instructor did an excellent job, the presentation skills of the instructor may not be identified as a driver of workshop satisfaction because the instructor was so good that there was no variance in the evaluations, and improvements to the presentation skills would not significantly improve the scores because they were already high. However, if the instructor with high evaluations were replaced with an instructor with low evaluations, then the presentation skills of the instructor could become a driver of satisfaction.

Drivers of satisfaction should be interpreted as components of a workshop that if improved, will increase overall satisfaction if the conditions of the workshop have not changed between the time of the satisfaction assessment and the introduction of the improvement. Under steady-state conditions, improvements in the satisfaction scores of the drivers of satisfaction will equate to improved overall satisfaction scores. This may not apply if the workshop has changed the measured component characteristics following

the evaluation. The drivers of satisfaction for the previous condition may not be the drivers of satisfaction in the changed condition.

Also, if a workshop has no drivers of satisfaction then all of the workshop components measured were found not to have a corresponding relationship to the overall satisfaction score. Put another way, the absence of primary or secondary drivers of satisfaction means that component satisfaction scores all have about the same influence on the overall workshop satisfaction score and that there may not be component satisfaction characteristics that directly correspond to overall satisfaction. It may also mean that we have yet to identify and measure a component of satisfaction that can be identified as a satisfaction driver.

The information presented in Table 11 combined with the information shown in Table 12 allows FEMP managers to focus management attention on items that can improve component satisfaction, as well as items that can improve the customer's overall levels of satisfaction with the workshop experience. Together these data provide powerful tools for prioritizing and focusing workshop improvement efforts.

Technical level of the workshop presentations

Another measure of customer satisfaction is the attendee's opinion about the technical presentations. If customers feel the presentations are too technical, they may not understand the concept foundations and, as a result, not have the necessary skills to understand the workshop or the intricacies and uses of the materials presented. In this case satisfaction can suffer because the workshop is too technical. Likewise, if customers feel the presentations are not technical enough or are too elementary for their use, satisfaction can also suffer. Finding the technical balance is often difficult for workshop managers especially when attendees range from customers who have already learned and used the skills being presented and are ready for advanced skills, to customers who are not familiar with the terms used to discuss the workshop concepts.

Overall, FEMP workshops have a good handle on the technical level of the presentations. Almost 80% of all attendees report the technical level of the workshop presentations and materials is about right. Only 8% of attendees think the presentations were too technical and about 13% think they were not technical enough. This same distribution applied across most of the FEMP workshops demonstrating good targeting of the presentations and materials to both informed and uninformed attendees. Table 13 presents the distribution of the customer's opinions regarding their level of satisfaction with the technical level of the workshop presentation and materials. In examining the results presented in this table please keep in mind that a balance between being too technical and not technical enough is where most managers want their workshop to fall. This goal was accomplished for most all of the FEMP workshops. However the ESPC and the O&M Workshop managers can examine the technical level of the workshop presentations and the supporting materials to see if they are too elementary for the attendees.

Table 13 Satisfaction with technical level of workshops

Workshop	Percent		
	Too technical	About right	Not technical enough
FRI	14	76	10
REP	13	69	19
ESPC		89	11
FEDS	9	75	16
LCC	8	84	8
O&M		85	15
Average	8	79	13

Workshop attributes most valued by customers

An aspect of workshop satisfaction sometimes overlooked in follow-up surveys are the things about the workshop that the attendees value the most. The identification of these items can be a significant contribution to assessing workshop satisfaction because it allows managers to examine the delivery mechanisms to see how well the workshop provides the items most valued. Managers can then assess if there are ways to improve these items or if they should focus on other aspects that they think should be more highly valued by the customer. As can be seen in Table 14, the general skills and methods presented during the workshop were most valued by attendees of the LCC and FRI Workshops. The methods for comparing different products and services were most valued by the LCC and FEDS workshop attendees. The methods for conducting financial comparison and the experiences of the instructor were most valued by the LCC, ESPC and FEDS attendees. The experience of the other attendees was most valued by the ESPC and the FEDS attendees.

Table 14 Workshop characteristics customers valued most

Workshop	Percent.				
	General skills and methods presented	Methods for comparing different products or systems	Methods for conducting financial comparisons	Experiences of the instructors	Experiences of the other attendees
ESPC	14	15	26	29	41
LCC	26	26	30	26	16
REP	9	11	4	12	9
O&M	13	5	4	2	3
FRI	24	16	16	10	9
FEDS	13	26	21	22	22

Customer recommendations to potential attendees

Another indicator of both workshop satisfaction and the value attendees place on the workshop is the percent of attendees that recommend the workshop to their peers. If less than 80% of the attendees say they would recommend the workshop to a peer with similar backgrounds and responsibilities, then managers need to focus attention on why so few people would recommend the workshop. On the other hand, a 100% recommendation rate is almost never possible, especially for workshops that are attended by both experts and beginners within a specific subject area and who come to the workshop for different reasons. However, ratings in the 85% to 90% range are possible for high-quality workshops with very satisfied to extremely satisfied customers. This is one standard by which workshops can be measured and evaluated.

When attendees of the FEMP workshops were asked if they would recommend the workshop to a peer with similar background and responsibilities, 90% of all attendees said yes, and an additional 5% said probably. This overall level of workshop recommendation is very strong and provides another indicator of the customer satisfaction levels associated with these workshops. This distribution held reasonably consistent when each workshop was examined independently. That is, all FEMP workshops examined in this project had high peer recommendation levels. As can be seen in Table 15, all workshops have a strong majority of attendees indicating that they would recommend the workshops to their peers. The workshops with the highest percent of peer recommendations are the ESPC, LCC, REP and the O&M Workshops. The workshops with the lowest levels are the FEDS and FRI Workshops, however, these scores are all very good scores and all pass the 80% test.

Table 15 Workshop recommendations from attendees

Workshop	Percent indicating if they would recommend workshop to a peer.				
	Yes	Maybe	Don't know	Probably not	Definitely not
ESPC	96		4		
LCC	95	3		3	
REP	94	6			
O&M	92				8
FRI	86	10		5	
FEDS	84	7	4		5
Average	90	5	2	1	2

Length of the workshop

Workshop satisfaction rates can also be affected by the length of the workshop compared to people's expectations. If customers feel the workshop was too short they can feel short-changed in terms of what they were expecting or the amount of time that was given to cover the subjects. If workshops are too long customers can feel their time was wasted or that the workshop planning was mishandled. In order to understand the attendee's opinion on the length of the workshop each attendee was asked if the workshop was too long, too short or about right. If the attendee said it was too short or too long they were

asked how long the workshop should have been. All of the workshops examined in this study are two day workshops.

On average, across all workshops, customers think the workshops were about right in length or were too short. Very few customers think the workshops were too long. In summary, about two-thirds think the workshops are about the right length of time and about one-third think they are too short.

Ideally, managers want to plan the workshop so that there is a balance between the customers who think the workshop is too long and those that think it is too short, with the majority of customers falling in the middle. From this perspective some of the workshops need to be modified to be presented over a longer period of time. For example, in one case more customers reported the workshops were too short than those who reported the workshops were about right in length. In three workshops no one reported the workshops were too long. However, in some cases the balance is approaching about what would be desired. For example, in the REP Workshop a strong majority of customers reported the workshops took about the right amount of time, with the remaining customers reporting the workshop was too short or too long.

If workshops continue to be a major product of FEMP, managers will want to look at the workshops from the perspective of how much time is needed to convey the material and information presented during each workshop and modify the timing of these sessions to reflect customer's expectations. One standard for planning the length of workshops is to re-plan workshop length each time the workshop is changed to coordinate with the quality and comprehensiveness of the material presented, and the needs of the attendees to understand the materials, such that 75% of the customers think the workshop is about right in length and 12.5% each think the workshops are either too long or too short. The following Table 16 presents the customers opinions pertaining to the length of time of the workshops they attended. From the opinions of the customers responding to this survey it is clear that at least four of the six workshops should seriously consider expanding the workshops so that customers are more satisfied with the workshop length.

Table 16 Opinions on length of time for workshop

Workshop	Percent too short	Percent about right	Percent too long
FRI	19	81	0
REP	19	75	6
ESPC	25	75	0
FEDS	32	65	3
LCC	33	64	3
O&M	54	46	0
Average	30	68	2

Table 16 shows that the O&M Workshop has 54% of the attendees providing an opinion that the workshop is too short. This is a very high percent of customers providing this comment and strongly suggests a delivery adjustment is needed for these customers. Likewise the LCC, FEDS and ESPC Workshops also have high numbers of customers

who think the workshops are too short, indicating a need to examine workshop length across several workshops from the customer's perspective.

In addition to asking questions about the length of the workshop we also asked a follow-up question of those who indicated that the workshop was either too long or too short. In this question we asked the customers how long the workshop should be. Table 17 presents the results of this question and provides indicators of how long the workshops should be from the opinion of the customers who think the workshop is too short. In examining this table it is important to keep in mind that these recommendations reflect the opinions of only those who think the workshop is too short, or about 30% of the surveyed customers.

Table 17 Recommended length of workshop in days

Workshop	Recommended number of days from those who think the workshop is too short
FRI	4.75
REP	3.5
ESPC	4.5
FEDS	3.7
LCC	3.4
O&M	3.6
Average	3.9

* Insufficient data for length of workshop for customers who think the workshop was too long.

Cost and value of the workshop

Most customers (60%) indicate the workshop has monetary value and that they would be willing to pay a fee for the workshop. When customers were asked what they would be willing to pay for the workshops, customers responded with a wide range of values from a low of zero-to-\$50 to a high of over \$800 per workshop. On average, customers said they would be willing to pay between \$350 to \$400 per workshop, however this value varied by workshop. Participants in the REP Workshop valued the workshop the highest, with an average value of from \$451 to \$500. The customers attending the O&M Workshop said that the average price they would pay is between \$151 and \$200. The remaining workshops had average values between these two. One explanation for the difference in the price that attendees said they would be willing to pay is that while 163 respondents answered this question, the largest single response group (40%) said that they did not know what they would be willing to pay to attend the workshop. Of the remaining 60% who were able to indicate a price, the distribution of these responses are too small to be statistically reliable across the remaining responses. For this reason the prices that attendees are willing to pay, as reported in Table 18 should be considered an indicator of what customers are willing to pay rather than a conclusive statement about price or value.

Table 18 Price attendees said they will pay for FEMP workshops

Workshop	Percent						Average range in dollars
	Less than \$50	\$51 to \$200	\$201 to \$500	\$501 to \$800	> \$800	Don't know	
FRI	10	10	24	10		48	\$201-350
REP		19	19	13	25	25	\$451-500
ESPC	7	14	11	18	4	46	\$351-400
FEDS	4	15	15	15	13	40	\$401-450
LCC	5	22	19	22	5	27	\$351-400
O&M		23	8	8		62	\$151-200
Average							\$351-400

When customers were asked about the total costs to register and attend the workshops compared to other workshops they have attended in the past, 56% of respondents said that the FEMP workshop cost about the same or less than the others, or they reported that they did not know if the costs were higher or lower. On average 35% of all respondents said the FEMP workshops cost about the same and about 35% said they cost less. About 25% said that they did not know. From a cost perspective customers think that the FEMP workshops are a good deal compared to others. This provides support for concluding that the total cost attendees pay for the workshops is not negatively impacting attendance compared to other workshops. However, these data can be expected to change if workshop costs are increased in the future. For now, at the cost to attend and register, price does not appear to be a barrier for surveyed customers.

Table 19 provides the results of the question pertaining to comparative costs.

Table 19 FEMP workshop cost compared to others

Workshop	Percent				
	Higher than others	Don't know	About the same	Less than others	Much less than others
FRI	10	35	30	10	15
REP		13	56	19	13
ESPC		25	50	14	11
FEDS	6	29	20	27	17
LCC	3	17	33	28	19
O&M		39	46	8	8
Average	4	26	35	21	15

No respondents said that the FEMP workshops were much higher than others.

Customer identified workshop improvements

One of the goals of the survey was to obtain customer recommendations for workshop improvements. FEMP managers wanted customers to be able to report their recommendations so that they could be evaluated and potentially incorporated into workshop designs. On average, about 40% of the attendees said that changes could be made to improve the workshops. This ranged from 56% of the REP attendees to 14% of the ESPC attendees. Table 20 presents the percent of customers saying that the workshop could be improved.

Table 20 Percent of customers saying workshops can be improved

Workshop	Percent saying changes can be made
FRI	33
REP	56
ESPC	14
FEDS	49
LCC	51
O&M	15
Average	40

If customers indicated that changes could be made to improve the workshops we asked them to tell us what changes could be made. However, not all respondents answered this question.

To present customer recommendations we grouped similar comments and placed them in Table 21. Because of the small sample sizes for this study we are not presenting the number of people indicating each comment but instead have placed them in the order of the number of attendees making this type of a comment. It should be remembered that in some cases only one or two people may have made the comment. As a result, comments should be considered sample comments rather than a statistically valid presentation of customer comments.

Table 21 Customer recommended changes for workshops

Workshop	Recommended changes
FRI	Teach attendees how to sell concepts to decision makers Use better case studies and examples to demonstrate concepts Use problem solving sets that give uniform results across attendees Make technical presentations more interesting More time on computer with different lighting systems Improve software and more software discussions Better preparation of computer systems to minimize classroom problems
REP	More on information and discussions of smaller projects and solar energy More question and answer time with instructors More examples of cost-effective projects with case-studies and histories More hands-on learning with tailored discussions to support topics On-site tours not necessary, may not be best use of time Instructors need to be experienced, skilled and prepared
ESPC	Tailor examples and case studies to attendee's situation and needs Need two levels, one for administrators one for technical staff
FEDS	Real hands-on examples and case studies with actual data and results Limit the number of attendees to make workshop more effective Better time management of workshop sessions Tailor examples and case studies to attendee's situation and needs Use most recent software during workshops User friendly software and more time teaching software Plan for different skill levels and time needs for different skill levels Plan for the different uses of the tool and skills (managers, staff, policy) Time needed to cover subject well needs to be examined, too rushed More engineering and technical materials and presentations Provide better take home and follow-up materials Needs to be a basic and advanced course Plan for and support different standards (i.e., Japan, Korea, etc.) Plan for different computers and operating systems
LCC	Real hands-on examples and case studies with actual data and results Better and more user friendly materials and software Keep up-to-date with changing technologies Too rushed, plan for the time needed Needs to be a basic and advanced course Plan for the different skill and technical levels of the attendees
O&M	Needs to be a basic and advanced course Plan for the different skill and technical levels of the attendees More on preventive maintenance and tracking Keep up-to-date with changing technologies

Additional services wanted by workshop customers

Another way of approaching the customer satisfaction issue is to move away from direct measures of workshop satisfaction and look at broader service delivery and demand issues and examine what is being offered to the customer in comparison to what the customer is saying they want. This comparison also acts to give advice to the FEMP management team for planning and structuring FEMP services to meet customer needs. We start this comparison by looking at services that the customer has indicated they want that are in addition to the services offered at the time of the survey.

Service needs identified by FEMP customers

Workshop attendees were asked to indicate their demand for other support services if those services were provided by the FEMP. Attendees were not given pricing information, and were asked to not consider price in their response, but provide an indicator of the likelihood that they would use the service if it were offered to them. Customers were asked if they were very likely, somewhat likely, somewhat unlikely or very unlikely to use each of seven different potential FEMP services. Table 22 presents the results of these questions and demonstrates very strong demand for a number of workshop related services should they be developed, offered, promoted and priced in a way to take advantage of that demand. However, it should be noted that some of the recommended services are already being provided by FEMP.

