PA Consulting Group

State of Wisconsin Department of Administration Division of Energy

Focus on Energy II Pilot Study

Final Report: Evaluation of the Commercial and Industrial Program

November 5, 2001

Evaluation Administrator: PA Consulting Group

Prepared by: Economic Development Research Group
PA Consulting Group

State of Wisconsin
Department of Administration
Division of Energy

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This evaluation report was prepared by Glen Weisbrod and Karen Hamilton of Economic Development Research Group (EDR Group) under the direction of PA Consulting Group. Jeff Erickson of PA Consulting provided guidance to the overall evaluation effort and supervised survey data collection. Jeff Erickson and Ralph Prahl led discussions among team members about the theoretical construct of this analysis and the methodological approach that was used.

PA Consulting subcontractors developed engineering case studies that formed the cornerstone of our analysis of energy impacts. The Michaels Engineering team, led by David Waffenschmidt, provided technical and qualitative information on commercial projects and implemented the participant, nonparticipant, and trade ally surveys. The SBW Consulting team, led by Michael Baker, provided technical and qualitative information on industrial projects. XENERGY, Inc. provided on-site metering work for seven industrial sites to support the case studies.

Team Delta offered feedback on the proposed analytical framework for assessing market preparation. In addition, Team Delta members were interviewed for the process evaluation and provided responses to questions posed by the evaluators.

C&I PROGRAM EXECUTIVE SUMMARY

A. BACKGROUND

The Wisconsin Department of Administration (DOA) pilot Commercial Program and Industrial (C&I) Programs are components of the DOA Focus on Energy (FOE) umbrella program. The evaluation objectives were threefold: (1) gauge the program's progress toward market transformation, (2) assess implementation issues to identify how the program can operate better in the future, and (3) provide an independent assessment of the program's energy savings. An overview of the participation status is presented in Section B below, followed by an summary of the program theory in Section C. Findings are summarized in Sections D through F, followed by evaluation recommendations in Section G.

This evaluation, which was performed by members of the PA Consulting Group team, follows up on the analysis described in the Second Interim Evaluation Report to the DOA (September 2000). Much of the analysis described in this current report was performed by Economic Development Research Group (EDR Group), with guidance from PA Consulting, Ralph Prahl, and other members of the evaluation team. SBW Consulting and Michaels Engineering prepared detailed engineering case studies of selected participants, which served as the cornerstone of EDR Group's estimates of energy savings.

The evaluation team analyzed the Commercial and Industrial Programs together since they have similar goals, delivery mechanisms, educational opportunities, and public outreach. The combined program brings together service providers and businesses to help transform the market for energy efficiency. It is unlike earlier utility demand-side management programs that paid rebates for energy efficiency measures and emphasized energy savings. Although both of those elements are still important, the overarching goal of this program is to begin the process of creating a self-sustaining market for energy efficiency in Wisconsin. This long-term goal will be realized when customers routinely demand these products and services (independent of the program) and energy service companies are conspicuously promoting them.

The program leverages some federal and state energy efficiency programs that existed prior to the pilot. The Commercial Program has ties to the U.S. Environmental Protection Agency's (EPA) Energy Star® Building Program, Energy Star® Small Business Programs, and the State of Wisconsin's Energy Initiative-2 (WEI-2) program. The Industrial Program initially marketed its services under the national Climate Wise® Program name developed by EPA. This national program was subsequently canceled, and the Industrial Program now uses the identity of "Focus on Energy."

B. PARTICIPATION STATUS

At the time of the evaluation's "snapshot" of participation taken in spring 2001, 208 businesses were participating in the program as partners. Both the Commercial Program and Industrial Program successfully met their participation goals. Within this group, a total of 94 participants had reached the stage at which their projects were declared "substantially complete" by program staff meaning that the program staff had substantially completed providing the assistance they expected to provide to the participant, including technical assessments, estimates of cost-effective potential energy savings, and assistance to the business as appropriate to help move it towards initial implementation, if desired.

Participating trade allies are defined as firms that signed up to have their company name and information included in the program database on the Internet. There were 169 firms in the trade ally database at the time this evaluation was conducted. Subsequent surveys with these firms revealed that these trade allies tended to be established firms that already provided a variety of energy-related products and services to commercial, government, school, residential, and industrial customers. Throughout most of the pilot, the primary role for trade allies was to provide follow-up services to participating customers after technical assessments of their facilities had been completed by program staff.

C. PROGRAM THEORY

The program theory for the C&I programs evolved over time. In the beginning of the pilot, evaluation and program staff worked together to reach agreement on the theory behind the C&I programs. This formed the basis of the approved evaluation plans and the related activities that led to the first and second interim evaluation reports on the C&I programs. Partly in response to information revealed through the evaluation effort, the program theory underwent some changes. As a result, the leaders of the C&I programs and evaluation staff worked together in late 2000 and early 2001 to once again examine the program theory. The evaluation presented in this report is based on the revised theory as agreed upon by the program administrator and his staff.

The theory behind the program is that strategic intervention in the marketplace for energy efficiency can accelerate growth in both the demand (through customers) and the availability (through providers) of energy efficiency products and services. Together, these forces can potentially transform the overall market for energy efficiency in Wisconsin on a lasting basis. These changes in market demand can occur when customers routinely insist on building and equipment solutions that are energy efficient. Corresponding changes in market supply can occur when trade allies increase both the manufacturing stock and the effort devoted to promotion of high-efficiency equipment – all with the knowledge that this is what customers expect from them.

The pilot program was designed to influence these key players on numerous fronts. It sought to influence customers through marketing, special events, one-on-one involvement with program staff, training courses, technical assessments (of customer facilities), action plans for implementing recommended measures and the formation of new business relationships that foster energy efficiency. The pilot program also sought to influence trade allies through technical training, trade shows, events such as breakfast meetings, a tools lending program and a listing service to help them acquire new business leads.

The program theory was based on five elements:

- **Marketing**. The hypothesis states that program marketing activities (direct mail, breakfast meetings, advertisements, etc.) will lead to greater awareness of the Focus on Energy Program and of energy efficiency. This in turn will lead to an increased sense among customers and trade allies that energy efficiency has value and that there are companies and programs that can help. Marketing activities will foster relationships between trade allies and potential participants and ultimately produce business opportunities for trade allies.

- **Opportunity identification and development**. The programs are hypothesized to increase customer understanding and influence how they make energy efficiency decisions and choices. Three goals were established for the C&I programs:
  - Improve technical knowledge of energy efficiency actions that could be taken. This is expected to occur through program actions such as energy audits, technical training, various informational mailings, building operator certification, and the like.
  - Promote energy-efficient decision making. This occurs through program elements such as conducting energy audits, helping participants complete their action plans, validating cost and energy savings, sponsoring training, informational brochures, and the like.
  - Assist in finding supporting resources. This includes fostering alliances with other organizations and institutions[1], conferences, and sharing information between participants and trade allies.
- **Project implementation.** This program element consists of technical assistance to participating customers and the technical training courses offered through the program. The programs are designed to facilitate connections between customers, trade allies, state and federal programs and other market actors such as lenders.
- **Non-Energy Program Benefits.** The program included a variety of advertisements, articles and awards whose purpose was to attract participants and trade allies and provide them with public recognition that would motivate them to participate and undertake recommended energy efficiency actions.
- **Market research**. Team Delta has supplemented the knowledge acquired through field experience by sponsoring focus groups and mail surveys. These have served as a basis for further modifying program design and implementation to improve effectiveness.

D. PROCESS EVALUATION

This evaluation included a variety of data collection and analysis tasks designed to provide insight into the operations of the program and to develop recommendations for improvements. The process evaluation results are organized into three areas of analysis: customer needs, the role of trade allies, and program marketing activities.

1. Customer Needs

The experience of customers who enrolled in the program and received a technical assessment at their facility has been generally quite positive. Many said the program helped them identify potential savings in their facilities and/or heightened awareness of energy efficiency opportunities they had only suspected existed. Most respondents to the follow-up survey reported they welcome follow-up with members of the program team after technical assessments are completed. Program staff are finding that participating businesses that are implementing their Action Plans tend to be more progressive, with a culture that welcomes

[1] These include financial institutions, utilities, universities, and other organizations in which relationships can be leveraged to help the program achieve its market preparation objectives.

input from trusted professionals. In addition, in companies with clear organizational decision making there is a strong likelihood that cost-effective projects will be implemented. The program team has learned that the process can be facilitated if the decision makers can be gotten onboard early. However, it is not uncommon for participants to take a considerable amount of time to implement recommended projects.

Participants generally agreed that the pilot program is offering the kind of energy efficiency services that are important to their organizations. Non-participants who were part of the federal programs outside of the C&I programs were considerably less enthusiastic about the services they had received.

Participating customers were generally satisfied with the program implementation staff they had contact with. Participants in the other federal programs in Wisconsin who were *not* FOE participants were much less likely to be able to offer an opinion about the staff they worked with since they often did not have close contact with program staff. Participants were also generally quite satisfied with the quality of the technical assistance they received. Compared to Focus on Energy C&I participants, non-participants outside FOE received considerably fewer services.

The follow-up surveys revealed that C&I participants recognized a range of benefits from energy efficiency, including health, safety, and better operating conditions. This represents a significant improvement from baseline conditions which indicated that respondents were really only interested in energy efficiency insofar as it could reduce operating costs.

The program is having some success in influencing participants' policies and procedures, which will be necessary to achieve lasting success. Prior to participation, 5% of the commercial and 24% of the industrial customers had a formal organizational unit or procedures or policies in place for considering energy efficiency opportunities. Subsequent to participation, 10% of commercial and 24% of industrial customers said they had adopted these types of procedures or policies as a result of participating. However, since it is not clear how comprehensive and effective these new procedures are, it is premature to conclude that the program is dramatically influencing decision-making processes.

2. Role of the Trade Allies

Trade allies are defined as contractors, engineering firms, energy service companies and other providers of energy efficiency products and services. As a group, they are key players in the marketplace for energy efficiency and an important element of the C&I Program. At the time the evaluation surveys were conducted, the primary role for trade allies, as established by the implementation team, was to provide follow-up services to participating customers after technical assessments of their facilities had been completed. The expectation was that trade allies who had been recruited into the program would begin helping customers install recommended energy efficiency measures in their facilities. As more participants moved through the program, trade allies would presumably have an opportunity to increase their level of involvement.

However, the reality is that the majority of participating trade allies had not yet obtained any business from the program at the time of the follow-up surveys in early 2001. The follow-up surveys revealed that 18% of the trade allies in the program had been contacted by Focus on Energy participants and only 12% had that contact turn into additional work. This experience was at odds with the initial expectation of these firms, which was to generate new business

and gain credibility with customers who could use their services. The trade allies who had obtained business through the program generally reported that their experience was positive and worth their effort. Most of the remaining trade allies had neutral or negative opinions of the program.

3. Marketing

Program staffs believe it is becoming possible to more successfully market the program to prospective participants as program implementation gains momentum. This momentum is adding both continuity and efficiency to program delivery. The program team has continued to refine its marketing techniques, revising printed material and introducing new pieces. For example, members of the program team say they have shifted the focus to the benefits of participation and the overall process, placing less emphasis on technical details (unless requested).

Targeted program marketing appears to be having a positive cumulative effect. Customers are sending back a larger percentage of the bounce-back cards that accompany initial solicitations. Nonetheless, one-on-one contact is still absolutely necessary for recruiting participants into the program.

The surveys of participating trade allies revealed that most (81%) remembered receiving some kind of marketing materials and somewhat fewer remembered hearing ads about the program (68%). Almost one quarter (71%) was aware that the program web site contained information about their firm. There was little evidence that any of the trade allies were doing much to market the program themselves. Even among trade allies who had obtained business through the program, most did not mention it in any advertisements, although many said they had told their customers about it.

C&I implementation staff have become increasingly involved with other groups to leverage program resources, provide additional services to participants, and obtain assistance in marketing the program. These efforts have started paying off. For example, after being briefed on the program by implementation staff, WPS utility account executives have begun referring some of their key customers to the program.

E. MARKET PREPARATION

The following table presents a summary of the evidence examined by the evaluation on each of the expected results included in the program theory. Overall, the programs seem to be effective in meeting participants' needs and showing them the value of specific energy efficiency actions. There is a clear need for continued services to participants to help them implement more of the identified energy efficiency actions. The evaluation understands that pilot program efforts have largely shifted to such follow-on services. The program has increased its efforts with trade allies but so far the results have not appeared. Trade allies are generally dissatisfied with the program and are more passive than active participants. They are doing some marketing of the programs but the vast majority remains fairly disconnected from the program.

Table ES-1.
Expected Results and Evaluation Findings – Partners

Program Theory Topic	Expected Results for Partners	Near or Longer-Term	Evaluation Findings
Marketing	• Raise awareness of energy efficiency and of Focus on Energy.	• Near	• Participants' knowledge is increased by the program. Nonparticipants are generally aware of the program but their knowledge is not deep.
	• Move non-participants forward to program.	• Near	• Need to track data over time to provide evidence.
	• Increased sense that "energy efficiency might have value for my company"	• Long	• Program appears effective in producing this result with participants. Further study needed with nonparticipants to determine effect of the program on the attitudes in the market in general.
	• Increased sense that "there might be companies or programs out there to help me."	• Long	• There is a problem in the market that makes it difficult for some companies to identify qualified trade allies and then learn to trust their advice. The program has been working toward improving this situation and should be encouraged to pay particular attention to this issue. The program also has education components that should, given sufficient attendance, improve the technical knowledge of trade allies, which should make them more trustworthy to program participants.
Opportunity Identification and Development	• Raise level of knowledge among participants.	• Near	• The program appears to be leading to increased understanding among participants.
	• Facilitate energy efficient project decision-making.	• Near	• The participants' follow-up surveys indicated that program services were important for identifying and specifying energy efficiency projects and in some cases providing the veneer of independent authority that was necessary to sell the project to upper management. However, it does appear that additional or continued program services are important for increasing the rate of measure implementation
	• Change energy-related decision-making methods or approach so efficiency is carefully considered in the future.	• Long	• Participants are not yet making dramatically different equipment and procedures choices as a result of their involvement in the program however, they are making progress on laying the groundwork for energy efficient decision making in the future.
	• Improve knowledge of resources (from other programs and from trade allies) to reduce information barriers for future projects.	• Long	• The program staffs have recently been working with other institutions in the region to advance the interests of the program. They have also been exploring ways to provide information about other resources to participants. To date, the evaluation has not gathered detailed information that will demonstrate progress in this area. However, given the potential this kind of effort offers, the evaluation staff will consider such metrics for future evaluation work.
Project Implementation	• Assist participants in moving projects forward.	• Near	• See discussion above under "Facilitate energy efficient project decision-making"
	• Implement energy efficiency projects	• Long	• See discussion above under "Facilitate energy efficient project decision-making"
	• Build expectation that energy efficiency projects are doable and worthwhile	• Long	• Participants' changes in energy efficiency policies and stated intentions to implement the recommended energy efficiency projects provide evidence that this result is being achieved. However, the evidence is not strong and more detailed study is needed.

Table ES-1. Continued.
Expected Results and Evaluation Findings – Partners

Program Theory Topic	Expected Results for Partners	Near or Longer-Term	Evaluation Findings
Non-Energy Program Benefits	• Provide participants with public recognition.	• Near	• The program has incorporated a variety of mechanisms for providing public recognition to participants. Program staffs have relayed anecdotal information to the evaluation staff indicating that public recognition has been a factor in some companies' decision to participate in the program. However, the participants' surveys did not directly address this topic. Future evaluation efforts will examine the potential and usefulness of tracking this indicator over time.
	• Increased business and profits for the Partner	• Long	• The evaluation design for the C&I programs did not incorporate any metrics for tracking effects on the profits of a business. However, other evaluation efforts are seeking to quantify the non-energy benefits produced by the Focus on Energy programs.
Market Research	• Modify program design and implementation to be more effective	• Near	• A separate research effort examined the market research done by Team Delta and other Administrators.

Table ES-1. Continued.
Expected Results and Evaluation Findings – Trade Allies

Program Theory Topic	Expected Results For Trade Allies	Near or Longer-Term	Evaluation Findings
Marketing	• Raise awareness of energy efficiency and of Focus on Energy.	• Near	• Most participating trade allies are aware of Focus on Energy but the program has had relatively little impact on their awareness of energy efficiency.
	• Encourage trade allies to want to participate in the program and to market the program.	• Near	• Trade allies are doing little marketing of the program. The evaluation did not collect information from nonparticipating trade allies.
	• Foster networks or relationships between trade allies and potential partners.	• Near	• There appears to be little progress on this result, although the program has picked up activity in this area.
	• Provide more business opportunities to trade allies.	• Near	• Relatively few participating trade allies have obtained business through the program.
	• Increased sense that "energy efficiency might have value for my company"	• Long	• The program has had little impact on trade allies' attitudes toward energy efficiency.
Opportunity Identification and Development	• Raise trade allies' level of knowledge of energy efficiency equipment and services, which will help them identify opportunities for their customers, e.g., Best Practices.	• Near	• About half of the trade allies in the follow-up survey reported that they had attended one or more program-related meetings. Less than one quarter (17%) reported that they had participated in some form of training through the program. The evaluation staff will examine the possibilities for gathering data in the future that will more directly bear on this issue.
	• Trade allies will identify potential program partners.	• Near	• The majority of the trade allies trade allies have not been actively marketing the program themselves. Some, however, stated that they have been involved in marketing it in one way or another.
	• Trade allies make contact with existing partners for specific projects.	• Near	• The program has included some events specifically designed to put trade allies in contact with participants. However, as of early 2001, only 18 percent of the trade allies have been contacted by participants about potential business as a result of the program and only 12 percent have gotten work from those contacts.
	• Shift trade allies toward promoting energy efficiency products and services.	• Long	• The evaluation has found no evidence that trade allies have changed how they promote energy efficiency products and services because of the program.
Project Implementation	• Trade allies will implement energy efficiency projects.	• Near	• This low level of involvement and the generally low level of satisfaction with the program argue against any conclusion that the program has caused a meaningful change yet in the energy efficiency business of trade allies.
	• Build expectation that energy efficiency projects are doable and worthwhile.	• Long	• See the discussion above under "Trade Allies – Longer Term: Increased sense that 'energy efficiency might have value for my company'".
	• Include energy efficiency in the goods and services they offer.	• Long	• To date, the program has had too little impact on trade allies to cause them to modify their business practices.
Non-Energy Program Benefits	• Provide cooperating trade allies with public recognition.	• Near	• The program has incorporated a variety of mechanisms for providing public recognition to trade allies. The evaluation trade ally surveys did not directly address this topic. Future evaluation efforts will examine the potential and usefulness of tracking this indicator over time.
	• Increased business for cooperating trade allies.	• Long	• To date, the program has had too little impact on trade allies to have a significant impact on their business. The in-depth surveys addressed this issue and found that the program, to date, has had little impact on their revenue.
Market Research	• Modify program design and implementation to be more effective	• Near	• A separate research effort examined the market research done by Team Delta and other Administrators.

F. ENERGY AND EMISSIONS SAVINGS

The program was designed to create energy savings for commercial and industrial businesses as a consequence of the broader market preparation process. This evaluation of the pilot program energy impacts is limited to covering program participation through March 2001. During this time period, a total of 208 commercial and industrial businesses had signed up and were at some stage of the participation process. Of these, 94 had been declared by program staff to be "substantially complete," meaning that the program staff had completed technical assessments, provided estimates of cost-effective potential energy savings, and provided assistance to the business as appropriate to help move it towards initial implementation, if desired.

The limited period of this evaluation has two critical consequences:

- For the substantially complete participants, only *short-term* energy savings can be estimated. The likely magnitude of *medium-term* energy savings can also be estimated for this group using survey data pertaining to these participants' intentions and expectations (which is still subject to some uncertainty). But there is little basis for speculating about these customers' *longer-term* energy savings beyond noting the progress being made towards shifting attitudes (Chapter 3).
- Among the remaining 114 businesses still in the process of being assisted by the program staff, it is premature to measure *short-term* energy savings. All that can be done at this point in time is to assume that once their participation is deemed substantially complete, they will implement actions to about the same degree as the "substantially complete" businesses above.

Follow-up analysis in subsequent years will be necessary – to confirm the actual *short-term* energy savings for participants whose assistance is still in progress and to assess the evidence of *medium-term* and *longer-term* energy savings for all of the participants. Until the follow-up work is completed, the analysis of energy savings from the program must necessarily rely on customers' stated intentions in surveys and extrapolation from initially completed cases.

This introduces an element of uncertainty, which we have addressed by using the terms "optimistic," "pessimistic," and "most likely" expected values of the energy savings. Regardless of the assumptions used in this report, it is important to keep in mind that the magnitude of initial energy savings could be dwarfed by the full longer-term possible energy savings from a sustained program.

Program staff estimated potential for all recommended projects extrapolated to the population of 208 participants are shown in Table ES-2.

Table ES-2.
Gross Potential Impacts
(All Participants)

	KWh †	Therms †
Commercial Program	8,223,871	895,000
Industrial Program	72,419,847	9,205,159
Combined Program	80,643,717	10,100,158

† Program estimated impacts for all recommended projects for substantially complete participants extrapolated to the population of participants (n=208).

Evaluation staff adjusted gross potential savings based on an engineering review and then for free riders to calculated net savings estimates. Evaluation-adjusted net savings estimates are shown in Table ES-3. Overall, the program will produce at least 4,175,643 kWh and 4,334,908 therms from projects that are either completed or quite likely to be completed in year 1 (the "Pessimistic" scenario) and under the most likely scenario should produce savings of 10,462,389 kWh and 4,690,918 therms in year 1.

