

# ThermWise® Direct-Install Pilot Program Evaluation

## Executive Summary

In 2017, Dominion Energy Utah (Dominion Energy or Company) launched the ThermWise® Direct-Install Pilot Program (the Direct-Install Pilot Program). This program was designed to engage those residential customers in areas with historically low participation rates for installation of air sealing, tier 1 and tier 2 attic insulation. Initially, the Utah Public Service Commission (Commission) authorized Dominion Energy to run the Direct-Install Pilot Program for three years. Over the initial three years of the Direct-Install Pilot Program the company has completed work on approximately 19,000 homes with over 37,000 measures rebated. Overall, Dominion Energy has been pleased with the participation levels in the program and the 96% positive customer satisfaction with the program.

In its Order dated December 13, 2019 in Docket No. 19-057-26 (the 2020 EE Budget Order) the Commission approved a one-year extension of the Direct-Install Pilot Program, which allowed for more participants to be included in the evaluation and measured for energy savings. In 2020, Dominion Energy's evaluation concluded that the Direct-Install Pilot Program achieved a natural gas realization savings rate of 77.81%. Based on these realization savings results, the Company has adjusted the cost effectiveness model and the previous deemed savings, to the actual realized savings.

## Program Description

Dominion Energy, its program administrator, Nexant, Inc. (Nexant), and selected contractors have implemented the Direct-Install Pilot Program. The Direct-Install Pilot Program is available to the Company's residential customers in selected areas. The Direct-Install Pilot Program's overall objective has been to reduce customer energy consumption through installation of cost-effective air sealing and insulation measures.

## Program Background

In Dominion Energy's 2017 Energy Efficiency and Market Transformation Budget Application in Docket No. 16-057-15 (the 2017 Application), the Company noted that "weatherization measures have been the leader in terms of customer interest and participation." (2017 Application at p. 7) The Company further indicated that it "has been pleased with the historical natural gas savings achieved by participating customers." (*Id.* at p. 7) Prior to seeking Commission approval for the Pilot Program, the Company recognized a trend of decreasing weatherization participation. "During meetings,

weatherization contractors have cited multiple reasons for this decline. Some of those reasons include increased marketing and collection costs associated with reaching the remaining rebate-eligible retrofit customers. As a result of these costs, contractors began to migrate to the more lucrative, less risky market segments". (*Id.* at p. 7)

The Company proposed to implement the Direct-Install Pilot Program in an effort to increase participation and decatherm savings. The Direct-Install Pilot Program would be designed to reach communities and customers with historically low participation in weatherization measures and would run for a period of three years. The Direct-Install Pilot Program is designed to encourage contractors to re-engage in the weatherization measures, which is a key component to customer participation. As part of the Direct-Install Pilot Program, the Company will pay the rebate directly to the contractors, rather than the customer, after the work is performed.

The Company proposed to begin the Direct-Install Pilot Program by contracting directly with qualified weatherization contractors already in the market. The Company selected contractors through a competitive request-for-proposal process. The Company selected contractors based on skills, experience, past performance, and pricing. The Company provided training and education to the contractors on correct marketing practices, program guidelines, and install requirements. The Company also provided ongoing training regularly through the pilot period by the Company to ensure compliance with program guidelines

Once contractors completed the weatherization work, the Company's inspectors performed quality control/assurance (QA/QC) on a percentage of jobs and documented Direct-Install Pilot Program compliance. Site inspections were random, and QA/QC work was done at a higher rate in the initial year of the program. As the program matured, the Company performed QA/QC inspections at a percentage necessary to maintain a high level of energy savings.

The Company has kept the Advisory Group informed on the progress of the Direct-Install Pilot Program throughout the pilot period and will continue to do so, throughout the life of the program.

