

NON-ENERGY BENEFITS FROM COMMERCIAL AND INDUSTRIAL ENERGY EFFICIENCY PROGRAMS: ENERGY EFFICIENCY MAY NOT BE THE BEST STORY

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Abstract

This paper presents a portion of the results of Wisconsin's Focus On Energy (Focus) Business Program's non-energy benefits research. This research was conducted in February and March of 2003 and included 74 interviews with program participants (Partners) installing program-incentivized measures. The research was conducted via telephone interviews with selected Partners that installed measures between 6 and 12 months prior to the interviews. This paper summarizes the findings from these interviews and reports the type of benefits that Partners experience, the level of importance that Partners place on the benefits realized, and the value of the benefits to the Partners. The results indicate that Partners place significant value on their non-energy benefits and value these benefits at a level far greater than the value of the energy savings.

Introduction

In 2001 the State of Wisconsin launched its FOCUS public benefits energy efficiency programs. In general, these programs serve both residential and non-residential ratepayers who are customers of the state's regulated utilities. Program services included a wide range of information and incentive programs that target specific types of customers including residential non-low-income, residential low-income, commercial, industrial, and agricultural customers. This study focuses on the participants in the Business Programs that provide information and technology installation incentives to the commercial, industrial, and agricultural markets. Technologies incentivized through the program and selected for inclusion in the non-energy benefits research include the energy efficient versions of the following technologies:

- Lighting systems
- HVAC systems
- Compressed air systems
- Commercial clothes washers
- Motors, pumps and variable speed drives
- Boiler systems
- Refrigeration systems
- Building envelope insulation and sealing
- Heat recovery and cogeneration systems
- Water heating systems
- Energy management systems
- Renewable energy projects
- Daylighting systems
- Other technologies

The research focuses on identifying the non-energy benefits that commercial and industrial customers report are associated with the installation and use of program-incentivized measures. To narrow the focus of the research the evaluation team identified ten benefit categories to address in the research. This allowed us to examine changes within a limited set of benefits categories, thereby allowing the interviews to be structured around specific changes in the business' operational environmental that the Partner identified as being caused directly by the installation and use of the

incentivized technologies. The operational areas examined by the non-energy benefits interviews included changes in:

- Sales levels
- Productivity
- Non-energy operating costs
- Equipment life
- Maintenance costs
- Waste generation
- Personnel needs
- Injuries or illnesses
- Defect or error rates
- Employee morale or satisfaction

To conduct the research, the evaluation team designed an interview instrument that asked if the Partner is experiencing a change in a specific benefit category as a direct result of the installation and use of the installed technology. If the Partner indicated that they had experienced a change, the interviewer asked if the change was positive or negative. Then the interviewer asked about the importance of the change to the business and the value of the change that the business places on that change. The business was also asked about the percent of change the benefit had on their operations within the benefit category.

The results indicate that businesses place significant importance on the non-energy benefits associated with the installed technologies, and that the value of these benefits are equal to about 2.5 times the projected energy savings for the installed measures. In summary, businesses report that the non-energy benefits associated with their participation in the Focus program is equal to about \$17,239 per measure installed per year. On average, each Partner reported 3.27 non-energy benefits that have cash value to their business operations for each technology installed.

Methodology

The sampling strategy for the non-energy benefits interviews involved a coordinated multi-stage selection process that focused on medium to high-energy savers but excluded the very-high savers or the low or medium-low energy savers. This process consisted of the following six steps:

1. The identification of all commercial, industrial, and agriculture participants taking part in one or more of the Business Programs offered during the first-year and early second-year of the statewide effort that installed program-incentivized measures.
2. The removal of Partners from the contact list that had savings in the top five-percent of the program's energy savings goals. This step removed the large energy savers that the impact evaluation team needed to reserve for their studies.
3. The removal of Partners from the contact list that were already contacted or targeted for contact by the energy impact evaluation team. This step helped reduce the number of times a typical Partner could be contacted by the evaluation team and allowed the impact evaluation to have first-pick of the Partners to contact.
4. Participants who had only minor measures installed, such as a programmable thermostats, a couple of lighting fixtures or exit lights, or a vending miser were removed from the contact list so that we would not be asking Partners about their non-energy benefits if they only saved a few dollars a year. This step acted to exclude all Participants that had low-cost or minor measures installed through the program.

