

“someone from the city contacted me; I am a community leader, so I was asked to get involved with the program.”

Two customers mentioned that they heard about this program through the media. They were asked to specify which media source, and these responses are listed below.

- *Channel 7 (South Carolina)*
- *I think I saw it on TV as well. (North Carolina)*

One participant in North Carolina mentioned learning about the program from an agency or community organization; they specified that this organization was *“the Housing Authority.”*

One participant in North Carolina mentioned a unique method of learning about the program, listed below.

- *There was a note from the rental office.*

Participants were asked to describe in their own words what they understood was required of them as a participant in the program, and what they would receive in return for their participation; these responses are summarized in Table 21. A majority mentioned that they would receive measures such as light bulbs, showerheads and HVAC filters (57.5% or 46 out of 80), nearly half mentioned the home audit (43.8% or 35 out of 80), a third mentioned saving energy (35.0% or 28 out of 80), and a quarter mentioned saving money on bills (26.3% or 21 out of 80) and home weatherization (26.3% or 21 out of 80).

Table 21. Participants Understanding of the Program (N=80)

	Carolina System (count)	Carolina System (percent)
Install measures	46	57.5%
Home audit	35	43.8%
Save energy	28	35.0%
Save money on bills	21	26.3%
Weatherize home	21	26.3%
Information / education about saving energy	14	17.5%
Must be present during home audit	12	15.0%
Make home more comfortable / fix things	7	8.8%
Participation is free	7	8.8%
Attend a community meeting	6	7.5%
Renters must notify landlord	4	5.0%
Everyone in the neighborhood is eligible	3	3.8%
I don't recall signing up for this program / they just showed up at my home	2	2.5%
Must be a home owner to participate	1	1.3%
Good for the environment	0	0.0%
Unique comments, listed below	3	3.8%
Negative comments, listed below	3	3.8%
I just let them do what they came to do	4	5.0%
Don't know	6	7.5%

Percentages total to more than 100% because responses mentioned multiple aspects of the program.

Three participants had unique comments, which are listed below.

- *I would get a change in batteries for my smoke detector.*
- *I expected I would get information about what I could do about signing up for more programs to reduce my energy bills.*
- *The program would help the neighborhood.*

Three participants had negative comments, which are listed below; all three of these comments are about increasing energy bills.

- *This program was supposed to save me money, but I want to find out why my bill has gone up. I'm on a fixed income and want to make sure my lights stay on.*
- *I was led to believe that I would get energy efficient things put in my house that was supposed to cut the cost of my monthly bill, but it didn't help the cost go down at all. My Duke Energy bill has actually increased since they came and supposedly did these improvements to my home.*
- *I don't know; after they did that, my bill was a little higher.*

Factors Motivating Participation

Participants were asked to list all of the reasons that they participated in the Residential Neighborhoods program, including the main reason for their participation; these results are shown in Figure 5. The most-mentioned reason overall is to save money on utility bills, which is the main reason for participation for 27.5% (22 out of 80) of customers and a secondary reason for participating for another 27.5% (22 out of 80), thus is the only reason for participation mentioned by a majority of surveyed customers (overall 55.0% or 44 out of 80). The second most-mentioned reason for participating in the program is to save energy (also the main reason for 27.5% or 22 out of 80, but a secondary reason for only 15.0% or 12 out of 80). Obtaining energy efficiency measures (overall 25.0% or 20 out of 80) and weatherization services and repairs (overall 22.5% or 18 out of 80) were also mentioned by about one-quarter of participants.

