

- *I know to change the filter at the start of the month.*
- *I write the date I changed the filter on the filter, and then write that I changed the filter on the calendar.*
- *I just go by if the filter looks like it needs to be changed. If it looks dirty, I change it.*

Participants who confirmed receiving calendar but not filters (N=1)

- *I know how often to change it according to the type of filters that I buy.*

The five participants who are changing filters without using the calendar were also asked how often they change their filters: three of these (60% of 5) change their filters every month, one changes them every other month, and the fifth explained “*I change it when it gets dirty. I really don't use the heater often because my oxygen machine emits so much heat.*”

Seven participants confirmed receiving the filters but reported that they are not changing them, and they were asked why not. These responses are listed below; interestingly, most of the customers who do not recall receiving the calendar usually point to the lack of the calendar as the reason that they are not changing the filters. In contrast, the customers who recall receiving the calendar say they are too busy or just forgot.

Participants who confirmed receiving both filters and calendar (N=2)

- *Because I'm a busy man. I'm not at home a whole lot because I work a lot. I have more important things to do.*
- *It passed my mind.*

Participants who confirmed receiving filters but not calendar (N=5)

- *I never got the calendar.*
- *I did not receive the calendar.*
- *I've misplaced the calendar.*
- *I'm not sure that I ever received the calendar.*
- *I'm not sure where any of that stuff is.*

Twenty-six participants who confirmed that they received the filter change calendar provided by the program rated their satisfaction with the calendar, and 43 participants who confirmed receiving the year's supply of HVAC filters rated their satisfaction with the filters, both using a ten-point scale where “10” is the most satisfied. As seen previously in Table 24, the mean satisfaction ratings for the program-provided calendar and filters are quite high at 9.35 and 9.47 respectively, and only 7.7% (2 out of 26) of calendar raters and 4.7% (2 out of 43) of filter raters gave satisfaction ratings of “7” or lower for these measures. These customers' explanation for their relatively low satisfaction scores are listed below.

Participants who rated the calendar at “7 out of 10” or lower (N=2)

- *It’s nice they gave me one, but I don’t use it. (rating “6 out of 10”)*
- *It’s not that I’m not satisfied with the calendar. The auditor put it in a place that’s out of the way, so I just don’t really use it at all. (rating “7 out of 10”)*

Participants who rated the filters at “7 out of 10” or lower (N=2)

- *The filters provided by the program are kind of flimsy and cheap compared to the filters I was previously using which I bought myself. (rating “5 out of 10”)*
- *They’re just those little cheap ones. (rating “5 out of 10”)*

Seven out of ten surveyed participants who confirmed receiving the calendar or filters (70.2% or 33 out of 47) report that they were already planning to purchase HVAC filters before participating in the Residential Neighborhoods program, however two in ten (21.3% or 10 out of 43) had not been intending to purchase any filters, as seen in Table 94. Only three participants (6.4% of 47) have purchased additional filters since participating in the program; these three participants have purchased from three to six filters on their own, averaging 5.0 filters purchased apiece.

Table 94. Purchasing HVAC Filters Before and After Participating in the Program

	Confirmed calendar and filters received (N=27)	Confirmed filters received but not calendar (N=17)	Confirmed calendar but not filters (N=3)	Total confirmed either measure received (N=47)
<i>Were you planning to purchase HVAC filters before receiving filters from the program</i>				
Yes	70.4%	76.5%	33.3%	70.2%
Maybe	11.1%	0.0%	0.0%	6.4%
No	14.8%	23.5%	66.7%	21.3%
Don’t know / not specified	3.7%	0.0%	0.0%	2.1%
<i>Have you purchased any additional HVAC filters since participating in the program?</i>				
Yes	3.7%	5.9%	33.3%	6.4%
No	96.3%	94.1%	66.7%	93.6%

Before participating in the program, 42.6% (20 out of 47) of participants who confirmed the receipt of these measures were already changing their filters on a near-monthly basis, though 17.0% (8 out of 47) were changing them less often than every three months. Overall, the 42 participants who were able to provide an estimate on the number of months between filter changes reported changing the filters every 2.8 months on average.