It should be realized that service demand analysis from survey research can not directly predict actual demand. However, demand analysis can predict relative demand between products. Actual demand can only be predicted once the service is designed, developed, packaged, promoted and distributed to targeted customers. Products and services that are expertly designed, developed, packaged, promoted and distributed will experience far greater demand levels than those which lack careful attention to these marketing aspects. It is clear that there is strong demand for other FEMP services as documented by these survey results.

Table 22 Demand for additional FEMP services

Additional services	Likelihood of using service (all customers – all workshops)				
	Very likely	Some- what likely	Don't know	Some- what unlikely	Very unlikely
FEMP Tracks stories on workshop topics	31	49	-	12	8
One page flyers and case study follow-ups	39	39	3	10	9
Downloadable software off homepage	35	34	1	15	16
Follow-up telephone support for workshop topic assistance	26	40		20	15
Additional copies of workshop materials and tools	27	38	2	19	15
Additional software programs	26	38	4	17	16
Advanced level workshops	23	3	2	18	14

How customers want FEMP services delivered

This section looks at the methods customers comparatively rated for the delivery of FEMP services. In this part of the survey customers were asked to rate how practical or desirable a service delivery method is to them. Customer's scores were then grouped into a ranking system ranging from an "extremely practical method" to "not practical" depending on the customer's score. Scores of 1-4 were coded as "not practical," scores of 5 or 6 were coded as "neither practical or impractical," a score of 7 was coded as "somewhat practical," 8 was set to mean "very practical," and 9 – 10 were coded as "extremely practical." This coding system produced the results displayed in Table 23.

The results from this process indicate that local and on-site stand-alone workshops are, by far, the customer's two most preferred methods for obtaining FEMP services. These two preferred methods are followed by training or workshops provided in conjunction with key conferences and meetings. All other delivery methods measured in this survey can be grouped into a single group of equivalently rated delivery methods, including off-site workshops requiring air travel and hotel. From this data we conclude that there are three tiers of preferred delivery methods with the first tier being local or on-site workshops, the second tier workshop offered in conjunction with other conferences and meetings where travel can be leveraged. The third tier consists of all other delivery methods, with no single method in this tier demonstrating significant advantage others in the tier.

These results send a clear message about the customer's ability to travel and their receptivity to electronic or database delivery methods. It is very interesting to note that customers rated their preference for electronic workshops, training on CD-ROM disks and workshops requiring travel, all with equal preference. It seems clear that in the case of FEMP services, the product must come to the customer and that the newer electronic systems for delivering training will not experience significant use compared to offering services at the customer's door.

However, as energy product researchers, we also know that new product introductions move through a structured market development and acceptance process. Low service entry demand does not necessarily equate directly to continuing low demand. Service demand and use is a function of many interacting components, and service acceptance is often driven by social networking and market development functions following initial adoption of the service by market innovators and early adopters. However, it should be understood that the timeline between service acceptance by the innovators and the more general market for a given service or delivery method can be as little as a few years to as long as several decades or more. Table 23 provides the results of the survey questions pertaining to program delivery methods.

Table 23 Customer ratings for different service delivery methods

Service delivery methods	Percent				
	Extremely practical	Very practical	Some-what practical	Neither practical or impractical	Not practical
Off site workshops located near the office	42	32	10	12	3
On-site workshop provided at your facility	45	13	4	16	22
Training presented in conjunction with key conferences and meetings	18	26	19	22	16
Courses provided through local college or university	14	17	16	28	25
CD-ROM courses with materials and video presentation on disk	13	16	14	32	25
Down-load courses from the internet with materials and video presentations	11	14	11	31	33
Live electronic workshops with 2-way presentation and discussions	11	16	12	29	32
Off-site workshop requiring air travel and hotel	10	22	23	22	23
On-line or internet workshop with 2-way discussions	10	16	15	31	28
Correspondent courses provided through the mail	8	10	13	26	42
Correspondent courses provided through e-mail	7	14	15	23	41
Live electronic workshop with one-way presentations and discussions	5	12	12	31	40

Sharing Workshop Ideas and Materials

We know from the adoption and diffusion literature that there are two ways in which new ideas are spread. The first is by broadcast methods. Broadcast methods include mailings, catalogs, advertisements, and other forms of mass media. The other way in which information is spread is through contagion. That is, people learn about new ideas from each other. Innovators and early adopters are most likely to learn about new ideas and concepts through mass media. Later adopters are most likely to learn about ideas and concepts through social and professional networks.

One indicator of the success of the workshops is the degree to which participants share information with others. Figure 4 shows that 80% of the workshop participants shared information with others. Just under half of that 80% shared information with individuals outside of their organization. When we asked the participants how many times they had shared information with parties outside their organization, the median response was three times. About 20% of the respondents indicated that they had shared the information 10 or more times.

Respondents were asked about the ways in which they share information. The largest percentage of respondents said that they personally reviewed materials with others. About the same percentage copied and distributed materials or sought additional copies from FEMP in order to distribute them. About 20% of the respondents sought the opinion of others about the materials that they were offering.

Table 24. Method for sharing information*

Method of sharing information with a colleague	Percent
Personally review materials with others	41
Copy and distribute materials	29
Ask others about their opinions of the materials	19
Obtain additional copies of the materials from the FEMP	11
Other methods	9

*Respondents were allowed to offer more than one response. Not all respondents offered a method.

The most common item that participants share is the workbook. Case studies and software were the next most frequently shared items.

Table 25. Most common items that were shared

Type of material shared	Percent
Workbook	47
Software	39
Case studies	40
Other lessons learned	30
Other items	15

Figure 4. Participants shared workshop information

Workshop participants are sharing data. Nearly all the participants said that they had shared information. More importantly, almost half of those who shared the information said that they shared information outside of their organization. About a quarter of the respondents were able to identify specific projects for which the information they shared was used. However, sharing information does not necessarily mean that information gets acted upon. Therefore, we asked if the respondent thought that the information that was shared would be used in decision making. Approximately 64 percent of those who said they shared information indicated that they thought it would be used. Thirty eight percent (53 respondents) said that they were familiar with the projects in which the information would be used.

These 53 respondents were also asked what types of projects the shared information might influence. The respondents reported that information was most often used in HVAC projects (54%) followed by lighting and motors related projects (45% each).

Table 26. Projects influenced by sharing information

Type of program or project in which information was used	Percent
HVAC systems or controls	53
Lighting systems	45
Motors, pumps, drive or motor controls	45
Building envelopes or envelope components	28
Energy management systems	19
Industrial processes or equipment	10
Commercial processes or equipment	6
Other systems not listed	4
Residential equipment or construction	2
Vehicles or transportation technologies	0

¹ Respondents were allowed to offer more than one response. Not all respondents offered a method. The N is 53.

Project and Energy Impacts

One of potential results of the FEMP workshops is the use of workshop information, skills or tools to achieve energy or environmental impacts through projects implemented in whole or in part as a result of these workshops. To obtain impact information we included customers who had attended workshops in 1995 and 1996. The 1996 sample was selected because these customers typically have better recall of the workshop than earlier participants and can typically provide more detailed opinions and recommendations relating to their participation. The 1995 sample was selected because these participants have had more time to use their FEMP training to implement projects and, in theory, be better able to report project impacts. This chapter reports the results of the survey questions pertaining to the impacts of the FEMP workshops on customer projects and activities.

Project impacts

The FEMP workshops are having a significant impact on projects designed to save energy or increase the energy efficiency of customer's facilities or processes. A total of 66% of attendees indicate they have used their workshop skills or tools on an average of 30 projects since their attendance. However, the mean number of projects per workshop type are significantly different and range from a low of 4 projects for attendees of the O&M Workshop to an average of 70 projects for the LCC Workshop. This response range is consistent with the type of workshop attended. The LCC Workshop teaches energy efficient product evaluation practices which give advantage to equipment with lower life-cycle costs. A "project" for the LCC Workshop can be every purchase made in which LCC skills or tools are used. On the other hand the O&M Workshop teaches energy efficient operations and maintenance procedures. These procedures are often limited to a small number of buildings or systems per attendee. As a result, we would expect to see workshops like LCC and the FRI Workshop, where attendees can be involved in a large number of projects, with more projects than attendees of the O&M or the REP Workshops where there is typically a smaller number of total project involvement by an individual.

The FEMP workshop attendee database identified 2,110 workshop participants. If these participants implement projects using their FEMP tools and skills at the same rate as the surveyed customers then FEMP has achieved approximately 51,468 incidents of project influence from the workshops identified in Table 36 between the period beginning January 1995 through December 1996. This does not account for projects occurring prior to this period or for those following this period. However, because this number is calculated using self reported use of FEMP workshop skills and tools for each customer surveyed it does not account for multiple incidents of influence on the same project. This aspect acts to over-count projects. In addition, an individual project can be as small as a single product purchase, to as large as a new energy production facility or energy improvements for an entire military base. There is no common definition of what constitutes a single "project."

Table 27 presents the number of projects on which workshop attendees said they have used these skills. Column two in this table provides the average number of projects implemented by attendees who said they have used their FEMP acquired skills and tools on projects. Column three divides the total number of projects by the total number of attendees to arrive at an estimated number of projects for all attendee. Distributing these projects across attendees who indicate they have and have not used their FEMP skills provides an average of 20 projects for each attendee. It is clear from these numbers that FEMP is having strong project impacts.

Table 27 Number of projects where FEMP skills or tools were used

Workshop	Number of projects where FEMP tools or skill were used per workshop attendee	
	Only those indicating they have used the tools or skills on projects*	Average number of projects reported per workshop attendee*
FRI	50	40
REP	7	3
ESPC	6	5
FEDS	14	8
LCC	72	53
O&M	4	4
Average	30	20

Table 28 presents an estimation of the number of times FEMP provided information, tools or skills have influenced energy projects between January 1995 and December 1996 and is estimated by multiplying the total number of workshop attendees by the average projects implemented per attendee.

Table 28 Estimate of the number of projects influenced by workshop attendees

Workshop	Estimated projects impacted by FEMP training		
	Number of attendees as reported on FEMP survey contact files	Average number of projects per workshop attendee	Estimated number of projects influenced by attendees
FRI	288	40	11520
REP	33	3	99
ESPC	701	5	3505
FEDS	426	8	3408
LCC	612	53	32436
O&M	50	4	200
Total	2110		51468

Does not account for collaboration on projects or multiple influences on the same project

Time needed for impacts to occur

An important issue to consider when attempting to document project impacts is the amount of time needed for impacts to be realized. If the typical planning and implementation period for a project is 2 years then impacts cannot be expected until after the 2nd year following exposure to a related training program. In order to estimate the amount of time needed for the planning and implementation of FEMP related projects we asked workshop attendees how long they typically take to plan and implement a typical project for each of the workshop types. As expected, different projects take different amounts of time to plan and implement. On average, FRI, O&M and LCC related projects take the least amount of time and can be expected to show results within a year of workshop attendance. However, other projects, such as those associated with ESPC, REP and FEDS Workshops can take between 1 and 2 years to plan and implement. For these workshops, impacts cannot be expected until the project has had time to show results.

It is interesting to note that there is a strong correlation between the number of projects reported by attendees (see Table 27) and the time needed to implement projects (Table 29). Attendees of the workshops with short planning and implementation horizons report implementing far more projects than attendees of workshops with typically long planning horizons. This is certainly a factor to consider for impact measurements. Because the majority of attendees contacted for this survey attended workshops in the 1995 to late 1996 and very early 1997 period, projects with long planning and implementation horizons may just now be in their final implementation stages, making it difficult to report energy impacts as they may not have yet been measured.

Table 29 Time needed to implement FEMP related energy projects

Workshop	Average number of months needed to plan and implement the average project	Range of planning and implementation months needed for different types of projects
FRI	7	2 - 4
REP	19	1 - 36
ESPC	22	3 - 50+
FEDS	14	1 - 50+
LCC	9	1 - 30
O&M	9	6 - 12
Average	14	

Energy impacts

Obtaining actual estimates of energy or environmental reductions for the projects with which people have been involved proved to be a difficult task. The method used to obtain project data involved the use of a secondary data collection instrument to be sent to the customer and returned shortly following the completion of the telephone survey.

In summary, during the survey if the customer said they had used the FEMP skills or tools on energy or environmental projects the surveyor asked for permission to fax them a form to obtain impact information. The form would be filled out by the customer and faxed back for recording into an impact spreadsheet. A total of 62 faxed data forms were sent to customers. Of these, 7 customers filled out information on 14 energy projects and returned the forms for analysis providing a very low response rate of 11%. Of the 14 forms returned 12 had usable data. Most of the data on the forms pertained to energy savings with almost no pollution reduction information. Of the 12 projects submitted by the 7 individuals, total project expenditures were \$5,775,700, saving an estimated \$832,500 dollars in energy costs a year, for a simple project payback of 6.9 years and a total estimate annual savings of 37,000 MBTUs.

Because of the very limited response and the limited amount of project information provided, we suspect that these data are not representative of the average FEMP project for any of the workshops examined in this study. While we are providing these results in this report, we strongly encourage FEMP managers not to use this information as an indicator of project impacts.

During the survey if customers indicated they used their FEMP skills or tools to implement a project they were also asked if they were interested in having their project become a FEMP case study or showcase. Of the customers asked this question, several indicated they would be interested. Should FEMP managers wish to follow-up and develop these projects into showcases or case studies, these individuals can be contacted to conduct project-specific examinations for project development. Because many of the FEMP workshop attendees have implemented several projects, we have linked these volunteers with the number of projects they have completed as reported during the telephone survey. The results of this comparison can be seen in Table 30 where 23 workshop attendees have used their FEMP training and skills in a total of 339 different energy projects and have volunteered to make these project showcases or case studies.

Table 30 Attendees receptive to using projects as FEMP case studies

Workshop	Receptive to using their projects as a FEMP showcase or case study	Number of projects they have completed
FRI	1	70
REP	1	6
ESPC	4	22
FEDS	11	118
LCC	4	114
O&M	2	9
Total	23	339

Contacts with FEMP Staff

In addition to the customer's experience with the FEMP workshops, the survey also asked questions pertaining to other (non-workshop) FEMP contacts. These questions help managers understand the range of FEMP services that are used by workshop customers and permits a comparison of customer satisfaction and reaction to these other services.

Slightly more than one-third of the workshop customers had additional contacts with FEMP staff. About half of this group (Table 31) said that they had 5 or fewer contacts. Surprisingly, there was a small group of individuals, about 10% of the group, that reported 50 or more contacts. In thinking about the amount of follow-up contact it is important to keep in mind that the participants come from a variety of agencies. Once they have taken the courses, they may be more likely to work with contacts within their own agencies than within FEMP depending on the level of energy support services within their agencies. We did not pursue the issues of whether participants were working more with individuals inside their agency following the workshop. However, having one-third of the sample with additional FEMP contacts is not a trivial proportion and the volume of contacts per individual is quite high, indicating that many workshop attendees also have an on-going relationship with the FEMP services beyond workshop participation.

Table 31. Number of contacts with FEMP offices and staff

Number of contacts	Percent N=60
1 to 5	53
6 to 10	17
11 to 20	12
21 to 50	6
50 to 150	12

Table 32 shows the offices with which those contacts occurred. With the exception of the operations and customer service team, the contacts have been geographically scattered. It is not clear why, but this group of people have made little use of the Project Finance Team or the Technical Assistance Team beyond their involvement with the workshops.