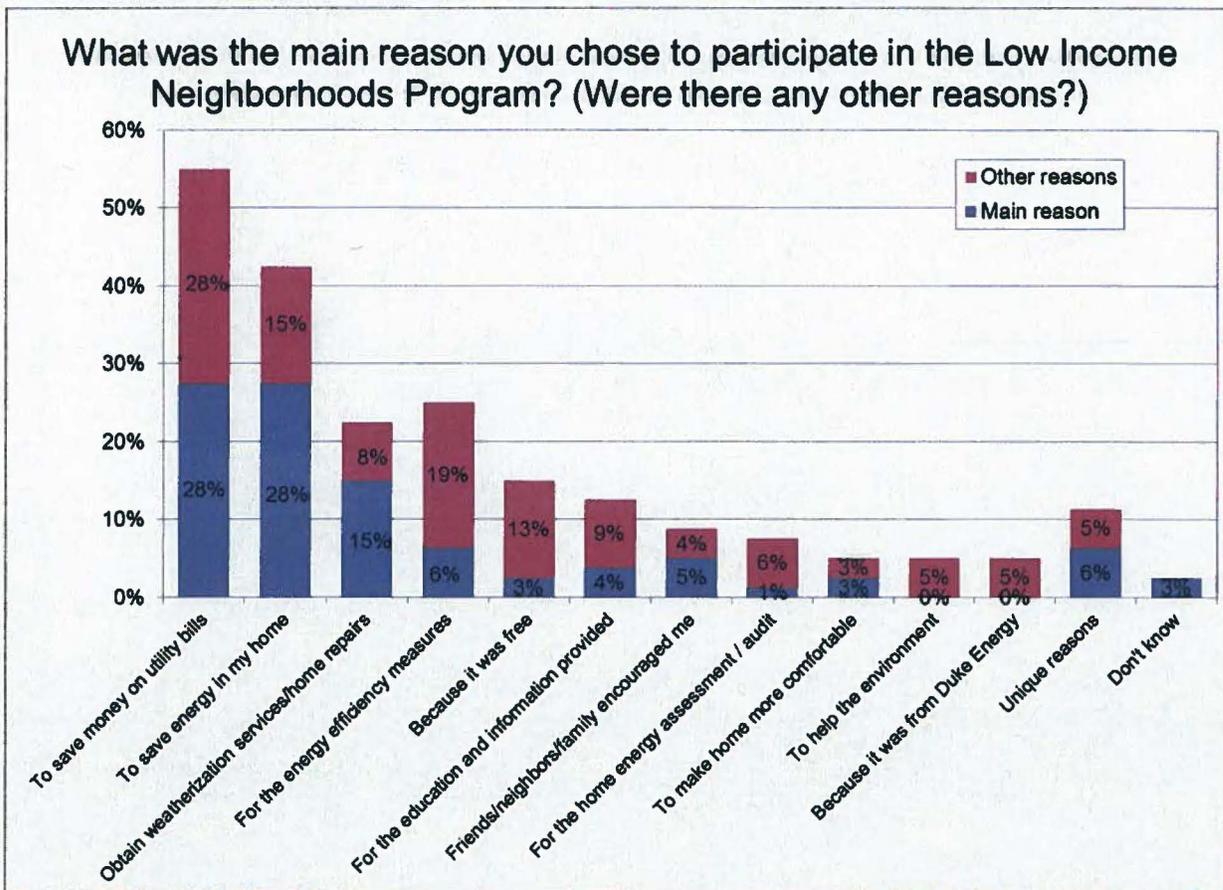


Figure 5. Factors Motivating Participation in the Residential Neighborhoods Program the Carolina System (N=80)

“Other reason” percentages total to more than 100% because participants could name multiple “other” reasons. “Main reason” percentages total to 100% because participants could only name one “main” reason.

Nine participants gave unique reasons for participating in the Residential Neighborhoods program, which are listed below.

Unique main reasons (N=5)

- *Duke was going to do all the units in my building anyway.*
- *The building management chose for me. I was at work when it was going on.*
- *I don't recall choosing to be in this program.*
- *I live in an older house, and although I rent, I am still concerned. I thought it would be the right thing to do.*
- *I saw no reason not to.*

Unique other reasons (N=4)

- *I did it to help out the landlord.*
- *It seemed like all the people involved in offering the program were polite and eager to help out the folks in my neighborhood.*
- *We needed new light bulbs.*
- *I didn't know anything about it. I had heard home owners talking about the program, but I didn't know whether Duke would also do the projects.*

Enrollment and Participation

Participants were asked how long they waited between signing up for the Residential Neighborhoods program and receiving the home audit. As seen in Table 22, about half of surveyed participants waited less than a week (45.0% or 36 out of 80 including customers who signed up the same day and those who claimed that they never signed up but the audit was performed anyway). Only 6.3% (5 out of 80) reported that they had to wait for three weeks or longer, though one in five (20.0% or 16 out of 80) could not recall the length of time between sign-up and audit. TecMarket Works considers this “service wait time” to be a best practice in the field of energy efficiency audit service offerings. Few utilities provide audits to customers with so few days between enrollment and service delivery.

Table 22. Length of Time between Sign-up and Audit (N=80)

	Carolina System (count)	Carolina System (percent)
Same day	8	10.0%
Next day up to one week	26	32.5%
One week up to two weeks	17	21.3%
Two weeks up to three weeks	6	7.5%
Three weeks up to six weeks	3	3.8%
Six weeks or longer	2	2.5%
I did not sign up, they just showed up and went to work	2	2.5%
Don't know / can't recall	16	20.0%

Participants were asked if the length of time they waited between signing up and receiving the audit was too long, too short or about right. Table 23 indicates that three-quarters (76.3% or 61 out of 80) feel that the time from sign-up to audit is “about right” though 17.5% (14 out of 80) are not sure. Participants were asked a similar question about the length of time the auditor was

in their home, and 92.5% (74 out of 80) reported that this was “about right.” For both of these questions, the percentages of customers saying “too long” or “too short” are about equal and in the low single-digits.