Table ES-3.
Net Program Impacts
(All Participants, First Year and Third Year)

Scenarios	kWh	Therms
Year 1		
Commercial Program		
Pessimistic	322,496	144,117
Most Likely	1,178,962	144,405
Optimistic	2,350,740	283,234
Industrial Program		
Pessimistic	3,853,147	4,190,791
Most Likely	9,283,427	4,546,513
Optimistic	29,039,937	4,765,441
Combined Program		
Pessimistic	4,175,643	4,334,908
Most Likely	10,462,389	4,690,918
Optimistic	31,390,677	5,048,675
Most Likely Scenario Year 3		
Commercial Program	1,665,194	205,729
Industrial Program	14,236,039	5,775,900
Combined Program	15,901,233	5,981,629

A separate Focus on Energy evaluation effort estimated emission factors or rates for the electric generating plants serving Wisconsin.[2] The emission rates can be used to estimate emissions reductions or savings created by the C&I programs, which are shown in Table ES-4. Under the most likely case, the substantially complete participants together would save 36,900 pounds of NO_x, 62,268 pounds of SO_2, and 13,837,418 pounds of CO_2.

Table ES-4.
Emissions Savings

	Net Electricity Savings †	Emissions Reduction (Pounds) ‡		
	kWh	NOx	SO2	CO2
Substantially Complete Participants				
Commercial Program	830,561	5,316	8,970	1,993,346
Industrial Program	4,935,030	31,584	53,298	11,844,072
Combined Program	5,765,591	36,900	62,268	13,837,418
All Participants				
Commercial Program	1,178,962	7,545	12,733	2,829,509
Industrial Program	9,283,427	59,414	100,261	22,280,225
Combined Program	10,462,389	66,959	112,994	25,109,734

† Net Electricity Savings is first year savings for the most likely scenario.
‡ Emission reductions are calculated using the marginal cost emission rates.

G. RECOMMENDATIONS

A few areas of enhancement are recommended by the evaluators.

- **Emphasize customer follow up**. Program staffs have begun putting greater emphasis on follow-up with participants after technical assessments have been performed. It is important that implementers continue to follow up with participants who entered the program under the pilot. (The evaluation staff understands that program staff in the pilot territory is now dedicating their time to providing follow-up assistance to participants rather than attempting to attract new participants.) If the program is to achieve its energy savings goals it will be important to make every reasonable effort to see that recommended measures are actually installed.
- **Increase trade ally involvement**. The evaluation team believes the time has come for program staff to work more actively at finding a more substantial and active program role for trade allies. This may include finding ways to motivate participating customers to work with the trade allies to install recommended measures. It may also mean using trade allies to perform services that are currently being carried out by program staff, such as conducting energy assessments. It might also include, for example, greater efforts to have them enroll in program-sponsored training and program events.

[2] "Development of Emissions Factors for Quantification of Environmental Benefits," PA Consulting Group, June 25, 2001.

- **Improve the trade ally database**. The trade ally database needs to be more aggressively marketed and it needs to be improved. Customers and trade allies need to be more aware of the database if they are to appreciate its value and understand its potential. It would be worthwhile for it to include more information about each trade ally in the database so participants find it more useful for identifying trade allies. It will become increasingly important as the program gets larger that the implementation team begin tracking information about who has visited this portion of the website and, if possible, track the outcome of any inquiries.
- **Fine tune the program financing program**. Program staff should continue to develop and promote the financing portion of the program. Although many customers claim they do not need external financing, others would clearly benefit from this program offering. The evaluators believe the potential market for financing may have been under-stated in the customer surveys. We strongly suspect that budget constraints are holding some customers back from proceeding with cost-effective and worthwhile projects.
- **Consider contractor certification services**. The implementation team should consider whether it is advisable for Focus on Energy to start offering some kind of contractor certification service. This would give users greater confidence in unknown firms they may be contacting for program services.
- **Continue coordination with other organizations**. The program has become more integrated with other programs, particularly EEP, and with other organizations such as the Department of Natural Resources. We expect that under the statewide program the level of integration will continue. It would be worthwhile for program staff to begin arranging periodic meetings with representatives from different organizations to enhance coordination and leverage opportunities across groups.

I. INTRODUCTION

A. OVERVIEW

This evaluation report analyzes the Wisconsin Department of Administration's (DOA) Commercial and Industrial (C&I) Programs, two components of the Focus on Energy (FOE) umbrella program which DOA has designed to address some of the key market segments in the 23-county area of the pilot. The purpose of the C&I Programs is to bring together business customers and service providers to help transform the market for energy efficiency in the C&I sectors. The C&I Programs were designed to encourage the growth of private-sector market solutions to energy efficiency and to encourage the demand for energy efficiency products and services.

This evaluation represents an independent assessment of process issues, market preparation, and energy savings of the C&I Programs. It is intended to serve as a basis for guiding internal DOA decision making and for refining the concepts of the programs as they shift from the pilot phase to a statewide program.

B. PROGRAM BACKGROUND

At the beginning of the pilot in early 1999, DOA contracted with private energy companies to design and implement its Focus on Energy programs. For the Commercial and Industrial Programs, DOA selected Delta Technologies and its subcontractors to deliver program services. SAIC is under subcontract to implement the Industrial Program, and Aspen Systems is responsible for the Commercial Program. L.K. Goldfarb Associates is responsible for program marketing. The overall C&I implementation team refers to itself as "Team Delta."

Using private companies to administer the Focus on Energy Program is a departure from conventional utility-sponsored demand-side management programs, where utilities traditionally provided most of the services. Another important difference is that earlier utility programs tended to emphasize resource acquisition (energy savings) over permanent market change. DOA recognized at the outset that to promote market-based solutions requires institutional changes among both customers and energy service providers. When market-based solutions are working, customers begin to demand energy-efficient products and services without the need for incentives, and energy service companies begin promoting and providing these services on their own.

The C&I programs are built on the principle that an investment in energy efficiency should ultimately lead to a self-sustaining market for such services. This result is referred to as "market transformation," and the process of moving toward this end is called "market preparation." The expectation is that when public support programs are eventually ended, customers will continue to pursue cost-effective energy efficiency opportunities, and private companies will exist to provide such services for profit. One goal of the pilot was to determine whether it is possible to deliver the kind of program services that ultimately prepare Wisconsin customers and trade allies for greater levels of self-sufficiency regarding energy efficiency.

The evaluation team has combined the analysis for the Commercial and Industrial Programs because these programs have similar goals, delivery mechanisms, public outreach, and educational opportunities.

The goals for both the Commercial and Industrial Programs were to develop market structures and entities that could deliver energy efficiency services and reduce market barriers to measure adoption. Both programs are voluntary and primarily based on federal and state energy efficiency programs that existed prior to the pilot. The Commercial Program ties into the U.S. Environmental Protection Agency's (EPA) Energy Star® Building and Energy Star® Small Business Programs and the State of Wisconsin's Energy Initiative-2 (WEI-2) program. The goal of WEI-2 is to make energy improvements cost-effective for local government facilities. The Commercial Program also includes a Commercial Technical Services component that offers technical services at no charge to selected customers. The Industrial Program initially marketed its services to industrial participants under the national Climate Wise® Program name developed by EPA. This national program was subsequently canceled, and the Industrial Program now uses the identity "Focus on Energy." The services offered under the current Industrial Program are essentially unchanged from the initial version. It has been designed to improve the profitability of manufacturers in Wisconsin, while increasing the efficiency of production processes. Significant service and informational enhancements were made to customize the program to this Wisconsin pilot effort.

Public outreach methods are also very similar for the C&I Programs. Both programs are directly marketed to customers and companies that provide energy efficiency services (trade allies). For both programs, direct mail solicitation is the primary method of recruiting prospective commercial, industrial, and municipal participants, as well as trade allies. Many other forms of public outreach have been sponsored by the implementation team to generate interest in the programs and provide networking and other opportunities. These include a PR campaign, breakfast meetings, conferences, showcase project tours, and participation in the Governor's Business Roundtable. Customers and trade allies are also eligible for a variety of technical and non-technical training, much of it in conjunction with the Energy Center of Wisconsin.

The pilot Commercial and Industrial Programs were implemented in two phases, Focus I and Focus II. Focus II is largely consistent with Focus I with some changes in emphasis. Focus II has concentrated more on providing follow-on services to participants and on promoting greater involvement of trade allies in the program. The programs evolved in other ways as well as they matured and as additional experience was acquired. New program elements have been introduced that build on this knowledge.

C. PROGRAM THEORY

The program theory for the C&I programs evolved over time. In the beginning of Focus I, evaluation and program staff worked together to reach agreement on the theory behind the C&I programs. This formed the basis of the approved evaluation plans and the related activities that led to the first and second interim evaluation reports on the C&I programs. Partly in response to information revealed through the evaluation effort, the program theory underwent some changes. As a result, the leaders of the C&I programs and evaluation staff worked together in late 2000 and early 2001 to once again examine the program theory. The description below represents the revised theory as agreed upon by the program administrator and his staff. The agreed-upon theory was embodied in the matrix shown in Table I-1.

Table I-1.
Commercial and Industrial Program Theory

Program Theory Topic	General Components	Specific Components – Partners	Expected Near-Term Results for Partners	Expected Longer-Term Results for Partners
Marketing	Marketing activities	• Direct marketing with letters and calls; Visits to potential partners; Ads; Breakfast meetings; Trade shows; C&I newsletter; Case studies; Program fact sheets; Coordinate with other organizations and trade schools; Press releases; articles	• Raise awareness of energy efficiency and of Focus on Energy. • Move non-participants forward to program.	• Increased sense that "energy efficiency might have value for my company" • Increased sense that "there might be companies or programs out there to help me."
Opportunity Identification and Development	Improve technical knowledge of energy efficiency actions that could be taken	• Energy audits; Technical training courses; Continue blast faxes and mailings to announce events and offer free tuition for partners to events and training; Get signed participation agreement; Building Operator Certification; Tool lending library; New construction assistance; • Industrial: Monthly fax information sheet; GBRT	• Raise level of knowledge among participants. • Facilitate energy efficient project decision-making.	• Change energy-related decision-making methods or approach so efficiency is carefully considered in the future. • Improve knowledge of resources (from other programs and from trade allies) to reduce information barriers for future projects.
	Promote energy efficiency decision-making	• Develop performance contracting guides; Provide expert advice to validate cost and savings estimates; Assist Partners complete action plans; Training; "How to Use Trade allies" brochure. • Commercial: Detailed audits • Industrial: New training event dealing with energy management in industry in the changing energy markets; Participation Agreement.		
	Assist in finding supporting resources	• Connect participants with lenders; Develop financing advisory information or tool; TA Web database; Financial info web site; RFP development and bid review assistance; Program alliances • Industrial: Making Sense conferences; Partner project listing to trade allies		
Project Implementation	Technical assistance	• Technical assistance; Technical training courses;	• Assist participants in moving projects forward.	• Implement energy efficiency projects • Build expectation that energy efficiency projects are doable and worthwhile
	Assist in finding supporting resources	• Connections to Trade Allies; Connections to other Wisconsin or Federal programs; Connect participants with lenders;		
Non-Energy Program Benefits	Ads, articles, and awards	• Recognition in Focus on Energy ads; Recognition at events; Recognition in fliers, press releases; Case studies; • Commercial: Energy Star Building label	• Provide participants with public recognition.	• Increased business and profits for the Partner
Market Research		• Focus groups; Mail survey;	• Modify program design and implementation to be more effective	

Table I-1. Continued.
Commercial and Industrial Program Theory

Program Theory Topic	General Components	Specific Components – Trade Allies	Expected Near-Term Results For Trade Allies	Expected Longer-Term Results for Trade Allies
Marketing	Marketing activities	• Ads; Trade Ally breakfast meetings; TA column in newsletter; Coordinate with other organizations and trade schools;	• Raise awareness of energy efficiency and of Focus on Energy. • Encourage trade allies to want to participate in the program and to market the program. • Foster networks or relationships betw een trade allies and potential partners. • Provide more business opportunities to trade allies.	• Increased sense that "energy efficiency might have value for my company"
Opportunity Identification and Development	Improve technical knowledge of energy efficiency actions that could be taken	• Technical training courses	• Raise trade allies' level of knowledge of energy efficiency equipment and services, which will help them identify opportunities for their customers, e.g., Best Practices. • Trade allies will identify potential program partners. • Trade allies make contact with existing partners for specific projects.	• Shift trade allies toward promoting energy efficiency products and services.
	Promote energy efficiency decision-making	• Special differentiation for Trade Allies		
	Assist in finding supporting resources	• TA Web database; Program alliances; Partner project listing to trade allies		
Project Implemen-tation	Technical assistance	• Connections to Partners needing assistance; TA Web database;	• Trade allies will implement energy efficiency projects.	• Build expectation that energy efficiency projects are doable and worthwhile. • Include energy efficiency in the goods and services they offer.
	Assist in finding supporting resources			
Non-Energy Program Benefits	Ads, articles, and awards	• Recognition in Focus on Energy ads; Recognition at events; Recognition in fliers, press releases; Case studies;	• Provide cooperating trade allies with public recognition.	• Increased business for cooperating trade allies.
Market Research		• Focus groups; Mail survey	• Modify program design and implementation to be more effective	

Table I-1. Continued. Commercial and Industrial Program Theory – Long Term Results
(beyond those shown in the table)

The program theory represented in the table shows near- and longer-term results that can be expected from the C&I programs. "Near-term" should be understood as within a matter of some months but generally less than a year. "Longer-term" should be understood as a year or two. Two issues related to longer-term impacts are best addressed in paragraph form, 1) the need for continuing technical assistance and 2) the need for continuing publicly-subsidized technical education and training.

The C&I programs as currently designed, but implemented over multiple years, will in the longer term (four or more years) contribute to the development of a market for independent technical experts to provide the types of technical services being provided by the programs for some customer segments. The program will increase the demand for such services and help set in motion changes that will perpetuate that demand, especially with customers that have not recently received our technical service. However, even though independent markets are anticipated to develop, continued public support for technical services may remain necessary, especially in support of technologies, markets, or other areas that would not advance completely on their own. Justifications for further program-provided technical services include promoting energy efficiency for new technological developments, for energy efficiency measures that become economical due to energy price increases, and to meet the needs of customer segments that do not have an active technical services market.

Similarly, public-supported technical education will likely evolve to be both within the free market, and within pubic supported areas. This will remain necessary by the changes markets, costs, and technologies.

The Commercial and Industrial Programs are based on the hypothesis that they could influence two key market groups—customers (commercial, industrial, municipal) and trade allies (the providers of energy-efficient products and services). It was hypothesized that these two groups could act in ways that would change the overall environment for energy efficiency in Wisconsin (e.g., by increasing customer demand for energy efficient products and services and by increasing sales channels and numbers/types of such products and services by qualified contractors and suppliers).

The theory assumes that business and municipal participants can be influenced through program marketing, program events, involvement with program staff, training they receive, technical assessments of their facilities, action plans that are developed, new relationships that are formed, etc. Similarly, it is theorized that trade allies can be influenced by participating in program-sponsored events—e.g., breakfast meetings, trade shows and technical training—which would help them cultivate new relationships and develop sales leads.

For both customers and trade allies, the theory states that program involvement will change awareness of energy efficiency, understanding of the opportunity it presents, and choices that are made as a result of this greater awareness and understanding. Ultimately, these sequential changes will alter the overall marketplace for energy efficiency in Wisconsin by affecting market demand, product and service availability, and the efficiencies of installed equipment.

The program elements are summarized below.

- **Marketing**. The hypothesis states that program marketing activities (direct mail, breakfast meetings, advertisements, etc.) will lead to greater awareness of the Focus on Energy Program and of energy efficiency. This in turn will lead to an increased

sense among customers and trade allies that energy efficiency has value and that there are companies and programs that can help. Marketing activities will foster relationships between trade allies and potential participants and ultimately produce business opportunities for trade allies.

- **Opportunity identification and development**. The programs are hypothesized to increase customer understanding and influence how they make energy efficiency decisions and choices. Four goals were established for the C&I programs:
  - Improve technical knowledge of energy efficiency actions that could be taken. This is expected to occur through program actions such as energy audits, technical training, various informational mailings, building operator certification, and the like.
  - Promote energy-efficient decision making. This occurs through program elements such as conducting energy audits, helping participants complete their action plans, validating cost and energy savings, sponsoring training, informational brochures, and the like.
  - Assist in finding supporting resources. This includes fostering alliances with other organizations and institutions[3], conferences, and sharing information between participants and trade allies.
  - Use advertisements, articles, and awards. The intention is to provide customers and trade allies with public recognition that would motivate them to participate and undertake recommended energy efficiency actions.
- **Project implementation.** This program element consists of technical assistance to participating customers and the technical training courses offered through the program. The programs are designed to facilitate connections between customers, trade allies, state and federal programs and other market actors such as lenders.
- **Market research**. Team Delta has supplemented the knowledge acquired through field experience by sponsoring focus groups and mail surveys. These have served as a basis for further modifying program design and implementation to improve effectiveness.

D. EVALUATION APPROACH

The evaluation approach focuses on three areas: (1) the **process evaluation** examines the operational aspects of the program, its evolution since the pilot began, changes in program emphasis and cumulative field experience; (2) the **market preparation** analysis examines the extent to which hypothesized changes in attitudes and behaviors are occurring as expected under the program theory; and (3) the program **energy impact** effort examines whether the expected energy efficiency results actually materialized.

The process evaluation is based on data collected from interviews with participants, trade allies, and program staff and compares program implementation to program theory. The

[3] These include financial institutions, utilities, universities, and other organizations in which relationships can be leveraged to help the program achieve its market preparation objectives.

process evaluation examines the methods used to implement the program to determine if any issues had a substantial impact on the results or if program implementation has deviated from program theory.

The approach to evaluating market preparation was designed to measure the program results postulated in the program theory. Data from the various data collection efforts was analyzed to measure progress in the near-term and longer-term indicators for partners and trade allies shown in the program theory.

The program energy impact was calculated using an engineering analysis approach, with supplementary metering to improve the accuracy of the results. Evaluation staff reviewed program documentation and baseline and follow-up interviews with participants to estimate program impacts. Evaluation engineers reviewed the assumptions made and algorithms used in individual project savings calculations and prepared revised estimates of impacts. Evaluation engineers also went on-site at seven industrial sites to measure energy consumption for specific pieces of equipment. The results of the measurement efforts were incorporated in the participant-specific estimates of energy impacts. The participant impacts were subsequently used as inputs to estimates of savings at the overall program and state level.

E. PROGRAM DATA COLLECTION

To collect the necessary data for determining whether hypothesized program results actually occurred, a series of telephone interviews and surveys were conducted by the evaluators. Participants, non-participants, trade allies, and program staff were interviewed to collect data for the process evaluation. Detailed engineering case studies were performed by PA's subcontractors Michaels Engineering and SBW Consulting to provide revised estimates of potential energy savings. On-site metering was performed by XENERGY, also a subcontractor on the evaluation team. The evaluation tools in Table I-2 below are described in the following section.

Table I-2.
Data Collection Tools

	Data Collection Tool	Quantity
1a	Participant Baseline Interviews	77
1b	Participant Follow Up Interviews	42
2a	Non-Participant Interviews Outside FOE Territory	20
2b	Non-Participant Interviews Inside FOE Territory	38
3a	Trade Ally Baseline Interviews	40
3b	Trade Ally Follow Up Interviews	142
3c	Trade Ally In-Depth Interviews	7
4	Program Staff Interviews	25
5	Engineering Case Studies	42
6	End Use Metering	7

1. Participant Interviews

The evaluation team collected information on participants at two stages in the participation process. A baseline interview was completed with all participants as soon as possible after customers signed up for the program and ideally (but not always) before a technical assessment of their facility had been completed. A follow-up interview was conducted after program staff informed the evaluation team that technical and advisory services were substantially complete.

- **Baseline participant interviews**. Throughout all of Focus I and most of Focus II to date, the evaluation team has conducted baseline interviews with a census of participants in the commercial and industrial programs. The goal was to complete the interview right after the participant had signed up for the program but before a technical assessment of their facility had been completed. The Second Interim Report to DOA (September 2000) contained a summary of the first 38 commercial interviews and the first 39 industrial interviews. This summary is included in Appendix 1.
- **Follow-Up Participant Interviews.** Throughout all of Focus I and most of Focus II to date, the evaluation team has been conducting follow-up interviews with a census of participants in the commercial and industrial programs. The evaluation team conducts these interviews after program staff informs them that technical and advisory services have been substantially completed. The evaluation team completed a total of 21 commercial and 21 industrial follow-up interviews in time to be included in the analysis presented in this report. These customers were interviewed after they had received technical assessments of their facilities and, in most cases, after action plans had been developed. A complete write-up of these interview results can be found in Appendix 2.

2. Non-participant Interviews

The evaluation team surveyed selected groups of non-participants in order to compare their attitudes and behaviors related to energy efficiency with those of participating customers. Separate survey tools were developed for interviews with customers outside the FOE pilot territory versus those inside the region.

