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July 15, 2021

Ms. Lisa Felice
Executive Secretary
Michigan Public Service Commission
7109 West Saginaw Highway
Lansing, MI 48917

RE: In the matter, on the Commission's own motion, regarding the regulatory reviews, revisions, determinations, and/or approvals necessary for DTE GAS COMPANY to fully comply with Public Act 295 of 2008, as amended by Public Act 342 of 2016.
MPSC Case No. U-20871

Dear Ms. Felice:

Attached for electronic filing in the above referenced matter is DTE Gas Company's Evaluation and Reconciliation Reports for Plan Year 2020. Also attached is the Proof of Service.

Very truly yours,

David S. Maquera

DSM/kbk
Attachments
cc: Service List



Audit & Weatherization Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-AW-01

Acknowledgements

Primary Contributors

The following individuals from Guidehouse developed this report:

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- › Brian Chang

Secondary Contributors

The following individuals from Guidehouse also provided critical guidance and advice contributing to this report:

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- › Debbie Brannan
- › Jessica Minor-Baetens
- › Joshua Rego
- › Nicole Reed Fry

DTE Contributors

Guidehouse gratefully acknowledges the generous and timely assistance of DTE Energy staff that have provided guidance and input throughout the project including, but not limited to:

- › Jason Kupser
- › Kevin Bilyeu
- › Dennis Mullan
- › Toben Galvin
- › Shalini Lawson
- › DTE PM
- › José Gonçalves

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, ICF:

- › Bill Allemon

Evaluation Context

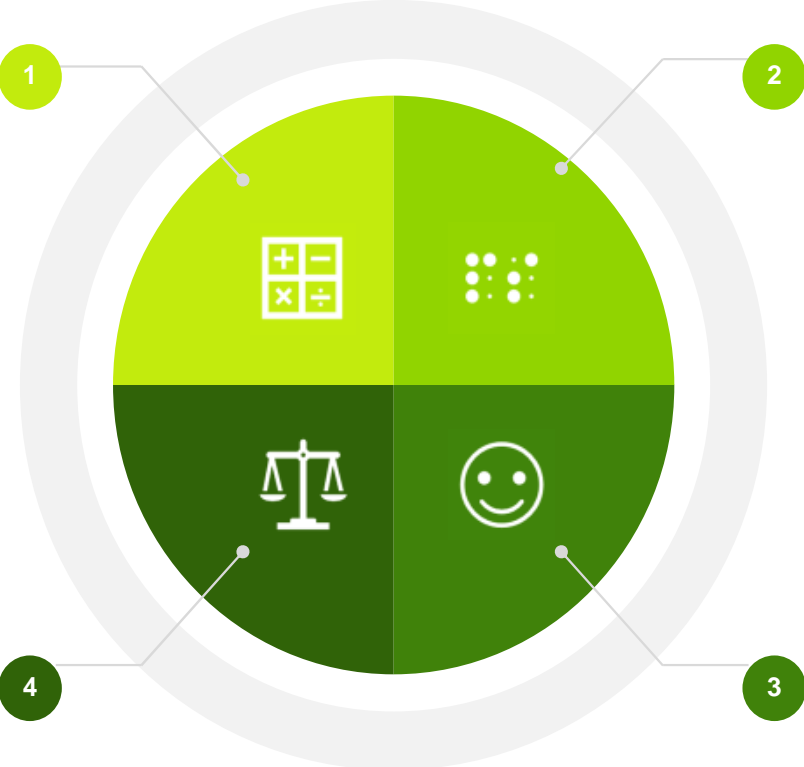
In PY2020, DTE Energy's (DTE's) Audit & Weatherization (A&W) program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric, demand, and gas savings to support DTE's annual reconciliation filing.

Net-to-Gross (NTG)

Guidehouse computed and provided program-level FR, SO, and NTGR values.



Installation Rate Adjustment Factor (IRAF)

Guidehouse provided fuel-neutral IRAF values for the program as a whole, and for each measure grouping.

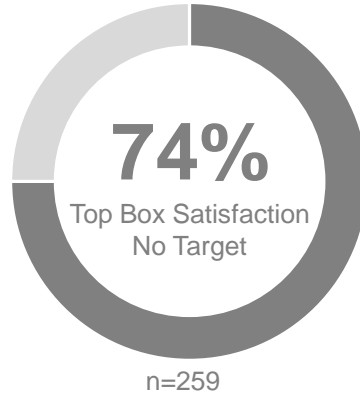
Satisfaction

Guidehouse provided program participant satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the customer experience.



Customer Satisfaction

Overall and Top Box



0 - 5	"Extremely long to process and was never given any updates."
6 - 8	"Lack of information and communication of what [my contractor] needed."
9 - 10	"It was easy/painless. Contractor did all the paperwork. I just reaped the expected rebate"

"The rebate amount was insufficient."
"For what I invested in my windows the rebate was small so I wish there was other ways that DTE could get involved."
"Everything was very smooth from the application through the payment."



Overall Satisfaction Achieved

The A&W program achieved the overall customer satisfaction target with 93% (+/- 2%). Overall satisfaction was 2 percentage points below the program's target of 95%, though not statistically different. Top box satisfaction was 74% (+/- 4%), 6 percentage points lower than in PY2019.



Home Performance Satisfaction

Top Box Satisfaction was 86%, 36 percentage points higher than PY2019. Overall Satisfaction was 86%, 3 percentage points higher than PY2019 (PY2020 n=7).¹



INWIN Satisfaction

The Top Box Satisfaction score was 74%, 8 percentage points lower than PY2019, and Overall Satisfaction was 9%, 2 percentage points lower than PY2019 (PY2020 n=251).

1. The program component known as Home Performance had seven survey completes in PY2020. This is similar to PY2019 when we had 12 survey completes for this program component.

IRAF

Year-over-year



Fuel-Neutral IRAF Values



The fuel-neutral Installation Rate Adjustment Factor (IRAF) is **1.00** in PY2020 (unchanged from PY2019).

Guidehouse performed surveys to collect primary data on installation rates. Our analysis found:

- IRAF for the Windows/Doors, Insulation, and Other measure strata was 1.00, unchanged from previous years.
- Measure-level IRAF for Windows/Doors, Insulation, and Other measures was 1.00 each.¹

1. The Other stratum includes infiltration, HVAC, and thermostat measures, but no thermostat sites were included in survey responses. Therefore, part-use factor analysis was not applicable for PY2020.

Net-to-Gross

Year-over-year change in program-level net-to-gross (NTGR)

Spillover Findings¹

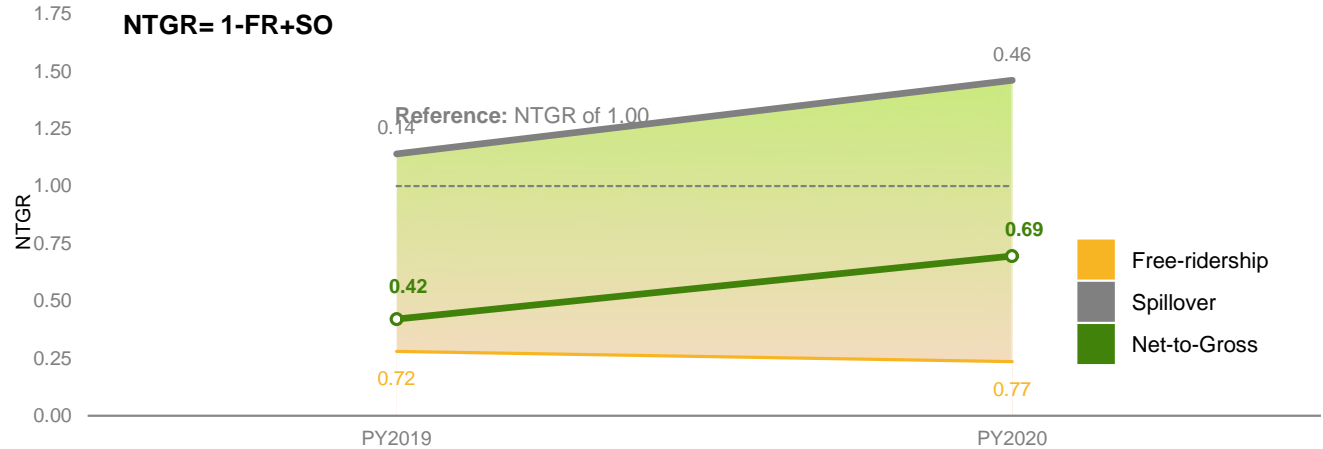
- Spillover (SO) is significantly up in PY2020, to 0.46.²
- SO was driven most by equipment (84% of SO savings), and to a lesser extent by behavioral actions (16%).³
- Most equipment SO was for additional Windows (55%) or Insulation (16%).⁴

Free-Ridership Findings⁵

- Free-ridership (FR) is up in PY2020, to 0.77.⁶
- FR was above 0.5 for all three measure strata, but highest at 0.8 for Windows, which are the largest component of program savings.

Net-to-Gross Findings⁷

- The net-to-gross ratio (NTGR) is 0.69 in PY2020, up from PY2019 and closer to PY2018 and earlier program years.



1. Guidehouse implemented an updated spillover methodology in PY2020, for consistency across multiple residential programs.
2. Guidehouse conducted a year-end spillover survey for the first time in PY2020. Previously, spillover had been captured in the monthly surveys, not allowing as much time for spillover to occur. This would explain the increase in spillover between PY2019 and PY2020. The spillover analysis for A&W includes participant spillover. It does not include non-participant spillover.
3. Over half (52%) of behavioral SO savings were from customers programming thermostats and following learned settings on smart thermostats. Other major sources were setting higher cooling setpoints and lower heating setpoints (25%), changing furnace filters (9%), and washing laundry using cold water (9%).
4. The remaining equipment SO came from thermostats (12%), heat pumps (6%), furnaces (4%), and pipe wrap insulation (2%). Other measures like water heaters and appliances each made up less than 2% of SO savings.
5. Guidehouse implemented an updated free ridership methodology in PY2020, for consistency across multiple residential programs.
6. The FR relative precision was 11.8% with a 90% confidence interval.
7. Beginning in PY2019, Guidehouse performed NTG analysis in Excel utilizing the PY2018 R code methodology. Guidehouse identified a methodology error in the FR calculation that had persisted for several years. The error inappropriately attributed a FR of 0 to participants who indicated FR. This led to lower FR and SO values which directly impacted the elevated NTGR values seen in previous years. The QC process was updated in PY2019 and going forward to ensure the updated NTG methodology is accurately capturing and transposing the correct FR values.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 93 percent, while Top Box satisfaction was 74 percent.

Program IRAF was 1.00 in PY2020, and was consistent with values measured in PY2019.

NTGR in PY2020 was 0.69, up from PY2019 and closer to PY2018 and earlier program years.

FR was up in PY2020, to 0.77.

SO is significantly up in PY2020, to 0.46.



Business Energy Consultation Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-BEC-01

Acknowledgements

Primary Contributors

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Secondary Contributors

The following individuals from Guidehouse also provided critical guidance and advice contributing to this report:

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- › Joshua Rego
- › Shannon Dorato

DTE Contributors

Guidehouse gratefully acknowledges the generous and timely assistance of DTE Energy staff that have provided guidance and input throughout the project including, but not limited to:

- › Jason Kupser
- › Kevin Bilyeu
- › Dennis Mullan
- › Shalini Lawson
- › Jeremy Cappello
- › Ken Randazzo

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, SEEL:

- › Scott Alan Davis
- › Jamarr Hill

Evaluation Context

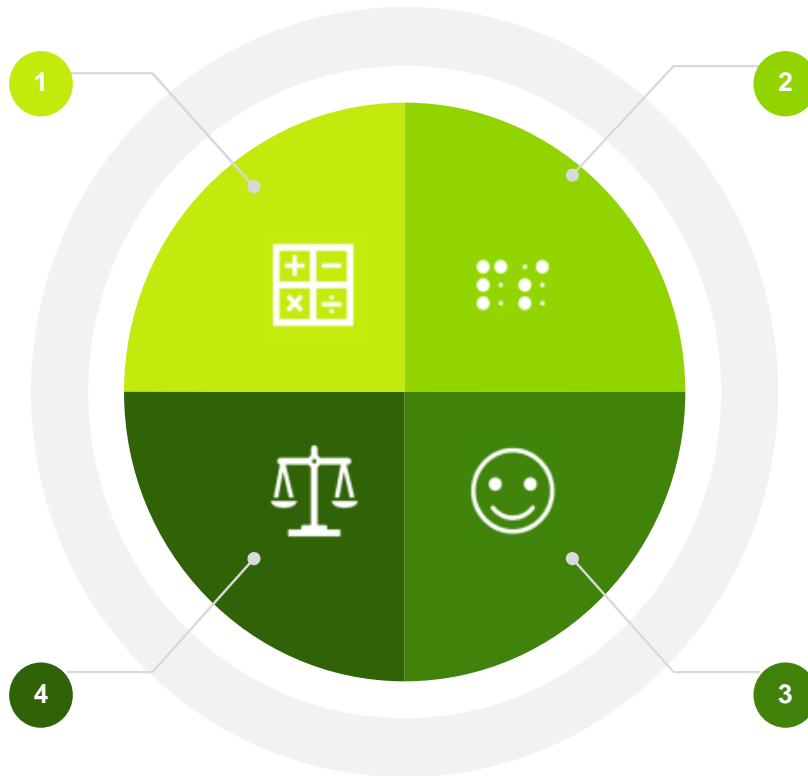
The Business Energy Consultation (BEC) Program offers direct install (DI) measures at no cost and incentives for other energy efficiency measures. In PY2020, DTE Energy's (DTE's) program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric and gas savings to support DTE's annual reconciliation filing.

Net-to-Gross (NTG)

Guidehouse computed and provided program-level FR values.



Installation Rate Adjustment Factor (IRAF)

Guidehouse provided fuel-neutral IRAF values for the program as a whole, and for each measure grouping.

Satisfaction

Guidehouse provided program participant satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the customer experience.

Evaluated

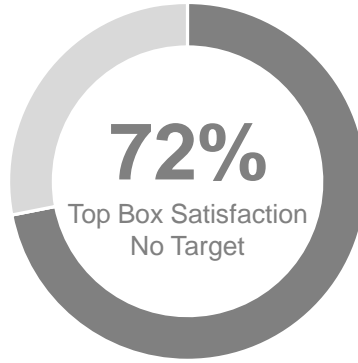
Not Applicable

Customer Satisfaction

Overall and Top Box



n = 59 monthly surveys



n = 59 monthly surveys

0 - 5

"I would have liked more information on my equipment, like is [it] too old. Does it need regular maintenance, etc."

6 - 8

"Basically, I was more than satisfied, but it wasn't perfect. There are other things that could have been done."

9 - 10

"Thank you DTE for being so professional. They [the TA] was phenomenal. They cleaned up after themselves and made sure to check in with me."

"They [the measures] did not work properly."

"I wish info was known sooner, learned about benefits and know more about other incentives and programs."



Overall Program Satisfaction

- The BEC program has consistently outperformed overall customer satisfaction targets.
- Overall Satisfaction for PY2020 is 7 points above the program's target of 88% (± 5 percentage points).
- Top Box Satisfaction is 72%, a decrease of 2 percentage points since PY2019 (± 10 percentage points).
- While Overall Satisfaction for the BEC program increased, it is not statistically different than PY2019.



Drivers of Satisfaction

- Satisfaction for the energy savings report continues to rank among the lowest of program delivery components.

IRAF

DI year-over-year



Fuel-Neutral IRAF Values



The fuel-neutral IRAF for the DI component of the program was down in PY2020.

Guidehouse performed field verification visits to collect primary data on installation rates. Our analysis found:

- The program-level DI IRAF is 0.90 (± 4 points) in PY2020, a decrease of 4 points from PY2019.
- The decrease in the program-level IRAF was due to a decrease in IRAFs across all measures in the DI program component with the primary driver being misreporting.
- In PY2020, the QC protocol was reduced from 100% to 50% for all DI measures.

IRAF

TA component



Fuel-Neutral IRAF Values

	PY2020 IRAF
BEC	0.87 (\pm 0.06)
SBF	0.97 (\pm 0.11)
Illinois-based Small Business Program ¹	0.99 (\pm N/A)

The fuel-neutral IRAF for the TA component of the program is 0.87 (\pm 6 points) in PY2020.

Guidehouse performed field verification visits to collect primary data on installation rates. Our analysis found:

- IRAF for the TA component of the program is similar to other DTE TA programs and similar TA programs in other utility territories.

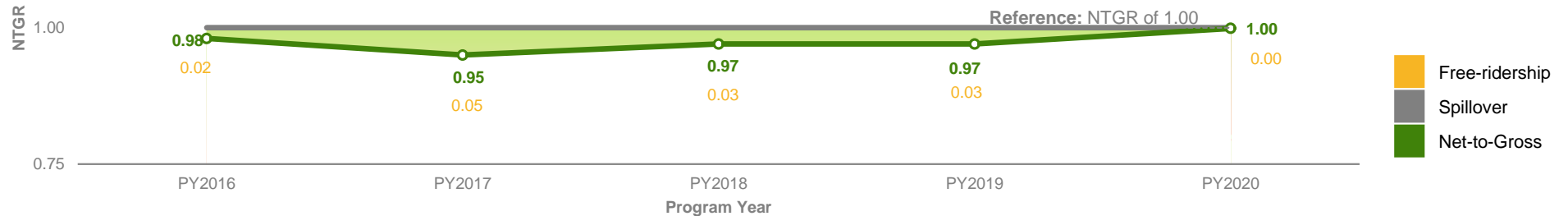
1. The Illinois (IL) Small Business Program uses a realization rate (RR), which is determined using a database review. This Small Business Program does not have a distinct DI program, but emphasizes their rebate program, that focuses primarily on lighting.

Net-to-Gross Ratio

DI Customer

1.25

$$\text{NTGR} = 1 - \text{FR} + \text{SO}$$



Spillover Findings

- Historically, BEC DI Spillover (SO) was negligible¹ and was not analyzed in PY2020.

Free-Ridership Findings

- Year-over-year free-ridership (FR) fluctuates but is 0.00 in PY2020.

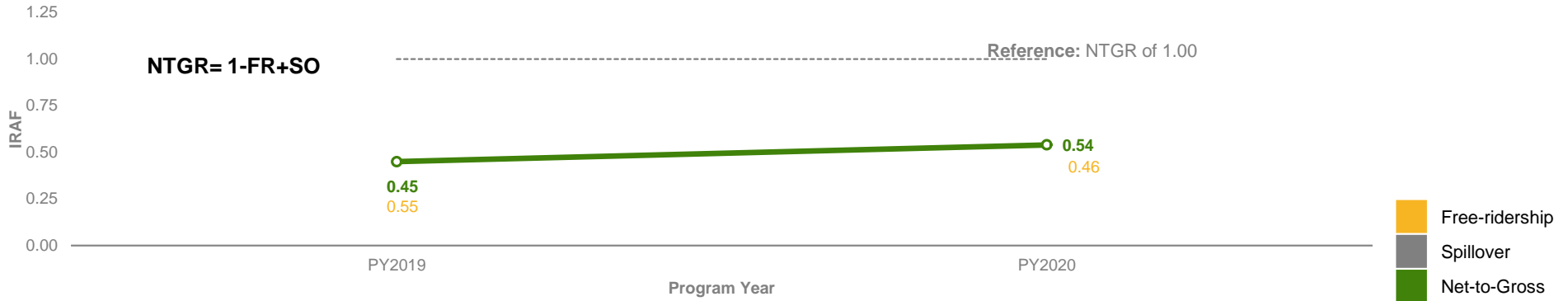
Net-to-Gross Findings

- The net-to-gross ratio (NTGR) of 1.00 in PY2020, increased from 0.97 in the previous program year.

1. Spillover was evaluated from PY2014 – PY2018 and had a value of less than ten percent each year.

Net-to-Gross Ratio

TA Customer



Spillover Findings

- SO was not calculated in the PY2020 program year.

Free-Ridership Findings

- TA FR is 0.46 (n=7). TA FR is based on perspectives of both the participant and the TA.
- FR values align with similar DTE TA focused programs, such as the C&I Downstream Program.

Net-to-Gross Findings

- The NTGR of 0.54 in PY2020, increased 14 points since PY2019.

Key Findings

DI Customer Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 95 percent, while Top Box satisfaction was 72 percent.

Program IRAF decreased by four percentage points in PY2020 to 0.90.

NTGR in PY2020 was 1.00, increased from 0.97.

FR was 0.00 in PY2020.

SO has historically been negligible, and therefore was not evaluated in PY2020.

Key Findings

TA Customer Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 95 percent, while Top Box satisfaction was 72 percent.

Program IRAF for PY2020 was 0.87.

NTGR in PY2020 increased 14 points to 0.54.

FR is for PY2020 was 0.46.

SO was not evaluated in PY2020.



C&I Non- Prescriptive Program

Program Year (PY) 2020
Evaluation Report

July 8, 2021



Report ID: DTE-PY2020-MPSC-CINP-02

Acknowledgements

Primary Contributors

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The following individuals from Guidehouse also provided critical guidance and advice contributing to this report:

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- › Debbie Brannan
- › Jessica Minor-Baetens
- › Joshua Rego
- › Emily Cross

DTE Contributors

Guidehouse gratefully acknowledges the generous and timely assistance of DTE Energy staff that have provided guidance and input throughout the project including, but not limited to:

- › Jason Kupser
- › Kevin Bilyeu
- › Dennis Mullan
- › Toben Galvin
- › Shalini Lawson
- › Alison Jaworowski
- › Ken Randazzo

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, DNV GL:

- › Taylor Searcy
- › Sean McCoy
- › Jamie McIver
- › William Ringrose

Evaluation Context

The Non-Prescriptive (NP) program targets lighting; heating, ventilation and air conditioning (HVAC); and industrial process measures not in the Michigan Energy Measures Database (MEMD) and that require custom Measurement & Verification (M&V). In PY2020, DTE Energy's (DTE's) program objectives influenced our key areas of evaluation focus.

Reconciliation

Compared the EOPT to the IC database to ensure no discrepancies between the two.

Net-to-Gross (NTG)

NTG research for C&I Non-Prescriptive is included in the C&I Process report.



Realization Rate (RR)

Gained understanding of the RR and factors leading to discrepancies in reported electric and gas savings, identifying opportunities to improve calculation methodologies and the accuracy of reported custom measure savings.

Satisfaction

Satisfaction research for C&I Non-Prescriptive is included in the C&I Process report.

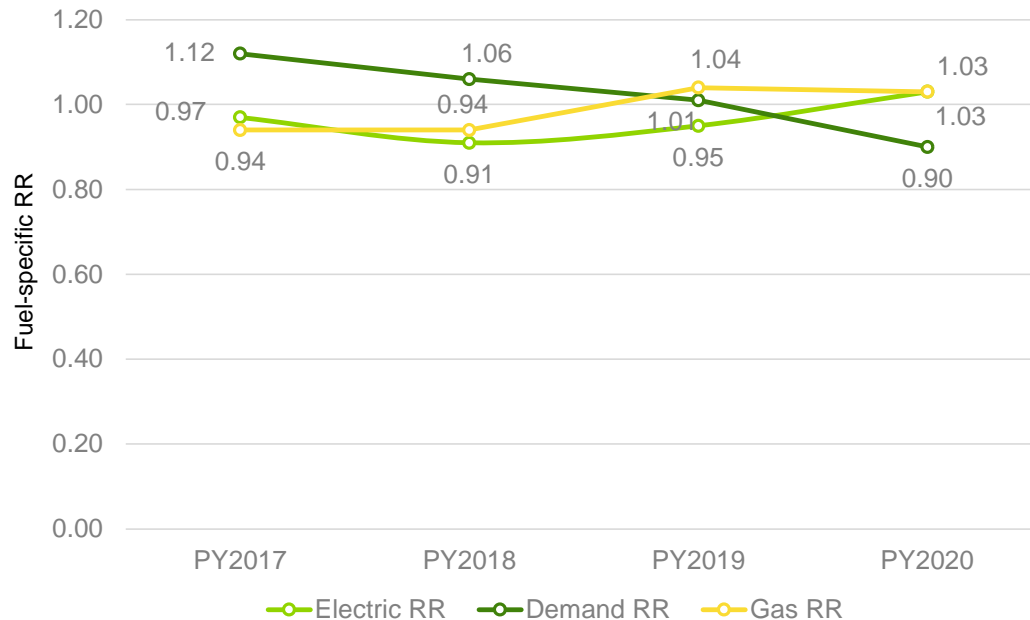


RR

Year-over-year (Evaluation Summary)



Fuel-Specific RR Values



The 3-year fuel-specific RRs are up for electric and down for demand and gas in PY2020; however, all are within ± 0.10 around $RR=1.00$.

Guidehouse performed desk reviews and onsite verification visits to collect primary data on realization rates. Our analysis found:

- The electric RR increased due to the addition of non-lighting electric projects whose RRs are close to 1.00.
- The demand RR is down due to the implementer not using a coincidence factor that corresponds to the custom reported hours-of-use (HOU).
- The gas RR decreased slightly due to projects with high RRs dropping out of the 3-year sample.

Key Findings

Critical learnings from PY2020 evaluation

Finding

3-year fuel-specific RRs are up for electric and down for demand and gas in PY2020.

Electric RR increased due to the addition of non-lighting electric projects whose RRs are close to 1.00.

Demand RR is down due to the implementer not using a coincidence factor that aligned with the custom reported hours of operation.

Gas RR decreased slightly due to projects with high RRs dropping out of the 3-year sample.



C&I Prescriptive Program

Program Year (PY) 2020
Evaluation Report

July 8, 2021



Report ID: DTE-PY2020-MPSC-CIP-02

Acknowledgements

Primary Contributors

The following individuals from Guidehouse developed this report:

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Secondary Contributors

The following individuals from Guidehouse also provided critical guidance and advice contributing to this report:

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- › Debbie Brannan
- › Jessica Minor-Baetens
- › Joshua Rego
- › Emily Cross

DTE Contributors

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- › Jason Kupser
- › Kevin Bilyeu
- › Dennis Mullan
- › Toben Galvin
- › Shalini Lawson
- › Alison Jaworowski
- › Ken Randazzo

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, DNV GL:

- › Taylor Searcy
- › Sean McCoy
- › Jamie McIver
- › William Ringrose

Evaluation Context

The C&I Prescriptive program targets measures in the Michigan Energy Measures Database (MEMD) and require tracking data review and measure installation measurement and verification (M&V). In PY2020, DTE's program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric, demand, and gas savings to support DTE's annual reconciliation filing.

Net-to-Gross (NTG)

NTG research activities are included in the PY2020 C&I Process Evaluation Report.



Installation Rate Adjustment Factor (IRAF)

Guidehouse provided fuel-specific IRAF values for the program, and for each measure grouping.

Satisfaction

Satisfaction research is included in the PY2020 C&I Process Evaluation Report.

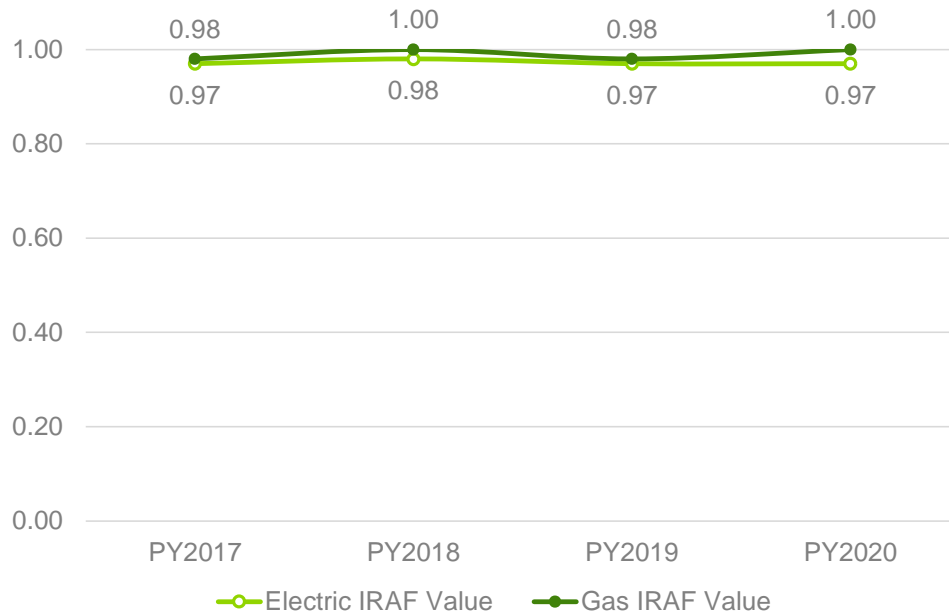


IRAF

Year-over-year



Three-Year Fuel-Specific IRAF Values



Guidehouse performed onsite verifications in PY2018, PY2019, and PY2020 to calculate the PY2020 IRAF that will be applied to determine verified gross savings in PY2022. The 3-year fuel-specific IRAF remained the same for electric and is up slightly for gas in PY2020.

Our analysis found:

- Almost all measures are installed and operating as expected.
- A few projects were missing equipment, but no systematic trends were identified.

Key Findings

Critical learnings from PY2020 evaluation

Finding

In PY2020, the 3-year fuel-specific electric RR was 0.97. The 3-year fuel-specific electric RR was 1.00.

Almost all measures were installed and operating as expected. A few projects were missing equipment, but no systematic trends were identified.



C&I Process Program

Program Year (PY) 2020
Evaluation Report

July 8, 2021



Report ID: DTE-PY2020-MPSC-PROC-02

Acknowledgements

Primary Contributors

The following individuals from Guidehouse developed this report:

- › Dave Bluestein
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Secondary Contributors

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- › Debbie Brannan
- › Jessica Minor-Baetens
- › Joshua Rego
- › Nicole Reed Fry
- › Latisha Younger-Canon

DTE Contributors

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- › Jason Kupser
- › Kevin Bilyeu
- › Dennis Mullan
- › Shalini Lawson
- › Alison Jaworowski
- › Ken Randazzo

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, DNV GL:

- › Sean McCoy
- › Taylor Searcy
- › Jamie McIver
- › Terri Cook

Evaluation Context

The Downstream C&I program offers prescriptive and non-prescriptive solutions to DTE C&I customers. In PY2020, DTE's program objectives influenced our key areas of evaluation focus.

Reconciliation

Reconciliation activities are covered in the 2020 C&I Prescriptive and Non-Prescriptive Evaluation Reports.

Net-to-Gross (NTG)

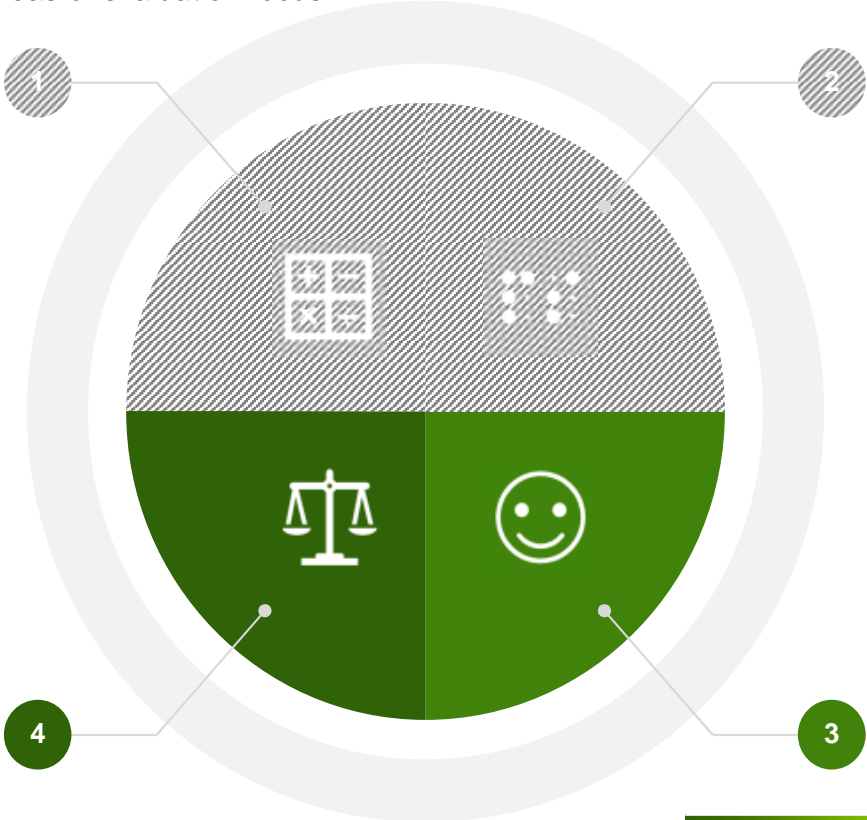
Guidehouse computed and provided program-level FR values.

Installation Rate Adjustment Factor (IRAF) and Realization Rate (RR)

IRAF and RR evaluation activities are covered in the 2020 C&I Prescriptive and Non-Prescriptive Evaluation Reports.

Satisfaction

Guidehouse provided program participant satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the customer experience.



C&I Process Program Evaluation Report

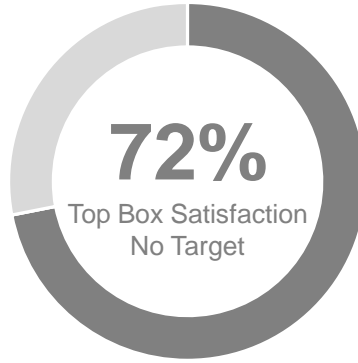
Evaluated	Covered in C&I P/NP reports
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Customer Satisfaction

Overall and Top Box



n = 129



n = 129

0 - 5

"As a business owner and a DTE employee - the process of the rebate is very difficult and not engaging. I believe that this can be done different and simpler. Great program but the application process is a nightmare. I am happy to discuss."

6 - 8

"Some aspects of the interactive PDF [incentive application] wouldn't work."

"Please include a building and sight description when communicating projects."

9 - 10

"This program and the people that are running it are first class. Everything from the beginning process to the end have gone very smooth both times I applied for it. Because the system is so good, I will be applying for my third energy upgrade project soon. Thank you DTE!!"



Overall Satisfaction Increased

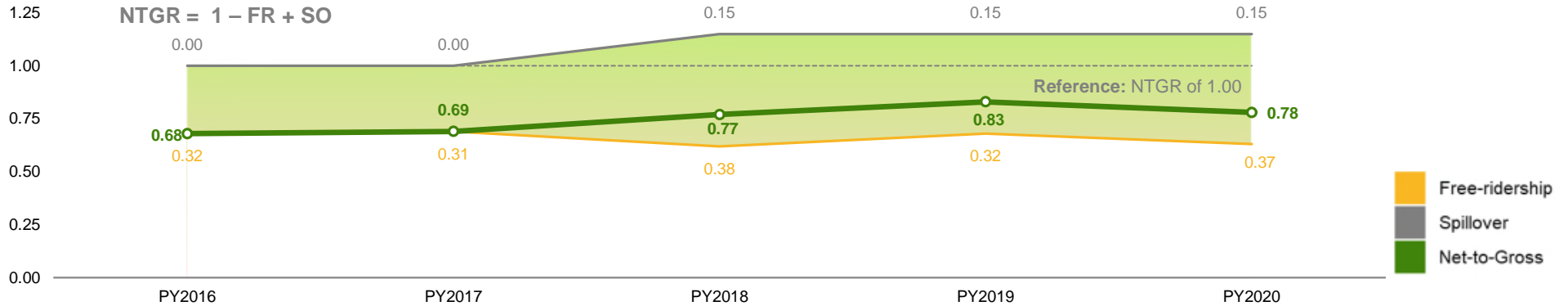
The Downstream C&I program has consistently out-performed Overall Satisfaction targets and succeeded with high Top Box Satisfaction results. Overall Satisfaction was 3 percentage points higher than the PY2019 results and 4 percentage points above the program's target of 92%.



Top Box Satisfaction Decreased

Top Box Satisfaction (a score of 9 or 10 on a 0-10 scale) decreased from the PY2019 result of 77%. The pandemic reduced the number of overall survey completes driving the fluctuation in Top Box Satisfaction, but the results are still on par with prior years.

Net-To-Gross Ratio (NTGR)



Spillover Findings

- Guidehouse did not conduct SO research in PY2020 and used the SO value (0.15) from the most recent evaluation.¹
- The program could benefit from renewed input from trade allies on sales not attributed to the program to refresh non-participant SO.

Free-Ridership Findings

- FR increased slightly from PY2019 (0.37 from 0.32) but remain largely consistent with the prior four program years.
- Fluctuation in FR is likely caused by the reduction in survey responses caused by the pandemic.²

Net-to-Gross Findings

- The NTG ratio (NTGR) of 0.78 in PY2020 is down slightly from PY2019 (0.83) due to the increase in FR.
1. Guidehouse last estimated spillover in PY2018 using non-participant research through interviews with participating Trade Allies.
 2. The fluctuation in free-ridership is within the margin of error for self-reported surveys and remain consistent with prior years. Guidehouse reviewed the types of projects conducted during the pandemic and did not find significant deviation from prior years.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 96 percent, while Top Box satisfaction was 72 percent.

NTGR in PY2020 is 0.78, down from 0.83 in PY2019.

FR is 0.37, up from 0.32 in PY2019.

SO research was not conducted in PY2020.