In its Application in Docket No. 19-057-26 (the 2020 Budget Application), the Company filed for a two-year extension of the Direct-Install Pilot Program for the purpose of evaluating the results of the program. In the 2020 EE Budget Order, the Commission approved a one-year extension of the Direct-Install Pilot Program with the potential of one-year extension after the 2020 program year.

## Eligibility Requirements and Incentives

The ThermWise® Direct-Install Pilot Program was targeted to residential customers in the Company's Utah service territory. Based on prequalifying conditions by the approved Direct-Install contractors, a customer would install one or more of the

measures listed in Table 1, complete an application, and be verified eligible for the program by the program implementer before receiving a rebate.

Table 1 represents measures available through this program as well as baseline requirements, minimum efficiency requirements, and rebate amount for each measure offered.

**Table 1. List of Qualified Measures and Rebate Amount—Direct-Install**

Measure	Baseline Requirement	Minimum Efficiency Requirements	Measure Lifetime (yrs)	Installation by Prequalified Contractor Required	Rebate Amount
Attic Insulation, Tier 1	Existing home with gas heat	Increment of R-19 or higher	35	Yes	\$.20/ft
Attic Insulation, Tier 2	Existing home with gas heat	Increment of R-11 or higher	35	Yes	\$.07/ft
Air Sealing	Existing home with gas heat		35	Yes	\$200.00 + \$0.12/sq.ft. conditioned floor area, not to exceed \$850.00

### Program Participation

Energy savings have been attributed to the program through use of deemed savings estimates. Table 2 lists the number of measures installed in participating homes, net savings (Dth), and expenditures for the pilot period through the end of 2019. The 2020 program year is on track to meet program goals.

**Table 2. Program Participation and Savings Goals 2017–2019**

Program Year	Participating Measures	Dth Savings (net)	Actual Program Cost
2017	3,763	15,488	953,523
2018	14,755	77,695	4,796,896
2019	18,702	92,544	5,709,802
<b>Total</b>	<b>37,220</b>	<b>185,727</b>	<b>11,460,221</b>

### Impact Evaluation Methodology

This section describes the methodology used to develop Direct-Install Pilot Program adjusted gross energy savings, based on utility gas billing data.

## **Introduction**

A statistical billing analysis was conducted to determine adjusted gross savings and realization rates for the Direct-Install Pilot Program over the 2017, 2018 and 2019 participation years.

Measures installed through the Direct-Install Pilot Program included air sealing and insulation measures.

In the Direct-Install Pilot Program approximately 14% of the 2017- 2019 participants who meet the evaluation criteria, were reviewed. The 2020 participants could not be evaluated because of insufficient post-period billing data.

## **Billing Analysis Methodology**

To evaluate the Direct-Install Pilot program, the Company examined monthly billing data for participating residential customers with customer billing data ranging from 2016 – 2019. To be considered as part of the evaluation, participating customers must have at least 12 months of pre-period or one year of continuous billing prior to receiving the direct-install measures. The Company also reviewed billing data for each customer for the two-years of post-installation. Only customers who participated in the combined three measures of attic insulation tier 1, attic insulation tier 2, and air sealing were included in this analysis.

Based on the evaluation, the Company calculated the respective deemed savings amounts from the Energy Efficiency Model utilized in the Company's cost benefit analysis. These deemed savings values were derived as a function of the square footage from the specific customer and compared the savings values associated with the air sealing, attic insulation tier 1, and attic insulation tier 2. Given that the savings values vary from customer to customer and depending on the total insulated area or area covered by air sealing, the Company generated a respective function to produce a deemed savings by customer value for this analysis. The Company then multiplied the square footage by the average area insulated or area encompassed as analyzed by the Company's total average rate.

Moreover, consistent with standard evaluation practices, nonparticipant billing data accounts were obtained and analyzed for this study. Non-participant customers were included in this analysis to evaluate the changes in savings relative to the participating customers. Similarly, the Company utilized data for non-participating customers with three consecutive years of billing history for evaluation. This method of analysis was used to adjust (+/-) the deemed savings based on energy efficiency usage.