- **Non-participants *Outside* FOE Territory**. Telephone surveys were conducted with a group of customers who were *no*t participants in the C&I Program, but who *did* participate in one of three federal programs that were components of the Focus on Energy program—Climate Wise, Energy Star Buildings, and Energy Star Small Business. Interviews were conducted with a total of 38 businesses in spring 2001. Participation in these programs, particularly Climate Wise, had been fairly limited in Wisconsin. In spite of the relatively small sample size, the results offer useful insight into these federal programs and a point of comparison with the Focus on Energy C&I Program. A complete write-up of these interview results can be found in Appendix 3.
  - Climate Wise. This program, which was offered by the U.S. Environmental Protection Agency, had been a component of the Industrial Program. In fall 2000, the EPA integrated Climate Wise into the Energy Star partnerships. The program is now referred to within the Industrial Program as Energy Star for Wisconsin Industries. A total of 17 Climate Wise participants outside the FOE territory were interviewed for this evaluation.

- Energy Star Buildings Program. The U.S. Department of Energy and the EPA offer the Energy Star Buildings Program, which also is a component of the Focus on Energy Commercial Program. A total of 10 participants located outside the FOE pilot area were surveyed.
- Energy Star Small Business Program. The U.S. Department of Energy and the EPA offer the Energy Star Small Business Program, which also is a component of the Focus on Energy Commercial Program. A total of 11 Energy Star Small Business Program participants outside the FOE territory were interviewed for this project.

- **Non-participants *Inside* FOE Territory**. Telephone interviews were conducted with a sample of commercial and industrial establishments located within the pilot area who were *not* participants in the Focus on Energy C&I Program. Interviews were conducted with a total of 20 of these customers in Spring 2001 to learn about their awareness of the FOE program, energy efficiency measures they had installed (or planned to), their attitudes toward energy efficiency, and other issues. The sample included a mix of establishments that were potentially eligible to participate in the C&I Program. A complete write-up of these interview results can be found in Appendix 4.

3. Trade Ally Interviews

Interviews were conducted with participating contractors, engineering firms, and energy service companies (collectively referred to as "trade allies"). Three sets of trade ally interviews were conducted to learn about various aspects of the program.

- **Baseline trade ally interviews**. Baseline interviews were conducted with 40 trade allies who had signed up to participate in the C&I Program. All of these trade allies provide energy efficiency products and services to commercial and industrial customers. The purpose of the interviews, which were conducted close to the beginning of the program, was to collect background information on the kinds of firms that were offering their services through the program and to collect preliminary information about their experiences. A complete write-up of these interview results is presented in Appendix 5.
- **Follow-up trade ally interviews**. In-depth interviews were conducted with 142 of the 169 participating trade allies included in the Focus on Energy C&I program database as of April 2001. Efforts were made to interview every trade ally, and an 84% response rate was achieved. The purpose was to learn about their awareness of program marketing, their involvement in the program, business they obtained as a result of participation, satisfaction, and areas for program improvement. A complete write-up of these interview results can be found in Appendix 6.
- **Follow-up interviews with trade allies with most program activity**. The follow-up trade ally surveys described above revealed that only 12% of these firms knew that they had obtained any business as a result of their involvement in the program. All respondents from this group, who agreed to answer additional questions, were interviewed in greater depth to learn about the projects these firms were involved in and their overall experience with the program. A complete write-up of these interview results can be found in Appendix 7.

4. Staff Interviews

Two sets of interviews were conducted with program staff. The first set included 10 individuals who were interviewed at the outset of the program under Focus I. The second set of interviews included 15 individuals who were interviewed one year later under Focus II. In addition to members of the program team, the evaluators interviewed staff at DOA and other individuals with direct involvement in the program. The purpose was to learn about the program from those with personal experience and to guide program improvement. The interviews explored the evolution of the pilot program, the marketing approach, relationships among component programs, program effectiveness, trade ally involvement, and suggestions for the statewide program.

5. Case Studies

The evaluation team obtained copies of action plans and other participation documentation from the Delta Team on those participants who were deemed substantially complete in time for inclusion in this analysis. The reviewed that documentation to create case studies, which are included in Appendix 10 (Commercial) and Appendix 11 (Industrial). The evaluation team reviewed the energy savings calculations shown in the documentation. When issues arose about the energy savings calculations or documentation, they discussed the details with the appropriate program administrator staff to confirm that the proper conclusions were reached. The evaluation team examined the energy savings calculations to validate both key parameters and the estimation methodology. The team then incorporated information from the follow-up surveys and the on-site metering to identify program-recommended measures that had already been implemented, that were in-progress, or that had some likelihood of being implemented in the future. With this information, the evaluation team produced revised estimates of energy savings by measure for each of the companies included in the case studies. The case studies also documented management changes identified in the follow-up surveys.

6. End Use Metering

To improve the accuracy of the evaluation estimates of energy savings, seven industrial sites were chosen for additional measurement and verification (M&V) effort. The documentation given to the evaluation team indicated that more detailed information on recommended measures was collected for industrial than for commercial program participants. This greater detail has allowed evaluation subcontractor SBW to develop preliminary M&V plans for individual industrial participants. These plans called for on-site data collection efforts including efforts such as monitoring large motors for several weeks, measuring runs of insulated steam pipe, and copying two years of operating logs for large production equipment. These plans include 14 measures at eight industrial sites. SBW chose these measures based on follow-up interviews that indicated which had been or were likely to be installed. Among all measures either installed or reported as having a higher possibility of being installed within one year, these 14 showed the largest savings among 21 industrial sites. Their estimated energy savings also compose more than half of the potential energy savings estimated for the C&I pilot. Evaluation subcontractor XENERGY performed the M&V activities at seven industrial sites and provided the data to SBW for incorporation in the industrial case studies. While at five of the sites, XENERGY also asked a battery of questions that supported a more detailed analysis of free-ridership.

II. PROCESS EVALUATION

The process evaluation of the C&I Program examines the program from an operational standpoint. It attempts to offer a comprehensive picture of how the program is performing and how it could operate better in the future. The process analysis was supported by data from staff interviews and interviews with participants, nonparticipants, and trade allies. The process evaluation presented in this chapter is divided into three areas of analysis: customer needs, the role of trade allies, and program marketing activities.

A. CUSTOMER NEEDS

As described above, the evaluation team surveyed four customer groups—baseline participants, follow-up participants, inside-FOE non-participants, and outside-FOE non-participants—to understand the extent to which the C&I Program is achieving its objectives and to learn how participants are experiencing the program. For a more detailed analysis of each of these surveys, the reader is referred to Appendices 1-4. The customer needs analysis was also informed by interviews with program staff and other involved market players (see Appendix 8). The finding from these separate research efforts is summarized in this section.

1. Program Theory

The theory behind the C&I Programs is that strategic intervention in the marketplace for energy efficiency can accelerate growth in customer demand for energy efficiency products and services. Changes in market demand can occur when customers routinely insist on building and equipment solutions that are energy efficient. The pilot program was designed to influence customers through marketing, special events, one-on-one involvement with program staff, training courses, technical assessments (of customer facilities), action plans for implementing recommended measures, and the formation of new business relationships that foster energy efficiency.

Over the long run, the program is designed to heighten customers' awareness of energy efficiency, enhance their understanding of the opportunity it presents, and improve the choices customers make as a result. Ultimately, these changes result in greater product and service availability and overall market shifts favoring energy efficiency in Wisconsin.

2. Participation Experience

The experience of customers who enrolled in the program and received a technical assessment at their facility has been generally quite positive. Among surveyed participants, 81% of the commercial customers and 85% of industrial customers felt that participation in the program made sense for them. These percentages are impressive in the context of the baseline respondents' modest expectations of the program. Few baseline respondents had any preconceptions about the value they could expect, and many had reservations about participating. None of the concerns raised in the baseline surveys appears to have been a problem for customers one year later.

Instead, participants learned that the program was valuable, did *not* take an excessive amount of time to participate, truly had "no strings attached," and did not charge for services that were promised for free. Most customers thought participation made sense for their firms.

Many said the program helped them identify potential savings in their facilities and/or heightened awareness of energy efficiency opportunities they had only suspected existed. Others pointed out that the program offered a valuable second opinion. Some participants, both commercial and industrial, noted that the program offered them a chance to obtain recognition and improve their image in the community.

The evaluation team learned in the baseline surveys that few customers considered themselves to be energy experts, and many were anxious to learn what the facility audits would reveal. Some of the participants in the follow-up survey group appeared to be impressed with what they learned through participation. For example, one customer remarked, “We never would have figured this out for ourselves."

Customers who were the most pleased with the results of participating were more than twice as likely (as less-pleased respondents) to think the program influenced how they currently considered energy efficiency and related cost savings. The program appears to be helping customers understand that energy efficiency does not necessarily have to compete with other interests. For example, some customers who had been preoccupied with the overall “look” of their building or with employee productivity admitted they had been overlooking the very achievable benefits of energy efficiency.

The follow-up participant surveys indicate that most participants thought the pilot program offered the most important energy efficiency services for their firm. The few customers who did *not* agree with this were twice as likely to also say participation had *not* made sense for their company.

Among the customers who thought participation had *not* made sense for their firm (in the largest sense), none subsequently adopted any policies or procedures for considering energy efficiency in their organizations. These same customers also tended to be less impressed with the audit and/or thought the program would be better suited for customers different from them. One of these participants said, “Nothing came out of it that we were surprised at,” and another said, “I was not impressed, I don’t think the person…was very knowledgeable about energy efficiency.” These were, however, minority views among participants as a whole.

3. Participant Decision-Making

Issues surrounding participant decision-making were explored in both the customer surveys and the interviews with program staff. Throughout this section, it is important to keep in mind that the C&I Program is wholly voluntary, from the decision to become a participant, through the decision to take action and install recommended measures. It is also important to remember that decision-making processes depend on the type of company involved. Franchises, for instance, are historically difficult to recruit for energy efficiency programs because decision-making is often far removed from the eligible site.

The types of businesses entering the C&I Programs today are not significantly different from the beginning of the pilot. Staff working on the Industrial Program continues to find it easiest to attract and provide technical assessments for mid-sized customers, a population they believe has been under-served in the area of energy efficiency. The Commercial Program continues to have the most difficulty in recruiting retail participants because so many of these establishments are chains, where decision makers reside outside the pilot area. Because the program has met its participation goals within customer groups that are relatively easier to recruit, there has not been a big push to reach these other segments.

Once a customer becomes a participant and has a facility audit, the customer is unlikely to move forward unless the projects are cost-effective as defined by that organization's planning criteria. The definition of cost-effectiveness varies for each firm. While some organizations may accept a five-year payback on energy efficiency investments, others are unmoved by even the shortest paybacks.

Even when payback is deemed acceptable (and cost-effectiveness is no longer a barrier), an internal project champion is often needed to guide the project through. It is typically necessary to obtain internal or corporate authorization for the investment. This can be more easily handled in small to mid-sized companies, which often have smaller organizational structures that allow team members to work directly with presidents and other senior officials. The evidence gathered in this process analysis suggests that some organizations are simply too disorganized to get past this critical juncture.

Once a participating business makes a decision to move forward and implement its Action Plan, it can take months or years to actually complete the energy efficiency improvements. Members of the program team say it is impossible to generalize about how long this process takes because there is tremendous variation in projects and budgeting processes. At one end of the spectrum are simple, cost-free initiatives such as changing dial settings on some equipment. Lighting retrofits also can take less than a year to implement. Projects that involve a design firm typically take longer. Large projects may be spread over more than one budget cycle, which prolongs the adoption process and the amount of time before resource acquisition (energy savings) materializes.

The program team has learned that the process can be facilitated if the decision makers can be gotten onboard early. They explained that it is necessary to find individuals who will not only champion the project, but who can also obtain the commitment for funds. According to program staff, linking energy efficiency with other problems (e.g., power quality, boilers that are not keeping a building warm enough) can go a long way toward ensuring the installation of energy efficiency measures. One team member noted that the challenge is to "Figure out how to introduce the concept of energy efficiency as a solution to these [other] problems."

Most respondents to the follow-up survey reported they welcome follow-up with members of the program team after technical assessments are completed. Program staffs have found that the participants who are ready to move on projects are usually anxious to talk with members of the program team again. Their needs tend to be very specific to circumstances at their facilities, and they are anxious to delve into the specifics. Program staff believes it is now clear that customers need information and advice from informed people more than they need software.

Program staff are finding that participating businesses that are implementing their Action Plans tend to be more progressive, with a culture that welcomes input from trusted professionals. In addition, in companies with clear organizational decision making there is a strong likelihood that cost-effective projects will be implemented. Program staff comments generally agreed with a statement made by one member of the team, who thought, "The likelihood of measure adoption is inversely proportional to the complexity of the organizational system."

However, it is not uncommon for commercial and industrial customers to take a considerable amount of time to implement recommended projects. As one program staff member remarked, "What has been done in the past has been quite simple and has not required major

modifications to plants." The speed of measure adoption tends to slow down when a customer discovers that a solution, although clearly worthwhile, is not going to be easy and inexpensive.

4. Program Services

Participating customers generally agreed that the pilot program is offering the kind of energy efficiency services that are important to their organizations. This was particularly true of industrial customers—94% said the program offered the right kinds of services—compared to 76% of commercial customers. The kinds of program services participants identified as the most important generally match what is offered by the implementation team. These services (in order of priority) are technical assessments, education/training, information on cost-effectiveness, the opportunity to obtain a second opinion, and the Action Plans that were developed.

Participants who thought they had received the kind of support they needed from the program also thought that participation generally made sense for their organizations. In fact, 94% of the customers who received the "right" kind of support also said that participation was a sensible move. In contrast, 67% of the customers who did *not* feel they had received adequate support were skeptical about whether participation made sense for them. Furthermore, none of the customers who said that the program failed to offer the right kind of services took any initiative to implement new policies or procedures within their organizations regarding energy efficiency.

Non-participants who were part of the federal programs outside of the C&I programs were considerably less enthusiastic about the services they had received. Only about half of the non-participants in the Climate Wise group said participation in this program had made sense for their organization. This compares with 85% in the Focus on Energy Industrial Program (all of whom received Climate Wise services). Similarly, customers in both Energy Star Buildings and Energy Star Small Business outside the pilot territory said they would have liked more personalized services, although some clearly understood that they received the level and depth of services that the standalone federal program was intended to provide. Fewer than half of these customers said participation in that program had made sense for them. This was far below the 81% of participants in the Focus on Energy Commercial Program who reported participation had been a good idea.

5. Effectiveness of Program Staff

Participating customers were generally satisfied with the program implementation staff they had contact with. In fact, customers gave this aspect of the program a satisfaction rating of 8.6 on average (based on a 10-point scale, with 1 representing "not at all satisfied" and 10 being "very satisfied") with program staff. There were virtually no differences between commercial and industrial customers.

Participants who were the most satisfied with program staff also held favorable opinions of the technical assistance they received. Satisfaction with program staff was also correlated with subsequent adoption of procedures for considering energy efficiency in the future. Indeed, among customers who adopted procedures as a result of the program, all gave the program staff high ratings.

Participants in the other federal programs in Wisconsin who were *not* FOE participants were also asked to score the staff they worked with. Only 8 of the 17 Climate Wise participants outside FOE territory felt they were in a position to answer this question because of their limited interaction with such staff. The average score was an 8. Only two of the 10 Energy Star Buildings respondents outside FOE territory had any personal involvement with program staff, and both gave these individuals a score of 8. Only two of the 11 Energy Star Small Business non-FOE respondents thought they were in a position to rate program staff.

6. Quality of Technical Assistance

The baseline participant surveys revealed that although commercial and industrial customers considered energy to be important, it was almost always secondary to other concerns. Even participants who said energy issues were important to their business seldom had any idea how much they were spending on energy. By and large, customers entering the program were not particularly sophisticated about energy efficiency opportunities at their facilities.

Following the technical assessments, however, they became considerably more educated and reported high levels of satisfaction with the program. Indeed, customers in the follow-up participant surveys gave an average satisfaction score of 8.3 (based on a 10-point scale, with 1 representing “not at all satisfied” and 10 being “very satisfied”) with the technical assistance.

Customers who were the most satisfied with their experience were particularly likely to have had other positive impressions of the program and to have made changes in the way they consider energy efficiency. Specifically, customers who were the most satisfied with the program's technical assistance were also quite satisfied with the program staff they were involved with. Furthermore, customers who were most satisfied with the technical assistance were much more likely to subsequently adopt new procedures for considering energy efficiency in the future. In other words, highly satisfied participants were the most likely to change their organizational behavior to ensure that energy efficiency opportunities are identified and acted upon in the future.

The experience of participants in the C&I Programs was compared to that of customers who received assistance through these same federal programs *outside* of the Focus on Energy programs. Compared to C&I participants, non-participants outside FOE received considerably fewer services. For example, only 41% of the Climate Wise non-FOE customers received any form of technical assessment of their facilities, and only 35% received a walk-through audit. Virtually all of these audits were described as "superficial" or "minimal." This is contrasted with the FOE Industrial Program in which *all* of the participants received walk-through facility audits. Furthermore, in the Climate Wise *non*-FOE sample, only a few energy efficiency measures were recommended, and these were typically standard retrofits pertaining to lighting, HVAC, and boilers. In contrast, the FOE Industrial Program involves, in virtually every case, a much broader spectrum of measures that are tailored to the individual customer.

Energy Star *non*-FOE customers had the same experiences as Climate Wise customers. Only 27% of Energy Star Buildings and 30% of Energy Star Small Business customers had received any form of technical assessment. Very few received any help specifying equipment or identifying trade allies. Most said they received phone calls from the staff at these federal programs about once a year, along with materials such as guidelines for selecting energy-efficient equipment.

7. Follow-Up After Technical Assessments

Participants in the C&I Program were asked various questions about the level and quality of follow-up they received from program staff. Most of the surveyed participants were satisfied with the amount of follow-up they received (90% of commercial customers and 95% of industrial customers were satisfied).

Almost all of the customers who thought participation made sense for their organization said program staff had provided the follow-up their firm needed (97%). Among these customers, most said the program offered the types of services their organization needed. The few customers who thought they had *not* received sufficient follow-up identified specific needs they felt were unmet.[4] None of these customers said the program had motivated them to adopt formal policies for considering energy efficiency in the future.

Customers gave a variety of reasons for implementing program recommendations, although industrial customers were better able to articulate their reasons. For both commercial and industrial customers, the main impetus was an opportunity to lower energy costs. This reason was cited by 95% of industrial customers and 85% of commercial customers. A secondary reason was to improve profitability, cited by 90% of industrial customers and 42% of commercial customers. Industrial customers also cited reliability/safety as motivational factors in 55% of cases (compared to less than 16% of commercial customers). Productivity was a more critical factor among industrial customers than commercial customers (30% vs. 11%, respectively).

The fact that participants recognized a range of benefits points to a program success, since the baseline surveys found that customers early in the participation process were really only interested in energy efficiency insofar as it could reduce operating costs. Indeed, the baseline surveys revealed virtually no interest in energy efficiency as a good business practice or even much recognition that it provided other benefits.

8. Impact on Customers' Energy Efficiency Behavior[5]

Participating customers were asked to what extent the program had influenced their organization's actions and intentions related to energy efficiency. Prior to participation, 5% of the commercial and 24% of the industrial customers had a formal organizational unit or procedures or policies in place for considering energy efficiency opportunities. Subsequent to participation, 10% of commercial and 24% of industrial customers said they had adopted these types of procedures or policies as a result of participating. Customers who were influenced to adopt internal policies also tended to be more satisfied with the program staff they worked with and to believe that participation made sense for their organization.

Some customers who reported the program had changed how their firm viewed energy efficiency said it made them more aware of opportunities or helped them look at things differently. The formal recommendations developed through the program were also thought to

[4] These pertained to a compressed air system, an HVAC project, and certain recommendations on an exhaust system.

[5] An analysis of the energy savings produced by the program is included in Chapter 4.

provide a useful platform for implementing and planning for energy efficiency. Participants reported that the program has been helpful in pulling together the kinds of information needed, making it easier for them to get projects implemented. This is a potentially important result, because the baseline surveys revealed that customers often find it difficult to obtain the necessary information for getting the process started. However, it is premature to conclude that the program is dramatically influencing decision-making processes.[6]

Customers who reported the program had changed their views were three times more likely than other customers to have actually adopted policies or procedures. These same customers were twice as likely to think participation made good sense for their organizations and slightly more likely to think the program offered the right types of services for their firm.

9. Funding Energy Efficiency

The interviews with program staff and surveys of participants and non-participants clearly show that energy efficiency projects compete with other projects for internal funds. Beyond this, there are differing views as to the priority (or lack of priority) energy efficiency projects are given. While many customers contend that energy efficiency projects are treated no different from other projects, there were also many examples of how this was *not* always the situation.

Many customers, both participants and non-participants, expressed a strong need to maintain an organizational focus on the production aspect of business. One customer said, "Production is definitely a first priority." Another said "bringing in sales" was first on their minds. Energy conservation projects simply "do not have the same urgency" and were characterized by one participant as a "byproduct of what is going on" in his company.

In contrast, other customers said energy efficiency projects actually get higher priority than investments in production or sales. One customer said that while non-energy capital projects are only undertaken when equipment is not functioning, energy efficiency projects are sometimes funded even when existing equipment is operational.

Customer financing was originally intended to be a significant component of the C&I Programs. However, there were mixed opinions among both program staff and customers about the need. Implementers have been finding that the organizations they are working with in the pilot normally have access to internal funds to carry out planned projects. They believe instead the real challenge is to get the projects into the budget. Each project must become a priority so that, according to one implementer, “It isn’t lopped off at some later point.”

While many members of the implementation team believe there is very little need to offer customers financing options, they were not opposed to this. One implementer had seen “very little need for financing…[but] there will be a need for those who need it.” Another implementer stated that customers do *not* want a long-term relationship with the program and might perceive financing as a threat to their independence. He believes customers are more comfortable figuring out for themselves how to pay for measures.