Table 23. Customer Perception of Home Audit Timing (N=80)

	Carolina System (count)	Carolina System (percent)
Time between signing up and audit was....		
Too long	3	3.8%
About right	61	76.3%
Too short	2	2.5%
Don't know	14	17.5%
Length of time auditor was in the home was....		
Too long	1	1.3%
About right	74	92.5%
Too short	3	3.8%
Don't know	2	2.5%

Attending the Community Meeting

Before auditing teams begin to install measures in customers’ homes, there is a kick-off meeting to inform customers about the program and what participation entails. About one in three surveyed participants (32.5% or 26 out of 80) attended the meeting in their area. Participant ratings of satisfaction with the staff and presenters and the information presented the meetings are included in the *Program Satisfaction* section of this report.

Recommending the Program

Surveyed participants were asked if they recommended this program to any of their friends, neighbors or relatives, and if so to how many people. Four out of five participants (81.3% or 65 out of 80) reported that they did recommend the program, and the range of reported recommendations per participant ranges from one to sixty, with an average of 5.5 and a median of three recommendations per participant recommending the program.

Participant Satisfaction

Participants were asked for their levels of satisfaction on a 1 to 10 scale (with one being the lowest and ten being the highest) for individual measures they received as well as different aspects of the program. The survey can be found in *Appendix F: Participant Survey Instrument* and the results of the satisfaction questions are presented below.

Measure Satisfaction

Table 24 below shows the respondents’ mean satisfaction scores with the various measures provided by this program. Customers only provided satisfaction ratings for measures they confirmed receiving.

Most measures provided by this program received mean satisfaction ratings between 8.5 and 9.5, indicating high levels of satisfaction. The highest satisfaction ratings are for the door sweeps (9.63 with 56 customers rating this measure), water heater insulation tank wrap (9.73 based on 15 ratings) and foam insulation spray (9.75 based on 12 ratings). The lowest satisfaction ratings

are for vinyl weather stripping for doors (8.14 based on 42 ratings) and the HVAC winter kit (8.35 based on 17 ratings).

Table 24. Mean Satisfaction Ratings for Measures (N=80)

Measure	Average Rating	Valid N (not including don't know)	Percentage of ratings at "7 out of 10" or lower
CFLs	9.18	73	11.0%
Switch Plate Wall Thermometer	9.11	65	10.8%
Door Sweeps	9.63	56	3.6%
Low-flow Showerheads	8.85	55	12.7%
Faucet aerators	9.22	49	12.2%
AC/Heat Filters Year Supply	9.47	43	4.7%
Vinyl Weather Stripping Doors	8.14	42	23.8%
Change Filter Calendar	9.35	26	7.7%
Water Heater Temperature Adjustment	9.36	22	9.1%
Water Heater Pipe Wrap	8.95	21	9.5%
HVAC Winter Kit for Wall/Window Unit	8.35	17	35.3%
Water Heater Tank Insulation Wrap	9.73	15	6.7%
Caulking Doors	8.83	12	16.7%
Foam Insulation Spray	9.75	12	0.0%
Vinyl Weather for window HVAC units	9.00	4	25.0%
Clear Glass Patch Tape	10.00	4	0.0%
Caulking Windows	10.00	1	0.0%

Customers who gave satisfaction ratings of "7" or lower on a ten-point scale were asked the reason for their relatively low satisfaction with a measure. These responses are listed in later sections of this report that discuss the installation of each individual measure.

Program Satisfaction

The surveyed participants are very satisfied with the Residential Neighborhood program. Table 25 below shows the respondents' mean satisfaction scores with various aspects of the program.

Overall program satisfaction is very high with a mean of 9.35 on a 10-point scale. Surveyed participants also rated their satisfaction with the auditors who came to their homes and performed the audit: on a 1 to 10 scale, the auditors' knowledge was rated at 9.39, and their helpfulness was rated at 9.31. The highest satisfaction ratings were given to the information presented at the community meetings (9.54) and the staff and presenters at these meetings (9.77), though only about a third of these participants attended a meeting and were thus able to give a satisfaction rating.

Table 25. Mean Satisfaction with Program Components (N=80)

Metric	Average Rating	Valid N (not including don't know)	Percentage of ratings at "7 out of 10" or lower
Convenience of enrolling in the program	9.49	76	6.6%
Knowledge of the auditor	9.39	76	6.6%
Helpfulness of the auditor	9.31	78	9.0%
Information presented at the community meeting (only asked of customers who attended)	9.54	26	3.8%
Staff and presenters at the community meeting (only asked of customers who attended)	9.77	26	0.0%
Overall program satisfaction	9.35	78	6.4%

For satisfaction ratings of "7" or below, participants were asked what could be done to improve the situation. The verbatim responses of these less-satisfied customers are listed below for each aspect rated.