5. The remaining contacts were sorted by incentivized technology and prioritized by the level of projected energy savings. The step allowed the non-energy benefits to target the highest energy savers for each of the technologies targeted in the non-energy benefits research.
6. Finally the last step was to set interview quotas for each of the technologies covered by the program. The evaluation budget supported the completion of 74 interviews. To make sure that the interview results reflected the mix of technologies incentivized, the number of interviews for each technology was set to match a proportional distribution of the technology.

The following table presents the technologies targeted for the non-energy benefits interviews, the number of participants in each technology category, the number of interviews targeted for each technology and the number of completed interviews within each technology group.

Table 1 Sample population and interview distribution

Measure category	Population in Contact List after step 6	NEB Interview Targets	Interview Completes
Lighting systems	235	25	23
HVAC	78	10	11
Compressed air	32	5	5
Commercial washers	26	5	5
Motors, pumps and drives	26	5	5
Other technologies	19	5	5
Boilers	17	4	4
Refrigeration	16	3	3
Building Envelope	14	3	3
Heat recovery/Cogeneration	11	2	3
Water heater measures	8	2	2
Energy management systems	5	2	3
Renewable energy	3	2	1
Daylighting	1	1	1
Total	491	74	74

The interview instrument is not included in this paper because of conference page limits but can be obtained by contacting the author of this paper.

Interview Results

This paper is organized into two sections. The first section provides the results of the interviews segregated by the individual benefits discussed during the interview. The second section provides a comparative summary of the interview results across the benefit groups. Implementing Partners report a variety of NEBs that occur as a result of initiatives taken under the Focus Business Programs. These are described in the following section.

Overview of Individual NEBs

Overall, businesses report a change in all ten benefit categories included in the NEB interview instrument. These benefits and the changes reported are presented and discussed in the following paragraphs. In order to present the interview results we prepared a series of summary tables with the results for each benefit incorporated into a single table. Because of the complexity of these tables a

table layout description is provided to help the reader gain an understanding of the information included in each table.

Explanation of results summary tables

Each table is headed with a label indicating the benefit presented (e.g., maintenance). The First column lists the three possible responses when a Partner indicated that there has been a change in the benefit: A Change with a positive value associated with it, a change with a negative value, and a change, but unable to estimate a value for the benefit. The last row gives the number of respondents that are in these three categories as “Change,” and also indicates the number of respondents who replied that there was no change in the benefit category, and how many said that they didn’t know if there was a change (a non-response). The second and third columns supply the number of partners giving the respective response, and the percent of the total indicating change for that benefit category. Values for each response category are given in the rows to the right. The value for those that indicated that there was a change, but were unable to provide a value, is calculated using the following equation:

Equation 1 Calculation of the value for the ‘Yes change, but value unknown’ responses.

$$\frac{(Total\ of\ positive\ values - Total\ of\ negative\ values)}{(n\ giving\ positive\ values + n\ giving\ negative\ values)}$$

The weighted mean value for the benefit is calculated using the following equation:

Equation 2 Calculation of the Weighted Mean Value of Benefit Category.

$$\frac{(Total\ of\ positive\ values + Total\ of\ negative\ values + (n\ replying\ Yes,\ DK\ x\ mean\ value))}{(n\ positive\ values + n\ negative\ values + n\ Yes,\ DK + n\ no\ change)}$$

This equation ignores the responses that indicate that they do not know if there has been a change, which is treated as a non-response. We believe that this approach to valuing the benefits provides the fairest estimate of the mean value for each benefit category because it values the change in benefits for the Partners who are unable to provide a value estimate at the average reported value for that benefit from the Partners who were able to provide a value.

The following paragraphs present the results of the interviews for each benefit category and are reported in the order in which the benefits were discussed with the Partners. The order in which they were discussed was determined by the incident level of the benefit within the business program participant population identified during the year-1 research efforts.

Maintenance

The most common benefit reported was a change in maintenance costs, with 57 (77%) of the businesses reporting that they experienced a change in their maintenance costs that resulted from the installed technology. Some of this change can be attributed to the fact that new equipment typically requires less maintenance than older equipment and that this decrease in maintenance is both noticed and valued by participants. Fifty-seven open-ended comments were recorded for this benefit category

and 20 (35%) of these comments specifically attributed a change in maintenance costs that was due to the fact that the new equipment required less maintenance than the equipment it replaced.

