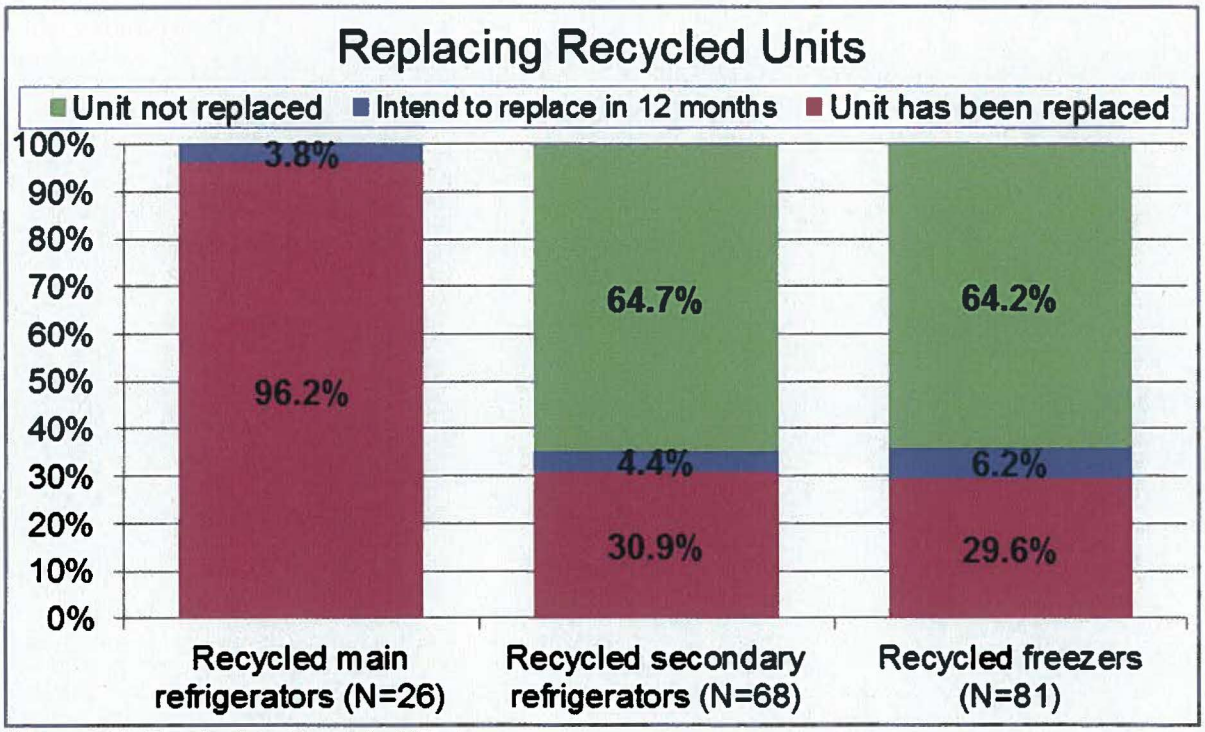


**Figure 13. Replacing Recycled Units**

Table 44 shows significant differences between replacement units for recycled refrigerators that were used as main units, and refrigerators that were used as secondary units. Main refrigerators are significantly more likely to be replaced with units purchased new (84.0% or 21 out of 25), and to be replaced before the old unit is recycled (64.0% or 16 out of 25) compared to secondary refrigerator replacements (only 33.3% or 7 out of 21 were replaced with brand new units, and only 33.3% or 7 out of 21 were replaced before recycling the old unit; these differences are significant at $p<.05$ using student's t-test). The pattern with replacement freezers more closely resembles main refrigerator replacement than secondary refrigerator replacement, in that freezers are mostly replaced with brand new units (75.0% or 18 out of 24) and replaced before recycling the old unit (62.5% or 15 out of 24).

Replacements for secondary refrigerators are also more likely to be units moved from somewhere else in the house (28.6% or 6 out of 21) compared to replacements for main refrigerator units (0.0% of 25) or replacements for freezers (4.2% or 1 out of 24; both differences are significant at $p<.05$ using student's t-test).

**Table 44. Source and Timing of Replacement Unit Acquisition**

| *Base: replaced units* | Replaced main refrigerator (N=25) | Replaced secondary refrigerator (N=21) | Replaced freezer (N=24) | Total (N=70) |
|---|---|---|---|---|
| Bought new replacement unit | 84.0% | 33.3% | 75.0% | 65.7% |
| Bought used replacement unit | 16.0% | 33.3% | 20.8% | 22.9% |
| Moved replacement unit from somewhere else in the home | 0.0% | 28.6% | 4.2% | 10.0% |
| Don't know | 0.0% | 4.8% | 0.0% | 1.4% |
| Acquired replacement same day as recycling pick-up | 32.0% | 0.0% | 4.2% | 12.9% |
| Acquired replacement before recycling pick-up | 64.0% | 33.3% | 62.5% | 54.3% |
| Acquired replacement after recycling pick-up | 4.0% | 33.3% | 29.2% | 21.4% |
| Replacement was another unit already in the home | 0.0% | 28.6% | 4.2% | 10.0% |
| Don't know | 0.0% | 4.8% | 0.0% | 1.4% |

Table 45 shows how long before or after the recycling pick-up date customers acquired their replacement units (for only those customers who purchased a replacement unit before or after the pick-up date). Majorities of customers who replaced a main refrigerator (75.0% or 12 out of 16) or freezer (60.0% or 9 out of 15) before recycling their old unit received the replacement unit less than two weeks before recycling pick-up. However, 42.9% (3 out of 7) of secondary refrigerator replacements were acquired more than six months before pick-up (significantly different from the other groups at $p<.05$ or better using student's t-test). Overall, only eight units replaced before recycling (21.1% of 38) were replaced more than two months before recycling pick-up.

Replacement units acquired after recycling pick-up are less common; recall from Table 45 that more than twice as many units were replaced before recycling as after recycling. About half of the units replaced after recycling pick-up (46.7% or 7 out of 15) were replaced within two weeks of recycling, and only one (6.7% of 15) was replaced more than six months after recycling.

**Table 45. Timing of Replacement of Recycled Units**

| ***Base: replaced unit BEFORE recycling*** | **Replaced main refrigerator** (N=16) | **Replaced secondary refrigerator** (N=7) | **Replaced freezer** (N=15) | **Total** (N=38) |
|---|---|---|---|---|
| Replaced unit less than 2 weeks before recycling | 75.0% | 42.9% | 60.0% | 63.2% |
| Replaced unit 2 weeks to 2 months before recycling | 12.5% | 14.3% | 20.0% | 15.8% |
| Replaced unit 2 to 6 months before recycling | 12.5% | 0.0% | 13.3% | 10.5% |
| Replaced unit more than 6 months before recycling | 0.0% | 42.9% | 6.7% | 10.5% |
| Don't know how long before recycling | 0.0% | 0.0% | 0.0% | 0.0% |
| ***Base: replaced unit AFTER recycling*** | **Replaced main refrigerator** (N=1) | **Replaced secondary refrigerator** (N=7) | **Replaced freezer** (N=7) | **Total** (N=15) |
| Replaced unit less than 2 weeks before recycling | 0.0% | 57.1% | 42.9% | 46.7% |
| Replaced unit 2 weeks to 2 months before recycling | 0.0% | 14.3% | 28.6% | 20.0% |
| Replaced unit 2 to 6 months before recycling | 0.0% | 14.3% | 28.6% | 20.0% |
| Replaced unit more than 6 months before recycling | 0.0% | 14.3% | 0.0% | 6.7% |
| Don't know how long after recycling | 100.0% | 0.0% | 0.0% | 6.7% |

## Characteristics of Replacement Units

As shown in Table 46, the most popular style of replacement refrigerator is a two-door model with the freezer on top, which replaced a plurality of main refrigerators (44.0% or 11 out of 25) and secondary refrigerators (38.1% or 8 out of 21). In total, 89.1% (41 out of 46) of replacement refrigerators are two-door models (with freezer on top, freezer on bottom, or side-by-side).

None of the replacement main refrigerators are manual defrost (0% of 25), while three of the replacement secondary refrigerators are manual defrost (14.3% or 3 out of 21; this difference is significant at $p<.05$ using student's t-test).

**Table 46. Replacement Refrigerator Type**

| *Base: replaced refrigerator* | Replaced main refrigerator (N=25) | Replaced secondary refrigerator (N=21) | Total (N=46) |
|---|---|---|---|
| Single door, freezer compartment inside | 0.0% | 9.5% | 4.3% |
| Two doors, side by side | 24.0% | 28.6% | 26.1% |
| Two doors, freezer on top | 44.0% | 38.1% | 41.3% |
| Two doors, freezer on bottom | 28.0% | 14.3% | 21.7% |
| Three doors, two for refrigerator and one for freezer on bottom | 4.0% | 0.0% | 2.2% |
| *"The recycled unit was replaced with a small chest freezer"* | 0.0% | 4.8% | 2.2% |
| *"Dorm style mini-fridge"* | 0.0% | 4.8% | 2.2% |
| Don't know | 0.0% | 0.0% | 0.0% |

Table 47 indicates that half of replacement freezers are upright models (50.0% or 12 out of 24), while a similar number are chest freezers (45.8% or 11 out of 24). One customer (4.2% of 24) replaced their recycled freezer with a refrigerator.

Twenty of these replacement freezers (83.3% of 24) are frost free, while three (12.5% of 24) are manual defrost, and in one case (4.2% of 24) the customer did not know.