Rated satisfaction with program overall at "7" or less (N=5)

- *I think that this is a great idea, and overall a great program, but I personally have not seen any results in my Duke Energy bill being reduced. The only change I have seen since participating in this program is that the cost on my monthly bill has actually gone up. I think, for folks who participate in this program whose bills don't reduce, another home audit, perhaps a more advanced one, should be performed and have it figured out as to why no improvements were made on reducing the amount of energy used in the home.*
- *This program should have followed through with what they said they were going to do. I did not receive the installations that were proclaimed to be installed, and I did not see a change for the better on my Duke Energy bill. I suggest for the program to offer installation of programmable thermostats as well as other options for energy efficient light bulbs besides CFLs. I like high wattage or very bright lights, and those CFLs do not offer that sort of light.*
- *I don't know how this can be improved. I didn't like the shower head and faucet aerators. I did like the door sweep which was keeping the air conditioning in, but the landlord had it removed.*
- *They could use products that are not so cheap.*
- *I would have like it better if I had more knowledge about the improvements they made.*

Rated convenience of enrolling at "7" or less (N=5)

- *The convenience could be improved by reducing the number of calls it takes to enroll in the program.*
- *Duke could set up appointments for the audit rather than soliciting participants door-to-door.*

- *They just showed up at my house and offered the services right away, I never really signed up to participate.*
- *They did a sloppy job. I am very dissatisfied.*
- *Explain more about it.*

Rated knowledge of auditor at "7" or less (N=5)

- *It didn't seem like my auditor knew what he was doing, I think he needed more training to have knowledge of what he was doing and what needed to be done to my home to help it save energy. Also, the things he did, like installing the foam vinyl door insulation, did not stay installed.*
- *The auditor had to come back to my house after the initial visit and needed to change out one of the shower heads that he installed. He did not test the shower head to see if it actually worked when he first installed it. Also, I asked about the purpose and function of the switch plate wall thermometer, and he was unable to give me any information about it. I still don't see the purpose of that thermometer.*
- *The auditor would have been more helpful if he was more knowledgeable about energy. I would have liked the auditor to be more knowledgeable about energy savings devices. The auditor was not able to answer a question I had about the device that attaches to the refrigerator to help save energy. He had not heard of it. I was hoping to find out what it was called.*
- *They should have explained about what they were putting in and why.*
- *Explain things better.*

Rated helpfulness of auditor at "7" or less (N=7)

- *They never explained what the things they put in are used for.*
- *The auditor could provide more explanation of what he's doing and why he's doing it.*
- *The auditor didn't seem to know much about what he was doing. This program should offer more training to the auditors. He should have been able to answer my questions about what he was installing and the function or maintenance of these things, and he could not do that for me.*
- *The auditor should have had full knowledge of what each installation's purpose was. I'm referring to how my auditor did not know what the purpose or function of the switch plate wall thermometer was to me. He was unable to explain it to me.*
- *The auditor would have been more helpful if he was more knowledgeable about energy savings devices. The auditor was not able to answer a question I had about the device that attaches to the refrigerator to help save energy. He had not heard of it. I was hoping to find out what it was called.*
- *He didn't talk much.*
- *I wish he took more time.*

Rated information presented at community meeting at “7” or less (N=1)

- *First of all, now everybody in the neighborhood may not be as dumb as I am, but we don't have the information about these energy-saving things. There needs to be more emphasis on identifying what things cause energy to go up and what can be done to reduce energy costs. A lot of people really need to know. Politicians like to be there to say hello, to say that they support the program, and that's good. But, what we really need to be presented with is with what causes energy bills to be high and what can be done to lower bills. A lot of people are not able to read the program information on the computer or the letters. When a block of people are listening at a meeting, it's a good thing. We can talk to each other. How often do we leave our cell phone chargers plugged in or appliances we're not using? For those of us who are conscious of saving energy, it's still important.*

Rated staff and presenters at community meeting at “7” or less (N=0)

Satisfaction with Duke Energy

Satisfaction with Duke Energy was generally high among these program participants, with a mean rating of 8.71 on a 10-point scale where “10” means “very satisfied”, and more than half of surveyed participants (53.8% or 43 out of 80) rate their satisfaction with Duke Energy at “10 out of 10”, the highest possible score. The full distribution of responses is shown in Figure 6.