A summary of the data is displayed in the table below. Out of the 57 Partners reporting a change in maintenance costs, 4 (7% of 57) reported their costs increased, and 52 (70% of 74) reported that costs decreased. Of these 57 reporting a change, 35 were able to provide a dollar value for that change. For those reporting an increase in costs, the range of values reported went from a low of \$15 per year to a high of \$1,000. The value of the decrease in maintenance demands ranged from a low of \$100 to a high of \$20,000.

Out of the 57 Partners that indicated a change in maintenance, 56 (98%) indicated some level of importance of this change to their business. Values are based on a scale of 1 to 10, with a 1 meaning the change is of little importance and a 10 meaning the change is extremely important. The range of values provided is from a low score of 3 to a high score of 10, with a median value of 8 and mean of 7.6.

Table 2 Interview results for maintenance benefits

Maintenance	N	Percent	Low	High	Median	St dev	Mean
Change, with positive value	31	54%	\$100	\$20,000	\$1,700	\$3,944	\$2,810
Change, with negative value	4	7%	-\$1,000	-\$15	-\$650	\$500	-\$579
Change, Don't Know value	22	39%	-	-	-	-	\$2,423
Weighted Value	-	-	-	-	-	-	\$2,031
Reported Importance	56	98%	3	10	8	2.11	7.6
Reporting	Change n=57		No Change n=11		Don't Know if Change n=6		

Also included in the table above is the mean value of the maintenance changes reported. The “Change, with positive value” row shows that 31 of the Partners reported a change in Maintenance, and that they were able to provide an annual dollar value for that change which averaged \$2,810.

The weighted mean in the table above reports that the mean value of the changes in Maintenance that is due to the implementation of the Focus on Energy Program is \$2,031. with 57 of the 74 Partners indicating a change, the weighted overall value of Maintenance as a non-energy benefit is \$2,031 per participant per year.

Employee Morale and Satisfaction

Employee Morale and Satisfaction also saw a significant change, with 55 (74%) of the implementing Partners reporting a change. Respondents report that a lot of these employees are happier at work with the improvements in lighting and temperature controls, with a corresponding decrease in the amount of time they spend dealing with problems stemming from the old equipment.

Table 3 Interview results for employee morale & satisfaction benefits

Employee Morale	N	Percent	Low	High	Median	St dev	Mean
Change, with positive value	2	4%	\$500	\$3,000	\$1,750	\$1,768	\$1,750
Change, with negative value	0	0%	-	-	-	-	-
Change, Don't Know value	53	96%	-	-	-	-	\$1,750
Weighted Value	-	-	-	-	-	-	\$1,356
Reported Importance	56	98%	1	10	8	2.21	7.73
Reporting	Change n=55		No Change n=16		Don't Know if Change n=3		

Only two businesses were able to provide an annual dollar value of the increase in employee morale. The implementing Partner that gave the \$500 estimate is indicative of what the interviewee thinks of how the employees feel over the better lighting. The \$3,000 estimate is an indication of how much the employer values the fact that his customers are happier with the new machines in a coin laundry business. Four businesses were able to indicate an average of a 63 percent increase in employee morale and satisfaction.

Of the two that indicated a decrease in morale, none were able to provide an estimate of value. In one case, employees are getting frustrated when the new lights won't go on when they enter a room. Another is from a school that has installed timers on the lights in classrooms, which has resulted in complaints of dark rooms when class isn't being held.

One hundred percent of the respondents indicating a change in this category placed a level of importance of the changes in employee morale. These responses ranged from a low of 1 to a high of 10 on the 10-point scale. The overall rating was fairly high with a median value of 8 and mean of 7.73.

Equipment Life

Thirty-four of the respondents (46%) reported a change in equipment life associated with the installed technologies. Some of the businesses report that equipment life was directly extended because the equipment was new and just beginning its useful life. Others reported extended equipment life as an indirect result of the installed technology. For example, one respondent indicated that the furnace is expected to last longer because it is now running less often due to the building envelope work that had been done.