[6] Subsequent surveys will ask participants more detailed questions about specific changes in policies or procedures as a result of the program in order to better understand this issue.

However, a few of the individuals interviewed thought financing was critical. One remarked, "In spite of what others believe, I have seen evidence that it is important." There can be a tendency to become wedded to current conventions. One individual remarked, "The way things are done becomes self-perpetuating." And it appears to be true that few trade allies and their customers have experience in approaching energy efficiency projects that involve external financing.

The question of how energy efficiency projects are financed was asked of both participants and non-participants. The baseline participant surveys revealed that industrial customers were fairly equally divided on whether they financed capital equipment projects using internal or external funding.

The follow-up surveys suggest that financing represents a significant obstacle, particularly to industrial customers. While only 15% of the commercial customers said financing can hold a project back, 33% of the industrial customers reported this to be the case. For example, one customer said, "Financing is always an obstacle," and another remarked that a financing vehicle would "help make things workable."

Other participants reported that financing was not a problem. A few noted that internal financing was available as long as the return on investment was reasonable (under 3 years) and/or it was possible to justify the investment. In some cases, budgets had been "padded" previously so capital was available.

In the sample of non-participants outside of FOE, energy efficiency projects generally did not require outside financing. However, 12% of these customers used outside financing for this purpose. Some of these customers had also used bonding through a bank or partnered with an electric utility for low-interest loans. Generally, projects were funded internally, often as an expense item rather than as part of a capital project, although this depended on the size of the project.

To meet the possible need for financing in the future, the program team was in the process of developing a tool that would facilitate applying for a loan through the program website. The evaluation team recommends that this work move forward.

10. Program Tools

At the outset of the pilot, one of the strategies of the C&I program was to introduce new tools and procedures that would facilitate energy efficiency planning. These included tools to expedite tasks such as project assessment, bid specification and bidder selection. At the time of the first evaluation, the program team had begun introducing some tools, such as the financing portion of the Focus on Energy website and the tool-lending library. However, at the time of the second interviews, only a little more had been done. The program team expressed the view, which they believed DOA shared, that the importance of this aspect of the original plan should be downgraded.

Program staff pointed out that experience with the pilot indicates that customers are not sufficiently independent to begin using these tools themselves. Originally, it was thought that customers would have both the ability and initiative to make use of these tools. But program staff has found that customers are willing to work--*in person*--with program implementation staff on devising projects to improve their facilities. They do not, however, show much interest in using software, spreadsheets, or other tools to do many things themselves.

Program staff also pointed out hat a variety of software tools currently available for customers. This is not to say that all of these tools are user-friendly – in fact, some are too difficult or plagued with software problems to be really usable. To be useful, tools need to be very good, they need to be easy, and they cannot require a lot of time. At the moment, people are much more willing to spend time with a knowledgeable person than with software.

According to one implementation team member, "We had hoped for a more tool-based approach…[and] that partners [participants] would do more." As it turns out, however, the program team is doing more for participants than they had anticipated. Although program staff still considers tools to be an important "adjunct to technical services," their experience indicates that tools are not a satisfactory substitute for one-on-one involvement. According to one team member, "We have a long way to go before customers will use tools independently." In other words, program staffs are still a critical link in assuring that energy efficiency occurs.

The evaluation team will defer to the experience of the implementation team in this area. However, program staff should plan to re-visit the issue of program tools within the next year.

11. Fee-Based Energy Audits

Under the C&I Program, participating customers receive free technical assessments of their facilities with the expectation that they will proceed with at least some of the recommended measures. Program staff was skeptical that commercial and industrial customers would be willing to pay for these technical assessments. They pointed out that if customers were interested in investing in this manner, there would have been little need for the program. Program staff believes they would have had many fewer participants had there been a charge for technical services.

One member of the program team estimated, "If we were to begin charging [for technical assessments], participation would drop to maybe 4-5 audits per year." In the words of another, "It would take a lot to get to the point where a fee-based program would work." Customers appear to be participating precisely because these services are provided free of charge. One program staff member said, "Energy prices would have to go up by a factor of ten for them to consider paying for these services." Program staff generally concur that, from their experience, customers simply will not spend what is required to obtain specific information about what they need. However, there are energy service companies and engineering firms successfully selling audit services to some firms. Future evaluation work might study this market to better understand this issue.

12. Recommendations

From the customer perspective, the C&I Program is operating very well. Program staff should continue to offer the same level of high quality, personal assistance to customers. Two areas of enhancement would be of even greater value to participating customers.

Evidence from the participant surveys indicates it would be worthwhile to find new ways to foster relationships between participants and trade allies. Greater trade ally involvement would not only help customers get more energy efficiency projects installed, but would also give trade allies a more meaningful role in the program. Eventual market transformation requires increases in both demand for energy efficiency products and services (customers)

and supply of such services (trade allies). This issue is explored in more detail in the next section.

Program staff has begun putting greater emphasis on follow-up with participants after technical assessments have been performed. It is important that implementers continue to follow up with participants who entered the program under the pilot, while they continue to recruit new participants. If the program is to achieve its energy savings goals it will be important to make every reasonable effort to see that recommended measures are actually installed.

Program staff should to continue to develop and promote the financing portion of the program. Although many customers claim they do not need external financing, others might benefit from this program offering. The evaluators believe the potential market for financing may have been under-stated in the customer surveys. For a variety of reasons, most customers under-invest in energy efficiency. One problem is that organizations become accustomed to doing things a certain way, e.g., relying on internal financing for energy efficiency projects. We strongly suspect that budget constraints are holding some customers back from proceeding with cost-effective and worthwhile projects.

The evaluation team will defer to the experience of program implementation staff on the matter of fee-based energy assessments. The evaluation team will look into ways of studying this issue more in the future.

B. ROLE OF TRADE ALLIES

Trade allies are defined as contractors, engineering firms, energy service companies, and other providers of energy efficiency products and services. As a group, they are key players in the marketplace for energy efficiency and an important element of the C&I Program. The evaluation team conducted three separate groups of surveys of trade allies (baseline, follow up and in-depth), as described in Appendices 5-7.

At the time the evaluation surveys were conducted, the primary role for trade allies, as established by the implementation team, was to provide follow-up services to participating customers after technical assessments of their facilities had been completed. The expectation was that trade allies who had been recruited into the program would begin helping customers install recommended energy efficiency measures in their facilities. As more participants moved through the program, trade allies would presumably have an opportunity to increase their level of involvement. A growing number of commercial and industrial customers are now advancing to the stage at which they should be ready to undertake energy efficiency improvements.

However, the reality is that the majority of participating trade allies had not yet obtained any business from the program at the time of the follow-up surveys in early 2001. The follow-up surveys revealed that 18% of the trade allies in the program had been contacted by Focus on Energy participants and only 12% had that contact turn into additional work. This experience was at odds with the initial expectation of these firms, which was to generate new business and gain credibility with customers who could use their services. Among the few trade allies who had obtained business through the program, they generally reported that their experience was positive and worth their effort.

1. Program Theory

Although some trade allies have negative opinions about the program because of the limited number of projects that have materialized for them, the program theory considers this to be just one milestone in an evolutionary process, not a sole indicator of success or failure. One purpose of the trade ally surveys was to consider how elements of the program theory correspond to actual awareness, experience, and behavior of these market participants.

The program theory postulates that the kinds of intervention offered through the C&I program will ultimately lead to a self-sustaining market for energy efficiency products and services in the region. For trade allies, this means they must obtain work through the program and, ultimately, take the initiative to promote these kinds of products and services on their own. It also means acquiring new skills by participating in training opportunities and expanding their networks.

The program theory regarding trade allies can be thought of as a continuum representing gradations of program involvement and ultimate market transformation (Figure II-1). The lowest level of involvement could be defined as an awareness of the basic facts of the program. This might include a trade ally's exposure to program marketing materials or knowledge that their company is part of the program's Internet database. A higher level of trade ally engagement could include attending program meetings with implementation staff, trade ally breakfasts, etc. The purpose of these meetings has been for trade allies to learn about the program and how they can work with customers, but it also provides an opportunity for trade allies to expand their knowledge of energy efficiency and extend their professional networks.

The next level of involvement could be enrollment in training sponsored by the program to acquire new skills. At around the mid-point of this continuum is the development of new business through the program. Once trade allies have financially benefited from their involvement, we begin to anticipate market shifts, such as new ways of viewing energy efficiency and a change in the mix of products and services trade allies sell.

Figure II-1.
Continuum of Trade Ally Involvement in Program

2. Role of Trade Allies

Program staff was asked during the evaluation interviews about the role of trade allies in the program. The trade ally role in the program, at the time the staff interviews were conducted was not fundamentally different from the previous year when the first round of staff interviews were conducted. Program staff continues to deliver basic program services, and then trade allies (ideally) step in and help customers install recommended measures. In a few cases, the program team has begun to seek technical assistance from outside organizations.

The program has, according to implementation staff, begun to focus on recruiting a greater variety of trade allies. One member of the implementation team has been assigned to work with associations and technical colleges. These specialty "trade allies," or “program allies,” could be used for joint training and as a resource for certain kinds of technical assessments or customer assistance. Another team member is contacting architects, design engineers, and other program allies to encourage them to become involved.

Members of the program team explained that trade allies are used sparingly because of customer worries related to unknown contractors. Several staff members thought that if trade allies were to assume a more substantive role, program staff might serve an independent monitoring function to help provide assurances to participants. This would help overcome customers’ reluctance to use trade allies and safeguard customer interests.

Interviewed program staff were asked about a potentially expanded role for trade allies. This could include greater responsibilities related to the recruitment of participants, technical assessments, and follow-up services. Opinions were mixed as to whether this would be plausible. One implementer saw “no barrier," but another thought the idea would be acceptable as long as trade allies were screened. Others were more skeptical, with some voicing concern over the potential loss of central coordination and overall control. There was also some concern that trade allies “may not come across very well to customers,” in the words of one respondent.

Some program staff thought trade allies could become involved in some of the more complicated technical assessments. The program team is already working with the Industrial Assessment Center, which is considered by program staff to be a very capable program ally. One staff person remarked, “My confidence in this idea increases” with this kind of ally.

3. Trade Ally Relationships

The role of trade allies was also explored in the participant surveys. These surveys revealed that some commercial and industrial customers prefer to work with trade allies, whereas others do not. Industrial customers are somewhat more likely to have already-established relationships with trade allies. However, some comments in the evaluation interviews indicate that some participants are unaware that their chosen trade allies do not possess the skills or inclination necessary to identify and undertake energy efficiency actions.

Among C&I customers who do not have established relationships with trade allies, many claim to possess the necessary capability in-house and do not feel the need for outside help. However, again their skills and methods of operation may not be conducive to identifying and implementing energy efficiency actions.

Customers who use trade allies, or would like to, have differing views as to how difficult it is to find qualified contractors to perform work at their facilities. Some customers are slow to initiate new trade ally relationships because they do not always trust what new tradesmen say. Others question the qualifications of other trade allies they might consider hiring.

Several customers mentioned (unprompted) they had difficulty with contractors who wanted to "push old technology" and "don't want to learn about new technology." Other customers complained about trade allies who want to do the "same old things" or expect the customer to "explain the solution" rather than take on the role of energy efficiency expert themselves.

Among customers who use trade allies, some involve them in their decision making processes, whereas others do not. Generally, larger customers who have undertaken previous energy efficiency projects also seem to trust contractors and seek their guidance. Among those who say contractors play only a minor role, many have been less aggressive in the area of energy efficiency or capital improvements.

4. Trade Ally Satisfaction

Trade allies entered the program with differing views on what it had to offer them. The baseline surveys revealed that many trade allies looked forward to this opportunity to develop additional business that could also offer financial benefit to their customers and help the environment.

In the large follow-up survey, trade ally satisfaction was not consistently high with either the program implementation staff or their overall experience with the program. Forty percent of the trade allies in the survey said they were satisfied or very satisfied with program staff, 30% were dissatisfied, and another 30% reported they were neither satisfied nor dissatisfied. Trade ally respondents made a variety of comments that suggested the program had not lived up to their expectations. The program was criticized by one as "Smoke more than anything else." Another trade ally complained, “Nothing ever happens."

The main reason for dissatisfaction among trade allies was too little contact with program staff. Additional comments were similar to one respondent’s, who said, "It [the program] was not what I expected; I felt we would get some leads." A few trade allies shared responsibility for inaction, noting they had not done much to promote the program themselves. Trade allies who had the greatest program engagement were also the most satisfied with their overall experience.

Higher levels of satisfaction were found among the 12% of trade allies who had obtained business through the program. These firms generally thought involvement was worth the effort. One trade ally said simply, "One [project] is better than none," and another said, "Yes, one is good." But even among the satisfied trade allies, negative comments continued to surface. One trade ally thought program resources appeared to be limited. Another said, "We feel like a sideline participant; we feel we need to be invited to the table."

5. Trade Ally Database

At the time the follow-up interviews were conducted, program staff had been working for over a year to improve the trade ally database and make it more user-friendly. Program staff cited improvements that have made it easier to conduct searches and gain quick access to trade ally websites and e-mail addresses. One problem with the database is the lack of a mechanism to track who has visited it or what has been done as a result.

Although strides have been made, some of the program staff thought the database was of limited use in its current form and that the effort to improve it needed to continue. Several people pointed out, in various ways, that the information is still fairly general in nature and that more definition within database entries would be helpful. In the words of one team member, it is “not much more useful than the yellow pages.” A key problem is that it remains difficult for a user to distinguish what individual trade allies actually do.

6. Recommendations

The evaluation team believes the time has come for program staff to work more actively at finding a more substantial and active program role for trade allies. This may include finding ways to motivate participating customers to work with the trade allies to install recommended measures. It may also mean using trade allies to perform services that are currently being carried out by program staff, such as conducting energy assessments. It might also include, for example, greater efforts to have them enroll in program-sponsored training and program events.

Another recommendation concerns the trade ally database, which needs to be improved and more aggressively marketed. Customers and trade allies need to be more aware of the database if they are to appreciate its value and understand its potential. It would be worthwhile to include more information about each trade ally in the database, making it easier for participants to identify trade allies. It should also offer some information to help users decide between similar companies. For example, some similar databases provide graphic symbols to highlight companies whose staff have participated in a particular type of training.

As the program grows, it will become more important for the implementation team to track information about who has visited this portion of the website and, if possible, the outcome of any inquiries. Without this information, it will be difficult for program staff to learn how well this portion of the program is working.

Finally, the implementation team should also consider whether it is advisable for Focus on Energy to start offering some type of contractor certification service. This would give users greater confidence in unknown firms they may be contacting for program services.

C. MARKETING

This section briefly reviews the program theory related to marketing, considers how the marketing approach has evolved, and offers a few recommendations.

1. Program Theory

The hypothesis states that program marketing activities (direct mail, breakfast meetings, advertisements, etc.) will lead to greater awareness of program and of energy efficiency. This in turn will lead to an increased sense among customers and trade allies that energy efficiency has value and that there are companies and programs that can help. Marketing activities will foster relationships between trade allies and potential participants and ultimately produce business opportunities for trade allies.

2. Marketing Approach

The marketing approach was explored in the interviews with program staff, as well as in the trade ally and customer surveys. Program staff believe it is becoming possible to more successfully market the program to prospective participants as program implementation gains momentum. This momentum is adding both continuity and efficiency to program delivery. The program team has continued to refine its marketing techniques, revising printed material and introducing new pieces. For example, members of the program team say they have shifted the focus to the benefits of participation and the overall process, placing less emphasis on technical details (unless requested).

Targeted program marketing appears to be having a positive cumulative effect. Customers are sending back a larger percentage of the bounce-back cards that accompany initial solicitations. One possible reason is that the initial information sent to prospective participants is now more targeted to specific industries. It could also be due to a greater brand awareness, as the pilot as been operational for a longer period of time. Program staff report that participation is pretty much assured by the time a member of the program team visits a prospect.

Nonetheless, one-on-one contact is still absolutely necessary for recruiting participants into the program. Program staff were unanimous in voicing the opinion that it is the face-to-face meetings that result in sign-ups. Contact may be initiated in many ways, such as following a "cold call," mailings, conversations at trade shows, scheduled meetings, other events, etc.

The program team has sponsored a series of C&I Program breakfast meetings to attract new participants to the program. These have been successful insofar as they have been well received and have generated some program leads. They are thought to be an improvement over ideas that were tried early in the program, such as speaking before Rotary groups. Likewise, participation in trade shows has resulted in some good customer and trade ally leads, particularly now that program staff have the experience to more accurately identify the types of shows that are most beneficial for their purposes. Recent trade shows have been described as far more worthwhile than earlier ones. One of the most popular and successful events has been the Governor's Roundtable. It involves bringing in program participants as keynote speakers to talk about their personal experience. Another valuable initiative was visiting Wisconsin Public Service Company to convince account executives to market the program to their large customer accounts.

Customers who ultimately participate tend to be somewhat sophisticated regarding energy efficiency and to be fairly well organized, conscientious, and focused. Program staff believe that participants are often businesses who had already made some kind of commitment to energy efficiency prior to joining the program. The program team believes that for customers who are not already interested in energy efficiency, there is probably little the program team can do. One implementer remarked that he has come to believe the program "cannot create an intention to undertake energy efficiency that is not already present." Over time, however, staff expect that because of the continued program effort, more customers will become converted to appreciate the benefits of energy efficiency and will be increasingly receptive to opportunities.

The surveys of participating trade allies revealed that most (81%) remembered receiving some kind of marketing materials, and somewhat fewer remembered hearing ads about the program (68%).[7] Many, although not all, were aware that the program web site contained information about their firm (71% knew). There was little evidence that any of the trade allies were doing much to market the program themselves. Even among trade allies who had obtained business through the program, most did not mention it in any advertisements, although many said they had told their customers about it.

[7] These actions are not independent events. For example, the trade allies who recalled the ads were more likely to have also had other involvement with the program, particularly to have participated in some kind of training.

3. Non-Participant Awareness of FOE

One objective of the non-participant surveys was to find out how much these companies knew of the FOE C&I Program and what their level of interest might be. The program had been marketed to non-participant industrial respondents within FOE territory. Results from surveys with these respondents indicate they were often aware of the FOE program, but had very little detailed knowledge. Although three-quarters had heard of Focus on Energy when prompted with the program name, most had very little idea what the program was about. Awareness of the federal programs within FOE, Energy Star and Climate Wise was far lower.

Once the component programs were described and explained to the interview subjects, non-participants were asked about their potential interest in participating and whether they had any energy efficiency projects in mind. Fifty percent said they would be interested, and an additional 28% said they might be interested. By and large, they did not know enough about the C&I Programs to be able to say which program would be right for them. However, some expressed an interest in learning more about these programs and how they could help. Others were simply uninterested. One of these remarked, "I don't want to get involved with the government." Another said that a utility program was already offering all the help their firm needed.

4. Relationships Among Component Programs

The C&I Program implementation staff explained in the interviews that they have always worked together internally in preparing joint events, recruiting trade allies, passing leads along to each other and sharing program ideas. Over time, team members have become increasingly involved with other groups as well to move the programs forward.

Implementation staff visited WPS to describe the C&I Programs and encourage utility account executives to inform their key customers of the program. This has resulted in a few new participants joining the program thus far. The program team has become involved with the Industrial Assessment Center in Milwaukee and the Wisconsin Manufacturing Education Program. The program team has also begun working in earnest with technical colleges in the area.

Program staff said they refer customers to other programs, particularly EEP, for a range of needs from performance contracting to financing recommended measures. Also, the program team has included EEP Program staff in a number of initiatives. At the time these evaluation interviews were conducted, program staff were in discussions with Department of Natural Resources to learn more about their programs and how the two organizations might work more closely in the future.

One staff member mentioned it would be useful, in the future, to have a meeting of representatives from these various organizations. This would allow different people to discuss the programs they are involved with and learn how they could help one another.

5. Federal Programs and Branding

Thus far, the benefits to the FOE program from leveraging certain EPA programs seem to have outweighed any disadvantages.[8] The surveys revealed that name recognition of the federal programs appears to be helping recruit potential participants. At the same time, certain requirements of the federal programs appear to be problematic for program staff and, to a lesser degree, for participants. This was particularly true of the EPA Climate Wise Program (now defunct) in which paperwork was considered excessive at times and the software difficult to use.

In terms of actual services, the FOE program offers commercial and industrial customers more than do the federal programs by themselves. For example, the FOE program offers technical assessments to *every* participant, as well as training opportunities, access to the program trade ally database, follow-up support to facilitate investment in recommended measures, networking opportunities (e.g., Governor's Roundtable, Breakfast Meetings), various tools (e.g., the Lending Library, financing facilitation) and personal attention.

Because the FOE brand awareness is expected to increase over time, there may be less need for the program to heavily leverage Energy Star identity. Nonetheless, the group of Energy Star programs have been quite successful and the federal government appears committed to their continuation so the Focus on Energy programs may continue to benefit from leveraging off the federal programs.

6. Recommendations

Program staff have done a good job of marketing the C&I Program to prospective participants. The Commercial and Industrial Program components of the C&I Program have been well integrated from the outset. With time, the program has become more integrated with other programs, particularly EEP, and with other organizations such as the Department of Natural Resources. We expect that under the statewide program the level of integration will continue. The evaluators believe that it would be worthwhile for program staff to begin having periodic meetings with representatives from different organizations. This should enhance coordination and leverage opportunities across groups.

[8] The Commercial Program ties into the U.S. Environmental Protection Agency's (EPA) Energy Star® Building and Energy Star® Small Business Programs. The Industrial Program initially marketed its services to industrial participants under the national Climate Wise® Program name developed by EPA, although this program was cancelled before this evaluation was completed.