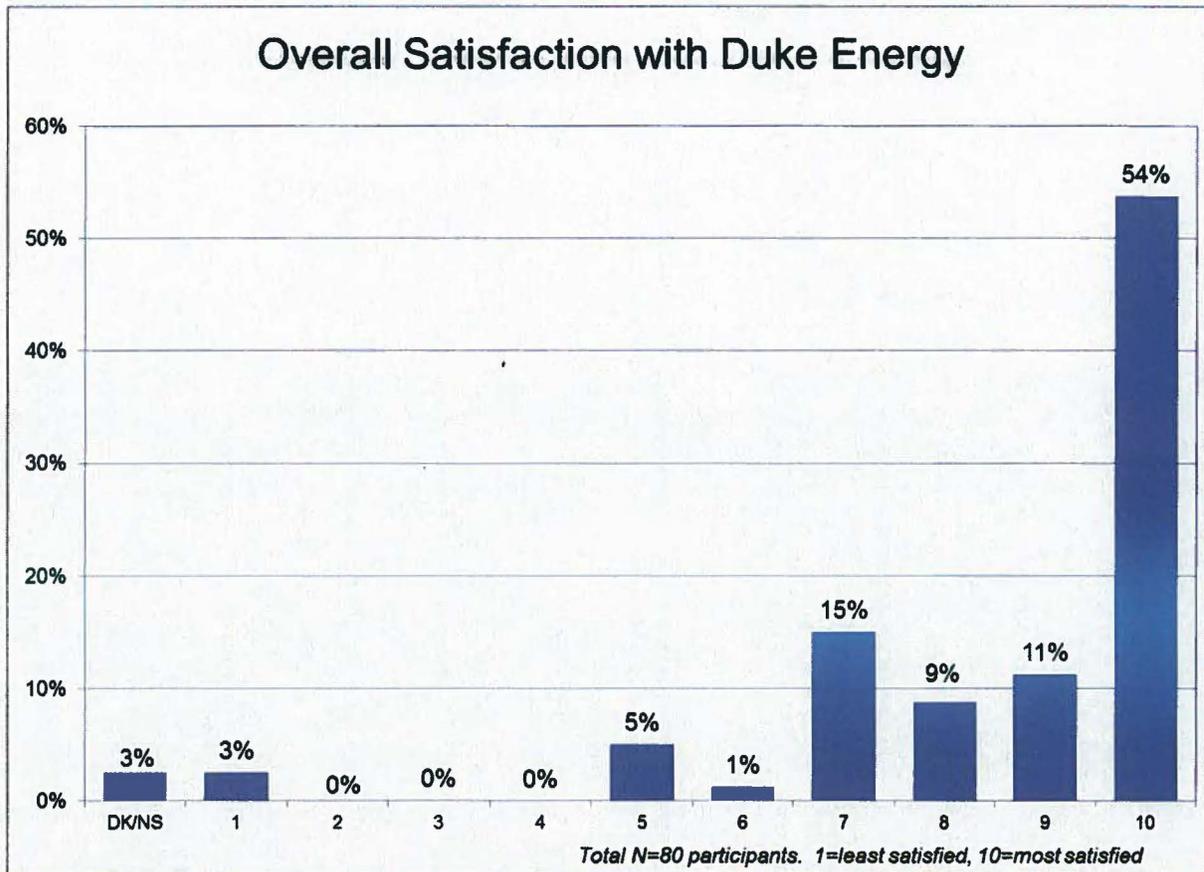


Figure 6. Program Participants' Overall Satisfaction with Duke Energy (N=80)

Nineteen participants (23.8% of 80) rated their satisfaction with Duke Energy at "7" or less on a 10-point scale and were asked how this situation could be improved. The most common responses to this question had to do with concerns about high energy rates and utility fees, as seen in the list below.

Rated satisfaction with Duke Energy overall at "7" or less (N=19)

- *Duke could reduce their energy rates.*
- *I think their rates are too high, they should work on lowering those rates.*
- *Duke could lower energy rates for elderly and/or infirmed people.*
- *The cost of my energy bill keeps on going up, I don't understand why my bills are so high. I live alone and am at work all day, I try my best to cut back and be energy efficient. I just don't understand why my monthly bill is now around \$150 per month when it used to be under \$100, usually around \$80 or \$90 dollars. Has the cost of Duke Energy really gone up that much recently?*
- *My bill was \$89 per month; it's now \$98. I don't know why it went up.*
- *My bill's just been high and I can't see where anything's really helping.*
- *Stop telling lies. Why is my bill so much higher than it used to be? There is something wrong with this picture.*
- *I understand that it takes money to maintain power grids, but it's hard on folks every time they raise rates. That seems to be happening a lot. Duke must think we're crazy. They know we need lights, we like electricity, so we put up with it.*
- *I am on a fixed income so I don't always have the full amount of the payment due and I frequently get cut off notices. The Duke Energy customer service people aren't flexible with the amount of money that I have to pay. It's frustrating for me because I don't like having to choose between having power in the apartment and being able to pay for food.*
- *What I don't like about Duke is they send this little card out with the bill, Share the Warmth, where they round off your bill to help someone else to pay their energy bill. They shouldn't do this when they give out these huge, huge, huge bonuses to their people and they're rounding off people's bill to pay off others' bills. It's a struggle for a lot more people than they may think. I don't like this at all!*
- *I wish Duke Energy had a payment plan for folks who are on a fixed income.*
- *Don't add a security deposit to your bill after six years.*
- *I think it's a pain in the neck when you have to call all those numbers to get to somebody, and the deposits for changing residences is outrageous.*
- *I'm disappointed by the reconnection fee. The DSS (a federally funded program) said that they would send Duke Energy \$200 on my behalf but that it would take 6-8 weeks for the money to get to Duke. My most recent bill was \$255 which I could not afford to pay. I had hoped that the \$200 from the DSS would have applied to that bill but it didn't and my power was shut off. Crisis Ministry paid the \$255 and \$75 reconnection fee for me. I feel like Duke didn't care about my situation and that the \$75 reconnection fee is excessive.*
- *I am disappointed that they used such cheap products. I hear other people complaining. I could have installed cheap stuff myself.*