**Table 47. Replacement Freezer Type**

| *Base: replaced freezer* | Replaced freezer (N=24) |
|---|---|
| Chest freezer | 45.8% |
| Upright freezer | 50.0% |
| Refrigerator with a freezer section | 4.2% |

More than half of replacement freezers (70.8% or 17 out of 24) are smaller than the recycled freezers they replaced, while only an eighth (12.5% or 3 out of 24) are larger, as seen in Table 48. However, most customers who replaced main refrigerators got a new unit the same size as the old one (60.0% or 15 out of 25), and more customers acquired larger replacement main refrigerators (28.0% or 7 out of 25) than acquired smaller replacements (12.0% or 3 out of 25). Secondary refrigerators which were replaced were about equally likely to be smaller, larger or the same size.

**Table 48. Relative Size of Replacement Units**

| *Base: replaced units* | Replaced main refrigerator (N=25) | Replaced secondary refrigerator (N=21) | Replaced freezer (N=24) | Total (N=70) |
|---|---|---|---|---|
| Replacement unit is larger | 28.0% | 38.1% | 12.5% | 25.7% |
| Replacement unit is the same size | 60.0% | 33.3% | 16.7% | 37.1% |
| Replacement unit is smaller | 12.0% | 28.6% | 70.8% | 37.1% |
| Don't know | 0.0% | 0.0% | 0.0% | 0.0% |

Most surveyed customers do not know the cubic footage of their replacement units (overall 55.7% or 39 out of 70). Based on the responses of customers who were able to report a number for the cubic footage of their replacement units, main refrigerators were replaced with units that average 22.9 cubic feet, while secondary units were replaced with models that average 20.9 cubic feet, and the average freezer replacement unit was 14.2 cubic feet. The distribution of responses is shown in Table 49.

**Table 49. Cubic Footage of Replacement Units**

| *Base: replaced units* | Replaced main refrigerator (N=25) | Replaced secondary refrigerator (N=21) | Replaced freezer (N=24) | Total (N=70) |
|---|---|---|---|---|
| Under 14 cubic feet | 0.0% | 0.0% | 16.7% | 5.7% |
| 14 cubic feet up to 18 cubic feet | 4.0% | 4.8% | 29.2% | 12.9% |
| 18 cubic feet up to 21 cubic feet | 16.0% | 9.5% | 4.2% | 10.0% |
| 21 cubic feet up to 25 cubic feet | 16.0% | 0.0% | 0.0% | 5.7% |
| 25 cubic feet or more | 20.0% | 9.5% | 0.0% | 10.0% |
| Don't know | 44.0% | 76.2% | 50.0% | 55.7% |

Recall from Table 44 that 32.9% (23 out of 70) of replacement units were not acquired or purchased new. Table 50 shows the ages of previously-used units that replaced units recycled by the program (both units purchased or otherwise acquired used, and units moved from somewhere else in the home). About half of (47.8% or 11 of 23) of used replacement units are reported as being less than ten years old, though 17.4% (4 out of 23) did not know how old their replacement units are.

**Table 50. Age of Used Replacement Units**

| *Base: replaced unit with used unit or unit moved from somewhere else in the home* | Replaced main refrigerator (N=4) | Replaced secondary refrigerator (N=13) | Replaced freezer (N=6) | Total (N=23) |
|---|---|---|---|---|
| Replacement unit less than 10 years old | 100.0% | 30.8% | 50.0% | 47.8% |
| Replacement unit 10 up to 15 years old | 0.0% | 30.8% | 33.3% | 26.1% |
| Replacement unit 15 up to 20 years old | 0.0% | 7.7% | 0.0% | 4.3% |
| Replacement unit 20 to 25 years old | 0.0% | 7.7% | 0.0% | 4.3% |
| Replacement unit 25 years old or older | 0.0% | 0.0% | 0.0% | 0.0% |
| Don't know age of replacement unit | 0.0% | 23.1% | 16.7% | 17.4% |

## Intentions in the Absence of the Recycling Program

TecMarket Works asked participants what they would have done with their recycled units in the absence of the program; the results are shown in Table 51. For both refrigerators and freezers, the most frequent response is "given it away for free" (29.3% or 27 out of 92 for refrigerators, 29.1% or 23 out of 79 for freezers), followed by "kept it" (22.8% or 21 out of 92 for refrigerators and 20.3% or 16 out of 79).

If the categories "taken it to a dump", "hired someone to take it to a dump" and "leave for curbside pick-up" are combined into one category representing units that would have been taken off of the grid even without the program, then 28.3% (26 out of 92) of refrigerator recyclers and

27.8% (22 out of 79) of freezer recyclers were going to have their units removed from the grid anyway. Thus, most of the units recycled by the program may have remained in use after the program, either in the customers' household (if they kept it) or in another household (if they were going to sell or donate it to someone).

There are some significant differences between the intentions of customers who recycled refrigerators and freezers. Customers who recycled freezers are more likely to say they would have donated their old units to charity (5.1% or 4 out of 79, compared to 1.1% or 1 out of 92 refrigerator recyclers; this difference is significant at $p<.10$ using student's t-test). Freezer recyclers would also have been more likely to pay someone to haul their unit to the dump (15.2% or 12 out of 79) than customers who recycled refrigerators (7.6% or 7 out of 92; this difference is significant at $p<.10$ using student's t-test), while refrigerator recyclers would have been somewhat more likely to haul their units to the dump themselves (16.3% or 15 out of 92, compared to 10.1% or 8 out of 79 freezer recyclers, though this difference is not statistically significant). Since a larger percentage of recycled refrigerators than freezers are replaced, participants who recycled refrigerator are also more likely to say they would have given their old units to the dealers who delivered their replacements (9.8% or 9 out of 92, compared to 3.8% or 3 out of 79 freezer recyclers; this difference is significant at $p<.10$ using student's t-test).

**Table 51. What Customers Would Have Done in the Absence of the Program**

| Recycled unit disposition without the program | Respondents who recycled refrigerators (N=92) | Respondents who recycled freezers (N=79) |
|---|---|---|
| Given it away for free | 29.3% | 29.1% |
| Kept the old unit | 22.8% | 20.3% |
| Hired someone to take it to a dump or recycling center | 7.6% | 15.2% |
| Taken it to a dump or recycling center | 16.3% | 10.1% |
| Sold it | 2.2% | 5.1% |
| Had it removed by the dealer that delivered replacement unit | 9.8% | 3.8% |
| Donated to a charity that accepts used appliances | 1.1% | 5.1% |
| Given it to a dealer that accepts used units (without buying a replacement) | 1.1% | 2.5% |
| Leave for curbside pick-up on large item recycling day | 4.3% | 2.5% |
| Get rid of it some other way (listed below) | 1.1% | 0.0% |
| Don't know | 4.3% | 6.3% |

One customer who recycled a refrigerator gave a response that did not fit any of the categories above, which is listed below.

- *We would have left it for the new homeowners.*

Customers who would have kept their recycled units in the absence of the program were asked how these units would have been used if they had kept them. As seen in Table 52, 19.0% of these refrigerators (4 out of 21) would have been stored unplugged, and 62.5% (10 out of 16) of these freezers would also have been stored unplugged. Most of the refrigerators that would have been

kept (76.2% or 16 out of 21) would have been used as secondary refrigerators at least part of the time.

**Table 52. Use of Recycled Units If They Had Been Kept Instead of Recycled**

| Recycled unit use without the program | Respondents who recycled refrigerators but would have kept them without the program (N=21) | Respondents who recycled freezers but would have kept them without the program (N=16) |
|---|---|---|
| Stored it unplugged | 19.0% | 62.5% |
| Used it as a secondary refrigerator at least some of the time | 76.2% | NA |
| Used it as my primary refrigerator or freezer | 4.8% | 37.5% |
| Don't know | 0.0% | 0.0% |

Customers who would have kept using their old units without the program were asked how much they would have used them. Among the sixteen refrigerator recyclers who would have continued using their old units as secondary refrigerators, thirteen (81.3% of 16) would have had them plugged in and running all of the time, while one (6.3% of 16) would have used their old unit for "certain months of the year only" (totaling 7 months out of a year), and two (12.5% of 16) would have used their old units "only for special occasions" (averaging 3.5 months out of a year) . The only refrigerator recycler who would have kept using their old unit as their main refrigerator would also have kept it plugged in and running all of the time.

Five of the six freezer recyclers (83.3% of 6) who would have kept using their freezers would have had them plugged in and running all of the time, and the sixth would have continued using their old unit "during certain months of the year only" (totaling 6 months out of the year).

Furthermore, customers that would have kept their old units in use without the program were asked how much longer they think they would be using them. Among the seventeen refrigerator recyclers who would have kept their units running, twelve (70.6% of 17) would have kept them running "indefinitely", four (23.5% of 17) would have stopped using the old units within one to five years (averaging 2.6 years), and one (5.9% of 17) did not know. Among the six freezer recyclers who would have kept their units running, all six (100%) would have kept them running "indefinitely."

Customers who "don't know" what they would have done in the absence of the program were also asked "*assuming you had kept [your old unit], would it have been stored unplugged or would you have continued using it?*" Among the four refrigerator recyclers who don't know what they would have done in the absence of the program, two say they would have stored their units unplugged, one would have kept using their recycled unit as a secondary refrigerator "all of the time", and one did not answer the question. Among the five freezer recyclers who don't know what they would have done in the absence of the program, three would have stored their units unplugged and two are not sure what they would have done if they had kept their old unit.