Table 4 Interview results for equipment life benefits

Equipment Life	N	Percent	Low	High	Median	St dev	Mean
Change, with positive value	8	24%	\$400	\$8,000	\$1,650	\$2,851	\$3,088
Change, with negative value	1	3%	-\$1,000	-\$1,000	-\$1,000	\$0	-\$1,000
Change, Don't Know value	25	74%	-	-	-	-	\$2,633
Weighted Value	-	-	-	-	-	-	\$1,357
Reported Importance	34	100%	3	10	8.5	2.05	8.15
Reporting	Change n=34		No Change n=32		Don't Know if Change n=8		

Only one of the two businesses that reported a decrease in equipment life was able to provide dollar values associated with that decrease. This was a business that received a wastewater bubble diffuser upgrade. This individual indicated that the “diffuser needs to be replaced more frequently” as a result of the upgrade.

Of the categories examined in this research the benefit with the fourth highest importance score is equipment life. The mean score for equipment life as reported by the responding Partners is 8.15.

Waste Generation

Changes in waste generation were reported by 24 (32%) of the implementing Partners. Many of these changes were due to a decrease in the need to discard as many burned out light bulbs for the businesses that underwent lighting upgrades. Others mentioned that they are wasting less water with their commercial washer upgrades, and that they are wasting less energy using more efficient products. However these partners did not provide values for wasting less water or energy and these values are not included in this analysis.

Table 5 Interview results for waste benefits

Waste	N	Percent	Low	High	Median	St dev	Mean
Change, with positive value	14	58%	\$6	\$17,500	\$550	\$5,013	\$2,507
Change, with negative value	0	0%	-	-	-	-	-
Change, Don't Know value	10	42%	-	-	-	-	\$2,507
Weighted Value	-	-	-	-	-	-	\$836
Reported Importance	24	100%	1	10	8	2.81	7.17
Reporting	Change n=24		No Change n=48		Don't Know if Change n=2		

One of the Partners indicated that he experienced an increase in waste generation, but in this case the Partner indicated that this was a desired effect (this value given is reflected as positive effects in all tables and later in the paper's summary graphs. This business upgraded their air compressor system, and as a result obtained a more reliable product and was able to increase production. The increased production produced a proportional increase in sawdust waste. This additional waste would normally have a negative effect if the Partner did not desire it. However, in this case the business sells this sawdust as a profit-producing product. The generation of additional waste and the added profit from the

sale of the waste, according to the Partner, was a result of the increased productivity that they associate with the installed technology. Therefore, in this case an increase in waste generation is a positive effect of the upgrade and is counted as such in this analysis. We report this benefit in this category (waste) instead of the productivity category because the Partner indicated that he considered this benefit a waste generation benefit rather than a productivity benefit.

Productivity

Twenty-five (34%) of the businesses reported a change in productivity. Most of the changes are from implementing Partners with lighting upgrades. They note that it is easier for the employees to see what they are working on and this results in fewer mistakes. Others noted that the better lighting made their employees happier, and as a result indicate that they are more productive. Businesses that had upgrades other than lighting noted that equipment has less down time, which in one case resulted in less down time for the employees while waiting for maintenance to perform repairs.

Table 6 Interview results for productivity benefits

Productivity	N	Percent	Low	High	Median	St dev	Mean
Change, with positive value	5	20%	\$400	\$20,000	\$10,000	\$7,448	\$8,880
Change, with negative value	0	0%	-	-	-	-	-
Change, Don't Know value	20	80%	-	-	-	-	\$8,880
Weighted Value	-	-	-	-	-	-	\$3,171
Reported Importance	25	100%	3	10	10	1.75	8.84
Reporting	Change n=25		No Change n=45		Don't Know if Change n=4		

Productivity was rated as being important with an average value of 8.84. Out of the 25 that gave a response to this question, half of them rated productivity as extremely important to their business (giving a response of 10).

As can be seen in the table above, the value of a change in productivity levels is reported to be relatively high, with a mean of \$3,171 per Partner indicating a change.

Non-Energy Operating Costs

Thirteen (18%) of the businesses reported a change in non-energy operating costs, but most of these overlapped with other benefits. For example, some noted the decrease in staff time spent on maintenance. Many respondents offered comments confirming that there was an overlap between this benefit and other benefits they reported when asked this question and also during the questions at the end of the interview that specifically identified benefit overlap. As a result we were able to adjust these values to eliminate reporting of overlapping benefits in this analysis.