Table 32. Contact locations for people seeking FEMP services in the last year

Location / group	Percent
The operations and customer service team	29
Other	14
PNNL	11
Seattle	11
Denver	9
NREL	9
Energy Management	5
LBNL	3
Atlanta	3
Chicago	2
Boston	2
The Technical Assistance Team	2
The Project Finance Team	2

We asked two questions about participants' general levels of satisfaction with their interactions with FEMP staff. First, we asked about their overall satisfaction with the office staff, and secondly we asked about overall satisfaction with the assistance they received. Although participants were quite positive about their interactions with staff (Table 33), there are sufficient scores at "7" or below to indicate that there are opportunities for improvement. Also, although the average score for each measure is 8.5, the two questions do not measure quite the same things.

Table 33. General satisfaction with FEMP office staff and assistance

	Mean	Percent having satisfaction level					
		1 to 4	5 to 6	7	8	9	10
Overall satisfaction with the office staff	8.5	2	9	16	17	19	38
Overall satisfaction with the assistance received	8.5		8	16	25	21	32

At the same time we asked about the overall satisfaction with technical assistance, we also asked about satisfaction with a number of other aspects of participant interactions with FEMP (Table 34). The highest rated category was staff politeness. The respondents also were quite pleased with the cost of obtaining assistance from FEMP and pleased with the reliability of the information and the timeliness of staff response. The value of

the assistance, the ease of contacting staff, and the knowledge of staff were positively rated, but fell in the middle of the distribution of the items. The lowest rated items were the ability of the staff to understand their needs, the ease of downloading information from the web-site, and the ease of obtaining information through the hot-line. It should be noted that the items related to the web-site and the hot-line had the smallest number of responses indicating that many people had not had experience with these services.

If FEMP has a desire to increase overall satisfaction, we can examine the relationship between each of the aspects of satisfaction and overall satisfaction with the non-workshop related FEMP contacts. However, as stated earlier, changing performance in an area with a low satisfaction score may not increase overall satisfaction if the area of performance is unrelated to general satisfaction.

Table 34. Average satisfaction scores for non-workshop related FEMP contacts

	Mean
Politeness of FEMP staff	9.0
Cost of obtaining FEMP's assistance compared to others	8.8
Reliability of the information provided	8.5
Timeliness of FEMP responses to your questions	8.4
Value of FEMP's technical assistance compared to others	8.3
Ease of contacting FEMP staff	8.2
Ease of accessing information through the FEMP web-page	8.2
Knowledge and experience of the FEMP staff	8.1
Ease of obtaining answers to questions	8.1
Range of services offered by the technical assistance programs	8.1
Ability of FEMP staff to understand your needs	8.0
Ease of downloading information from the web-site	7.5
Ease of accessing information through the FEMP toll-free hotline	7.4

Table 35 displays the results of using this technique for each of the two general non-workshop satisfaction variables, overall satisfaction with technical assistance and overall satisfaction with FEMP contacts. Because there were some variables with fewer cases than might be desirable, we limited the variables in the analysis to those variables which had at least 45 cases. The "driver" variables are marked with the bold capital "X" and the variables that were deleted in order to maintain the case base have been marked with a small "x."

For each of the overall satisfaction variables, the analysis identified two "driver" variables. In the case of overall satisfaction with office contact, ease of obtaining answers and the range of services offered were closely associated with general satisfaction. In other words, people who thought it difficult to obtain information were less satisfied with their office interactions than were people who found it easy to obtain information. Managers need to look for ways to improve the ease with which information can be obtained.

The exact nature of the "ease of obtaining information" problem needs to be explored more thoroughly. The problem may be one of people not knowing where to go for information. It may be that knowledgeable personnel are hard to identify or difficult to reach, or people making inquiries may not know for sure what they need and therefore may be experiencing difficulty getting to relevant information.

The second driver of general satisfaction with FEMP offices is the range of services. However, the correlation is negative. Those who rate the general service highly are most likely to rate the range of services the lowest and those who rate the range of services lowest rate overall satisfaction the most highly. This is a problem that deserves some exploration. While there may not be a causal relationship, the correlation is strong enough to be statistically significant. What this finding seems to suggest is that services may be spread too thin. People might be more satisfied if there were fewer but higher quality services, or perhaps, the same number of services but higher quality services.

The other general measure, satisfaction with technical assistance, is driven by two variables, timeliness and value. The fact that the drivers are different than for the other general measure is consistent with the earlier point that these two general satisfaction variables have some commonalties, as well as some differences.

People who feel that technical assistance is timely are more likely to be generally satisfied than those who do not. Those who perceive value in what they receive are more likely to be satisfied than those who do not perceive value. From a management perspective, these findings imply that managers should be seeking ways to provide technical assistance in a more timely manner and should be looking for ways to increase the perceived value of offerings if their goal is to increase overall satisfaction with general technical assistance.

Table 35. Drivers of overall satisfaction for non-workshop FEMP contacts

	Overall satisfaction with interaction with offices	Overall satisfaction with technical assistance received
Politeness of FEMP staff		
Cost of obtaining FEMP's assistance compared to others	x	x
Reliability of the information provided		
Timeliness of FEMP responses to your questions		X
Value of FEMP's technical assistance compared to others		X
Ease of contacting FEMP staff		
Ease of accessing information through the FEMP web-page	x	x
Knowledge and experience of the FEMP staff		
Ease of obtaining answers to questions	X	
Range of services offered by the technical assistance programs	X	
Ability of FEMP staff to understand your needs		
Ease of downloading information from the web-site	x	x
Ease of accessing information through the FEMP toll-free hotline	x	x

X indicates a primary driver of satisfaction, x indicates a secondary driver

Recommendations

In an effort to help FEMP managers consider the implications of the information presented in this report, we have prepared a number of recommendations that FEMP managers can consider. These recommendations include:

1. Provide customers with time during the workshop to interact with other attendees. Customers want to hear about the perspectives and experiences of other customers pertaining to the technologies and techniques and to share related stories and anecdotes. This is consistent with what is known about product diffusion in the marketplace. Customer networking of energy efficient information is among the most effective tools for moving the market once the innovators and early adapters have moved to the new technology. Workshops that allow this powerful tool to influence attendees will be more successful once the products are established following early market development. There should be ample time for attendees to share their experiences during the workshops. Workshops can take advantage of the range of expertise of those registering for the workshops and use that expertise to help sell the workshop concepts. Improving these aspects of the workshops will also increase customer satisfaction in two areas where satisfaction is low, the time to interact with others and the use of examples, anecdotes, and stories.
2. FEMP workshop managers should consider modifying their presentations and customer involvement to include more customer interaction to take advantage of customer expertise. In support of the previous recommendation we find that FEMP workshops are attended by customers with a wide range of expertise, ranging from people who are unfamiliar with the terminology, to customers who have already implemented the technologies being taught. At the same time customers are recommending that they be allowed to learn from other attendees and be able to share stories and anecdotes related to the technologies. This combination of attendee demand and the range of customer expertise is rare in a classroom environment.
3. FEMP should increase the amount of time for several workshops. Managers should examine the materials and subjects to be covered in the workshops in addition to the need for customer interaction and case study reviews and confirm the amount of time needed for each workshop. This applies to the ESPC, FEDS, and LCC Workshops, each of which have from 25% to 33% of attendees saying they are too short, but especially the O&M Workshop where the majority of attendees say it is too short.
4. Whenever possible, workshops should be scheduled at or near the customers facilities or in conjunction with other travel. Workshop managers should plan workshops to correspond to the areas of high customer density and piggyback with other customer travel habits.
5. FEMP should take advantage of customers who have volunteered to use their projects as showcases and case studies. Many customers indicated the need for "case studies and stories" that reflect actual field conditions. This would act to fill this need.

Likewise, FEMP instructors and follow-up support staff can maintain contacts with attendees who they believe are involved with projects that can serve as "real world" examples to improve their presentations and customer understanding of the technologies being presented.

6. Managers should adjust their materials and presentation methods to accommodate customer recommendations. Workshop managers should review the customer comments presented in this report and examine their workshop formats and presentations from the perspectives of these comments.
7. Managers should carefully consider the impacts additional fees to attend will have on the workshop. While 60% said they would pay from \$151 to \$500 to attend, 40% did not know what they would pay. If FEMP elects to charge for workshop attendance they may want to start at about the \$200-\$300 level if customer travel is required and monitor attendance impacts. FEMP may also want to keep auxiliary funds available to assist agencies that need financial help. Because customers do not want to incur travel expenses to attend the workshop it is clear that there are already strong monetary considerations. Charges for the workshop would clearly be more favorably received if the workshop were held on location or nearby.
8. Managers should review annually the results of on-going workshop evaluations and re-engineer the workshops to stay current with customer expectations and market conditions. Because of the number of recommendations regarding improvements to the workshops, managers will want to make sure workshop evaluations are distributed and reviewed following each workshop or the annual evaluation can include a workshop redesign component to assist with this process.
9. Workshop managers should make extra copies of workshop materials available to workshop attendees during and following the workshops. Because 80% of workshop customers share materials with others inside and outside of their organization, FEMP workshops will want to make sure extra copies of all materials are available for the attendees to take with them. In addition, workshop managers will want to make sure that attendees can easily order and quickly obtain additional materials as needed and that attendees are familiar with the phone numbers from which materials can be ordered.
10. Managers will want to incorporate time during the workshop to inform attendees of the range of other services provided by FEMP and how they can take advantage of these services. When customers were asked about their demand for additional FEMP services, many customer indicated strong to medium levels of demand. FEMP will want to make sure workshop customers are aware of how they can take advantage of these services by including a brief presentation on available services during the workshops. However, FEMP may want to conduct a quantitative and qualitative review of these services to assure that customer satisfaction will be high for those referred to these services prior to increased workshop marketing efforts.

11. FEMP should consider providing customers with information and materials related to workshop subjects, but which may not be included in the workshops. FEMP workshop customers are energy professionals who enjoy staying up-to-date on energy issues, technologies, and systems. The FEMP workshops will want to capitalize on these personal interests and provide information in addition to workshop materials that support these interests. This could take the form of new technologies currently in the development phase, or identification of organizations conducting product research and development and some of the technologies just may be released, or other energy related topics of interest. These can be provided at the end of the workshop with a short overview presentation so that the materials add to workshop satisfaction but do not interfere with workshop content or presentations.
12. Follow-up evaluations to document impacts from FEMP workshops need to be coordinated with the type of workshop being evaluated and scheduled to allow time for impacts to occur. Impact evaluations for the FRI, LCC and O&M Workshops can be evaluated between 1 and 2 years after workshop attendance, however, the ESPC and REP workshops will need to be evaluated from 2 to 4 years after attendance. The FEDS Workshop can fall between these periods. However, evaluators will find that customers may not know the impacts of their projects. In addition survey researchers will have a difficult time obtaining impact information over the telephone. It will be necessary to conduct impact evaluations using repetitive calls and possibly multiple follow-up mailings to obtain impact data. In many cases on-site examinations by skilled evaluation staff trained in impact analysis may be required.
13. FEMP is planning to conduct an annual customer survey. This survey can include questions from this survey that are particularly valuable for workshop managers. FEMP should identify a short subset of the questions pertained to in the workshop survey and routinely conduct customer call-back surveys to identify the impacts that the workshops are having on their market and to identify potential subjects for improvements.

Appendix

Workshop descriptions

The Federal Energy Management Program's (FEMP) Technical Assistance Team provides a wide range of energy efficiency services to customers. Each of these services is designed to support one or more of the following goals: 1) increase the energy efficiency of customer's facilities or processes, 2) reduce environmental emissions, and 3) provide cost-effective energy management. One of the types of services provided by FEMP are energy efficiency or energy management related workshops designed to support energy efficient or energy management activities or decisions. This report provides the results of an evaluation of a number of technical assistance workshops provided by FEMP and covers the following workshops.

Energy Efficient Operations and Maintenance (O&M) Workshop

This workshop focuses on the operations and maintenance of buildings and building systems to achieve maximum levels of energy efficiency associated with different building technologies. The workshop demonstrates that energy efficiency is often a function of the ability to effectively operate and maintain energy consuming systems and that projected energy efficiency levels are often a function of the operations and maintenance of the equipment in addition to the selection and installation of the equipment. This workshop identifies energy efficient monitoring, operation and maintenance practices required to guarantee maximum energy performance from selected building systems. Attendees of the workshop are able to identify building systems that impact energy efficiency, the monitoring needs of those systems with respect to maintaining energy efficient performance, and the maintenance procedures and schedules that are needed to assure continued efficient operations.

Federal Re-lighting Initiative (FRI) Workshop

This workshop focuses on facility re-lighting or re-lamping to achieve energy savings and in most cases a reduction in the cost of operating lighting systems. This workshop presents how to identify re-lighting opportunities, how to evaluate re-lighting options with different equipment and equipment configurations, how to identify the costs and cost differences across different lighting systems, and how to identify lighting systems that can be successfully installed to achieve a reduction in energy consumption. The workshops interact with and help support the Environmental Protection Agency's Green Lights program. The workshop helps attendees understand the amount of energy that is used for lighting, and help identify potential improvements in energy efficiency, maintenance and operations and in lighting quality.

The workshop includes the presentations of the Federal Lighting Expert software and in some cases the Lighting System Screening Tool. These software programs can assist with the identification of lighting and re-lighting opportunities and the selection of lighting equipment and configurations that can be used to achieve lighting goals with an accompanying savings in energy and energy related costs.

Energy Savings Performance Contracting Workshop (ESPC)

This workshop focuses on the use of contracting mechanisms to acquire and maintain energy efficiency improvements and/or the on-going operations of energy systems, typically with respects to building designs and equipment. The workshop reviews and demonstrates different types of contracting projects and procedures, including project evaluation procedures that lend themselves to the performance contracting environment. The workshop also reviews project examples and provides case studies on the benefits, potential problems and possible results associated with contracting the performance of building systems to performance vendors. Attendees of this workshop become familiar with potential performance contracting opportunities, the limitations and drawbacks associated with performance contracting, the benefits and opportunities possible and leads them through example of good and bad performance contracts and contracting projects. Attendees become very familiar with both the possibilities and problems associated with performance contracting and are able to successfully identify performance contracting opportunities in their facilities and enter into and negotiate beneficial performance contracts.

Facility Energy Decision System Workshop (FEDS)

This workshop provides training pertaining to the use of software and analytical tools for building energy decisions focusing on energy efficient materials, products and systems, and on the operations of those systems in ways that maximize the energy efficiency and reduce the environmental impact of the building. The workshop presents a method for evaluating different building design systems and identifying opportunities for energy efficient improvements to the building structure, the climate control equipment serving the building and the operation of that equipment. The workshop helps building operators select and manage different building systems in ways that increase the energy efficiency of the building and in most cases minimize operational costs. The workshop is strongly linked to the use of the Facility Energy Decision Screening Tool and focuses on the use of this tool to achieve the results described above. As a result of the workshop, attendees are familiar with the operations of the software and how it can be used to drive or assist with decisions that directly impact the energy efficiency of building operations.

Energy Efficient Life-Cycle Costing Workshop (LCC)

This workshop provides training in the area of total cost product acquisition. In many cases purchase decisions are made on a first-cost, or first cost plus materials and supplies basis. The LCC workshop carries the concept much further and introduces participants to the concept of making purchase decisions on the total lifetime costs associated with a purchase decision, including the cost of the energy consumed by the product over its useful life. Because in many cases the cost to operate a product is a major component of the total product costs this workshop provides training on how to both reduce total costs and increase energy efficiency by accounting for the lifetime energy consumption costs in making the purchase decisions. This workshop provides the tools and skills that enable attendees to make decisions that save dollars and reduce energy consumption.

The skills presented in the workshop are supported by the Building Life-Cycle Costing software that is distributed and demonstrated during the workshop. This software program provides a method for comparatively analyzing the total costs to purchase, use and maintain a product over its useful life and identifies the best product decision from an energy perspective and a cost perspective once the individual characteristics of multiple products are entered into the program. Together the workshop and the software program provide a comprehensive presentation of the concept of energy efficient life-cycle costing and provides the tools the attendees need to implement LCC purchase decisions within their organizations.