Energy Efficiency Assistance Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-EEA-01

Acknowledgements

Primary Contributors

The following individuals from Guidehouse developed this report:

- › Meg Campbell
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- › Brian Chang

Secondary Contributors

The following individuals from Guidehouse also provided critical guidance and advice contributing to this report:

- › Craig McDonald
- › Debbie Brannan
- › Jessica Minor-Baetens
- › Joshua Rego

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- › Jason Kupser
- › Kevin Bilyeu
- › Dennis Mullan
- › Toben Galvin
- › Shalini Lawson
- › David Becker
- › Tanisha Rawls
- › Jeff LeBrun

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementers, SEEL and ICF:

- › Michelca Scruggs, SEEL
- › Scott Davis, SEEL
- › Chris Munn, ICF

Evaluation Context

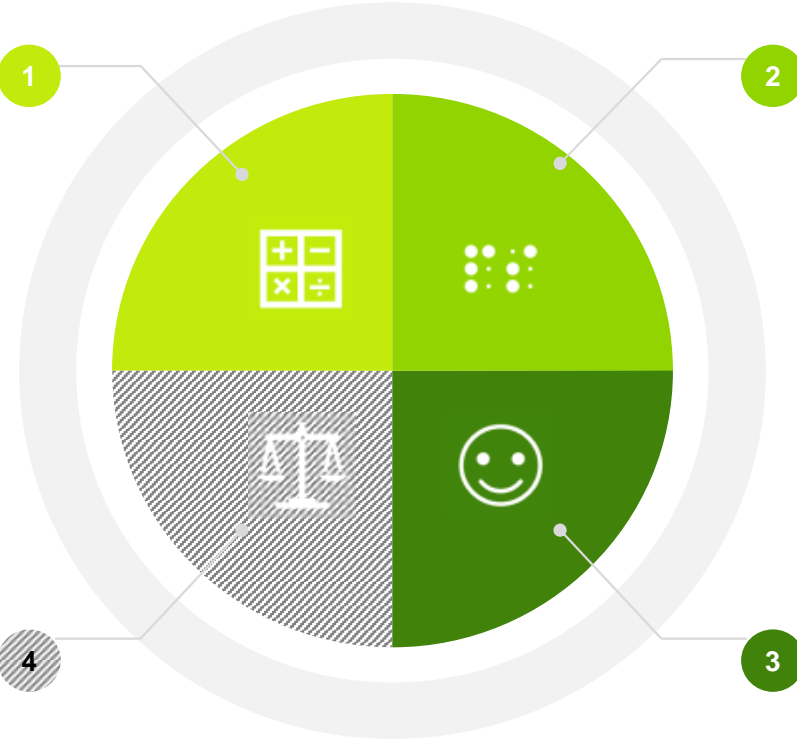
In PY2020, DTE Energy's (DTE's) program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric, demand, and gas savings to support DTE's annual reconciliation filing.

Net-to-Gross (NTG)

Guidehouse did not complete NTG research for the EEA program because a deemed net-to-gross ratio (NTGR) of 1.0 is applied to low-income programs.



Installation Rate Adjustment Factor (IRAF)

Guidehouse provided fuel-neutral (fuel-specific) IRAF values for the program as a whole and for each measure grouping.

Satisfaction

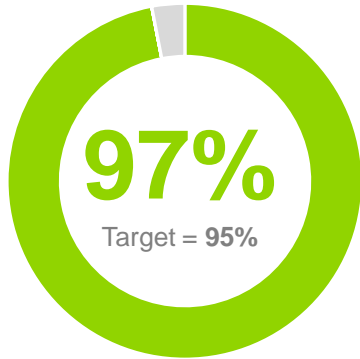
Guidehouse provided program participant satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the customer experience.

Evaluated

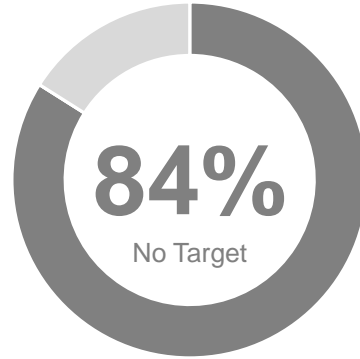
Not Applicable

Customer Satisfaction

Overall and Top Box



Overall Satisfaction
(n=347)



Top Box Satisfaction
(n=347)



Overall Satisfaction Achieved

The EEA program has consistently met Overall and Top Box customer satisfaction targets. Overall Satisfaction was 97% ($\pm 1\%$), 2 percentage points above the program's target of 95%. Top Box Satisfaction was 84% ($\pm 3\%$), 1 percentage point lower than in PY2019.

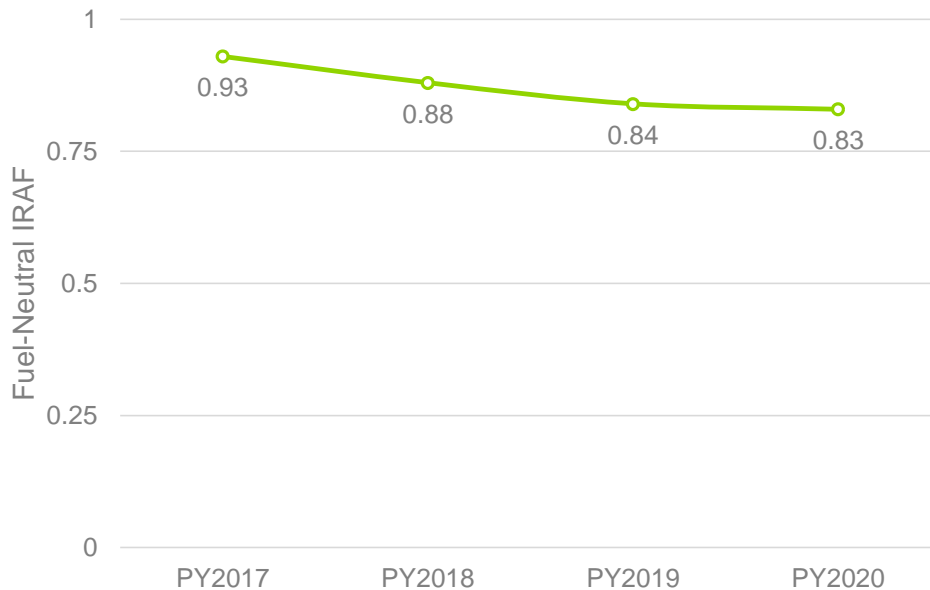
0 - 5	"Communication and checks on contractors are lacking. Also, documentation was lost several times."
6 - 8	"I should have been informed [about] what is being done and how customers are educated on what they're doing upon completion."
9 - 10	"Each person I talked to was helpful and always broke our conversation down so I could understand. Very outstanding crew."

IRAF

Year-over-year



Fuel-Neutral IRAF Values



The fuel-neutral installation rate adjustment factor¹ (IRAF) is **0.83** (± 0.02) in PY2020 (down **1** point from PY2019).

Guidehouse performed field verification visits to collect primary data on installation rates.²

- In the first round of site visits, customers frequently reported not receiving measures that were claimed in program tracking data and the measures were not found onsite. This impacted Thermostat, LED Bulb and Low Flow Fixture measures the most. It did not affect Equipment or Tune-up measures.
- After additional quality assurance (QA) and quality control (QC) processes were implemented, missing measure issues were not found during year-end visits.

1. Guidehouse is currently working with DTE to determine whether or not using a deemed PUF for Tier 1 thermostats is appropriate in PY2020 (to be applied in PY2022) and beyond.

2. Guidehouse completed two waves of field visits and weighted the IRAF results from each wave based on savings. See page 9 for additional details on the IRAF methodology.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 97 percent, while Top Box satisfaction was 84 percent.

Program IRAF decreased by one percentage point in PY2020 to 0.83.

ENERGY STAR Products Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-ES-01

Acknowledgements

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DTE Contributors

Guidehouse gratefully acknowledges the generous and timely assistance of DTE Energy staff that have provided guidance and input throughout the project including, but not limited to:

- › Jason Kupser
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- › Cynthia Rucker
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- › Jeff LeBrun

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, ICF International:

- › Alexander Citron
- › Quinn Zeagler

Evaluation Context

The primary objective of the ENERGY STAR Products Program is to increase the adoption of high efficiency ENERGY STAR products sold through retail channels. In PY2020, DTE's program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric, demand, and gas savings to support DTE's annual reconciliation filing.

NTG

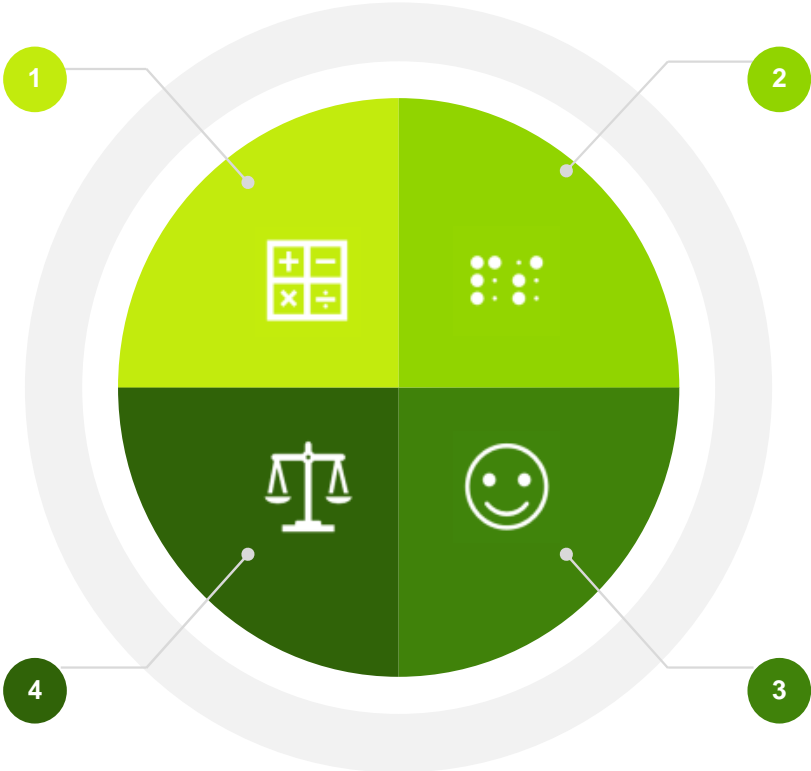
Guidehouse computed and provided program-level FR and NTGR values.

IRAF

Guidehouse provided fuel-neutral (fuel-specific) IRAF values for the program as a whole and for each measure grouping.

Satisfaction

Guidehouse provided program participant satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the customer experience.

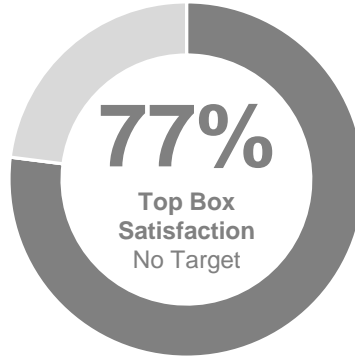


Customer Satisfaction

Overall and Top Box



(n=580)



(n=580)

0 - 5

"Just get rid of it, it's way [too] hard for anyone at your company to make this easy. Not worth making your customers work that hard for \$25.00"

6 - 8

"Make it easier to find and receive the rebates."

9 - 10

"Thank you. The rebate helped a lot."

"The rebate program was very frustrating and so much wasted postage and printing and providing the same thing over and over . . . Very confusing and frustrating."

"I received no less than 12 letters in the mail stating that they needed an additional receipt . . . please fix!"



The downstream Appliances program successfully met its satisfaction targets.

Overall Satisfaction met the target of 96% ($\pm 1\%$), an increase of 1 percentage point from 2019 (95%). High satisfaction is driven by customer appreciation of the program and rebate, quality customer service and product quality.



Top Box Satisfaction remains high, though lower than 2019.

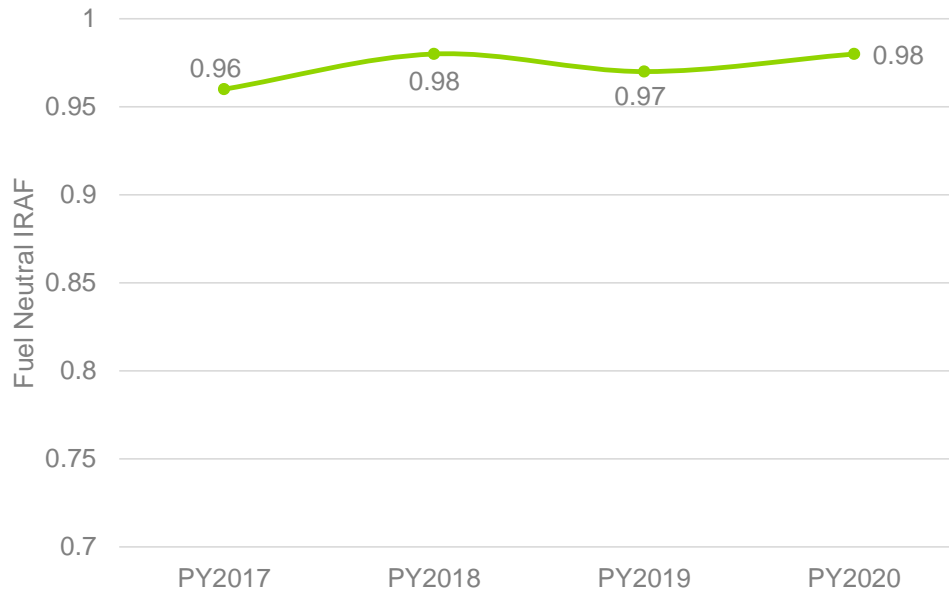
Top Box Satisfaction decreased by 2 percentage points from 2019 (79%) to 77% ($\pm 3\%$). Lower satisfaction is driven by the rebate amount and frustration with the application process.

IRAF

Year-over-year



Fuel-Neutral IRAF Values



The fuel-neutral IRAFs¹ are up in PY2020 for all measures except Clothes Dryers.

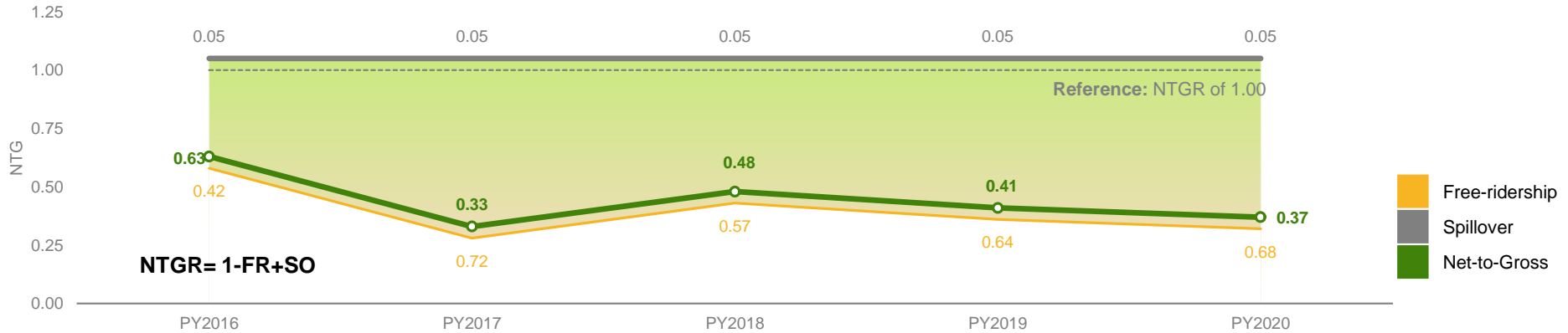
Guidehouse performed surveys to collect primary data on installation rates. Our analysis found:

- The program-level IRAF is **0.98** (± 0.20) in PY2020 (**up 1 point** from PY2019 IRAF).
- Measure-level IRAF remains high, between 0.96 and 1.00.
- IRAF increased slightly for all measures except Clothes Dryers and Clothes Washers, which decreased slightly.

1. Guidehouse is currently working with DTE to determine whether or not a deemed PUF for Tier I thermostats is appropriate for PY2020 (to be applied in PY2022) and beyond.

Net-to-Gross Ratio

Year-over-year change in program-level NTG^{1,2}



Spillover Findings

- Spillover (SO) is assumed to be 0.05, as in prior years.

Free-Ridership Findings²

- The FR is 0.68 in PY2020, up from 0.64 in the previous program year.

Net-to-Gross Findings¹

- The NTGR is 0.37 in PY2020, down from 0.41 in the previous program year.

1. NTGR values do not include Tier 2/3 thermostats; thermostat savings are considered verified net.
2. This program was included as part of the PY2019 free ridership refresh and as such the results for PY2020 follow a different methodology than prior years.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 96 percent, while Top Box satisfaction was 77 percent.

Program IRAF increased by one percentage points in PY2020 to 0.98.

NTGR in PY2020 is 0.37, down from 0.41 in PY2019, driven by an increase in FR.

FR is up 4 points from PY2019 to 0.68.

SO is assumed to be 0.05, as in prior years.



Home Energy Consultation Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-HEC-01

Acknowledgements

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DTE Contributors

Guidehouse gratefully acknowledges the generous and timely assistance of DTE Energy staff that have provided guidance and input throughout the project including, but not limited to:

- › Jason Kupser
- › Kevin Bilyeu
- › Dennis Mullan
- › Toben Galvin
- › Shalini Lawson
- › Denise Allard
- › Jeff LeBrun

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, Walker-Miller Energy Services:

- › Cameron Seeley

Evaluation Context

In PY2020, DTE Energy's (DTE's) program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric, demand, and gas savings to support DTE's annual reconciliation filing.

NTG

Guidehouse computed and provided program-level FR, SO, and NTGR values.

IRAF

Guidehouse provided fuel-neutral IRAF values for the program as a whole, and for each measure grouping.

Satisfaction

Guidehouse provided program participant satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the customer experience.



Customer Satisfaction

Overall and Top Box



The HEC program achieved a near perfect Overall Satisfaction score, meeting 100% Overall Satisfaction for seven out of 10 of the months the program was active in PY2020.

The HEC program has consistently outperformed Overall and Top Box customer satisfaction targets. Overall Satisfaction was 99% (\pm zero percentage points) and 6 percentage points above the program's target of 93%.

With an online survey, closer to real-time feedback was collected and resulted in high satisfaction ratings.

0 - 5

"The consultant didn't seem to know much about energy savings or electricity in general. I do approve of swapping out light bulbs though, thanks for that."

"No information specific to my house/energy usage was given."

6 - 8

"The program is great, but the consultant missed eight light bulbs in the basement and two in the hallway."

"I was impressed by everything the consultant went over. The only thing I wish could have been performed was a scan on the house to see hot/cold spots that indicates more insulation is needed."

9 - 10

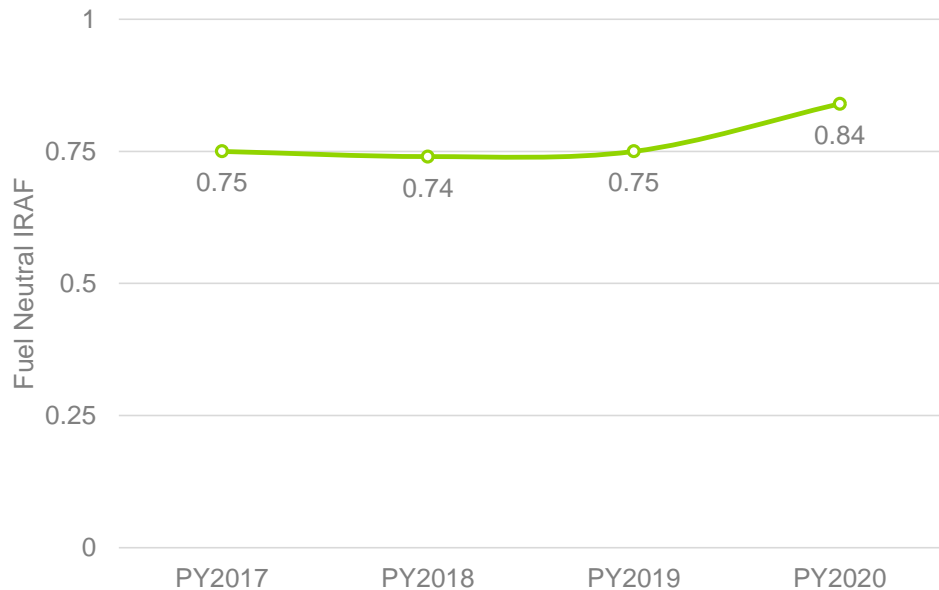
"The tech that came out to my home was on schedule in his COVID-19 gear, extremely professional, shared tips on saving energy, shared pamphlets and briefly went over the pamphlets with us on how to use the equipment provided. KUDOS to that guy!! He earned a 10+."

IRAF

Year-over-year



Fuel-Neutral IRAF Values¹



Guidehouse analysis of SFV data resulted in an increase of the fuel-neutral IRAF in PY2020, to 0.84 ± 0.05 .

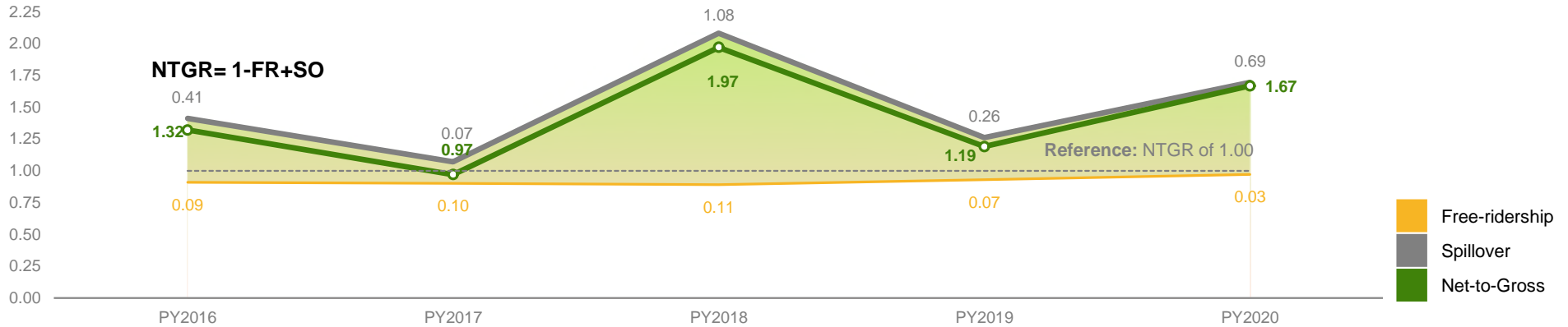
Guidehouse performed SFV visits to collect primary data on installation rates. Our analysis found:

- The Tier 1 Thermostat IRAF² was up 41 points. A considerable increase compared to previous years. This could be an anomaly as it is not consistent with previous years.
- The Smart Strip IRAF decreased 22 points due primarily to people being given two Strips, but only using one and putting the other in storage.

1. *Evaluated fuel-neutral IRAF values will be applied during the PY2022 reconciliation effort.*
2. *Guidehouse is currently working with DTE to determine whether or no using a deemed PUF for Tier I thermostats is appropriate in PY2020 (to be applied in PY2022) and beyond.*

Net-to-Gross Ratio

Year-over-year change in program-level net-to-gross



Spillover Findings¹

- Spillover (SO) increased in PY2020, to 0.69.
- SO included both equipment installation (59%) and behavior changing activity (41%).
- Spillover is primarily being driven by 73% of participants who reported SO activity being influenced by the program (scoring eight or above on a 10-point scale).

Free-Ridership Findings²

- Free-ridership (FR) decreased in PY2020, to 0.03 (±0.01).
- FR is primarily being driven by LED Bulbs.

Net-to-Gross Findings

- The Net-to-gross ratio (NTGR) of 1.67 in PY2020 increased from 1.19 in the previous program year.

1. The methodology to calculate SO was updated for Residential programs in PY2020.

2. The methodology to calculate FR was updated for the HEC program in PY2019.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 99 percent, while Top Box satisfaction was 93 percent.

Program IRAF increased by nine percentage points in PY2020 to 0.84.

NTGR in PY2020 is 1.67, up 48 points from PY2019.

FR decreased to 0.03; primarily being driven by LED Bulbs.

SO increased to 0.69; primarily being driven by 73% of participants who reported SO activity being influenced by the program.



Home Energy Efficiency Kit Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-HEEK-01

Acknowledgements

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- › Toben Galvin
- › Shalini Lawson
- › Andi Campau
- › Thac Nguyen
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Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, ICF:

- › Jenni Abraham
- › Jennifer Malcolm

Evaluation Context

The Home Energy Efficiency Kit (HEEK) program provides customers with a kit of energy efficiency equipment. In PY2020, DTE's program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric, demand, and gas savings to support DTE's annual reconciliation filing

Net-to-Gross (NTG)

Guidehouse computed and provided program-level FR, SO, and NTGR values

Installation Rate Adjustment Factor (IRAF)

Guidehouse provided fuel-neutral (fuel-specific) IRAF values for the program as a whole, and for each measure grouping

Satisfaction

Guidehouse provided program participant satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the customer experience



Customer Satisfaction

Overall and Top Box



n = 1,365



n = 1,365



Program satisfaction is high

The HEEK program has consistently outperformed Overall and Top Box Satisfaction targets.

Overall Satisfaction was 91% ($\pm 1\%$), 29% over the target satisfaction. Top Box Satisfaction was 70% ($\pm 2\%$).



Both Overall Satisfaction and Top Box Satisfaction increased slightly over 2019 (from 90% Overall and 67% Top Box). Feedback from participants included:

- Twenty-one respondents wanted either a longer amount of pipe insulation or for it to not have been included.
- Fifteen percent of respondents noted they would have liked the addition of an inventory list.

0 - 5

"It seemed to be a pretty random assortment of gadgets that don't fit all appliances. Nothing was labeled and there were no instructions."

"I won't use some of the items in it, like the very short length of pipe insulation. It won't really help. More LED light bulbs would be useful."

6 - 8

"A pamphlet on small energy saving ideas would have made the score higher."

"I really loved the idea and it came with a lot more stuff than I thought it would. My complaint is that there was **no insert itemizing** or explaining what was in the kit."

9 - 10

"All the things in the kit were usable, but the pipe coverings required future work in the house."

"It contained items needed in the home but it could have included energy efficient lightbulbs."

IRAF

Year-over-year



Fuel-Neutral IRAF Values

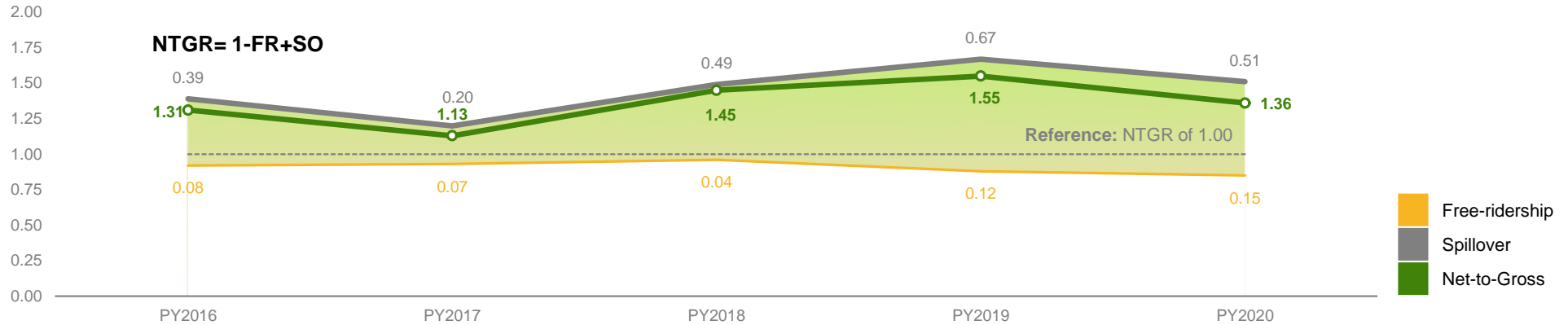


Guidehouse performed surveys to collect primary data on installation rates:¹

- The program-level fuel-neutral IRAF decreased by 1 point in PY2020. This difference was not statistically significant.
- Factors driving IRAF were decreases in kitchen faucet aerator, LED bulb, and LED night light IRAF values.
- IRAF values for the two measures with the most savings, pipe wrap and showerheads, increased from PY2019.
- In its first year of evaluation, the IRAF value for advanced power strips is 0.55.

1. Evaluated fuel-neutral IRAF values will be applied during the PY2022 reconciliation effort.

NTGR



Spillover Findings

- SO is down in PY2020, to 0.51.
- SO is made up entirely of reported equipment savings, as behavioral SO data was not collected in PY2020 due to the removal of the program’s educational component.

Free-Ridership Findings

- Free-Ridership (FR) increased 0.03 to 0.15 in PY2020, though this difference was not statistically significant.
- FR has consistently risen since 2018 and has almost doubled since 2016.
- The primary driver of this increase is a 10-point increase in LED bulb FR (0.29).

Net-to-Gross Findings

- The NTGR is 1.36 in PY2020, down from 1.55 in the previous program year.
- This decrease was almost entirely driven by a decrease in SO. Unlike previous years, behavioral SO was not evaluated in PY2020. While equipment SO increased, the removal of behavioral SO resulted in a net decrease.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 91 percent, while Top Box satisfaction was 70 percent.

Program IRAF decreased by one percentage point in PY2020 to 0.49.

NTGR in PY2020 was 1.36, down 19 points from PY2019, driven by a decrease in SO.

FR was up 3 points from PY2019 at 0.15.

SO was down 16 points in PY2020 to 0.51; SO was made up entirely of reported equipment savings.



Home Energy Report Program

Program Year (PY) 2020
Evaluation Report

July 8, 2021



Report ID: DTE-PY2020-MPSC-HER-02

Acknowledgements

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DTE Contributors

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- › Jason Kupser
- › Kevin Bilyeu
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- › Andrea Campau
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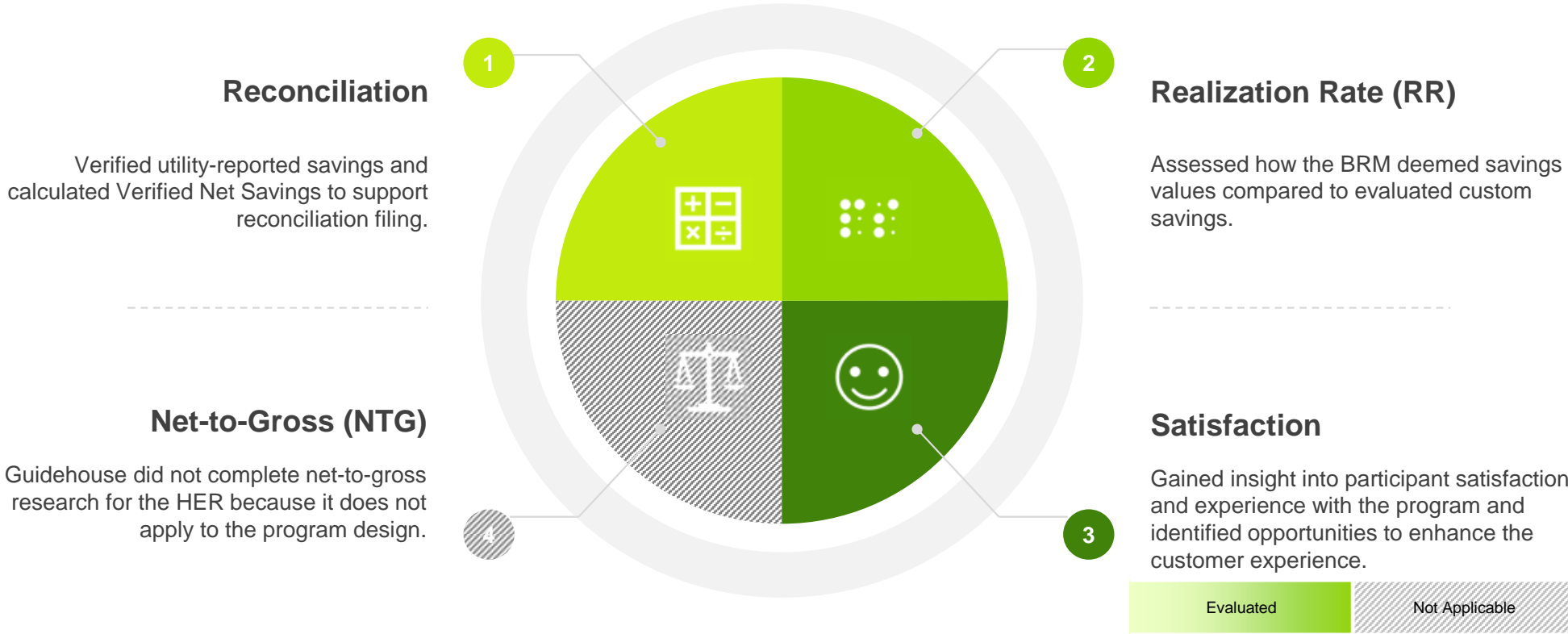
Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, Oracle:

- › Connor Lawless
- › Alex Mazarredo

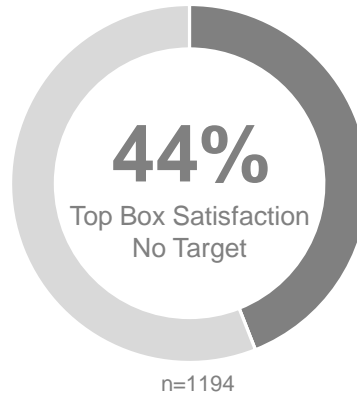
Evaluation Context

In PY2020, DTE Energy's (DTE's) program objectives influenced our key areas of evaluation focus.



Customer Satisfaction

Overall and Top Box



0 - 5

"Comparisons with like homes is neither representative nor transparent enough to be meaningful."

"It says that we use twice as much power as others in the area. That is because others in the area only live here half the year, so the report does not mean anything since it is not an apples-to-apples comparison."

6 - 8

"I wish I knew how to improve my energy usage after doing all of the things DTE had already suggested."

"You don't (yet) explain "why" we are higher or lower, just that we are."

9 - 10

"I like to know how much energy and gas I use each month through the month compared to others in the area. I am a competitive person and even the visual note of having great on my report is wonderful."



Exceeding Satisfaction Goals

Overall Customer Satisfaction for PY2020 was 79% ± 2%, exceeding the 72% target by 7 points.^{1,2,3} Top Box Satisfaction was 44% ± 2%.

- Satisfied customers appreciated how the report was easy to understand and liked being in the know about their energy usage and chances for improvement.



Room for Improvement

Comments from dissatisfied recipients focused on similar complaints to PY2019:

- Skepticism about the accuracy of the similar home comparison.
- Questioning DTE's knowledge of unique home attributes (e.g., household size, full or part-time residency, EV ownership).
- Desire to continue to reduce their energy usage after already taking steps to do so.

1. *Non-numeric customer responses were not included in this analysis.*

2. *Annual satisfaction scores were weighted by HER wave to ensure survey sample was representative of the program population.*

3. *Wave 201107_D was treated this year, but none of the wave's recipients were surveyed. Wave 201610 was not treated, but some were surveyed. Both waves were excluded from the process analysis.*

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 79 percent, while Top Box satisfaction was 44 percent.

Custom net electric savings were higher than the verified savings; custom net gas savings were also higher, but by a less significant percentage.

Residential HVAC Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-HVAC-01

Acknowledgements

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- › Dennis Mullan
- › Toben Galvin
- › Shalini Lawson
- › Kia Neely
- › José Gonçalves
- › Jeff LeBrun

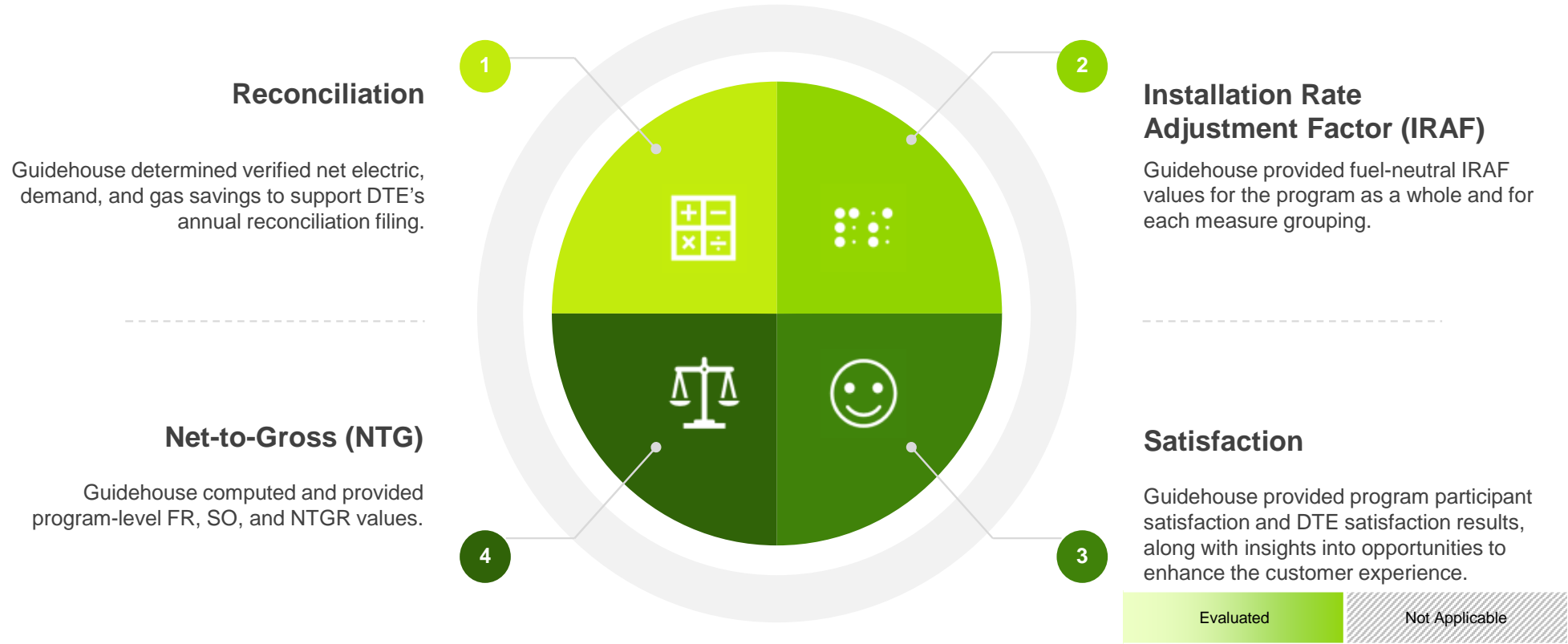
Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, ICF:

- › David Glanville

Evaluation Context

In PY2020, DTE's program objectives influenced our key areas of evaluation focus.