III. MARKET PREPARATION

A. INTRODUCTION

The theory behind the Commercial and Industrial Programs is that strategic intervention in the marketplace for energy efficiency can accelerate growth in both the demand (through customers) and the availability (through providers) of energy efficiency products and services. Together, these forces can potentially transform the overall market for energy efficiency in Wisconsin on a lasting basis. These changes in market demand can occur when customers routinely insist on building and equipment solutions that are energy efficient. Corresponding changes in market supply can occur when "trade allies" (manufacturers, distributors, retailers and contractors) increase both the manufacturing stock and the effort devoted to promotion of high efficiency equipment--all with the knowledge that this is what customers expect from them.

The pilot program was designed to influence these key players on numerous fronts. It sought to influence customers through marketing, special events, one-on-one involvement with program staff, training courses, technical assessments (of customer facilities), action plans for implementing recommended measures and the formation of new business relationships that foster energy efficiency. The pilot program also sought to influence trade allies through technical training, trade shows, events such as breakfast meetings, a tools lending program and a listing service to help them acquire new business leads.

The program theory for the C&I programs evolved over time. In the beginning of Focus I, evaluation and program staff worked together to reach agreement on the theory behind the C&I programs. This formed the basis of the approved evaluation plans and the related activities that led to the first and second interim evaluation reports on the C&I programs. Partly in response to information revealed through the evaluation effort, the program theory underwent some changes. As a result, the leaders of the C&I programs and evaluation staff worked together in late 2000 and early 2001 to once again examine the program theory.

Given the intent of the pilot, it is appropriate that administrators modify their program theories as time goes along and as they gain experience in the market. However, one casualty of changing a program theory could be fit between evaluation activities and the current program theory. The evaluation activities that produced the data for this report were based on the original program theory. The evaluation team mined the available data to provide evidence where they could about the current program theory, but there are some aspects of the current theory that could not be completely covered with the existing data collection methods. In those cases, and where appropriate, we have suggested future evaluation activities that could address key aspects of the current program theory.

The program theory groups program activities into five topics:

- Marketing
- Opportunity identification and development
- Project implementation
- Non-energy program benefits
- Market Research

The analysis of the market changes produced by the program and presented in this chapter is organized around those five topics to directly address the program theory. The complete program theory is presented in Table III-1. A summary of the results, organized by the same five topics, is presented at the end of this chapter.

Table III-1.
Commercial and Industrial Program Theory–Partners

Program Theory Topic	General Components	Specific Components – Partners	Expected Near-Term Results for Partners	Expected Longer-Term Results for Partners
Marketing	Marketing activities	• Direct marketing with letters and calls; Visits to potential partners; Ads; Breakfast meetings; Trade shows; C&I newsletter; Case studies; Program fact sheets; Coordinate with other organizations and trade schools; Press releases; articles	• Raise awareness of energy efficiency and of Focus on Energy. • Move nonparticipants forward to program.	• Increased sense that "energy efficiency might have value for my company" • Increased sense that "there might be companies or programs out there to help me."
Opportunity Identification and Development	Improve technical knowledge of energy efficiency actions that could be taken	• Energy audits; Technical training courses; Continue blast faxes and mailings to announce events and offer free tuition for partners to events and training; Get signed participation agreement; Building Operator Certification; Tool lending library; New construction assistance; • Industrial: Monthly fax information sheet; GBRT	• Raise level of knowledge among participants. • Facilitate energy efficient project decision-making.	• Change energy-related decision-making methods or approach so efficiency is carefully considered in the future. • Improve knowledge of resources (from other programs and from trade allies) to reduce information barriers for future projects.
	Promote energy efficiency decision-making	• Develop performance contracting guides; Provide expert advice to validate cost and savings estimates; Assist Partners complete action plans; Training; "How to Use Trade allies" brochure. • Commercial: Detailed audits • Industrial: New training event dealing with energy management in industry in the changing energy markets; Participation Agreement.		
	Assist in finding supporting resources	• Connect participants with lenders; Develop financing advisory information or tool; TA Web database; Financial info web site; RFP development and bid review assistance; Program alliances • Industrial: Making Sense conferences; Partner project listing to trade allies		
Project Implementation	Technical assistance	• Technical assistance; Technical training courses;	• Assist participants in moving projects forward.	• Implement energy efficiency projects • Build expectation that energy efficiency projects are doable and worthwhile
	Assist in finding supporting resources	• Connections to Trade Allies; Connections to other Wisconsin or Federal programs; Connect participants with lenders;		
Non-Energy Program Benefits	Ads, articles, and awards	• Recognition in Focus on Energy ads; Recognition at events; Recognition in fliers, press releases; Case studies; • Commercial: Energy Star Building label	• Provide participants with public recognition.	• Increased business and profits for the Partner
Market Research		• Focus groups; Mail survey;	• Modify program design and implementation to be more effective	

Table III-1. Continued.
Commercial and Industrial Program Theory–Trade Allies

Program Theory Topic	General Components	Specific Components – Trade Allies	Expected Near-Term Results For Trade Allies	Expected Longer-Term Results for Trade Allies
Marketing	Marketing activities	• Ads; Trade Ally breakfast meetings; TA column in newsletter; Coordinate with other organizations and trade schools;	• Raise awareness of energy efficiency and of Focus on Energy. • Encourage trade allies to want to participate in the program and to market the program. • Foster networks or relationships between trade allies and potential partners. • Provide more business opportunities to trade allies.	• Increased sense that "energy efficiency might have value for my company"
Opportunity Identification and Development	Improve technical knowledge of energy efficiency actions that could be taken	• Technical training courses	• Raise trade allies' level of knowledge of energy efficiency equipment and services, which will help them identify opportunities for their customers, e.g., Best Practices. • Trade allies will identify potential program partners. • Trade allies make contact with existing partners for specific projects.	• Shift trade allies toward promoting energy efficiency products and services.
	Promote energy efficiency decision-making	• Special differentiation for Trade Allies		
	Assist in finding supporting resources	• TA Web database; Program alliances; Partner project listing to trade allies		
Project Implementation	Technical assistance	• Connections to Partners needing assistance; TA Web database;	• Trade allies will implement energy efficiency projects.	• Build expectation that energy efficiency projects are doable and worthwhile. • Include energy efficiency in the goods and services they offer.
	Assist in finding supporting resources			
Non-Energy Program Benefits	Ads, articles, and awards	• Recognition in Focus on Energy ads; Recognition at events; Recognition in fliers, press releases; Case studies;	• Provide cooperating trade allies with public recognition.	• Increased business for cooperating trade allies.
Market Research		• Focus groups; Mail survey	• Modify program design and implementation to be more effective	

Table III-1. Continued.
Commercial and Industrial Program Theory– Long Term Results
(beyond those shown in the table)

The program theory represented in Table III-1 shows near- and longer-term results that can be expected from the C&I programs. "Near-term" should be understood as within a matter of some months but generally less than a year. "Longer-term" should be understood as a year or two. Two issues related to longer-term impacts that need special mention are (1) the need for continuing technical assistance and (2) the need for continuing publicly subsidized technical education and training.

The C&I programs as currently designed, but implemented over multiple years, will in the longer term (four or more years) contribute to the development of a market for independent technical experts to provide the types of technical services being provided by the programs for some customer s egments. The program will increase the demand for such services and help set in motion changes that will perpetuate that demand, especially with customers that have not recently received technical service from the program. However, even though independent markets are anticipated to develop, continued public support for technical services may remain necessary, especially for technologies, markets or other areas that would not advance completely on their own. Justifications for further program -provided technical services include promoting energy efficiency for new technological developments, for energy efficiency measures that become economical due to energy price increases, and to meet the needs of customer segments that do not have an active technical services market.

Similarly, public-supported technical education will likely evolve to be both within the free market, and within public supported areas. This will remain necessary by the changes markets, costs, and technologies.

B. MARKETING

This section addresses evaluation evidence on the near- and longer-term results of program marketing, the first of five program theory topics. (This report does not address other aspects of the marketing effort, whether designed and implemented by Team Delta or by the Marketing Administrator. Those other aspects are covered by the evaluation effort specifically directed at the marketing program.)

The marketing topic in the program theory contains two expected near-term and two expected longer-term results for customer partners. It also contains four expected near-term and one longer-term result for trade allies. Evidence on progress in each of these areas is examined below.

1. Partners: Raise awareness of energy efficiency and of Focus on Energy

One of the critical goals of the program is to heighten awareness of the opportunities that energy efficiency offers to customers and trade allies. As expected, the surveys reveal a fairly high level of awareness of the program among participants. The initial outreach is through the marketing efforts (often direct mail) of program staff. Additional outreach has included a public relations campaign, breakfast meetings, conferences, showcase project tours, and participation in the Governor's Business Roundtable. Customers and trade allies are also eligible for a variety of technical and non-technical training, much of it in conjunction with the Energy Center of Wisconsin.

Customer awareness also increases through their involvement with program staff, the training they receive, technical assessments of their facilities, action plans that are developed, new relationships that are formed, and the like. Similarly, trade ally awareness is heightened by

their participation in events such as breakfast meetings, trade shows, and training through the program.

As expected, the vast majority of program participants who have had technical assessments were aware that these services were being offered through the C&I Program and that it was part of the overall Focus on Energy (FOE) Program.

Among nonparticipants who received program marketing materials, there was a general awareness (but minimal detailed knowledge) of the program or its components. Although three-quarters of the nonparticipants in the sample said they had heard of Focus on Energy, awareness of Energy Star and Climate Wise was considerably lower, in the 17% - 18% range.

2. Partners: Move nonparticipants forward to program

Progress in this area is certainly important for the program, but it is fundamentally difficult to directly measure. The fact that the program has successfully converted nonparticipants into participants is of course one measure. Awareness of the program and energy efficiency among nonparticipants are the most appropriate proxies for this indicator on the theory that the more companies know about energy efficiency and the program, the more likely they are to sign up. (Of course there are certainly likely to be some companies that have sufficient in-house expertise and commitment to energy efficiency that they have no need for program services.) The evaluation currently has point estimates for awareness and attitudes among nonparticipants. Tracking those estimates over time will provide evidence of the program's effectiveness in this area.

Compared to participants, nonparticipants in the FOE territory were far less aware of the potential that energy efficiency projects offered their facilities. However, some were aware and were using such knowledge as a rational basis for making energy efficiency investment decisions. It appears that lingering concerns may be holding these customers from the optimal amount of investment in energy efficiency. These include the view that energy efficiency may not deliver expected performance and cost savings and that energy service providers are not fully aware of these savings opportunities (see Table III-2).

Table III-2.
Attitudes of Nonparticipants in FOE Territory

Statement	Score 1=strongly disagree 5=strongly agree	Percent Reporting Agreement
This organization is generally unaware of energy savings opportunities	2. 6	21,0%
When this organization is aware of savings opportunities, it generally does not pursue them because of the uncertainty of the potential performance of the options and if cost savings will result	2. 8	21.0%
Unawareness of savings opportunities is limiting entry of energy efficiency service providers into the field	3. 3	36,5%

The nonparticipant survey analysis supports the theory that awareness is one step in the process toward emerging sophistication regarding energy efficiency and subsequent actions. In other words, customers who demonstrated the greatest awareness were also more likely to understand what could be achieved and to take action in their own self-interest.

3. Partners – Longer Term: Increase the sense that "Energy efficiency might have value for my company"

Program participants made various comments that demonstrated an emerging awareness and appreciation of energy efficiency. In some cases, customers entered the program with prior notions about the kinds of improvements that their facilities needed. The value added for these customers was assistance in identifying the most cost-effective opportunities. In other cases, the program provided other kinds of guidance such as a valued second opinion.

This is important since earlier baseline surveys revealed that few customers considered themselves to be energy experts and many said they were anxious to learn more about energy efficiency. The program is offering services these customers want and need. Indeed, customers who eventually had an energy assessment of their facility were generally impressed with what they learned. Many comments were made along the lines of, "We never would have figured this out for ourselves."

Greater awareness of the value of energy efficiency also appears to help customers reorder their priorities. For example, the baseline surveys revealed that some customers are very concerned with non-energy aspects of their facilities, such as the overall "look" of a building. Preoccupation with image, productivity, and the like carry a risk of overlooking the achievable gains that can be acquired through greater energy efficiency.

Respondents to the baseline surveys clearly communicated the message that they were really only interested in energy efficiency insofar as it could reduce operating cost. There was virtually no interest in energy efficiency as a desirable business practice, nor was there a recognition that it provided other benefits. The subsequent surveys of customers after their involvement in the program found a greater understanding and appreciation of the benefits of energy efficiency.

Customer awareness of the value of energy efficiency was also explored through the baseline surveys of trade allies. In the view of the trade allies, energy efficiency is simply not a priority for their customers. They believe their customers are far more focused on cost (usually meaning initial price), payback, and having reliable and "workable" equipment.

The program appears to be effective in producing positive attitudes about energy efficiency among participants. But further study is needed with nonparticipants to determine the effect of the program on the attitudes of the market in general.

4. Partners – Longer Term: Increase the sense that "There might be companies or programs out there to help me."

Program staff are concerned that C&I customers are generally suspicious of the impartiality of any trade allies they have not previously worked with. Customers appear to suspect that any advice these contractors give will be tainted by their desire to sell their own products and services. It seems logical to predict that one result of this suspicion is the customer belief that

it is difficult to find trade allies who could help identify and implement energy efficiency actions for their facility.

Two related patterns are evident from the participant surveys. First, many companies believe they possess the internal capability of identifying and implementing energy efficiency actions, even though their skills and methods of operation may not be conducive to this. Second, many of the companies that use trade allies are not aware that the contractors they typically work with do not possess the necessary skills or inclination to identify and undertake energy efficiency actions.

Some companies who use trade allies find it difficult to locate qualified contractors to perform work at their facilities. They might question the qualifications of the trade allies they know about or they might be having difficulty finding trade allies with the skill set they are looking for. Several customers mentioned (unprompted) they had difficulty with contractors who wanted to "push old technology" and "don't want to learn about new technology." Other customers complained about trade allies who want to do the "same old things" or expect the customer to "explain the solution" rather than take on the role of energy efficiency expert themselves.

In conclusion, evidence seems to indicate there is a problem in the market that makes it difficult for some companies to identify qualified trade allies and then learn to trust their advice. The program has been working toward improving the links between businesses and trade allies and should be encouraged to pay particular attention to this issue. The program also has education components that should, given sufficient attendance, improve the technical knowledge of trade allies, which should in turn make them more trustworthy to program participants.

5. Trade Allies: Raise awareness of energy efficiency and of Focus on Energy.

Among the trade allies, all of the firms included in the follow-up survey knew that their firms were participants in the FOE C&I Program. Awareness was lower in the baseline trade ally survey, which was administered at the outset of the program. For example, at the earlier point, the majority of trade allies (78%) admitted they did *not* understand the relationship between FOE and other energy conservation programs. In the follow up surveys, all trade allies were aware that they were participants in the program and most of them (81%) remembered receiving some kind of marketing materials. Somewhat fewer remembered hearing ads about the program (68%). A majority of the participating trade allies were also aware that the program web site contains information about their company (71% knew). In general, trade ally awareness was found to be important because it is correlated with the likelihood of other program involvement such as participation in training sponsored through the program.

Among the seven trade allies who participated in the in-depth follow-up interviews (see Appendix 7), two said their experiences with the program had increased their sense that energy efficiency might have value for their company. Another three said they had felt that way prior to the program. Since program involvement for the remaining participating trade allies was so minimal, it is unlikely the program is causing much (if any) change in trade ally awareness of energy efficiency. The evaluation did not include any surveys with non-participating trade allies. Thus, there is no direct evidence on changes in this population. It might be useful, however, for future evaluations to explore the changes in the awareness of

energy efficiency and the FOE program among both participating and nonparticipating trade allies.

6. Trade Allies: Encourage trade allies to want to participate in the program and to market it.

The in-depth follow-up interviews with trade allies addressed trade ally marketing of the program, while the broader trade ally survey did not. The in-depth interviews found that although most of the trade allies did not market the program through their advertisements, many said they have mentioned it to their customers. Only one of the seven in-depth trade ally respondents said they had mentioned the program in any advertising or marketing materials. However, six had brought up the subject with their customers. One had held a seminar in January and also mentioned FOE during a presentation. Another felt "out of place as consultants mentioning much about the program [because it] gives the impression that we are doing a hard sell." He felt he should remain neutral about the program, but inform prospective clients about its merits. None of the trade allies were aware of any new business that had emerged from their promotion of the program. Only one of the seven trade allies believed that FOE had mentioned their company in its ads or marketing materials.[9]

The evaluation was not designed to include surveys with nonparticipating trade allies. Such surveys should be considered in the future, however, because they could more directly address awareness of the program and, along with participant surveys, address this indicator more thoroughly.

7. Trade Allies: Foster networks or relationships between trade allies and potential partners.

Program staff have shared with the evaluation staff anecdotal information about how trade allies helped individual participants implement projects. However little concrete data exists to document the extent and nature of participating trade ally involvement with program participants. The evaluation's trade ally follow-up survey revealed that only 18% of the trade allies in the program have been contacted by participants and only 12% received any business as a result of their participation. Less than 40% of the participants surveyed said that they obtained information on trade allies from the program. Eleven percent had been to the trade ally referral site on the program's web site. Thirteen percent thought it was useful to get contractor referrals from the program.

If the program is to have a lasting impact on the market, improving the links between qualified trade allies and C&I businesses seems to be a critical component. The program has increased its emphasis on trade allies recently. Future evaluation activity should attempt to further track the effects of this stepped-up activity.

[9] This was the non-profit educational institution that sponsors workshops on energy efficiency and site consultations.

8. Trade Allies: Provide more business opportunities to trade allies.

As discussed in the previous paragraph, relatively few participating trade allies have obtained business through the program. The evaluation will continue to track this indicator.

9. Trade Allies – Longer Term: Increase the sense that "Energy efficiency might have value for my company"

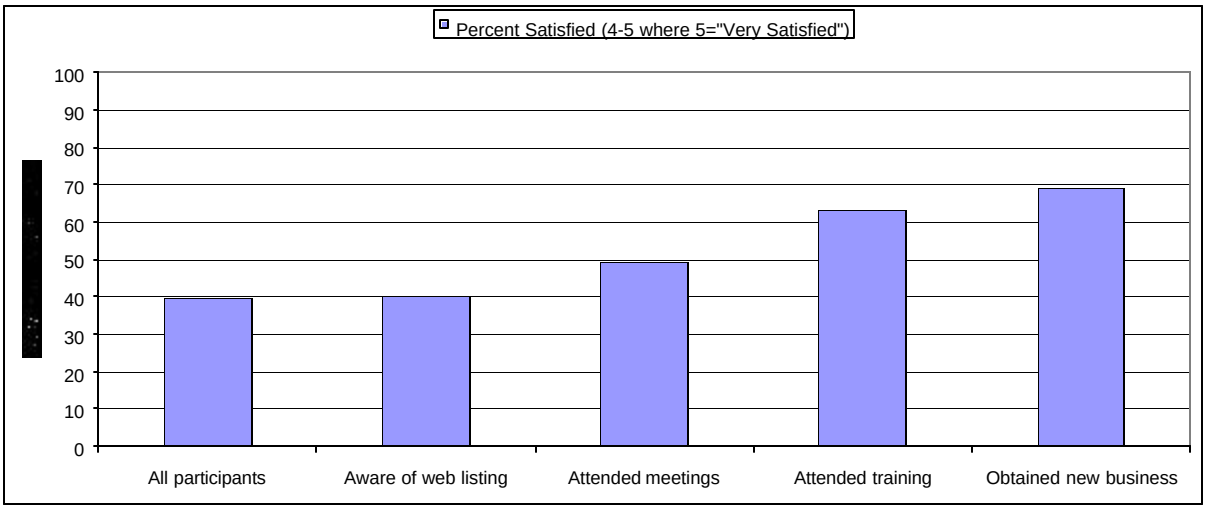
An important part of the pilot program design was to engage trade allies and help them understand the program and the energy efficiency opportunities available in the market so that they in turn could effectively sell and support the products and services. Those trade allies who had obtained work through the program were asked about their agreement with the statement, "My participation in this program has increased my sense that energy efficiency might have value for my company." Forty-three percent of these trade allies strongly disagreed with this statement, primarily because they already held this belief prior to participating in the program (Table III-3). In other words, the program did not create this knowledge since it already existed. Among remaining trade allies, 29% strongly agreed that their participation had altered their view, and another 29% had opinions that were closer to the middle of the road.

Table III-3.
My Participation in This Program Has Increased My Sense That Energy Efficiency Might Have Value for My Company
(1 = strongly disagree, 5 = strongly agree)

Statistic	Score
Range	1 to 5
Mean	2. 8
Median	3

Trade ally satisfaction with the program was relatively low (Figure III-1). Trade allies who had the greatest program engagement were the most satisfied with their experience. The major complaint among trade allies was that the program had not produced any new business. This low level of satisfaction would argue against any conclusion that the program is having much of an effect on trade ally attitudes toward energy efficiency.

Figure III-1.
Trade Ally Satisfaction Among Various Subgroups



C. OPPORTUNITY IDENTIFICATION AND DEVELOPMENT

This section addresses evaluation evidence pertaining to expected near- and longer-term results of the program topic "opportunity identification and development." This topic covers program services designed to help participants identify potential energy efficiency improvements and then develop and implement the most promising.

This program theory topic contains three general components:

- Improve technical knowledge of energy efficiency actions that could be taken
- Promote energy efficiency decision-making
- Assist in finding supporting resources.