Renewable Energy Projects Workshop (REP)

This workshop focuses on the use of renewable energy in a variety of projects where renewable energy can be used instead of non-renewables. The workshop is project focused in that the contents of the workshop look at specific projects that have successfully used renewable energy to accomplish a specific task or activity. A goal of the workshop is to demonstrate how renewable energy projects can be used in a variety of different settings, structures, or environments. Projects range from the use of solar energy to heat and/or light structures, projects that provide power to remote operations or equipment, projects that use wind energy or biomass to meet energy needs or the use of other renewables. Participants in this workshop come away with an understanding of how renewable energy projects can be designed and implemented to achieve specific results. Examples of several renewable projects are presented and discussed in the workshop, including both project energy and financial reviews.

The workshop also provides guidance to attendees on how Federal policies regarding the consideration and use of renewable energy can be effectively satisfied. The workshop also, in some cases, demonstrates the use of the Renewable Screening Tool software program that assists managers in determining the potential for the use of renewable energy at a specific project and location. This program helps evaluate the use of renewable energy to accomplish specific tasks and helps compare the use of renewable energy with other non-renewable sources. Attendees at the workshop are provided with a framework from which renewable energy projects can be examined and evaluated for potential benefits and for compliance with Federal policies.

Workshop Dates

The workshops were conducted at different locations across the United States with the earliest workshop held during 1991. We do not have information on where the workshops were held, however the following table provides the dates of the workshops as listed in the FEMP tracking system for the six workshops evaluated in this study. Table 36 provides the workshop dates as listed in the FEMP customer contact database provided for this survey.

Table 36 Workshop dates as listed in the FEMP contact database

ESPC	FEDS	LCC	FRI	O&M	REP
1/1/93	1/1/91	1/1/92	1/1/93	11/29/95	11/29/95
1/1/94	1/1/92	1/1/93	1/1/94	3/4/96	3/4/96
10/1/94	1/1/93	1/1/94	1/1/95	7/10/96	7/9/96
11/1/94	1/1/94	10/1/94	4/1/96	9/9/96	8/15/96
3/1/95	18/1/94	1/1/95	4/3/96	5/15/97	
5/1/95	10/1/94	5/17/96	7/22/96		
6/1/95	1/1/95	5/22/96			
12/5/95	2/1/95	6/18/96			
1/1/96	3/6/96	5/20/97			
1/11/96	4/4/96	6/4/97			
4/30/96	6/20/96				
5/1/96	4/10/97				
5/15/96					
6/4/96					
6/11/96					
6/22/96					
7/17/96					
7/23/96					
10/31/96					
12/10/96					

Methodology

The project began with meetings and discussions with members of the FEMP management team to determine which workshops to target during the survey and the identification of topics on which to focus survey questions. During these meetings the six targeted workshops were identified for inclusion in the project. Following the initial project scoping meetings, draft surveys were developed by Nick Hall of TecMRKT Works, and Gretchen Jordan of Sandia National Laboratories, with input from John Reed of TecMRKT Works. The survey development process built on the teams experience and history conducting energy program research and was guided by two key papers¹ on measuring customer satisfaction and the diffusion and use of new technologies in the marketplace.

Once draft surveys were completed for each workshop they were submitted for review to FEMP managers in both the headquarters office and in the FEMP field offices. The review process was structured so that FEMP managers could review and comment on the surveys pertaining to their workshops and software packages, as well as the surveys developed for other workshops. The review process produced significant changes and expansion of the original instrument, but served to focus the instrument on key issues important to the FEMP managers. The results of this process produced a 60 to 65 minute interview instrument that was made ready for field testing.

The sample selection for the workshop and software components was conducted using a random customer identification and extraction process from a master file of FEMP workshop attendees and software recipients. This electronic file consisted of about 2,000 individuals who have attended one or more FEMP workshops or have received one or more of the targeted software programs. This file was processed to identify customers for survey contact. This process started by filtering the file for multiple contacts within the program target period so that we would not contact the same individual for more than one survey. The sample data was then filtered to exclude individuals who worked for DOE. The filtered file was then segmented into workshop and software components and sorted by participation dates beginning in January 1995, and ending in December 1996. The remaining contacts were then assigned a random number and the contact data files were segmented by workshop or type of software received and sorted by their random number. We then selected the first 150 individuals from each of the targeted workshops and software programs. The exception to this rule was for workshops and software programs that had less than 150 contacts. In several cases there were fewer than 50 contacts. In the cases where there were less than 150 customers listed the entire population was selected for the sample. The contacts were then assigned to telephone interviewers and the survey was field tested. Following field tests the surveys were modified to reflect changes identified during the field test and readied for full field

¹ 1997, Reed, John H. and Nicholas P. Hall, Methods for Measuring Customer Satisfaction, in *Proceedings of the 1997 International Energy Program Evaluation Conference*, Chicago, IL.

1997, Reed, John H. and Nicholas P. Hall, Methods for Measuring Market Transformation, in *Proceedings of the 1997 International Energy Program Evaluation Conference*, Chicago, IL.

implementation. The modifications shortened the survey to about 50 minutes by dropping questions that were not productive or were confusing to the customer.

Once the survey was ready for field implementation hardcopies of the survey were produced along with sample contact sheets. These were provided to the survey staff for field implementation. The survey was conducted using pen and hard-copy surveys because the size of the survey was too large to be programmed into the CATE (computer aided terminal entry) system. This proved to be a significant disadvantage to the survey substantially delaying the examination of survey results because it required transferring the hard-copy data to electronic datasets rather than using direct survey entry methods.

Once the surveys were assigned to the telephone surveyors each surveyor systematically cycled through the contact sheets until 40 surveys were completed or the sample was exhausted. Because of project budget limitations and the length of the interview, the interview goals were set between 20 and 40 completed surveys per workshop depending on the size of the individual workshop or software sample and the ability to reach targeted contacts.

Survey researchers attempted to contact individuals targeted for the survey no less than 10 times and in most cases 12 to 15 attempts were made before the participant was dropped from the contact sheet. Successfully contacting workshop attendees proved to be a major obstacle for this project. Four reasons for dropping contacts as communicated to us by FEMP customers and by our survey researcher team are:

1. many of the workshop attendees are military staff who tend to move every few years,
2. recent reassignments and restructuring of Federal programs due to budget cuts and lack of promotional ability have significantly changed staff assignments and responsibilities,
3. extensive use of voice mail systems and an inability to contact the customer while they are in their office required excessive call-backs many of which were unsuccessful, and
4. many of the telephone numbers recorded on the FEMP datasets used to reach the customers proved to be non-working or reassigned telephone numbers.

Together these conditions initiated the elimination of the majority of customers on our contact sheet after fruitless attempts to reach these customers. In an attempt to combat some of these obstacles we obtained additional in-coming, call-back telephone lines for the telephone interview staff so that return telephone numbers could be left for customers through their voice mail. These phone numbers were linked to special lines installed in the office of the contracting team and in the homes of the interview staff so that return calls could be received 24 hours a day. This technique proved to be valuable. In several cases return calls to complete the surveys were received from the targeted staff throughout the day and night.

Even with these additional efforts, we were unable to complete the targeted number of surveys for two workshops. In both these cases we exhausted the entire sample database without reaching our survey goal.

Inability to contact workshop participants proved to be the greatest barrier to reaching our survey goals and required more than doubling the time needed to conduct the surveys. However, once remaining customers were reached we were successful at completing the 50 minute survey. Over the six different workshops the survey refusal rate was less than 4% once the customer was successfully contacted. The final number of completed surveys for each of the targeted workshops, the percent of the workshop attendees surveyed and the confidence interval for the sample size is presented in the following table.

Table 37 Survey completion totals

Workshop	Surveys completed	Number of attendees	Percent	Confidence interval
LCC	37	612	6.0	95 +/- 15
FEDS	58	426	13.6	95 +/- 12
ESPC	28	701	4.0	95 +/- 18
O&M	13	50	26.0	95 +/- 24
FRI	21	288	7.3	95 +/- 20
REP	16	33	48.5	95 +/- 18
Total sample	173	2110		95 +/- 7

Managers of future FEMP surveys will need to understand that the field staff conducting the surveys will need to make themselves available to the customer outside of typical business hours for many of the targeted contacts. In addition, samples of participants will need to be selected with the understanding that significant investigative work may need to be conducted to locate customers. This is especially true if the contact entry in the database is more than 1 or 2 years old.

Once the contact goal was reached for each workshop or software program or the contact sheet was exhausted, the survey team begin entering the data into electronic databases. These databases were checked and reviewed by the survey supervisor and then converted to SPSS analysis files. The SPSS analysis files were used to conduct the analysis and write the research conclusions.

Workshop specific job responsibilities**Table 38 Job responsibilities of FRI workshop attendees**

Federal Re-lighting Initiative Workshop	Degree of job responsibility (percent)				
	Very large	Large	Medium	Small	None
Energy related tasks					
Recommend purchase or installation of equipment	43	33	14	5	5
Evaluate cost or savings of energy equipment	33	48	19		
Manage new or construction or renovation projects	38	14	14	10	24
Evaluate energy technologies for your organization	19	33	19	19	10
Coordinate contacts with utilities or ESCOs	24	33	10	10	24
Track or measure energy consumption or pollution	24	19	14	24	19
Educate others on energy efficient systems/technology	38	14	24	5	19
Report progress of energy or environmental actions	14	52	14	10	10
Design energy consuming system or improvements	10	19	33	10	29
Purchase or install energy equipment or services	19	33	19	5	24
Develop or direct policy change about energy mgmt	5	19	38	10	29
Keep facilities up-to-date with current technology		43	38	10	10
Install equipment or energy management systems	10	24	29	5	33
Maintain equipment or energy management systems	5	14	19	10	52
Evaluate energy technologies for other organizations	14	19		5	62
Demonstrate new or improved energy technologies	14	24	24	14	24
Evaluate environmental impacts of equipment		33	24	33	10

Table 39 Job responsibilities of REP workshop attendees

Renewable Energy Projects Workshop Energy related tasks	Degree of job responsibility (percent)				
	Very large	Large	Medium	Small	None
Recommend purchase or installation of equipment	44	19	6	13	19
Evaluate cost or savings of energy equipment	31	25	19		25
Manage new or construction or renovation projects	25	6	6	25	38
Evaluate energy technologies for your organization	25	25	13		38
Coordinate contacts with utilities or ESCOs	25	25	6	13	31
Track or measure energy consumption or pollution	13	25	19		44
Educate others on energy efficient systems/technology	38	13	19	13	19
Report progress of energy or environmental actions	31	13	13	19	25
Design energy consuming system or improvements	25	31			44
Purchase or install energy equipment or services	19			19	63
Develop or direct policy change about energy mgmt	6	19	25	25	25
Keep facilities up-to-date with current technology	25	13	13	19	31
Install equipment or energy management systems	19			13	69
Maintain equipment or energy management systems	25	6			69
Evaluate energy technologies for other organizations	13	18	13	6	50
Demonstrate new or improved energy technologies	31	13	6	19	31
Evaluate environmental impacts of equipment	13	6	13	31	38

Table 40 Job responsibilities of ESPC workshop attendees

Energy Savings Performance Contracting Workshop Energy related tasks	Degree of job responsibility (percent)				
	Very large	Large	Medium	Small	None
Recommend purchase or installation of equipment	32	29	14	4	21
Evaluate cost or savings of energy equipment	39	14	25	7	14
Manage new or construction or renovation projects	32	25	4	7	32
Evaluate energy technologies for your organization	32	21	7	11	29
Coordinate contacts with utilities or ESCOs	29	21	14	11	25
Track or measure energy consumption or pollution	39	4	18	7	32
Educate others on energy efficient systems/technology	18	18	18	14	32
Report progress of energy or environmental actions	25	21	32	4	18
Design energy consuming system or improvements	28	11	11		50
Purchase or install energy equipment or services	25	25	11		39
Develop or direct policy change about energy mgmt	21	14	21	11	32
Keep facilities up-to-date with current technology		43	38	10	10
Install equipment or energy management systems	14	14	18	4	50
Maintain equipment or energy management systems	21	11	18	7	43
Evaluate energy technologies for other organizations	11	14	14	4	57
Demonstrate new or improved energy technologies	11	21	18	14	36
Evaluate environmental impacts of equipment	7	11	11	18	54

Table 41 Job responsibilities of FEDS workshop attendees

Federal Energy Decisions Workshop Energy related tasks	Degree of job responsibility (percent)				
	Very large	Large	Medium	Small	None
Recommend purchase or installation of equipment	32	35	23	4	7
Evaluate cost or savings of energy equipment	40	33	11	4	12
Manage new or construction or renovation projects	32	16	16	11	26
Evaluate energy technologies for your organization	40	26	8	11	14
Coordinate contacts with utilities or ESCOs	35	21	18	12	14
Track or measure energy consumption or pollution	28	25	21	2	25
Educate others on energy efficient systems/technology	26	33	26	4	11
Report progress of energy or environmental actions	28	25	21	9	18
Design energy consuming system or improvements	21	32	12	14	21
Purchase or install energy equipment or services	18	16	25	12	29
Develop or direct policy change about energy mgmt	25	21	18	11	26
Keep facilities up-to-date with current technology	18	42	14	9	18
Install equipment or energy management systems	14	14	23	11	39
Maintain equipment or energy management systems	21	8	23	11	47
Evaluate energy technologies for other organizations	14	21	12	5	47
Demonstrate new or improved energy technologies	14	25	19	21	21
Evaluate environmental impacts of equipment	12	21	21	9	37

Table 42 Job responsibilities for LCC workshop attendees

Energy Efficient Life-Cycle Costing Workshop Energy related tasks	Degree of job responsibility (percent)				
	Very large	Large	Medium	Small	None
Recommend purchase or installation of equipment	62	14	14	5	5
Evaluate cost or savings of energy equipment	54	16	16	14	
Manage new or construction or renovation projects	38	16			46
Evaluate energy technologies for your organization	24	22	16	16	22
Coordinate contacts with utilities or ESCOs	29	20	14	14	23
Track or measure energy consumption or pollution	30	8	24	14	24
Educate others on energy efficient systems/technology	32	30	22	8	8
Report progress of energy or environmental actions	32	14	24	5	24
Design energy consuming system or improvements	19	24	19	8	30
Purchase or install energy equipment or services	19	16	3	14	49
Develop or direct policy change about energy mgmt	27	11	21	14	27
Keep facilities up-to-date with current technology	28	17	17	8	31
Install equipment or energy management systems	19	16		8	57
Maintain equipment or energy management systems	8	8	14	8	62
Evaluate energy technologies for other organizations	19	16	16	5	43
Demonstrate new or improved energy technologies	8	22	35	11	24
Evaluate environmental impacts of equipment	8	24	24	14	30

Table 43 Job responsibilities of O&M workshop attendees

Operations and Maintenance Workshop Energy related tasks	Degree of job responsibility (percent)				
	Very large	Large	Medium	Small	None
Recommend purchase or installation of equipment	46	23	23	8	
Evaluate cost or savings of energy equipment	39	23	31	8	
Manage new or construction or renovation projects	31	31	8	15	15
Evaluate energy technologies for your organization	23	8	46	15	8
Coordinate contacts with utilities or ESCOs	23	23	23	23	8
Track or measure energy consumption or pollution	31	23	23	15	8
Educate others on energy efficient systems/technology	15	15	39	31	
Report progress of energy or environmental actions	23	30	23	8	15
Design energy consuming system or improvements	23	23	15	15	23
Purchase or install energy equipment or services	39	39	15		8
Develop or direct policy change about energy mgmt	23	15	8	15	39
Keep facilities up-to-date with current technology	31	23	23	15	8
Install equipment or energy management systems	39	23	15	15	8
Maintain equipment or energy management systems	54	15	8		23
Evaluate energy technologies for other organizations	19	16	16	5	43
Demonstrate new or improved energy technologies	15	23	31	31	
Evaluate environmental impacts of equipment	23	15	15	23	23

The adoption and diffusion of innovations

The product diffusion literature tells us a great deal about how new ideas and practices spread in the market. Figure 5 illustrates a widely accepted model of the diffusion of innovations (Rogers, 1995). This model is based on a long research tradition and defines a process by which market actors, in this case government employees and others, adopt a new innovation.