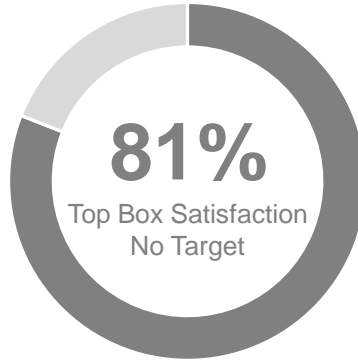


Customer Satisfaction

Overall and Top Box



n=1,541



n=1,541



Overall Satisfaction Achieved

The HVAC program achieved the overall customer satisfaction target with 94% (+/- 1%). Overall satisfaction was 1 percentage point below the program's target of 95%. Top box satisfaction was 81%, 4 percentage points lower than in PY2019.



Customer Dissatisfaction

Some respondents offered explanations for their lower satisfaction scores (n=1,310 total verbatim responses). Within the comments, rebate amount was the main driver of dissatisfaction, similar to PY2019.

0 - 5

"The contractor and I expected to receive a larger rebate than the \$50.00 I received"

"I have not received the rebate yet. The communication about this has been poor."

6 - 8

"We spent over \$6000 on our new system. \$50 is nice, but I'd have liked a little more."

"The techs were not experienced w the DTE process. There needs to be better training with the contractors you recommend."

9 - 10

"Great program especially in these tough times it helped."

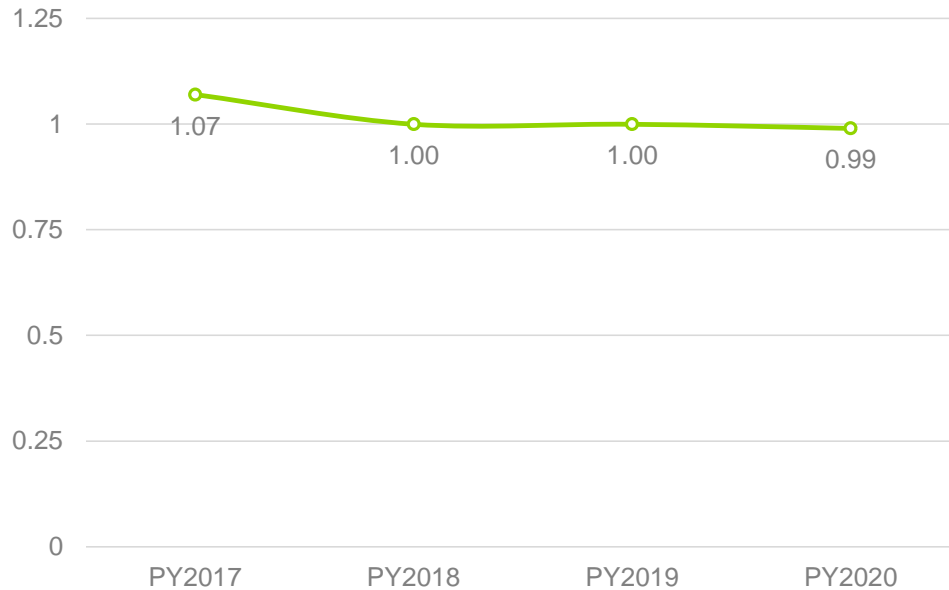
"Replacing the furnace was a big expense. Rebate was a little bit of help to encourage us to act."

IRAF

Year-over-year



Fuel-Neutral IRAF Values



The fuel-neutral installation rate adjustment factor (IRAF) is **0.99** (± 0.01) in PY2020 (down **1** point from PY2019).¹

Guidehouse performed surveys to collect primary data on installation rates. Our analysis found:

- IRAF was 0.98 for Electronically Commutated Motor (ECM) Blower Motors due to customers uninstalling furnaces. ECM Blower Motors are no longer offered beginning in PY2021. Therefore, this result will not be applied in any future years.²
- IRAF³ was 1.0 for all other measures, including Furnaces which comprise the majority of program savings.

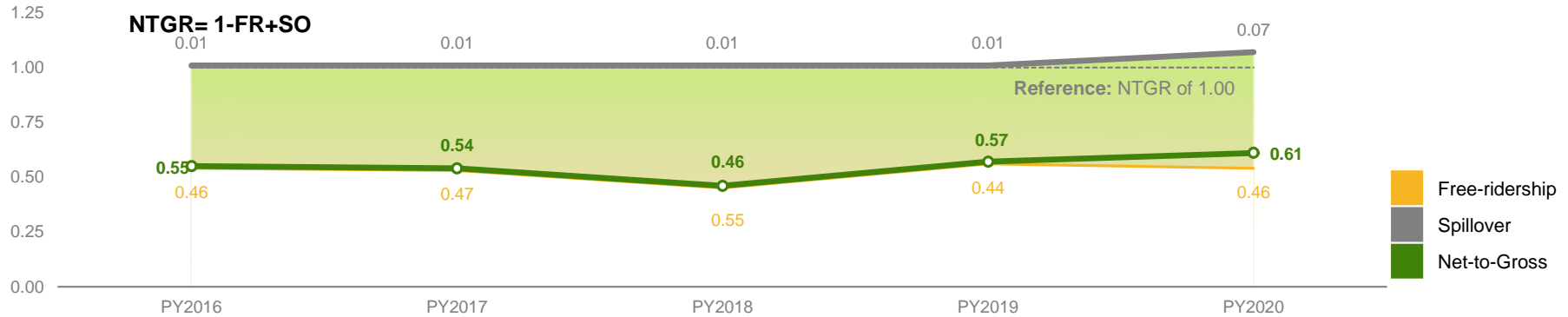
1. This 0.99 program-level IRAF does not include Tier 2/3 thermostats, which receive a deemed IRAF of 1.00 per Michigan Public Service Commission (MPSC) guidance.

2. Guidehouse believes that the survey responses indicating that ECM Blower Motors and Furnaces were installed may have resulted from participants misunderstanding the survey question as asking about their old furnace rather than their new furnace.

3. Guidehouse is currently working with DTE to determine whether or not a deemed PUF for Tier I thermostats is appropriate for PY2020 (to be applied in PY2022) and beyond.

Net-to-Gross Ratio

Year-over-year change in program-level net-to-gross (NTG)



Spillover Findings¹

- The PY2013 SO value of 0.01 was used historically through PY2019. The participant equipment SO was surveyed in PY2020 and determined to be 0.07.
- SO¹ is primarily being driven by Windows, Furnaces, Thermostats and Water Heaters.

Free-Ridership Findings³

- The PY2020 program free-ridership (FR) is 0.46 or 2% higher than PY2019; but lower than the program high of 0.55 in PY2018.³
- Boilers had the highest FR of 0.50 and Tune-ups had the lowest with 0.29.

Net-to-Gross Findings²

- The net-to-gross ratio (NTGR) of 0.61 in PY2020 is an increase of 4 points from PY2019; the PY2020 SO was the main driver of this increase. Not considering SO for either year, the PY2020 NTG would be 0.54 or 2 points lower than PY2019.

1. The SO survey was for participants only.
 2. Thermostat NTGR values are detailed in Appendix A. These values are not currently applied when determining Verified Net Savings.
 3. The FR relative precision is 2.6% with a 90% confidence interval.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 94 percent, while Top Box satisfaction was 81 percent.

Program IRAF decreased by one percentage points in PY2020 to 0.99.

NTGR in PY2020 was 0.61, up 4 points from PY2019; SO was the main driver of this increase.

FR was up 2% from PY2019 at 0.46.

Participant equipment SO was surveyed in PY2020 and determined to be 0.07. Participant SO was primarily driven by Windows, Furnaces, Thermostats and Water Heaters.

Insight Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-INS-01

Acknowledgements

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- › Toben Galvin
- › Shalini Lawson
- › Sereen Dababneh
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Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, Powerley:

- › Ben Mothershead
- › Harsha Sirigireddy

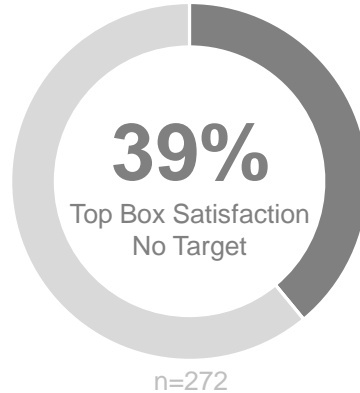
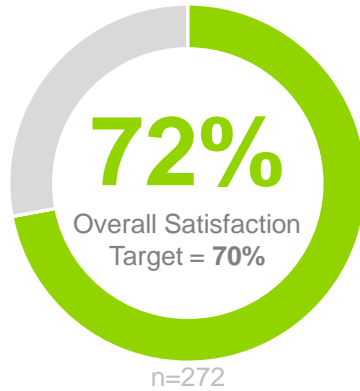
Evaluation Context

In PY2020, DTE's program objectives influenced our key areas of evaluation focus.



Customer Satisfaction

Overall and Top Box



Customer Satisfaction

The Insight program satisfaction was 72% ± 4%, consistent with the Overall Satisfaction from PY2019. Top Box Satisfaction was 39% ± 5%, consistent with PY2019 results.

0 - 5

"It is confusing to use and does not always work."

"It doesn't pinpoint any specific appliance/area of house using energy. It said my expected bill was \$138 but it actually was \$210."

6 - 8

"I wish there were a better tutorial for this app. Some features I didn't know this could do until I did this survey. Otherwise, I probably would have given this a better score."

"Remove the payment requirement for real-time monitoring. By lagging two days, you cannot correlate actions to results."

9 - 10

"It has helped greatly to analyze our pattern of use throughout the day, especially to help evaluate where peak usage is occurring. [The app] helped to reduce [my] bill for one month by about one-half."

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 72 percent, while Top Box satisfaction was 39 percent.



Multifamily Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-MF-01

Acknowledgements

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DTE Contributors

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- › Jason Kupser
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- › Toben Galvin
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- › Denise Allard
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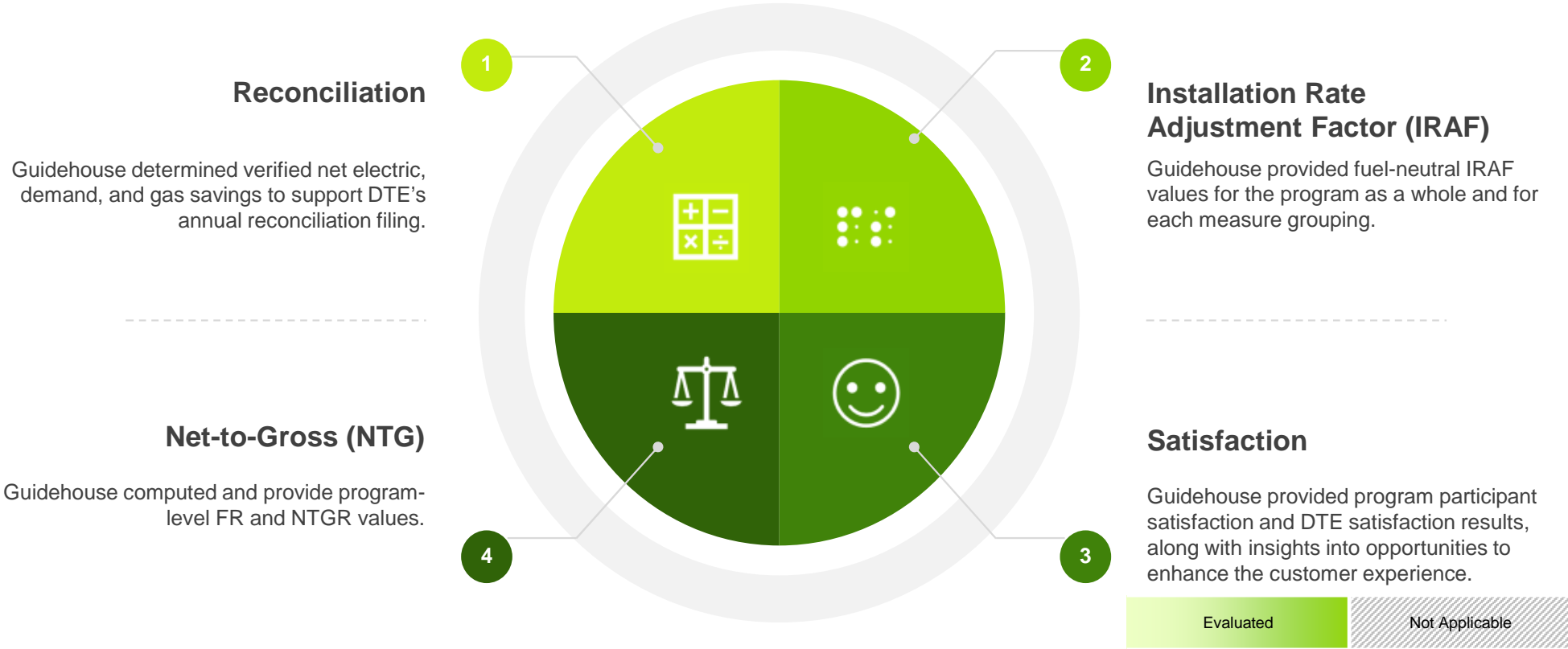
Implementer Support

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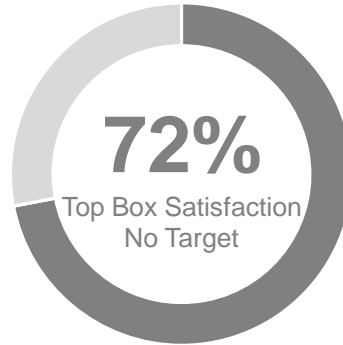
Evaluation Context

In PY2020, DTE Energy's (DTE's) program objectives influenced our key areas of evaluation focus.



Customer Satisfaction

Overall and Top Box



n= 168 (135 tenant + 33 property manager)



Overall and Top Box Satisfaction increased from PY2019.

The MF program has consistently outperformed Overall and Top Box customer satisfaction targets. Overall Satisfaction was 96%(± 2 percentage points) and was 5 percentage points above the program's target of 91%. Top Box Satisfaction was 72% (± 2 percentage points), 5 percentage points higher than in PY2019.

While the program's satisfaction improved from PY2019, the PY2020 CJM effort aims to provide recommendations to help further improve customer satisfaction.

0 - 5
"No information (instructions) to program thermostat and your 888 # no one to speak to at 8 PM. What good is it!!"

Lightbulbs left everywhere/one was not even working. Dirt on floor. Carpet was dirty. Clean up your mess!"

6 - 8
"Was told to expect them on 6/15, they did not show and came without warning 6/17."

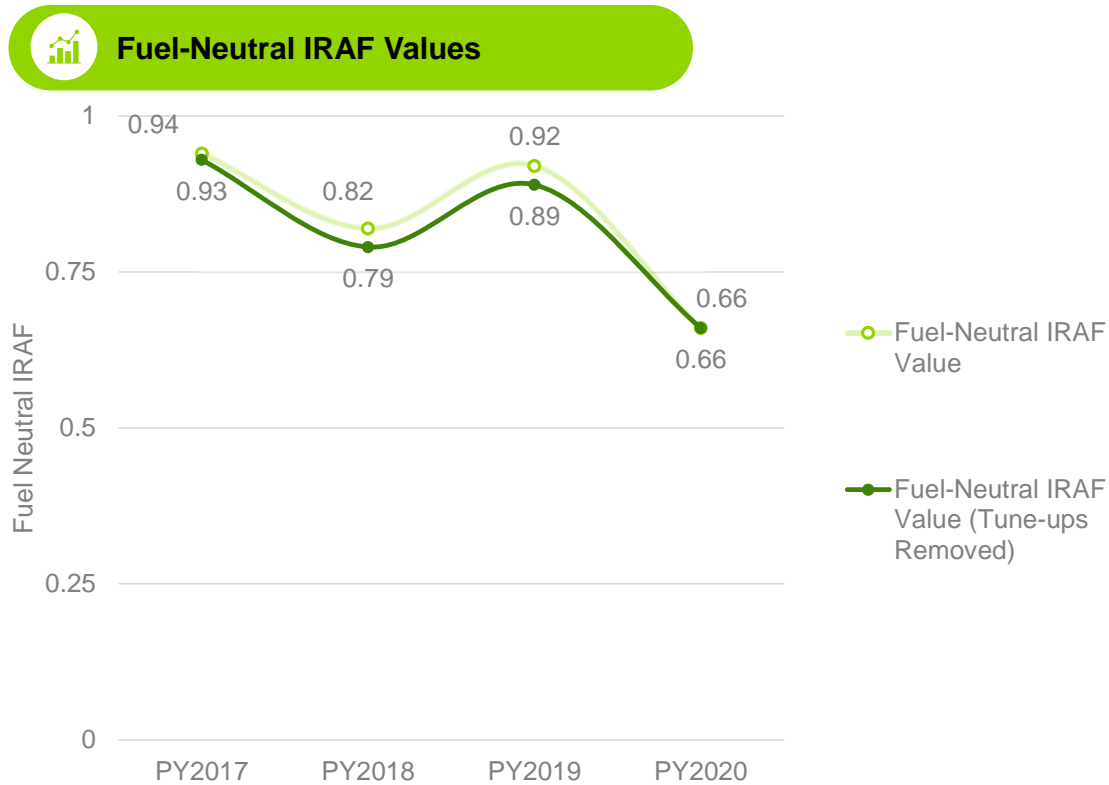
"No substantive issues and the program is of value. Only issues are the presentation of applicable capital rebates can be applied to could be clearer."

9 - 10
"When I asked a question, both young men were very knowledgeable and friendly. One young man did the lights and showerhead, and the other young man did the thermostat and explained everything well."

"You enabled us to install high efficiency furnaces and hot water heaters that will save our low-income family's money. You will also save the housing commission money."

IRAF (Residential)

Year-over-year



The total fuel-neutral Residential IRAF decreased in PY2020 by 26 points to 0.66. Guidehouse found the Tier 1 Thermostat IRAF to be significantly lower in PY2020 and was the main driver for the decreased IRAF. Additionally, for the first time starting in PY2020, Furnace Tune-ups were moved from the Residential DI evaluation over to the Commercial evaluation. However, this change did not have a noticeable effect on the total IRAF. Guidehouse performed field verification visits to collect primary data on installation rates. Our analysis found:

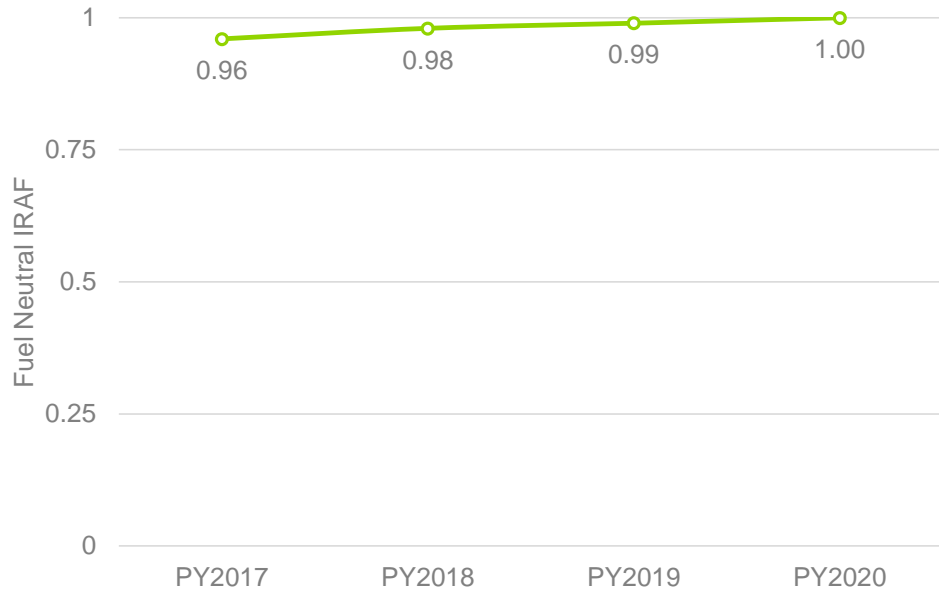
- The IRAF is 0.66 (± 0.05) in PY2020 (down 26 points from the PY2019 IRAF).
- Tier 1 Thermostats had the largest decrease in IRAF in PY2020 by 33 points to 0.19.

IRAF (Commercial)

Year-over-year



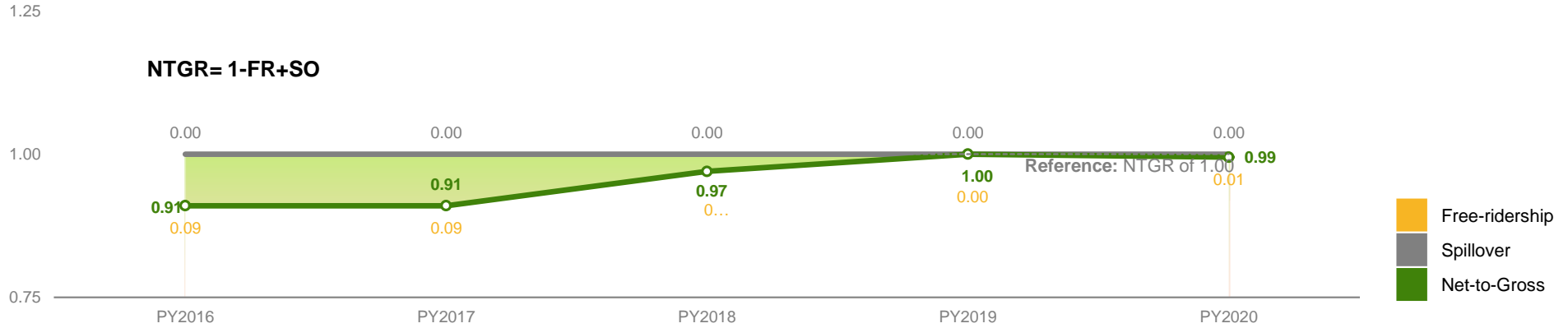
Fuel-Neutral IRAF Values



Guidehouse performed field verification visits to collect primary data on installation rates. Our analysis found:

- The Commercial IRAF is 1.00 (± 0.00) in PY2020 (up 1 point from the PY2019 IRAF).
- Misreporting discrepancies were present, both over-reporting and under-reporting of measure quantities were observed.

Net-to-Gross



Spillover Findings

- Spillover (SO) remains at zero. Guidehouse has evaluated SO in previous years and found no quantifiable results from PM survey responses.

Free-Ridership Findings¹

- Free-ridership (FR) is 0.01 (±0.05) in PY2020, 1 point higher than in PY2019.

Net-to-Gross Findings

- The Net-to-Gross Ratio (NTGR) is 0.99 in PY2020, 1 point lower than in the previous program year.

1. The methodology to calculate FR was updated for the MF program in PY2019.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 96 percent, while Top Box satisfaction was 72 percent.

Residential program IRAF decreased by twenty-six percentage points in PY2020 to 0.66.

Commercial program IRAF increased by one percentage points in PY2020 to 1.00.

NTGR in PY2020 was 0.99, down one point from PY2019.

FR was up one point from PY2019 at 0.01.

SO remained 0.00 in PY2020.



C&I Midstream Food Service Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-MSFS-01

Acknowledgements

Primary Contributors

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- › Dennis Mullan
- › Toben Galvin
- › Shalini Lawson
- › Sarah Tocco
- › Ken Randazzo

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, Energy Solutions:

- › Arunabha Sau
- › Alex Gutkowski
- › Alex MacCurdy
- › Kyle Booth

Evaluation Context

In PY2020, DTE Energy's (DTE's) program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric, demand, and gas savings to support DTE's annual reconciliation filing.

Net-to-Gross (NTG)

Guidehouse computed and provided program-level FR and NTGR values.

Installation Rate Adjustment Factor (IRAF)

Guidehouse provided fuel-neutral (fuel-specific) IRAF values for the program as a whole and for each measure grouping.

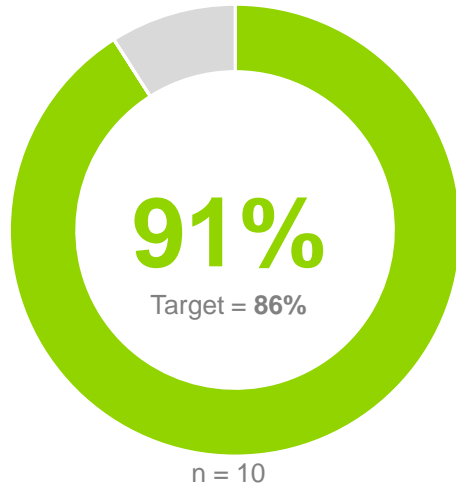
Satisfaction

Guidehouse provided program end-user satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the end-user experience.



Overall Program Satisfaction

End-User and Distributor



End-User Satisfaction



Distributor Satisfaction



High program satisfaction

The MSFS Program has consistently outperformed overall end-user satisfaction targets. End-user satisfaction was 5 percentage points above the program's target of 86%, down 3 percentage points vs. PY2019. Distributor satisfaction was 92%.



Low end-user response rates

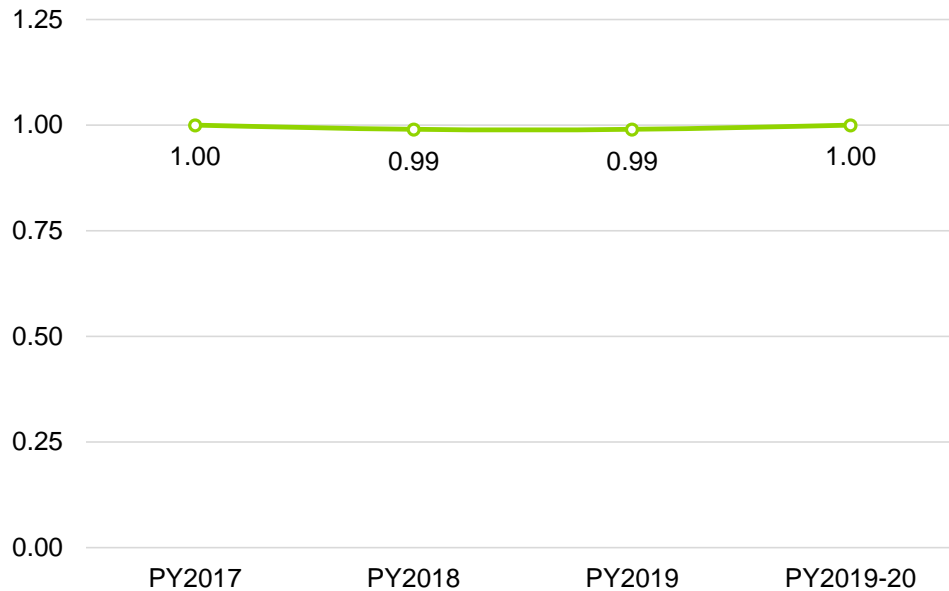
Despite employing a number of different strategies to improve response rates, Guidehouse was only able to complete 10 end-user surveys (20% of our target). For reference, Guidehouse completed 42 end-user surveys in PY2019, or 79% of our target. A portion of this decline in response rates can be attributed to the COVID-19 pandemic, which required many businesses to close or reduce operating hours.

IRAF

Year-over-year



Fuel-Neutral IRAF Values



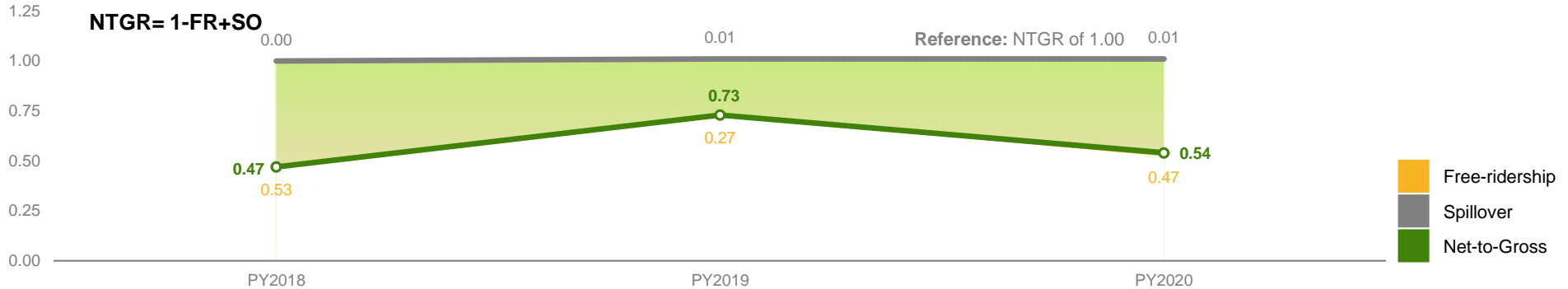
In PY2020, the program-level fuel-neutral installation rate adjustment factor (IRAF) was 0.995 (rounded to 1.00 for reporting and application purposes).

- This represents an increase of 0.001 points compared to PY2019.

Guidehouse performed surveys to collect primary data on installation rates. Due to a low response rate driven by the COVID-19 pandemic, Guidehouse combined survey data from PY2019 and PY2020 to report program-level IRAF values for PY2020.

Net-to-Gross

Year-over-year change in program-level NTG



Spillover Findings¹

- Participant SO questions were not asked in 2020. The evaluated value from PY2019 (0.01) is shown here in PY2020.

Free-Ridership Findings

- FR saw an increase from 0.27 in PY2019 to 0.47 in PY2020.
- Distributor-level FR was calculated for the first time in PY2020. Distributor FR at the program level was found higher (0.56) than end-user FR (0.35).
- Distributor and end-user FR scores were combined to report a single FR value at the program level.

Net-to-Gross Findings²

- The NTG ratio (NTGR) decreased from 0.73 in PY2019 to 0.54 in PY2020.

1. Guidehouse did not collect SO information in PY2020 and is currently evaluating the appropriate method(s) for quantifying SO for commercial midstream programs moving forward.

2. In PY2020, Guidehouse updated the NTG end-user methodology and included distributor interview data for the first time. The updated methodology no longer includes spillover.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction for end-users was 91 percent, while Distributor satisfaction was 92 percent.

Program IRAF increased by 0.001 points in PY2020 to 0.995.

NTGR in PY2020 was 0.54, down 19 points from PY2019.

FR increased 20 points from PY2019 to 0.47.

SO was not evaluated in PY2020.



C&I Midstream HVAC Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-MSHVAC-01

Acknowledgements

Primary Contributors

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- › Joshua Rego
- › Cherish Smith
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- › Emily Cross

DTE Contributors

Guidehouse gratefully acknowledges the generous and timely assistance of DTE Energy (DTE) staff that have provided guidance and input throughout the project including, but not limited to:

- › Jason Kupser
- › Kevin Bilyeu
- › Dennis Mullan
- › Toben Galvin
- › Shalini Lawson
- › Sarah Tocco
- › Ken Randazzo

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, Energy Solutions:

- › Arunabha Sau
- › Alexander Gutkowski
- › Alex MacCurdy
- › Kyle Booth

Evaluation Context

In PY2020, DTE's C&I Midstream HVAC (MSHVAC) program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric, demand, and gas savings to support DTE's annual reconciliation filing.

Net-to-Gross (NTG)

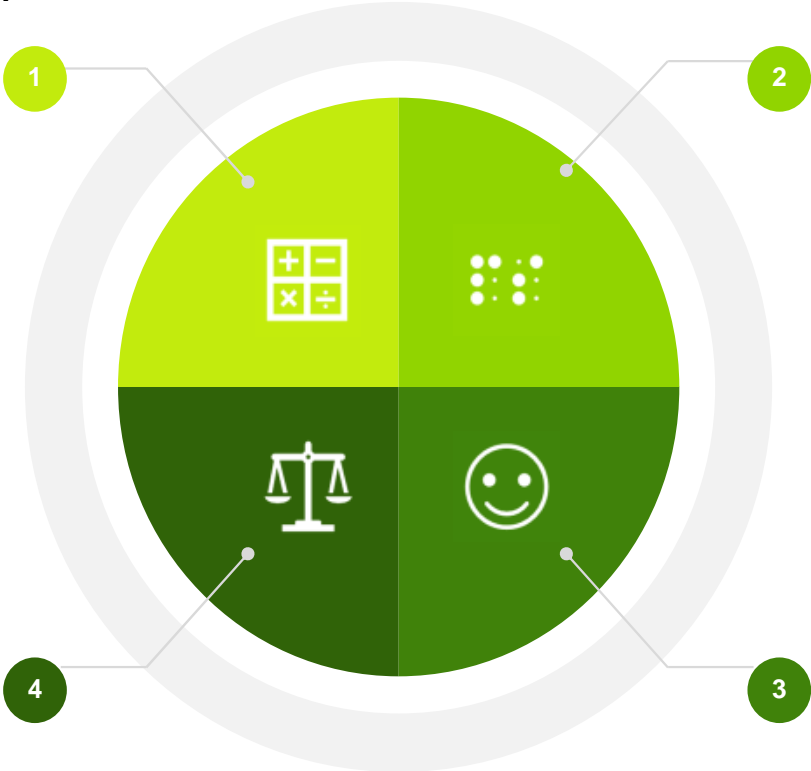
Guidehouse computed and provided program-level FR and NTGR values.

Installation Rate Adjustment Factor (IRAF)

Guidehouse provided fuel-neutral (fuel-specific) IRAF values for the program as a whole, and for each measure grouping.

Satisfaction

Guidehouse provided program satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the distributor experience.



Evaluated	Not Applicable
-----------	----------------

Distributor Satisfaction

Overall and Top Box



Overall Satisfaction



Top Box Satisfaction

6 - 8

"Improving communication would help."

"There are some units we could add that would benefit us substantially but heading in right direction and open to feedback and communication."

9 - 10

"When talking to contractor this program has helped us instead [of] just [going in with] the basic, [we] go in with higher more efficient equipment, because would save money."



High Distributor Satisfaction

Overall distributor satisfaction with the C&I MSHVAC program was 90%, and Top Box distributor satisfaction was 66%. The program out-performed its overall distributor satisfaction target by 4 percentage points.



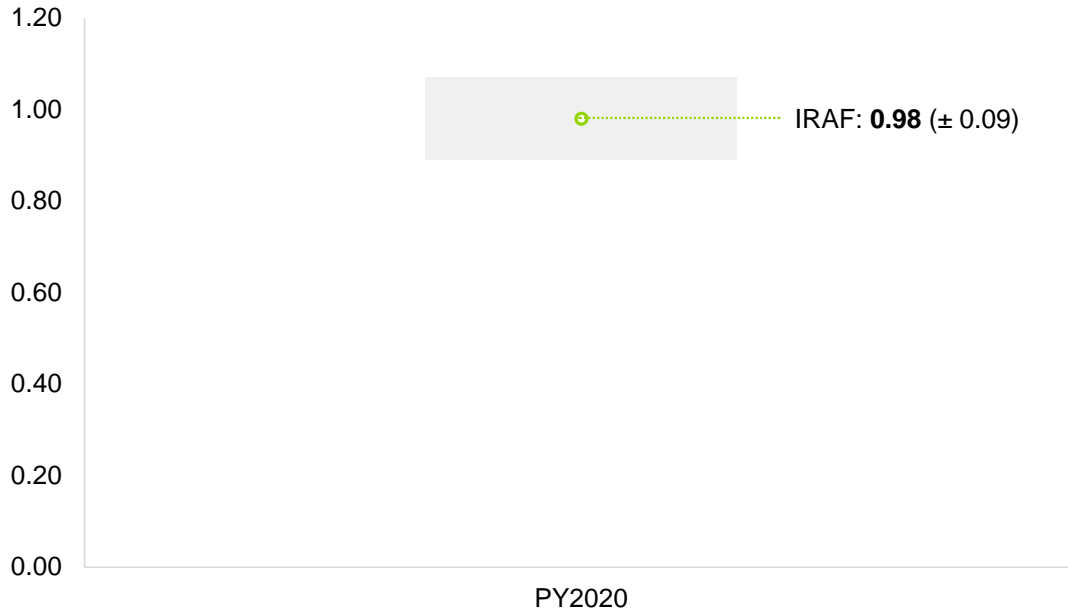
Product Variety Can Diversify

The variety of HVAC product types that are available to customers had the lowest satisfaction of any program component (7.2 out of 10). Three distributors mentioned water cooled chillers as a product they would like included in the program. Other requested products included variable refrigerant flow (VRF), water source heat pumps, air chillers, electronically commutated motor (ECM) commercial pumps, permanent magnet pumps, and magnetic bearing chillers.

IRAF

Year-over-year

Fuel-Neutral IRAF Values

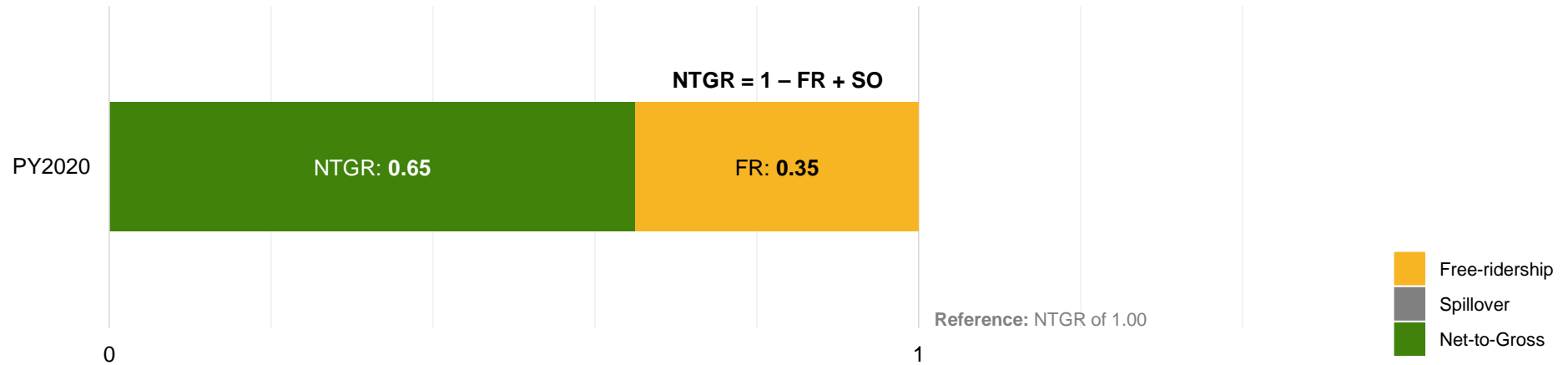


PY2020 is the first year Guidehouse evaluated IRAF.¹ The fuel-neutral program Installation Rate Adjustment Factor (IRAF) was high in PY2020 at 0.98 (± 0.09).