Applicable to all three components are five expected near- and long-term results for partners and four for trade allies. Below we examine evidence for progress in each of these areas.

1. Participants: Raise level of knowledge among participants.

The program appears to be increasing customers' understanding of energy efficiency technical issues. For example, participants who had received technical assessments of their facilities had a far better understanding of the advantages of energy efficiency than they exhibited in the baseline surveys (conducted soon after signing up for the program). The high levels of satisfaction with program staff and the technical services provided are also consistent with an increased level of understanding.

It is difficult to directly measure changes in knowledge in a business setting. As a result, past and likely future evaluation activities will continue to focus on self-reported knowledge and on secondary indicators, such as satisfaction.

Respondents to the follow-up survey cited a number of reasons for implementing program recommendations (Table III-4), which demonstrates they understand that energy efficiency improvements frequently come with ancillary benefits. A second conclusion is also possible: it may indicate customers are choosing the improvements primarily for the ancillary benefits and view the energy efficiency benefits as of secondary importance. The main impetus was an opportunity to lower energy costs, but there was also a clear intention among many (particularly industrial) customers to improve profitability, safety, reliability, and productivity.

Table III-4.
Participants' Reasons for Following Up with Recommended Efficiency Improvements

Response	Program Element		
	Commercial	Industrial	Combined C&I
Lower energy costs	89. 5%	95. 0%	92. 3%
Improve profitability	42. 1%	90. 0%	66. 7%
Improve safety/reliability	15. 8%	55. 0%	35. 9%
Improve productivity	10. 5%	30. 0%	20. 5%
Old equipment break down	10. 5%	10. 0%	10. 3%
Remodeling/expanding	5. 3%	10. 0%	7. 7%

Commercial n=19, Industrial n=20, Missing observations = 3

2. Participants: Facilitate energy efficient project decision-making.

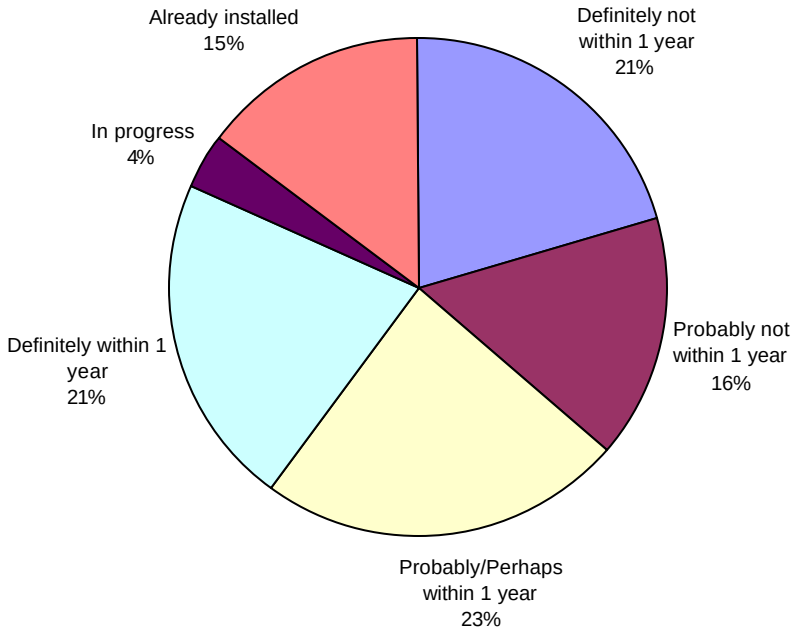
The participant follow-up surveys indicated that program services were important for identifying and specifying energy efficiency projects and in some cases providing the veneer of independent authority that was necessary for selling the project to upper management. While some of the recommended projects were already identified or planned prior to program involvement, it appears that program staff are providing valuable services in identifying new energy efficiency projects. It also appears that the documentation provided by the program is useful for some participants, because it enables them to sell projects to others within their companies.

That said, it is also evident that only a fraction of the recommended measures are being implemented in the months immediately following program involvement. Some of the blame for this lies in the pace of company decision making and in budget cycles. However, it does appear that additional or continued program services could help increase the rate of measure implementation. The evaluation staff understand that program staff in the pilot territory are now dedicating their time to providing follow-up assistance to participants rather than attempting to attract new participants.[10]

[10] Evaluation staffs have been told that any new participants in the pilot territory will be defined as "statewide" participants, rather than pilot participants.

At the time the evaluation was conducted, participants had installed 15% of the measures recommended by the implementation staff, and an additional 4% was in the process of being installed (Figure III-2). In addition, respondents said they definitely planned to install 22% of the remaining uninstalled measures within the year. This means that 41% of the recommended energy efficiency projects were expected to be producing savings within the year.

Figure III-2.
Customers' Reported Likelihood of Installing Recommended Measures Over Next Year



3. Participants – Longer Term: Change energy-related decision-making methods or approach so efficiency is carefully considered in the future.

Customers and trade allies are not yet making dramatically different equipment and procedures choices as a result of their involvement in the program. However, they are making progress in laying the groundwork for energy efficiency decision making in the future. Generally speaking, industrial customers are more often making choices involving energy efficiency than are commercial customers.

To learn what effect the program may have had on their actions, customers were asked whether they had adopted policies for considering energy efficiency both before and after participation (Table III-5). Prior to participation, 5% of the commercial and 24% of the industrial customers had a formal organizational unit or procedures/policies in place for considering energy efficiency opportunities. Subsequent to participation, 10% of commercial and 24% of industrial customers said they had adopted these types of procedures or policies as a result of participating. Another quarter of industrial participants plan to develop such policies, as do 14% of the commercial participants. Industrial customers were much more

likely to have implemented such policies prior to joining the program—24% versus 5% of commercial customers.

Some customers who reported the program had changed how their firm viewed energy efficiency said it made them more aware of opportunities or helped them look at things differently. The formal recommendations developed through the program were also thought to provide a useful platform for implementing and planning for energy efficiency. Participants reported that the program has been helpful in pulling together the kinds of information needed, making it easier for them to get projects implemented. This is a potentially important result, because the baseline surveys revealed that customers often find it difficult to obtain the necessary information for getting the process started. However, it is premature to conclude that the program is dramatically influencing decision-making processes.

Because it appears that this indicator is quite important for the eventual broader impact of the program, the evaluation staff recommend that the program increase its efforts designed to specifically affect participants' energy policies. The evaluation, in turn, will examine methods for tracking this indicator more precisely in the future.

Table III-5.
Customers' Reported Adoption of Policies or Procedures for Energy Efficiency

	Program Element		
Response	**Commercial**	**Industrial**	**Combined C&I**
Adoption of policies prior to participation (n=42)	4. 8%	23. 8%	14. 3%
Actual adoption of policies as a result of participation (n= 42)	9. 5%	23. 8%	16. 7%
Intention to adopt policies as a result of participation (n=40)	14. 3%	26. 3%	20. 0%

4. Participants – Longer Term: Improve customers' knowledge of resources (from other programs and from trade allies) to reduce information barriers for future projects.

The program staff have recently been working with other institutions in the region to advance the interests of the program. Among other things, they have been exploring training for trade allies, and detailed energy audits provided by other institutions, such as the Industrial Assessment Center. They have also been exploring ways to provide information about other resources to participants. Several of the group activities sponsored by the program, such as the Governor's Business Roundtable, serve to introduce companies to other resources. This type of effort appears to offer significant potential for leveraging knowledge and resources provided through the Focus on Energy program. To date, the evaluation has not gathered detailed information that can demonstrate progress in this area. However, given the potential this kind of effort offers, the evaluation staff will consider such metrics for future evaluation work.

5. Trade Allies: Raise trade allies' level of knowledge of energy efficiency equipment and services, which will help them identify opportunities for their customers, e.g., Best Practices.

Directly measuring trade ally knowledge of energy efficiency would be difficult. Although the evaluation did not include any direct measures of this issue, it did track some indicators that address whether the program is doing things that could reasonably be expected to improve trade allies' knowledge.

About half of the trade allies in the follow-up survey reported they had attended one or more program-related meetings. Within this group, roughly half had attended a breakfast meeting and a quarter had participated in the Governor's Business Roundtable. Less than one-quarter (17%) had participated in some form of training through the program. This training (in descending order of occurrence) pertained to monitoring and verification, compressed air, day lighting, refrigeration, diagnostic tools and industrial management.

The evaluation staff will examine the possibilities for gathering data in the future that will more directly bear on this issue.

6. Trade Allies: Encourage trade allies to identify potential program partners.

Based on the trade ally follow-up survey, 56% of the trade allies have not been actively marketing the program themselves, and their involvement in it appears to be largely passive to date. The remainder have either passed names of participants on to Focus on Energy staff (16%), helped companies become participants (11%), or brought up the topic of Focus on Energy with their customers (40%). Eighteen percent of the trade allies say they were contacted by a potential customer who found their name on the program web site, although not all leads resulted in projects (recall that only 12% of trade allies actually obtained business). In addition, 11% were contacted because a potential customer obtained their company's name from program staff.

7. Trade Allies: Promote trade allies making contact with existing Partners for specific projects.

The program has included some events specifically designed to put trade allies in contact with participant partners. Some of these events were very successful. In fact, some customers who participated in the events requested that no additional trade allies be sent their way since they have been inundated with offers of assistance. However, as of early 2001, only 18 percent of the trade allies had been contacted by participants about potential business as a result of the program, and only 12 percent had gotten work from those contacts. Largely due to this low level of response, many trade allies have a relatively poor opinion of the program.

The evaluation staff will examine ways of tracking this metric more closely in the future.

8. Trade Allies – Longer Term: Shift trade allies toward promoting energy efficiency products and services.

To date, the evaluation has found no evidence that trade allies have changed how they promote energy efficiency products and services because of the program. As has been discussed before, only 12 percent of the trade allies in the program's Internet database know

they have gotten business from the program. It appears unlikely that the program will induce any change in trade ally marketing until the percent of trade allies getting business from the program increases significantly or until more trade allies attend program training or see the benefits of added publicity from being associated with the program.

D. PROJECT IMPLEMENTATION

This section addresses the evaluation evidence regarding expected near- and longer-term results for the theory topic of "project implementation." This topic covers program services designed to help participants implement the recommended energy efficiency improvements.

This program theory topic contains two general components:

- Providing technical assistance
- Help customers find supporting resources.

Applicable to both of these components are three expected near- and long-term results for partners and three for trade allies. Below we examine the evidence for progress in each of these indicators. Since much of the available evidence was also relevant for other topics (discussed above), the reader is referred to several earlier discussions. As future evaluation efforts are designed, the evaluation team will consider whether data can (and should) be developed that specifically target these indicators.

1. Partners: Assist participants in moving projects forward.

The discussion above under "2. Participants: Facilitate energy efficient project decision-making" applies to this indicator as well.

2. Partners – Longer Term: Implement energy efficiency projects

The discussion above under "2. Participants: Facilitate energy efficient project decision-making" applies to this indicator as well.

3. Partners – Longer Term: Build expectation that energy efficiency projects are doable and worthwhile.

Participating customers were asked questions in the survey about the extent to which the program had influenced their actions and what their organization was likely to do concerning energy efficiency. Industrial customers appear to have been more influenced by the program than commercial customers. Indeed, 43% of the industrial customers in the program are now formally considering energy efficiency and related cost savings compared with 15% of commercial participants (Table III-6). Also, as discussed above, the program was effective in getting some participants to adopt policies for considering energy efficiency actions (although we cannot be sure how effective those policies are).

Participants were generally satisfied with the overall process of participating in the program (giving it a score of 7.9 where 0 meant "not at all satisfied" and 10 was "very satisfied"), another indicator they had, or had developed, a positive attitude toward energy efficiency.

Table III-6.
Has the Program Affected the Way You Consider Energy-Efficiency and Cost Savings?

Response	Commercial	Industrial	Combined C&I
Yes	15.0%	42.9%	29.3%
No	85.0%	57.1%	70.7%
Total	100.0%	100.0%	100.0%

Commercial n=20, Industrial n=21, Missing observations = 1

As discussed earlier (under "2. Participants: Facilitate energy efficient project decision-making"), at the time the evaluation was conducted, participants had installed 15% of the measures recommended by the implementation staff, and an additional 4% was in the process of being installed (see Figure III-2). In addition, respondents said they definitely planned to install 22% of the remaining uninstalled measures within the year. This means that 41% of the recommended energy efficiency projects were expected to be installed within a year. While the actual implementation rate will certainly be less than that (and potentially substantially less), this nonetheless indicates that participants believe the recommended energy efficiency projects to be worthwhile. It seems likely they will extend this attitude from recommended projects to other energy efficiency projects. Future evaluation efforts should consider devising a method for testing this extension.

4. Trade Allies: Work towards getting trade allies to implement energy efficiency projects.

As has been discussed before, only 12 percent of the trade allies in the program's Internet database know they had gotten business from the program. It is possible some got work from the program and did not know it. However, this low level of involvement and the generally low level of satisfaction with the program argue against any conclusion that the program has caused a any meaningful change in the energy efficiency business of trade allies.

5. Trade Allies – Longer Term: Build expectation that energy efficiency projects are doable and worthwhile.

The discussion above under "9. Trade Allies – Longer Term: Increase the sense that 'Energy efficiency might have value for my company'" applies to this indicator as well.

6. Trade Allies – Longer Term: Include energy efficiency in the goods and services they offer.

To date, the program has had too little impact on trade allies to cause them to modify their business practices. One trade ally thought his revenue had increased by about two percent because of the program, and another said it had increased by a "small" amount. The remaining five of the seven who completed in-depth interviews (among the 12 who got business from the program) said the program caused no change in their revenue. One of the in-depth interviewees said his company has undertaken changes in management and business practices as a result of the program. He said they "look closer at how we can save

the customer money." The others reported the program had caused no change. None of the seven respondents had added staff as a result of being involved in the program.

The discussion above under "9. Trade Allies – Longer Term: Increase the sense that 'Energy efficiency might have value for my company'" also supports the conclusion that the program has not yet caused trade allies to make any significant changes in their operations.

E. NON-ENERGY PROGRAM BENEFITS

This section addresses the evaluation evidence supporting the expected near- and longer-term results of the program theory topic "non-energy program benefits." This topic covers program services designed primarily to provide public recognition to participants. The topic includes such components as recognition in Focus on Energy ads, recognition at events, recognition in fliers, press releases, case studies, and the Energy Star Building label.

This program theory topic contains one general component: Ads, articles, and awards recognizing customers and trade allies.

This component contains two expected near- and long-term results for partners and two largely similar ones for trade allies. Below we examine evidence for progress in each of these areas.

1. Partners: Provide participants with public recognition.

The program has incorporated a variety of mechanisms for providing public recognition to participants. Program staff have relayed anecdotal information to the evaluation staff indicating that public recognition has been a factor in some companies' decision to participate in the program. However, since the original program theory did not emphasize this expected result, the participant survey did not directly address this topic. Future evaluation efforts will examine the potential and usefulness of tracking this indicator over time.

2. Partners – Longer Term: Help increase Partners' business and profits.

It is reasonable to assume that the promotion services provided by the program can increase the business coming to participants, which would translate into an effect on the profits of a business. Since the original program theory did not emphasize this expected result, the evaluation design for the C&I programs did not incorporate any metrics for tracking such impacts. However, other evaluation efforts are seeking to quantify the non-energy benefits produced by the Focus on Energy programs.

3. Trade Allies: Provide cooperating trade allies with public recognition.

As with participants, the program has incorporated a variety of mechanisms for providing public recognition to trade allies. Since the original program theory did not emphasize this expected result, the evaluation trade ally surveys did not directly address this topic. Future evaluation efforts will examine the potential and usefulness of tracking this indicator over time.

4. Trade Allies – Longer Term: Increased business for cooperating trade allies.

To date, the program has had too little impact on trade allies to have a significant impact on their business. The in-depth surveys addressed this issue and found that the program, to date, has had little impact on their revenue. One trade ally mentioned that his revenue increased by about two percent because of the program and another said it increased by a "small" amount. The remaining five of the seven who completed in-depth interviews (among the 12 who got business from the program) said the program caused no change in their revenue. It is safe to assume that the remaining 130 trade allies surveyed in the follow-up survey saw no change in their revenue since they were not aware of having gotten any business because of the program.

F. MARKET RESEARCH

The one expected near-term result from the C&I market research was to "Modify program design and implementation to be more effective." A separate research effort examined the market research done by Team Delta and other Administrators.[11]

G. SUMMARY

Table III-7 summarizes the evidence examined by the evaluation team on each of the expected results included in the program theory. Overall the program(s) seem to be effective in meeting their participants' needs and showing them the value of specific energy efficiency actions. There is a clear need for continued services to participants to help them implement more of the identified energy efficiency actions. The evaluation understands that pilot program efforts have largely shifted to such follow-on services. The program has increased its efforts with trade allies, but so far the results have not appeared. Trade allies are generally dissatisfied with the program and are more passive than active participants. They are doing some marketing of the programs, but the vast majority remain fairly disconnected from the program.

[11] "Review of FOE Program Administrator Market Research Reports," Draft May 17, 2001.

Table III-7.
Expected Results and Evaluation Findings – Partners

Program Theory Topic	Expected Results for Partners	Near or Longer-Term	Evaluation Findings
Marketing	• Raise awareness of energy efficiency and of Focus on Energy.	• Near	• Participants' knowledge is increased by the program. Nonparticipants are generally aware of the program but their knowledge is not deep.
	• Move nonparticipants forward to program.	• Near	• Need to track data over time to provide evidence.
	• Increased sense that "energy efficiency might have value for my company"	• Long	• Program appears effective in producing this result with participants. Further study needed with nonparticipants to determine effect of the program on the attitudes in the market in general.
	• Increased sense that "there might be companies or programs out there to help me."	• Long	• There is a problem in the market that makes it difficult for some companies to identify qualified trade allies and then learn to trust their advice. The program has been working toward improving this situation and should be encouraged to pay particular attention to this issue. The program also has education components that should, given sufficient attendance, improve the technical knowledge of trade allies, which should make them more trustworthy to program participants.
Opportunity Identification and Development	• Raise level of knowledge among participants.	• Near	• The program appears to be leading to increased understanding among participants.
	• Facilitate energy efficient project decision-making.	• Near	• The participants' follow-up surveys indicated that program services were important for identifying and specifying energy efficiency projects and in some cases providing the veneer of independent authority that was necessary to sell the project to upper management. However, it does appear that additional or continued program services are important for increasing the rate of measure implementation
	• Change energy-related decision-making methods or approach so efficiency is carefully considered in the future.	• Long	• Participants are not yet making dramatically different equipment and procedures choices as a result of their involvement in the program however they are making progress on laying the groundwork for energy efficient decision making in the future.
	• Improve knowledge of resources (from other programs and from trade allies) to reduce information barriers for future projects.	• Long	• The program staff have recently been working with other institutions in the region to advance the interests of the program. They have also been exploring ways to provide information about other resources to participants. To date, the evaluation has not gathered detailed information that will demonstrate progress in this area. However, given the potential this kind of effort offers, the evaluation staff will consider such metrics for future evaluation work.
Project Implementation	• Assist participants in moving projects forward.	• Near	• See discussion above under "Facilitate energy efficient project decision-making"
	• Implement energy efficiency projects	• Long	• See discussion above under "Facilitate energy efficient project decision-making"
	• Build expectation that energy efficiency projects are doable and worthwhile	• Long	• Participants' changes in energy efficiency policies and stated intentions to implement the recommended energy efficiency projects provide evidence that this result is being achieved. However the evidence is not strong and more detailed study is needed.

Table III-7. Continued.
Expected Results and Evaluation Findings – Partners

Program Theory Topic	Expected Results for Partners	Near or Longer-Term	Evaluation Findings
Non-Energy Program Benefits	• Provide participants with public recognition.	• Near	• The program has incorporated a variety of mechanisms for providing public recognition to participants. Program staff have relayed anecdotal information to the evaluation staff indicating that public recognition has been a factor in some companies' decision to participate in the program. However, the participants' surveys did not directly address this topic. Future evaluation efforts will examine the potential and usefulness of tracking this indicator over time.
	• Increased business and profits for the Partner	• Long	• The evaluation design for the C&I programs did not incorporate any metrics for tracking effects on the profits of a business. However, other evaluation efforts are seeking to quantify the non-energy benefits produced by the Focus on Energy programs.
Market Research	• Modify program design and implementation to be more effective	• Near	• A separate research effort examined the market research done by Team Delta and other Administrators.