The model identifies the stages through which actors pass in adopting a new technology. First, actors must become aware of the innovation. Once aware, the actor enters a persuasion or information gathering stage. In this stage the actor seeks and processes information in order to decide whether to adopt the innovation. How quickly the actor moves from the awareness stage to the information gathering stage varies with the circumstances. In some cases the movement is hours, in other cases it may take many years.

At some point following the persuasion stage, the market actor moves from information seeking to a decision. That decision might be to adopt the new technology, to postpone adoption, to continue the search for information, or to adopt the new technology.

The decision to adopt and the implementation of the decision are separate acts and may also be separated in time (Reed, Erickson, Ford and Hall, 1996). For example, a market actor might decide to buy a new camera, but might also decide to wait several weeks because the cash is not available, a new technology may be introduced, or the decision maker may expect a drop in the price of the camera.

Finally, actors constantly reevaluate or confirm their decisions. This may result in continuance or discontinuance of the adoption. Because markets and products are constantly evolving, a decision to purchase a technology today may be followed by a decision not to purchase that technology in the future. This is called the confirmation stage, where previous decision are reevaluated.

Source: Rogers, 1995.

Figure 5. Model of innovation diffusion

Factors influencing the rate of diffusion of an innovation

There are a variety of factors that influence the rate of adoption of innovations. The rate of adoption of a product or innovation is determined by the nature of the customer's social systems, the channels used to communicate about the innovation, the attributes of the product or innovation, the type of innovation decision, and the extent of promotional efforts.

The adoption of new innovations does not occur in vacuum. Prior practice, for instance, the availability of specifications from previous jobs may weigh heavily in determining whether or not to adopt an innovation. Norms within a social system, such as union practices, local codes, or customer communication networks also influence adoption decisions.

The nature or perceived nature of a product or service contributes to whether and how quickly it is adopted. The literature identifies five key attributes of products or services: relative advantage (for example, initial cost), compatibility (with existing culture and practice), complexity, trial-ability, and observe-ability. Of these, relative advantage and observe-ability are known to be the most important.

Relative advantage is the degree to which technologies, products or services, are perceived to be better than similar products and services. The literature identifies key dimensions of relative advantage to include "degree of economic profitability, low initial cost, a decrease in discomfort, social prestige, savings in time and effort, and immediacy of the reward" (Rogers, 1995). Scholars have found that economic profitability may explain considerably less than half of the variance associated with relative advantage.

Energy efficient products may have some characteristics that place them at a relative disadvantage in relation to other products. Whereas products that are adopted rapidly often have low initial cost, energy efficiency products often have high initial costs. Life cycle costs, a frequent justification for purchasing energy products, focus on long-term rather than the short-term rewards of products that have relative advantage. In this study we examine the movement of customers through the product diffusion cycle, however we did not examine the reasons why customers move through the cycle or the technology/market conditions assisting with that movement. However, the movement of customers through the cycle provides evidence of the ability of the workshops to cause a change in the practices or technologies used by the attendees. However, workshops alone cannot move people to adopt energy efficient practices or technologies. If the characteristics of a technology do not meet customer needs, then it is unlikely that the technology will be adopted or that the market will be transformed. As a result, we assume that the practices and technologies presented in the FEMP workshop do meet a customer need and that the workshops were able to build on this need.

Types of adopters

The adoption of a new practice or technology is really a series of decisions by individuals and firms. The decision to adopt has to be made by each actor, at least until the point at which actors have no alternatives but to adopt (e.g., the market is fully transformed).

However, people and organizations differ in the speed with which they will accept innovations. Adopters are generally categorized into one of five groups: innovators, early adopters, the early majority, the late majority, and laggards (Figure 6).

Source: Rogers

Figure 6. Categories of adopters

The product diffusion literature points out that there are significant differences among these groups and that these differences have important implications. Market transformation begins in earnest when the early majority begins to adopt.

Innovators are a very small group and they pursue technology aggressively and will purchase and use new technologies out of pure interest in the technology. *Early adopters* appreciate the potential benefits of a technology and will utilize the technology when they see that its benefits match their own needs and desires. The *early majority* has an interest in the technology but is driven by practicality. They will wait and see if the technology delivers on its promises, but they also want to reference others of the early majority, not just innovators and early adopters, before they buy. This is the point at which the interpersonal channels become important. The late adopters differ from the early majority in one major respect. They are not comfortable with technology and will wait until a product has become the standard before purchasing. The laggards simply do not want to have anything to do with new technology and will hold off purchasing the technology until they are forced to or feel they have to.

These concepts provide a useful framework with which to examine the FEMP workshops. For example, we might ask the stage of adoption of people who attend FEMP workshops. If most of the attendees are at the aware stage, then they probably have need of very basic information. If attendees are at the decision or implementation stages, then they may be looking for more detailed or more sophisticated information about implementing a new idea or technology. The stages of adoption also provide a way to measure the effectiveness of the workshops. For example, if we could measure the stage of adoption before and after the workshops, we could use movement between stages as a measure of the impact of the workshops. This is what we have done in this study.

Individual workshop satisfaction scores**Workshop component satisfaction scores**

Workshop	Comprehen- siveness of materials	Quality & accuracy of materials	Presentation skills of instructor(s)	Knowledge of instructor(s)
O&M	8.0	8.5	8.5	8.9
FRI	8.2	8.7	8.7	8.9
ESPC	8.4	8.6	8.7	8.8
FEDS	7.9	8.3	8.6	8.7
LCC	8.0	8.5	8.0	8.6
REP	7.0	7.6	7.6	8.1
Average	8.0	8.4	8.4	8.7

Workshop	Workshop location	Time to interact with others	Examples, anecdotes, stories	Facilities	Overall satisfaction
O&M	8.2	7.9	8.0	9.1	8.7
FRI	7.9	7.3	7.8	8.6	8.4
ESPC	8.1	8.2	8.0	7.6	8.4
FEDS	8.2	7.6	7.7	8.4	8.2
LCC	8.0	7.0	7.1	8.4	8.1
REP	8.9	7.3	7.7	8.6	7.9
Average	8.2	7.5	7.7	8.4	8.2

Scale 1= extremely dissatisfied, 10= extremely satisfied, n=247

Experience with the workshop questionnaire

The questionnaire used to conduct this evaluation consisted of over 350 variables covering a wide range of workshops and workshop related issues. The survey itself took about 50 minutes to complete.

The survey included 19 strings of questions dispersed through the survey covering the following topics:

1. Confirmation of participation
2. Customer employment and organizational characteristics and demographics
3. Job responsibilities
4. Personal energy-related interests
5. How people heard about the workshops
6. A technology diffusion and adoption battery
7. Satisfaction with the workshop presentations and formats
8. Professional benefits and value of the workshops
9. Impacts of the workshop on customer processes, procedures and operations
10. Workshop costs and attendance issues
11. Value of the workshop to the customer
12. Customer use of workshop skills, materials and tools
13. Impact of workshops on energy consumption and environmental pollution
14. Timelines for energy and environmental projects
15. Networking and sharing of workshop materials
16. Demand for different training delivery mechanisms
17. Recommendations for workshop improvements
18. Demand for additional FEMP services (non-workshop)
19. Customer experience and satisfaction with other FEMP services (non-workshop)

During the survey development process there was speculation that the length of the survey would pose a problem with customers and that some customers would not be able to answer some of the questions. Both these issues complicated the survey process.

The length of the survey was an issue for many customers. In several cases we needed to schedule survey appointments or conduct the survey over multiple contacts. This, coupled with the accuracy of the contact database and customer's use of voice mail systems significantly challenged the survey effort. During the survey many customers commented that the survey was too long. It was clear that customers were inconvenienced by the length of the survey. Typically customer surveys range from 10 to 25 minutes in length. This survey was several times this average. However, even with these obstacles the survey enjoyed a 4% dropout rate once a customer contact was made. This very low dropout rate is a result of two important characteristics of this study.

- First, skilled staff conducted the surveys and survey procedures included provisions to accommodate customer schedules and demands. The survey staff was extremely experienced at conducting complicated surveys and understand customer frustrations. The survey staff went to great lengths to accommodate customer availability by setting appointments and by conducting multiple sessions when requested. In several cases this required evening and early morning appointments.
- Second, the customers are committed professionals who understand the importance of customer feedback in the design and delivery of FEMP workshops. Customers rarely asked to be dropped from the survey or asked to terminate the interviews in mid-stream.

Together, these two conditions worked to make the survey a success. However, in future efforts surveys may need to be limited to about 30 minutes. To assist in the effort we have identified survey questions that worked well and others that need to be eliminated or revised. Table 44 provides a summary the recommended changes to the workshop surveys.

Careful redevelopment of the survey instrument, focusing on high priority questions and eliminating or reducing questions of less value should reduce the length of the survey to 30 minutes or less. These changes will both reduce the level of customer resistance and streamline the data collection process while providing high-value information to FEMP managers.

Table 44 Recommendations for survey changes

Question string	Recommendations for future surveys
Confirmation of participation	Worked well, no change needed
Customer employment and organizational characteristics and demographics	Worked well, but some cannot answer
Job responsibilities	Worked well, but shorten
Personal energy-related interests	Worked well, but limited value, potential drop
How people heard about the workshops	Worked somewhat well, often don't recall, potential drop
Technology diffusion battery	Worked well, but can be shortened
Satisfaction with the workshop presentations and formats	Worked well, but should be shortened
Professional benefits and value of the workshops	Worked well, but should be shortened
Impacts of the workshop on customer procedures and operations	Worked well, but should be shortened
Workshop costs and attendance issues	Worked somewhat well, many could not answer questions, shorten
Overall value and ratings for the workshop	Worked very well, no changes needed
Use of workshop skills, materials and tools	Worked well, can shorten somewhat
Impact of workshops on energy consumption and environmental pollution	Did not work. Few customers know, fax-back form did not gain reliable data, additional efforts needed or different method
Timelines for energy and environmental projects	Worked well, but wide ranges for different projects,
Networking and sharing of workshop materials	Worked well, can shorten
Demand for different training delivery mechanisms	Worked well, can shorten and condense
Recommendations for workshop improvements	Worked well, may need more prompting to get details
Demand for additional FEMP services (non-workshop)	Worked well, but may not be necessary
Customer experience and satisfaction with other FEMP services (non-workshop)	Worked well, but may not be necessary

Sample survey instrument

Module A
INTERVIEW INTRODUCTION AND APPROVAL

Hello, my name is ____ and I am calling on behalf of the United State Department of Energy.

May I speak with Mrs./Ms./Dr./Mr. *(if known)* FirstName - LastName please?

1. ☐ Yes, speaking → *Continue with interview.*
2. ☐ Individual is not in → *Arrange for call back (Record date, time & phone number).*
3. ☐ No longer here → *Request forwarding phone number (____) _____.
 Company or organization _____.
 (If unavailable, or)
 → Request to talk to individual taking their place, if any
 and re-introduce and explain purpose.*

(If speaking to the person)

Mrs./Ms./Dr./Mr. LastName, We are conducting interviews with individuals who have received technical assistance from the United States Department of Energy's Federal Management Program, also known as FEMP. We would like to obtain feedback about the program and more specifically, workshops that we offer. We are only interviewing approximately 50 individuals nationwide who have attended the ____ workshop, so you can see your experiences and opinions are very important for determining the future services from FEMP. The interview is voluntary and confidential and will take about 35-40 minutes.

May we begin, or would a different time be more convenient for you ?

- ☐ Yes, begin → *Go to Module Q1*
 - ☐ No, rather not take interview → *Thank them and terminate call.*
 - ☐ No another time is better → *Make appointment for return call.*
- ↓
 Our interview team is available for call backs day or night, seven days a week.
 When would be the best time for us to call you?
*Record date, time, & confirm phone number or different number.
 Confirm call-back with respondent, thank them, and terminate call.*

Q1. Mrs./Ms./Dr./Mr. LastName, we would like to confirm the type of contact you had with the FEMP technical assistance program(s). Our records indicate that you attended (*as appropriate*) (place TA service(s) received or taken part in here from FEMP data) during Month of Year. Is this correct? (*May be more than one FEMP service, check database for multiple contacts.*)

1. ☐ Yes, _____ → *Set program for correct module(s) to come up on interview screen.*
2. ☐ No, did not receive technical assistance. → *Probe, confirm, thank them and terminate call.*
3. ☐ No, the type of assistance is wrong, should be: *Probe, set program for module(s) to come up.*
4. ☐ No, the date is wrong, should be: _____ → *Probe, change records and continue with interview.*

Q2. Are there any other FEMP services or technical assistance that you received or took part in during the last 2 years other than the (*see above*). (These can include FEMP training workshops, materials, demonstrations of energy efficient technologies, technology audits or assessments, software programs, or publications provided by the FEMP program such as FEMP Tracks or FEMP Technology Alerts.)

1. ☐ Yes, → What did you receive or take part in? →

1. ☐ Other workshops
2. ☐ Other software
3. ☐ Demonstrations
4. ☐ Technology Audits
5. ☐ Publications
6. ☐ Other assistance

2. ☐ No, did not receive other assistance.
3. ☐ Not sure / don't know.

Q3. Are you currently in the same position since the workshop. ?

1. ☐ No, _____
2. ☐ Yes, _____ → (*Go to Module A*)
3. ☐ Don't know / not sure → (*Go to Module A*)

Q3-a Do you still have responsibilities that pertain to energy efficiency?

1. ☐ Yes, (*Go to Module A*)
2. ☐ No, Thank them and terminate call.
3. ☐ Don't know / not sure terminate call.

MODULE A CUSTOMER BACKGROUND INFORMATION

Next, we would like to understand a little bit about who our customers are and the reasons for attending the workshop.

A1. Was the technical assistance you received to be used for professional or work-related purposes?

1. ☐ Yes *Continue* →
 2. ☐ No → *Thank them and terminate*
 3. ☐ Yes, but also personal → *Continue*
 4. ☐ Other → *Continue*

A2.a. Are you employed by a government organization, by a private company, by a non-profit organization, or by an educational organization?

1. ☐ Private sector employee
 2. ☐ Non profit/not-for-profit
 3. ☐ Ed/Academic
 4. ☐ Other
 5. ☐ Government employee

A2.b. Were you working under an energy related government contract at the time you attended the workshop?

1. ☐ Yes 2. ☐ No 3. ☐ Don't know

A2.c. Are you currently working under an energy related government contract?

1. ☐ Yes 2. ☐ No 3. ☐ Don't know

A3. Which of the following categories BEST describes the organization with which you are employed?