- Overall installation rates among non-water source heat pump sites were high.
- High installation rates are likely due to new construction participation and HVAC equipment is typically replaced on burnout. COVID-19 may have increased the maintenance activities of participating businesses.
- DTE tested water source heat pumps as new measures in the C&I MSHVAC program in PY2020. In many cases, reported measures could not be verified onsite, which led to a low IRAF value with high precision for water source heat pumps.

1. Evaluated fuel-neutral IRAF values will be applied during the PY2022 reconciliation effort.

Net-to-Gross Ratio (NTGR)



Spillover Findings

- SO was not conducted in PY2020.

Free-Ridership Findings

- PY2020 was the first year Guidehouse evaluated program FR. In PY2020, FR was 0.35, in line with FR evaluated in DTE's other commercial midstream programs.
- Guidehouse conducted distributor interviews for the first time to collect NTG related information. FR was calculated based on seven distributor interviews conducted during PY2020.

Net-to-Gross Findings

- The NTGR was 0.65 in PY2020.
- PY2020 was the first year Guidehouse evaluated program NTG.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 90 percent, while Top Box satisfaction was 66 percent.

First-year program IRAF was 0.98.

First-year NTGR came in at 0.65.

Fist-year FR came in at 0.35, in alignment with FR evaluated in DTE's other commercial midstream programs.

SO was not evaluated in PY2020.



New Homes Construction Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-NHC-01

Acknowledgements

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DTE Contributors

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Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, ICF International:

- › Jenni Abraham

Evaluation Context

The New Homes Construction (NHC) program is designed transform the residential construction market by incentivizing construction of energy efficient homes in DTE Energy (DTE) service territory. In PY2020, DTE's program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric, demand, and gas savings to support DTE's annual reconciliation filing.

Net-to-Gross (NTG)

Guidehouse computed and provided program-level FR and NTGR values.

Realization Rate (RR)

Guidehouse provided fuel-specific RR values for the program as a whole

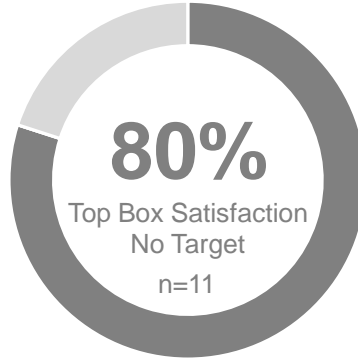
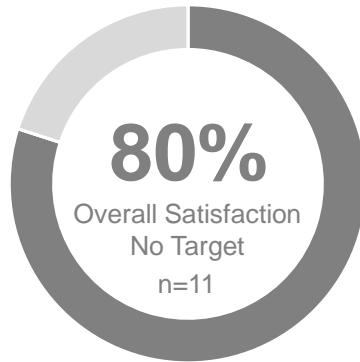
Satisfaction

Guidehouse provided builder and HERS Rater satisfaction results, along with insights into opportunities to enhance their experiences



Builder Satisfaction

Overall and Top Box



Builder verbatims:

0 - 5

"It would be awesome if a builder could submit homes with documentation provided by the HERS Rater. This is the biggest problem that we have had, and it left us blindsided that we did not qualify for rebates as they were so far behind in submissions."

"We followed all electric energy efficiency guidelines, and our energy bill was double what it was with gas...Not enough incentive to subsidize the extra cost"

6 - 10

"very easy to work with, very hands off on our end"

"You have a great team and they work great with us...THANK YOU!!!!"

"This has been a very easy and informative program to participate in, the weekly spreadsheets are great to keep track of where we stand with rebates"



Top Box Satisfaction

Guidehouse received 11 completes out of 30 participating builders in PY2020. Builder Top Box Satisfaction increased by 5 percentage points from PY2019. Builders continue to be pleased with program staff and incentive amounts.

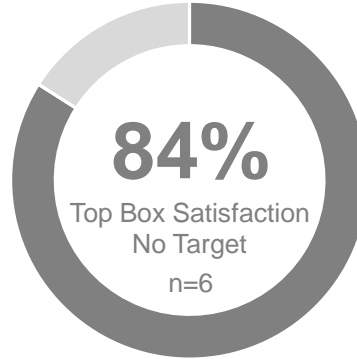


Overall Satisfaction

Overall Satisfaction decreased by 20 percentage points from PY2019 but still remains high at 80%. Key drivers of dissatisfaction include late documentation submission by HERS Raters and increased energy bills.

HERS Rater Satisfaction

Overall and Top Box



Satisfaction

Guidehouse was able to interview six out of the nine participating HERS Raters in PY 2020. Overall Satisfaction among HERS Raters is 100% in PY2020 highlighting how well the program is operating. Raters are happy with the level of engagement from program staff.

Top Box Satisfaction is also high for the program at 84%. One HERS Raters reported inconsistency among raters' scoring, obstructing fair disbursement of rebates. A small builder shared the same concerns as the rater on this issue.

Raters note that a detailed review of the files required for rebates could be beneficial for the program.

HERS Rater Verbatims:

6 - 8

"I'm happy for the program and the opportunity but the challenge is that we've lost 2 clients due to enforcing the rules and the fraudulent HERS ratings. Something needs to be done there with more auditing of the files. I've for example never needed to provide a blueprint to the program so those implementing the program can't do proper oversight."

9 - 10

Yes, Jenny is so fast "ICF is the most top-notch there is, the best guys to work with, I want you to write that down."

Realization Rates (RR)

By savings type



Fuel-Specific RR Values

Savings Type	RR ¹	Absolute Precision ²
Electric Energy (MWh)	1.00	0%
Peak Demand (MW)	1.00	0%
Gas Energy (Therms)	0.99	2%

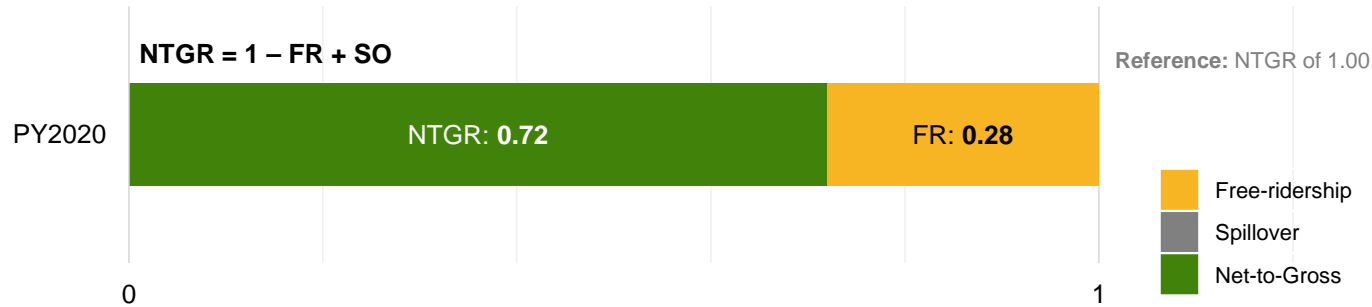
Savings for the NHC program are determined by inputting home characteristics collected by HERS Raters into the Ekotrope platform. Guidehouse performed field verification visits to confirm the accuracy of Ekotrope inputs for a sample of projects. The team calculated realization rates for program savings based on these field visits. The team calculated RRs of 100% for electric savings, 100% for peak demand savings, and 99% for gas savings.

- Drivers of variance were underreporting of LED lighting and misreporting of conditioned space and window square footage.
- PY2020 is the first full year of program activity for the NHC program. Due to limited field verification opportunities, Guidehouse assumed RRs of 1.00 in PY2019.

1. Realization Rates of 100% are rounded, not exactly equal to 100%.
2. 0% precision is a rounded number, not equal to absolute zero.

Net-to-Gross Ratio

Program-level NTGR



Spillover Findings

- Guidehouse did not collect SO data in PY2020. The NHC program is designed to be a market transformation program. SO is expected to manifest as builders construct energy efficient homes outside of the program but due to program influence.

Free-Ridership Findings

- FR decreased from 0.98¹ to 0.28 (± 0.06) in PY2020.
- FR was highest among medium² builders (0.31) and lowest among large builders (0.23).
- In PY2020, DTE reduced the program participation requirement to a maximum HERS score of 60 (65 in PY2019). The adjustment in program requirements likely contributed to the lower FR score.

Net-to-Gross Findings

- The NTGR 0.72 in PY2020, up from 0.02 in the previous program year.
- Guidehouse updated the methodology to account for program influence on energy efficiency decisions and what participants might do without the program.

1. *In PY2019, only four builders completed the year-end survey and as a result, there is high uncertainty around the PY2019 FR value. PY2019 also used a different methodology to calculate FR compared to PY2020.*
2. *Medium builders built between 78 and 208 in the NHC program.*

Key Findings

Critical learnings from PY2020 evaluation

Finding

Builder overall and top box satisfaction were both 80 percent in PY2020.

HERS Rater overall satisfaction was 100 percent, while top box satisfaction was 84 percent.

In PY2020, the program had RRs of 100% for electric and demand savings, and 99% for gas savings.

NTGR in PY2020 was 0.72, up 2 points from PY2019.

FR decreased from 0.98 to 0.28 in PY2020; more stringent program participation requirements likely contributed to the lower FR score.

SO was not evaluated in PY2020.



Marketplace Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-OM-01

Acknowledgements

Primary Contributors

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- › Joshua Rego
- › Nicole Reed Fry

DTE Contributors

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- › Kevin Bilyeu
- › Dennis Mullan
- › Toben Galvin
- › Shalini Lawson
- › Cynthia Rucker
- › José Gonçalves
- › Jeff LeBrun

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, ICF International:

- › Alexander Citron
- › Quinn Zeagler

Evaluation Context

The Marketplace is a website where residential customers can shop online for ENERGY STAR-qualified products. The Marketplace automatically applies downstream incentives to its product prices as instant rebates, reducing barriers and increasing convenience for customers to purchase energy efficient products. In PY2020, DTE Energy's (DTE's) program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric, demand, and gas savings to support DTE's annual reconciliation filing.

Net-to-Gross (NTG)

Guidehouse computed and provided program-level FR and NTGR values.

Installation Rate Adjustment Factor (IRAF)

Guidehouse provided fuel-neutral (fuel-specific) IRAF values for the program as a whole and for each measure grouping.

Satisfaction

Guidehouse provided program participant satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the customer experience.



Evaluated	Not Applicable
-----------	----------------

Customer Satisfaction

Overall and Top Box



(n=1,236)



(n=1,236)

0 - 5

"Return of a single defective product resulted in a cumbersome process that felt like I was the first to do so."

6 - 8

"I was limited to only being able to purchase 4 sets of lights. Given the opportunity. I would have purchased significantly more"

9 - 10

"Very useful items available at a great price. I will be able to use items and use less energy and save money."

"It [would not verify] my address so I could not get the rates advertised."

"It took a lot of effort to get the right bulbs to replace the wrong ones. Eventually, I was provided with the bulbs I wanted."



The Marketplace met its satisfaction targets.

Overall Satisfaction met the target of 96% ($\pm 1\%$). Top Box Satisfaction was 75% ($\pm 2\%$), 5 points higher than in PY2019. High satisfaction is driven by product quality and price.



The Marketplace continues to provide value.

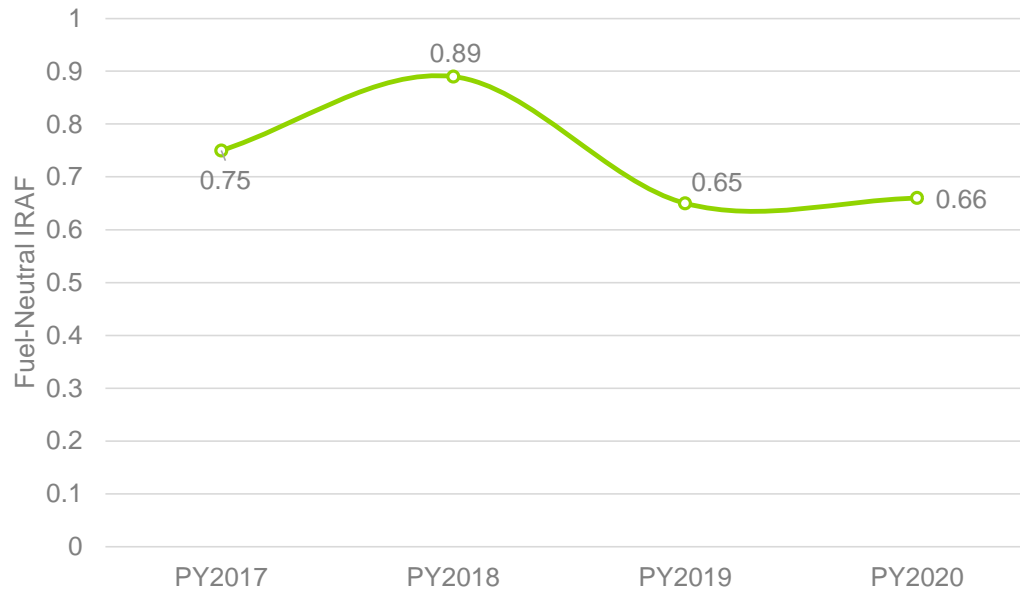
In an unusual year with unexpected challenges due to the COVID-19 pandemic, the Marketplace provided customers access to energy-saving opportunities from the comfort of their own home.

IRAF

Year-over-year



Fuel-Neutral IRAF Values



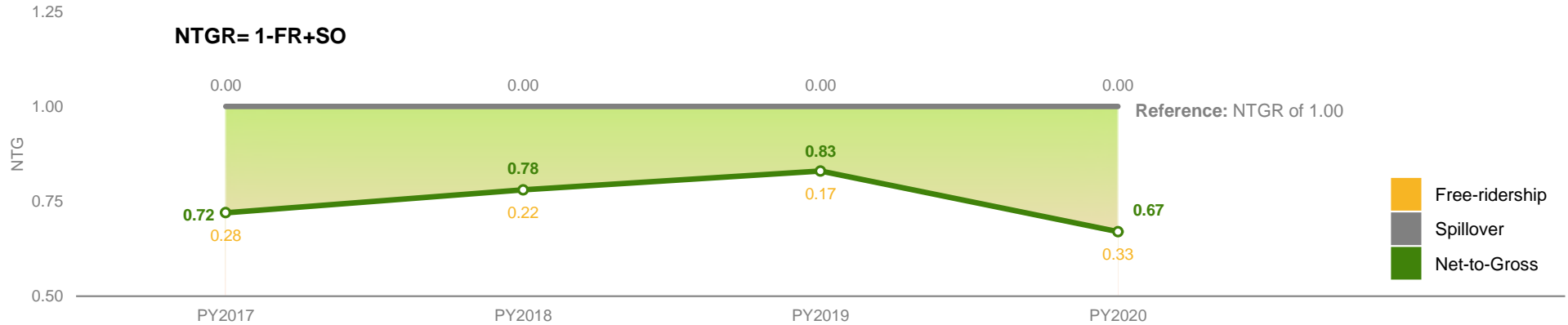
The fuel-neutral Installation Rate Adjustment Factors (IRAF) are up in PY2020, with the exception of LED Night Light and LED Specialty bulbs.

Guidehouse performed surveys to collect primary data on installation rates. Our analysis found:

- The program-level IRAF is **0.66** (± 0.08) in PY2020 (**up 1 point** from PY2019 IRAF).
- LED Standard had the largest increase at 3%.
- LED Night Lights had the largest decrease of 12%; this may be driven by a change in pack-size since PY2019, in PY2019 38% of measures were from a 2-pack and during PY2020 DTE shifted to only offer 2-packs via an individual item (68%) or an 'Electric Essentials' bundle (32%).

Net-to-Gross Ratio

Year-over-year change in program-level net-to-gross (NTG)^{1,2}



Spillover Findings

- Spillover (SO) is assumed to be zero for Marketplace, as in prior years.

Free-Ridership Findings

- The free-ridership (FR) is 0.33 in PY2020, up from 0.17 in the previous program year.

Net-to-Gross Findings

- The net-to-gross ratio (NTGR) is 0.67 in PY2020, down from 0.83 in the previous program year.

1. NTGR values do not include Tier 2/3 thermostats; thermostat savings are considered verified net.
2. This program was included as part of the PY2019 free ridership refresh and as such the results for PY2020 follow a different methodology than prior years.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 96 percent, while Top Box satisfaction was 75 percent.

Program IRAF increased by one percentage points in PY2020 to 0.66.

NTGR in PY2020 was 0.67, down from 0.83 in PY2019.

FR was up 16 points from PY2019 to 0.33.

As in prior years, SO was assumed to be zero for the Marketplace program in PY2020.

Payment Troubled Customer Initiative

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-PTCI-01

Acknowledgements

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- › David Becker
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- › Jeff LeBrun
- › Jason Kupser
- › Abbas Abdallah

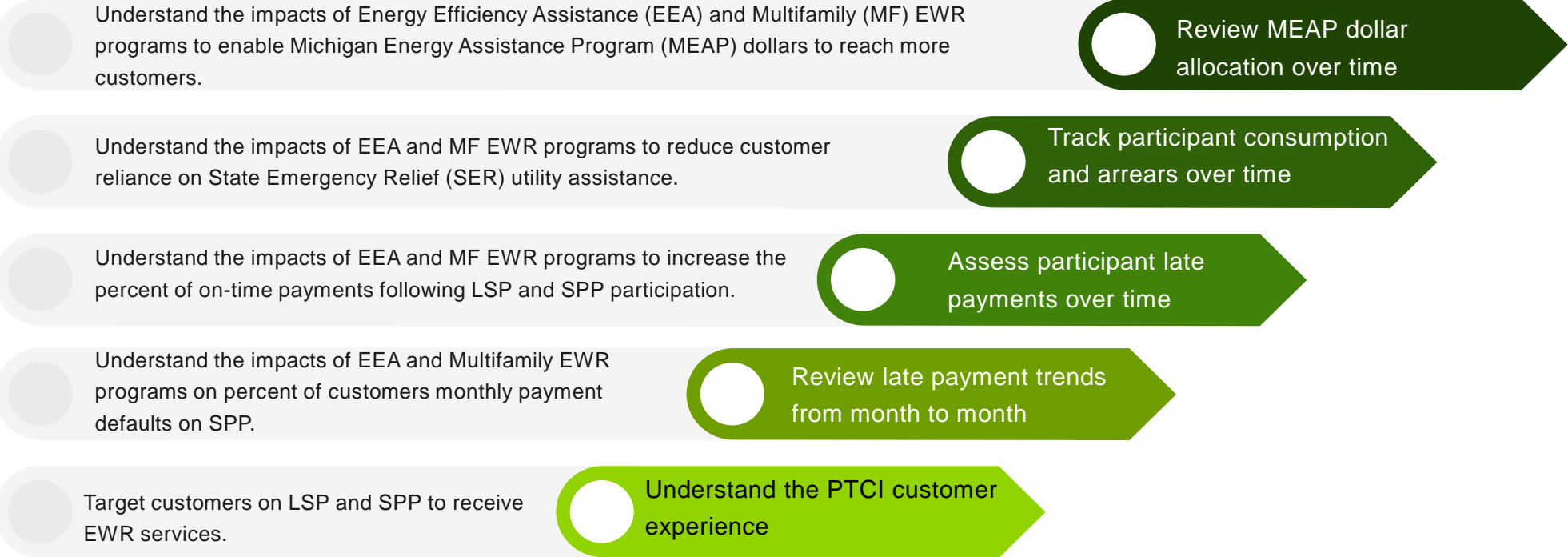
Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementers, SEEL, ICF, and Walker Miller Energy Services:

- › Michelca Scruggs, SEEL
- › Scott Davis, SEEL
- › Chris Munn, ICF
- › Adam Constantino, Walker Miller Energy Services

Evaluation Context

In PY2020, DTE's program objectives influenced our key areas of evaluation focus.



Customer Satisfaction



Initiative Satisfaction

PTCI had an overall satisfaction of 75 percent. Customers were slightly more satisfied with their payment plan itself¹, providing a satisfaction of 76 percent.



Driving Factors

- Single-family customers (SF) (n=13) were more satisfied than multifamily customers with the initiative, citing the ability to budget on a monthly basis, the measures received, and the ability to keep the lights on. Driving factors of dissatisfaction was the high cost of the bill even while on the payment plan.
- Multifamily customers (MF) (n=4) were more dissatisfied with the initiative. Driving factors of dissatisfaction include the amount of the bill and having to pay more in the long-run due to the structure of the payment plan (SPP).

0 - 5
"Payments are still too high."

"If the amount could be lower, I would be more satisfied."

6 - 8
"It does make it affordable but in the long run you end up owing way more."

"[The initiative] helps people on fixed incomes facilitate their homes. Sometimes you can't afford to pay a high bill."

9 - 10
"Very good opportunity; if in need of equipment or assistance with DTE bill it's a good program."

1. Both LSP and SPP payment plans

Payment Trend Summary

There are early indications of positive results, but the evaluation will benefit from additional years of data.

Goal	Status
To enable MEAP dollars to reach more customers	More customers are receiving MEAP assistance, and PTCI participants are receiving more MEAP dollars.
To reduce customer reliance on SER utility assistance	Reliance from 2019 to 2020 is relatively steady.
To increase the percentage of on-time payments following LSP/SPP participation	Data provides some indication that proportionally fewer PTCI participants are accruing fewer late payment charges, but results are not statistically significant in this early stage.
To understand the impact on percentage of customer monthly payment defaults on SPP	Too early to tell.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 75 percent, while Top Box satisfaction was 76 percent.



Retro- Commissioning Program

Program Year (PY) 2020
Evaluation Report

July 8, 2021



Report ID: DTE-PY2020-MPSC-RCX-02

Acknowledgements

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IMPLEMENTER SUPPORT

Guidehouse also acknowledges the timely assistance and openness of the program implementer, Energy Sciences:

- › Tyler Armstrong
- › Laurie Catey
- › Shelley Sullivan

Evaluation Context

The Retro-Commissioning (RCx) program targets operational gas and electric savings through custom energy conservation measures that are not in the Michigan Energy Measures Database (MEMD) to optimize building energy consumption. In PY2020, DTE's program objectives influenced our key areas of evaluation focus.

Reconciliation

Included in RR activities.

Net-to-Gross (NTG)

NTG research was not conducted for the RCx program.



Realization Rate (RR)

Understanding of the RR and factors leading to discrepancies in reported electric and gas savings, identifying opportunities to improve calculation methodologies and accuracy of reported custom measure savings.

Satisfaction

Research into participant satisfaction and experience with the program was not conducted for the RCx program.

Evaluated

Not Applicable

RR

Year-over-year



Fuel-Specific RR Values



Guidehouse performed application and telephone survey engineering reviews to collect project specific data on sampled projects. Our analysis found the fuel-specific RRs decreased in PY2020.

- The RCx program energy savings calculator key input values, operating schedules, and control setpoints (night-time setback temperature, weekly operating schedule, supply fan static pressure, and ground source heat pump efficiency) were different than those assumed by the implementation contractor (IC) which decreased the verified electric savings.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Fuel-specific RRs decreased for both electric and gas in PY2020.

Revolving Loan Fund Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-RLF-01

Acknowledgements

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Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, Michigan Saves:

- › Todd Parker, Michigan Saves

Evaluation Context

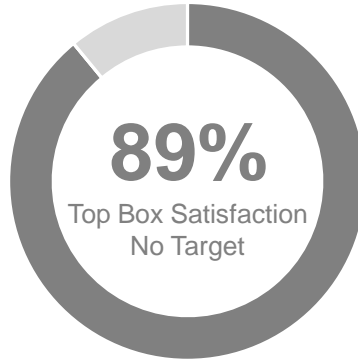
The Revolving Loan Fund (RLF) program¹ is designed to provide energy efficiency measures to low-to-moderate income residential customers in DTE Energy's (DTE's) combo service territory. The focus of RLF is a whole home approach to energy efficiency. In PY2020, DTE's program objectives influenced our key areas of evaluation focus.



1. Michigan Saves acts as the RLF Program manager, coordinating with Habitat for Humanity of Huron Valley to refer potential program participants to fill out an application. Michigan Saves and Habitat for Humanity of Huron Valley then coordinate with Ecotelligent Homes (the contractor) to install the energy efficient measures in the homes of approved program participants. Initially, in 2019, the program was only in Washtenaw County, but expanded in 2020 to also include Wayne County. After PY2021, the Revolving Loan Fund program will be discontinued, as it has been difficult to manage the loan aspect of the program. However, the EEA program will be expanding to serve a wider range of eligible customers. Findings from this evaluation may be applied to similar loan programs in the future.

Customer Satisfaction

Overall and Top Box



Customer Satisfaction Is High

The RLF program received high customer satisfaction marks. Overall Satisfaction was consistent with PY2019, achieving 100% overall satisfaction. Top Box Satisfaction was 89%, 22 percentage points higher than in PY2019.

6 - 8

"I would have liked to have been more involved in the decision about the equipment that would be installed."

"The assessment should be based on the needs analysis of the home."

9 - 10

"More communication would be beneficial. It was difficult to communicate between the contractors."

"Program marketing could be improved. I was looking for information about the program on DTE Energy's website, but it was not listed."

9 - 10

"I am so thankful for the equipment that was installed. This is a great program, and the process was easy."

IRAF

Year-over-year



Fuel-Neutral IRAF Values



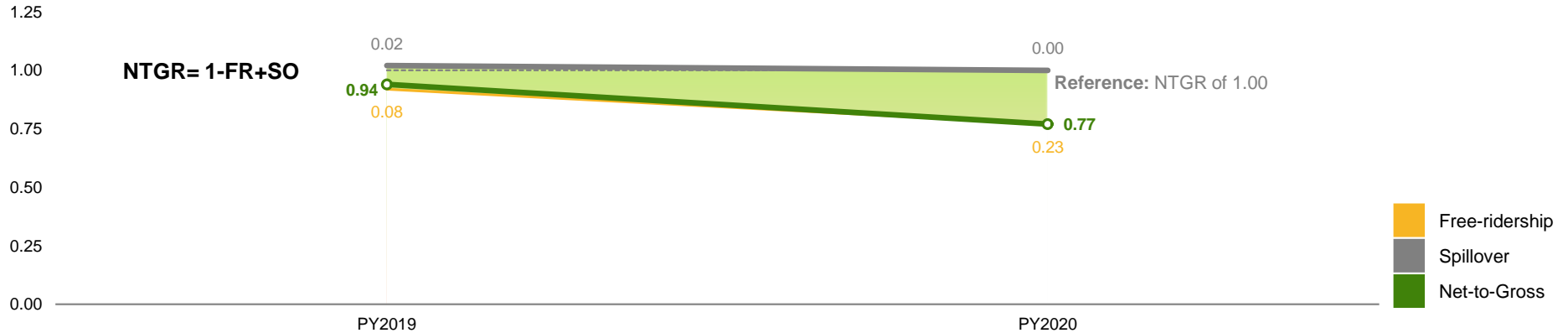
Guidehouse performed surveys to collect primary data on installation rates.¹

- All customers were asked about up to three of the largest savings measures they received.
- All customers reported that the measures were still installed, resulting in a fuel-neutral IRAF of 1.00 for all measures.
- This is unchanged from PY2019, which was the first year the program was evaluated.

1. IRAF sample sizes were $N = 19$ for Insulation measures, $N = 8$ for Equipment measures, and $N = 6$ for Other measures. Other measures includes advanced power strips, can lights, LED bulbs, aerators, duct sealing, tune-ups, and thermostats. All thermostats in PY2020 were Tier 3 thermostats. Tier 3 thermostat savings are considered Verified Net. However, the IRAF and part use factor (PUF) for Tier 3 thermostats was also 1.0 ($N = 2$).

Net-to-Gross

Year-over-year change in program-level net-to-gross (NTG)



Spillover Findings

- Spillover (SO) is down 0.02 in PY2020, to 0.00.
- Respondents did not install additional energy efficient measures directly attributed to the program, which lead to a SO score of 0.00.

Free-Ridership Findings

- Free Ridership (FR) is 0.23,¹ which is up from 0.08 in PY2019.

Net-to-Gross Findings

- The net-to-gross ratio (NTGR) is 0.77 in PY2020, down from 0.94 in PY2019 as a result of decreased SO and increased FR.

1. The FR relative precision is 12.5% with a 90% confidence interval.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 100 percent, while Top Box satisfaction was 89 percent.

Program IRAF was 1.00, unchanged from the value evaluated in PY2019.

NTGR in PY2020 was 0.77, down 17 points from PY2019.

FR was up 15 points from PY2019 yo 0.23.

SO as down 0.02 in PY2020 to 0.00.



Small Business Focus Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-SBF-01

Acknowledgements

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Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementer, Franklin Energy:

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- › Melissa Grace
- › Nic Schueller

Evaluation Context

The Small Business Focus (SBF) program offers direct install (DI) measures at no cost and incentives for other energy efficiency measures. In PY2020, DTE Energy's (DTE's) program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric and gas savings to support DTE's annual reconciliation filing.

Net-to-Gross (NTG)

Guidehouse computed and provided program-level FR values.



Installation Rate Adjustment Factor (IRAF)

Guidehouse provided fuel-neutral IRAF values for the program as a whole and for each measure grouping.

Satisfaction

Guidehouse provided program participant satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the customer experience.



Customer Satisfaction

Overall and Top Box



n = 75 monthly surveys



n = 75 monthly surveys



Overall Program Satisfaction

The SBF program achieved a high overall customer satisfaction in its first year of commercialization. Overall Satisfaction is 88% (± 8 percentage points) achieving the target, and Top Box Satisfaction is 68% (± 11 percentage points).



Satisfaction Drivers

- Similar to other DTE TA-focused programs, driving factors for high satisfaction include the quality of the work performed and staff's ability to answer questions.
- Factors driving low satisfaction include the energy savings items installed and the time it took to receive a rebate check.

0 - 5

"We obtained financing and paid the contractor right away. After more than 8 months, he still has not finished the job that we paid for in full. Our repeated attempts to have him finish the job have been met with promises that he will finish, and he still has not..."

6 - 8

"I thought I would save more; I would be interested in other money saving programs."

9 - 10

"The service technician was perfect. I would highly recommend them to others."

Installation Rate Adjustment Factor

DI component



Fuel-Neutral IRAF Values

	PY2020 IRAF
SBF	0.98 (\pm 0.05)
BEC	0.90 (\pm 0.03)

The fuel-neutral installation rate adjustment factors (IRAFs) for the DI component of the program is 0.98 (\pm 5 points) in PY2020.

Guidehouse performed field verification visits to collect primary data on installation rates. Our analysis found:

- The primary factor driving down IRAF is misreporting.
- The DI component-level IRAF is similar to other DI programs within DTE, such as the Business Energy Consultation (BEC) program.

Installation Rate Adjustment Factor

TA component



Fuel-Neutral IRAF Values

	PY2020 IRAF
SBF	0.97 (\pm 0.11)
BEC	0.87 (\pm 0.06)
Illinois-based Small Business Program ¹	0.99 (\pm N/A)

The fuel-neutral IRAF for the TA component of the program is 0.97 (\pm 11 points) in PY2020.

Guidehouse performed field verification visits to collect primary data on installation rates. Our analysis found:

- IRAF for the TA component of the program is similar to other DTE TA programs and other TA programs in other utility territories.

1. The Illinois (IL) Small Business Program uses a realization rate (RR), which is determined using a database review. This Small Business program does not have a distinct DI program, but emphasis their rebate program, that focuses primarily on lighting.

Net-to-Gross Ratio



Component-Level NTGR

Component- Level	FR	NTGR
SBF DI	0.01	0.99
SBF TA	0.32	0.68

Free-Ridership (FR) for the SBF program was derived from customer phone surveys. The FR value for the DI component of the program is 0.01 (± 8 points), and the FR value for the TA component of the program is 0.32 (± 4 points). TA FR is based on perspectives of both the participant and the TA.

- The primary driver of DI FR in PY2020 is pipe-wrap, with a measure-level FR of (0.01).
- The primary driver of TA FR is the large project stratum (0.50).
- The net-to-gross ratio (NTGR) for the TA component of the program aligns with similar DTE TA-focused programs, such as the C&I Downstream Program (0.77) and the BEC program (0.54).
- Although overall precision targets were met, reaching customer survey targets was a challenge in PY2020.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 88 percent, while Top Box satisfaction was 68 percent.

IRAF for the direct install component of the program was 0.98 in PY2020.

IRAF for the trade ally component of the program was 0.97 in PY2020.

NTGR for the direct install component of the program in PY2020 was 0.99, with FR at 0.01.

NTGR for the trade ally component of the program in PY2020 is 0.68, with FR at 0.32.

School Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-SCH-01

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Implementer Support

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- › Lauren Johnson

Evaluation Context

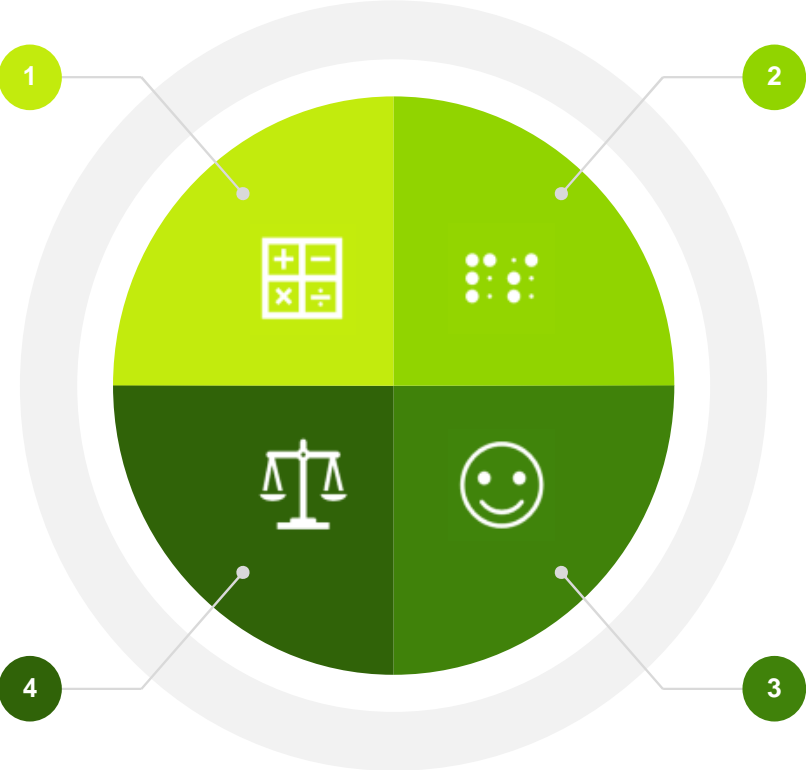
The School program targets equipment and behavioral changes in households with school-age students through educational presentations and an energy efficiency kit of specific measures. In PY2020, DTE's program objectives influenced our key areas of evaluation focus.

Reconciliation

Guidehouse determined verified net electric, demand, and gas savings to support DTE's annual reconciliation filing

Net-to-Gross (NTG)

Guidehouse computed and provided program-level FR, SO, and NTGR values



Installation Rate Adjustment Factor (IRAF)

Guidehouse provided fuel-neutral IRAF values for the program as a whole, and for each measure grouping

Satisfaction

Guidehouse provided program participant satisfaction and DTE satisfaction results, along with insights into opportunities to enhance the customer experience

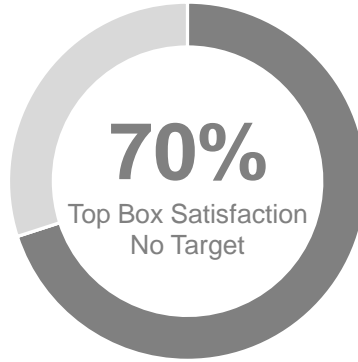


Customer Satisfaction

Overall and Top Box



n=187



n=187

0 - 5

"The aerators and shower heads weren't compatible with my house."

"Some things/activities for the students were unclear."

6 - 8

"I already had water saving faucets and showerheads, so it felt like a waste."

"It seems like a great program. It is nice to educate children and parents about this."

9 - 10

"So far I think it's a great program. My only suggestion would be to have some of the items be returned if not used, like the extra aerators that we cannot use since they don't fit. That way more things will not end up in a landfill."



Satisfaction Remains High

The School program has had consistently high satisfaction ratings. Overall Satisfaction was 3 percentage points above the program's target of 90% at 93% ($\pm 3\%$).

Factors driving high satisfaction include robust student engagement with energy efficiency and new learnings for families about savings energy.



Overall and Top Box Satisfaction have decreased from 2019

While Overall Satisfaction remains high, Top Box Satisfaction was 70%, 12 percentage points lower than 2019.