Customers who would have sold their old units were asked how much they think they would receive for the sale and how they would sell it. These responses are listed below.

**Recycled refrigerators (N=2)**

- *$25 or $30 through garage/curb sale and word-of-mouth.*
- *$22 through garage/curb sale.*

**Recycled freezers (N=4)**

- *$60 through craigslist.com/internet sale.*
- *$50 through word-of-mouth.*
- *$25 to $50 through posting on a community message board.*
- *$20 through newspaper ad.*

Customers who would have hired someone to haul their old unit away were asked how much they would be willing to pay for this service. These responses are listed below.

**Recycled refrigerators (N=7)**

- *I knew it was going to cost me, and I knew I couldn't afford it.*
- *$100* (N=2)
- *$50* (N=2)
- *$30*
- *$25*

**Recycled freezers (N=12)**

- *Up to $100.*
- *$75 to $100*
- *$50* (N=4)
- *$30 to $50*
- *$25*
- *Don't know* (N=4)

Customers who would have given away or sold their old units were also asked if they had recipients (or buyers) in mind for these transactions.

- Among refrigerator recyclers, neither of the two customers (0%) who were intending to sell their unit had a specific person in mind, and only five of the 27 customers (18.5%) who were intending to give their unit away had a specific person in mind. The survey also included a question asking if respondents who would have transferred refrigerators to other people in the absence of the program knew whether the person they would have sold or given the unit to was going to use it as a main or secondary refrigerator. The five potential recipients and their potential usage of these recycled refrigerators are listed below.
  - *A scrap collector: not applicable.*
  - *My brother: would have salvaged the old refrigerator for parts.*
  - *My sons: to have them get rid of it for me.*

- *My daughter-in-law's parents: would have used it as their main refrigerator.*
- *A friend of the family: not sure how they would have used the refrigerator.*

- Among freezer recyclers, two of the four customers (50%) who were intending to sell their units said they had a specific person in mind, though they described these recipients very generically as "*a neighbor or friend who has a family*" and "*family or friends*". Among the 23 freezer recyclers who would have given their old units away for free, six (26.1% of 23) did have specific recipients in mind; these also tend to be generic responses and are listed below.
  - *A co-worker.*
  - *A family friend.*
  - *Any family in need.*
  - *A family member.*
  - *Family or friends.*
  - *To whomever.*

Survey participants were also asked about the timing of disposing of their old units if the Duke Energy Appliance Recycling program had not been available. Table 53 shows that more than half of participants would have delayed disposing of their units: 63.0% (58 out of 82) of refrigerator recyclers would have waited, as would 58.2% (46 out of 79) of freezer recyclers.

Respondents who recycled refrigerators are significantly more likely to say they would have recycled their units *sooner* without the program (13.0% or 12 out of 92, compared to 3.8% or 3 out of 79 for freezer recyclers), and customers who recycled freezers are more likely than to answer "don't know" to this question (8.9% or 7 out of 79) compared to refrigerator recyclers (1.1% or 1 out of 92; both of these differences are significant at $p<.05$ using student's t-test).

**Table 53. Timing of Unit Disposal in the Absence of the Program**

| Timing of recycled unit disposition without the program | Respondents who recycled refrigerators (N=92) | Respondents who recycled freezers (N=79) |
|---|---|---|
| **Would have removed it sooner without the program** | **13.0%** | **3.8%** |
| **Would have removed it at the same time without the program** | **22.8%** | **29.1%** |
| **Would have removed it later without the program (total)** | **63.0%** | **58.2%** |
| Up to a month later | 8.7% | 7.6% |
| More than one month up to six months later | 10.9% | 3.8% |
| Six months up to a year later | 6.5% | 12.7% |
| More than a year later | 10.9% | 6.3% |
| Would have kept it indefinitely / until it broke | 14.1% | 16.5% |
| Would have kept it for "other" time period (listed below) | 2.2% | 2.5% |
| Not sure how much later | 9.8% | 8.9% |
| **Don't know** | **1.1%** | **8.9%** |

Four surveyed customers gave "other" descriptions of how long they would have kept their recycled units in the absence of the program; these are listed below.

**Recycled refrigerators (N=2)**

- *Until I heard of someone who needed it.*
- *Until we sold the house sometime.*

**Recycled freezers (N=2)**

- *Until my death, and then my kids would have to deal with it.*
- *Until we sell the house.*

Table 54 shows that five refrigerator recyclers (5.4% of 92) who did not replace their old units would have purchased replacements in the absence of the program, and only one surveyed customer (1.1% of 92) who replaced their old unit would not have done so in the absence of the program. Only four freezer recyclers (5.1% of 79) did not replace units but would have in the absence of the program, while three (3.8% of 79) did replace units but would not have done so in the absence of the program. However, a large majority of customers surveyed would have taken the same action (either purchasing a replacement or not) with or without the program.

**Table 54. Replacing Units in the Absence of the Program**

| Unit replacement without the program | Respondents who recycled refrigerators (N=92) | Respondents who recycled freezers (N=79) |
|---|---|---|
| Replaced unit, and would have replaced it without the program | 47.8% | 26.6% |
| Did not replace unit, but would have replaced it without the program | 5.4% | 5.1% |
| Replaced unit, but would not have replaced it without the program | 1.1% | 3.8% |
| Did not replace unit, and would not have replaced it without the program | 41.3% | 62.0% |
| Don't know if unit would have been replaced without the program | 4.3% | 2.5% |

## Program Satisfaction

TecMarket Works asked program participants to rate several specific aspects of the Duke Energy Appliance Recycling program on a 10-point scale, with "10" indicating very high satisfaction, and "1" indicating very low satisfaction. The average rating scores for all 161 surveyed participants are shown in Figure 14, along with average satisfaction ratings for the program overall and Duke Energy overall.

The Appliance Recycling program gets very high marks for satisfaction from surveyed customers: 9.75 for the program overall, as well as average scores above 9.5 for the collection team (9.91), telephone customer service representatives (9.76), and the sign-up and scheduling process (9.75). The size of the incentive payment (9.50) and time it took to receive payment (9.46) receive somewhat lower satisfaction ratings, and the time between scheduling and pick-up (9.34) was rated lowest of any aspect of the program (the mean ratings for these three items are significantly lower than the top four items in Figure 14 at $p<.10$ using student's t-test). However, average satisfaction scores over 9.0 still represent a very high level of customer satisfaction; even for the lowest rated aspect of the program shown in the chart below, 73.2% or 115 out of

157 customers surveyed rated their satisfaction with the time between scheduling and pick-up at "10 out of 10", the highest possible score.

Duke Energy received an overall mean satisfaction rating score of 8.81 from surveyed program participants, which is also a very high level of satisfaction, but lower than the 9.75 satisfaction for the Appliance Recycling program overall or for any of the six specific aspects of the program shown in Figure 14 (all differences significant at $p<.05$ using student's t-test). However, nearly half of surveyed program participants (47.8% or 76 out of 159) still rated their satisfaction with Duke Energy a "10 out of 10", the highest possible score.

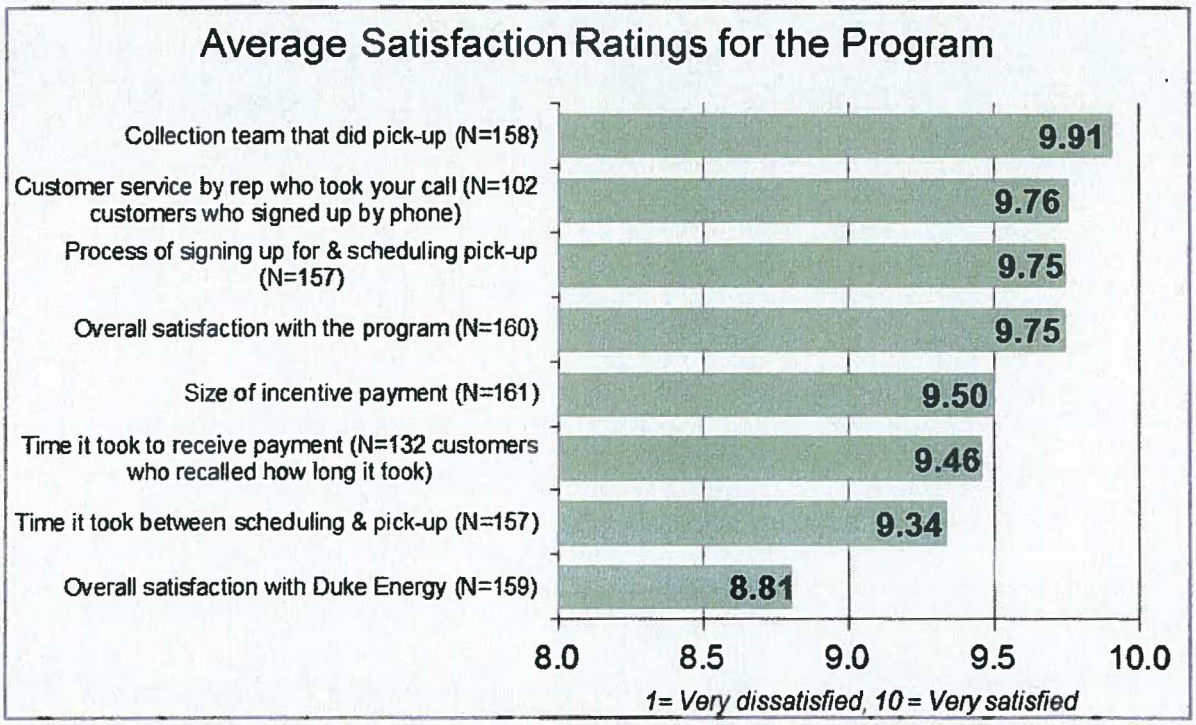


**Figure 14. Average Satisfaction Ratings for the Appliance Recycling Program**

Table 55 shows the average satisfaction ratings by unit(s) recycled. Customers who recycled one refrigerator give significantly lower satisfaction ratings than other surveyed customers for telephone customer service (9.61), the amount of the incentive payment (9.25), the time it took to receive payment (9.13) and the time between scheduling and pick-up (8.97; all differences significant at $p<.10$ or better using ANOVA), although these are still very high levels of satisfaction. There are no significant differences by units recycled for overall program satisfaction or for satisfaction with Duke Energy.