- *Duke is great with emergencies, but I do have a problem with the ash spill. I don't think the customers should have to pay for it and I have concern about the impact on the environment.*
- *I'm not getting very good prices lately and all that coal ash stuff has given them a black eye. I guess more community involvement helps.*
- *Duke Energy does not give you any warning for when your services are to be interrupted. They don't give us enough time to pay our bills, and their deferment plan does not help us. I think Duke Energy needs to get a whole new CEO and new team, start all over again. What they are doing now is not currently working. I want to move somewhere where I don't have to deal with Duke Energy anymore. Duke needs to stop doing stuff that is making them look bad, all this pollution is bad for them, their customers, and especially the environment, Duke's 'efforts' are poisoning people's drinking water! Duke needs to start helping us, not hurting us! The cost of Duke Power is too high on too many levels.*
- *I don't know.*

Surveyed participants were also asked if their participation in the Residential Neighborhoods program has made their attitude toward Duke Energy more positive or more negative. Table 26 shows that nearly a clear majority say that the program has made them more positive towards Duke Energy (58.8% or 47 out of 80), and nearly two-thirds report that their knowledge of how to save energy has increased (67.5% or 54 out of 80). Only two customers report that their attitude towards Duke Energy has gotten worse (2.5% of 80) and a similar number report that their knowledge of how to save energy has decreased somewhat (2.5% or 2 out of 80).

Table 26. Changes in Attitude and Knowledge due to Program Participation (N=80)

	Carolina System (count)	Carolina System (percent)
<i>This program has made my attitude towards Duke Energy....</i>		
Much more positive	22	27.5%
Somewhat more positive	25	31.3%
About the same	30	37.5%
Somewhat more negative	0	0.0%
Much more negative	2	2.5%
Don't know	1	1.3%
<i>Has your knowledge of how to save energy</i>		
Increased a lot	21	26.3%
Increased somewhat	33	41.3%
Stayed the same	24	30.0%
Decreased somewhat	2	2.5%
Decreased a lot	0	0.0%
Don't know	0	0.0%

Participants who said their attitude towards Duke Energy was altered by their participation in the program were asked to explain this; these responses are categorized and listed below.

Much more negative towards Duke Energy (N=2)

- *They did not do the installations they said they would and I have not seen any savings on my utility bill; there have been no actual improvements made.*
- *The materials they used are of waste of money and my time.*

Much more positive towards Duke Energy (N=22)

- *Because it seems as though Duke Energy is making an effort to save costs and offer provisions for the homes. Costs are always going up on everything we need, so it's great that Duke has made an effort to help control those necessary costs.*
- *Because of the impact that this program has made. The program is working! People have had the opportunity to improve things in their homes that would have never been improved without the help from this program offered by Duke Energy.*
- *Because their lighting seems to last longer and you don't have to buy as many bulbs.*
- *I did not know that Duke Power would come to your home and do those repairs. I think it's a very good project.*
- *I like that they are trying to give their customers help.*
- *I think it was very nice of them to provide this service and to help us senior. We are so often neglected. I have been working since I was 14 and am now almost 80. I see young people getting so much help but as a senior I get very little help. I have so much to pay on a limited income: taxes, insurance, utility bills.....*
- *It shows that they are more concerned about us saving a dollar than them making a dollar.*
- *It was great that Duke offered a free program that would potentially save us money on our utility bills.*
- *It was very helpful Duke came out and make this program for us. Also I liked that the program is free.*
- *It's nice that Duke has done this program. It really helps people like me who want to conserve energy for financial reasons but aren't able to afford the things that Duke provided. I wanted to use door sweeps and try out CFLs but I really couldn't find the money to do these things. I don't think that my bill has decreased but I think that's because the rates keep going up and I think I'm using fewer kilowatt hours.*
- *My attitude is much more positive because I am grateful for the help I received. I knew that Duke's rates were going up, so getting an offer for a free energy assessment was nice.*
- *My attitude is much more positive because I learned ways to reduce my energy bill. Duke Energy demonstrated that they care about their customers.*
- *Programs like the Residential Neighborhood Program demonstrate that Duke Energy cares about their customers.*
- *They are helping us conserve on energy.*
- *They did a lot for our neighborhood. They visited many peoples' homes.*
- *They helped a lot of people.*