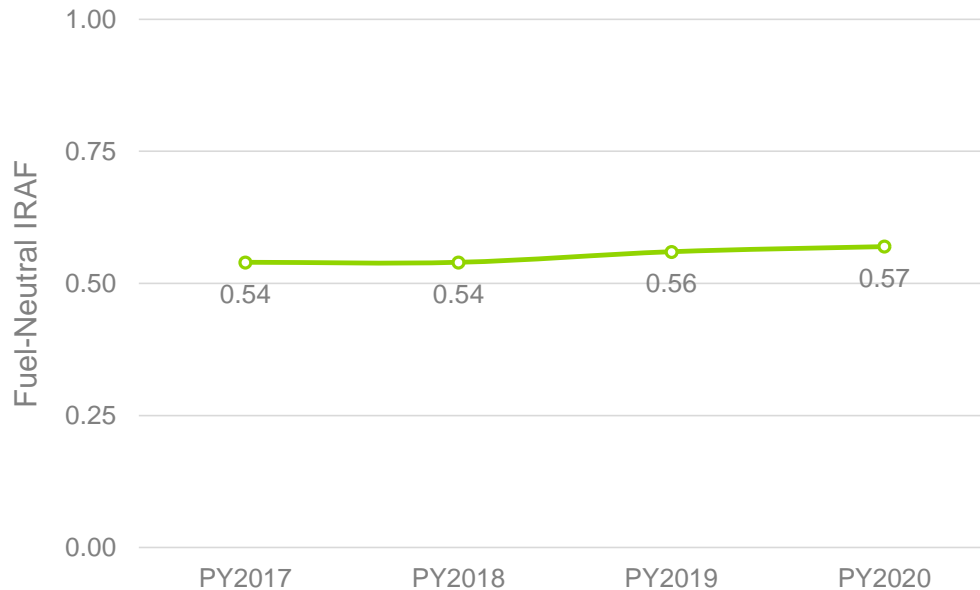
Customers that expressed dissatisfaction with the program described not needing the measures in the kits, being unable to use the measures, or unclear instructions and activities.

IRAF

Year-over-year



Fuel-Neutral IRAF Values

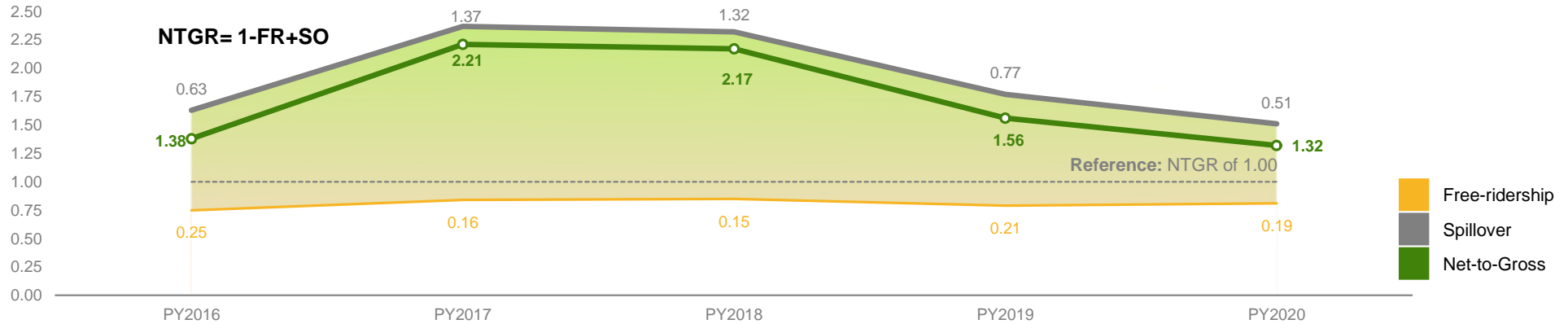


Guidehouse fielded surveys to collect primary data on installation rates. Our analysis found:

- The program's fuel-neutral Installation Rate Adjustment Factor (IRAF)¹ increased by 1 point in PY2020.
- The increase in IRAF is largely driven by greatly increased fraction of customers who installed pipe wrap measures.
- Factors keeping IRAF from increasing further included decreased installations of kitchen faucet aerators and showerheads, and relatively steady values for bathroom aerators and lighting measures.

1. Evaluated fuel-neutral IRAF values will be applied during the PY2022 reconciliation effort.

NTGR



Spillover Findings

- Spillover (SO) is down in PY2020, from 0.77 to 0.51.
- SO is primarily being driven by updated furnaces, insulation, and thermostats.
- Customers reported setting their AC to lower levels at reduced rates compared to PY2019, resulting in a decrease in year-over-year SO.

Free-Ridership Findings

- Free-Ridership (FR) is down slightly in PY2020, from 0.21 to 0.19
- FR is primarily driven by high LED FR (0.44) relative to the other measures (0.10–0.25).

Net-to-Gross Findings

- The net-to-gross ratio (NTGR) is 1.32 in PY2020, down from 1.56 in the previous program year.
- The decrease in NTGR is mostly driven by a 26-point decrease in SO compared to PY2019.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Overall satisfaction was 93 percent, while Top Box satisfaction was 70 percent.

Program IRAF increased by one percentage point in PY2020 to 0.57.

NTGR in PY2020 was 1.32, down 24 points from PY2019, driven by the decrease in SO.

FR was down 2 points from PY2019 to 0.19.

SO was down in PY2020, from 0.77 to 0.51.



Strategic Energy Management Program

Program Year (PY) 2020
Evaluation Report

June 25, 2021



Report ID: DTE-PY2020-MPSC-SEM-01

Acknowledgements

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DTE Contributors

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- › Rebecca Malfroid
- › Don Boza
- › Ken Randazzo

Implementer Support

Guidehouse also acknowledges the timely assistance and openness of the program implementation team:

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Evaluation Context

The Strategic Energy Management (SEM) program targets operational savings through custom energy conservation measures that are not in the Michigan Energy Measures Database (MEMD) to optimize energy consumption at commercial and industrial facilities. In PY2020, DTE’s program objectives influenced our key areas of evaluation focus.

Reconciliation

Included in RR activities.

Net-to-Gross (NTG)

NTG research was not conducted for the program.



Realization Rate (RR)

Understanding of the realization rate and factors leading to discrepancies in reported electric and gas savings, identifying opportunities to improve calculation methodologies and accuracy of reported custom measure savings.

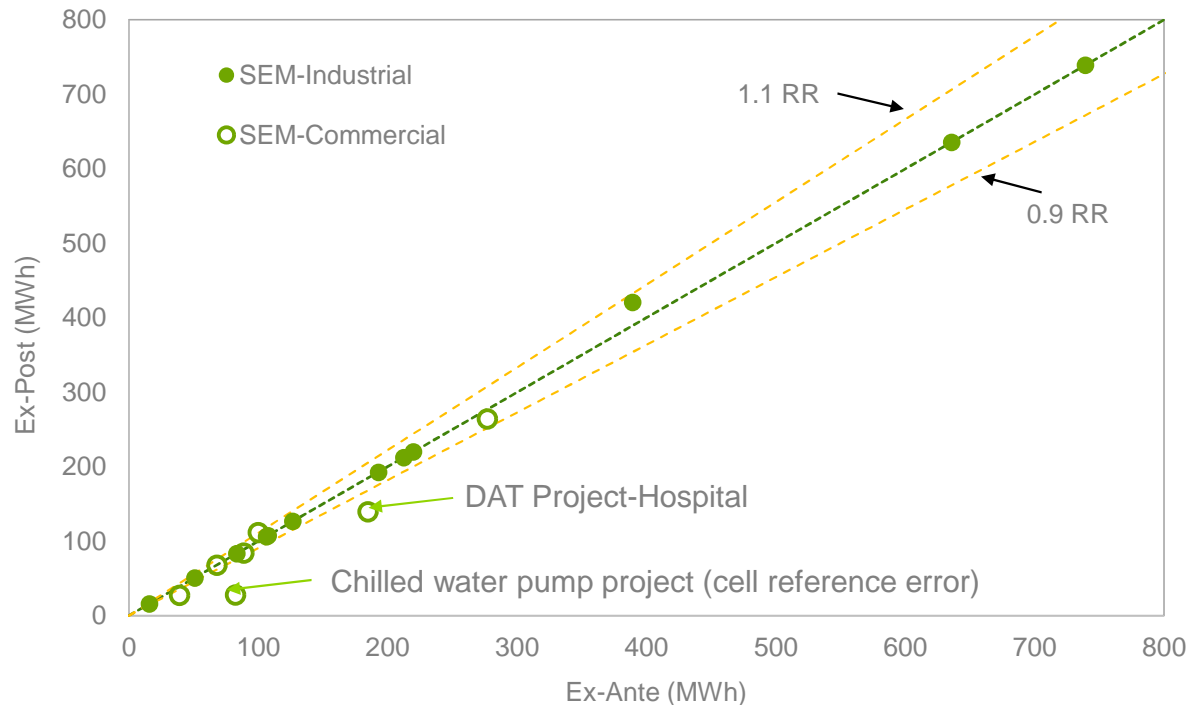
Satisfaction

Research into participant satisfaction and experience with the program was not conducted for the SEM program.



SEM RRs: Electric

Ex Post vs. Ex Ante Electric Energy Savings

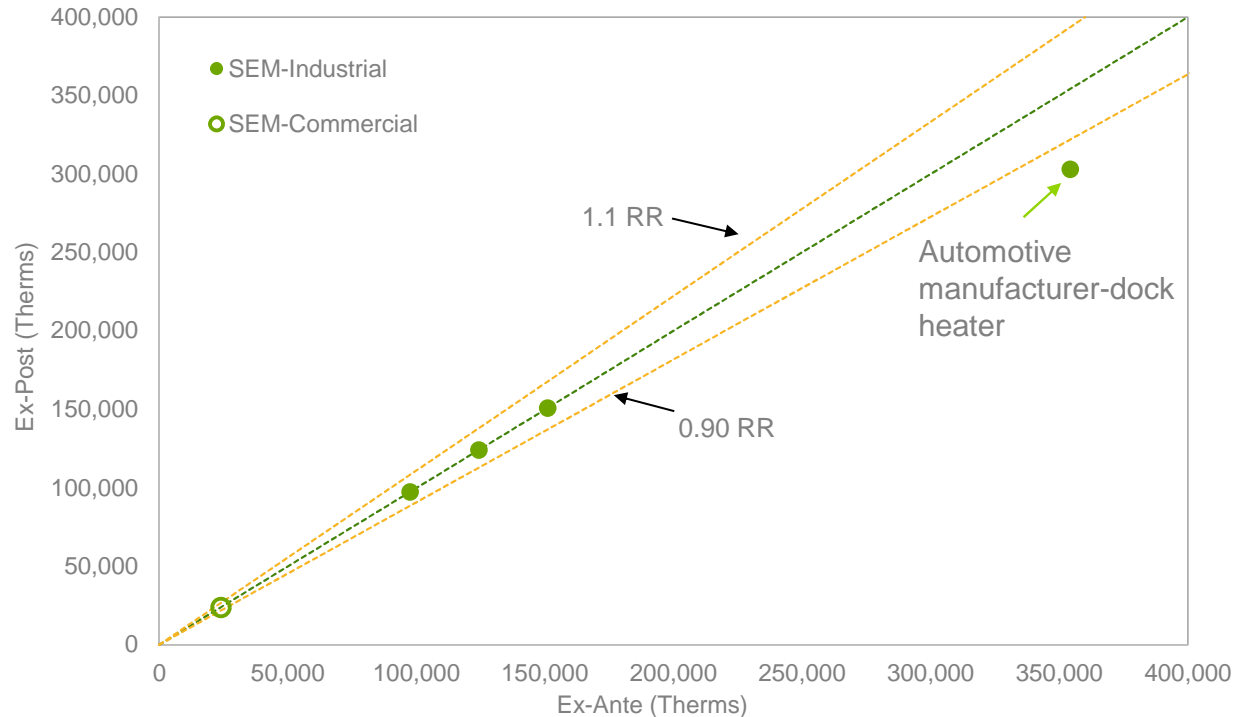


Key findings for the highest-impact measure types were as follows:

- **Discharge Air Temperature (DAT).** One hospital project had RR = 0.95 where Guidehouse found minor differences in the air handling unit's DAT during the customer phone interview and those reported by the IC, reducing energy savings slightly.
- **Variable Speed Controls.** Ex ante energy savings for two pump control projects and one fan control project were calculated using rough estimations of pump/fan speeds. Since trend data was available for these projects, Guidehouse calculated verified savings using averages of trend data for pump speed:
 - Hot water pump controls project, RR=0.95.
 - Chilled water pump project, RR=0.34 (cell reference error).
 - Variable air volume project RR = 1.12.
- One project, (chilled water pump control at a hospital site) assumed motor load factor of 1 without supporting information. Typical motor factor assumed for custom calculations is application specific with an assumed default value less than one absent site-specific supporting information.

SEM RRs: Gas

Ex Post vs. Ex Ante Gas Savings



Most gas projects had a RR = 1.00, leading to an overall RR close to 1.00.

- One large SEM-Industrial project (automotive manufacturer) had a RR = 0.86. Guidehouse found that this project claimed energy savings for all dock heaters being turned off during the COVID-19 plant shutdown but based on trend data supplied by the customer Guidehouse found several dock heaters were operating, reducing the gas energy savings.

Key Findings

Critical learnings from PY2020 evaluation

Finding

Project-specific RRs for electric savings ranged between 0.90 and 1.10.

Most gas projects had a RR = 1.00, leading to an overall RR close to 1.00.



Audit and Weatherization Program

Program Year (PY) 2020
Reconciliation Report

April 2, 2021



Report ID: DTE-PY2020-RECON-AW-01

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DTE CONTRIBUTORS

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Program Savings Summary

In PY2020, the Audit and Weatherization program¹ resulted in Verified Net Savings of 916 MWh, 0.29 MW of coincident peak demand, and 37,423 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2018 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » Implementation Contractor (IC) records contained 89 fewer projects than DTE's Energy Optimization Program Tracking (EOPT) database. The IC confirmed the projects were inadvertently left out of the IC extract and corrected the issue.
- » There were ten projects with savings discrepancies between the EOPT and IC databases. The IC confirmed that the EOPT savings values were correct and adjusted the IC database.



	MWH	PEAK MW	MCF
Utility Reported Gross	996	0.31	40,669
Audited Gross Realization Rate ²	100%	100%	~100%
Audited Gross ³	996	0.31	40,674
IRAF ⁴	1.00	1.00	1.00
Verified Gross	996	0.31	40,674
NTGR ⁵	0.92	0.92	0.92
Verified Net⁶	916	0.29	37,423

Measure-Level Verified Net Savings

Verified Net Savings are 92 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 Audit and Weatherization Attic Insulation R30 - Retail Insulation Combo	2	-	132	1	-	122
2020 Audit and Weatherization Attic Insulation R30 - Retail Insulation Gas	-	-	94	-	-	86
2020 Audit and Weatherization Attic Insulation R38 - Retail Insulation Combo	2	-	138	1	-	127
2020 Audit and Weatherization Attic Insulation R38 - Retail Insulation Gas	-	-	109	-	-	100
2020 Audit and Weatherization Wall Insulation - Retail Insulation Combo	31	-	2,714	28	-	2,497
2020 Audit and Weatherization Wall Insulation - Retail Insulation Gas	-	-	3,834	-	-	3,528
2020 Audit and Weatherization- Patio Doors - Midstream Combo - Custom	24	-	746	22	-	687
2020 Audit and Weatherization- Patio Doors - Midstream Electric - Custom	1	-	-	1	-	-
2020 Audit and Weatherization- Patio Doors - Midstream Gas - Custom	-	-	214	-	-	197

Measure-Level Verified Net Savings (cont.)

Verified Net Savings are 92 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 Audit and Weatherization- Windows - Midstream Combo - Custom	254	-	8,044	234	-	7,401
2020 Audit and Weatherization- Windows - Midstream Electric - Custom	11	-	-	11	-	-
2020 Audit and Weatherization- Windows - Midstream Gas - Custom	-	-	1,945	-	-	1,789
Basement Wall Insulation	7	0.00	272	7	0.00	251
Crawlspace Wall Insulation	2	0.00	257	2	0.00	237
Floor Insulation	2	0.00	115	2	0.00	106
High efficiency 95 AFUE furnace NC or without ECM	-	-	20	-	-	19
High efficiency 96 AFUE furnace NC or without ECM	-	-	305	-	-	280
Infiltration reduction - 10%	0	0.00	17	0	0.00	16
Infiltration reduction - 20%	1	0.00	144	1	0.00	133
Infiltration reduction - 30%	1	0.00	222	1	0.00	204

Measure-Level Verified Net Savings (cont.)

Verified Net Savings are 92 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Infiltration reduction - 40%	2	0.00	252	2	0.00	232
Infiltration reduction - 50%	4	0.00	406	4	0.00	374
O&M Tune-up - furnace only	-	-	16	-	-	15
R-30 Roof Insulation	6	0.00	353	6	0.00	325
R-38 Roof Insulation	13	0.01	696	12	0.01	641
R-49 Roof Insulation	32	0.02	1,625	29	0.01	1,495
R-60 Roof Insulation	32	0.01	945	30	0.01	870
R6 to R19 kneewalls	8	0.00	258	7	0.00	238
Rim Joist Insulation	18	0.00	902	17	0.00	830
Setback thermostat - moderate setback	0	-	33	0	-	33
Wall Insulation	49	0.02	2,695	45	0.01	2,479
Window Replacement	493	0.25	13,165	454	0.23	12,113
Total⁴	996	0.31	40,669	916	0.29	37,423
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				92%	92%	92%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data to audit Utility Reported Gross Savings.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the IC database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

Installation Rate Adjustment Factor

Following the PY2020 DTE Energy Plan Filing, the evaluation team applied the fuel-specific measure-level IRAF from PY2018 to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings. There were a few exceptions:

- » An IRAF of 1.00 is applied to Tier 2 & 3 Thermostats based on guidance from MPSC staff.
- » The Insulation and Windows (INWIN) Midstream channel is relatively new and has not been separately evaluated. As a result, Midstream and Retail measures are not distinguished from the other channels and receive the same IRAF values.

	Measure	Electric	Gas
Home Performance	HVAC ¹	N/A	1.00
	Shell ²	1.00	1.00
	Tier 2/3 Thermostats	1.00	1.00
INWIN	Insulation	1.00	1.00
	Windows	1.00	1.00
INWIN Midstream	Insulation	1.00	1.00
	Windows and Doors	1.00	1.00

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to all measures, except for Tier 2 & 3 Thermostats, to determine the Verified Net Savings. A NTGR of 1.00 is applied to Tier 2 & 3 Thermostats per guidance from MPSC staff.

	Measure	NTGR
	HVAC ¹	0.92
Home Performance	Shell ²	0.92
	Tier 2/3 Thermostats	1.00
INWIN	All Measures	0.92
INWIN Midstream	All Measures	0.92

Data Tracking Audit

The Guidehouse team compared DTE and IC databases to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD and agreed-upon custom savings values.

The Guidehouse team found four issues when comparing the IC and EOPT databases:

- » There were 89 projects present in the EOPT, but not present in the IC database.
- » There was one project with two measure entries in the EOPT but four measure entries in the IC database.
- » There were ten projects with savings discrepancies (nine with kWh and one with kW) between the EOPT and IC databases.

All issues were resolved by the IC with no effect on savings reported in the EOPT.

	IC ¹	EOPT ¹	Action
There were 89 projects present in the EOPT but not present in the IC database.	89	-	These records were from the same invoice. They were inadvertently left out of the IC extract but submitted to the EOPT without issue. The IC provided a corrected IC extract.
There was one project with 2 measure entries in the EOPT but 4 measure entries in the IC database.	2	-	The IC confirmed the measure entries were duplicated in the IC database and the EOPT entries were correct. The IC provided a corrected IC extract.
There were 9 retail insulation projects with zero savings in the EOPT but nonzero savings in the IC database.	9	-	The nonzero values in the IC database were placeholder values from project pipeline estimates. The IC confirmed that the EOPT values were correct. The IC provided a corrected IC extract.
There was one project with zero kW savings in the EOPT but savings of 9,198 kW in the IC database.	1	-	The IC confirmed that this was an entry error in the IC database and the EOPT value was correct. The IC provided a corrected IC extract.
Total Records	101	-	

Measure-Level Audited Gross Savings

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings and ~100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 Audit and Weatherization Attic Insulation R30 - Retail Insulation Combo	2	-	132	2	-	132
2020 Audit and Weatherization Attic Insulation R30 - Retail Insulation Gas	-	-	94	-	-	94
2020 Audit and Weatherization Attic Insulation R38 - Retail Insulation Combo	2	-	138	2	-	138
2020 Audit and Weatherization Attic Insulation R38 - Retail Insulation Gas	-	-	109	-	-	109
2020 Audit and Weatherization Wall Insulation - Retail Insulation Combo	31	-	2,714	31	-	2,714
2020 Audit and Weatherization Wall Insulation - Retail Insulation Gas	-	-	3,834	-	-	3,834
2020 Audit and Weatherization- Patio Doors - Midstream Combo - Custom	24	-	746	24	-	747
2020 Audit and Weatherization- Patio Doors - Midstream Electric - Custom	1	-	-	1	-	-
2020 Audit and Weatherization- Patio Doors - Midstream Gas - Custom	-	-	214	-	-	214

Measure-Level Audited Gross Savings (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings and ~100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 Audit and Weatherization- Windows - Midstream Combo - Custom	254	-	8,044	254	-	8,045
2020 Audit and Weatherization- Windows - Midstream Electric - Custom	11	-	-	11	-	-
2020 Audit and Weatherization- Windows - Midstream Gas - Custom	-	-	1,945	-	-	1,945
Basement Wall Insulation	7	0.00	272	7	0.00	272
Crawlspace Wall Insulation	2	0.00	257	2	0.00	258
Floor Insulation	2	0.00	115	2	0.00	115
High efficiency 95 AFUE furnace NC or without ECM	-	-	20	-	-	20
High efficiency 96 AFUE furnace NC or without ECM	-	-	305	-	-	305
Infiltration reduction - 10%	0	0.00	17	0	0.00	17
Infiltration reduction - 20%	1	0.00	144	1	0.00	144
Infiltration reduction - 30%	1	0.00	222	1	0.00	222

Measure-Level Audited Gross Savings (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings and ~100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Infiltration reduction - 40%	2	0.00	252	2	0.00	252
Infiltration reduction - 50%	4	0.00	406	4	0.00	406
O&M Tune-up - furnace only	-	-	16	-	-	16
R-30 Roof Insulation	6	0.00	353	6	0.00	353
R-38 Roof Insulation	13	0.01	696	13	0.01	697
R-49 Roof Insulation	32	0.02	1,625	32	0.02	1,625
R-60 Roof Insulation	32	0.01	945	32	0.01	945
R6 to R19 kneewalls	8	0.00	258	8	0.00	259
Rim Joist Insulation	18	0.00	902	18	0.00	902
Setback thermostat - moderate setback	0	-	33	0	-	33
Wall Insulation	49	0.02	2,695	49	0.02	2,695
Window Replacement	493	0.25	13,165	493	0.25	13,166
Total⁴	996	0.31	40,669	996	0.31	40,674
Audited Gross Savings Realization Rates^{5,6}				100%	100%	~100%

Verified Savings

In PY2020, the Audit and Weatherization program resulted in Verified Net Savings of 916 MWh, 0.29 MW of coincident peak demand, and 37,423 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

	Savings	MWH	PEAK MW	MCF
Home Performance	Utility Reported	16	0.02	2,395
	Audited Gross ¹	16	0.02	2,396
	IRAF ²	1.00	1.00	1.00
	Verified Gross	16	0.02	2,396
	NTGR ³	0.92	0.92	0.92
	Verified Net ⁴	15	0.01	2,204
INWIN	Utility Reported	656	0.30	20,304
	Audited Gross ¹	656	0.30	20,307
	IRAF ²	1.00	1.00	1.00
	Verified Gross	656	0.30	20,307
	NTGR ³	0.92	0.92	0.92
	Verified Net ⁴	603	0.27	18,682
INWIN Midstream	Utility Reported	324	0.00	17,970
	Audited Gross ¹	324	0.00	17,971
	IRAF ²	1.00	1.00	1.00
	Verified Gross	324	0.00	17,971
	NTGR ³	0.92	0.92	0.92
	Verified Net ⁴	298	0.00	16,534
Total	Utility Reported	996	0.31	40,669
	Audited Gross	996	0.31	40,674
	Verified Gross	996	0.31	40,674
	Verified Net	916	0.29	37,423



Business Energy Consultation Program

Program Year (PY) 2020
Reconciliation Report

April 30, 2021



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Program Savings Summary

In PY2020, the Business Energy Consultation (BEC) program (including both the Direct Install (DI) and Trade Ally (TA) sub-programs) resulted in Verified Net Savings of 14,641 MWh, 0.81 MW of coincident peak demand, and 36,552 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2019 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » Data transfer errors in three of the 24 applications reviewed.

	MWH	PEAK MW	MCF
Utility Reported Gross	15,902	0.89	39,751
Audited Gross Realization Rate ¹	~100%	100%	100%
Audited Gross ²	15,898	0.89	39,751
IRAF ³	~1.00	0.99	0.96
Verified Gross	15,882	0.88	38,049
NTGR ⁴	0.92	0.92	0.92
Verified Net⁵	14,641	0.81	36,552

Measure-Level Verified Net Savings: BEC DI

Verified Net Savings are 94 percent of Utility Reported Gross electric, 89 percent of peak demand, and 92 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Commercial Smart thermostat	306	-	16,515	306	-	16,515
LED A-line 1600-2600 lumen output replacing Incandescent/Halogen	41	0.01	-	37	0.01	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	152	0.03	-	136	0.03	-
LED A-line 800-1599 lumen output replacing Incandescent/Halogen	46	0.01	-	41	0.01	-
LED Candelabra <= 5W	2	0.00	-	2	0.00	-
LED Exit Signs Electronic Fixtures (Retrofit Only)	7	0.00	-	6	0.00	-
LED Globe <= 8W	7	0.00	-	6	0.00	-
LED PAR/R/BR <= 15.5W	110	0.02	-	97	0.02	-
Low Flow Faucet Aerator – Private Restroom - 1.0 gpm	0	0.00	300	0	0.00	251
Low Flow Faucet Aerator – Public Restroom - 1.0 gpm	42	0.00	18,429	35	0.00	15,428

Measure-Level Verified Net Savings: BEC DI (cont.)

Verified Net Savings are 94 percent of Utility Reported Gross electric, 89 percent of peak demand, and 92 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Low Flow Showerhead - 1.5 gpm	-	-	935	-	-	852
Occupancy Sensor less than 150 sq ft	0	0.00	-	0	0.00	-
Occupancy Sensors between 150 and 500 sq ft	1	0.00	-	1	0.00	-
Occupancy Sensors over 500 W	5	0.00	-	5	0.00	-
Pipe Wrap - DWH 140F - Conditioned – elec water heater	0	0.00	-	0	0.00	-
Pipe Wrap - DWH 140F - Conditioned – gas water heater	0	0.00	15	0	0.00	14
Pipe Wrap - DWH 140F - Unconditioned – elec water heater	1	0.00	-	1	0.00	-
Pipe Wrap - DWH 140F - Unconditioned – gas water heater	-	-	582	-	-	531
Pre Rinse Sprayers CEE Tier 1 <= 1.13 gpm (Retrofit Only)	-	-	174	-	-	159
Setback/Setup	69	0.00	2,825	69	0.00	2,825
Total⁴	789	0.07	39,776	741	0.07	36,575
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				94%	89%	92%

Measure-Level Verified Net Savings: BEC TA

Verified Net Savings are 92 percent of Utility Reported Gross electric, 93 percent of peak demand, and 92 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
A-line	31	0.01	-	29	0.01	-
Custom Lighting	11,485	-	-	10,566	-	-
De-lamping	113	0.02	-	104	0.02	-
Downlight	13	0.00	-	12	0.00	-
Exterior Lighting	866	-	-	797	-	-
Flood	440	0.08	-	405	0.08	-
High/Low Bay	830	0.49	-	763	0.45	-
LED Tube	894	0.16	-	818	0.14	-
Occupancy Sensors	267	0.01	-	246	0.01	-
Other Measures (non-lighting)	71	0.00	(25)	66	0.00	(23)
Specialty Lighting	103	0.04	-	95	0.04	-
Total⁴	15,113	0.81	(25)	13,900	0.75	(23)
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				92%	93%	92%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data and program applications to audit Utility Reported Gross Savings.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the implementation contractor's (IC) database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

02

Phase 2 Audit. The *Phase 2, the Application Audit*, a statistically significant sample of rebate applications was reviewed to ensure that information was correctly transferred in the IC's database. Adjustments were made to the sample of applications if discrepancies were identified. Second, Guidehouse tested whether Phase 1 and Phase 2 savings were statistically different. If significant differences were identified, the Phase 2 sample Realization Rate is applied to Phase 1 savings for the entire population (i.e., findings are extrapolated to the population).

Verified Gross Savings

The BEC DI program underwent substantial changes after PY2018 such that the PY2018 fuel-specific measure-level IRAF were no longer applicable. Instead, the evaluation team applied the PY2019 fuel-specific measure-level IRAF to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings with one exception:

- » The MEMD savings values for Tier 3 Thermostats and commercial Tier 1 Thermostats were developed based on billing analysis, and as a result an IRAF is not applicable as the MEMD savings values represents Verified Net Savings.

An IRAF of 1.00 was applied to the BEC TA program. PY2019 was the first year for the TA component of the program, therefore the agreed upon default value of 1.00 was applied for the first two years.

	Measure	Electric	Gas
Direct Install	Thermostats	1.00	1.00
	Regular LED Bulbs	0.97	-
	Specialty LED Bulbs	0.96	-
	Faucet Aerators	0.91	0.91
	Other Measures (Pipe Wrap, Pre-Rinse Sprayers, Occupancy Sensors, Showerheads)	0.99	0.99
Trade Ally	All Measures	1.00	1.00

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the BEC program's measures, except for Tier 2 Thermostats and Tier 1 Commercial Thermostats, to determine the Verified Net Savings. A NTGR of 1.00 is applied to Tier 2 Thermostats per guidance from MPSC staff.

Track	Measure	NTGR
Direct Install	Thermostats	1.00
	Other Measures <i>(excluding thermostats)</i>	0.92
Trade Ally	All Measures	0.92

Application Audit

The Guidehouse team reviewed a random, statistically significant sample of 24 incentive applications targeting a criterion of 90 percent confidence and 10 percent precision by application type for each fuel type, to verify the accuracy of the IC program tracking databases.

Specifically, program applications were reviewed to ensure the following information was correctly transferred into the IC's database (where applicable): customer contact information, customer account number, and measure-level information used to map MEMD measures, including quantity, measure characteristics (such as HVAC system type or hot water heater fuel type), per-unit energy savings, and installation costs and incentive amounts.

Using findings from the application review, the Guidehouse team calculated energy savings for each application and reports them as Phase 2 Audited Gross Savings.

The Phase 2 audit of the BEC program found errors on three applications demonstrating incorrect savings claimed in EOPT.

The result of these errors was not statistically different than a Realization Rate of 100 percent. Therefore, no Realization Rate was applied and only the specific applications in question were adjusted.

	Records ¹	Sample
Measure type reported in EOPT does not match application	1	24
One measure claimed on application was not reported in EOPT	1	24
Custom savings claimed on application does not match EOPT	1	24
Total	3	24

Measure-Level Audited Gross Savings: BEC DI

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings and nearly 100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Commercial Smart thermostat	306	-	16,515	306	-	16,515
LED A-line 1600-2600 lumen output replacing Incandescent/Halogen	41	0.01	-	41	0.01	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	152	0.03	-	152	0.03	-
LED A-line 800-1599 lumen output replacing Incandescent/Halogen	46	0.01	-	46	0.01	-
LED Candelabra <= 5W	2	0.00	-	2	0.00	-
LED Exit Signs Electronic Fixtures (Retrofit Only)	7	0.00	-	7	0.00	-
LED Globe <= 8W	7	0.00	-	7	0.00	-
LED PAR/R/BR <= 15.5W	110	0.02	-	110	0.02	-
Low Flow Faucet Aerator - Private Restroom – 1.0 gpm	1	0.00	300	1	0.00	300
Low Flow Faucet Aerator - Public Restroom – 1.0 gpm	42	0.00	18,429	42	0.00	18,429
Low Flow Showerhead - 1.5 gpm	-	-	935	-	-	935

Measure-Level Audited Gross Savings: BEC DI (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings and nearly 100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Occupancy Sensor less than 150 sq ft	0	0.00	-	0	0.00	-
Occupancy Sensors between 150 and 500 sq ft	1	0.00	-	1	0.00	-
Occupancy Sensors over 500 W	5	0.00	-	5	0.00	-
Pipe Wrap - DWH 140F - Conditioned - elec water heater	0	0.00	-	0	0.00	-
Pipe Wrap - DWH 140F - Conditioned - gas water heater	0	0.00	15	0	-	15
Pipe Wrap - DWH 140F - Unconditioned - elec water heater	1	0.00	-	1	0.00	-
Pipe Wrap - DWH 140F - Unconditioned - gas water heater	-	-	582	-	-	582
Pre Rinse Sprayers CEE Tier 1 <= 1.13 gpm (Retrofit Only)	-	-	174	-	-	174
Setback/Setup	69	0.00	2,825	69	0.00	2,825
Total⁴	789	0.07	39,776	789	0.07	39,777
Audited Gross Savings Realization Rates⁵				100%	100%	~100%

Measure-Level Audited Gross Savings: BEC TA

Audited Gross Savings are nearly 100 percent of Utility Reported Gross electric savings and 100 percent of peak demand and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
A-line	31	0.01	-	31	0.01	-
Custom Lighting	11,485	-	-	11,485	-	-
De-lamping	113	0.02	-	113	0.02	-
Downlight	13	0.00	-	13	0.00	-
Exterior Lighting	866	0.00	-	866	0.00	-
Flood	440	0.08	-	440	0.08	-
High/Low Bay	830	0.49	-	830	0.49	-
LED Tube	894	0.16	-	889	0.16	-
Occupancy Sensors	267	0.01	-	267	0.01	-
Other Measures (non-lighting)	71	0.00	(25)	71	0.00	(25)
Specialty Lighting	103	0.04	-	103	0.04	-
Total⁴	15,113	0.81	(25)	15,109	0.81	(25)
Audited Gross Savings Realization Rates⁵				~100%	100%	100%

Verified Annual Savings

In PY2020, the Business Energy Consultation program resulted in Verified Net Savings of 14,461 MWh, 0.81 MW of coincident peak demand, and 36,552 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2019 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

		MWH	PEAK MW	MCF
Direct Install	Utility Reported Gross	789	0.07	39,776
	Audited Gross ¹	789	0.07	39,777
	IRAF ²	0.98	0.96	0.96
	Verified Gross	773	0.07	38,074
	NTGR ³	0.92/1	0.92/1	0.92/1
	Verified Net ⁴	741	0.07	36,575
Trade Ally	Utility Reported Gross	15,113	0.81	(25)
	Audited Gross ¹	15,109	0.81	(25)
	IRAF ²	1.00	1.00	1.00
	Verified Gross	15,109	0.81	(25)
	NTGR ³	0.92	0.92	0.92
	Verified Net ⁴	13,900	0.75	(23)
Total	Utility Reported Gross	15,902	0.89	39,751
	Audited Gross¹	15,898	0.89	39,751
	IRAF²	~1.00	~1.00	~1.00
	Verified Gross	15,882	0.88	38,049
	NTGR³	0.92/1	0.92/1	0.92/1
	Verified Net⁴	14,641	0.81	36,552



C&I Non- Prescriptive Program

Program Year (PY) 2020
Reconciliation Report

April 30, 2021



Report ID: DTE-PY2020-RECON-NP-02

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Program Savings Summary

In PY2020, the C&I Non-Prescriptive program resulted in Verified Net Savings of 89,662 MWh, 23.15 MW of coincident peak demand, and 467,439 MCF.

The Commercial & Industrial (C&I) Non-Prescriptive program targets measures without a prescriptive incentive or deemed savings value. The measures reported in the Non-Prescriptive program are generally not listed in the Michigan Energy Measures Database (MEMD); instead, they have custom savings algorithms and inputs. The evaluation of the Non-Prescriptive program involved a full, custom assessment of the reported savings values for sampled projects. There are two main types of Non-Prescriptive programs: (1) Custom, and (2) RFP.

During the reconciliation process, Guidehouse found:

- » No discrepancies resulting in changes to savings were identified through the data tracking audit, resulting in Audited Gross Savings Realization Rates of 100 percent.
- » Based on site-specific Measurement and Verification (M&V) for randomly selected projects the NP gross Realization Rate (RR) is 103 percent for electric, 90 percent for peak demand, and 103 percent for gas.

	MWH	PEAK MW	MCF
Utility Reported Gross	94,839	27.92	493,287
Audited Gross Realization Rate ¹	1.00	1.00	1.00
Audited Gross ²	94,839	27.92	493,287
Realization Rate ³	1.03	0.90	1.03
Verified Gross	97,459	25.17	508,085
NTGR ⁴	0.92	0.92	0.92
Verified Net⁵	89,662	23.15	467,439

Non-Prescriptive Verified Net Savings

Verified Net Savings are 92, 82, and 95 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Custom	94,336	27.92	214,542	89,197	23.15	203,300
RFP - NP	503	-	278,745	475	-	264,138
Total⁴	94,839	27.92	493,287	89,662	23.15	467,439
Verified Net Savings as a Percent of Utility Reported Gross Savings⁴				95%	83%	95%

Determination of Verified Gross Savings

Unlike other DTE Energy programs that apply a fuel-specific Installation Rate Adjustment Factor (IRAF) from PY2018, the determination of Verified Savings for the C&I Non-Prescriptive program requires M&V because the program targets measures without a deemed savings value by design.

The reconciliation of program impacts included a review of program tracking data to develop an Audited Gross Savings value, and a full custom assessment of reported savings impacts including onsite M&V for a sample of projects to develop a RR. The evaluation team applied the RR to Audited Gross Savings to determine Verified Gross Savings.

01

Phase 1 Audit. For Phase 1, the Data Tracking Audit, DTE Energy's EOPT extract was compared to the implementation contractor's (IC) database to ensure an accurate transfer of program data. The comparison included program savings, incentives, quantities, and invoice dates.

02

Determination of Verified Gross Savings. The evaluation team calculated the program-level Verified Gross Savings for PY2020 Non-Prescriptive projects using RRs developed over a three-year project population which included PY2018, PY2019, and PY2020.

The team developed an independent estimate of fuel-specific project-level savings by conducting full, custom assessments of randomly sampled projects across all three years in the sampling period using onsite M&V and engineering calculations. The evaluation team extrapolated the project-level RR findings to the population of projects to determine Verified Gross Savings.