**Table 55. Average Satisfaction Ratings by Unit(s) Recycled**

| Satisfaction ratings | Recycled one refrigerator (N=80) | Recycled one freezer (N=67) | Recycled multiple units (N=14) | Total (N=161) |
|---|---|---|---|---|
| Collection team that did pick-up | 9.85 | 9.95 | 10.00 | 9.91 |
| Customer service by representative who took your call (*Total N=102 customers who signed up by phone*) | 9.61 | 9.91 | 9.89 | 9.76 |
| Process of signing up for and scheduling pick-up | 9.63 | 9.86 | 9.86 | 9.75 |
| Size of incentive payment | 9.25 | 9.79 | 9.57 | 9.50 |
| Time it took to receive payment (*Total N=132 customers who recalled how long it took*) | 9.13 | 9.75 | 9.77 | 9.46 |
| Time it took between scheduling and pick-up | 8.97 | 9.67 | 9.86 | 9.34 |
| Overall satisfaction with the program | 9.65 | 9.87 | 9.79 | 9.75 |
| Overall satisfaction with Duke Energy | 8.69 | 8.94 | 8.85 | 8.81 |

Customers who gave satisfaction scores of "7" or lower on a 10-point scale were asked what could be done to improve the situation. These responses are listed below for each aspect of the program rated.

No surveyed customers (0% of 161) gave satisfaction ratings of "7" or lower for the collection team.

One customer (0.6% of 161) gave satisfaction ratings of "7" or lower for the Appliance Recycling Program overall:

**Recycled one refrigerator (N=1)**

- *Duke could improve customer service to eliminate mistakes such as the one we experienced in which our initial pick up date was never entered into the system, requiring us to call back a second time to reschedule the appointment.*

One customer (1.0% of 102 respondents who signed up by telephone) gave a satisfaction rating of "7" or lower for the customer service representative who took their call:

**Recycled one refrigerator (N=1)**

- *There could be more people available to answer calls. The line was busy. It was hard getting ahold of someone.*

Four customers (2.5% of 161) gave satisfaction ratings of "7" or lower for the process of signing up and scheduling pick-up:

**Recycled one freezer (N=1)**

- *The days available were not in keeping with my schedule. I had to get someone else to be there when the crew came since no Thursdays were available in my area, only Tuesdays and Fridays.*

**Recycled one refrigerator (N=3)**

- *Duke could pick up the appliances in a timelier manner.*
- *Duke could provide a confirmation number for the scheduled appointment. The first time we called to schedule a pick-up we did not receive confirmation, the second time we did.*
- *Duke could shorten the length of time between scheduling the appliance pickup and when it actually was picked up.*

Five customers (3.8% of 132 respondents who could recall how long it took to receive payment) gave satisfaction ratings of "7" or lower for time it took to receive payment:

**Recycled one refrigerator (N=5)**

- *Duke could shorten the length of time it takes to receive the check to two weeks or less.*
- *The payment could arrive within two to three weeks.*
- *There could be a shorter turnaround time between pickup and receiving the check. It took two months.*
- *I wanted it quicker.*
- *They could have taken the $30 off the bill instead; I would have preferred that.*

Nine customers (5.6% of 161) gave satisfaction ratings of "7" or lower for the size of the incentive payment:

**Recycled one refrigerator (N=8)**

- *Duke could offer a higher incentive of $75 to $100 for a working appliance.*
- *Duke could offer a much higher monetary incentive, say $75 or more.*
- *Duke could offer a slightly higher incentive, say $50, or a credit towards the electric bill.*
- *Duke could offer a slightly higher monetary incentive, say $50.*
- *The size of the payment could be increased to $50.*
- *Duke could offer more money for the appliance, say $40-50.*
- *Would have liked higher payment, since refrigerator was in good working order.*
- *The incentive is good, considering the refrigerator would have otherwise collected dust and taken up space.*

**Recycled multiple units (N=1)**

- *They could increase the payment, I think $50 for each appliance would be a better incentive.*

Fifteen customers (9.3% of 161) gave satisfaction ratings of "7" or lower for the time it took between scheduling and pick-up:

**Recycled one refrigerator (N=14)**

- *Duke could shorten the length of time between enrollment and pick-up to one week or less.* (N=3)
- *The pick-up could occur within one week of the initial call.*

- *Duke could shorten the length of time between enrollment and pick-up to five business days or less.*
- *The pick-up could take place within three to four days of the initial call.*
- *The appliance pick up could take place within two weeks of enrolling in the program.*
- *The pick-up could occur within two weeks of the initial phone call.*
- *Duke could shorten the length of time between enrollment and actual pick-up.*
- *The pick-up could have been sooner.*
- *Would like a little faster availability.*
- *Have more available pickup times. It was difficult to coordinate my schedule with the appliance recycling team's schedule.*
- *I had to wait a month a half before the refrigerator was picked up. We had to move the fridge out to the backyard because we did not have room to store it in our house once we replaced our old fridge with the new one. We were concerned that by the time the refrigerator was picked up it would no longer work and would not be eligible for the program.*
- *I recall that crew was scheduled to come only in a narrowly defined time window, and I had to take an extra week to get a time that worked for me.*

**Recycled one freezer (N=1)**

- *I would have liked it if they could have come to pick up the appliance the same week as when called.*

Twenty-six customers (16.1% of 161) gave satisfaction ratings of "7" or lower for Duke Energy overall:

**Recycled one refrigerator (N=17)**

- *I've been hearing some things about what's been going on in Florida and this doesn't make me happy. They were going to build or rebuild a power plant, collected taxes to do this, and then jumped out. They didn't return the money collected in taxes. I'm not sure if I understand this situation exactly as it is, but I think this is a terrible way to treat your customers.*
- *Our neighborhood has a tendency to lose its electric when we get a storm. We have lived through several four and five-day outages. The lights flicker too often. They need to find some way to keep the electric more steady. It's a real pain to be constantly having to reset clocks and the like.*
- *The woman who sold us our house had the power shut off. We didn't know this before moving in the middle of November, so we called on a Friday to get the power turned on. We live right down the street from a substation. We were told by Duke customer service that they could not connect service until Monday because there was no one working that Saturday. So, our family, including a two-year-old child, spent a very cold weekend in this house. When the guy came on Monday to turn on the power, he literally had to flip two switches and it took him all of five minutes. I told him about what Duke customer service had said and he told me they had been working on Saturday. I felt like we had been given the runaround, sorry, out of luck. I'm a very easy going person, but this really made me mad. I mean, I've got a toddler in the house in winter. I was not happy.*

- *We have a power outage during every storm.*
- *We're new to the neighborhood. There are a lot of short outages where we just moved to. When we moved into the area neighbors warned us that there are just as many outages in the winter only they last for days so we should invest in a generator.*
- *When I was first getting service there was a previous outstanding bill at my address that blocked me getting service. I had to fax a lot of information over, and I found out that other person moved out of state. I think if that person has bills somewhere else that should be enough to indicate they no longer live here. I had to do so much paperwork, and the customer service folks weren't friendly, either. They often told me different stories of who I needed to call and what I needed to send in.*
- *Duke could provide better customer service, with more human interaction, particularly when power outages occur.*
- *It is my God-given right to complain about utilities. They do fine as a service, but it's a monopoly. I wish I could still get a paper copy of the bill, since I am now on electronic payment. It has caused me to miss a payment once when I didn't see the e-mail.*
- *I had great difficulty attempting to sign up for an energy assistance program with Duke. I would either get a recorded message saying something like they were full for the day or else get hung up on. I felt Duke created an expectation for me but in the end it seems that the program is not readily available. What is the point of offering it if I cannot even get on the phone with a representative?*
- *Duke could not charge a flat monthly rate for natural gas and instead base it on usage.*
- *Duke could lower their electricity rates and greatly reduce the number of inexplicable power outages we seem to experience every year.*
- *Duke could lower their rates and supply some information as to why they're the best competitive choice to provide our energy.*
- *Lower the rates.* (N=5)

**Recycled one freezer (N=7)**

- *We are at the end of the line and we lose power frequently while the newer homes that were built around our home don't lose power every time we do. No one has been out to trim the trees around the power lines in ten or fifteen years. We lose power in most storms no matter how severe. When the wind from Hurricane Ike came through we lost power for nine days which was a horrible experience for us in our all-electric house. We even use electricity for our water well.*
- *We live in a neighborhood where it takes ten to twelve hours to get the power back on for our one block. Our neighbors across the street don't have this problem. It's very strange. We can't ever get them to explain why everyone around us has power, but it takes them that long to get our power back on. I mean, I don't know anything about how this works, maybe it's a transformer or something, but we haven't been real happy with them this week for this reason.*
- *I think that the Duke Energy rates are high, and I'd like to see them lower our bills. Also, I think Duke Energy should find some other means of choosing who qualifies for their assistance with the energy efficiency programs such as Home Energy House Call, home weatherization materials and labor. Duke needs to expand their scale as to who gets additional assistance; they especially should include and consider single parenting as a qualifier.*

- *I don't understand the billing or why the rates are what they are and why they keep going up.*
- *I think the rates are too high. The service has been good, though. I wish Duke Energy was a local company like it used to be.*
- *The rates are way too expensive and the rates keep going up far too much.*
- *The rates keep going up. I know they say it's only going to cost like $3 per household but it never does. It's always more.*

**Recycled multiple units (N=2)**

- *Duke could be more understanding when customers are going through periods of financial strife and are temporarily unable to pay the entire amount of their energy bill.*
- *Duke could provide more information about how their energy rates compare with others.*

### Program Satisfaction in Ohio

Survey respondents in Ohio were asked an additional question about their satisfaction with the program on a five-point Likert scale. An overwhelming majority of 95.4% (125 out of 131) gave the highest possible rating of "very satisfied", while six participants (4.6% of 131) said they were "somewhat satisfied" and nobody said they were dissatisfied or even neutral towards the program. The distribution is shown in Figure 15.