The formula for calculating deemed savings per customer is below.

$$\begin{aligned} &= \text{CustomerSquareTotalFootage} \times (\text{TotalAverageAirSealingAdjustment}) \\ &\times (\text{Savings per Square Foot AirSealing}) + \text{CustomerSquareTotalFoot} \\ &\times (\text{TotalAverageAtticInsulationTier1Adjustment}) \times (\text{Savings per Square Foot} \\ &\text{AtticInsulationTier1}) + \text{CustomerSquareTotalFootage} \\ &\times (\text{TotalAverageAtticInsulationTier2Adjustment}) \\ &\times (\text{Savings per Square Foot AtticInsulationTier2}) \\ &+/- \text{Nonparticipant Adjustment} \end{aligned}$$

For consistency of customer data analysis and customer comparison, Weather Normalized Data (WND) was used in this evaluation. The Company selected the weather normalized decatherm from its billing system. Weather normalized decatherms already take into analysis weather related gas consumption adjustments.

## Data Screening

The Direct-Install Pilot Program participant billing data was combined with residential nonparticipant billing data. The series of steps the Company used to screen participant and non-participant usage data is described below. The Company used this data to prepare non-participant selection and the final modeling analysis group. First, weather normalized decatherms were utilized for all points of analysis regardless of participation. Second, monthly Decatherm usage for pre- and post-periods were summarized for each account. Third, Direct-Install participant data was then removed from the analysis if any of the following screens applied:

1. The Company only considered participating customers who participated in all Direct-Install measures (air sealing, attic insulation tier 1, and attic insulation tier 2)
2. The Company only considered participating customers with at least 12 monthly bills of pre-installation usage and 24 monthly bills post-installation billing data.
3. The Company removed accounts with a usage change greater than or less than three standard deviations from the mean for pre-installation period to post period year 1 as outliers.
4. The Company removed accounts with a usage change greater than or less than three standard deviations from the mean for pre-installation period to post period year 2 as outliers.

These criteria, commonly used in billing data analyses, were selected to ensure sufficient user data was available and to reduce chances of including customers with significant changes (other than measures installed through the program), which may have impacted energy consumption. After applying the screening criteria, 1,336 Direct-Install Weatherization participants or approximately 40% of eligible participants remained in the analysis.

## Non-participant Selection

The Company selected non-participant customers in a fashion similar to that used to select participating customers. The Company utilized the same area locations as it did in selecting program participants, and it applied the following criteria in the selection process:

1. The Company only considered non-participating customers who had not participated in any Company-offered rebate programs.
2. The Company only considered non-participating customers who had at least 36 monthly bills beginning in 2016 and ending 2018.
3. The Company removed accounts with a usage change greater than or less than three standard deviations from the mean for pre installation period to post period year 1 as outliers.
4. The Company removed accounts with a usage change greater than or less than three standard deviations from the mean for pre installation period to post period year 2 as outliers.

After screening for non-participants, a group of 36,210 customers remained for analysis.

## Billing Analysis Results

To reduce anomalies commonly exhibited in the first year of post-measure installation, the Company only considered the second-year comparison to generate the realization rate. The following table illustrates the findings from the Direct-Install Pilot Program analysis. The analysis compares average estimated deemed expected savings with the average per participant compared to the program. Table 3 represents the natural gas realization savings rate of 77.81%.