Determination of Verified Gross Savings (cont.)

The sample design targeted a criterion of 10 percent relative precision (RP) at the 90 percent confidence interval (CI) for the Non-Prescriptive programs based on the three-year population. For the population of 740 projects, a sample size of 48 was needed to meet the design criterion for RP and CI.

Projects from prior program years are sometimes evaluated when there are an insufficient number of projects in the current program year to satisfy the required sample size. The program RRs calculated for the three-year population are by statistical definition applicable to any other sample subset selected from the population, such as random samples of PY2018, PY2019, and PY2020 projects, therefore this approach is justified.

Guidehouse sampled, requested, and reviewed the IC's project files for the program. Guidehouse engineers developed a project-specific M&V plan for each sampled project and field technicians went onsite to verify measure installation and operation, utilizing data logging where required to reduce uncertainty in savings estimates.

The evaluation team used data collected onsite in custom, measure-specific savings algorithms to determine Verified Gross Savings for each sampled project, then extrapolated the project-level RR findings to the population of Non-Prescriptive projects to determine Verified Gross Savings.

<u>Stratum</u>	<u>Population Size</u>	<u>Sample Size</u>
C&I Non-Prescriptive	740	48

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the C&I Non-Prescriptive program.

Track	NTGR
C&I Non-Prescriptive	0.92

Audited Gross Savings

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings. The Guidehouse team found no issues when comparing the IC and EOPT databases, including program savings, incentives, quantities, and invoice dates.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Custom	94,336	27.92	214,542	94,336	27.92	214,542
RFP - NP	503	-	278,745	503	-	278,745
Total³	94,839	27.92	493,287	94,839	27.92	493,287
Audited Gross Savings Realization Rates^{3,4}				100%	100%	100%

Three-Year Population Gross Realization Rates

The Guidehouse team calculated RRs of 100 percent for electric savings, 89 percent for peak demand savings, and 103 percent for gas savings.

	MWh		Peak MW		MCF	
	RR	RP	RR	RP	RR	RP
Lighting, Large	109%	0.18	133%	0.19	-	-
Lighting, Medium	125%	0.46	225%	0.74	-	-
Lighting, Small	86%	0.26	54%	0.13	-	-
Non-Lighting, Large	100%	-	100%	-	-	-
Non-Lighting, Small	102%	0.14	100%	0.25	-	-
Gas, All	-	-	-	-	103%	0.00 ¹
Total^{2,3,4}	103%	0.08	90%	0.14	103%	-

Verified Savings

In PY2020, the C&I Non-Prescriptive program resulted in Verified Net Savings of 113,458 MWh, 27.49 MW of coincident peak demand, and 467,439 MCF.

To determine Verified Gross Savings the Guidehouse team applied the RR to the Audited Gross Savings.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Program	Savings	MWH	PEAK MW	MCF
Custom	Utility Reported	94,336	27.92	214,542
	Audited Gross ¹	94,336	27.92	214,542
	Realization Rate ²	1.03	0.90	1.03
	Verified Gross	96,943	25.17	220,978
	NTGR ³	0.92	0.92	0.92
	Verified Net ⁴	89,187	23.15	203,300
RFP-NP	Utility Reported	503	-	278,745
	Audited Gross ¹	503	-	278,745
	Realization Rate ²	103%	NA	103%
	Verified Gross	517	-	287,107
	NTGR ³	0.92	NA	0.92
	Verified Net ⁴	475	-	264,138
Total	Utility Reported	94,839	27.92	493,287
	Audited Gross¹	94,839	27.92	493,287
	Realization Rate²	1.03	0.90	103%
	Verified Gross	97,459	25.167	508,085
	NTGR³	0.92	0.92	0.92
	Verified Net⁴	89,662	23.15	467,439



C&I Prescriptive Program

Program Year (PY) 2020
Reconciliation Report

April 2, 2021



Report ID: DTE-PY2020-RECON-CIP-01

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Program Savings Summary

In PY2020, the C&I Prescriptive program resulted in Verified Net Savings of 240,647 MWh, 24.07 MW of coincident peak demand, and 486,365 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2018 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational. During the reconciliation process, Guidehouse found:

- » There is an incorrect measure life for six VFD measure types. The EOPT lists a value of 10 whereas the IC Database lists a value of 15.
- » Six measures have a building type discrepancy caused by one-off substitutions when the appropriate building type was not a choice resulting in an Audited Gross Realization Rate other than 100 percent. This building type discrepancy particularly affected the peak MW savings based on the MEMD building types involved.

	MWH	PEAK MW	MCF
Utility Reported Gross	265,449	35.09	495,292
Audited Gross Realization Rate ¹	101%	76%	107%
Audited Gross ²	266,911	26.70	528,657
IRAF ³	0.98	0.98	1.00
Verified Gross	261,572	26.16	528,657
NTGR ⁴	0.92	0.92	0.92
Verified Net⁵	240,647	24.07	486,365

Program-Level Verified Net Savings

Verified Net Savings are 91, 69, and 98 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Prescriptive⁴	262,726	35.09	495,292	238,192	24.07	486,365
RFP - P	2,723	-	-	2,455	-	-
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				91%	69%	98%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data and program applications to audit Utility Reported Gross Savings.

The Guidehouse team conducted the audit of Utility Reported Gross Savings in two phases, similar to past reconciliation efforts.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's Energy Optimization Tracker (EOPT) extract was compared to the implementation contractor's (IC) database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

02

Phase 2 Audit. The *Phase 2, the Application Audit*, a statistically significant sample of Direct Installation (DI) logs was reviewed to ensure that information was correctly transferred in the IC's database. Adjustments were made to the sample of logs if discrepancies were identified. Second, Guidehouse tested whether Phase 1 and Phase 2 savings were statistically different. If significant differences were identified, the Phase 2 sample Realization Rate is applied to Phase 1 savings for the entire population (i.e., findings are extrapolated to the population).

Installation Rate Adjustment Factor

Following the PY2020 DTE Energy Plan Filing, the evaluation team applied the fuel-specific measure-level IRAF from PY2018 to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings.

Measure	Electric	Gas
All Measures	0.98	1.00

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the PROGRAM program's measures to determine the Verified Net Savings.

Measure	NTGR
All Measures	0.92

Data Tracking Audit

The Guidehouse team found three issues when comparing the IC and EOPT databases; issues were resolved by the IC and DTE with an overall effect on savings of less than one percent of electric savings and seven percent of gas savings.

The audit of Utility Reported Gross Savings for the C&I Prescriptive program is conducted in two phases, the Data Tracking Audit and the Application/Sales Record Audit.

The Guidehouse team compared DTE and IC databased to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD and agreed-upon savings values.

Overall, the Guidehouse team found close agreement between the databases and accurate savings estimates with the following exceptions:

- » There is an incorrect measure life for six VFD measure types. The EOPT lists a value of 10 whereas the IC database lists a value of 15.
- » Six measures have a building type discrepancy caused by one off substitutions when the appropriate building type was not a choice.

	IC ¹	EOPT	Action
Incorrect measure life for VFD Measures	6	6	Revise measure life in EOPT database
Minor discrepancies caused by no appropriate building type	6	6	No action taken
One measure missing from IC database	1	0	Add measure to IC database
Total Records	13	13	

Application Audit

The Guidehouse team reviewed a sample of 43 random incentive applications targeting 90 percent confidence and 10 percent precision by application type and fuel type to verify the accuracy of the program tracking databases. Specifically, program applications were reviewed to ensure data related to customer information and affecting energy and peak demand impacts and costs was correctly transferred into the program databases.

No discrepancies were identified in this review.

Audit of Utility Reported Gross Savings

The Data Tracking and Application Audits (Phase 1 and Phase 2) resulted in major adjustments to Utility Reported Gross Savings for web enabled EMS measures.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments (Phase 1 Phase 2) ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
LED Low Bay (per kW saved)	18,003	3.31	-	+3 +0	+0.00 +0.00	+0 +0
Sensible ERV (flat plate HX)	(96.81)	(0.07)	2,825	-8 +0	+0.00 +0.00	+0 +0
DCV	19	0.03	11,240	+3 +0	+0.00 +0.00	+0 +0
Boiler tuneup	-	-	57,753	+0 +0	+0.00 +0.00	+25 +0
Web enabled EMS	10,734	(0.01)	56,609	+1,461 +0	-8.40 +0.00	+33,339 +0
Audited Gross Savings Adjustments⁴				+1,460 +0	-8.40 +0.00	+33,364 +0

Measure-Level Audited Gross Savings

Audited Gross Savings are 101, 76, and 107 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Prescriptive⁴	262,276	35.09	495,292	264,188	26.70	528,657
RFP – P	2,723	-	-	2,723	-	-
Audited Gross Savings Realization Rates⁵				101%	76%	107%

Verified Savings

In PY2020, the C&I Prescriptive program resulted in Verified Net Savings of 240,647 MWh, 26.70 MW of coincident peak demand, and 486,365 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Program	Savings	MWH	PEAK MW	MCF
Prescriptive	Utility Reported	262,276	35.09	495,292
	Audited Gross ¹	264,188	26.70	528,657
	Realization Rate ²	0.98	0.98	1
	Verified Gross	258,904	26.16	528,657
	NTGR ³	0.92	0.92	0.92
	Verified Net ⁴	238,192	24.07	486,365
RFP-P	Utility Reported	2,723	0.00	0
	Audited Gross ¹	2,723	0	0
	Realization Rate ²	0.98	0.98	1
	Verified Gross	2,669	0	0
	NTGR ³	0.92	0.92	0.92
	Verified Net ⁴	2,455	0	0
Total	Utility Reported	264,999	35.09	495,292
	Audited Gross¹	266,911	26.70	528,657
	Realization Rate²	0.98	0.98	1
	Verified Gross	261,573	26.16	528,657
	NTGR³	0.92	0.92	0.92
	Verified Net⁴	240,647	24.07	486,365



Energy Efficiency Assistance Program

Program Year (PY) 2020
Reconciliation Report

April 2, 2021



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Program Savings Summary

In PY2020, the Energy Efficiency Assistance (EEA) program resulted in Verified Net Savings of 8,294 MWh, 0.74 MW of coincident peak demand, and 51,721 MCF.

To determine Verified Net Savings, the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2018 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » Water Heater measure entries with measure codes that did not match the latest version of the 2020 MEMD in both Implementation Contractor (IC) records and DTE's Energy Optimization Program Tracking (EOPT) database.
- » Furnace/AC measure records with zero gas savings, which does not match values calculated using the MEMD and MLR.
- » Two outlier Thermostat measure entries with a quantity of 7,000 home sq. ft. or greater.
- » Discrepancies in measure quantities reported on program applications for one Furnace record and two Thermostat records.



	MWH	PEAK MW	MCF
Utility Reported Gross	12,651	1.20	60,248
Audited Gross Realization Rate ¹	~100%	100%	~100%
Audited Gross ²	12,650	1.20	60,180
IRAF ^{3,4}	0.66	0.62	0.86
Verified Gross	8,294	0.74	51,721
NTGR ⁵	1.00	1.00	1.00
Verified Net⁶	8,294	0.74	51,721

Measure-Level Verified Net Savings

Verified Net Savings are 66, 62, and 86 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 EEA – ClearCorps Refrigerator Replacement - Custom	78	-	-	78	-	-
2020 EEA - Refrigerator Replacement - Custom	1,446	-	-	1,446	-	-
Advanced Power Strip Tier 1 AV Systems	5	0.00	-	5	0.00	-
Basement Wall Insulation	0	0.00	90	0	0.00	87
Boiler 90% plus AFUE	-	-	114	(1)	-	114
Boiler 95% plus AFUE	(4)	-	2,683	(4)	-	2,683
Boiler Tune-up	-	-	6	-	-	6
Crawlspace Wall Insulation	0	0.00	54	0	0.00	52
Duct Insulation	-	-	6	-	-	6
ECM Furnace	4	0.00	-	4	0.00	-
ENERGY STAR Dehumidifier	57	0.03	-	57	0.03	-
Energy Star Door	0	0.00	58	0	0.00	55

Measure-Level Verified Net Savings (cont.)

Verified Net Savings are 66, 62, and 86 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55 gallons	-	-	1,585	-	-	1,678
ENERGY STAR Instant Gas Water Heater	-	-	140	-	-	145
ENERGY STAR Room AC greater than 8,000 Btu hr	8	0.01	-	8	0.01	-
Floor Insulation	0	0.00	65	0	0.00	62
Furnace/AC - SEER 15	13	0.00	(12)	13	0.00	(80)
Furnace/AC - SEER 16	19	0.01	(18)	19	0.01	(81)
High efficiency 95 AFUE furnace NC or without ECM	-	-	2,710	-	-	2,710
High efficiency 95 AFUE furnace with ECM	115	0.00	6,333	114	0.00	6,333
High efficiency 96 AFUE furnace NC or without ECM	-	-	13,485	-	-	13,485
High efficiency 96 AFUE furnace with ECM	229	0.00	13,223	226	0.00	13,217
High efficiency 97 AFUE furnace NC or without ECM	-	-	28	-	-	28

Measure-Level Verified Net Savings (cont.)

Verified Net Savings are 66, 62, and 86 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Infiltration reduction - 10%	0	0.00	447	0	0.00	429
Infiltration reduction - 20%	1	0.00	282	1	0.00	271
Infiltration reduction - 30%	1	0.00	347	1	0.00	333
Infiltration reduction - 40%	3	0.00	586	3	0.00	563
Infiltration reduction - 50%	3	0.00	759	3	0.00	728
LED A-line 1100-1599 Lumen output replacing Incandescent/Halogen	0	0.00	-	0	0.00	-
LED A-line 1600-1999 Lumen output replacing Incandescent/Halogen	30	0.00	-	19	0.00	-
LED A-line 450-799 Lumen output replacing Incandescent/Halogen	247	0.03	-	31	0.00	-
LED A-line 450-799 Lumen output replacing Incandescent/Halogen - Kit	-	-	-	102	0.01	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	10,327	1.09	-	205	0.02	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen - Kit	-	-	-	5,195	0.55	-

Measure-Level Verified Net Savings (cont.)

Verified Net Savings are 66, 62, and 86 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
LED Night Light	1	-	-	1	-	-
LED PAR/R/BR <= 15.5W	1	0.00	-	0	0.00	-
Low e storm window single pane base	-	-	9	-	-	9
Low Flow Bathroom Faucet Aerators - 1.5 gpm gas water heater	-	-	28	-	-	19
Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	180	-	-	122
Low Flow Showerheads 1.5 gpm gas water heater	-	-	222	-	-	151
O&M Tune-up	0	0.00	5	0	0.00	5
O&M Tune-up - furnace only	-	-	1,212	-	-	1,211
Pipe Wrap R3 - gas water heater	-	-	459	-	-	441
R-30 Roof Insulation	4	0.00	1,190	4	0.00	1,142
R-38 pull-down stairs Attic hatch	0	0.00	19	0	0.00	18
R-38 Roof Insulation	1	0.00	229	1	0.00	219

Measure-Level Verified Net Savings (cont.)

Verified Net Savings are 66, 62, and 86 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
R-38 scuttle hole Attic hatch	0	0.00	55	0	0.00	53
R-49 Roof Insulation	1	0.00	299	1	0.00	287
R-60 Roof Insulation	0	0.00	27	0	0.00	26
R6 to R19 kneewalls	0	0.00	26	0	0.00	25
Refrigerators Freezers ENERGY STAR - Top Freezer	0	0.00	-	0	0.00	-
Rim Joist Insulation	5	0.00	1,600	4	0.00	1,536
Setback thermostat - moderate setback	55	-	11,048	25	-	2,822
Setback thermostat - moderate setback - Tier 2	-	-	-	0	-	166
Wall Insulation	1	0.00	302	1	0.00	291
Window Replacement	1	0.00	368	1	0.00	353
Delayed Installation (LED Kits)	-	-	-	730	0.08	-
Total⁴	12,651	1.20	60,248	8,294	0.74	51,721
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				66%	62%	86%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data and program applications to audit Utility Reported Gross Savings.

The Guidehouse team conducted the audit of Utility Reported Gross Savings in two phases, similar to past reconciliation efforts.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the IC database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

02

Phase 2 Audit. The *Phase 2, the Application Audit*, a statistically significant sample of Direct Installation (DI) logs was reviewed to ensure that information was correctly transferred in the IC's database. Adjustments were made to the sample of logs if discrepancies were identified. Second, Guidehouse tested whether Phase 1 and Phase 2 savings were statistically different. If significant differences were identified, the Phase 2 sample Realization Rate is applied to Phase 1 savings for the entire population (i.e., findings are extrapolated to the population).

Installation Rate Adjustment Factor

Following the PY2020 DTE Energy Plan Filing, the evaluation team applied the fuel-specific measure-level IRAF from PY2018 to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings. There were a few exceptions:

- » Advanced Power Strip, Dehumidifier, Room AC, and Central AC measures are new measure beginning in PY2020. As a result, an IRAF of 1.00 is applied for two years.
- » An IRAF of 1.00 is applied to Tier 2 Thermostats based on guidance from MPSC staff.

Measure	Electric	Gas
Advanced Power Strip, Dehumidifier, Room AC	1.00	N/A
Central AC	1.00	1.00
Equipment ¹	0.99	1.00
Insulation	0.96	0.96
LED Bulbs	0.61	N/A
LED Kit Distribution ²	0.52	N/A
Refrigerator Replacement	1.00	N/A
Showerhead and Aerators	N/A	0.68
Tier 1 Thermostat	0.47	0.26
Tier 2 Thermostat	1.00	1.00
Tune-up	1.00	1.00

Delayed Installations

The Guidehouse team tracked and applied verified gross savings due to delayed installations for LED Kit measures. First-year savings are calculated based on a first-year IRAF for bulbs distributed during a given program year, with delayed savings for future years projected based on the following methodology:

- » Second-year installation rate is estimated as 32 percent of the remaining bulbs after the first-year installations
- » Third-year installation rate is estimated as 18 percent of the remaining bulbs after the first- and second-year installations
- » Subsequent year installations are estimated at 18 percent each year of the remaining bulbs

For PY2020 reconciliation, delayed installations of bulbs distributed during the prior two years are credited to the PY2020 program as shown in the figure to the right.

	PY2018	PY2019
Audited Quantity	187,500	265,450
Installation Rate	0.08	0.04
Unit Savings (MWh MW)	28.5 0.003	28.5 0.003
Verified Gross (MWh MW)	427.5 0.05	302.6 0.03

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A deemed NTGR of 1.00 is applied to the EEA program's Verified Gross Savings to determine the Verified Net Savings.

Measure	NTGR
All Measures	1.00

Data Tracking Audit

The Guidehouse team compared DTE and IC databases to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD and agreed-upon custom savings values.

The Guidehouse team found two issues when comparing the IC and EOPT databases:

- » There were 861 Water Heater measure entries with measure codes that did not match the latest version of the 2020 MEMD.
- » There were 145 Furnace/AC - SEER 15 and Furnace/AC - SEER 16 measure records with zero gas savings for sites marked as Elec&Gas. Gas savings are nonzero when calculated using the MEMD and MLR.
- » There were two outlier Thermostat measure entries with a quantity of 7,000 sq. ft. or greater.

All issues were resolved by the IC, DTE, or Guidehouse with a negligible overall effect on savings.



	IC ¹	EOPT	Action
There were water heater measure entries with measure codes that did not match the latest version of the 2020 MEMD.	861	861	DTE updated the measure codes and sent corrected data extracts.
There were Furnace/AC - SEER 15 and Furnace/AC - SEER 16 measure records with zero gas savings for sites marked as Elec&Gas. Gas savings are nonzero when calculated using the MEMD and MLR.	145	145	For these records, Guidehouse assigned the gas savings values calculated using the MEMD and MLR.
There were two outlier Thermostat measure entries with a quantity of 7,000 sq. ft. or greater.	2	2	These quantities were sourced from online real estate sources. In one case, the lot square footage was used instead of the home square footage. In the other case, the quantity was incorrectly transcribed. The IC has fixed the quantities, which are closer to approx. 4,500 sq. ft.
Total Records	863	863	

Application Audit

The Guidehouse team reviewed a sample of 46 random incentive applications targeting 90 percent confidence and 10 percent precision by application type and fuel type to verify the accuracy of the program tracking databases. Specifically, program applications were reviewed to ensure data related to customer information and affecting energy and peak demand impacts and costs was correctly transferred into the program databases.

Using findings from the application review, the Guidehouse team calculated energy savings for each application and reports them as Phase 2 Audited Gross Savings.

The Phase 2 audit of the EEA program found:

- » Input heat capacity was incorrectly entered for one Furnace record, resulting in a measure quantity adjustment of 25 percent
- » Home square footage was incorrectly entered for two Thermostat records, which resulted in measure quantity adjustments of 50 percent and 23 percent

The result of these errors was not statistically different than a Realization Rate of 100 percent. Therefore, no Realization Rate was applied and only the specific projects in question were adjusted.

Application	Records¹	Sample	Action
Large Contractors	1,042	16	Project-level updates made
Medium Contractors	2,163	16	Project-level updates made
Small Contractors	1,517	14	Project-level updates made
Total	4,722	46	

Audit of Utility Reported Gross Savings

The Data Tracking and Application Audits resulted in minor adjustments to Utility Reported Gross Savings, primarily for water heater, furnace, and thermostat measures.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments (Phase 1 Phase 2) ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55 gallons	-	-	1,585	-	-	+93 -
ENERGY STAR Instant Gas Water Heater	-	-	140	-	-	+5 -
Furnace/AC - SEER 15	13	0.00	(12)	-	-	-68 -
Furnace/AC - SEER 16	19	0.01	(18)	-	-	-63 -
High efficiency 96 AFUE furnace with ECM	229	0.00	13,223	-	-	- -5
LED A-line 450-799 Lumen output replacing Incandescent/Halogen	247	0.03	-	-196 -	-0.02 -	-
LED A-line 450-799 Lumen output replacing Incandescent/Halogen – Kit	-	-	-	+196 -	+0.02 -	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	10,327	1.09	-	-9,991 -	-1.05 -	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen - Kit	-	-	-	+9,991 -	+1.05 -	-
Setback thermostat - moderate setback	55	-	11,048	-	-	-189 -7
Setback thermostat - moderate setback - Tier 2	-	-	-	-	-	+166 -
Audited Gross Savings Adjustments^{4,5}				-1 -	± 0.00 -	-55 -12

Measure-Level Audited Gross Savings

Audited Gross Savings are ~100 percent of Utility Reported Gross electric savings, 100 percent of peak demand savings, and ~100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 EEA – ClearCorps Refrigerator Replacement - Custom	78	-	-	78	-	-
2020 EEA - Refrigerator Replacement - Custom	1,446	-	-	1,446	-	-
Advanced Power Strip Tier 1 AV Systems	5	0.00	-	5	0.00	-
Basement Wall Insulation	0	0.00	90	0	0.00	90
Boiler 90% plus AFUE	-	-	114	(1)	-	114
Boiler 95% plus AFUE	(4)	-	2,683	(4)	-	2,683
Boiler Tune-up	-	-	6	-	-	6
Crawlspace Wall Insulation	0	0.00	54	0	0.00	54
Duct Insulation	-	-	6	-	-	6
ECM Furnace	4	0.00	-	4	0.00	-
ENERGY STAR Dehumidifier	57	0.03	-	57	0.03	-
Energy Star Door	0	0.00	58	0	0.00	58

Measure-Level Audited Gross Savings (cont.)

Audited Gross Savings are ~100 percent of Utility Reported Gross electric savings, 100 percent of peak demand savings, and ~100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55 gallons	-	-	1,585	-	-	1,678
ENERGY STAR Instant Gas Water Heater	-	-	140	-	-	145
ENERGY STAR Room AC greater than 8,000 Btu hr	8	0.01	-	8	0.01	-
Floor Insulation	0	0.00	65	0	0.00	65
Furnace/AC - SEER 15	13	0.00	(12)	13	0.00	(80)
Furnace/AC - SEER 16	19	0.01	(18)	19	0.01	(81)
High efficiency 95 AFUE furnace NC or without ECM	-	-	2,710	-	-	2,710
High efficiency 95 AFUE furnace with ECM	115	0.00	6,333	115	0.00	6,333
High efficiency 96 AFUE furnace NC or without ECM	-	-	13,485	-	-	13,485
High efficiency 96 AFUE furnace with ECM	229	0.00	13,223	228	0.00	13,217
High efficiency 97 AFUE furnace NC or without ECM	-	-	28	-	-	28

Measure-Level Audited Gross Savings (cont.)

Audited Gross Savings are ~100 percent of Utility Reported Gross electric savings, 100 percent of peak demand savings, and ~100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Infiltration reduction - 10%	0	0.00	447	0	0.00	447
Infiltration reduction - 20%	1	0.00	282	1	0.00	282
Infiltration reduction - 30%	1	0.00	347	1	0.00	347
Infiltration reduction - 40%	3	0.00	586	3	0.00	586
Infiltration reduction - 50%	3	0.00	759	3	0.00	759
LED A-line 1100-1599 Lumen output replacing Incandescent/Halogen	0	0.00	-	0	0.00	-
LED A-line 1600-1999 Lumen output replacing Incandescent/Halogen	30	0.00	-	30	0.00	-
LED A-line 450-799 Lumen output replacing Incandescent/Halogen	247	0.03	-	51	0.01	-
LED A-line 450-799 Lumen output replacing Incandescent/Halogen - Kit	-	-	-	196	0.02	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	10,327	1.09	-	336	0.04	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen - Kit	-	-	-	9,991	1.05	-

Measure-Level Audited Gross Savings (cont.)

Audited Gross Savings are ~100 percent of Utility Reported Gross electric savings, 100 percent of peak demand savings, and ~100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
LED Night Light	1	-	-	1	-	-
LED PAR/R/BR <= 15.5W	1	0.00	-	1	0.00	-
Low e storm window single pane base	-	-	9	-	-	9
Low Flow Bathroom Faucet Aerators - 1.5 gpm gas water heater	-	-	28	-	-	28
Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	180	-	-	180
Low Flow Showerheads 1.5 gpm gas water heater	-	-	222	-	-	222
O&M Tune-up	0	0.00	5	0	0.00	5
O&M Tune-up - furnace only	-	-	1,212	-	-	1,211
Pipe Wrap R3 - gas water heater	-	-	459	-	-	459
R-30 Roof Insulation	4	0.00	1,190	4	0.00	1,190
R-38 pull-down stairs Attic hatch	0	0.00	19	0	0.00	19
R-38 Roof Insulation	1	0.00	229	1	0.00	229

Measure-Level Audited Gross Savings (cont.)

Audited Gross Savings are ~100 percent of Utility Reported Gross electric savings, 100 percent of peak demand savings, and ~100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
R-38 scuttle hole Attic hatch	0	0.00	55	0	0.00	55
R-49 Roof Insulation	1	0.00	299	1	0.00	299
R-60 Roof Insulation	0	0.00	27	0	0.00	27
R6 to R19 kneewalls	0	0.00	26	0	0.00	26
Refrigerators Freezers ENERGY STAR - Top Freezer	0	0.00	-	0	0.00	-
Rim Joist Insulation	5	0.00	1,600	5	0.00	1,600
Setback thermostat - moderate setback	55	-	11,048	54	-	10,852
Setback thermostat - moderate setback - Tier 2	-	-	-	0	-	166
Wall Insulation	1	0.00	302	1	0.00	303
Window Replacement	1	0.00	368	1	0.00	368
Delayed Installation (LED Kits)	-	-	-	-	-	-
Total⁴	12,651	1.20	60,248	12,650	1.20	60,180
Audited Gross Savings Realization Rates⁵				~100%	100%	~100%

Verified Savings

In PY2020, the EEA program resulted in Verified Net Savings of 8,294 MWh, 0.74 MW of coincident peak demand, and 51,721 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Savings	MWH	PEAK MW	MCF
Utility Reported Gross	12,651	1.20	60,248
Audited Gross ¹	12,650	1.20	60,180
IRAF ^{2,3}	0.66	0.62	0.86
Verified Gross	8,294	0.74	51,721
NTGR ⁴	1.00	1.00	1.00
Verified Net ⁵	8,294	0.74	51,721



Energy Star Program

Program Year (PY) 2020
Reconciliation Report

April 30, 2021



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Reconciliation Report

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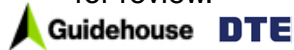
Program Savings Summary

In PY2020, the Energy Star Products program (consisting of the Lighting, Appliances, Consumer Electronics, and Online Marketplace components) resulted in Verified Net Savings of 121,020 MWh, 14.05 MW of coincident peak demand, and 24,571 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2018 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » Several LED records were misclassified as omni-directional bulbs instead of 3-way bulbs.
- » A discrepancy in the demand savings for both Commercial and Residential 3-way bulbs.
- » Measure quantity/savings discrepancies due to missing files batched to EOPT that were not initially provided to Guidehouse for review.



	MWH	PEAK MW	MCF
Utility Reported Gross	211,909	24.53	25,293
Audited Gross Realization Rate ¹	~100%	~100%	~100%
Audited Gross ²	212,006	24.60	25,297
IRAF ^{3,4}	0.96	0.96	0.98
Verified Gross	203,673	23.67	24,897
NTGR ⁵	0.57/0.71/0.92/1	0.57/0.71/0.92/1	0.57/0.71/0.92/1
Verified Net⁶	131,717	15.27	24,571

Measure-Level Verified Net Savings: Residential Lighting

Verified Net Savings are 63 percent of Utility Reported Gross electric savings and 64 percent of peak demand savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Residential LED (Reflector)	56,054	3.80	-	35,023	2.37	-
Residential LED (Specialty)	12,148	1.40	-	10,408	1.25	-
Residential LED (Standard)	91,468	10.09	-	45,666	5.03	-
Delayed Installs	-	-	-	9,793	1.05	-
Total⁴	159,670	15.29	-	100,889	9.71	-
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				63%	63%	-

Measure-Level Verified Net Savings: Small Commercial Lighting

Verified Net Savings are 58 percent of Utility Reported Gross electric and peak demand savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Commercial LED (Reflector)	8,336	1.55	-	5,208	0.97	-
Commercial LED (Specialty)	3,629	0.66	-	3,139	0.58	-
Commercial LED (Standard)	28,744	5.37	-	14,202	2.65	-
Delayed Installs	-	-	-	999	0.19	-
Total⁴	40,708	7.57	-	23,548	4.39	-
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				58%	58%	-

Measure-Level Verified Net Savings: Residential Appliances

Verified Net Savings are 91 percent of Utility Reported Gross electric savings, 89 percent of peak demand savings, and 99 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Air Purifier	150	0.02	-	138	0.02	-
Clothes Dryer	119	0.04	466	109	0.04	429
Clothes Washer	254	0.04	908	231	0.03	910
Dehumidifier	195	0.12	-	174	0.11	-
Pool Pump	203	0.15	-	187	0.14	-
Room AC	234	0.36	-	205	0.31	-
Smart Strip	110	0.01	-	69	0.01	-
Thermostat	519	-	13,024	520	-	13,025
Total⁴	1,784	0.73	14,398	1,632	0.65	14,263
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				91%	89%	99%

Measure-Level Verified Net Savings: Residential Consumer Electronics

Verified Net Savings are 92 percent of Utility Reported Gross electric and peak demand savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Display	122	0.02	-	112	0.01	-
PC	69	0.01	-	64	0.01	-
Total⁴	191	0.03	-	176	0.02	-
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				92%	92%	-

Measure-Level Verified Net Savings: Online Marketplace

Verified Net Savings are 53 percent of Utility Reported Gross electric, 50 percent of peak demand, and 95 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Aerator	6	0.00	262	4	0.00	137
Holiday Lights	21	-	-	19	-	-
Residential LED (Nightlight)	94	-	-	86	-	-
Residential LED (Reflector)	2,687	0.14	-	1,456	0.07	-
Residential LED (Specialty)	190	0.02	-	133	0.02	-
Residential LED (Standard)	5,544	0.67	-	2,591	0.31	-
Pipe Insulation	3	0.00	136	2	0.00	88
Shower Start	21	0.00	1,287	16	0.00	1,077
Showerhead	22	0.00	1,149	17	0.00	962
Smart Strip	657	0.08	-	411	0.05	-
Thermostat	295	-	7,785	295	-	7,788
Weatherstripping	16	0.00	278	15	0.00	255
Delayed Installs	-	-	-	434	0.05	-
Total⁴	9,556	0.91	10,896	5,473	0.50	10,307
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				57%	55%	95%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data and program applications to audit Utility Reported Gross Savings.

The Guidehouse team conducted the audit of Utility Reported Gross Savings in two phases, similar to past reconciliation efforts.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the implementation contractor's (IC) database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

02

Phase 2 Audit. The *Phase 2, the Application Audit*, a statistically significant sample of Appliances and Consumer Electronics incentive applications was reviewed to ensure that information was correctly transferred in the IC's database. Adjustments were made to the sample of applications if discrepancies were identified. Second, Guidehouse tested whether Phase 1 and Phase 2 savings were statistically different. If significant differences were identified, the Phase 2 sample Realization Rate is applied to Phase 1 savings for the entire population (i.e., findings are extrapolated to the population).

Installation Rate Adjustment Factor

Following the PY2020 DTE Energy Plan Filing, the evaluation team applied the fuel-specific measure-level IRAF from PY2018 to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings. There were several exceptions:

- » Weather Stripping, Air Purifiers, and Aerators are new measures beginning in PY2019, and Holiday Lights are a new measure beginning in PY2020, and as a result, an IRAF of 1.00 is applied for two years.
- » Standard LED IRAF accounts for delayed installation; the first year IRAF evaluated in PY2018 (0.82) plus delayed installations from PY2017 and PY2016 are applied.
- » Specialty and Reflector LEDs were not sampled in PY2018 due to low measure participation, therefore, the PY2017 evaluated IRAF value is applied.
- » Pipe Insulation IRAF is based on the average evaluated PY2018 IRAF value of the Pipe Wrap measure offered in the Home Energy Survey and Home Energy Consultation programs, as it was a new measure in PY2019.
- » Room Air Conditioners in the Appliances program moved to a new midstream delivery channel in PY2020, so an IRAF of 1.00 is applied.
- » Advanced Power Strip were introduced to the Appliances program in PY2019, so the PY2020 IRAF value is based on the PY2018 evaluated IRAF value of the Advanced Power Strip measure offered in the Online Marketplace program.
- » A deemed IRAF of 1.00 is applied to Consumers Electronics.
- » The MEMD savings values for Tier 3 Thermostats and commercial Tier 1 Thermostats were developed based on billing analysis, and as a result an IRAF is not applicable as the MEMD savings values represents Verified Net Savings.

Program	Measure	Electric	Gas
Lighting ¹	Standard LED	0.88	N/A
	Reflector LED	0.88	N/A
	Specialty LED	0.88	N/A
Appliances	Tier 2 & 3 Thermostats	1.00	1.00
	Clothes Washer	0.99	0.97
	Clothes Dryer	1.00	1.00
	Dehumidifier	0.97	N/A
	Room AC	0.95	N/A
	Pump	1.00	N/A
Consumer Electronics	Consumer Electronics	1.00	N/A
Online Marketplace	Standard LED	0.82	N/A
	Reflector LED	0.76	N/A
	Specialty LED	0.76	N/A
	LED Nightlight	1.00	N/A
	Holiday Lights	1.00	N/A
	Tier 2 & 3 Thermostats	1.00	1.00
	Shower Start	0.82	0.91
	Advanced Power Strip	0.68	N/A
	Aerator	0.71	0.57
	Air Purifier	1.00	N/A
Weather Stripping	1.00	1.00	
Pipe Insulation	0.74	0.70	

Delayed Installations

The Guidehouse team tracked and applied verified gross savings due to delayed installations for certain LED measures. First-year savings are calculated based on a first-year IRAF for bulbs sold during a given program year, with delayed savings for future years projected based on the following methodology:

- » Second-year installation rate is estimated as 32 percent of the remaining bulbs after the first-year installations
- » Third-year installation rate is estimated as 18 percent of the remaining bulbs after the first- and second-year installations
- » Subsequent year installations are estimated at 18% percent each year of the remaining bulbs.

For PY2020 reconciliation, delayed installations of bulbs sold during the prior two years are credited to the PY2020 program as shown in the figure to the right.

		PY2018	PY2019
Residential Retail	Audited Quantity	5,036,312	5,999,958
	Installation Rate	0.04	0.04
	Unit Savings (MWh MW)	33.4 0.004	35.5 0.004
	Verified Gross (MWh MW)	6,721.6 0.74	8,530.2 0.90
Residential Online Marketplace	Audited Quantity	8,671	149,835
	Installation Rate ¹	0.12	0.12
	Unit Savings (MWh MW)	38.6 0.004	39.4 0.004
	Verified Gross (MWh MW)	40.9 0.00	695.8 0.08
Commercial	Audited Quantity	186,467	256,851
	Installation Rate	0.04	0.04
	Unit Savings (MWh MW)	91.8 0.017	98.8 0.018
	Verified Gross (MWh MW)	684.5 0.13	1,014.9 0.19

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.57 was applied to standard LEDs, 0.71 to Reflector LEDs, and 0.92 to Specialty LEDs and all other measures (except for Tier 2 & 3 Thermostats) to determine the Verified Net Savings. A NTGR of 1.00 is applied to Tier 2 & 3 Thermostats per guidance from MPSC staff.

Program	Measure	NTGR
Lighting	Standard LED	0.57
	Reflector LED	0.71
	Specialty LED	0.92
Appliances	Thermostats	1.00
	Other Measures	0.92
Consumer Electronics	All Measures	0.92
	Thermostats	1.00
Online Marketplace	Standard LED	0.57
	Reflector LED	0.71
	Specialty LED	0.92
	Other Measures (excluding LEDs)	0.92

Data Tracking Audit

The Guidehouse team compared DTE and IC databased to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD and agreed-upon custom savings values.

The Guidehouse team found three issues when comparing the IC and EOPT databases:

- » Incorrect unit demand savings were claimed for 3-way LED bulbs
- » Several LED records were misclassified as omni-directional bulbs instead of 3-way bulbs
- » Measure quantity/savings discrepancies due to missing files batched to EOPT that were not initially provided to Guidehouse for review.