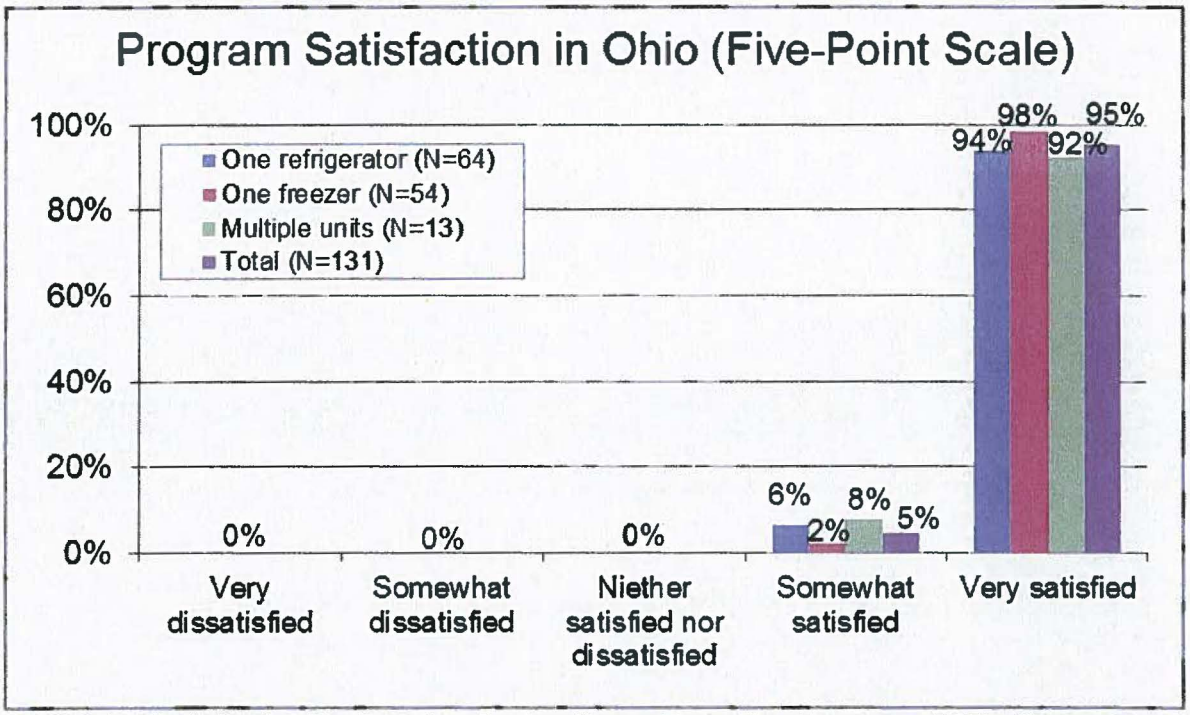


**Figure 15. Satisfaction Ratings for the Appliance Recycling Program (Ohio Customers Only)**

After Ohio respondents rated the program, they were asked why they gave the ratings they did. These verbatim responses are listed in *Appendix J: Ohio Participants' Reasons for Program Satisfaction Ratings*.

## Effect of the Program on Customers' Perception of Duke Energy

Survey respondents were asked if participating in the program made them feel more or less favorably about Duke Energy, or if it made no difference. Table 56 indicates that most customers (67.1% or 108 out of 161) feel more favorably about Duke Energy after the program, and none (0.0% of 161) feel less favorably. Customers who recycled multiple units were more likely to say the program made them feel more favorably about Duke Energy (85.7% or 12 out of 14, significantly higher than the other groups at p<.10 using student's t-test).

**Table 56. Effect of Program Participation on Perception of Duke Energy**

| Perception of Duke Energy | Recycled one refrigerator (N=80) | Recycled one freezer (N=67) | Recycled multiple units (N=14) | Total (N=161) |
|---|---|---|---|---|
| Participating in the program made me feel more favorable about Duke Energy | 66.3% | 64.2% | 85.7% | 67.1% |
| Participating in the program did not make me feel any different about Duke Energy | 33.8% | 35.8% | 14.3% | 32.9% |
| Participating in the program made me feel less favorable about Duke Energy | 0.0% | 0.0% | 0.0% | 0.0% |
| Don't know | 0.0% | 0.0% | 0.0% | 0.0% |

## Favorite and Least Favorite Aspects of the Program

Surveyed customers were asked about their favorite and least favorite aspects of participating in the Appliance Recycling program. Table 57 indicates that the overall most popular aspects of the program are the convenience of home pick-up (and not having to personally haul the unit away; 26.7% or 43 out of 161), getting rid of old units (24.8% or 40 out of 161), the incentive payment (23.0% or 37 out of 161) and the ease of participation (hassle-free sign-up and scheduling; 19.9% or 32 out of 161). Some lesser-mentioned benefits include "green" disposal of old units (8.7% or 14 out of 161), the courtesy and helpfulness of the pick-up crew and customer service representatives (6.2% or 10 out of 161), and creating space at home by reducing clutter (4.3% or 7 out of 161).

Only three of the surveyed customers mentioned "saving energy" (1.9% of 161), and only one (0.6% of 161) mentioned "saving money on energy bills" as a favorite aspect of the program. However, recall from Figure 9 and Figure 10 that saving energy and saving money on bills were mentioned by several customers as reasons why they wanted to dispose of their old refrigerators and freezers; while saving money and energy may be motivations for deciding to participate in the program, they are not viewed as primary program benefits by the customers afterwards.

There were some significant differences between customers who recycled different units: Customers who recycled multiple units are the most likely to mention "getting rid of old units", "creating space" and "ease of participation" but none of them mentioned the incentive payment (significantly different than other groups at p<.10 or better using student's t-test). Customers who recycled a refrigerator are the most likely to mention "convenience of home pick-up" and the least likely to mention "getting rid of old units" and "ease of participation" (significantly different than other groups at p<.10 or better using student's t-test).

**Table 57. Customers' Favorite Thing about Participating in the Appliance Recycling Program**

| Favorite aspects of the program | Recycled one refrigerator (N=80) | Recycled one freezer (N=67) | Recycled multiple units (N=14) | Total (N=161) |
|---|---|---|---|---|
| Convenience of home pick-up / not having to haul it myself | 31.3% | 23.9% | 14.3% | 26.7% |
| Getting rid of old unit(s) | 18.8% | 28.4% | 42.9% | 24.8% |
| The incentive payment | 25.0% | 25.4% | 0.0% | 23.0% |
| Ease of participation / sign-up and scheduling | 13.8% | 23.9% | 35.7% | 19.9% |
| Proper unit disposal / recycling parts / good for environment | 8.8% | 10.4% | 0.0% | 8.7% |
| Crew and customer reps were courteous / helpful / prompt / kind / etc. | 8.8% | 4.5% | 0.0% | 6.2% |
| Creating space at home / less clutter | 6.3% | 1.5% | 14.3% | 4.3% |
| Timing / quick turnaround / conveniently scheduled | 3.8% | 3.0% | 7.1% | 3.7% |
| Duke's concern for customers | 1.3% | 6.0% | 0.0% | 3.1% |
| Getting a better new unit | 2.5% | 1.5% | 0.0% | 1.9% |
| Not having to pay for hauling / disposal | 0.0% | 3.0% | 7.1% | 1.9% |
| Saving energy | 3.8% | 0.0% | 0.0% | 1.9% |
| Saving money on energy bills | 0.0% | 0.0% | 7.1% | 0.6% |
| Other (listed below) | 1.3% | 1.5% | 7.1% | 1.9% |
| Don't know / not specified | 1.3% | 1.5% | 0.0% | 1.2% |

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

Three survey respondents mentioned "other" favorite aspects of the program. These are listed below.

**Recycled one refrigerator (N=1)**

- *My favorite thing was hearing that we were recycling one of the oldest refrigerators in the area.*

**Recycled one freezer (N=1)**

- *Everyone was shocked at how old the freezer was.*

**Recycled multiple units (N=1)**

- *My favorite thing was that my two appliances qualified for the program.*

Most surveyed program participants (66.5% or 107 out of 161) could not name a least favorite aspect of the program, and the only least favorite aspect mentioned by more than about 5% of surveyed participants was that they wanted a shorter turnaround time between scheduling and pick-up (7.5% or 12 out of 161). Customers' least favorite aspects of the program are shown in Table 58.