Table 7 Interview results for non-energy operating cost benefits

Non-energy	N	Percent	Low	High	Median	St dev	Mean
Change, with positive value	5	38%	\$100	\$7,500	\$3,000	\$3,131	\$3,200
Change, with negative value	1	8%	-\$333 ¹	-\$333	-\$333	\$0	-\$333
Change, Don't Know value	7	54%	-	-	-	-	\$2,611
Weighted Value	-	-	-	-	-	-	\$485
Reported Importance	13	100%	1	10	8	2.95	7.09
Reporting	Change n=13		No Change n=57		Don't Know if Change n=4		

Sales

Thirteen (18%) of the implementing Partners report a change in sales. Some noted that customers appreciate the fact that commercial washers were new and clean, resulting in more returning business. Managers of buildings for sale or rent noted that the building envelope improvements and energy management systems made it easier to attract buyers and retain renters.

Table 8 Interview results for sales benefits

Sales	N	Percent	Low	High	Median	St dev	Mean
Change, with positive value	3	23%	\$2,000	\$7,500	\$4,000	\$2,784	\$4,500
Change, with negative value	0	0%	-	-	-	-	-
Change, Don't Know value	10	77%	-	-	-	-	\$4,500
Weighted Value	-	-	-	-	-	-	\$824
Reported Importance	13	100%	6	10	9	1.34	8.85
Reporting	Change n=13		No Change n=58		Don't Know if Change n=3		

Sales as a benefit category was given the highest level of importance of all ten NEBs with a mean score of 8.85. There were no negative scores associated with this NEB, indicating that there were no decreases in sales for the responding businesses. While one Partner indicated “sales” were down, he noted that this is good for his business. This individual has rental buildings and does not like excessive turnover rates (units of sale). He reports that the upgrades help him retain renters because of the improved climate control resulting from the Energy Management System. While the Partner reported this as a decrease in sales, we treat this as a positive benefit in the summary presented at the end of this paper.

Personnel Needs

Changes in personnel needs were noted by 11 (15%) of the businesses. This is the one benefit category where there is close to an equal amount of positive and negative responses. One of the increases in personnel needs is a positive benefit, as the new lighting system created more office space, and they were able to hire two additional employees. No values were placed on this change and as a

¹ A \$5,000 negative benefit was reported, but the comment made it clear it was a one-time cost. \$333 is \$5,000 over fifteen years.

result there have been no adjustments made to the table. In the summary, this increase in personnel needs will be recorded as a positive change as expressed by the implementing Partner.

Table 9 Interview results for personnel benefits

Personnel	N	Percent	Low	High	Median	St dev	Mean
Change, with positive value	3	27%	\$5,500	\$10,000	\$6,300	\$2,401	\$7,267
Change, with negative value	1	9%	-\$1,500	-\$1,500	-\$1,500	\$0	-\$1,500
Change, Don't Know value	7	64%	-	-	-	-	\$5,825
Weighted Value	-	-	-	-	-	-	\$715
Reported Importance	11	100%	1	10	7.5	4.23	6.33
Reporting	Change n=11		No Change n=61		Don't Know if Change n=3		

The other reported increases are negative changes. One business reported that the new equipment requires leak tests that were not required with the old equipment. He reports that he now has to have employees come in on weekends when it is quiet enough to hear the leaks when performing the tests. Others note the time needed to train employees to operate the new systems has increased personnel costs.

Injuries and Illnesses

Four (5%) of the businesses reported a change in the number of injuries and/or illnesses that are due to the changes made through the program but cannot provide values to this benefit. Two of the four comments indicate that they anticipate fewer accidents with the better lighting installed through the program.

Table 10 Interview results for injury and illness benefits

Injury/illness	N	Percent	Low	High	Median	St dev	Mean
Change, with positive value	0	0%	-	-	-	-	-
Change, with negative value	0	0%	-	-	-	-	-
Change, Don't Know value	4	100%	-	-	-	-	-
Weighted Value	-	-	-	-	-	-	-
Reported Importance	4	100%	7	10	9	1.5	8.75
Reporting	Change n=4		No Change n=69		Don't Know if Change n=1		

Implementing partners who rate the benefit rate it very high, with a mean score of 8.75, just below the importance of sales changes. No Partner reported an increase in accidents or illnesses, and reported no expectations of an increase. All implementing partners that reported a change expected there to be fewer accidents with the upgrades that were installed.

Defect and Errors

Fifteen (20%) of the businesses reported a change in defects and/or error rates that are associated with the installed technologies. One Partner reported an increase in defects due to the lighting fixtures that were installed. In this case the Partner reported that between 2 and 5 percent of the fixtures installed were defective, costing the business an extra \$1,000 to replace them. All other reported changes were positive.