All issues were resolved by the IC and DTE with an overall effect on savings of less than one percent.

	IC ¹	EOPT	Action
Incorrect unit demand savings reported for 3-way LED bulbs	-	11,598	EOPT extract corrected
Several LED records misclassified as omni-directional bulbs instead of 3-way	-	2,430	EOPT extract corrected
Several quantity/savings discrepancies between EOPT/IC	4	-	IC extract corrected
Total Records	4	14,028	

Application Audit

The Guidehouse team reviewed a random sample of 48 incentive applications targeting 90 percent confidence and 10 percent precision by application type and fuel type to verify the accuracy of the program tracking databases. Specifically, program applications were reviewed to ensure data related to customer information and affecting energy and peak demand impacts and costs was correctly transferred into the program databases.

Using findings from the application review, the Guidehouse team calculated energy savings for each application and reports them as Phase 2 Audited Gross Savings.

The Phase 2 audit of the Energy Star program found no errors for both the appliance rebate component and consumer electronics components.

02

Application	Records ¹	Sample	Action
Air Purifier	6	2	No action
Clothes Dryer	215	8	No action
Clothes Washer	696	8	No action
Dehumidifier	85	8	No action
Pool Pump	4	1	No action
Thermostat	312	14	No action
Consumer Electronics	12	3	No action
Total	1,330	44	

Audit of Utility Reported Gross Savings

The Data Tracking and Application Audits resulted in minor adjustments to Utility Reported Gross Savings for the Residential Lighting component.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments (Phase 1 Phase 2) ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Residential LED (Reflector)	56,054	3.80	-	0 0	0.00 0.00	-
Residential LED (Specialty)	12,148	1.40	-	707 0	0.14 0.00	-
Residential LED (Standard)	91,468	10.09	-	-428 0	-0.06 0.00	-
Audited Gross Savings Adjustments⁴				280 0	0.09 0.00	-

Audit of Utility Reported Gross Savings

The Data Tracking and Application Audits resulted in minor adjustments to Utility Reported Gross Savings for the Commercial Lighting component.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments (Phase 1 Phase 2) ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Commercial LED (Reflector)	8,336	1.55	-	0 0	0.00 0.00	-
Commercial LED (Specialty)	3,629	0.66	-	248 0	0.06 0.00	-
Commercial LED (Standard)	28,744	5.37	-	-431 0	-0.08 0.00	-
Audited Gross Savings Adjustments⁴				-182 0	-0.01 0.00	-

Audit of Utility Reported Gross Savings

The Data Tracking and Application Audits resulted in no adjustments to Utility Reported Gross Savings for the Appliances components.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments (Phase 1 Phase 2) ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Air Purifier	150	0.02	-	0 0	0.00 0.00	-
Clothes Dryer	119	0.04	466	0 0	0.00 0.00	0 0
Clothes Washer	254	0.04	908	0 0	0.00 0.00	0 0
Dehumidifier	195	0.12	-	0 0	0.00 0.00	-
Pool Pump	203	0.15	-	0 0	0.00 0.00	-
Room AC	234	0.36	-	0 0	0.00 0.00	-
Smart Strip	110	0.01	-	0 0	0.00 0.00	-
Thermostat	519	-	13,024	0 0	-	0 0
Audited Gross Savings Adjustments⁴				0 0	0.00 0.00	0 0

Audit of Utility Reported Gross Savings

The Data Tracking and Application Audits resulted in no adjustments to Utility Reported Gross Savings for the Consumer Electronics component.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments (Phase 1 Phase 2) ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Display	122	0.02	-	0 0	0.00 0.00	-
PC	69	0.01	-	0 0	0.00 0.00	-
Audited Gross Savings Adjustments⁴				0 0	0.00 0.00	0 0

Audit of Utility Reported Gross Savings

The Data Tracking and Application Audits resulted in no adjustments to Utility Reported Gross Savings for the Online Marketplace component.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments (Phase 1 Phase 2) ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Aerator	6	0.00	262	0 0	0.00 0.00	0 0
Holiday Lights	21	-	-	0 0	-	-
Residential LED (Nightlight)	94	0.00	-	0 0	0.00 0.00	-
Residential LED (Reflector)	2,687	0.14	-	0 0	0.00 0.00	-
Residential LED (Specialty)	190	0.02	-	0 0	0.00 0.00	-
Residential LED (Standard)	5,544	0.67	-	0 0	0.00 0.00	-
Pipe Insulation	3	-	136	0 0	-	0 0
Shower Start	21	-	1,287	0 0	-	0 0
Showerhead	22	-	1,149	0 0	-	0 0
Smart Strip	657	0.08	-	0 0	0.00 0.00	-
Thermostat	295	0.00	7,785	0 0	0.00 0.00	0 0
Weatherstripping	16	0.00	278	0 0	0.00 0.00	0 0
Audited Gross Savings Adjustments⁴				0 0	0.00 0.00	0 0

Measure-Level Audited Gross Savings: Residential Lighting

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Residential LED (Reflector)	56,054	3.80	-	56,054	3.80	-
Residential LED (Specialty)	12,148	1.40	-	12,855	1.54	-
Residential LED (Standard)	91,468	10.09	-	91,040	10.03	-
Total⁴	159,670	15.29	-	159,950	15.38	-
Audited Gross Savings Realization Rates⁵				~100%	~100%	-

Measure-Level Audited Gross Savings: Small Commercial Lighting

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Commercial LED (Reflector)	8,336	1.55	-	8,336	1.55	-
Commercial LED (Specialty)	3,629	0.66	-	3,877	0.72	-
Commercial LED (Standard)	28,744	5.37	-	28,313	5.29	-
Total⁴	40,708	7.57	-	40,526	7.56	-
Audited Gross Savings Realization Rates⁵				~100%	~100%	-

Measure-Level Audited Gross Savings: Residential Appliances

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Air Purifier	150	0.02	-	150	0.02	-
Clothes Dryer	119	0.04	466	119	0.04	466
Clothes Washer	254	0.04	908	254	0.04	908
Dehumidifier	195	0.12	-	195	0.12	-
Pool Pump	203	0.15	-	203	0.15	-
Room AC	234	0.36	-	234	0.36	-
Smart Strip	110	0.01	-	110	0.01	-
Thermostat	519	-	13,024	519	-	13,024
Total⁴	1,784	0.73	14,398	1,784	0.73	14,398
Audited Gross Savings Realization Rates⁵				100%	100%	100%

Measure-Level Audited Gross Savings: Residential Consumer Electronics

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Display	122	0.02	-	122	0.02	-
PC	69	0.01	-	69	0.01	-
Total⁴	191	0.03	-	191	0.03	-
Audited Gross Savings Realization Rates⁵				100%	100%	-

Measure-Level Audited Gross Savings: Online Marketplace

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Aerator	6	0.00	262	6	0.00	262
Holiday Lights	21	-	-	21	-	-
Residential LED (Nightlight)	94	-	-	94	-	-
Residential LED (Reflector)	2,687	0.14	-	2,687	0.14	-
Residential LED (Specialty)	190	0.02	-	190	0.02	-
Residential LED (Standard)	5,544	0.67	-	5,544	0.67	-
Pipe Insulation	3	-	136	3	-	136
Shower Start	21	-	1,287	21	-	1,286
Showerhead	22	0.00	1,149	22	0.00	1,149
Smart Strip	657	0.08	-	657	0.08	-
Thermostat	295	-	7,785	295	-	7,788
Weatherstripping	16	-	278	16	-	277
Total⁴	9,556	0.91	10,896	9,556	0.91	10,899
Audited Gross Savings Realization Rates⁵				100%	100%	100%

Verified Savings

In PY2020, the Energy Star Products program resulted in Verified Net Savings of 121,202 MWh, 14.05 MW of coincident peak demand, and 24,571 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing, with several exceptions.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Program	Savings	MWH	PEAK MW	MCF
Residential Lighting	Utility Reported	159,670	15.29	-
	Audited Gross ¹	159,950	15.38	-
	IRAF ²	0.98	0.99	-
	Verified Gross	156,007	15.17	-
	NTGR ³	0.65	0.64	-
	Verified Net ⁴	100,889	9.71	-
Small Commercial Lighting	Utility Reported	40,708	7.57	-
	Audited Gross ¹	40,526	7.56	-
	IRAF ²	0.92	0.92	-
	Verified Gross	37,362	6.96	-
	NTGR ³	0.63	0.63	-
	Verified Net ⁴	23,548	4.39	-
Appliances and Consumer Electronics	Utility Reported	1,975	0.76	14,398
	Audited Gross ¹	1,975	0.76	14,398
	IRAF ²	0.97	0.97	1.00
	Verified Gross	1,920	0.73	14,371
	NTGR ³	0.94	0.92	0.99
	Verified Net ⁴	1,808	0.67	14,263
Online Marketplace	Utility Reported	9,556	0.91	10,896
	Audited Gross ¹	9,556	0.91	10,899
	IRAF ²	0.88	0.89	0.97
	Verified Gross	8,384	0.81	10,526
	NTGR ³	0.65	0.62	0.98
	Verified Net ⁴	5,473	0.50	10,307
Total	Utility Reported	211,909	24.53	25,294
	Audited Gross	212,006	24.60	25,297
	Verified Gross	203,673	23.67	24,897
	Verified Net	131,717	15.27	24,571



Home Energy Consultation Program

Program Year (PY) 2020
Reconciliation Report

April 2, 2021



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Reconciliation Report

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Program Savings Summary

In PY2020, the Home Energy Consultation program resulted in Verified Net Savings of 11,406 MWh, 1.19 MW of coincident peak demand, and 93,866 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2018 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » No discrepancies resulting in changes to savings through the data tracking audit, resulting in Audited Gross Savings Realization Rates of 100 percent

	MWH	PEAK MW	MCF
Utility Reported Gross	13,910	1.42	122,339
Audited Gross Realization Rate ¹	100%	100%	~100%
Audited Gross ²	13,910	1.42	122,340
IRAF ³	0.87	0.89	0.79
Verified Gross	12,093	1.26	96,607
NTGR ⁴	0.94	0.94	0.97
Verified Net⁵	11,406	1.19	93,866

Measure-Level Verified Net Savings: Standard

Verified Net Savings are 81 percent of Utility Reported Gross electric, 82 percent of peak demand, and 79 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Advanced Power Strip Tier 1 AV Systems	996	0.12	-	623	0.07	-
LED A-line 1600-1999 Lumen output replacing Incandescent/Halogen	627	0.08	-	531	0.07	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	3,850	0.41	-	3,259	0.34	-
LED Candelabra <= 5W	895	0.11	-	757	0.10	-
LED Globe <= 8W	582	0.06	-	493	0.05	-
LED Night Light	414	-	-	206	-	-
LED PAR/R/BR <= 15.5W	2,128	0.24	-	1,801	0.20	-
Low Flow Bathroom Faucet Aerators - 1.5 gpm electric water heater	10	0.00	-	7	0.00	-
Low Flow Bathroom Faucet Aerators - 1.5 gpm gas water heater	-	-	925	-	-	673
Low Flow Kitchen Faucet Aerators - 1.5 gpm electric water heater	40	0.00	-	29	0.00	-

Measure-Level Verified Net Savings: Standard (cont.)

Verified Net Savings are 81 percent of Utility Reported Gross electric, 82 percent of peak demand, and 79 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	4,472	-	-	3,250
Low Flow Showerheads 1.5 gpm electric water heater	103	0.01	-	75	0.01	-
Low Flow Showerheads 1.5 gpm gas water heater	-	-	12,798	-	-	9,419
Pipe Wrap R3 - electric water heater	100	0.01	-	83	0.01	-
Pipe Wrap R3 - gas water heater	-	-	16,360	-	-	13,546
Setback thermostat - moderate setback	318	-	42,601	34	-	4,629
Setback thermostat - moderate setback-Tier 2	-	-	-	233	-	29,361
Thermostatic Shower Head 1.5 gpm gas water heater	-	-	9	-	-	6
Total⁴	10,061	1.04	77,166	8,130	0.85	60,885
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				81%	82%	79%

Measure-Level Verified Net Savings: Low Income

Verified Net Savings are 85 percent of Utility Reported Gross electric, 88 percent of peak demand, and 73 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Advanced Power Strip Tier 1 AV Systems	542	0.06	-	369	0.04	-
LED A-line 1600-1999 Lumen output replacing Incandescent/Halogen	233	0.03	-	214	0.03	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	1,966	0.21	-	1,809	0.19	-
LED Candelabra <= 5W	278	0.04	-	256	0.03	-
LED Globe <= 8W	168	0.02	-	155	0.02	-
LED Night Light	228	-	-	123	-	-
LED PAR/R/BR <= 15.5W	192	0.02	-	177	0.02	-
Low Flow Bathroom Faucet Aerators - 1.5 gpm electric water heater	2	0.00	-	2	0.00	-
Low Flow Bathroom Faucet Aerators - 1.5 gpm gas water heater	-	-	434	-	-	343
Low Flow Kitchen Faucet Aerators - 1.5 gpm electric water heater	18	0.00	-	14	0.00	-

Measure-Level Verified Net Savings: Low Income (cont.)

Verified Net Savings are 85 percent of Utility Reported Gross electric, 88 percent of peak demand, and 73 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	4,959	-	-	3,918
Low Flow Showerheads 1.5 gpm electric water heater	23	0.00	-	19	0.00	-
Low Flow Showerheads 1.5 gpm gas water heater	-	-	7,966	-	-	6,373
Pipe Wrap R3 - electric water heater	22	0.00	-	20	0.00	-
Pipe Wrap R3 - gas water heater	-	-	9,521	-	-	8,569
Setback thermostat - moderate setback	175	-	22,289	44	-	5,218
Setback thermostat - moderate setback-Tier 2	-	-	-	74	-	8,557
Thermostatic Shower Head 1.5 gpm electric water heater	1	0.00	-	1	0.00	-
Thermostatic Shower Head 1.5 gpm gas water heater	-	-	3	-	-	3
Total⁴	3,849	0.38	45,173	3,276	0.34	32,981
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				85%	88%	73%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data to audit Utility Reported Gross Savings.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the implementation contractor's (IC) database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

Installation Rate Adjustment Factor

Following the PY2020 DTE Energy Plan Filing, the evaluation team applied the fuel-specific measure-level IRAF from PY2018 to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings. There were a few exceptions:

- » In PY2020, Tier 2 Thermostats claimed the same MEMD savings values as Tier 1 Thermostats. However, an IRAF of 1.00 is applied to Tier 2 Thermostats per guidance from MPSC staff.

Measure	Electric	Gas
Power Strip	0.68	N/A
Tier 1 Thermostat	0.44	0.38
Tier 2 Thermostat	1.00	1.00
Pipe Wrap	0.90	0.90
Showerhead	0.80	0.80
LED Bulbs	0.92	N/A
LED Night Light	0.54	N/A
Bathroom Aerator	0.79	0.79
Kitchen Aerator	0.79	0.79
Shower Starter	0.80	0.80

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the Home Energy Consultation program's measures, except for Tier 2 Thermostats, to determine the Verified Net Savings. A NTGR of 1.00 is applied to Tier 2 Thermostats per guidance from MPSC staff.

The deemed NTGR of 1.00 is applied to the Low Income program component.

Track	Measure	NTGR
Standard	All Measures <i>(excluding Tier 2 Thermostats)</i>	0.92
	Tier 2 Thermostats	1.00
Low Income	All Measures	1.00

Data Tracking Audit

The Guidehouse team compared DTE and IC databased to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during PY2020. Measure unit savings were checked against the MEMD and agreed-upon custom savings values.

The Guidehouse team found one issue when comparing the IC and EOPT databases:

- » One site appeared to have received extra LED bulbs in the EOPT compared to the IC database. It was determined that this measure was accidentally deleted from the IC database during the data transfer process to Guidehouse, and that the EOPT was reporting the measure quantity correctly.

The issue was resolved by the IC and DTE with no overall effect on savings.

Guidehouse split out Tier 2 Thermostats quantities and savings from Tier 1 Thermostats to apply the appropriate IRAF values based on guidance from the MPSC. This resulted in rounding discrepancies with no overall effect on total savings.

	IC ¹	EOPT	Action
One site reported in the EOPT that A-Line bulbs were installed, but were not reported in IC data	1	-	The IC database was corrected
Total Records	1	-	

Audit of Utility Reported Gross Savings-Standard

The Data Tracking resulted in minor adjustments to Utility Reported Gross Savings, primarily for four measures.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Advanced Power Strip Tier 1 AV Systems	996	0.12	-	-	-0.00	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	3,850	0.41	-	-0.00	-0.00	-
Setback thermostat - moderate setback	318	-	42,601	-232.50	-	-29,360.65
Setback thermostat - moderate setback-Tier 2	-	-	-	+232.52	-	+29,361.36
Audited Gross Savings Adjustments⁴				+0.02	-0.00	+0.72

Measure-Level Audited Gross Savings-Standard

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Advanced Power Strip Tier 1 AV Systems	996	0.12	-	996	0.12	-
LED A-line 1600-1999 Lumen output replacing Incandescent/Halogen	627	0.08	-	627	0.08	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	3,850	0.41	-	3,850	0.41	-
LED Candelabra <= 5W	895	0.11	-	895	0.11	-
LED Globe <= 8W	582	0.06	-	582	0.06	-
LED Night Light	414	-	-	414	-	-
LED PAR/R/BR <= 15.5W	2,128	0.24	-	2,128	0.24	-
Low Flow Bathroom Faucet Aerators - 1.5 gpm electric water heater	10	0.00	-	10	0.00	-
Low Flow Bathroom Faucet Aerators - 1.5 gpm gas water heater	-	-	925	-	-	925
Low Flow Kitchen Faucet Aerators - 1.5 gpm electric water heater	40	0.00	-	40	0.00	-
Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	4,472	-	-	4,472

Measure-Level Audited Gross Savings-Standard (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Low Flow Showerheads 1.5 gpm electric water heater	103	0.01	-	103	0.01	-
Low Flow Showerheads 1.5 gpm gas water heater	-	-	12,798	-	-	12,798
Pipe Wrap R3 - electric water heater	100	0.01	-	100	0.01	-
Pipe Wrap R3 - gas water heater	-	-	16,360	-	-	16,360
Setback thermostat - moderate setback	318	-	42,601	85	-	13,241
Setback thermostat - moderate setback-Tier 2	-	-	-	233	-	29,361
Thermostatic Shower Head 1.5 gpm gas water heater	-	-	9	-	-	9
Total⁴	10,061	1.04	77,166	10,061	1.04	77,166
Audited Gross Savings Realization Rates⁵				100%	100%	100%

Audit of Utility Reported Gross Savings: Low Income

The Data Tracking resulted in minor adjustments to Utility Reported Gross Savings, primarily for two measures.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Setback thermostat - moderate setback	175	-	22,289	-74.40	-	-8,556.28
Setback thermostat - moderate setback-Tier 2	-	-	-	+74.41	-	+8,556.79
Audited Gross Savings Adjustments⁴				+0.01	-	+0.51

Measure-Level Audited Gross Savings: Low Income

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings, and nearly 100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Advanced Power Strip Tier 1 AV Systems	542	0.06	-	542	0.06	-
LED A-line 1600-1999 Lumen output replacing Incandescent/Halogen	233	0.03	-	233	0.03	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	1,966	0.21	-	1,966	0.21	-
LED Candelabra <= 5W	278	0.04	-	278	0.04	-
LED Globe <= 8W	168	0.02	-	168	0.02	-
LED Night Light	228	-	-	228	-	-
LED PAR/R/BR <= 15.5W	192	0.02	-	192	0.02	-
Low Flow Bathroom Faucet Aerators - 1.5 gpm electric water heater	2	0.00	-	2	0.00	-
Low Flow Bathroom Faucet Aerators - 1.5 gpm gas water heater	-	-	434	-	-	434
Low Flow Kitchen Faucet Aerators - 1.5 gpm electric water heater	18	0.00	-	18	0.00	-

Measure-Level Audited Gross Savings: Low Income (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings, and nearly 100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	4,959	-	-	4,959
Low Flow Showerheads 1.5 gpm electric water heater	23	0.00	-	23	0.00	-
Low Flow Showerheads 1.5 gpm gas water heater	-	-	7,966	-	-	7,966
Pipe Wrap R3 - electric water heater	22	0.00	-	22	0.00	-
Pipe Wrap R3 - gas water heater	-	-	9,521	-	-	9,521
Setback thermostat - moderate setback	175	-	22,289	101	-	13,733
Setback thermostat - moderate setback-Tier 2	-	-	-	74	-	8,557
Thermostatic Shower Head 1.5 gpm electric water heater	1	0.00	-	1	0.00	-
Thermostatic Shower Head 1.5 gpm gas water heater	-	-	3	-	-	3
Total⁴	3,849	0.38	45,173	3,849	0.38	45,174
Audited Gross Savings Realization Rates⁵				100%	100%	~100%

Verified Savings

In PY2020, the Home Energy Consultation program resulted in Verified Net Savings of 11,406 MWh, 1.19 MW of coincident peak demand, and 93,866 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Program	Savings	MWH	PEAK MW	MCF
Standard	Utility Reported Gross	10,061	1.04	77,166
	Audited Gross ¹	10,061	1.04	77,166
	IRAF ²	0.88	0.89	0.82
	Verified Gross	8,817	0.93	63,626
	NTGR ³	0.92	0.92	0.96
	Verified Net ⁴	8,130	0.85	60,885
Low Income	Utility Reported Gross	3,849	0.38	45,173
	Audited Gross ¹	3,849	0.38	45,174
	IRAF ²	0.85	0.88	0.73
	Verified Gross	3,276	0.34	32,981
	NTGR ³	1.00	1.00	1.00
	Verified Net ⁴	3,276	0.34	32,981
Total	Utility Reported Gross	13,910	1.42	122,339
	Audited Gross	13,910	1.42	122,340
	Verified Gross	12,093	1.26	96,607
	Verified Net	11,406	1.19	93,866



Home Energy Efficiency Kits Program

Program Year (PY) 2020
Reconciliation Report

April 2, 2021



Report ID: DTE-PY2020-RECON-HEEK-02

Acknowledgements

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DTE CONTRIBUTORS

Guidehouse gratefully acknowledges the generous and timely assistance of DTE Energy staff that have provided guidance and input throughout the project including, but not limited to:

- › Jason Kupser
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- › Toben Galvin
- › Shalini Lawson
- › Rebecca Malfroid
- › Jeff LeBrun
- › Andi Campau

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- › Jennifer Malcolm
- › Jenni Abraham



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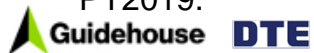
Program Savings Summary

In PY2020, the Home Energy Efficiency Kits (HEEK) program resulted in Verified Net Savings of 7,848 MWh, 0.71 MW of coincident peak demand, and 44,703 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2018 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » Implementation Contractor (IC) records did not include all the invoice numbers while the EOPT records did. The IC database was updated to match the EOPT records.
- » The Advanced Power Strips were using a deemed savings value for AV power systems (77 kWh/unit), while in PY2019 the measure had used a custom blended measure based on information from the Online Marketplace program (60.62 kWh/unit). The EOPT was updated to match the value from PY2019.



	MWH	PEAK MW	MCF
Utility Reported Gross	11,549	1.09	113,795
Audited Gross Realization Rate ¹	96%	94%	100%
Audited Gross ²	11,031	1.02	113,795
IRAF ³	0.77	0.75	0.43
Verified Gross	8,531	0.77	48,590
NTGR ⁴	0.92	0.92	0.92
Verified Net⁵	7,848	0.71	44,703

Measure-Level Verified Net Savings

Verified Net Savings are 68, 65, and 39 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 Online Marketplace - Tier 1 Advanced Power Strip - Custom Blended	2,431	0.28	-	1,197	0.14	-
LED A-line Bulb	5,097	0.54	-	3,658	0.39	-
LED Night Light	1,544	-	-	1,250	-	-
Bathroom Faucet Aerators - electric water heater	102	0.01	-	40	0.01	-
Bathroom Faucet Aerators - gas water heater	-	-	4,164	-	-	1,456
Kitchen Faucet Aerators - electric water heater	711	0.08	-	425	0.05	-
Kitchen Faucet Aerators - gas water heater	-	-	28,451	-	-	9,161
Showerheads - electric water heater	659	0.05	-	346	0.03	-
Showerheads - gas water heater	-	-	30,313	-	-	11,155
Pipe Wrap R3 - electric water heater	1,005	0.12	-	527	0.06	-
Pipe Wrap R3 - gas water heater	-	-	50,868	-	-	22,931
Delayed Installation	-	-	-	405	0.04	-
Total⁴	11,549	1.09	113,795	7,848	0.71	44,703
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				68%	65%	39%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data to audit Utility Reported Gross Savings.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the IC database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

Installation Rate Adjustment Factor

Following the PY2020 DTE Energy Plan Filing, the evaluation team applied the fuel-specific measure-level IRAF from PY2018 to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings. There were two exceptions:

- » Advanced Power Strips were new measures beginning in PY2019, and as a result, the IRAF from Energy Star Online Marketplace, 0.68, was applied.
- » LED A-line Bulbs incorporated delayed installation savings from the past two years and thus include an increased IRAF from the evaluated PY2018 value.

Measure	Electric	Gas
2020 Online Marketplace - Tier 1 Advanced Power Strip - Custom Blended	0.68	N/A
LED A-line Bulb	0.87	N/A
LED Night Light	0.88	N/A
Bathroom Faucet Aerators - electric water heater	0.43	N/A
Bathroom Faucet Aerators - gas water heater	N/A	0.38
Kitchen Faucet Aerators - electric water heater	0.65	N/A
Kitchen Faucet Aerators - gas water heater	N/A	0.35
Showerheads - electric water heater	0.57	N/A
Showerheads - gas water heater	N/A	0.40
Pipe Wrap R3 - electric water heater	0.57	N/A
Pipe Wrap R3 - gas water heater	N/A	0.49

Delayed Installations

The Guidehouse team tracked and applied verified gross savings due to delayed installations for certain LED measures. First-year savings are calculated based on a first-year IRAF for bulbs sold during a given program year, with delayed savings for future years projected based on the following methodology:

- » Second-year installation rate is estimated as 32 percent of the remaining bulbs after the first-year installations
- » Third-year installation rate is estimated as 18 percent of the remaining bulbs after the first- and second-year installations
- » Subsequent year installations are estimated at 18 percent each year of the remaining bulbs.

For PY2020 reconciliation, delayed installations of bulbs sold during the prior two years are credited to the PY2020 program as shown in the figure to the right.

	PY2018	PY2019
Audited Quantity	85,720	110,670
Installation Rate	0.09	0.07
Unit Savings (kWh kW)	28.5 0.003	28.5 0.003
Verified Gross (MWh MW)	220 0.02	221 0.02

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the HEEK program's measures to determine the Verified Net Savings.

Measure	NTGR
All Measures	0.92

Data Tracking Audit

The Guidehouse team compared DTE and IC databases to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD and agreed-upon custom savings values.

The Guidehouse team found two issues when comparing the IC and EOPT databases:

- » The IC records did not include all the invoice numbers while the EOPT records did.
- » The Advanced Power Strips were using a deemed savings value for AV systems (77 kWh/unit), whereas DTE and the IC should have used a custom blended measure (60.62 kWh/unit) reflecting the use of Advanced Power Strips for AV systems and workstations as in PY2019.

All issues were resolved by the IC and DTE with an overall effect on savings of less than five percent.

	IC ¹	EOPT	Action
The IC's database was missing 11,269 records that the EOPT had included.	11,269	-	The IC updated their database to match the EOPT records.
The Advanced Power Strip measure in the EOPT had incorrect values for unit kWh savings.	-	31,567	DTE updated the EOPT to use the custom blended measure.
Total Records	11,269	31,567	

Audit of Utility Reported Gross Savings

The Data Tracking Audits resulted in minor adjustments to Utility Reported Gross Savings, primarily for the advanced power strip measures.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 Online Marketplace - Tier 1 Advanced Power Strip - Custom Blended	2,431	0.28	-	-517	-0.06	+0
LED A-line Bulb	5,097	0.54	-	+0	+0.00	+0
LED Night Light	1,544	-	-	+0	+0.00	+0
Bathroom Faucet Aerators - electric water heater	102	0.01	-	+0	+0.00	+0
Bathroom Faucet Aerators - gas water heater	-	-	4,164	+0	+0.00	+0
Kitchen Faucet Aerators - electric water heater	711	0.08	0	+0	+0.00	+0
Kitchen Faucet Aerators - gas water heater	-	-	28,451	+0	+0.00	+0
Showerheads - electric water heater	659	0.05	-	+0	+0.00	+0
Showerheads - gas water heater	-	0.00	30,313	+0	+0.00	+0
Pipe Wrap R3 - electric water heater	1,005	0.12	-	+0	+0.00	+0
Pipe Wrap R3 - gas water heater	-	-	50,868	+0	+0.00	+0
Audited Gross Savings Adjustments⁴				-517	-0.06	+0

Measure-Level Audited Gross Savings

Audited Gross Savings are 96, 94 and 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 Online Marketplace - Tier 1 Advanced Power Strip - Custom Blended	2,431	0.28	-	1,913	0.22	-
LED A-line Bulb	5,097	0.54	-	5,097	0.54	-
LED Night Light	1,544	-	-	1,544	-	-
Bathroom Faucet Aerators - electric water heater	102	0.01	-	102	0.01	-
Bathroom Faucet Aerators - gas water heater	-	-	4,164	-	-	4,164
Kitchen Faucet Aerators - electric water heater	711	0.08	-	711	0.08	-
Kitchen Faucet Aerators - gas water heater	-	-	28,451	-	-	28,451
Showerheads - electric water heater	659	0.05	-	659	0.05	-
Showerheads - gas water heater	-	-	30,313	-	-	30,313
Pipe Wrap R3 - electric water heater	1,005	0.12	-	1,005	0.12	-
Pipe Wrap R3 - gas water heater	-	-	50,868	-	-	50,868
Total⁴	11,549	1.09	113,795	11,031	1.02	113,795
Audited Gross Savings Realization Rates⁵				96%	94%	100%

Verified Savings

In PY2020, the HEEK program resulted in Verified Net Savings of 7,848 MWh, 0.71 MW of coincident peak demand, and 44,703 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Savings	MWH	PEAK MW	MCF
Utility Reported	11,549	1.09	113,795
Audited Gross ¹	11,031	1.02	113,795
IRAF ²	0.77	0.75	0.43
Verified Gross	8,531	0.77	48,590
NTGR ³	0.92	0.92	0.92
Verified Net ⁴	7,848	0.71	44,703



Home Energy Report Program

Program Year (PY) 2020
Reconciliation Report

April 12, 2021



Report ID: DTE-PY2020-RECON-HER-01

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- › Rebecca Malfroid
- › Jeff LeBrun
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- › Alex Mazarredo



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Program Savings Summary

In PY2020, the Home Energy Report program resulted in Verified Net Savings of 54,498 MWh, 14.39 MW of coincident peak demand, and 216,811 MCF.

The Home Energy Report (HER) program promotes energy-saving behaviors by distributing print or electronic home energy reports (HERs) to selected residential customers. Participants also have access to a web portal containing additional information about their energy usage. Participants are assigned to the Electric Only, Gas Only, or Dual Fuel groups based on whether DTE Energy (DTE) is their electric provider, gas provider, or both electric and gas provider.

The program is designed as a Randomized Controlled Trial (RCT) in which the implementation contractor (IC) randomly assigns eligible customers to the participant and control groups. Customers assigned to the participant group are automatically enrolled in the program, with the option to opt out if desired.

To determine Verified Net Savings the Guidehouse team determined the deemed savings from the Behavior Resource Manual (BRM) for each wave and then applied the realization rate (RR) from the PY2018 evaluation.

	MWH	PEAK MW	MCF
Verified Net	54,498	14.39	216,811

Estimation of Verified Net Savings

The reconciliation of program impacts includes verifying electric and gas savings, and coincident peak demand savings.

The Michigan BRM provides deemed percent savings for HER waves by usage band.

01

Verify Average Annual Usage or Coincident Peak Demand

02

Verify Active Participants

03

Calculate Savings Using BRM Deemed Value

04

Adjust Using Realization Rate

Audited Verified Net Savings

01

02

03

The Guidehouse team confirmed savings by verifying the following components:

1. Calculate *average annual energy usage* using DTE's 2019¹ billing data for customers randomly assigned to the Control Group for the HER Program.

OR

1. Calculate *average coincident peak demand* using DTE's 2019² hourly demand data for customers randomly assigned to the Control Group for the HER program. The coincident peak period defined by the Michigan Public Service Commission is 3 PM to 6 PM on the three hottest consecutive weekdays in July. The 2019 coincident peak days were July 17-19.
2. Count the *number of active participants* using DTE billing data defined as customers that received at least one report in 2020 and had an active account as of December 31, 2020.
3. Average annual energy usage determines the appropriate BRM percent savings value to be applied for both electric energy savings and coincident peak demand savings. After verifying average annual energy usage, the Guidehouse team verified the appropriate *BRM percent savings* value was applied.

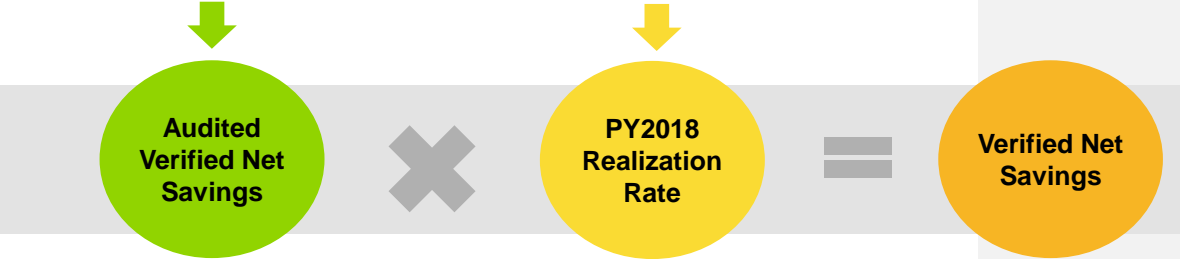
$$\text{Audited Verified Net Savings} = (\text{Average Usage}) * (\text{Active Participants}) * (\text{BRM \% Savings})$$

Application of Realization Rate

Per an agreement with the MPSC, the evaluation team applied the fuel-specific RR from the PY2018 to the Verified Net Savings as calculated using the 2020 BRM. The RR is a comparison of 2018 evaluated net adjusted percentage savings to the BRM savings assumptions.

Billing data is used to estimate the annual usage for each HER wave; the deemed savings value from the 2020 BRM is applied to determine net savings

Guidehouse compared evaluated HER savings to the deemed BRM values in PY2018 to determine a realization rate



Fuel Type	Realization Rate
Electric	73%
Demand	73%
Gas	91%

Usage Band Comparison

01

For each wave of the HER program, the Guidehouse team compared their analysis of the control group annual usage to the Implementation Contractor's to ensure an accurate estimation of program savings. The analysis was performed on a year-end billing extract from the DTE. Discrepancies were identified for all waves, potentially stemming from the IC's application of the analysis steps. However, when the IC performed the analysis on their curated billing data, the annual usage differed by one percent or less. Guidehouse, DTE, and the IC agreed to proceed with the Guidehouse results.

Wave ¹	Guidehouse (kWh)	IC (kWh)	Percent Difference	Guidehouse (Therms)	IC (Therms)	Percent Difference
201107_D	8,778	8,310	5%	1,260	1,300	-3%
201309_E_Reduced	15,309	13,092	16%			
201401_D	6,025	5,835	3%	1,203	1,243	-3%
201401_E	10,897	9,716	11%			
201504_D	7,139	6,761	5%	931	965	-4%
201504_E	10,643	9,552	11%			
201602_E	12,674	11,377	11%			
201602_G				1,812	1,864	-3%
201606_D	8,506	8,122	5%	1,151	1,191	-3%
201606_E	9,971	9,000	10%			
201710_D	6,995	6,878	2%	1,351	1,391	-3%
201710_G				1,190	1,226	-3%
201711_G				928	957	-3%
201803_D	6,050	5,745	5%	949	981	-3%
201901_D	6,631	6,357	4%	1,044	1,078	-3%
202004_E	11,782	10,641	10%			

Participant Count Comparison

02

For each wave of the HER program, the Guidehouse team compared their analysis of the active participant counts to the IC's to ensure an accurate estimation of program savings. Guidehouse's participant count estimation methodology differed from the IC's in one way: Guidehouse compared the active participant list to DTE's 2020 billing data to ensure continuous billing within the program year. This resulted in slightly lower participant counts across all waves.

The participant counts calculated by Guidehouse were used in the calculation of audited verified net savings.