There are a few significant differences between customers who recycled different types of units: Customers who recycled multiple units (78.6% or 11 out of 14) and those who recycled a freezer

(83.6% or 56 out of 67) are more likely to have not named a least favorite aspect of the program compared to those who recycled a refrigerator (50.0% or 40 out of 80; these differences are significant at $p<.05$ using student's t-test). Compared to other customers, those who recycled a refrigerator are more likely to complain about wanting faster pick-up, having to move the unit for pick-up, worrying that the unit would not be working, and the incentive payment being too small (differences significant at $p<.10$ or better using student's t-test).

**Table 58. Least Favorite Things about Participating in the Appliance Recycling Program**

| Least favorite aspects of the program | Recycled one refrigerator (N=80) | Recycled one freezer (N=67) | Recycled multiple units (N=14) | Total (N=161) |
|---|---|---|---|---|
| Too long between scheduling and pick-up / pick-up was delayed | 13.8% | 1.5% | 0.0% | 7.5% |
| Scheduling the pick-up / had to schedule more than once / want more scheduling options | 2.5% | 6.0% | 7.1% | 4.3% |
| Misunderstanding about what would happen to recycled unit / feel bad about destroying a working unit | 3.8% | 3.0% | 0.0% | 3.1% |
| Waiting for payment / time to receive payment | 2.5% | 1.5% | 7.1% | 2.5% |
| Having to be present for pick-up / making arrangements / taking time off work | 1.3% | 4.5% | 0.0% | 2.5% |
| Having to move unit for pick-up | 3.8% | 0.0% | 0.0% | 1.9% |
| Having to clean / defrost unit for pick-up | 3.8% | 1.5% | 7.1% | 2.5% |
| Unit had to be plugged in for pick-up | 1.3% | 0.0% | 0.0% | 0.6% |
| (Lack of) information about pick-up and scheduling | 1.3% | 0.0% | 0.0% | 0.6% |
| Incentive payment is too small | 6.3% | 0.0% | 0.0% | 3.1% |
| Not being aware of the program sooner / need more advertising and awareness | 2.5% | 1.5% | 0.0% | 1.9% |
| Worried that unit would not be working by time of pick-up | 3.8% | 0.0% | 0.0% | 1.9% |
| Other (listed below) | 7.5% | 0.0% | 0.0% | 3.7% |
| Nothing / don't know | 50.0% | 83.6% | 78.6% | 66.5% |

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

Six customers (3.7% of 161) mentioned "other" aspects of the program as their least favorite; these responses are listed below.

**Recycled one refrigerator (N=6)**

- *I didn't realize when I was going to get check until the crew told me. I probably missed that information when I signed up.*
- *I had to coordinate two different people with two different appointments: one with the delivery of the new refrigerator and one with the pick-up of the old one. These appointments needed to be done on the same day.*
- *I wish they could have applied credit to my account balance instead of sending a check.*
- *My least favorite thing was getting a courtesy call from the collection team a mere two minutes before they arrived, which was also a bit earlier than the appointment was initially scheduled for.*

- *My least favorite thing was the collection team mentioning that I had narrowly missed winning a $1000 monthly prize for donating the oldest refrigerator.*
- *My least favorite thing was trying to determine whether our appliance qualified for the program.*

### Customers Noticing a Reduction in Their Electric Bill after Removing Appliances

Survey participants were asked if they have noticed a reduction in their electric bills since their old units were recycled. As indicated in Figure 16, only about a quarter of customers (24.2% or 39 out of 161) definitely noticed a reduction in their electric bills. The percentage of customers noticing a reduction in their utility bill is not significantly different depending on whether the customer recycled a refrigerator, a freezer or multiple units.

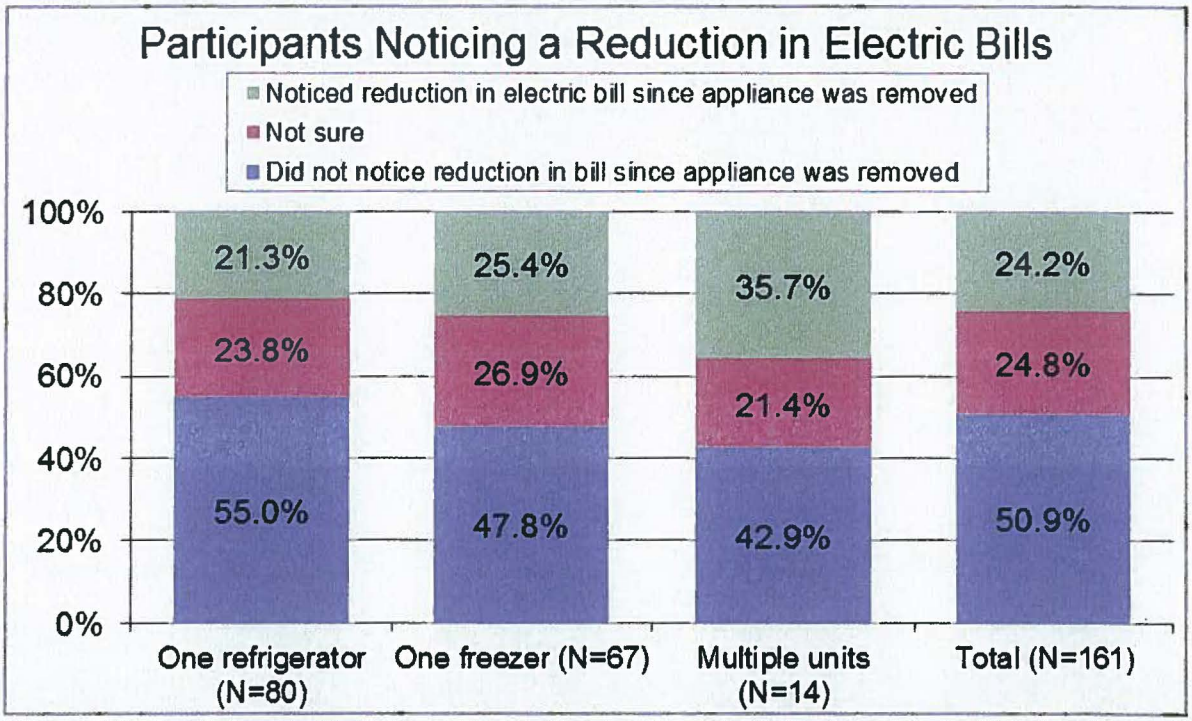


**Figure 16. Participants Noticing a Reduction in Electric Bills since Their Old Appliance(s) Were Removed by Unit(s) Recycled**

## Additional Energy Efficiency Actions since the Program

Surveyed program participants were asked, "*Based on your participation in the Duke Energy Appliance Recycling program, have you been inspired to take any additional actions to save energy?*", and also asked to rate the influence of the program on any actions taken.

Table 59 shows that the most common energy efficiency action taken since participating in the Appliance Recycling program is the installation of more efficient CFL and LED light bulbs (11.8% or 19 out of 16a). Additionally, 2.5% (4 out of 161) of participants have had a Home Energy House Call, another 2.5% (4 out of 161) say they are following tips from MyHER

reports, 1.2% (2 out of 161) say they have disposed of additional refrigerators and freezers, and one participant (0.6% of 161) joined Power Manager. However, most participants (68.3% or 110 out of 161) report not having taking any additional energy efficiency actions.

There is only one statistically significant difference between groups: Customers who recycled a refrigerator are more likely than the rest of the survey respondents to have installed more efficient lighting ($p<.05$ using student's t-test).

Overall, the average influence of the program on actions taken after participation is 6.1 on a 10-point scale, were a "10" indicates the highest influence. The highest average influence ratings of the program are for conserving water (9.0 for the two respondents who took this action ) and unplugging additional refrigerators and freezers (8.0 for the two respondents who took this action), although the number of respondents who took any given action is very small so these influence ratings should be taken only as directional indicators.

**Table 59. Energy Efficiency Actions Taken after Participating in the Program**

| Energy efficiency actions taken since the program | Recycled one refrigerator (N=80) | Recycled one freezer (N=67) | Recycled multiple units (N=14) | Total (N=161) | Average Rating Influence of Program |
|---|---|---|---|---|---|
| Use efficient light bulbs | 16.3% | 7.5% | 7.1% | 11.8% | 6.6 |
| Upgrade appliances / Energy Star | 3.8% | 4.5% | 7.1% | 4.3% | 3.1 |
| Upgrade HVAC system | 3.8% | 1.5% | 7.1% | 3.1% | 6.2 |
| Home Energy House Call | 2.5% | 3.0% | 0.0% | 2.5% | 7.3 |
| Heating & cooling decisions | 2.5% | 3.0% | 0.0% | 2.5% | 4.5 |
| Following MyHER tips / joined MyHER | 2.5% | 3.0% | 0.0% | 2.5% | 5.0 |
| Conserving water | 2.5% | 0.0% | 0.0% | 1.2% | 9.0 |
| Add insulation | 1.3% | 0.0% | 7.1% | 1.2% | 6.5 |
| Install programmable thermostat | 1.3% | 1.5% | 0.0% | 1.2% | 4.5 |
| Unplug extra fridge / freezer | 1.3% | 1.5% | 0.0% | 1.2% | 8.0 |
| Joined Power Manager | 0.0% | 1.5% | 0.0% | 0.6% | 2.0 |
| Other (listed below) | 8.8% | 4.5% | 7.1% | 6.8 | 7.5 |
| Did not take additional actions | 63.8% | 71.6% | 78.6% | 68.3% | NA |
| Don't know / not specified | 1.3% | 0.0% | 0.0% | 1.3% | NA |

*Percentages total to more than 100% because participants could mention multiple actions.*

Eleven surveyed participants (6.8% out of 161) mentioned "other" actions they have taken for energy efficiency. These responses are listed below.