Table 95. Changing HVAC Filters Before and After Participating in the Program

	Total confirmed calendar and/or filters received (N=47)
<i>How often were you changing your filters before you participated in this program?</i>	
More often than every other month	42.6%
Every other month up to every three months	29.8%
Less often than every three months	17.0%
Other response, listed below	8.5%
Don't know	2.1%

Four surveyed participants gave “other” responses when asked how often they changed their filters before participating in the program, which are listed below.

- *I only changed it when I thought it needed it, if the filter looked dirty.*
- *Before, I would only change the filter when it looked to be really dirty.*
- *I really don't use the heater often because my oxygen machine emits quite a bit of heat.*
- *I change the filters every other month in the summer and monthly in the winter.*

Among 29 participants who used these measures and reported specific time periods for changing their filters both before and after the program, three (10.3%) reported changing their filters more frequently after the program (these three customers went from changing filters an average of every 3.5 months to once every 1.3 months), and none (0% of 29) reported changing their filters less frequently after the program.

Switch Plate Wall Thermometer Installations

As seen in Table 96, most participants confirmed receiving switch plate wall thermometers (89.2% or 66 out of 74 who received this measure according to auditor records). According to auditor records, one of these customers received two thermometers, while the rest received one apiece. Overall, customers confirmed the installation of 70 out of 75 (93.3%) thermostats received according to auditor records.³⁵ None of the surveyed participants reported installing this measure themselves, or receiving any spare measures to install later.

³⁵ Sixty-six participants confirmed that the auditor installed the installation of 67 thermometers, while three participants did not recall if they received a thermostat. Thus the total confirmed thermostats installed is 67 confirmed by customers plus 3 where auditor records are assumed correct equals 70 installed.

Table 96. Measure Installation: Switch Plate Wall Thermometer

<i>74 participants received wall thermometers according to auditor records</i>	Customer count (N=74)	Measures installed count according to auditor records (N=75)	Confirmed measures installed count (N=70)
Auditor installed thermometer	89.2%	89.3%	95.7%
Auditor gave thermometer to customer, customer installed it	0.0%	0.0%	0.0%
Auditor gave thermometer to customer, customer has NOT installed it	0.0%	0.0%	0.0%
Did not receive thermometer	6.8%	6.7%	0.0%
Don't know (assuming auditor record is correct and measure was installed)	4.1%	4.0%	4.3%

Table 97 shows where in the home switch plate wall thermometers were installed: a third are installed in hallways (33.3% or 22 out of 66), and a quarter are installed in bedrooms (25.8% or 17 out of 68).

Table 97. Switch Plate Wall Thermometer: Room Installed (N=66)

<i>66 participants confirmed the installation of thermometers</i>	Count	Percent
Hallway	22	33.3%
Bedroom	17	25.8%
Kitchen	9	13.6%
Dining room	7	10.6%
Den / computer room / office	4	6.1%
Living room / family room	3	4.5%
Bathroom	2	3.0%
Other, listed below	2	3.0%

Two participants reported “other rooms” where their thermometers were installed; these are listed below.

- *At the bottom of the stairs, by the TV.*
- *In the kitchen hallway.*

Nearly half of participants surveyed (45.5% or 30 out of 66 who confirmed the installation of thermometers) did not have any thermometers in their home before the program, as seen in Table 98.

Table 98. Number of Thermometers in the Home After the Program (N=66)

<i>66 participants confirmed the installation of thermometers</i>	Count	Percent
One thermometer (none before the program)	30	45.5%
Two thermometers (one before the program)	34	51.5%
Three thermometers (two before the program)	2	3.0%

One participant who received a thermometer has moved it to a different room in their home, but none of the thermometers have been removed completely, as seen in Table 99. The participant

who moved their thermometer moved it from the master bedroom to the laundry room, and explained: “the laundry room is not insulated and we wanted to watch the temperature in that room for the safety of the pipes.”