Table III-7. Continued.
Expected Results and Evaluation Findings – Trade Allies

Program Theory Topic	Expected Results For Trade Allies	Near or Longer-Term	Evaluation Findings
Marketing	• Raise awareness of energy efficiency and of Focus on Energy.	• Near	• Most participating trade allies are aware of Focus on Energy but the program has had relativ ely little impact on their awareness of energy efficiency.
	• Encourage trade allies to want to participate in the program and to market the program.	• Near	• Trade allies are doing little marketing of the program. The evaluation did not collect information from nonparticipating trade allies.
	• Foster networks or relationships between trade allies and potential partners.	• Near	• There appears to be little progress on this result, although the program has picked up activity in this area.
	• Provide more business opportunities to trade allies.	• Near	• Relatively few participating trade allies have obtained business through the program.
	• Increased sense that "energy efficiency might have value for my company"	• Long	• The program has had little impact on trade allies' attitudes toward energy efficiency.
Opportunity Identification and Development	• Raise trade allies' level of knowledge of energy efficiency equipment and services, which will help them identify opportunities for their customers, e.g., Best Practices.	• Near	• About half of the trade allies in the follow-up survey reported that they had attended one or more program-related meetings. Less than one quarter (17%) reported that they had participated in some form of training through the program. The evaluation staff will examine the possibilities for gathering data in the future that will more directly bear on this issue.
	• Trade allies will identify potential program partners.	• Near	• The majority of the trade allies trade allies have not been actively marketing the program themselves. Some, however, stated that they have been involved in marketing it in one way or another.
	• Trade allies make contact with existing partners for specific projects.	• Near	• The program has included some events specifically designed to put trade allies in contact with participants. However, as of early 2001, only 18 percent of the trade allies have been contacted by participants about potential business as a result of the program and only 12 percent have gotten work from those contacts.
	• Shift trade allies toward promoting energy efficiency products and services.	• Long	• The evaluation has found no evidence that trade allies have changed how they promote energy efficiency products and services because of the program.
Project Implementation	• Trade allies will implement energy efficiency projects.	• Near	• This low level of involvement and the generally low level of satisfaction with the program argue against any conclusion that the program has caused a meaningful change yet in the energy efficiency business of trade allies.
	• Build expectation that energy efficiency projects are doable and worthwhile.	• Long	• See the discussion above under "Trade Allies – Longer Term: Increased sense that 'energy efficiency might have value for my company'".
	• Include energy efficiency in the goods and services they offer.	• Long	• To date, the program has had too little impact on trade allies to cause them to modify their business practices.
Non-Energy Program Benefits	• Provide cooperating trade allies with public recognition.	• Near	• The program has incorporated a variety of mechanisms for providing public recognition to trade allies. The evaluation trade ally surveys did not directly address this topic. Future evaluation efforts will examine the potential and usefulness of tracking this indicator over time.
	• Increased business for cooperating trade allies.	• Long	• To date, the program has had too little impact on trade allies to have a significant impact on their business. The in-depth surveys addressed this issue and found that the program, to date, has had little impact on their revenue.
Market Research	• Modify program design and implementation to be more effective	• Near	• A separate research effort examined the market research done by Team Delta and other Administrators.

IV. ENERGY IMPACTS

A. BACKGROUND

The Commercial and Industrial pilot program was designed to create energy savings for commercial and industrial businesses as a consequence of the market preparation process (described in Chapter 3). The energy savings could occur in three ways:

1. "Short-term" energy savings – occurring as participating businesses initiate "action plans" and at least partially implement them by upgrading existing facilities or equipment (during the 12 months following initiation of the action plans);

2. "Medium-term" energy savings – occurring as participating businesses implement part of their action plans in later years as major equipment fails or needs to be replaced;

3. "Longer-term" energy savings – occurring as (participating or non-participating) businesses implement other energy-saving improvements because of attitude or policy changes brought about by the program's business education activities and support for enhanced trade ally activities.

This evaluation of the pilot program energy impacts is limited to covering program participation through March 2001. During this time period, a total of 208 commercial and industrial businesses had signed up and were at some stage of the participation process. Of these, 94 had been declared by program staff to be "substantially complete," meaning that the program staff had substantially completed providing the assistance they expected to provide to the participant, including technical assessments, estimates of cost-effective potential energy savings, and assistance to the business as appropriate to help move it towards initial implementation, if desired.

The limited period of this evaluation has two critical consequences:

- For the substantially complete participants, only *short-term* energy savings can be estimated. The likely magnitude of *medium-term* energy savings can also be estimated for this group using survey data pertaining to these participants' intentions and expectations (which is still subject to some uncertainty). But there is little basis for speculating about these customers' *longer-term* energy savings beyond noting the progress being made towards shifting attitudes (Chapter 3).

- Among the remaining 114 businesses still in the process of being assisted by the program staff, it is premature to measure *short-term* energy savings. All that can be done at this point in time is to assume that once their participation is deemed substantially complete, they will implement actions to about the same degree as the "substantially complete" businesses above.

Follow-up analysis in subsequent years will be necessary – to confirm the actual *short-term* energy savings for participants whose assistance is still in progress and to assess the evidence of *medium-term* and *longer-term* energy savings for all of the participants. Until the follow-up work is completed, the analysis of energy savings from the program must necessarily rely on customers' stated intentions in surveys and extrapolation from initially completed cases.

This introduces an element of uncertainty, which we have addressed by using the terms "optimistic," "pessimistic," and "most likely" expected values of the energy savings. Regardless of the assumptions used in this report, it is important to keep in mind that the magnitude of initial energy savings could be dwarfed by the full longer-term possible energy savings from a sustained program.

The remainder of this chapter is divided into the following sections:

B. Methodology: Explains the process used for measuring and estimating short-term and medium-term energy impacts.

C. Gross Energy Savings – Substantially Complete Participants: Measures the *short-term* energy savings and estimates the expected medium-term energy savings of the 94 participants whose projects were "substantially complete."

D. Gross Energy Savings – All Participants: Extrapolates the short-term and medium-term energy savings estimates to all 208 participants, including those participants whose assistance was still in-progress.

E. Net Energy Savings: Adjusts the energy savings estimates to exclude energy savings from implementation of measures that reportedly would have been installed even if the program had not existed.

F. Scenarios – Optimistic and Pessimistic: Gives alternative measures of energy savings under "more optimistic" and "more pessimistic" assumptions about medium-term rates of implementing program recommendations.

G. Summary: Reports gross and net kWh and therm savings.

B. METHODOLOGY

Time Periods. Program staff implementing the C&I Program first perform technical assessments of the facilities of participating businesses. Businesses then make their own arrangements with contractors and energy service providers to implement whatever actions they desire, when they desire to do so. In contrast to the direct-install and rebate programs that existed a few years ago in Wisconsin, in this program the cost of undertaking recommended energy efficiency improvements must be borne wholly by the participant. In addition, there is no deadline for installation as is commonly found in direct-install and rebate programs.

As a result, there can be a significant lag between (1) the initial process of obtaining information about energy efficiency opportunities and getting the recommended action plan, and (2) actually implementing some or all of the recommended actions. For commercial and industrial businesses, energy efficiency projects must often be funded through an annual budgeting process, which can delay adoption. In addition, outside assistance from energy service providers (e.g., engineers and contractors) is often required before businesses can implement actions.

For the above reasons, this evaluation has estimated energy savings impacts for two time periods – the end of year 1 (representing *short*-term impacts) and the end of year 3 (representing cumulative *short-term* plus *medium-term* impacts). Both electricity (kWh) and natural gas (therm) savings have been estimated by the evaluation team.

Impact Measures. As part of program operation, the implementers of the C&I Program tracked program activity on a project-by-project basis, estimating the potential energy savings for each recommended measure. One of the evaluation team's assignments was to develop independent engineering estimates of the potential and implemented program impacts on energy savings.

To develop these estimates, the evaluation team conducted case studies for 42 of the 94 "substantially complete" participants. Each of the 42 case-study businesses participated in a telephone survey and received a detailed engineering review of each project. Results from the case studies were then used to revise the initial estimates of potential savings that had been prepared by the program implementers for the 94 substantially complete projects. For participants who were at an earlier stage of participation (not quite finished) as of March 2001, evaluators used ratio estimation techniques to extrapolate the results and produce estimates of overall program energy savings. Estimates were first produced for the 94 substantially complete participants (Section C), then extrapolated to apply to all 208 participants (Section D).

Gross vs. Net Impacts. The evaluators estimated both *gross* and *net* energy savings from the program. The estimates of net energy savings (Section E) are smaller than the gross energy savings (Sections C and D), because savings for any installed measures that participants reported (in surveys) would have been installed without the program have been deleted. In earlier energy efficiency programs that provided financial incentives or subsidies for installing energy-saving measures, participants who would have installed the measure without the program were referred to as "free riders."

Alternative Scenarios. Evaluators estimated energy savings for an "expected case" (Sections C, D and E), as well as for an "optimistic case" and a "pessimistic case" (Section F). The expected case is built on a consensus reached among members of the evaluation team regarding the percentages of recommended measures participants are likely to install. The optimistic case assumes that many (although not all) of the measures participants report they will install are actually installed. The pessimistic case assumes that only the measures that were either installed or were in progress at the time of the evaluation can be counted toward savings.

Overall Findings. Section C below describes the reader through the detailed calculations and assumptions evaluators used to arrive at the estimated impact of the program on participants' energy savings. Readers interested in the overall findings may wish to focus on the estimates of overall gross and net energy savings in Sections D and E.

C. GROSS ENERGY SAVINGS: "SUBSTANTIALLY COMPLETE" PARTICIPANTS

Overview. This section describes in detail how the evaluation team estimated gross energy savings for the 94 substantially complete participants. Participants were declared "substantially complete when the program staff had substantially completed providing the assistance they expected to provide to the participant, including technical assessments, estimates of cost-effective potential energy savings, and assistance to the business as

appropriate to help move it towards initial implementation, if desired. These estimates are based on data collected from detailed case studies of 42 of these early participants (21 commercial and 21 industrial businesses). For each participant, evaluators performed a detailed engineering analysis to adjust the implementer's estimates of potential program savings and collected installation data through a telephone survey to produce estimates of realized energy savings. Each of these types of savings is discussed below.

Table IV-1 summarizes the results for the C&I Program's "substantially complete" participants in terms of gross realized savings. For this first set of 94 participants, program services resulted in gross savings of almost 7 million kWh and 3 million therms per year. By the end of year 3, savings are expected to rise to 8.6 million kWh and 3.1 million therms per year. Although there were more participants in the Commercial Program than in the Industrial Program, industrial participants account for the majority of the total savings. This is because a few very large industrial participants had disproportionately large energy-saving potential at their facilities. Likewise, therm savings were also much larger among industrial participants than commercial.

Table IV-1. Summary:
Gross Realized Program Savings for Substantially Complete Participants [12,13]

	Number of Participants	KWH Savings/Year		Therm Savings/Year	
		Year 1	Year 3	Year 1	Year 3
Commercial Program	56	1,005,933	1,237,706	123,209	152,925
Industrial Program	38	5,977,054	7,424,197	2,926,665	3,012,174[14]
Combined Program	94	6,982,987	8,661,903	3,049,874	3,165,098

Evaluators' Process for Estimating Savings. Program implementers estimated potential gross energy savings for their participants. Potential savings represent what would occur if participants actually installed every measure identified by the technical assessments. The evaluators performed an engineering review of the savings calculations for 42 participants and calculated a revised estimate of the potential impact (Table IV-2). Compared to the implementers, evaluators estimated somewhat lower kWh and therm savings for the Commercial Program, but higher kWh and therm savings for the Industrial Program.

[12] This table shows *realized* energy savings, which are potential energy savings adjusted by the results of an engineering review of savings estimates and adjusted for actual installation rates, based on survey data.

[13] Savings for year 3 are based on evaluators' estimates of when measures will be installed. Supporting data for this analysis came from participant survey data on installation intentions by measure category (described in Section D).

[14] Natural gas savings do not increase greatly between year 1 and year 3 because some delayed measures pertain to fuel switching from electricity to natural gas.

Table IV-2.
Implementer vs. Evaluator Estimates of Potential Gross Energy Savings for "Substantially Complete" Participants[15]

		Commercial	Industrial	Combined
Electricity Savings (kWh)				
Case Studies (n=42)				
Implementer		2,345,400	9,091,972	11,437,372
Evaluator		2,078,305	11,082,566	13,160,871
	Percent	89%	122%	115%
Extrapolated to all Substantially Complete Participants (n=94)				
Implementer		4,471,196	26,208,688	30,679,884
Evaluator		3,961,927	31,945,770	35,907,697
	Percent	89%	122%	117%
Natural Gas Savings (Therms)				
Case Studies (n=42)				
Implementer		275,539	946,107	1,221,646
Evaluator		225,867	999,383	1,225,250
	Percent	82%	106%	100%
Extrapolated to all Substantially Complete Participants (n=94)				
Implementer		486,598	3,331,340	3,817,938
Evaluator		398,864	3,518,894	3,917,759
	Percent	82%	106%	103%

Using a 7-step process, evaluators adjusted the estimates of potential savings shown above to produce estimates of realized savings. Realized savings includes for adjustments for the engineering review and for installation rates. Each step is explained below and corresponds to a column in Table IV-3.

To briefly summarize, the leftmost column in Table IV-3 shows the implementer's estimates of potential program savings for the 94 customers in the pilot whose projects were "substantially complete." Evaluators then applied an adjustment factor based on the engineering review (column 2) to the potential savings estimates. Column 3 reflects this revised estimate of potential savings, calculated as the product of columns 1 and 2. Columns 4 and 5 show the estimated realization rates (which could also be termed "installation rates"), which reflect the fact that not all recommended measures are expected to be actually installed. Finally, columns 6 and 7 re-compute program savings by applying the realization rates to the revised estimates of potential savings.

[15] These estimates of potential energy savings assume that all recommended measures are actually installed. In contrast, the estimates of realized program impacts shown in Table IV-1 represent savings only for measures that the evaluators expect to be installed. Section C describes how the evaluators converted potential estimates into realized estimates of program savings.

Table IV-3.
Gross Realized Energy Savings for "Substantially Complete" Participants

(n=94)

	Implementer Estimates of Potential Savings (substantially complete) (1)	Adjustment Factor (based on case study) (2)	Revised Estimates of Potential Savings (substantially complete) (3)	Year 1 Realization Rate (based on case study) (4)	Year 3 Realization Rate (case study) (5)	Year 1 Realized Savings (substantially complete) (6)	Year 3 Realized Savings (substantially complete) (7)
Commercial Program							
KWH	4,471,196	88.61%	3,961,927	25.39%	31.24%	1,005,933	1,237,706
Therms	486,598	81.97%	398,864	30.89%	38.34%	123,209	152,925
Industrial Program							
KWH	26,208,688	121.89%	31,945,770	18.71%	23.24%	5,977,054	7,424,197
Therms	3,331,340	105.63%	3,518,894	83.17%	85.60%	2,926,665	3,012,174
Combined C&I Program							
KWH	30,679,884	–	35,907,697	–	–	6,982,987	8,661,903
Therms	3,817,938	–	3,917,759	–	–	3,049,874	3,165,098

Column 1: Implementer's estimates of potential savings. The starting point for this analysis was the estimates of potential program savings for the 94 "substantially complete" participants provided by the implementation team. These savings represent annual savings and include all cases designated substantially complete by March 2001. These estimates reflect the total kWh and therm savings implementers would expect if participants actually installed all of the measures recommended in the technical assessments. Although all of the measures were determined by field implementation staff to be cost-effective and beneficial to the customer, not every customer installs every measure. Consequently, this first estimate is considered to be a maximum potential estimate.[16]

Column 2: Estimate the adjustment factor. The evaluation team derived adjustment factors to revise the implementer's estimates of savings (Table IV-4). The adjustment factors are based on an independent, detailed engineering analysis of 42 participants.[17] The adjustment factor is computed as the evaluators' estimates of potential savings divided by the implementer's estimates of potential savings for the same group of 42 participants. The adjustment factors were calculated for kWh and therm savings for both programs.

[16] There is additional potential for savings from market transformation, as described in Chapter 3 of this report. Although these savings may not be directly related to specific recommendations, cumulative results of the program will need to be recognized.

[17] PA's subcontractor Michaels Engineering performed the detailed engineering analysis of 21 Commercial Program projects, and SBW Consulting performed a parallel analysis of 21 Industrial Program projects.

Table IV-4.
Calculate Adjustment Factors (Column 2)

	Commercial	Industrial
KWH	88.61%	121.89%
Therms	81.97%	105.63%

Table IV-4 shows that the implementers of the Commercial Program slightly over-estimated the potential energy savings from this program (with adjustment factors of 89% for kWh savings and 82% for therm savings). Conversely, implementers for the Industrial Program may have been conservative in their estimates of potential savings. The evaluation team found that potential kWh savings for the Industrial Program were nearly 22% greater and therm savings were nearly 6% greater than implementers had estimated.

Column 3: Revised estimates of potential savings. The third step was to revise the implementer's estimates of potential kWh and therm savings for "substantially complete" participants using the adjustment factors. Implementer estimates of potential savings were multiplied by the adjustment factors to arrive at a revised estimate of potential savings (Table IV-5).

Table IV-5.
Revised Potential Energy Savings for "Substantially Complete" Participants

Calculation:	Implementer estimate of potential savings (1)	x	Adjustment factor (2)	=	Revised estimate of potential savings (3)
Commercial Program					
• KWh	4,471,196	x	88.61%	=	3,961,927
• Therms	486,598	x	81.97%	=	398,864
Industrial Program					
• KWh	26,208,688	x	121.89%	=	31,945,770
• Therms	3,331,340	x	105.63%	=	3,518,894

Column 4: Calculate the year-1 realization rate. The realization rate is an intermediate ratio that is required to compute realized savings (Table IV-3, Column 6). The realization rate is based on information gathered from participant surveys, the evaluators' case studies, and the implementer's tracking data for "substantially complete" projects. The realization rate is defined as the ratio of energy savings from measures installed by the end of year 1 to estimates of total *potential* savings. Data in the numerator come from the case studies, where evaluators looked for evidence of installation for each recommended project. Data in the denominator come from respondents' survey responses to questions that asked about their intentions for installing each measure. This combined information was tabulated on a measure-by-measure basis. Survey respondents were asked how likely they were to install the recommended measures. The realization rate analysis assigned an installation probability percentage to each answer, as shown in Table IV-6.

Table IV-6.
Likelihood That Each Recommended Measure Will Be Installed in Year 1

Survey response	Participant survey response	Evaluator-assigned likelihood of installation in year 1[18]
1. Already installed	Varies by measure category	100%
2. Installation in progress		100%
3. Definitely plan to install within 1 year		60%
4. Probably install within 1 year		10%
5. Might install within 1 year		0%
6. Probably won't install within 1 year		0%
7. Definitely won't install within 1 year		0%

The next step is to calculate total *realized* savings for these participants, that is the expected savings based on their installation status and stated intentions. The calculation shown in Table IV-7 involves multiplying potential savings for each recommended measure by the likelihood of installation (from Table IV-6 above). Next, realization rates were calculated by dividing the realized savings by the revised estimate of potential savings (Table IV-3, column 3). This ratio is needed later to "scale up" the findings from the case study sample of 42 to the population of 94 "substantially complete" projects (Column 6 in Table IV-3).

Table IV-7.
Calculation of Realization Rate[19]

Steps					
4a	Potential savings	x	Likelihood of installation	=	Realized savings
4b	Realized savings	÷	Potential savings	=	Realization rate

Column 5: Calculate year 3 realization rate. The fifth step was to calculate the expected realization rate as of the end of year 3 (using the same formula described in Table IV-7). This step combines the already-realized savings from the first year with additional energy savings from measures that could not be installed in the first year but will be installed by the end of year 3.

To derive these estimates, the evaluation team reached an "expert-opinion" consensus on what constituted a reasonable interpretation of participants' survey responses regarding future intentions to install. For measures that survey respondents said they would definitely install within the first year, evaluators assumed that 75% (not 100%) would actually be

[18] These percentages were used to downwardly adjust customer responses to survey questions on intentions to install recommended measure, under the principle that some but not all of the measures participants say they are going to install actually get installed. These percentages represent a general consensus among members of the evaluation team.

[19] These computations were performed separately for the Commercial Program and the Industrial Program and for each measure category. Realized kWh and therm savings were calculated for year 1 from which the year 1 realization rate is calculated (year 3 savings are a separate calculation).

installed by year 3.[20] For measures customers would *probably* install in year 1, evaluators assumed that 30% would actually be installed by year 3.[21] For measures that *may* be installed within the first year, evaluators assumed none would actually be installed. The customers' survey responses were discounted based on evaluators' judgment and experience from previous projects. Also, some percentage of survey respondents will always try to provide the "right" answer or, in this case, want to appear "conscientious."

Table IV-8.
Likelihood That Each Recommended Measure Will Be Installed in Year 3

Survey response	Participant survey response	Evaluator assigned likelihood of installation in year 3
Already installed	Varies by measure category	100%
Installation in progress		100%
Definitely plan to install within 1 year		75%
Probably install within 1 year		30%
Might install within 1 year		0%
Probably won't install within 1 year		0%
Definitely won't install within 1 year		0%

Realized savings were then calculated by multiplying evaluation-adjusted potential energy savings by the likelihood percentages. (In Section F, other likelihood assumptions of "more optimistic" and "more pessimistic" are used to derive alternative estimates of realization rates.)

Column 6: Calculate realized energy savings for year 1. Using the year 1 realization rates, evaluators extrapolated the findings from the 42 case studies to all 94 "substantially complete" participants (Table IV-9). Realization rates (Column 4) were multiplied by revised estimates of potential savings (Column 3) to provide estimates of realized savings for "substantially complete" customers in year 1 (Column 5).

Table IV-9.
Gross Realized Savings for "Substantially Complete" Participants in Year 1

Calculation:	Revised estimate of potential savings (3)	x	Realization rate year 1 (4)	=	Savings year 1 (6)
Commercial Program					
• KWH	3,961,927	x	25.39%	=	1,005,933
• Therms	398,864	x	30.89%	=	123,209
Industrial Program					
• KWH	31,945,770	x	18.71%	=	5,977,054
• Therms	3,518,894	x	83.17%	=	2,926,665

[20] This is slightly more than the year 1 assumption of 60% for "definitely plan to install."

[21] This is slightly more than the year 1 assumption of 10% for "probably will install."

Column 7: Calculate realized energy savings for year 3. Table IV-10 shows year 3 realization rates (Column 5) applied to year 3 potential program savings for "substantially complete" customers (Column 3). This is a cumulative estimate of realized savings expected from the program.