**Table 3. Direct-Install Pilot Program Realization Rate**

A	B	C	D	E	F	G
				(C+D)		(D/E)
Direct-Install Participant Count	Non-Participant Count	Participant Savings (Dth)	Non-Participant Adjustment (Dth)	Participant Realized Savings (Dth)	Deemed Savings (Dth)	Realization Percentage
1,336	36,210	7.54	2.56	10.10	12.98	77.81%

## Process Evaluation Methodology

### Interviews with Program Implementation Contractors

Dominion Energy solicited responses from selected contractors to gain a better understanding of how the programs have been operating over the course of the pilot period. Some of their comments are listed below:

- *“We have been in the home energy efficiency industry for 11 years now and have worked with utility rebate programs around the country to offer these types of services to customers in single family, multi-family, and commercial properties. The Direct-Install Program has proven to be a successful way to work with homeowners to make energy improvements in their homes”.*
- *“The Direct-Install Program offers a huge benefit to homeowners as it offers a rebate to assist with the cost to make needed energy efficient upgrades to their homes. The majority of customers that we do this work for would never seek to have this work performed because the issues within their homes aren’t obvious or might be too expensive without the offered rebate. Much of the Direct-Installwork is performed in attics, crawlspaces, unfinished basements and mechanical rooms where homeowners spend very little time and so they aren’t aware of the problems that exist”.*
- *“The Program also offers a huge benefit to the contractor because the rebate is able to be sent directly to the contractor to ensure prompt payment which keeps costs low. Many customers that need to have this type of work performed in their homes are lower income and do not have the funds to pay for the work to be completed. Without the Direct-Install Program, the contractor is often left with large receivable accounts because homeowners receive the rebate and spend the funds leaving them with a new debt and no money to pay it. With receivables being high it forces the contractor to charge more for the services to make up for collections costs and funds that are deemed uncollectable”.*
- *“By offering the Direct-Install Program it allows Dominion Energy to assist contractors in targeting homes with high usage and assist homeowners in making beneficial home energy improvements. We have had countless customers thank us for this service noting the difference that they are able to feel in their homes almost immediately. We have been very pleased to be a part of this great program”.*
- *“We feel that the program is doing very well and look forward to continuing to grow and be a part of it in the future. The feedback that we get from past and current customers are all very positive. A lot of what we do is because of one customer's positive experience and them sharing it with a friend or a neighbor. We are receiving more inbound phone calls than we ever have, customers are calling to ask us about the program and wanting to schedule for work to be done or just calling in to say that they appreciate what the program was able to do for them. Our Technicians, Installers, and Salesman have remained relatively the*

*same for the past two years, they all enjoy what they do and this has helped us to become better and find new ways to improve the work we do for the program”.*

## Contractor Administered Participant Surveys

The Company requested that each of the program contractors conduct customer surveys in order to better understand the customers' perception of work completed and job satisfaction. Some contractors send the survey via email and others conduct telephone surveys with customers.

Of those surveyed, over 96% of participating customers responded positively to the following questions:

- The crew completing the work acted professionally.
- They explained the program in a way that I could understand.
- The Company scheduled to complete work arrived on time.
- The contractor reviewed the work completed and explained results.
- The contractor left my home your home clean at the end of the job.
- I was satisfied with the overall work performed in your home.

If a customer reports a negative response, contractors will incorporate those responses into the QA/QC process and conduct follow-up inspections. Inspections are completed by supervisors or crew leads. These inspections allow the contractor to gather additional customer feedback, inspect the quality of work that was completed and attempt to resolve any outstanding issues or concerns.

## Program Performance

In July of 2017 program work commenced after completing training and education with selected contractors. By the end of 2017, contractors had completed installation on approximately 1,300 homes. Contractors were able to complete work on approximately 8,000 homes in 2018 and in 2019 they completed work on approximately 10,000 homes. As of August 2020, contractors have completed work on approximately 7,000 homes.

Contractors have been working in targeted areas but working in separate locations to avoid any potential for customer confusion. They are permitted to complete referral work outside the targeted areas but that accounts for a small amount of their overall work. One of the selected contractors has been primarily working south of Salt Lake City and while the other contractor has primarily been working north and west of Salt Lake City.



## Program Updates

In 2018 the Company updated the program by including pipe insulation as a rebate-eligible measure in the Direct-Install Pilot Program.