Table 99. Removing Program-Provided Switch Plate Wall Thermometer

	Customers with confirmed installation percent (N=69)	Confirmed measures installed percent (N=70)
<i>Has the thermometer that was installed through the program since been removed?</i>		
No, installation is still in place	65	94.3% installed
Yes, moved to somewhere else in the home	1	1.4% installed
Yes, thermometer is no longer installed	0	0.0% removed
Not sure if thermometer was installed (did not answer questions about installation)	3	4.3% assumed installed

Customers who confirmed receiving wall thermometers from the program were asked how often they use them. Table 100 indicates that nearly two-thirds (62.1% or 41 out of 66) check their thermometers at least once a week, and the frequency of use by customers who did not previously have thermometers in their homes is similar to the frequency among customers who did previously have thermometers in their homes.

Table 100. Frequency of Checking the Program-Provided Thermometer (N=66)

	Customers with thermometers before audit (N=36)	Customers with no thermometer before audit (N=30)	Total confirming thermometer installed (N=66)
<i>How often do you check the thermometer that was installed through this program?</i>			
More than once a day	13.9%	6.7%	10.6%
About once a day	16.7%	26.7%	21.2%
Once every few days	30.6%	16.7%	24.2%
About once a week	2.8%	10.0%	6.1%
Less often than once a week	27.8%	26.7%	27.3%
Never	8.3%	13.3%	10.3%

Participants who confirmed the installation of the wall thermometer were asked if they have made any adjustments to their heating or cooling settings since the program. Table 101 indicates that about one participant in four (25.8% or 17 out of 66) turned their heat down in the winter, but only about one in twenty turned their cooling temperature up in the summer (4.5% or 3 out of 66). Customers who did not previously have a thermometer in their home are twice as likely to report turning their heat down (36.7% or 11 out of 30) compared to those who already had thermometers (16.7% or 6 out of 36; this difference is significant at $p < .05$ using Student’s t-test). However, the behavior patterns between these two groups are not significantly different when it comes to cooling adjustments in the summer.

Table 101. Heating and Cooling Adjustments since Installation of the Thermometer (N=66)

	Customers with thermometers before audit (N=36)	Customers with no thermometer before audit (N=30)	Total confirming thermometer installed (N=66)
Have you made any adjustments to your heating settings in the <u>winter</u> since the thermometer was installed?			
No changes	72.2%	43.3%	59.1%
Yes, turned temperature up	5.6%	10.0%	7.6%
Yes, turned temperature down	16.7%	36.7%	25.8%
Yes, with no effect or unexplained	5.6%	6.7%	6.1%
Don't know	0.0%	3.3%	1.5%
Have you made any adjustments to your heating settings in the <u>summer</u> since the thermometer was installed?			
No changes	72.2%	70.0%	71.2%
Yes, turned temperature up	2.8%	6.7%	4.5%
Yes, turned temperature down	0.0%	3.3%	1.5%
Yes, with no effect or unexplained	5.6%	10.0%	7.6%
Don't know	0.0%	6.7%	3.0%
Not applicable (no air conditioning)	19.4%	3.3%	12.1%

The 26 customers who reported adjusting their heating temperatures in the winter (39.4% of 66 with thermometers installed) were asked what changes were made: On average, these customers turned their heating down by 2.7 degrees Fahrenheit.

The nine customers who reported adjusting their cooling temperatures in the summer (13.6% of 66) were also asked what changes were made: The average adjustment made by these customers is to set the cooling back (raise the temperature) by 1.4 degrees Fahrenheit.

Sixty-five participants who confirmed that they currently have wall thermometers supplied by the program installed in their homes rated their satisfaction with this measure on a ten-point scale where "10" is the most satisfied. As seen previously in Table 24, the mean satisfaction rating for the program-provided door caulking is quite high at 9.11, and only 10.8% (7 out of 66) gave a rating of "7" or lower. The seven participants who gave ratings of "7" or lower were asked the reasons for their relatively low ratings, which are listed below; four of these customers report that they have trouble reading the display.