If Government

1. ☐ Federal
 2. ☐ State
 3. ☐ Local
 4. ☐ Foreign
 5. ☐ Other

If Ed/Academic

1. ☐ Univ/College
 2. ☐ School (K-12)
 3. ☐ Other Ed

If private sector

1. ☐ Utility
 2. ☐ Power producer
 3. ☐ ESCO
 4. ☐ Industrial/manufacturing
 5. ☐ Buildings/construction
 6. ☐ Agriculture
 7. ☐ Financial
 8. ☐ Medical
 9. ☐ Govt. contractor/consultant
 10. ☐ Media
 11. ☐ Other commercial
 12. ☐ Other

Non-profit/not-for-profit

1. ☐ Environmental organization
☐ Trade associations/councils
 3. ☐ Labor union / organization
 4. ☐ Funding organization
 5. ☐ Research group or org.
 6. ☐ Non-profit org
 7. ☐ Not-for-profit org.

A4. I am now going to read a list of general responsibilities regarding the use and management of energy in your organization. Please indicate on a 1 to 10 scale the extent to which each activity is a part of your current responsibilities, with a 1 meaning not a part of your current responsibilities and a 10 meaning this is a very large and significant part of your responsibilities. Ready?

1-10 Score	Area Of Responsibility
1. Score _____	Evaluate the feasibility of energy technologies for your organization
2. Score _____	Evaluate the feasibility of energy technologies for other organizations
3. Score _____	Design energy consuming systems or system improvements
4. Score _____	Recommend the purchase or installation of energy efficient equipment
5. Score _____	Manage new building construction or renovation projects
6. Score _____	Purchase or install energy efficient equipment or services
7. Score _____	Evaluate cost or savings associated with energy consuming equipment
8. Score _____	Install powered equipment or energy management systems
9. Score _____	Maintain powered equipment or energy management systems
10. Score _____	Demonstrate or pilot new or improved energy technologies
11. Score _____	Educate others about energy efficient systems or technologies
12. Score _____	Coordinate contacts with utilities or Energy Service Companies
13. Score _____	Evaluate environmental impacts of energy consuming equipment
14. Score _____	Track or measure energy consumption or pollution production
15. Score _____	Report on the status or progress of energy or environmental improvements
16. Score _____	Develop or direct policy changes pertaining to energy consumption or management
17. Score _____	Keep your facilities up-to-date with current or improved technologies

A5. I am now going to read 4 short phrases about a person's potential interests in energy efficiency. Please indicate for each phrase if it reflects your personal or professional interests. Again, we will use a 1 to 10 scale, with a 1 meaning does not at all apply, and a 10 meaning it applies to you very much. The first phase is...

1-10 Score	Area Of Interest
1. Score _____	Enjoy staying up-to-date on energy efficient technologies or issues
2. Score _____	Have professional associates who rely on you for energy advice
3. Score _____	Have a network of peers with whom you discuss new energy issues or projects
4. Score _____	Enjoy reading about the development and use of new energy technologies

(Go to modules appropriate for this respondent.)

MODULE B-1

LIFE-CYCLE COSTING WORKSHOP

We would now like to ask you some questions about your participation and experience in the Life-Cycle Costing workshop. These questions apply only to the Life-Cycle Costing Workshop and not the ASEAM workshop that is offered with the Life-Cycle Costing Workshop.

Int 1-1 To begin this module, we would like to know how you first found out, or heard about the workshop. Do you recall?

1. ☐ No / don't know
2. ☐ Yes → How was that? *(Open-ended response put down what they say.)*

Response:

If found out from someone associated with FEMP, Ask

Int 1 -2 What office or location first provided you the information about this workshop? *(Do not read list, just check box that best fits what they provide)*

1. ☐ Don't Recall

REAP Offices

2. ☐ The Seattle Regional Energy Action Program office
3. ☐ The Chicago Regional Energy Action Program office
4. ☐ The Philadelphia Regional Energy Action Program office
5. ☐ The Denver Regional Energy Action Program office
6. ☐ The Boston Regional Energy Action Program office
7. ☐ The San Francisco Regional Energy Action Program office
8. ☐ The Atlanta Regional Energy Action Program office

Laboratories

9. ☐ The Pacific Northwest National Laboratory office
10. ☐ The Lawrence Berkeley National Laboratory office
11. ☐ The National Renewable Energy Laboratory office

FEMP Headquarters Offices in WDC

12. ☐ The Operations and Customer Service Team
13. ☐ The Technical Assistance Team
14. ☐ The Project Financing Team
15. ☐ The in-house Energy Management Team
16. ☐ Other

Product Diffusion Questions

The next set of questions ask about your activities and opinions regarding energy efficient life cycle costing prior to the workshop. We're trying to understand what your organization may have known or been doing at that time rather than what is happening today. Please answer the questions based upon your personal experience as a member of your organization. The first set of questions require a yes or no response and ask about your previous knowledge and experience with energy efficient life cycle costing. Ready?

Just prior to the workshop had you:

Awareness issues

D1. heard of the term, "life cycle costing"?	1. ☐ yes 2. ☐ no 3. ☐ Don't remember
D2. heard of the term "energy efficient life cycle costing"?	1. ☐ yes 2. ☐ no 3. ☐ Don't remember
D3. learned how to calculate the total cost of energy over a product's lifetime?	1. ☐ yes 2. ☐ no 3. ☐ Don't remember
D4. calculated the total energy costs of a product or service over its lifetime?	1. ☐ yes 2. ☐ no 3. ☐ Don't remember
D5. used life-time energy costs to finalize or recommend a purchase decision	1. ☐ yes 2. ☐ no 3. ☐ Don't remember

*If "no" to all of the above skip to question D16,
If yes or don't remember to any then continue.*

Persuasion or information seeking stage

D6. At any time prior to registering for the workshop, had you tried to find information about energy efficient life cycle costing by . . .

(read all at once and record yes or no if they have done any of the following)

- seeking publications,
- discussing the pros and cons with a colleague
- attending an internal or external workshop
- looking for guidance, regulations or case studies
- or, searching for information on the internet.

1. ☐ yes 2. ☐ no 3. ☐ Don't know or other

↓

If yes to D6,

D7a. Had you used any of this information to evaluate whether or not to use energy efficient life cycle costing in your organization?

1. ☐ yes 2. ☐ no 3. ☐ Don't know or other

↓

(If no or don't remember to D6)

D7b. Did you ask someone else in your organization to look for information about energy efficient life cycle costing?

1. ☐ yes 2. ☐ no 3. ☐ Don't know or other
 ↓
 (Skip to D8)

D7c. Do you know if you or anyone else used any of this information to evaluate whether or not to use energy efficient life cycle costing in your organization?

1. ☐ yes 2. ☐ no 3. ☐ Don't know or other

Decision stage

Okay, and again, just prior to attending the workshop, had you

- D8. Decided whether energy efficient life cycle costing would be a good idea for your organization..... 1. ☐ yes 2. ☐ no 3. ☐ Don't remember
- D9. Recommended that your organization use energy efficient life cycle costing..... 1. ☐ yes 2. ☐ no 3. ☐ Don't remember
- D10. Decided that energy efficient life cycle costing was something that your organization should try..... 1. ☐ yes 2. ☐ no 3. ☐ Don't remember
- D11. Deferred or postponed a decision to use energy efficient life cycle costing..... 1. ☐ yes 2. ☐ no 3. ☐ Don't remember

Implementation stage

- D12. Tried to use data to factor life-time energy costs into a purchase decision..... 1. ☐ yes 2. ☐ no 3. ☐ Don't remember
- D13. Developed or used spreadsheets or other tools to make energy efficient life cycle costing decisions.... 1. ☐ yes 2. ☐ no 3. ☐ Don't remember
- D14. Used information or software to implement energy efficient life cycle costing..... 1. ☐ yes 2. ☐ no 3. ☐ Don't remember
- D15. Established procedures for making energy efficient life cycle costing decisions and used them on a regular basis..... 1. ☐ yes 2. ☐ no 3. ☐ Don't remember

Previous questions have dealt with the period of time prior to your attendance at the workshop. Now, we would now like to ask you about your current situation regarding energy efficient life cycle costing. The following questions apply to the period of time starting just after the workshop through today.

Has your organization...

D16a. Continued to look for or acquire information on energy efficient life cycle costing, through publications, meetings, workshops, conferences, the internet, or through other means?

1. ☐ yes
2. ☐ no
3. ☐ Don't Know

On as scale of 1 to 10 (with 1 being not at all helpful, and 10 being extremely helpful..)

D16b. How helpful was the workshop in your efforts to look for or acquire additional information on energy efficient life cycle costing?

Score: _____

Has your organization...

D17a. Made a policy decision not to use energy efficient life cycle costing on some or all of your energy consuming purchases?

1. ☐ yes
2. ☐ no
3. ☐ Don't Know

D17b. How helpful was the workshop in making this decision?

Score: _____

Has your organization...

D18a. Made a policy decision to use energy efficient life cycle costing on some or all of your energy consuming purchases?

1. ☐ yes
2. ☐ no
3. ☐ Don't Know

D18b. How helpful was the workshop in making this decision?

Score: _____ (go to 19a)

D18.c Is your organization currently in the process of making a decision to use or not use energy efficient life cycle costing?

1. ☐ yes
2. ☐ no
3. ☐ don't know

D18d. How helpful was the workshop in your current decision making efforts?

Score: _____

Has your organization...

D19a. Developed internal plans or procedures for using energy efficient life cycle costing?

1. ☐ yes
2. ☐ no
3. ☐ Don't Know

D19b. How helpful was the workshop in the development of these plans or procedures?

Score: _____

Has your organization...

D20a. Calculated the total energy costs of a product or service over its lifetime?

1. ☐ yes
2. ☐ no
3. ☐ Don't Know

D20b. How helpful was the workshop in making these calculations?

Score: _____

Has your organization...

D21a. Calculated the total energy costs of a product or service over its life time and used these calculations to finalize a purchase decision?

1. ☐ yes
2. ☐ no
3. ☐ Don't Know

D21b. How helpful was the workshop in making this decision?

Score: _____

Has your organization...

D22a. Used new methods or changed your process or methods of calculating life-time energy costs?

1. ☐ yes
2. ☐ no
3. ☐ Don't Know

D22b. How helpful was the workshop in making these changes?

Score: _____

Has your organization...

D23a. Changed the type of products or services you obtain through energy efficient life cycle costing?

1. ☐ yes
2. ☐ no
3. ☐ Don't Know

D23b. How helpful was the workshop in making these changes to your product selections?

Score: _____

Has your organization...

D24a. Made a decision to not use energy efficient life cycle costing for some of your current purchasing decisions where it would be possible to use it?

1. ☐ yes
2. ☐ no
3. ☐ Don't Know

D24b. How helpful was the workshop in helping you make this decision?

Score: _____

Has your organization...

D25a. Begun using energy efficient life cycle costing and, as a result, decided that you will continue to use it?

1. ☐ yes
2. ☐ no
3. ☐ Don't Know

D25b. How helpful was the workshop in your decision to continue to use energy efficient life cycle costing?

Score: _____ (Skip to B1-1)

Has your organization...

D26a. Reconsidered or discontinued using energy efficient life cycle costing for your purchasing decisions?

1. ☐ yes
2. ☐ no
3. ☐ Don't Know

D26b. How helpful was the workshop in your decision to discontinue using it?

Score: _____

Satisfaction With The Workshop

Now, I would like to ask about your satisfaction with the workshop in general, and with some of the specific aspects of the workshop. To do this, I am going to read a list of workshop components. After each component, please indicate your level of satisfaction on a "1" to 10 scale with "1" being extremely dissatisfied, and 10 being extremely satisfied.

B1-1 Overall how satisfied are you with the...

Aspect Being Measured	(1 - 10) Level of Satisfaction
1. Comprehensiveness of the materials presented during the workshop,	_____
2. Quality and accuracy of the materials presented,	_____
3. Presentation skills of the instructors,	_____
4. Knowledge of the instructors,	_____
5. Location of the workshop,	_____
6. Amount of time to interact with attendees & instructors,	_____
7. Examples, stories, and anecdotes presented during the workshop	_____
8. Facilities where the workshop was held?	_____
9. Considering everything, how satisfied are you with the Life-Cycle Costing Workshop you attended?	_____

B1-2 When thinking about the length of time for the workshop and the amount of material that needed to be covered during the workshop, would you say the workshop was, too long, too short or about right?

1. ☐ Too long _____
2. ☐ About right _____
3. ☐ To short _____

→ How long do you think it should have been?

_____. ____ Days

(Record response to the nearest half day)

B1-3 When thinking about the technical presentations during the workshop, and the different skill levels of the attendees, would you say the workshop was too technical, about right, or not technical enough?

1. ☐ Too technical
2. ☐ About right
3. ☐ Not technical enough

The next set of questions ask your opinion on how well the workshop influenced your ability to incorporate LCC techniques into your organization's methods of operation. Please indicate your score on a 1 to 10 scale, (with 1 being not at all helpful and 10 being extremely helpful.) If the topic does not apply to you or your organization, or if you were already using LCC prior to the workshop, just say "does not apply" or "already using".

B1-4 How well did the workshop help you...

Topic Being Measured	Level of workshop help			
	(1-10 score)	or (Doesn't apply)	or (Already use)	
1. Convince senior directors and managers of LCC benefits,	_____	or	98	or 99
2. Deal with organizational or administrative barriers to LCC,	_____	or	98	or 99
3. Modify internal decision processes to incorporate LCC,	_____	or	98	or 99
4. Provide materials to "sell" LCC within your organization,	_____	or	98	or 99
5. Recommend methods to demonstrate LCC in your organization,	_____	or	98	or 99
6. Provide you with contacts to help support LCC techniques,	_____	or	98	or 99
7. Provide materials to compare LCC results with current results	_____	or	98	or 99
8. Help you identify, define, initiate or improve a project	_____	or	98	or 99
9. Help you get your job done faster	_____	or	98	or 99
10. Help you get your job done cheaper or less expensively	_____	or	98	or 99
11. Help you do a better job	_____	or	98	or 99

B1-5 As you think about the different components of the workshop, in your opinion, can any of the components be improved, or presented in a different way?

1. ☐ No, don't know, not sure, or cannot think of any.
2. ☐ Yes

↓

B1-6 What can be improved, and how will the improvement help the workshop or the attendees? *(Open ended, record response.)*

Improvement area: _____

Professional Benefits

B1-6 I would now like to ask you about the materials and information you obtained from the workshop. First, I will read four short phrases about what you may have gained from the workshop. Please indicate which of the following four statements **best** represents your experience with the workshop?

During the Life-Cycle Costing workshop...

(Check only one)

1. ☐ I obtained no new materials, tools or knowledge during the workshop, —————→ (Skip to B1-11)
2. ☐ I obtained both new knowledge and new materials or tools —————→ (Include B1-7 to 10) —
3. ☐ I obtained some new tools or materials but no new knowledge, —————→ (Include B1-7 & 8) —
4. ☐ I obtained some new knowledge, but no new materials or tools, or —————→ (Include B1-9 & 10) —

(Then skip to B1-12) ←————

B1-7 In thinking about the new tools or materials you obtained during the workshop, which of the tools do you think are the most valuable to you? (Check all that apply)

1. ☐ Software program and users-guide on Life-Cycle Costing
2. ☐ Life-cycle Costing hand-out materials
3. ☐ Case-study examples reviewed during the workshop
4. ☐ Other tools or materials obtained at the workshop

————→ B1-8 What tools are these? —————→ (List other tools)

B1-9 In thinking about the new information or knowledge you obtained during the workshop, which of the information presented is the most valuable to you? (Check all that apply)

1. ☐ General Life-Cycle Costing skills and methods
2. ☐ Methods for evaluating and comparing different products and systems
3. ☐ Discounting methods or financial calculations
4. ☐ The experiences of the instructors
5. ☐ The experiences of the other attendees
6. ☐ Other information or knowledge obtained

————→ B1-10 What are these? —————→ (List other knowledge)

B1-11 What would you say is the main reason or reasons why you did not obtain new tools or knowledge during the workshop?