Table 11 Interview results for defect and error benefits

Defects	N	Percent	Low	High	Median	St dev	Mean
Change, with positive value	3	20%	\$2,000	\$25,000	\$5,000	\$12,503	\$10,667
Change, with negative value	1	7%	-\$67 ²	-\$67	-\$67	\$0	-\$67
Change, Don't Know value	10	67%	-	-	-	-	\$7,983
Weighted Value	-	-	-	-	-	-	\$1,531
Reported Importance	13	100%	2	10	8	2.31	7.93
Reporting	Change n=15		No Change n=59		Don't Know if Change n=1		

The reported decrease in defects is a benefit that has been realized in a variety of ways: better lighting results in fewer measurement errors and shipping mistakes; better temperature control results in more consistent, higher quality milk products; and a new air compressor has made the pressure adequate to produce better sand molds.

Overview of All Non-Energy Benefits

This section will briefly describe how the benefits compare to each other in frequency, importance, and value.

Number of Implementing Partners Reporting Benefits

A change in maintenance costs was the most common category in which implementing Partners reported a change. While these numbers are reported in the tables above, they are graphed in Figure 1 allowing for a direct comparison of the percent of partners reporting a change in each of the benefit categories.

² A \$1,000 negative benefit was reported, but the comment made it clear it was a one-time cost. \$67 is \$1,000 over fifteen years.

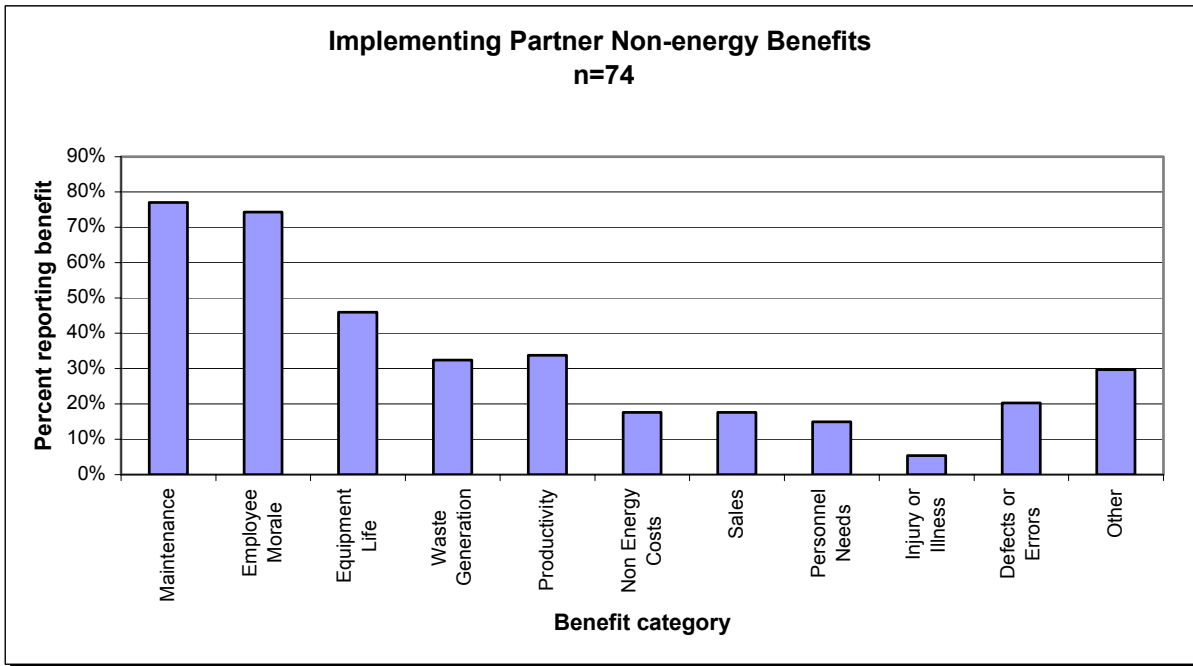


Figure 1 Partners reporting a change in costs

Importance of NEBs to Businesses

We asked the business Partners how important each of these changes in benefits were to them and their operations using a 1 to 10 scale, with 1 meaning of little importance, and a 10 meaning extreme importance. Overall, the changes were considered to be quite important to most of the implementing partners, with very few answers below 5. Figure 2 shows the average level of importance of the changes in the benefit categories.