- *They work with you and they try to help you out. There's no other company that I know of who think about equality Very good for them! Whoever owns Duke must have a big heart.*
- *They're helping people save energy; they didn't have to do that. They could have let us keep wasting power.*
- *Things are working out for me, the program worked out great towards making my home more comfortable. I think my energy bills came down a little bit as well.*
- *Through participating in this program, it is the first time I have ever known that Duke Energy wanted to help the residents to be more energy efficient. I see it as they are caring for their customers.*
- *Who else does these things? Why would you do these things if you didn't care? They were all over the neighborhood. Really nice they are reaching out. I was unemployed at time and the program saved me money. I think it's awesome that someone was doing something.*
- *With this program they try to show you things that you probably would have missed, or did not even know, that could help you save energy. This program offered things that everyone should be doing for their homes.*

Somewhat more positive towards Duke Energy (N=25)

- *After taking advantage of this program, I got a feeling that Duke Energy cared about how much money I had to spend on my utilities. This program helped me save money, yet it did not cost me anything but a little bit of time. I think it is wonderful.*
- *Because for them to offer us this program, to save on our electricity, I have a better opinion about them. It's so great that this program and all these home improvements were all free to us, it shows that Duke Energy cares about being conservative with energy use. I like that they have given us the right things to conserve energy in our homes.*
- *Duke Energy is giving us something for nothing even though they don't have to. They are concerned about their customers' bills and helping the environment.*
- *I appreciated it. Any help I can get, I'm all for it. I'm disabled and I'm on a fixed income.*
- *I learned a little bit and got some things done I needed to.*
- *I like that they are taking the initiative to let people know how to save energy.*
- *I like the helpfulness of the auditor. I would give a higher rating if their rates were lower.*
- *I like their concern for us and the help they gave our neighborhood.*
- *I love what they offered.*
- *I mean, Duke Energy was nice enough to come out to my neighborhood and help us out with saving energy in our homes, I'm impressed on their efforts to help out individuals.*
- *I understand that Duke Energy's rates have gone up quite some percentage wise, but they are still trying to save their customers money by offering programs like this one.*
- *I've always liked Duke Energy but I thought that it was really nice that they are providing this service to their customers. It's not something that they have to do, but they are doing it for their customers and the environment.*
- *It was a good idea to help people save money and energy.*

- *It woke me up to change some of the things I was doing.*
- *It's beneficial to the community, so that's a positive step.*
- *It's a good program.*
- *It's like they're giving back to community. Not just out there to make money.*
- *My attitude is somewhat more positive because I gained useful knowledge about energy efficiency.*
- *They did everything well.*
- *They send me a form every month and I can tell where I was before I got these lights.*
- *They're trying to help people save on their bill.*
- *You don't really think of an energy company helping you save energy in your home and taking an interest in us personally.*
- *My bill's the same.*
- *I think they could do more, Duke Energy could get more involved in communities and offer more of these energy efficiency programs to the 'little people'. Currently, it seems like a lot of Duke's attention goes to industrial and commercial efforts instead of residents and the individuals.*
- *I like the program. However, Duke has been sloppy with the Ash Spill. It's endangering our environment and health. The customers have to pay for the Ash problem yet executives are getting raises and utility bills are increasing.*

Nearly half of surveyed participants (43.8% or 35 out of 80) report that their utility bills have decreased since participating in the program, though one in ten (10.0% or 8 out of 80) report that their bills have actually increased. A third of these participants (31.3% or 35 out of 80) have seen no change, and 15.0% (12 out of 80) are not sure if their bills have gone up or down. Table 27 also shows participants' estimates for the monthly change in their bills; the six customers who say their bills "decreased a lot" report saving an average of about \$70 per month, while those who say their bills "decreased somewhat" report saving an average of about \$13 per month. Overall, the average savings of the 65 participants¹¹ who were able to estimate the change in their bill is about \$8 per month, though the median savings is only \$1 per month (indicating that overall nearly as many surveyed participants saw their bills stay the same or increase as saw their bills decrease).

¹¹ Out of 80 participants surveyed, twelve participants were not sure if their bills had changed, so were not asked to estimate the amount of the change. Three more participants who were able to answer the question about their bill changing were unable to provide a specific dollar estimate for the amount of the change.

Table 27. Changes in Energy Bills due to Program Participation (N=80)

	Carolina System (count)	Carolina System (percent)	Estimated dollars per month savings (negative means increase in bill)
Have your monthly utility bills			
Decreased a lot	6	7.5%	\$69.6
Decreased somewhat	29	36.3%	\$12.6
Stayed about the same	25	31.3%	\$0.0
Increased somewhat	5	6.3%	-\$23.8
Increased a lot	3	3.8%	-\$47.5
Don't know	12	15.0%	NA
Total average savings per month			\$8.4

Predicting Overall Program Satisfaction

Table 28 shows the correlations between overall program satisfaction and seven factors which could be used to predict program satisfaction. All of the satisfaction ratings with aspects of the program, mean satisfaction with measures received, and satisfaction with Duke Energy are highly correlated to satisfaction with the program. However, attending the community meeting and the number of measures received are not significantly correlated with overall program satisfaction.