Open ended response: _____

Operational Impacts

I would now like to ask you how the information from the LCC workshop may have been incorporated into your organization.

B1-12 Has any of the information, materials or tools presented during the workshop been incorporated into a formal or informal process within your organization, for evaluating different energy or environmental related decisions?

- 1. ☐ No _____ → (Skip to B1-15)
- 2. ☐ Don't know, not sure _____ → (Skip to B1-15)
- 3. ☐ Yes,

B1-13 Was this process established prior to, or after your participation in the workshop?

- 1. ☐ Prior to the workshop
- 2. ☐ After the workshop
- 3. ☐ Don't know, not sure _____ → (Skip to B1-15)

B1-14 On a scale of 1 to 10, please indicate the amount of influence the workshop had on how you or your organization evaluates energy related projects or decisions. (Please give your answer on a 1 to 10 scale with a 1 being not at all influential, and 10 being extremely influential to your process).

Process influence score: _____

B1-15 Sometimes workshops presented by FEMP complement other training programs offered in the public or private sector. In other cases, the FEMP workshops provide one of the few avenues for people to obtain the skills presented during the workshops. In thinking about your specific situation, would you say the information presented in the LCC workshop is...

- 1. ☐ Readily available from several other sources
- 2. ☐ Somewhat available
- 3. ☐ Don't know or not sure
- 4. ☐ Rarely available
- 5. ☐ Not available from other sources

B1-16 The next question asks how often you use any of the information presented in the LCC - workshop. On average, over any given month, how often would you estimate you use at least some of the information presented during the workshop?

Number of times skills used: _____

We would now like to ask you if the workshop has changed or influenced the way in which you or your organization evaluates or invests in energy efficient technologies or systems.

B1-17 Since your participation in the workshop have you or your organization changed any of the criteria you examine, or the weighting of the importance of the criteria, for making decisions concerning energy efficient systems, policies, procedures or equipment.

- 1. ☐ No —————→ (Skip to B1-19)
- 2. ☐ Don't know or not sure —————→ (Skip to B1-19)
- 3. ☐ Yes —————↓

B1-18 To the best of your knowledge, how was this change influenced by the information, materials, or tools presented during the LCC workshop? Please indicate your response on a 1 to 10 scale.)with 1 being "had no influence" and 10 being "was greatly influenced")

Degree of influence from the workshop: _____

Costs and Attendance

The next few questions deal with the costs of the workshop and issues pertaining to your attendance at this or similar workshops.

B1-19a In thinking about the total costs to register and attend the Life-Cycle Costing workshop, would you say the cost is...

- 1. ☐ Much higher than others
- 2. ☐ Higher
- 3. ☐ Don't know or not sure
- 4. ☐ About the same
- 5. ☐ Less
- 6. ☐ Much less than others

B1-19b In thinking about a fair price for the LCC workshop, how much would you or your organization be willing to pay to register for this workshop?

- 1. ☐ \$0 to \$50
- 2. ☐ \$51 to \$100
- 3. ☐ \$101 to \$150
- 4. ☐ \$151 to \$200
- 5. ☐ \$201 to \$350
- 6. ☐ \$351 to \$400
- 7. ☐ \$401 to \$450
- 8. ☐ \$451 to \$500
- 9. ☐ \$501 to \$550
- 10. ☐ \$551 to \$600
- 11. ☐ \$601 to \$700
- 12. ☐ \$701 to \$800
- 13. ☐ More than \$800
- 14. ☐ Don't know

B1-20 In your opinion, if this workshop was not available from the FEMP program, what is the likelihood that you would have attended a similar workshop over the two years before or after your attendance at the FEMP LCC workshop? Would you say...

- 1. ☐ Very likely
- 2. ☐ Likely
- 3. ☐ Don't know or not sure
- 4. ☐ Not likely
- 5. ☐ Not at all likely

B1-21 In the past five years how many classes, workshops or training seminars have you attended that covered the same subject matter presented in FEMP's LCC workshop. Please do not include the FEMP LCC workshop in your count.

Number of training sessions: _____

Overall Rating of Workshop

B1-22.a Now I would like you to give me an overall "value rating" for the Life-Cycle Costing workshop you attended. On a 1 to 10 scale, (with 1 being not at all valuable, and 10 being extremely valuable.)

Overall value rating: _____

B1-22.b If a professional associate of yours, with similar background and responsibilities were to ask you if he or she should attend this workshop, would you recommend their attendance?

- 1. ☐ Yes
- 2. ☐ probably/maybe/possibly
- 3. ☐ Don't know or not sure
- 4. ☐ Probably not
- 5. ☐ Definitely not

Why: _____

Energy and Environmental Impacts

This section of the interview asks about the ways in which the skills and tools presented during the LCC workshop are currently being used by you or your organization to achieve energy savings, dollar savings, or environmental improvements.

B1-23 Since attending the workshop, have you or your organization used the skills or tools obtained during the workshop to evaluate energy, dollar savings or pollution reduction opportunities?

- 1. ☐ No → (Skip to B1-34)
- 2. ☐ Don't know or not sure → (Skip to B1-34)
- 3. ☐ Yes

B1-24 To the best of your knowledge, about how many projects, assessments, or evaluations have been started or completed by you or your organization, in which the workshop tools or skills were used?

Number of projects or evaluations: _____

B1-25 Are you familiar with the amount of energy savings, dollar savings or pollution reductions that are ultimately being achieved from these projects?

- 1. ☐ No →
- 2. ☐ Don't know or not sure →
- 3. ☐ Yes

B1-26 Is there another person we can talk
with who would know the level of savings?

- 1. ☐ No → (Skip to B1-34)
- 2. ☐ Don't know or not sure → (Skip to B1-34)
- 3. ☐ Yes

B1-27 Can you provide that person's name and
telephone number so that we may call them
and ask this question?

- 1. ☐ No → (Skip to B1-34)
- 2. ☐ Don't know → (Skip to B1-34)
- 3. ☐ Yes

Who would that be?

Name: _____

Title: _____

Phone: () _____ - _____

B1-28 When would be a good time to call this person?

Date/Day/Time: _____

B1-29 May we use your name as a referral when we call?

- 1. ☐ No
- 2. ☐ Yes, or don't care

↓
(Skip to B1-54)

B1-30 One of the most important goals for this interview is to determine the amount of energy, pollution or dollar savings that are ultimately being achieved by projects or decisions that use the skills or tools presented in the LCC workshop. We realize that this is sometimes difficult to do, or that people need to refer to charts or reports to answer this question. For this reasons I would like to FAX you a very short form that asks about the amount of energy, pollution, and dollars you are saving from three or fewer LCC projects that you have been most recently involved with. May I FAX these to you?

1. ☐ No _____ → (Skip to B1-34)

2. ☐ Not now, but at a later time
↓ (Arrange for Fax time)

3. ☐ Yes

↓
Date/Day/Time _____

What is your fax telephone number? _____

Using one form per project, how many forms should I fax to you? _____ Forms

Project 1:

Name of project: _____

Total dollar value of project: \$ _____, _____, _____ .00 Total Square Feet _____
(If Applicable)Type of Project FEMP Tracks groups here Project Location FEMP Tracks groups here**Energy Savings From Project**

Quantity # _____ Units _____ per _____ of _____ Year savings began _____

☐ kWh ☐ Day
☐ BTU, ☐ Month
☐ Therms ☐ Year
☐ Gallons ☐ Other _____
☐ Other _____

☐ Electricity
☐ Natural gas
☐ Propane
☐ Oil, gasoline, kerosene
☐ Other _____

Dollar Savings From Project

Quantity \$ _____ .00 per _____ from _____ Year savings began _____

☐ Day
☐ Month
☐ Year
☐ Other _____

☐ Energy savings
☐ Pollution reduction
☐ Both

Pollution Savings From Project

Quantity # _____ Units _____ per _____ of _____ Year savings began _____

☐ Lbs ☐ Day
☐ US tons ☐ Month
☐ Metric tons ☐ Year
☐ Gallons ☐ Other _____
☐ Other _____

☐ Carbon dioxide
☐ Hydrocarbons
☐ Sulfur Oxides
☐ Nitrous Oxides
☐ Other _____

Actual or Estimated Savings

To the best of your knowledge are these energy, dollar and pollution savings based upon estimates of savings, or are they from actual savings data that you or someone else has measured?

Savings are...

<u>Energy</u>	<u>Dollars</u>	<u>Pollution</u>
☐ Estimated	☐ Estimated	☐ Estimated
☐ Actual data	☐ Actual data	☐ Actual data
☐ Don't know	☐ Don't know	☐ Don't know
☐ Other _____	☐ Other _____	☐ Other _____

Contribution of Workshop

Which of the following components of the Life-Cycle Costing workshop were helpful to you in achieving the savings from this project? (Check all that apply.)

- ☐ Knowledge gained or skill learned in the workshop
- ☐ Printed materials received through the workshop
- ☐ Software programs received through the workshop
- ☐ Other _____

Form Tracking Number W001

B1-31 Are any of these projects of the nature that you would be interested in showcasing them as a demonstration project for others to see and learn from, or would you be interested in showcasing them as an example of a "Success Story" for others to read about in a special FEMP publication?

1. ☐ No _____ → (Skip to B1-34)
2. ☐ Not sure, will need to ask others
3. ☐ Yes _____ ↓

B1-32 May I give your name and phone number to a program manager who will call to discuss this option with you?

1. ☐ No _____ → (Skip to B1-34)
2. ☐ Yes
3. ☐ Not sure ↓

B1-33 If you think you may be interested, would you like the name and phone number of a FEMP manager to discuss this with now or in the future?

1. ☐ No _____
2. ☐ Yes _____ → (Give Name and Number)

Fill in blank with name

Mx. _____
Phone 800 ____ - ____

Networking, Distribution and Use of Technical Assistance Materials and Information

The next set of questions ask about how people have shared or distributed the information presented during the Life-Cycle Costing workshop. Through these questions we are trying to learn the extent to which other people or organizations have been exposed to, or used the information presented in the workshop.

B1-34 Have you shared, or discussed any of the information presented during the workshop with other people you know?

1. ☐ No, don't know, not sure, or cannot think of any. _____ → (Skip to B1-54)
2. ☐ Yes

B1-35a Was this with other professionals employed within your organization, outside your organization, or both?

1. ☐ Shared inside of firm
2. ☐ Shared outside of firm _____
3. ☐ Shared both inside and outside _____
4. ☐ Don't know, not sure

B1-25b How many different organizations have you shared with? _____ Organizations

- B1-36 Did you...
1. ☐ Copy the materials and distribute them to others
 2. ☐ Personally review the material with others
 3. ☐ Ask others their opinions about the materials or methods
 4. ☐ Obtain additional copies of materials from FEMP and distribute them
 5. ☐ Other ways: _____

I am now going to read a list of materials presented during the workshop. As I read each item, please indicate if you have shared that item with other individuals. Again, these can be people within your organization, or other business associates.

B1-37-42 Have you shared the...

	<u>No</u>	<u>Don't know</u>	<u>Yes</u>	
37.	1. ☐	2. ☐	3. ☐	Software program and documentation on Life-Cycle Costing
38.	1. ☐	2. ☐	3. ☐	Life-cycle Costing Workbook
39.	1. ☐	2. ☐	3. ☐	Case-study examples reviewed during the workshop
40.	1. ☐	2. ☐	3. ☐	Lessons learned or other material presented
41.	1. ☐	2. ☐	3. ☐	Any other information about the workshop
42.	1. ☐	2. ☐	3. ☐	Are there any other items you have shared that I have not mentioned?

What items are these? _____ (List other items) B1-43

B1-44 To the best of your knowledge, do you think the information you shared will be used by the individual or individuals to make energy related decisions?

1. ☐ Don't know, or not sure
2. ☐ No _____ (Skip to B1-54)
3. ☐ Yes

B1-52 Are you familiar with any specific projects, programs or activities in which the information shared by you was used to make energy related purchase decisions or product evaluations?

1. ☐ No _____ (Skip to B1-54)
2. ☐ Don't know, not sure _____ (Skip to B1-54)
3. ☐ Yes
4. ☐ Maybe or possibly

B1-53 To the best of your knowledge in what general type of project, program, or activity was this information used? (Check all that apply.)
Was it used in ...

- Evaluation or purchase of:
1. ☐ Lighting systems
 2. ☐ HVAC systems or controls
 3. ☐ Motors, pumps, drives or motor controls
 4. ☐ Building envelopes or envelope components
 5. ☐ Energy management systems
 6. ☐ Industrial processes or equipment
 7. ☐ Commercial processes or equipment
 8. ☐ Residential equipment or construction
 9. ☐ Vehicles or transportation technologies
 10. ☐ Other systems not listed

Additional Services Needed

B1-54-61 Mrs./Ms./Dr./Mr. LastName, the next set of questions ask about additional services that individuals like yourself might want provided by the FEMP program to supplement the Life-Cycle Costing workshop. At this time we are not linking these ideas to available resources, but just trying to gage the potential demand for these services if they were provided. To do this, I am going to read a list of other services that can supplement the workshop. Please indicate after each item how likely it would be for a person in your position to take advantage of the service if it were offered at an attractive price and location. Would you be very likely, somewhat likely, somewhat unlikely, or very unlikely to attend an:

	Very Likely	Somewhat Likely	Don't Know	Somewhat Unlikely	Very Unlikely	
54.	1. ☐	2. ☐	3. ☐	4. ☐	5. ☐	Advanced LCC techniques workshop
55.	1. ☐	2. ☐	3. ☐	4. ☐	5. ☐	Use LCC software to make analysis more convenient
56.	1. ☐	2. ☐	3. ☐	4. ☐	5. ☐	Request additional copies of LCC tools and materials if available
57.	1. ☐	2. ☐	3. ☐	4. ☐	5. ☐	Download LCC software through the FEMP home-page
58.	1. ☐	2. ☐	3. ☐	4. ☐	5. ☐	Receive follow-up telephone support for LCC assistance
59.	1. ☐	2. ☐	3. ☐	4. ☐	5. ☐	Read FEMP Tracks stories on LCC case studies
60.	1. ☐	2. ☐	3. ☐	4. ☐	5. ☐	Read one-page LCC case study flyers after the workshop

B1-62 Can you think of any other follow-up activities or services a person like yourself might find helpful in their attempts to use LCC analysis techniques?

1. ☐ No —————→ (Skip to C1 if appropriate)
2. ☐ Don't know, not sure —————→ (Skip to C1 if appropriate)
3. ☐ Yes,

↓
What additional services would that be? (Open-ended response)

• Module C

CUSTOMER IMPRESSIONS OF THE FEMP TECHNICAL ASSISTANCE SERVICES

Thank you for your patience so far. We are nearing the end of the interview.

C1-1a Now I would like to ask you to identify the FEMP offices with which you have had as least some contact over the last 12 months. This can be as short as a telephone call, an e-mail, a visit to the webpage, or an office visit to a multi-day workshop or technical visit.

Have you had any contacts with one or more of the FEMP offices during the last 12 months?

1. ☐ Yes 2. ☐ No 3. ☐ Don't know/not sure

(Skip to C1-3)

C1-1b With which offices have you had at least some contact ?