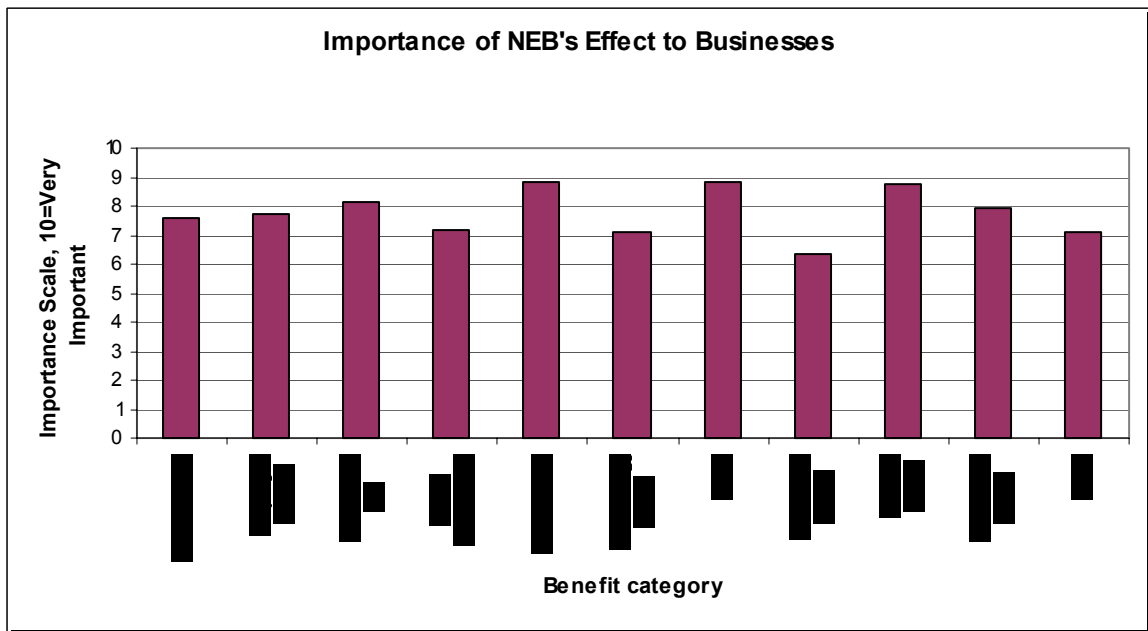


Figure 2 Importance of the benefit change to business operations

As indicated in Figure 2, sales, productivity, and injuries/illnesses were given the highest importance scores of the categories discussed during the interview.

Effect of NEBs on Businesses

Here we will dissect each benefit category and indicate the percent of both positive and negative effects that can be attributed to the Focus on Energy program implementation, along with the dollar values for each benefit that was reported by the interviewees.

Overall, 90 percent of the benefits reported were positive and most all interviewed Partners reported benefits from their installations. Figure 3 shows the breakdown of reported positive and negative effects for each benefit category. Each benefit category included in the interviews is presented in the following figure and displays each benefit so that the total reported changes equal 100 percent. This allows the reader to see the ratio between benefits that are reported as positive changes and those that are reported as negative. For example, out of the four businesses that reported a change in the number or anticipation of injuries, all of them reported the change as resulting in fewer accidents, i.e., a positive change equaling 100 percent. Therefore, positive change is not an indication of number of instances, but of the effect of the change.

The changes in the costs associated with each of the benefit categories are mostly positive except for the change in personnel costs. The changes in this category are more equally balanced between negative and positive changes in costs due to the installed technology, indicating that several of the energy efficient technologies installed through the program results in more labor costs, at least in the short-term.