Table 28. Correlations with Overall Program Satisfaction

	Correlation with program satisfaction (Pearson's r)	Significance
Helpfulness of the auditor	.784	p<.01
Satisfaction with Duke Energy	.727	p<.01
Convenience of enrolling in the program	.715	p<.01
Knowledge of the auditor	.644	p<.01
Mean satisfaction with measures received	.487	p<.01
Attended community meeting	.117	-
Number of measures received	.094	-

Next, simple linear regressions were performed to predict overall participant satisfaction with the program using ratings of satisfaction for ten different aspects of the program. Two models were used: a stepwise model that selects predictors based on incremental improvements to the model (producing the most efficient model that predicts the most variance using the fewest predictors), and a "complete" model that uses all predictors simultaneously (which represents the maximum variance that can be explained using this set of predictors).

The two regression models produce highly consistent results, as both indicate the aspects of the program that have the most influence on overall program satisfaction are being satisfied with the helpfulness of the auditor and being satisfied with Duke Energy in general, followed by

satisfaction with the convenience of enrollment. The two models also produce very similar levels of variance explained, indicating that the non-significant predictors included in the complete model have little additional effect.

The stepwise algorithm is iterative, adding or subtracting predictors from the model based on predetermined criteria. For the model presented in Table 29, predictors are added to the model as long as their coefficients when added to the model are significant at the $p < .10$ level, and removed from the model if the significance of their coefficients falls below $p < .20$ (due to multicollinearity with other predictors added to the model on subsequent steps). The algorithm will take as many steps as necessary until all predictors that meet the criteria have been added to (or subtracted from) the model. For this model, the algorithm added three predictors (and removed none) in order to arrive at the final regression equation in three steps.

Table 29. Stepwise Regression to Predict Overall Program Satisfaction (N=71¹²)

Predictor	Beta coefficient	Significance
Satisfaction with Duke Energy	.393	$p < .01$
Helpfulness of the auditor	.380	$p < .01$
Convenience of enrolling in the program	.243	$p < .05$

The three-predictor regression model produced using the stepwise method predicts 76.7% of the variance in overall program satisfaction (R-squared), and is significant at the $p < .01$ level using ANOVA. Beta coefficients are standardized values and indicate the relative importance of the predictors in the model (absolute value of 1.0 would indicate that the predictor determines the predicted variable perfectly, and zero indicates no effect at all. Negative coefficients would represent negative influence, though for this model all coefficients are positive).

For the “complete” model, all seven predictors are used simultaneously to predict overall program satisfaction. Since there are no criteria used to determine which predictors are included in the model, most of the predictors do not reach the level of statistical significance. However the complete model does show the maximum amount of variance in overall satisfaction that can be explained using this set of predictors.

¹² Though there are 80 participants in this survey, the number of valid cases used for regression models is 71 due to “listwise” deletion of missing data. In order to be included in the model, a participant had to give valid answers to all questions used in the model; nine customers who are missing one or more ratings were excluded.

Table 30. “Complete” Regression to Predict Overall Program Satisfaction (N=71)

Predictor	Beta coefficient	Significance
Helpfulness of the auditor	.441	p<.01
Satisfaction with Duke Energy	.401	p<.01
Convenience of enrolling in the program	.263	p<.01
Number of measures received	.044	-
Mean satisfaction with measures received	.003	-
Knowledge of the auditor	-.085	-
Attended community meeting	-.106	-

The “complete” seven-predictor regression model predicts 77.7% of the variance in overall program satisfaction (R-squared), and is significant at the p<.01 level using ANOVA. The additional non-significant predictors in this model only increase the variance explained by 1.0% over the stepwise model. The negative beta coefficients seen in this model are not significantly different from zero at p<.10 or better.

Comparing the correlations in Table 28 (relationship between predictors and program satisfaction one-at-a-time) with the regression model in Table 30 (relationship between predictors and program satisfaction all-at-once) indicates that mean satisfaction with measures received and the knowledge of the auditor become non-significant in the presence of the three significant predictors in the regression model: helpfulness of the auditor, satisfaction with Duke Energy and convenience of enrollment.

Installation of Energy Efficiency Measures

Duke Energy provided program records of which measures were installed in which customers’ homes, which are based on the auditors’ records of which measures were installed during audits. The number and percentage of surveyed Carolina System participants who received each measure according to these records is shown in Table 31. Out of the sixteen categories of measures shown in this table, all customers who were surveyed received between five and thirteen measures, and on average customers received nine of these measures (the mean is 9.2 types of measures received and the median is 9.0).

More than 90% of surveyed customers received CFLs (of either wattage: 97.5% or 78 out of 80), switch plate wall thermometers (92.5% or 74 out of 80) and faucet aerators (91.3% or 73 out of 80). The measures customers were least likely to receive are caulking for windows (13.8% or 11 out of 80), vinyl weather stripping for window units (7.5% or 6 out of 80) and the glass patch tape (7.5% or 6 out of 80).