- *When the switch plate wall thermometer was first installed I checked it every day, but it was always at the same temperature. I still look at it a couple times during the week just to see if it has changed, but it doesn't.*
- *I'm not so sure that the switch plate thermometer was reading correctly, it always felt warmer than what the thermometer reading was saying. I have basically stopped looking at it.*

- *It does not do anything, I don't understand the purpose of that switch plate wall thermometer. I even asked the auditor what it was for and he could not explain it to me.*
- *It is too small for me to read.*
- *The numbers are too small to read clearly.*
- *It's hard to read.*
- *I don't understand the numbers because it's in Centigrade.*

Additional Actions to Save Energy in the Home

A majority of 60.0% (48 out of 80) of surveyed participants report that they have taken additional steps to save energy since participating in the Residential Neighborhoods Program. These actions are categorized in Table 102; the only actions mentioned by at least 10% of surveyed participants are turning off lights when not in use (22.5% or 18 out of 80) and using less heating (11.3% or 9 out of 80)

Table 102. Additional Actions to Save Energy since Participating in the Program (N=80)

	Count	Percent
Have not taken any additional actions	32	40.0%
Have taken additional actions	48	60.0%
Actions taken:		
Turn off lights when not in use	18	22.5%
Use less heat / turn down thermostat	9	11.3%
Turn electronics off / unplug	7	8.8%
Caulk/tape doors/windows	4	5.0%
Add insulation to walls, floors, ceilings, attics	4	5.0%
Upgrade HVAC system	3	3.8%
Maintain steady temp / do not adjust thermostat	3	3.8%
Upgrade windows / doors	3	3.8%
Use curtains / shades to control heat/light	3	3.8%
Keep doors / windows shut	2	2.5%
Use efficient lighting / CFLs	2	2.5%
Added space heaters	2	2.5%
Turn down temp of water heater	2	2.5%
Upgrade to Energy Star appliances	1	1.3%
Conserving water (other than clothes washing)	1	1.3%
Use fans to circulate air better	1	1.3%
Use stove / oven less	1	1.3%
Close off rooms / don't use entire house	1	1.3%
Outlet / switch gasket insulators	1	1.3%
Unique actions, listed below	7	8.8%

Percentages total to more than 100% because respondents could take multiple actions.

Seven respondents reported taking unique actions to save energy, which are listed below.

- *I put in new power vents underneath the house.*
- *I upgraded my circuit breaker box.*

- *I installed blinds.*
- *I installed a water purifier on my faucet.*
- *I've educated my children about ways to save energy.*
- *I'm making sure those energy efficiency efforts are still installed properly.*
- *I applied for a city program to make my house more energy efficient.*

What Participants Learned from Residential Neighborhoods

TecMarket Works asked participants “*what would you say are the most important things you learned from the Residential Neighborhood Program?*” and recorded up to three responses per respondent. These responses are categorized in Table 103; the lessons learned cover a broad range of topics, with the most-mentioned being “saving energy” in general (17.5% or 14 out of 80), the need to weatherize and plug leaks (17.5% or 14 out of 80), that measures and steps to save energy also save money on utility bills in the long run (15.0% or 12 out of 80), about the benefits of CFLs and efficiency lighting (13.8% or 11 out of 80) and that Duke Energy offers programs to help their customers (10.0% or 8 out of 80). Only about one in seven customers could not name anything that they learned by participating in this program (13.8% or 11 out of 80).

Table 103. What Participants Learned by Participating in the Residential Neighborhoods Program (N=80)

<i>What are the most important things you learned from this program?</i>	Count	Percent
About saving energy (general measures)	14	17.5%
Need to plug drafts / weatherize	14	17.5%
Measures save money on bills / cost effective over time	12	15.0%
About CFLs / efficient lighting	11	13.8%
Duke Energy has programs to help customers / Duke cares	8	10.0%
Turn off / unplug unused electronics	7	8.8%
Use less heating and cooling / how to use a thermostat	7	8.8%
About saving water (aerators & showerheads)	5	6.3%
Closing blinds / keeping doors shut	4	5.0%
My home needed efficiency improvements / that I should use less energy	4	5.0%
Turn off lights when not in use	3	3.8%
My home was already very efficient / I am doing things right	3	3.8%
Change HVAC filters regularly	3	3.8%
Duke is trying to lower customer bills	2	2.5%
Save energy by hot water adjustment	2	2.5%
Unique responses, listed below	14	17.5%
Don't know / nothing	11	13.8%

Percentages total to more than 100% because respondents could give multiple responses.