CONTACT=YES	NO=BLANK
1. ☐	The <u>Seattle</u> Regional Energy Action Program office
2. ☐	The <u>Chicago</u> Regional Energy Action Program office
3. ☐	The <u>Philadelphia</u> Regional Energy Action Program office
4. ☐	The <u>Denver</u> Regional Energy Action Program office
5. ☐	The <u>Boston</u> Regional Energy Action Program office
6. ☐	The <u>San Francisco</u> Regional Energy Action Program office
7. ☐	The <u>Atlanta</u> Regional Energy Action Program office
☐ Laboratories	
8. ☐	The Pacific Northwest National Laboratory office
9. ☐	The Lawrence Berkeley National Laboratory office
10. ☐	The National Renewable Energy Laboratory office
☐ FEMP Headquarters Offices in WDC	
11. ☐	The Operations and Customer Service Team
12. ☐	The Technical Assistance Team
13. ☐	The Project Financing Team
14. ☐	The In-house Energy Management Team

Contact
Frequency

Satisfaction
With Contacts

C1-1c Now I would like to ask about the number of times you have had contact with each of the offices. About how many times have you had contact with (read office checked) during the last 12 months? _____

C1-1d Now I would like for you to rate the level of satisfaction with each offices. On a scale of from 1 to 10, with 1 being very dissatisfied and 10 being very satisfied how would you rate your overall satisfaction with the(read office checked)? _____

C1-2 I would like to ask you about some of the aspects of your FEMP contacts. To do this, I will read a list of items and ask your opinion of each item. Please provide your opinion using a 1 to 10 scale, (with 1 being very dissatisfied and 10 being very satisfied.... Ready?

How would you rate the...

	<u>Score</u>	<u>Unable to Rate or N/A</u>
1. Ease of contacting FEMP staff	___	99
2. Ease of obtaining answers to questions	___	99
3. Ease of accessing information through the FEMP toll-free hotline	___	99
4.	___	99
5. Knowledge and experience of the FEMP staff	___	99
6. Ability of FEMP staff to understand your needs	___	99
7. Timeliness of FEMP responses to your questions	___	99
8. Politeness of FEMP staff	___	99

And how about the...

9. Range of services offered by the technical assistance programs	___	99
10. Value of FEMP's technical assistance compared to others	___	99
11. Reliability of the information provided	___	99
12. Cost of obtaining FEMP's assistance compared to others	___	99

And about the FEMP homepage and internet access,... How would you rate the...

13. Ease of accessing information through FEMP's web-site	___	99
14. Ease of downloading information off the web	___	99

And last of all,

15. Considering everything, how satisfied are you with the technical assistance you received	___	99
--	-----	----

C1-3 When thinking about you and your organization's needs for training and software in the area of energy efficiency and management, would you say the FEMP technical assistance program..

1. ☐ Meets all your needs
2. ☐ Meets most
3. ☐ Meets some, or
4. ☐ Meet none of our your needs
5. ☐ Don't know or not sure

The Federal Energy Management Program has a series of workshops, and technical services called the "University Series". We would like to know if customers have heard about the "University Series"

C1-5 Are you aware of the University Series offered through the FEMP services?

1. ☐ Yes 2. ☐ No 3. ☐ Don't know/not sure

_____ → If "no" skip to C1-7

C1-6 Do you use the University Series to identify or select technical assistance services for you or other individuals working in your organization?

1. ☐ Yes 2. ☐ No 3. ☐ Don't know/not sure

C1-7 I would now like to ask you about the ways in which you might obtain technical training for you or your organization. To do this, I am going to read a list of possible ways which you might obtain training in energy efficient technologies and systems. After I read each method, please indicate your opinion of the method using a 1 to 10 scale (with 1 being not at all practical for your organization, and 10 being very practical or desirable for you or your organization.) Ready?

How would you rate...

	Score	Don't know
1. Off-site workshops where air-travel and hotel accommodations are required	_____	99
2. Off-site workshops located near your office	_____	99
3. On-site workshops provided at your facility	_____	99
4. Workshops provided via the internet, with on-line presentations and discussions	_____	99
5. Formal courses provided through a college or university in your area	_____	99
6. Correspondent courses provided through the mail	_____	99
7. Correspondent courses provided through electronic mail	_____	99
8. Courses provided via the internet with on-line presentations and feed-back	_____	99
9. CD ROM courses with materials and video presentations on the disk	_____	99
10. Down-load courses from the internet with materials and video presentations	_____	99
11. Live electronic workshops with one-way presentations and discussions	_____	99
12. Live electronic workshops with two-way presentations and discussions	_____	99
13. Training presented in conjunction with key conferences and meetings	_____	99

C1-8 What additional ways of obtaining training do you think would be of value to you or your organization and how would you rate these methods using the same 1 to 10 scale?

	Score	Don't know
_____	_____	99
_____	_____	99

One concern we have is the timing and usefulness of the FEMP technical assistance services and how these services can be integrated with our customer's planning procedures and timeframes. For example, some organizations have specific planning periods in which energy efficient designs, equipment or process changes must occur. Other organizations look at these on an on-going basis or have timeframes for each individual project.

C1-9 When thinking about your organization, and your procedures for planning and implementing changes that affect energy consumption or management, how many months does your organization typically use to evaluate, plan and implement a typical energy or pollution reduction project? You may need to estimate these timeframes, or group them into a size category, such as a small, medium or large projects, and estimate a typical or average timeframe.

Average project planning and implementation timeframes... *(Record what the customer can give and use the customer's definitions of small, medium or large or the average project.)*

Small project	_____	☐ Months	or	☐ Years
Medium project	_____	☐ Months	or	☐ Years
Large project	_____	☐ Months	or	☐ Years

- OR -

Average project

Module D
RECORDS CONFIRMATION MODULE

D-1 Finally, we would like to confirm or up-date our records and obtain some information about the organization in which you work.

D-2. How many people are employed by your organization at your current location?

- 1. ☐ Less than 100
- 1. ☐ 100 to 200
- 1. ☐ 200 to 500
- 1. ☐ 500 to 1,000
- 1. ☐ 1,000 to 9,999
- 1. ☐ 10,000 or more
- 1. ☐ Don't know / not sure

D-3 How many people are employed in the unit or section in which you work ? By unit or section we mean your business unit, consisting of people with whom you routinely interact over the course of a month.

- 1. ☐ Less than 100
- 1. ☐ 100 to 200
- 1. ☐ 200 to 500
- 1. ☐ 500 to 1,000
- 1. ☐ 1,000 to 9,999
- 1. ☐ 10,000 or more
- 1. ☐ Don't know / not sure

D-4 To the best of your knowledge, how much money does your entire organization spend each year on energy, excluding transportation fuels?

1. ☐ Less than \$50,000
2. ☐ \$50,000 to \$250,000
3. ☐ \$250,000 to \$500,000
4. ☐ \$500,000 to \$2,000,000
5. ☐ \$2,000,000 to \$10,000,000
6. ☐ \$10,000,000 to \$50,000,000
7. ☐ \$50,000,000 to \$100,000,000
8. ☐ \$100,000,000 or more
9. ☐ Don't know
10. ☐ Doesn't apply

D-5 Mrs./Ms./Dr./Mr. LastName, we would like to thank you for taking your time to help us with this interview and we appreciate your cooperation. Do you have any additional questions or comments that you would like conveyed to the FEMP staff or management?

1. ☐ No → (Thank them again and terminate call.)
2. ☐ Yes ↓

F-3 (Record questions or comments and answer if possible,
if not, refer question to FEMP interview coordinator, Mx. XXXX XXXXXX.)

(End of Interview

Thank them for their participation and cooperation and terminate call.)

Results of the software module will be reported in a separate report from the workshop report.

Module E1
BUILDING LIFE-CYCLE COSTING SOFTWARE

Our records indicate you received the Building Life-Cycle Costing Software. We would like to ask you a few questions about your experience with this Software. We are interested in your opinions of the software, how you use the software in your organization, and how you think the software can be improved.

E1-1 Before we start I would like to confirm our records. Can you tell me if you received the Building Life-Cycle Costing Software ?

1. ☐ Don't know, not sure → *(Remind them about the software and ask again)*
2. ☐ No or repeated response 1. →
3. ☐ Yes, ↓

Okay, Now lets move on to the next section of the interview
(Section C)

E1-1d Do you recall which version of the software you received?

1. ☐ No, don't know, not sure *(skip to E1-2)*
2. ☐ Yes, → E1-1e Which version is that?

Record response as given: _____

E1-1f Are you currently using this version or a different version of the software?

1. ☐ Same version
2. ☐ Don't know not sure
3. ☐ Different version → E1-1g What version are you now using?

Record response as given: _____

E1.1g Did you receive a Users-guide with the software?

1. ☐ Don't know, not sure
2. ☐ No
3. ☐ Yes,

E1-2 Can you tell me if you have loaded, examined, or used the software?

E1-3a I would now like to read a number of topics related to the Building Life-Cycle Costing Software. As I read each topic please rate how well the software performed, or met your expectations by rating each topic on a 1 to 10 scale (with 1 being "very poor performance" and 10 being "excellent performance").

How would you rate the.....

Topics	1-10 Rating	Don't Know	Not Applicable
1. Ease of loading the software	_____	98	99
2. Quality of the documentation with the software	_____	98	99
3. Visual appearance and lay-out of the screens	_____	98	99
4. Ability of the software to work with your hardware	_____	98	99
5. Compatibility of the software with your operating system	_____	98	99
6. On-screen tools and prompts to help you through the program	_____	98	99
7. Ability of the program to support or meet your analysis needs	_____	98	99
8. Quality of the printouts and presentations from the software	_____	98	99
9. Ability to down-load and transfer information from the program	_____	98	99

The next set of questions ask about how you obtain and use software support services and your satisfaction with these services.

E1-3b Have you obtained or attempted to obtain software support services for the Building Life-Cycle Costing Software?

1. ☐ Don't know or recall → (Skip to E1-4)
2. ☐ No → (Skip to E1-4)
3. ☐ Yes,

E1-3c Where did you go or what office did you call to obtain this support?

1. ☐ Don't know or recall *or*

Record response: _____

E1-3d I would now like to read a number of topics related to the support services you received for the Building Life-Cycle Costing Software. As I read each topic, please rate how well the support you received met your needs on a 1 to 10 scale, with 1 being "very dissatisfied" and 10 being "very satisfied".

How would you rate the.....

Topics	1-10 Rating	Don't Know	Not Applicable
1. Ease of determining where to go, or who to call for support	_____	<u>98</u>	<u>99</u>
2. Amount of time it took to contact the right office or person	_____	<u>98</u>	<u>99</u>
3. Timeliness of support once you reached the right person	_____	<u>98</u>	<u>99</u>
4. Amount of time available to you from the support staff	_____	<u>98</u>	<u>99</u>
5. Familiarity of support staff with the program	_____	<u>98</u>	<u>99</u>
6. Level of staff expertise regarding program uses and applications	_____	<u>98</u>	<u>99</u>
7. Ability of the staff to understand your specific situation or needs	_____	<u>98</u>	<u>99</u>
8. Ability of the support staff to solve your problem or questions	_____	<u>98</u>	<u>99</u>

E1-3e If you were to provide one or two recommendations for improvements to the software support services, what would you recommend?

1. _____
2. _____

E1-3f When you compare your experiences obtaining support for the Building Life-Cycle Costing Software with support you have obtained for other software designed for specific technical applications, would you say that on average, the support you received for the Building Life-Cycle Costing Software is...

1. ☐ Much better than others,
2. ☐ Better
3. ☐ About the same
4. ☐ Worse, or
5. ☐ Much worse than others?
6. ☐ Don't know

E1-4 Overall, on a 1 to 10 scale, how satisfied are you with the Building Life-Cycle Costing Software?

Score: _____ or 98 Don't know

The next set of questions ask your opinion on how well the Building Life-Cycle Costing Software influenced your ability to incorporate energy efficient technologies and systems into your organization. Please rate each topic using a scale of 1 to 10 (with 1 being not at all helpful and 10 being extremely helpful).

E1-5a How well did the software help you...

Topic Being Measured	Level of software help			
	(1-10 score)	or	(Doesn't apply)	or (Already use)
1. Analyze opportunities to reduce or control energy consumption,	_____	or	98	or 99
2. Compare different energy systems, methods or technologies,	_____	or	98	or 99
3. Obtain a clearer understanding of an energy efficient opportunity,	_____	or	98	or 99
4. Help you identify, define, initiate or improve a project	_____	or	98	or 99
5. Help you get your job done faster	_____	or	98	or 99
6. Help you get your job done cheaper or less expensively	_____	or	98	or 99
7. Help you do a better job	_____	or	98	or 99

E1-5b Now I would like you to think about your projects, and the Building Life-Cycle Costing Software and tell me how you think the software can be changed to improve its usefulness or what capabilities should be added to the program.

(Open-ended, record response)

E1-7 In thinking about the ways that you have used the Building Life-Cycle Costing Software, have any of these uses ultimately resulted in a reduction in the use of energy, pollution or in a dollar savings?

1. ☐ No _____→ (Go to Section C)
2. ☐ Don't know or not sure _____→ (Go to Section C)
3. ☐ Yes (NOTE: do not read paragraph if workshop fax has been sent)

E1-8 (One of the most important goals for this interview is to determine the amount of energy, pollution or dollar savings that are ultimately being achieved by projects or decisions that use the software packages provided by the Federal Energy Management Programs. We realize that this is sometimes difficult to do because of the different ways the software programs are used by people and organizations. We also realize that people often need to refer to charts or reports to answer questions pertaining to energy and pollution savings. For this reason...)

(I would like to FAX you a very short form that asks about the amount of energy, pollution, and dollars savings from projects where you or your organization have used the Building Life-Cycle Costing Software provided through FEMP's Technical Assistance Services.)

May I FAX this form to you?

1. ☐ No _____→ (Go to Section C)
2. ☐ Not now, but at a later time _____→ (Arrange for Fax time)↓
3. ☐ Yes

Date/Day/Time _____

What is your fax telephone number? _____

Using one form per project, how many forms should I fax to you? _____ Forms

Project 1:

Name of project: _____

Total dollar value of project: \$ _____ .00 Total Square Feet _____
(If Applicable)Type of Project FEMP Tracks groups here Project Location FEMP Tracks groups here**Energy Savings From Project**

Quantity # _____ Units _____ per _____ of _____ Year savings began _____

☐ kWh ☐ Day ☐ Electricity
☐ BTU, ☐ Month ☐ Natural gas
☐ Therms ☐ Year ☐ Propane
☐ Gallons ☐ Other _____ ☐ Oil, gasoline, kerosene
☐ Other _____ ☐ Other _____

Dollar Savings From Project

Quantity \$ _____ .00 per _____ from _____ Year savings began _____

☐ Day ☐ Energy savings
☐ Month ☐ Pollution reduction
☐ Year ☐ Both
☐ Other _____

Pollution Savings From Project

Quantity # _____ Units _____ per _____ of _____ Year savings began _____

☐ Lbs ☐ Day ☐ Carbon dioxide
☐ US tons ☐ Month ☐ Hydrocarbons
☐ Metric tons ☐ Year ☐ Sulfur Oxides
☐ Gallons ☐ Other _____ ☐ Nitrous Oxides
☐ Other _____ ☐ Other _____

Actual or Estimated Savings

To the best of your knowledge are these energy, dollar and pollution savings based upon estimates of savings, or are they from actual savings data that you or someone else has measured?

Savings are...	<u>Energy</u>	<u>Dollars</u>	<u>Pollution</u>
	☐ Estimated	☐ Estimated	☐ Estimated
	☐ Actual data	☐ Actual data	☐ Actual data
	☐ Don't know	☐ Don't know	☐ Don't know
	☐ Other _____	☐ Other _____	☐ Other _____

Contribution of Workshop

Which of the following components of the Building Life-Cycle Costing Software were helpful to you in achieving the savings from this project? (Check all that apply.)

- ☐ The software program
☐ Printed materials receive through the FEMP workshop along with the software
☐ Knowledge gained or skills learned in a workshop obtained with this software
☐ Other _____

Form Tracking Number W001

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