**Recycled one refrigerator (N=7)**

- *We installed thermal curtains to cut down on drafts next winter.*
- *We had a new digital energy meter installed.*
- *We added a sub-floor in the basement.*
- *I have continued to consider recycling more appliances.*
- *I installed a new storm door.*

- *I recycle cans and plastic.*
- *I read the monthly energy-saving tips included in my Duke bill, such as using a crock pot instead of the oven.*

**Recycled one freezer (N=3)**

- *I thought if they're saying this would program would save me money, and they were willing to come forward to pay to do it, I could try to save money in other areas of my home.*
- *It has increased our energy usage awareness. We think about other appliances that we don't need to be using and appliances that we should be replacing with more efficient models.*
- *This summer, I used ceiling fans more to cut down on the cost of running air conditioning.*

**Recycled multiple units (N=1)**

- *I did some caulking and weather stripping. I wanted to try to do my part, also.*

## Participation in Other Duke Energy Programs

TecMarket Works asked Appliance Recycling program participants if they had participated in any other Duke Energy programs since recycling their appliances. As seen in Table 60, about a quarter of these customers report participating in at least one additional program (27.3% or 44 out of 161). The most common are CFL giveaway programs (13.0% or 21 out of 161), Power Manager (4.3% or 7 out of 161) and Home Energy House Call (also 4.3% or 7 out of 161).

There is only one significant difference between groups: Customers who recycled a freezer were more likely to sign up for Power Manager than customers who recycled a refrigerator ($p<.05$ using student's t-test).

**Table 60. Self-Reported Participation in Other Duke Energy Programs**

| Participation in other Duke Energy programs | Recycled one refrigerator (N=80) | Recycled one freezer (N=67) | Recycled multiple units (N=14) | Total (N=161) |
|---|---|---|---|---|
| CFL program | 10.0% | 14.9% | 21.4% | 13.0% |
| Power Manager | 1.3% | 7.5% | 7.1% | 4.3% |
| Home Energy House Call | 3.8% | 6.0% | 0.0% | 4.3% |
| My Home Energy Report | 3.8% | 3.0% | 0.0% | 3.1% |
| Rate lock-in program | 2.5% | 0.0% | 0.0% | 1.2% |
| Residential Smart $aver | 1.3% | 0.0% | 0.0% | 0.6% |
| CFLs through school (K-12 program) | 1.3% | 0.0% | 0.0% | 0.6% |
| StrikeStop (power surge protection) | 0.0% | 0.0% | 7.1% | 0.6% |
| Personalized Energy Report | 0.0% | 0.0% | 0.0% | 0.0% |
| Other (listed below) | 3.8% | 0.0% | 0.0% | 1.9% |
| None of the above | 75.0% | 70.1% | 64.3% | 72.0% |
| Don't know | 0.0% | 0.0% | 7.1% | 0.6% |

*Percentages total to more than 100% because participants could mention multiple programs.*

Three surveyed participants (1.9% out of 161) mentioned "other" Duke Energy programs they have joined since participating in the Appliance Recycling Program. These responses are listed below.

**Recycled one refrigerator (N=3)**

- *I am considering Home Energy House Call and the Peak Time Rebate Residential Pilot Program.*
- *I tried to sign up for the A/C checkup, but enrollment was full.*
- *I signed up for the Select Rate program.*

# Appendix A: Management Interview Instrument

Name: _____
Title: _____

**We are conducting this interview to obtain your opinions about and experience with the [STATE NAME] Appliance Recycling Program. We'll talk about the Program and its objectives, your thoughts on improving the program and its participation rates, and the technologies the program covers. The interview will take about an hour to complete. May we begin?**

## PROGRAM DESCRIPTION

In your own words, please describe the [STATE NAME] Appliance Recycling Program.

Please discuss the history and development of the program.

Why appliance recycling? Why not just disposal? Why can't customers drop off appliances?

Why refrigerators and freezers? (high energy consumption, common second units, models prior to 1993, etc.) Are other appliances being considered, such as room air conditioners, kitchen and laundry appliances? If so, which ones? When might they be incorporated into the program? What factors will be used to make the determination?

What are the program's goals? That is, what goals and metrics are you tasked with achieving (such as energy savings targets, numbers of new enrollments, numbers of units recycled, website visits, etc.)? What is the current performance towards these targets?

What are the current program's objectives? That is, aside from the numerical goals what is the program trying to accomplish (save energy, improve CSAT, protect environment, etc)? In your opinion, which objectives do you think are being met or will be met? Have the objectives changed over time. If yes, how do you think they have changed??

Are there any program objectives that are not being addressed or that you think should have more attention focused on them? If yes, which ones? How should these objectives be addressed? What should be changed? How will these changes improve the program? Would it improve customer satisfaction, lower program costs or delivery a better product to customers?

Should the program objectives be changed in any way because of market conditions, other external or internal program influences, or any other conditions that have developed since the program objectives were devised? What changes would you put into place, and how would it affect the objectives?

What are the program requirements for participation? What are the customer eligibility requirements?

What are the appliance requirements for program participation? Why unit sizes of 10-30 cu ft? Why is size important? Why a limit of 2 units?

Does ARP apply to renters as well as homeowners? Why or why not?

Are there any program changes that you think would improve the program's performance towards its goals and objectives?

## PROGRAM MANAGEMENT AND OPERATIONS

Please describe your role and scope of responsibility in detail. What is it that you are responsible for as it relates to this program? When did you take on this role? If a recent change in management…Do you feel that Duke Energy gave you enough time to adequately prepare to manage this program? Did you get all the support that you needed to manage this program?

Please review with us how the Appliance Recycling Program operates relative to your duties, that is, please walk us through the processes and procedures and key events that allow you do currently fulfill your duties.

Have any recent changes been made to your duties? If so, please tell us what changes were made and why they were made. What are the results of the change?

Is there any other person or group within Duke Energy that you work with on the implementation of this program? Who is that and what role do they serve?

## PROGRAM IMPLEMENTATION

Which third parties or vendors do you work with to implement this program? Please describe their roles in the implementation of the program.

Describe process of hiring and integrating JACO. Is the JACO program turn key?

What kinds of marketing, outreach and customer contact approaches do you use to make your customers aware of the program and its options?

Please describe the ARP process from initial marketing, through appliance pick up and dismantling, to verification and incentive processing.

Why must unit be plugged in at time of pick up?

Please describe the incentive process. How was the $30 incentive amount determined? How long does it take for customers to get paid? In what form is the payment?

Please describe the JACO tracking and reporting system. Is it online? What reporting can you monitor and access? Pick ups, energy savings, program costs, emission impacts, call center volume, etc.

How effective is JACO in its assigned role? What works well? What could be improved? (Repeat for each third party vendor.)

How often and in what form do you communicate with JACO and any other vendors? How would you characterize your working relationships?

How do you manage and monitor or evaluate third-party involvement or performance? What do you do if vendor performance is exemplary or below expectations?

What are your quality assurance measures? What have those efforts uncovered?

## MARKET ASSESSMENT AND BARRIERS

Describe the use of any advisors, technical groups or organizations that have in the past or are currently helping you think through the program's approach or methods. How often do you use them? What do you use them for?

What information, research or assessments are you using to identify barriers and to develop more effective approaches/mechanisms for achieving program goals?

Can you cite any market, operational or technical barriers that impede a more efficient program operation? Please describe.

## CUSTOMER RESPONSE

What percent of people schedule online pick up versus call in?

Do you assess, track or measure customer reaction to the program? If so, how?

What is the call volume for the program? Please characterize the nature of the calls?

How is customer satisfaction addressed in this program?

What percentage of participants donate to the Helping Hand assistance program?

## DATA COLLECTION AND ENERGY SAVINGS

How does Duke Energy track and attribute energy savings?

## CLOSING SUGGESTIONS AND COMMENTS

Overall, what about the Appliance Recycling Program works well and why?

Do you have any suggestions for how program performance toward goals can be increased?

In what ways can the Appliance Recycling Program's operations be improved?

If you could change any part of the program what would you change and why?

Are there any other issues or topics you think we should know about and discuss for this evaluation?

Is there anyone else that I should speak with to better complete this evaluation?

# Appendix B: Vendor Interview Instrument

Name: _____
Title: _____

**We are conducting this interview to obtain your opinions about and experience with the [STATE NAME] Appliance Recycling Program. We'll talk about the Program and its objectives, your thoughts on improving the program and its participation rates, and the technologies the program covers. The interview will take about an hour to complete. May we begin?**

## PROGRAM DESCRIPTION

In your own words, please describe the [STATE NAME] Appliance Recycling Program.

What is the history and relationship between JACO and Appliance Recycling Centers of America?

Why appliance recycling? Why not just disposal? Why can't customers drop off appliances?