Fourteen participants gave unique responses when asked what were the most important things they learned from the program, which are listed below.

- *I learned how to check my home for air leaks.*

- *I learned that it is important to replace some of the things you might already have installed in the past.*
- *I know the home repairs should be kept up.*
- *It set me off on replacing and fixing items in my home to make my home more efficient.*
- *I learned how they'd been around to other communities. I was surprised to hear that.*
- *I am more aware about the utility bill now.*
- *The air conditioners are heavy, so it's nice I can leave it in the window this year.*
- *They did the work they were supposed to do and didn't mess around.*
- *They took the time to answer questions at the meeting.*
- *I have a better general awareness.*
- *It gave me an awareness of my home in general. Nothing particularly stands out thought.*
- *That sometimes you can get something for nothing.*
- *The reports I get in the mail give me more information than any of the programs.*
- *That they use cheap material.*

What Participants Liked Most about Residential Neighborhoods

TecMarket Works asked participants what was their favorite thing about participating in this program; their responses are shown in Table 104. Positive comments about the audit and the auditors were the most frequently mentioned (by 32.5% or 26 out of 80), followed by the fact that the program and/or measures were free (27.5% or 22 out of 80), the informational and educational aspects of the program (17.5% or 14 out of 80), and saving money on utility bills (17.5% or 14 out of 80).

Table 104. What Participants Liked Most About the Residential Neighborhoods Program (N=80)

<i>What was your favorite thing about participating in this program?</i>	Count	Percent
Home audit / advice and assistance from auditor	26	32.5%
Free program / free measures	22	27.5%
Saving money on energy bills	14	17.5%
Education and information gained	14	17.5%
Saving energy / conservation	13	16.3%
Like measures received, listed below	13	16.3%
Improvements to the home	10	12.5%
Duke Energy wants to help customers	6	7.5%
Participation was easy / convenient	1	1.3%
Unique responses, listed below	3	3.8%
Don't know / nothing	4	5.0%

Percentages total to more than 100% because respondents could give multiple responses.

Three participants made unique comments about their favorite aspect of the program, which are listed below.

- *The community meeting was great. We got to meet more of the people in our neighborhood. We're retired, so I always enjoy a reason to get out and socialize and they even served barbeque.*
- *I like that they gave us gifts at the community meeting.*
- *It was great to find out that I was already doing everything right.*

Thirteen participants mentioned specific measures received as being their favorite aspect of the program; these are listed below.

- *I like that they're changing the lights, which seem to last a long time.*
- *I liked getting the light bulbs.*
- *That I got the bulbs and the strips around the door preventing air from going through. Everything he did I needed. I think it really helped.*
- *I liked receiving the heater and air conditioner filters and I like the CFL light bulbs. The offering of these items has saved me some money that I would have had to spend on these necessary items.*
- *The night light!! I love, love, love it!*
- *I like the new low-flow showerheads, I can tell the difference from my old ones, these seem to be using less water while still doing a good job as a showerhead.*
- *Receiving things, especially the furnace filters and faucet aerator. The program was beneficial, even without the light bulbs.*
- *I really liked having those door sweeps installed; they make a big difference in keeping cold, drafty air out.*
- *Weather stripping around the door helped me a lot, because I'm short and couldn't reach that high to install it myself. The weatherstripping keeps a lot of air from going past the door and saves a lot now.*
- *I use the thermometer.*
- *I like that they put up a motion detector light outside.³⁶*
- *My favorite part was all the things the auditor brought out.*
- *I was very pleased with the program and the things that they offered me.*

What Participants Liked Least about Residential Neighborhoods

TecMarket Works also asked the surveyed participants what they liked least about the program. Their responses are shown in Table 105. Two-thirds of participants (67.5% or 54 out of 80) could not name a least favorite aspect of the program. The only other response categories mentioned by more than 5% of participants are that they disliked measures they received (13.8% or 11 out of 80) or didn't receive a measure they wanted or expected (6.3% or 5 out of 80).

³⁶ The Residential Neighborhoods program does not include outdoor light sensors.