Table IV-10.
Gross Realized Savings for "Substantially Complete" Participants in Year 3

Calculation:	Revised estimate of potential savings (3)	x	Realization rate year 3 (5)	=	Savings year 3 (7)
Commercial Program					
• KWH	3,961,927	x	31.24%	=	1,237,706
• Therms	398,864	x	38.34%	=	152,925
Industrial Program					
• KWH	31,945,770	x	23.24%	=	7,424,197
• Therms	3,518,894	x	85.60%	=	3,012,174

D. GROSS ENERGY SAVINGS: ALL PARTICIPANTS

This section describes how gross kWh and therm savings were calculated for all 208 participants who entered the program during the analysis period (up to March 2001). Much of this discussion describes how savings were computed for the 114 customers whose projects were not substantially complete, that is those that were at an earlier stage of the participation process at the time of the evaluation.

Table IV-11 summarizes the gross realized savings for all participants in the study. The analysis results conclude that gross energy savings from the pilot totaled about 12.6 million kWh for year 1, and are expected to climb to 19.2 million kWh/year (cumulative) by the end of year 3. For gas savings, 5.7 million therms were saved in year 1, and are expected to climb to 7.2 million therms/year by the end of year 3.

Table IV-11.
Gross Realized Energy Savings for All Pilot Participants

	Number of Participants	KWH Savings		Therm Savings	
		Year 1	Year 3	Year 1	Year 3
Projects Not Substantially Complete					
Commercial Program	47	421,966	779,092	51,687	96,244
Industrial Program	67	5,266,554	9,817,758	2,579,837	3,983,298
Combined Program	114	5,688,520	10,596,850	2,631,524	4,079,542
All Projects (Substantially Complete plus Not Substantially Complete)[22]					
Commercial Program	103	1,427,899	2,016,798	174,896	249,169
Industrial Program	105	11,243,608	17,241,955	5,506,502	6,995,472
Combined Program	208	12,671,507	19,258,753	5,681,398	7,244,640

Calculation steps for all participants. To calculate savings for all the participants, total gross energy savings had to be extrapolated from the 94 "substantially complete" participants to the 208 "not substantially complete" participants. At the time of the analysis, far less information was available for the 114 participants whose projects were not yet complete. Consequently, the evaluation team used statistical techniques to extrapolate results from the 94 participants with advanced projects to the 114 participants whose projects were not as advanced.

Separate realization rates had to be calculated for the 114 customers whose projects were less advanced and who thus would be expected to have fewer measures installed at the end of year 1 and year 3 (Table IV-12). To calculate these, evaluators first assumed that only half of the year 1 realization rate estimated for the 94 advanced-project participants could be expected for the less-advanced-project participants (Table IV-12, column 1). They also assumed that 75% of the year 3 realization rate estimated for "substantially complete" participants would be applicable to the "not as complete" group.

Table IV-12.
Realization Rate for Not Substantially Complete Participants

Calculation:	Adjustment Ratio (Column 1)	x	Realization Rate for Substantially Complete Projects (Column 2)[23]	=	Realization Rate for Not Substantially Complete Projects (Column 3)
Commercial Program					
Year 1					
• KWH	.50	x	25.39%	=	12.69%
• Therms	.50	x	30.89%	=	15.44%
Year 3					
• KWH	.75	x	31.24%	=	23.43%

[22] To calculate total kWh and therm savings for all projects (bottom half of Table IV-11), add the savings for substantially complete projects (Table IV-1) to the savings in the top half of Table IV-11.

[23] For "substantially complete" participants, from Table IV-3, column 5.

Calculation:	Adjustment Ratio (Column 1)	x	Realization Rate for Substantially Complete Projects (Column 2)[23]	=	Realization Rate for Not Substantially Complete Projects (Column 3)
• Therms	.75	x	38.34%	=	28.75%
Industrial Program					
Year 1					
• KWH	.50	x	18.71%	=	9.35%
• Therms	.50	x	83.17%	=	41.58%
Year 3					
• KWH	.75	x	23.24%	=	17.43%
• Therms	.75	x	85.60%	=	64.20%

The next step in the analysis was to calculate a ratio that could be used to scale calculations of potential savings from advanced-project participants to not-as-advanced participants. This ratio was calculated as the number of not-as-advanced participants divided by the number of advanced-project participants (Table IV-13).

Table IV-13.
Estimate Ratio for Scaling Realized Savings

Calculation:	Number of participants with not substantially complete projects	÷	Number of participants with substantially complete projects	=	Ratio
Commercial Program	47	÷	56		.8393
Industrial Program	67	÷	38		1.7632

These ratios were then applied to the potential savings for substantially complete participants to arrive at potential savings for the not-as-complete participants (Table IV-14). This step required the evaluators to multiply the ratios in Table IV-13 by the estimate of potential savings for substantially complete participants in Table IV-2.

Table IV-14.
Potential Savings for Not Substantially Complete Participants

Calculation:	Adjustment Ratio	x	Potential Savings for Substantially Complete Customers	=	Potential Savings for Not Substantially Complete Customers
Commercial Program					
• KWH	.8393	x	3,961,927	=	3,325,189
• Therms	.8393	x	398,864	=	334,761
Industrial Program					
• KWH	1.7632	x	31,945,770	=	56,326,781
• Therms	1.7632	x	3,518,894	=	6,204,514

Performing the same basic calculations done to this point but using as a basis the **unadjusted** gross savings estimates from program staff produces the following gross potential savings estimates.

Table IV-15.
Gross Potential Impacts
(All Participants)

	KWh †	Therms †
Commercial Program	8,223,871	895,000
Industrial Program	72,419,847	9,205,159
Combined Program	80,643,717	10,100,158

† Program estimated impacts for all recommended projects for substantially complete participants extrapolated to the population of participants (n=208).

To calculate gross realized savings for year 1 and year 3 for the not-substantially-complete participants, evaluators multiplied the realization rates in Table IV-12 by estimates of potential savings for these same participants (Table IV-14). Table IV-16 shows this result and illustrates how year 1 savings were calculated (year 3 savings were computed similarly).

Table IV-16.
Estimate Gross Realized Savings for
Not Substantially Complete Participants (Year 1)

Calculation:	Estimate of potential savings	x	Realization rate year 1	=	Savings year 1
Commercial Program					
• KWh	3,325,189	x	12.69%	=	421,966
• Therms	334,761	x	15.44%	=	51,687
Industrial Program					
• KWh	56,326,781	x	9.35%	=	5,266,554
• Therms	6,204,514	x	41.58%	=	2,579,837

Interestingly, the ratio of year 3 savings to year 1 savings was considerably higher for customers with less-advanced projects than for customers whose projects were further along. To understand this, recall that the majority of savings will occur within the first two years of receiving program recommendations. Although some delay will occur before many customers can take action, after a certain point there is little likelihood that measures not already installed ever will be. Thus, the majority of savings for the substantially complete customers will materialize within one year of this analysis (which can be up to 2 years after the technical assessment). In addition, some incremental savings will occur by the end of year 3 for these customers.

In contrast, for participants whose projects are not as far along, relatively little savings can be expected one year from this analysis. In fact, some of these customers are still awaiting their technical assessments. But three years from now all of these customers will have moved through the program, and nearly all of the measures that are going to be installed will have been installed. Thus, the ratio of year 3 to year 1 savings is larger for customers whose projects were not substantially complete than for customers whose projects were near completion.

E. NET ENERGY SAVINGS

The impact estimates described in Sections C and D above represent *gross* savings. This section describes how *net* energy savings were estimated. Net savings subtract the portion of energy savings that would have occurred even in the absence of the program, that is measures that customers claim they would have installed without the program. Table IV-17a shows net energy savings for the substantially complete participants and for all businesses participating during the study period. Net savings were calculated using the following formula:

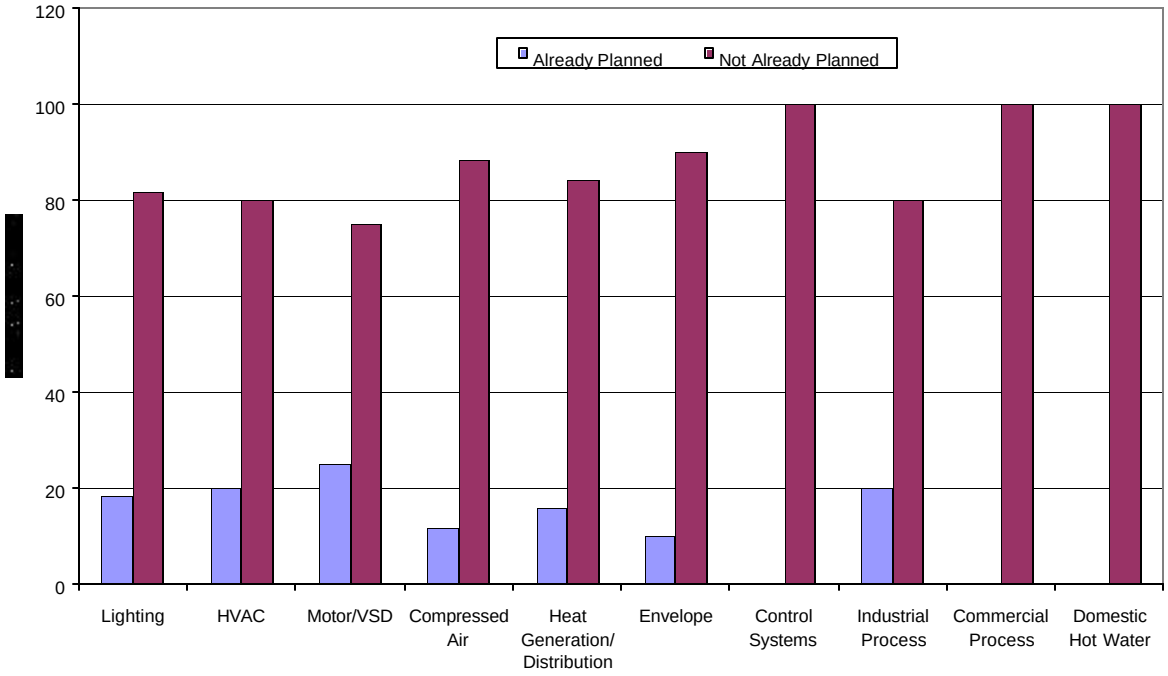
Gross realized savings	***x***	***(1- Free ridership rate)***	**=**	***Net savings***

Table IV-17a.
Summary of Net Program Impacts

	KWH Savings		Therm Savings	
	Year 1	Year 3	Year 1	Year 3
Commercial Program				
Substantially Complete (n=56)	830,561	1,021,928	101,729	126,264
All Participants (n=103)	1,178,962	1,665,194	144,405	205,729
Industrial Program				
Substantially Complete (n=38)	4,935,030	6,129,882	2,416,438	2,487,039
All Participants (n= 105)	9,283,427	14,236,039	4,546,513	5,775,900
Combined Program				
Substantially Complete (n=94)	5,765,591	7,151,810	2,518,167	2,613,304
All Participants (n=208)	10,461,971	15,901,233	4,690,918	5,981,629

The data for estimating net savings came from several different sources. One source was the survey of 42 case-study participants, which asked these customers whether they had any prior intentions of installing the measures the technical assessment had identified (Figure IV-17b). The second data source was on-site interviews with facility staff at a subset of the industrial participants. The interviews included questions about free ridership for each measure group. Both of these analyses revealed that customers had not planned to install the majority of recommended measures prior to participating. An average free ridership rate of 17.4% was calculated from these two data sources. (Responses were weighted by the estimated savings of the measure to calculate the average rate.)

Figure IV-17b.
Customers' Installation Intentions Prior to Participating
(Customer Surveys, n=42)



F. SCENARIOS: OPTIMISTIC AND PESSIMISTIC

The estimates of energy savings necessarily required assumptions about the installation percentages that would be associated with participants' statements of "definitely", "probably" or "maybe" installing recommended measures during the first year or subsequent years. As described earlier, the evaluators reached a consensus on these percentages to derive the estimates of energy savings in Sections C, D, and E.

However, more optimistic or pessimistic assumptions are also possible. An *optimistic* case would assume that many (although not all) of the measures customers said they would install within one year will actually be installed. A *pessimistic* case would assume that only those measures that were either installed or in progress at the time of the evaluation will actually be installed by the end of year 1. Gross program savings under these alternative scenarios are shown in Table IV-18.

Table IV-18.
Program Impact Scenarios
(Substantially Complete Projects, Year 1)

	Gross Savings		Net Savings	
	KWH	Therms[24]	KWH	Therms
Commercial Program				
Most Likely Case†	1,005,933	123,209	830,561	101,729
Optimistic Case	2,007,112	241,831	1,657,197	199,671
Pessimistic Case	275,354	123,050	227,350	101,597
Industrial Program				
Most Likely Case†	5,977,054	2,926,665	4,935,030	2,416,438
Optimistic Case	18,707,443	3,069,884	15,446,037	2,534,689
Pessimistic Case	2,482,186	2,699,695	2,049,448	2,229,038
Combined Program				
Most Likely Case†	6,982,987	3,049,874	5,765,591	2,518,167
Optimistic Case	20,714,555	3,311,715	17,103,235	2,734,360
Pessimistic Case	2,757,540	2,822,745	2,276,798	2,330,635

† Year 1 realized savings for substantially complete participants (n=94) (from Column 7, Table IV-3).

Extrapolating the savings scenarios to the entire population produces the estimates shown in Table IV-19.

Table IV-19.
Net Savings Under Program Impact Scenarios For All Participants
(All Participants, Year 1)

	KWh	Therms
Commercial Program		
Most Likely	1,178,962	144,405
Optimistic	2,350,740	283,234
Pessimistic	322,496	144,117
Industrial Program		
Most Likely	9,283,427	4,546,513
Optimistic	29,039,937	4,765,441
Pessimistic	3,853,147	4,190,791
Combined Program		
Most Likely	10,462,389	4,690,918
Optimistic	31,390,677	5,048,675
Pessimistic	4,175,643	4,334,908

[24] Therm savings can vary widely under different scenarios depending on whether recommended measures increase or decrease natural gas usage. For example, energy efficiency and insulation measures aimed at natural gas end uses will reduce usage, whereas fuel switching from electric to gas will increase therm usage (with offsetting kWh savings).

Calculation of optimistic and pessimistic scenarios. To estimate program impacts under these two scenarios, new realization rates had to first be developed based on revised assumptions about customers' installation of recommended measures. These assumptions are summarized in Table IV-20 below. Next, revised realization rates were calculated for each scenario based on the different assumptions about installation patterns. These realization rates were then multiplied by the estimates of potential savings to calculate kWh and therm savings (Table IV-21).

Table IV-20.
Likelihood of Installation for Optimistic, Most Likely, and Pessimistic Cases

Survey response	Participant survey response	Evaluator-assigned likelihood of installation in year 1		
		Optimistic Case	Most Likely Case	Pessimistic Case
1. Already installed	Varies by measure category	100%	100%	100%
2. Installation in progress		100%	100%	100%
3. Definitely plan to install within 1 year		100%	60%	60%
4. Probably install within 1 year		75%	10%	0%
5. Might install within 1 year		50%	0%	0%
6. Probably won't install within 1 year		25%	0%	0%
7. Definitely won't install within 1 year		0%	0%	0%

Table IV-21.
Gross Realized Energy Savings for "Substantially Complete" Participants Under Optimistic, Most Likely, and Pessimistic Cases

Calculation:	Estimate of potential savings†		Realization rate optimistic case	or	Realization rate pessimistic case		Savings optimistic case	or	Savings pessimistic case
Commercial Program									
• KWH	3,961,927	x	50.66%		6.95%	=	2,007,112		275,354
• Therms	398,864	x	60.63%		30.85%	=	241,831		123,050
Industrial Program									
• KWH	31,945,770	x	58.56%		7.77%	=	18,707,442		2,482,186
• Therms	3,518,894	x	87.24%		76.72%	=	3,069,883		2,699,695

† Potential savings as adjusted by evaluation engineering review.

G. IMPACT ON EMISSIONS

A separate Focus on Energy evaluation effort estimated emission factors or rates for the electric generating plants serving Wisconsin.[25] Those rates are shown in Table IV-22. The emission rates can be used to estimate emissions reductions or savings created by the C&I programs, which are shown in Table IV-23. Under the most likely case, the C&I programs together would save 36,900 pounds of NO_x, 62,268 pounds of SO_2, and 13,837,418 pounds of CO_2. Emissions reductions extrapolated to the entire population of participants are shown in Table IV-24.

Table IV-22.
Emissions Rates

(Lbs/MWh)

	By Marginal Cost	By Capacity Factor
NOx	6.4	5.9
SO2	10.8	10.0
CO2	2400	2035

Table IV-23.
Emissions Savings Substantially Complete Participants

	Net Electricity Savings †	Emissions Reduction (Pounds) ‡		
	KWh	NOx	SO2	CO2
Commercial Program				
Most Likely Case	830,561	5,316	8,970	1,993,346
Optimistic Case	1,657,197	10,606	17,898	3,977,273
Pessimistic Case	227,350	1,455	2,455	545,640
Industrial Program				
Most Likely Case	4,935,030	31,584	53,298	11,844,072
Optimistic Case	15,446,037	98,855	166,817	37,070,489
Pessimistic Case	2,049,448	13,116	22,134	4,918,675
Combined Program				
Most Likely Case	5,765,591	36,900	62,268	13,837,418
Optimistic Case	17,103,235	109,461	184,715	41,047,764
Pessimistic Case	2,276,798	14,572	24,589	5,464,315

† Net Electricity Savings is first year savings for the substantially complete participants.
‡ Emission reductions are calculated using the marginal cost emission rates.

[25] "Development of Emissions Factors for Quantification of Environmental Benefits," PA Consulting Group, June 25, 2001.

Table IV-24.
Emissions Savings All Participants

	Net Electricity Savings †	Emissions Reduction (Pounds) ‡		
	KWh	NOx	SO2	CO2
Commercial Program				
Most Likely Case	1,178,962	7,545	12,733	2,829,509
Optimistic Case	2,350,740	15,045	25,388	5,641,777
Pessimistic Case	322,496	2,064	3,483	773,991
Industrial Program				
Most Likely Case	9,283,427	59,414	100,261	22,280,225
Optimistic Case	29,039,937	185,856	313,631	69,695,848
Pessimistic Case	3,853,147	24,660	41,614	9,247,553
Combined Program				
Most Likely Case	10,462,389	66,959	112,994	25,109,734
Optimistic Case	31,390,677	200,900	339,019	75,337,626
Pessimistic Case	4,175,643	26,724	45,097	10,021,544

† Net Electricity Savings is first year savings for all participants.
‡ Emission reductions are calculated using the marginal cost emission rates.

H. SUMMARY

As discussed throughout this chapter, there are many uncertainties in estimating savings from the Commercial and Industrial pilot program. According to the evaluators' best estimates at this time, the program has begun to produce energy savings from commercial and industrial businesses.

The impact analysis focuses on short-term energy savings resulting from participants who have begun initiating their action plans and installing or implementing the recommended measures. The analysis does not quantify savings over the medium term, where participants might undertake energy efficiency improvements as equipment fails or needs to be replaced. It also does not consider longer-term savings that might occur as businesses implement other energy-saving improvements because of attitude and policy changes influenced by the program's education and support activities.

In addition, the impact analysis was based on participants who reached the substantially complete phase by March 2001 and then extrapolated to the entire population of participants. By March 2001, 94 participants had been declared by program staff to be "substantially complete" and a total of 208 companies had signed up for the program and were at some stage of the participation process. Estimates of savings from the 94 participants are based on more information and are hence more accurate than estimates for the remaining 114 participants with less complete projects.

Program staff estimated potential for all recommended projects extrapolated to the population of 208 participants are shown in Table IV-25.

Table IV-25.
Gross Potential Impacts
(All Participants)

	KWh †	Therms †
Commercial Program	8,223,871	895,000
Industrial Program	72,419,847	9,205,159
Combined Program	80,643,717	10,100,158

† Program estimated impacts for all recommended projects for substantially complete participants extrapolated to the population of participants (n=208).

Evaluation staff adjusted gross potential savings based on an engineering review and then for free riders to calculated net savings estimates. Evaluation-adjusted net savings estimates are shown in Table IV-26. Overall, the program will produce at least 4,175,643 kWh and 4,334,908 therms from projects that are either completed or quite likely to be completed in year 1 (the "Pessimistic" scenario) and under the most likely scenario should produce savings of 10,462,389 kWh and 4,690,918 therms in year 1.

Table IV-26.
Net Program Impacts
(All Participants, First Year and Third Year)

Scenarios	kWh	Therms
Year 1		
Commercial Program		
Pessimistic	322,496	144,117
Most Likely	1,178,962	144,405
Optimistic	2,350,740	283,234
Industrial Program		
Pessimistic	3,853,147	4,190,791
Most Likely	9,283,427	4,546,513
Optimistic	29,039,937	4,765,441
Combined Program		
Pessimistic	4,175,643	4,334,908
Most Likely	10,462,389	4,690,918
Optimistic	31,390,677	5,048,675
Most Likely Scenario Year 3		
Commercial Program	1,665,194	205,729
Industrial Program	14,236,039	5,775,900
Combined Program	15,901,233	5,981,629

Follow-up analysis in subsequent years will be necessary to confirm energy savings for participants whose assistance is still in progress, and also to assess the evidence of *medium-term* and *longer-term* energy savings for all participants. Until that follow-up work is completed, the analysis of energy savings from the program must necessarily utilize estimation from stated intentions in surveys and extrapolation from initially completed cases.