The Direct-Install Pilot Program has seen great success. It has resulted in higher efficiency in thousands of homes, increased participation in targeted zip codes to more than double the historic participation levels. The Company has also found over the pilot period, that many of the homes in the targeted zip codes were moderate to low-income. Often, these homes exceed the income requirements for participation in the State Weatherization Agency's programs. Without the Direct-Install Pilot Program, it is unlikely that these customers would have had the opportunity to achieve the energy efficiency savings that this program offered. The Company also found that many of the participating homes were in need of a tighter structure/building envelope, and therefore required greater air sealing (instead of the anticipated need for additional attic, wall, or floor insulation). As a result, contractors adapted services to meet both program requirements and the customers' needs, and by doing so continued to help the customer and the Company achieve energy savings.

## Education and Outreach

The Company has worked closely with Nexant on program design and implementation and has conducted the following education and outreach over the pilot period:

- The Company directed participating contractors to zip codes with historically low Weatherization Program participation.
- The Company works closely with the Direct-Install contractors. The Company's Field Representatives are each assigned to interface with specific Direct-Install contractor's and they keep in close contact to address issues as they arise. Field Representatives meet regularly with their assigned contractors and with program staff to review progress and discuss those issues. Field Representatives also spent time onsite with contractors multiple times each month during the pilot period.
- Dominion Energy's Home Energy Experts worked with each Direct-Install Contractor to schedule an Energy Plan with interested customers. They reviewed work performed and offered other natural gas saving opportunities to customers.
- The Company has implemented practices to ensure accuracy of data. The Company has collected weekly rebate processing data, reviewed that data, and corrected information prior to sending that information for rebate

processing. The Company meets with Nexant regularly to discuss and review processing metrics.

- The Company works with contractors to ensure that their sales staff and installation crews receive training regarding the program. Contractor's market the program independent of each other, using primarily door-to-door or referral methods to generate participation. They hold regular meetings with their respective sales staff and installation crews to insure coordination and compliance with program guidelines.
- The Company also ensures that contractor's track and report regular program data on process and overall programs metrics. The Company also holds annual meetings with all contractor staff to review elements of the program and coordinate any changes.
- In 2019 the Company signed an Inter-Utility Agreement with Rocky Mountain Power under which the two utilities to more closely coordinate efforts related to energy efficiency and the Direct-Install Pilot Program.

Additionally, the Company has implemented processes to better manage the program and participation. Those modifications include :

- Utilizing Nexant, third party processor, to update/review program processes;
- Reviewing standard installation practices and conducting contractor education to help improve program outcomes;
- Developing an in-house customer call process to help answer questions related to the Direct-Install Pilot Program in a more timely and accurate manner;
- Managing regular meetings with approved contractors to discuss inspections, customer feedback, and program requirements.

## **Program Barriers**

The Direct-Install Pilot Program has been very successful at reaching customers in underserved neighborhoods and providing them with energy efficiency solutions. As a result, the remaining target areas will likely put contractors in a position to be working in closer geographic proximity to each other. The Company will develop strategies and work with closely with contractors to ensure that their efforts do not overlap, and to reduce the likelihood that customer confusion might occur.

## Goals for Future Program Years

If the Commission approves continuation of the program Dominion Energy plans to:

- Implement measures in more rural areas of the state;
- Continue to explore efforts to coordinate with Rocky Mountain Power;
- Expand offerings to include other cost-effective measures; and
- Enhance customer experience and communicate customer benefits.

## Conclusion

Overall, the Direct-Install Pilot Program has been a successful program with high participation, especially for those areas that have typically seen lower historical participation in the ThermWise® Energy Efficiency programs. As a result of the evaluation, the program is realizing 77.81% of the deemed savings.

The Company has adjusted the deemed savings rate of 12.98 decatherm to the realized rate of 10.10 decatherms for the direct-install measures. With this change, the program remains cost effective with the current modeled variables and the latest gas rates.