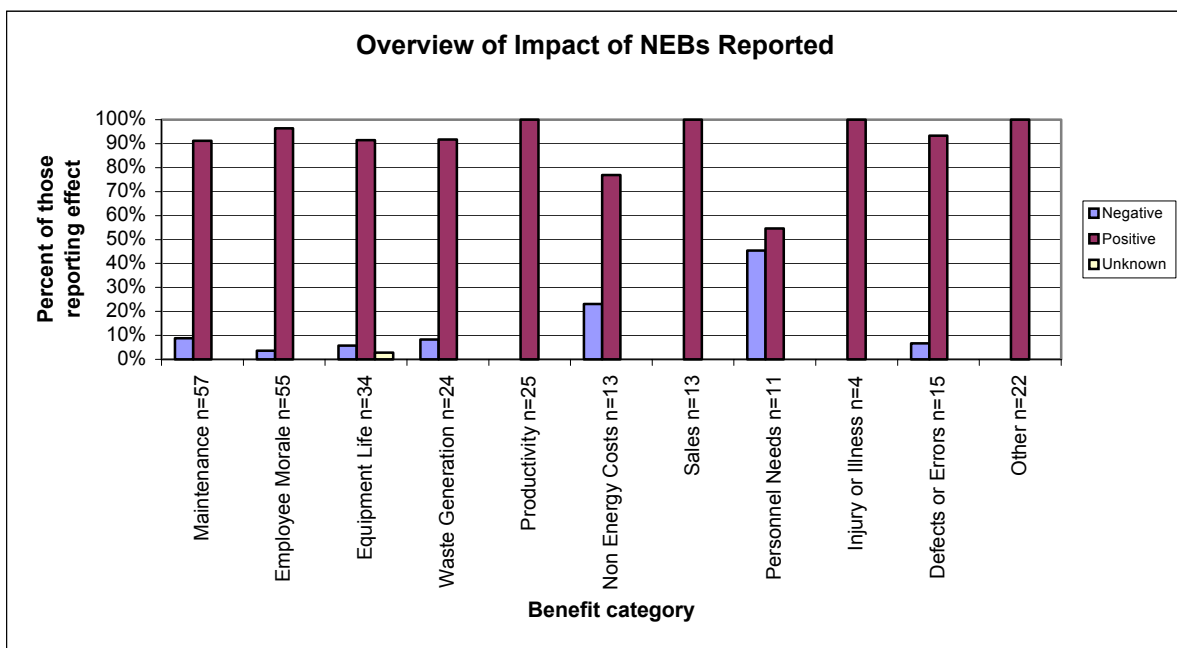


Figure 3 Benefit changes by reported category

Summary of Early Findings

Out of the 74 businesses interviewed, 69 of them reported some level of change in non-energy benefits. Of these 69, the average per Partner reported 3.27 benefits.

The weighted mean value of the non-energy benefits for each of the Partners is \$17,293. This value takes into account all positive, negative, and don't know answers given throughout the interviews, and is weighted to acknowledge that not all respondents experienced a change in benefit.

As with most research using interview data these values hold within them a certain amount of uncertainty due to a variety of issues. First, there is the sampling method that was used and discussed in the introduction. Secondly, there is the risk of the Partner's misunderstanding of the questions, and our misinterpretation of the data which could lead to problems: double counting, both false positive and false negative NEBs being reported, and one-time costs or benefits being reported as annual. The values that the Partners reported can not be blindly accepted as reality, it is sometimes difficult to estimate the values of NEBs during an interview, this is reflected in how often Partners responded saying that yes, there has been a change in benefit, but we do not know the value of the increase or decrease. We have done our best to eliminate these sources of error by designing the interview instrument to specifically deal with these issues and through meticulous analysis of the data.

The total energy savings associated with the interviewed partners for this report is 8,380,652 kWh and 96,494 therms of gas. Using the energy cost values used by the impact program staff to value year-2 energy savings of \$0.054 per kWh and \$0.518 per therm, this savings equals about \$502,539 in annual cost savings. On average, the non-energy benefits associated with the actions installed by the interviewed partners indicates that the annual non-energy benefits are equivalent to about 2.5 times the level of energy benefits. As a result, program managers should be ready to describe the full range of benefits to potential participants and also understand that the non-energy benefits associated with energy efficient up-grades may typically be significantly more important to the participant than the energy savings. Programs may want to "sell" the benefits of the up-grade based on the value of the energy savings, and then close the sale by presenting the full range and value of the energy and non-energy benefits.

Likewise public policy makers should understand the full-range of benefits provided to their constituents as a result of the energy efficiency programs they provide via the public benefits financing mechanisms. Policy makers should also understand that in addition to the energy and non-energy benefits from these programs, there are also economic development benefits and environmental emission reduction benefits. The Wisconsin Focus on Energy Evaluation Team has conducted extensive investigations into the economic and environmental benefits that are in addition to the non-energy benefits identified in this paper. Dr. David Sumi of PA Consulting is presenting these additional findings in a paper also being presented in this session.