Why refrigerators and freezers? (high energy consumption, common second units, models prior to 1993, etc.) Are other appliances being considered, such as room air conditioners, kitchen and laundry appliances? If so, which ones? When might they be incorporated into the program? What factors will be used to make the determination? Do you recycle other appliances for other utilities?

Please discuss the history and development of the program. When did you formally start the program with Duke? What dates did you start in each state?

What are the program's goals for 2012 and 2013 for each state? That is, what goals and metrics are you tasked with achieving (such as energy savings targets, numbers of new enrollments, numbers of units recycled, website visits, etc.)? How were these goals established? What is the current performance towards these targets?

What are the current program's objectives? That is, aside from the numerical goals what is the program trying to accomplish (save energy, improve CSAT, protect environment, etc)? In your opinion, which objectives do you think are being met or will be met? Have the objectives changed over time. If yes, how do you think they have changed??

Are there any program objectives that are not being addressed or that you think should have more attention focused on them? If yes, which ones? How should these objectives be addressed? What should be changed? How will these changes improve the program? Would it improve customer satisfaction, lower program costs or delivery a better product to customers?

Should the program objectives be changed in any way because of market conditions, other external or internal program influences, or any other conditions that have developed since the program objectives were devised? What changes would you put into place, and how would it affect the objectives?

What are the program requirements for participation? What are the customer eligibility requirements? Are you considering expanding to a wider audience?

What are the appliance requirements for program participation? Why unit sizes of 10-30 cu ft? Why is size important? Why a limit of 2 units? Why not built-ins, SubZeros?

Does ARP apply to renters as well as homeowners? Why or why not?

What are the requirements for the pick up location?

Are there any program changes that you think would improve the program's performance towards its goals and objectives?

## PROGRAM MANAGEMENT AND OPERATIONS

Please describe your role and scope of responsibility in detail. What is it that you are responsible for as it relates to this program? When did you take on this role? If a recent change in management…Do you feel that Duke Energy gave you enough time to adequately prepare to manage this program? Did you get all the support that you needed to manage this program?

Please review with us how the Appliance Recycling Program operates relative to your duties, that is, please walk us through the processes and procedures and key events that allow you do currently fulfill your duties.

Have any recent changes been made to your duties? If so, please tell us what changes were made and why they were made. What are the results of the change?

Is there any other person or group within Duke Energy that you work with on the implementation of this program? Who is that and what role do they serve?

## PROGRAM IMPLEMENTATION

Other than Duke Energy do you work with any other firms or organization to implement this program? Please describe their roles in the implementation of the program.

How is marketing handled? What is your relationship with Runion, Salzman, Einhorn? What marketing channels do you use? How are these coordinated? Tell me about your pop up museum, filet-a-frig, and other media events.

Help me to understand the mechanics of how the program operates. Walk me through the process by which a customer signs up for the program/requests an appointment. What info do you capture when the customer enrolls? What happens if the appointment time doesn't work for the customer? What happens if the customer can't be home?

Please describe the ARP process from initial marketing, through appliance pick up and dismantling, to verification and incentive processing.

What do you do while at the customer's house? Why must unit be plugged in at time of pick up?
Why do you start to dismantle the frig at the customer's house?

What does ATO stand for?

Can you describe the demanufacturing process for me? What are the environmental regulations and controls that go into this effort? Why are they important?

How is the program structured so that Duke Energy never actually takes ownership/possession of the appliance?

How are customer incentives handled? Please describe that process from start to finish.

What are your quality assurance measures? What have those efforts uncovered?

Please describe your tracking and reporting system. Is it online? What sort of tracking and reporting do you do? How often and in what format? Tell me about the customer dashboard.

Please characterize your performance to date. What are your SLAs? How are you doing towards them? Any lapses since you started?

How often and in what form do you communicate with Duke Energy and any other businesses? How would you characterize your working relationships?

What is the business cycle of the program? Are there certain times of the year that are busier than others? When and why? How do you take this into consideration for marketing and implementation?

How does the way you run the program for Duke Energy differ from how you run it for other utility clients?

## MARKET ASSESSMENT AND BARRIERS

Describe the use of any advisors, technical groups or organizations that have in the past or are currently helping you think through the program's approach or methods. How often do you use them? What do you use them for?

What information, research or assessments are you using to identify barriers and to develop more effective approaches/mechanisms for achieving program goals?

Can you cite any market, operational or technical barriers that impede a more efficient program operation? Please describe.

## CUSTOMER RESPONSE

What percent of people schedule online pick up versus call in?

Do you assess, track or measure customer reaction to the program? If so, how?

What is the call volume for the program? Please characterize the nature of the calls?

How is customer satisfaction addressed in this program?

## CLOSING SUGGESTIONS AND COMMENTS

Overall, what about the Appliance Recycling Program works well and why?

Do you have any suggestions for how program performance toward goals can be increased?

In what ways can the Appliance Recycling Program's operations be improved?

If you could change any part of the program what would you change and why?

Are there any other issues or topics you think we should know about and discuss for this evaluation?

Is there anyone else that I should speak with to better complete this evaluation?

# Appendix C: Used Appliance Dealer Survey Instrument

INSTRUMENT

## Respondent information

Name: _____ Title: _____

Address: _____ City: _____

Zip: _____ Phone: _____

## Introduction

Hello. I am calling on behalf of Duke Energy, which sponsors the Appliance Recycling program that collects and recycles old operating refrigerators and freezers. We are trying to figure out how this program is affecting the market for used refrigerators and freezers. First, we want to ask your opinions of the program and the effects it may or may not be having on your business and the market for used units. Then, we want to ask you some questions to understand how the market for used units operates. The information you provide will be combined with information from others and summarized to describe how this market works. As we are doing the interview, please feel free to let me know if you are not comfortable with answering any of the questions I ask.

## Respondent responsibilities

1. What are your primary responsibilities? *(Get respondent's title)*

## Effect of Appliance Recycling- program on market

2. Are you aware of Duke Energy's Appliance Recycling program? *(Describe program to respondent if not aware. The Duke Energy Appliance Recycling program pays the utility's residential customers a rebate to have their working refrigerators and freezers picked up and removed from their homes to be recycled in an environmentally safe way.)*

3. What are your opinions of the Appliance Recycling program?

4. What effect does the program have on your business? Why? *(Carefully probe for whether or not these effects have already happened. If they have already happened, ask for examples. If they have not already happened, ask about how big they think the program would have to be and how long they think the program would have to run before it started to have an effect on their business.)*

5. What effect does the program have on the supply of used refrigerators? Why? *(As with Q4, carefully probe for whether or not these effects have already happened.)*

6. What effect does the program have on the demand for used refrigerators? Why? *(As with Q4, carefully probe for whether or not these effects have already happened.)*

## Overview of operations

7. Please briefly describe how your business operates in the used refrigerator market. *(Obtain enough information to sketch flowchart)*

8. Do you also sell new refrigerators? What percent of the refrigerators you sell are new vs. used?

9. Considering the other businesses that you know of in STATE NAME that sell used refrigerators and freezers, how would you compare the number of units that your company sells compared to the number that they sell?
   - ☐ We sell more used units than the average company
   - ☐ We sell about the same number as other companies.
   - ☐ We sell fewer used units than the average company
   - ☐ Don't know/Not Sure

## Acquisition process

10. Describe the ways in which you locate and obtain used refrigerators? Has this changed in the last year? If so, how has this changed? *(For each way that units are located and obtained, probe for percent of units in which this method was used last year vs. now)*

| | Way unit is located and obtained | Refrigerators | |
|---|---|---|---|
| | | Percent of units last year | Percent of units now |
| a. | | | |
| b. | | | |
| c. | | | |
| d. | | | |
| e. | | | |

11. Who are your main suppliers of used refrigerators? *(Ask for description of each supplier)*

12. Roughly how many used refrigerators do you obtain in typical year? *(If not answered in Q4-Q6, then probe for changes in the last year)*

| | | Number of refrigerators |
|---|---|---|
| a. | Now | |
| b. | Last year | |

13. How do the number of refrigerators you obtain vary by supplier? *(Obtain percent breakdown of refrigerators by supplier)*

| | Supplier (from Q11) | Percent of refrigerators |
|---|---|---|
| a. | | |

| | | |
|---|---|---|
| b. | _____ | _____ |
| c. | _____ | _____ |
| d. | _____ | _____ |
| e. | _____ | _____ |

14. Do you have enough used refrigerators to meet customer demand? If not, why is there a shortage? *(If not answered in Q4-Q6, then probe for changes in the last year)*

15. Please describe the range of conditions of the units that you accept in terms of age, working condition, wear, damage, appearance, etc?

16. What steps do you take to prepare the units you accept for sale to the public?

17. What are the main reasons why you reject units?

18. What do your suppliers do with the units that you reject?

## Market for used refrigerators

19. Can you please characterize the general types of customers you sell to? (*Landlords, individuals, people looking for a primary or secondary unit, homeowners/renters/college students, etc.)*

20. What percent of the used refrigerators that you get in are made available for sale to your customers? What happens to the other percentages?

_____ %

21. Of the number you get in and make available for sale, what percent are actually sold?

_____ %

22. Typically about what percent of the units you make available for sale do you end up getting rid of because you were unable to sell them?

_____ %

23. What are the main reasons why you are unable to sell these units?

24. I would now like to ask you a hypothetical question: If your current used refrigerator stream was reduced in half, how would that effect your sales of used refrigerators?

25. What kind of things would you do to cope with this market reduction? Could you get more from other sources?

26. How successful do you think you would be in filling the void?