Wave ¹	Guidehouse (Elec)	IC (Elec)	Percent Difference	Guidehouse (Gas)	IC (Gas)	Percent Difference
201107_D	20,362	20,645	-1%	20,365	20,645	-1%
201309_E_Reduced	51,378	51,896	-1%			
201401_D	35,707	36,231	-1%	35,707	36,231	-1%
201401_E	52,962	53,436	-1%			
201504_D	13,448	13,694	-2%	13,448	13,694	-2%
201504_E	22,873	23,066	-1%			
201602_E	9,873	10,004	-1%			
201602_G				22,002	22,219	-1%
201606_D	4,129	4,250	-3%	4,129	4,250	-3%
201606_E	12,503	12,651	-1%			
201710_D	14,828	15,242	-3%	14,828	15,242	-3%
201710_G				50,746	51,211	-1%
201711_G				44,147	44,455	-1%
201803_D	18,150	18,501	-2%	18,151	18,501	-2%
201901_D	18,367	18,814	-2%	18,355	18,814	-2%
202004_E	115,369	116,920	-1%			

Electric BRM Savings Values

03

Using the verified average annual energy usage and the number of years the program has been active, Guidehouse verified the appropriate BRM usage band and savings values were applied in all cases

Wave	Verified Average Annual Usage (kWh)	BRM Usage Band	Years Active	Deemed kWh Savings	Deemed kW Savings
201107_D	8,778	7k-9kWh Annual Usage (10th year - 7th year value) ¹	10	2.20%	3.30%
201309_E_Reduced	15,309	>11kWh Annual Usage (8th year - 7th year lower band) ²	8	2.73%	2.67%
201401_D	6,025	5k-7kWh Annual Usage (7th year - 2nd year value) ³	7	0.77%	1.16%
201401_E	10,897	9k-11kWh Annual Usage (7th year)	7	2.73%	4.10%
201504_D	7,139	7k-9kWh Annual Usage (6th year)	6	1.70%	2.55%
201504_E	10,643	9k-11kWh Annual Usage (6th year)	6	2.12%	3.18%
201602_E	12,674	>11kWh Annual Usage (5th year - lower band) ⁴	5	2.18%	2.67%
201606_D	8,506	7k-9kWh Annual Usage (5th year)	5	2.01%	3.02%
201606_E	9,971	9k-11kWh Annual Usage (5th year)	5	2.18%	3.27%
201710_D	6,995	5k-7kWh Annual Usage (4th year - 2nd year value) ⁵	4	0.77%	1.16%
201803_D	6,050	5k-7kWh Annual Usage (3rd year - 2nd year value) ⁶	3	0.77%	1.16%
201901_D	6,631	5k-7kWh Annual Usage (2nd year)	2	0.77%	1.16%
202004_E	11,782	>11kWh Annual Usage (1st year)	1	1.20%	1.80%

Gas BRM Savings Values

03

Using the verified average annual energy usage and the number of years the program has been active, Guidehouse verified the appropriate BRM usage band and savings values were applied in all cases

Wave	Verified Average Annual Usage (Therms)	BRM Usage Band	Years Active	Deemed Savings
201107_D	1,260	>1200 Therms Annual Usage (10th year - 7th year value) ¹	10	0.82%
201401_D	1,203	>1200 Therms Annual Usage (7th year)	7	0.82%
201504_D	931	900-1200 Therms Annual Usage (6th year)	6	0.73%
201602_G	1,812	>1200 Therms Annual Usage (5th year)	5	1.09%
201606_D	1,151	900-1200 Therms Annual Usage (5th year)	5	0.66%
201710_D	1,351	>1200 Therms Annual Usage (4th year)	4	0.66%
201710_G	1,190	900-1200 Therms Annual Usage (4th year)	4	0.86%
201711_G	928	900-1200 Therms Annual Usage (4th year)	4	0.86%
201803_D	949	900-1200 Therms Annual Usage (3rd year)	3	0.91%
201901_D	1,044	900-1200 Therms Annual Usage (2nd year)	2	0.53%

Application of Realization Rate

Audited Verified Net Savings are adjusted using a 73 percent RR for electric energy and demand savings, and a 91 percent RR for gas savings.

Wave	Audited Verified Net Savings ¹			Verified Net Savings ¹		
	MWh	MW	MCF	MWh	MW	MCF
201107_D	3,932	1.27	21,042	2,871	0.93	19,148
201309_E_reduced	21,473	3.58	-	15,675	2.61	-
201401_D	1,656	0.56	35,225	1,209	0.41	32,054
201401_E	15,756	4.77	-	11,502	3.48	-
201504_D	1,632	0.52	9,142	1,191	0.38	8,320
201504_E	5,161	1.56	-	3,767	1.14	-
201602_E	2,728	0.66	-	1,991	0.48	-
201602_G	-	0.00	43,466	-	0.00	39,554
201606_D	706	0.21	3,136	515	0.16	2,854
201606_E	2,718	0.84	-	1,984	0.61	-
201710_D	799	0.25	13,217	583	0.18	12,028
201710_G	-	0.00	51,938	-	0.00	47,264
201711_G	-	0.00	35,250	-	0.00	32,078
201803_D	846	0.27	15,678	617	0.20	14,267
201901_D	938	0.29	10,159	685	0.21	9,245
202004_E	16,311	4.93	-	11,907	3.60	-
Total²	74,655	19.71	238,254	54,498	14.39	216,811

Verified Savings

To determine Verified Net Savings the Guidehouse team verified average annual energy usage, average coincident peak demand, the number of active participants, and the appropriate application of the BRM percent savings values and realization rate adjustment.

In PY2020, the HER program resulted in Verified Net Savings of 54,498 MWh, 14.39MW of coincident peak demand, and 216,811MCF.

	MWH	PEAK MW	MCF
Verified Net	54,498	14.39	216,811

Residential HVAC Program

Program Year (PY) 2020
Reconciliation Report

April 2, 2021



Report ID: DTE-PY2020-RECON-HVAC-01

Acknowledgements

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- › Nicole Reed Fry

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Reconciliation Report

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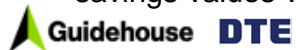
Program Savings Summary

In PY2020, the Residential HVAC program (consisting of the Downstream, Midstream, and Rebate-as-a-Service channels) resulted in Verified Net Savings of 16,500 MWh, 2.85 MW of coincident peak demand, and 271,343 MCF.

To determine Verified Net Savings, the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2018 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » There were 238 water heater measure entries with measure codes that did not match the latest version of the 2020 MEMD in both Implementation Contractor (IC) records and DTE's Energy Optimization Program Tracking (EOPT) database.
- » There were 213 projects with demand (kW) savings discrepancies and 6 projects with gas savings discrepancies between the EOPT and IC databases. ICF confirmed the EOPT savings values were correct and adjusted the IC database.



	MWH	PEAK MW	MCF
Utility Reported Gross	18,018	3.12	293,319
Audited Gross Realization Rate ¹	100%	100%	~100%
Audited Gross ²	18,018	3.12	293,366
IRAF ³	0.99	0.99	~1.00
Verified Gross	17,856	3.09	292,985
NTGR ⁴	0.92	0.92	0.93
Verified Net⁵	16,500	2.85	271,343

Measure-Level Verified Net Savings: HVAC Downstream

Verified Net Savings are ~92, 91, and 93 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ASHP - SEER 16 - SEER 14 base	2	0.00	-	2	0.00	-
ASHP - SEER 17 - SEER 14 base	3	0.00	-	3	0.00	-
ASHP - SEER 18 - SEER 14 base	2	0.00	-	2	0.00	-
ASHP - SEER 19 - SEER 14 base	8	0.00	-	8	0.00	-
ASHP - SEER 20 - SEER 14 base	2	0.00	-	2	0.00	-
ASHP - SEER 21 - SEER 14 base	2	0.00	-	2	0.00	-
Boiler 90% plus AFUE	-	-	285	-	-	257
Boiler 92% plus AFUE	-	-	153	-	-	138
Boiler 95% plus AFUE	(23)	-	25,576	(19)	-	23,059
Boiler Tune-up	-	-	567	-	-	527
ECM Furnace	14,201	1.28	-	12,934	1.17	-
ENERGY STAR Heat Pump Water Heaters in Semi-Conditioned Space, <= 55 gallons UEF >= 3.0	50	0.00	-	48	0.00	-

Measure-Level Verified Net Savings: HVAC Downstream (cont.)

Verified Net Savings are ~92, 91, and 93 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55 gallons	-	-	199	-	-	206
Furnace/AC - SEER 15	681	0.19	(1,171)	620	0.17	(1,077)
Furnace/AC - SEER 16	1,229	0.93	(1,432)	1,119	0.84	(1,318)
Furnace/AC - SEER 17	277	0.24	(311)	252	0.22	(286)
Furnace/AC - SEER 18	78	0.07	(65)	71	0.07	(60)
Furnace/AC - SEER 19	168	0.16	(161)	153	0.15	(148)
Furnace/AC - SEER 20	121	0.12	(100)	110	0.11	(92)
Furnace/AC - SEER 21	41	0.04	(42)	37	0.04	(38)
GSHP - EER 17	10	0.00	-	9	0.00	-
GSHP - EER 19	43	0.01	-	40	0.01	-
GSHP - variable speed EER 22	9	0.00	-	9	0.00	-
GSHP - variable speed EER 22 with DSH	68	0.02	-	62	0.02	-

Measure-Level Verified Net Savings: HVAC Downstream (cont.)

Verified Net Savings are ~92, 91, and 93 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
High efficiency 95 AFUE furnace NC or without ECM	-	-	16,615	-	-	15,285
High efficiency 96 AFUE furnace NC or without ECM	-	-	194,268	-	-	178,726
High efficiency 97 AFUE furnace NC or without ECM	-	-	13,100	-	-	12,052
High efficiency 98 AFUE furnace NC or without ECM	-	-	12,966	-	-	11,928
Instant Medium Draw Gas Water Heater	-	-	629	-	-	640
Minisplit Heat pump SEER 21 HSPF 10 ASHP base	48	0.00	-	44	0.00	-
Minisplit Heat pump SEER 21 HSPF 10 Elec Resistance base	48	0.00	-	44	0.00	-
O&M Tune-up	29	0.03	98	26	0.03	91
O&M Tune-up - furnace only	-	-	7,699	-	-	7,154
Setback thermostat - moderate setback	911	-	22,458	911	-	22,459
Total⁴	18,008	3.12	291,331	16,491	2.85	269,504
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				~92%	91%	93%

Measure-Level Verified Net Savings: HVAC Midstream

Verified Net Savings are 92, 83, and ~92 percent of Utility Reported Gross electric savings, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 HVAC-Boiler 95% plus AFUE - Custom	-	-	1,862	-	-	1,713
ENERGY STAR Heat Pump Water Heaters in Semi-Conditioned Space, <= 55 gallons UEF >= 3.0	10	0.00	-	10	0.00	-
ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55 gallons	-	-	8	-	-	7
Instant Medium Draw Gas Water Heater	-	-	74	-	-	71
Total⁴	10	0.00	1,944	10	0.00	1,792
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				92%	83%⁶	~92%

Measure-Level Verified Net Savings: HVAC RaaS

Verified Net Savings are 103 percent of Utility Reported Gross gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55 gallons	-	-	45	-	-	47
Total³	-	-	45	-	-	47
Verified Net Savings as a Percent of Utility Reported Gross Savings⁴				-	-	103%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data to audit Utility Reported Gross Savings.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the IC database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

Installation Rate Adjustment Factor

Following the PY2020 DTE Energy Plan Filing, the evaluation team applied the fuel-specific measure-level IRAF from PY2018 to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings. There were a few exceptions:

- » The IRAF for Heat Pumps was not evaluated in PY2018 or PY2019 due to limited sample size. The applied IRAF is from mid-year PY2020 evaluation results.
- » An IRAF of 1.00 is applied to Tier 2 & 3 Thermostats based on guidance from MPSC staff.
- » As a newer delivery channel, HVAC Midstream has not been separately evaluated. As a result, an IRAF of 1.00 is applied.
- » HVAC RaaS measures are not evaluated separately and receive IRAF values from the downstream channel.

Channel	Measure	Electric	Gas
HVAC Downstream	Boiler	0.89	0.98
	Central AC	0.99	1.00
	ECM Blower Motor	0.99	N/A
	Furnace	N/A	1.00
	Heat Pump	1.00	1.00
	Tier 2 & 3 Thermostat	1.00	1.00
	Tune-Up	1.00	1.01
	Water Heater	1.06	1.06
HVAC Midstream	Boiler	N/A	1.00
	Water Heater	1.00	1.00
HVAC RaaS	Water Heater	N/A	1.06

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the Residential HVAC program's measures, except for Tier 2 & 3 Thermostats, to determine the Verified Net Savings. A NTGR of 1.00 is applied to Tier 2 & 3 Thermostats per guidance from MPSC staff.

Channel	Measure	NTGR
All Channels	Boiler	0.92
	Central AC	0.92
	ECM Blower Motor	0.92
	Furnace	0.92
	Heat Pump	0.92
	Tier 2 & 3 Thermostat	1.00
	Tune-Up	0.92
	Water Heater	0.92

Data Tracking Audit

The Guidehouse team compared DTE and IC databases to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD and agreed-upon custom savings values.

The Guidehouse team found three issues when comparing the IC and EOPT databases:

- » In all three channels, there were 238 water heater entries with measure codes that did not match the latest version of the 2020 MEMD (199 Downstream, 15 Midstream, and 24 RaaS).
- » In HVAC Downstream, there were 213 projects with mismatched demand (kW) savings between the EOPT and IC databases.
- » In HVAC Midstream, there were six projects with mismatched gas savings between the EOPT and IC databases.

All issues were resolved by the IC and DTE with a negligible overall effect on Downstream and Midstream savings and a six percent effect on RaaS savings.

Issue	IC ¹	EOPT	Action
In all three channels, there were water heater measure entries with measure codes that did not match the latest version of the 2020 MEMD.	238	238	DTE updated the measure codes and sent corrected data extracts.
In HVAC Downstream, there were 213 projects with mismatched demand (kW) savings between the EOPT and IC databases.	213	-	The mismatched savings came from outdated unit savings values in the IC database. The IC corrected the values for affected measures.
In HVAC Midstream, there were 6 projects with mismatched gas savings between the EOPT and IC databases.	6	-	The mismatched savings were a result of default savings values entered in the IC database for estimating pipeline and projecting savings for future projects. The IC corrected these values.
Total Records	457	238	

Audit of Utility Reported Gross Savings: HVAC Downstream

The Data Tracking Audit resulted in negligible adjustments to Utility Reported Gross Savings for the measures shown below.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55 gallons	-	-	199	-	-	+12
Instant Medium Draw Gas Water Heater	-	-	629	-	-	+28
Audited Gross Savings Adjustments^{4,5}				0	0.00	+41

Measure-Level Audited Gross Savings: HVAC Downstream

Audited Gross Savings are ~100 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ASHP - SEER 16 - SEER 14 base	2	0.00	-	2	0.00	-
ASHP - SEER 17 - SEER 14 base	3	0.00	-	3	0.00	-
ASHP - SEER 18 - SEER 14 base	2	0.00	-	2	0.00	-
ASHP - SEER 19 - SEER 14 base	8	0.00	-	8	0.00	-
ASHP - SEER 20 - SEER 14 base	2	0.00	-	2	0.00	-
ASHP - SEER 21 - SEER 14 base	2	0.00	-	2	0.00	-
Boiler 90% plus AFUE	-	-	285	-	-	285
Boiler 92% plus AFUE	-	-	153	-	-	153
Boiler 95% plus AFUE	(23)	-	25,576	(23)	-	25,576
Boiler Tune-up	-	-	567	-	-	567
ECM Furnace	14,201	1.28	-	14,201	1.28	-
ENERGY STAR Heat Pump Water Heaters in Semi-Conditioned Space, <= 55 gallons UEF >= 3.0	50	0.00	-	50	0.00	-

Measure-Level Audited Gross Savings: HVAC Downstream (cont.)

Audited Gross Savings are ~100 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55 gallons	-	-	199	-	-	211
Furnace/AC - SEER 15	681	0.19	(1,171)	681	0.19	(1,170)
Furnace/AC - SEER 16	1,229	0.93	(1,432)	1,229	0.93	(1,432)
Furnace/AC - SEER 17	277	0.24	(311)	277	0.24	(311)
Furnace/AC - SEER 18	78	0.07	(65)	78	0.07	(65)
Furnace/AC - SEER 19	168	0.16	(161)	168	0.16	(161)
Furnace/AC - SEER 20	121	0.12	(100)	121	0.12	(100)
Furnace/AC - SEER 21	41	0.04	(42)	41	0.04	(42)
GSHP - EER 17	10	0.00	-	10	0.00	-
GSHP - EER 19	43	0.01	-	43	0.01	-
GSHP - variable speed EER 22	9	0.00	-	9	0.00	-
GSHP - variable speed EER 22 with DSH	68	0.02	-	68	0.02	-

Measure-Level Audited Gross Savings: HVAC Downstream (cont.)

Audited Gross Savings are ~100 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
High efficiency 95 AFUE furnace NC or without ECM	-	-	16,615	-	-	16,615
High efficiency 96 AFUE furnace NC or without ECM	-	-	194,268	-	-	194,267
High efficiency 97 AFUE furnace NC or without ECM	-	-	13,100	-	-	13,100
High efficiency 98 AFUE furnace NC or without ECM	-	-	12,966	-	-	12,966
Instant Medium Draw Gas Water Heater	-	-	629	-	-	657
Minisplit Heat pump SEER 21 HSPF 10 ASHP base	48	0.00	-	48	0.00	-
Minisplit Heat pump SEER 21 HSPF 10 Elec Resistance base	48	0.00	-	48	0.00	-
O&M Tune-up	29	0.03	98	29	0.03	98
O&M Tune-up - furnace only	-	-	7,699	-	-	7,699
Setback thermostat - moderate setback	911	-	22,458	911	-	22,459
Total⁴	18,008	3.12	291,331	18,008	3.12	291,371
Audited Gross Savings Realization Rates⁵				~100%	~100%	~100%

Audit of Utility Reported Gross Savings: HVAC Midstream

The Data Tracking Audit resulted in negligible adjustments to Utility Reported Gross Savings to the water heater measure shown below.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Instant Medium Draw Gas Water Heater	-	-	74	-	-	+3
Audited Gross Savings Adjustments⁴				-	-	+3

Measure-Level Audited Gross Savings: HVAC Midstream

Audited Gross Savings are 100, 90, and ~100 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 HVAC-Boiler 95% plus AFUE - Custom	-	-	1,862	-	-	1,862
ENERGY STAR Heat Pump Water Heaters in Semi-Conditioned Space, <= 55 gallons UEF >= 3.0	10	0.00	-	10	0.00	-
ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55 gallons	-	-	8	-	-	8
Instant Medium Draw Gas Water Heater	-	-	74	-	-	78
Total⁴	10	0.00	1,944	10	0.00	1,947
Audited Gross Savings Realization Rates⁵				100%	90%⁶	~100%

Audit of Utility Reported Gross Savings: HVAC RaaS

The Data Tracking Audit resulted in minor adjustments to Utility Reported Gross Savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55 gallons	-	-	45	-	-	+3
Audited Gross Savings Adjustments				-	-	+3

Measure-Level Audited Gross Savings: HVAC RaaS

Audited Gross Savings are 106 percent of Utility Reported Gross gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55 gallons	-	-	45	-	-	48
Total³	-	-	45	-	-	48
Audited Gross Savings Realization Rates⁴				-	-	106%

Verified Savings

In PY2020, the Residential HVAC program resulted in Verified Net Savings of 16,500 MWh, 2.85 MW of coincident peak demand, and 271,343 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing, with some exceptions.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Channel	Savings	MWH	PEAK MW	MCF
HVAC Downstream	Utility Reported Gross	18,008	3.12	291,331
	Audited Gross ¹	18,008	3.12	291,371
	IRAF ²	0.99	0.99	1.00
	Verified Gross	17,845	3.09	290,987
	NTGR ³	0.92	0.92	0.93
	Verified Net ⁴	16,491	2.85	269,504
HVAC Midstream	Utility Reported Gross	10	0.00	1,944
	Audited Gross ¹	10	0.00	1,947
	IRAF ²	1.00	1.00	1.00
	Verified Gross	10	0.00	1,947
	NTGR ³	0.92	0.92	0.92
	Verified Net ⁴	10	0.00	1,792
HVAC RaaS	Utility Reported Gross	-	-	45
	Audited Gross ¹	-	-	48
	IRAF ²	-	-	1.06
	Verified Gross	-	-	51
	NTGR ³	-	-	0.92
	Verified Net ⁴	-	-	47
Total	Utility Reported Gross	18,018	3.12	293,319
	Audited Gross	18,018	3.12	293,366
	Verified Gross	17,856	3.09	292,985
	Verified Net	16,500	2.85	271,343



DTE Insight Program

Program Year (PY) 2020
Reconciliation Report

April 30, 2021



Report ID: DTE-PY2020-RECON-INS-02

Acknowledgements

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- › Jason Kupser
- › Kevin Bilyeu
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- › Shalini Lawson
- › Rebecca Malfroid
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- › Duncan Ward



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Slide 16

Program Savings Summary

In PY2020, the DTE Insight program resulted in Verified Net Savings of 10,415 MWh, 3.56MW of coincident peak demand, and 42,380 MCF.

The DTE Insight program is a part of DTE Energy’s (DTE) diverse portfolio of residential energy waste reduction programs. The primary goal of the program is to promote energy efficiency and engage its customers through the Insight smartphone application (henceforth referred to as an “app”).

The DTE Insight app aims to achieve behavior-based energy savings from the use of the app, and to cause lasting changes in the energy efficiency market and increase adoption of energy efficient products, services or practices. The app seeks to motivate users to save energy by providing access to a variety of information and tools including hourly (with a one-day delay) interval data, target setting, weekly challenges and tips for completing various home projects that can save the user energy and money on their bill.

The Energy Bridge (henceforth referred to as the “bridge”) is an add-on device some customers receive through the Insight program. The bridge communicates with their meter to give them real-time minute-by-minute electricity usage data.

	MWH	PEAK MW	MCF
Verified Net	10,415	3.56	42,380

Evaluation of Verified Net Savings

The reconciliation of program impacts is a custom analysis that includes all participants who downloaded the app since the program's inception, logged in to the app five or more times in 2020, and had an active account at the end of the program year (2020).

Unlike other DTE programs that apply a fuel-specific Installation Rate Adjustment Factor (IRAF) to a deemed savings value in the Michigan Energy Measures Database (MEMD) or relies on a deemed savings value from the Behavior Resource Manual (BRM), the DTE Insight program requires a custom evaluation to determine Verified Net Savings because a deemed savings value does not exist.

The evaluation team estimated Verified Net Savings (electric and gas) for the Insight App and Energy Bridge using four steps.

01

Select Matched Control Group

02

Estimate Average Verified Net Savings per Participant

03

Calculate Total Annual Program Savings

04

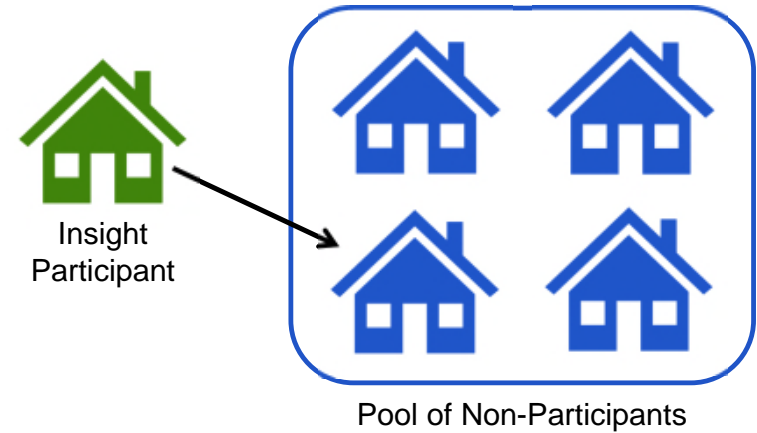
Adjust for Double Counting to Reach Verified Net Program Savings

Select a Matched Control Group

01

For each program participant in the custom evaluation, Guidehouse compared energy consumption in each month in the period spanning 12 months before program enrollment (a twelve-month period before downloading the app) to that of all customers in the available pool with billing data over the same 12-month period.¹

For a given participant, the non-participant whose average monthly consumption pattern across the 12-month pre-period had the shortest Euclidean distance from the participant was selected as that participant's match².

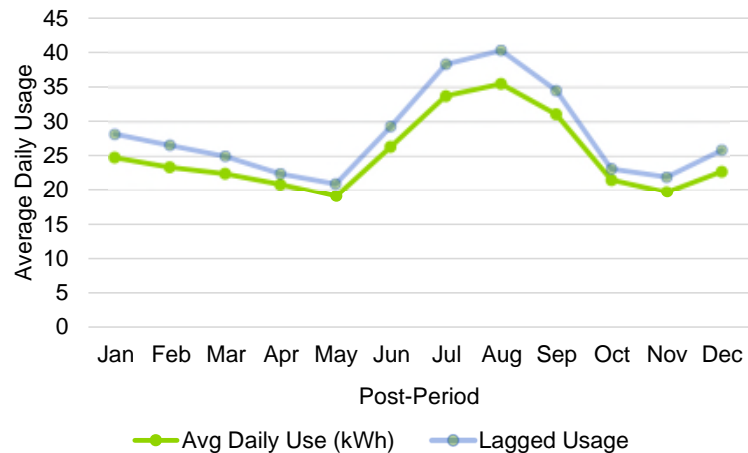


Estimate Average Verified Savings per Participant

02

This evaluation uses the lagged dependent variable (LDV) model with matching, which is a recommended approach in Chapter 21 of the Uniform Methods Project¹ for estimating net savings from energy efficiency programs.

For the Insight program, the LDV is lagged usage from the pre-period, which is highly correlated with post-period usage. The illustrative figure below shows how these usage values correlate for an individual customer.



The model estimated for energy savings is as follows:

$$ADU_{kt} = \alpha_1 Treatment_k + \sum_t \alpha_{2t} YrMo_t + \sum_t \alpha_{3t} ADUlag_{kt} \cdot YrMo_t + \sum_l \alpha_{4l} Zip_{kl} + \sum_l \alpha_{5m} Dem_{km} + \varepsilon_{kt}$$

- LDV controls for differences between the treatment and matched control groups by including lagged usage (from the pre-period) as an explanatory variable.
- The lagged usage does a good job of controlling for differences in usage over time.
- Time invariant customer characteristics must be explicitly added to the model to be accounted for. For the Insight program, zip code and specific demographic attributes² are controlled for in the model .
- Insight participants in the model include customers with only the app and customers with the app and energy bridge. Program savings are not segmented by bridge status.

Calculate Total Annual Program Savings

03

- The regression provides an estimate of average daily Verified Net Savings estimate per participant. The use of a matched control group accounts for free-ridership (FR) and participant spillover (SO)¹, so no additional FR or SO analysis is needed. Due to the design of the program, FR is expected to be minimal, and all participant SO would be captured within the savings estimate.
- The daily savings estimate is an average across all Insight participants, regardless of whether the participant has an installed Energy Bridge.
- To calculate total annual savings, the team multiplied daily savings by the number of days in PY2020 (366) and by the number of qualified participants (customers who logged into the app on five days in 2020 and were active on December 31, 2020).

Qualifying Insight Participants

All customers who downloaded the Insight app between 2014 and 2020 and logged in using their DTE account

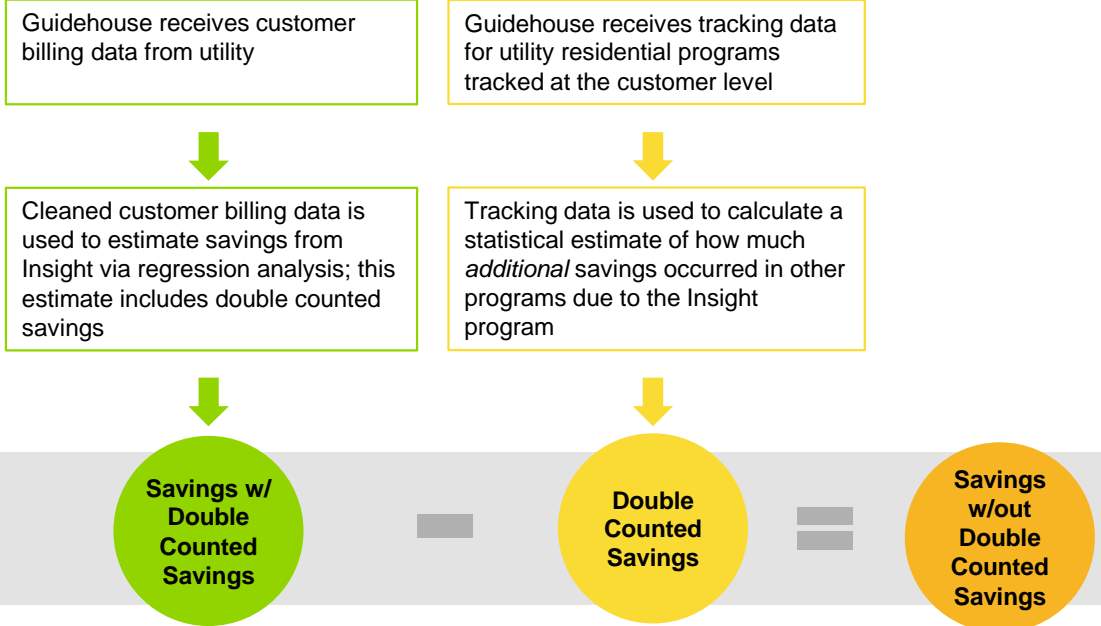
Customers with an active DTE account on December 31st, 2020

Customers who have logged into the app at least 5 times within 2020

Qualified Insight Participants

Adjust for Double Counting

The Insight app provides customers energy-saving tips, some of which encourage participants to enroll in other DTE Energy Waste Reduction (EWR) programs. If participation rates in other EWR programs are the same for Insight participants and matched controls, the savings estimates from the regression analyses are already “net” of savings from other programs. However, if the Insight app affects participation and savings rates in other EWR programs, then savings across all programs are lower than indicated by the simple summation of savings in the Insight and EWR programs. For instance, if the Insight program increases participation in other EWR programs, the increase in savings may be allocated to either the Insight program or the EWR program but should not be allocated to both programs simultaneously. Note that when the Insight program appears to decrease participation in other programs, there is no issue of double-counting and thus no adjustment to the savings total is made.

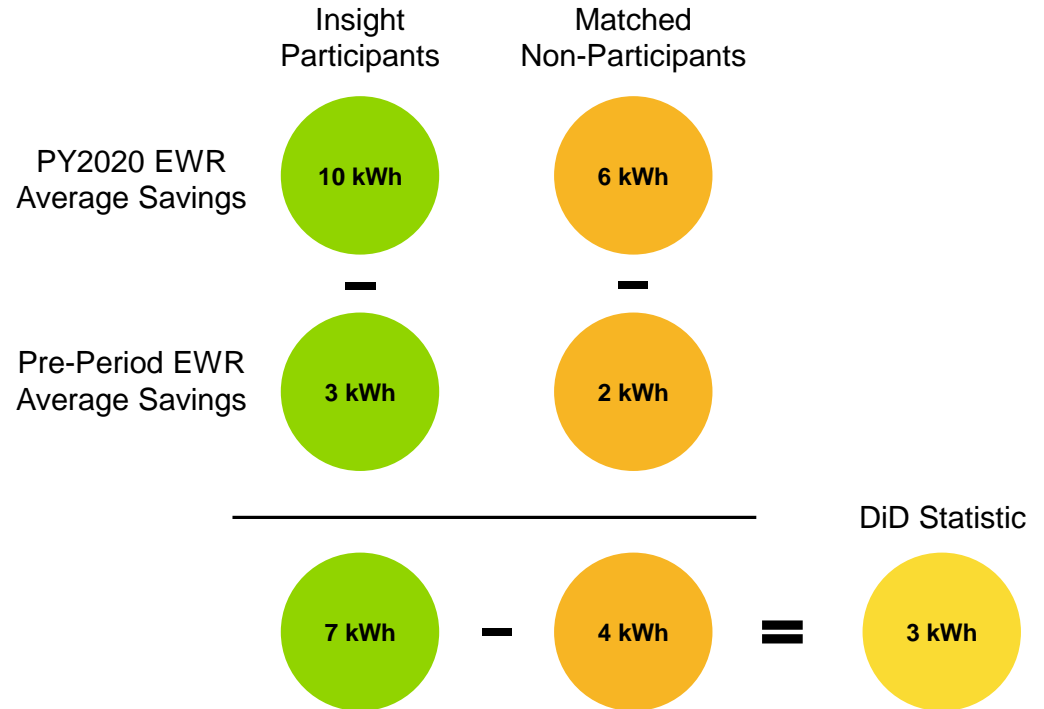


Adjust for Double Counting (Cont'd)

To estimate double counted savings, or “uplift”, Guidehouse uses a difference-in-difference (DiD) statistic¹. To calculate the DiD statistic, the change in the average rate of savings in another EWR program between PY2020 and the pre-program year for the comparison group is subtracted from the same change for the participant group.

To calculate the total double counted savings impact for each EWR program, the DiD statistic is adjusted for each program’s PY2020 IRAF and NTGR and then multiplied by the total number of PY2020 Insight participants. These total EWR-attributable savings are then subtracted from the total Insight program savings to reach Verified Net Savings, as shown on the previous slide.

DiD Statistic Illustration



Evaluation of Verified Net Coincident Peak Savings

As in the energy savings analysis, the evaluation team estimated Verified Net Coincident Peak Demand Savings for the Insight App using the same four steps.

The coincident peak period defined by the Michigan Public Service Commission is 3 PM to 6 PM on the three hottest consecutive weekdays in July. For the analysis, the coincident peak days from 2014-2020 were as follows:

- 2014: 7/21 – 7/23
- 2015: 7/27 – 7/29
- 2016: 7/25 – 7/27
- 2017: 7/19 – 7/21
- 2018: 7/9 – 7/11
- 2019: 7/17 – 7/19
- 2020: 7/7 – 7/9

01

Select Matched Control Group

02

Estimate Average Verified Net Savings per Participant

03

Calculate Total Annual Program Savings

04

Adjust for Double Counting to Reach Verified Net Program Savings

Estimate Average Verified Net Savings per Participant

01

02

Guidehouse used the same matched controls selected in the electric savings analysis, as described on slide 5.

As in the energy savings analysis, Guidehouse used an LDV model to estimate average coincident peak demand savings for 2020.

The coincident peak demand model estimated is as follows:

$$kW_{kt} = \sum_t \alpha_{1t} Treatment_k \cdot HE_t + \sum_t \alpha_{2t} HE_t + \sum_t \alpha_{3t} kWlag_{kt} \cdot HE_t + \sum_i \alpha_{4i} weekday_i + \sum_l \alpha_{5l} Zip_{kl} + \sum_l \alpha_{6m} Dem_{km} + \epsilon_{kt}$$

- LDV controls for differences between the treatment and matched control groups by including **lagged peak demand (from the pre-period)** as an explanatory variable.
- The lagged demand does a good job of controlling for differences in peak demand over time.
- Time invariant customer characteristics must be explicitly added to the model to be accounted for. For the Insight program, **zip code** and specific **demographic attributes** are controlled for in the model .

Calculate Total Annual Program Savings and Adjust for Double Counting

03

04

The regression provides an estimate of average hourly Verified Coincident Peak Demand Savings per participant. To calculate total annual savings, the team multiplied hourly savings by the number of qualified participants.

Guidehouse employed the same methods to account for double counting peak demand savings as in the energy savings analysis, described on slide 7.

Qualifying Insight Participants

All customers who downloaded the Insight app between 2014 and 2020 and logged in using their DTE account

Customers with an active DTE account on December 31st, 2020

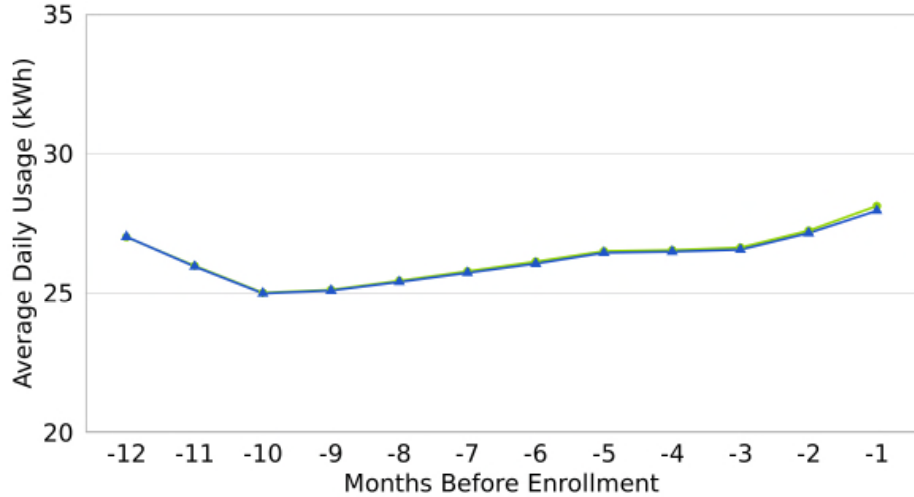
Customers who have logged into the app at least 5 times within 2020

Qualified Insight Participants

Selecting a Matched Control Group

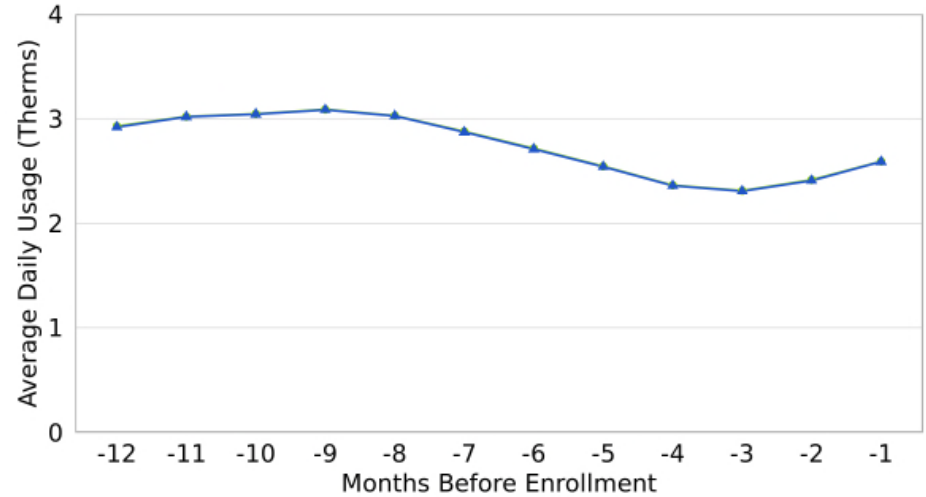
The Guidehouse team selected a matched control group by identifying non-participants that had the closest electricity use to the participants in the 12 months before the participant joined the program. The figures below illustrate average daily electricity and gas use in the twelve months prior to program participation. Differences between participants and their matched controls were small in magnitude and statistically insignificant.

PY2020 Electric Matched Control Group



—◆— Participants —▲— Matched Controls

PY2020 Gas Matched Control Group

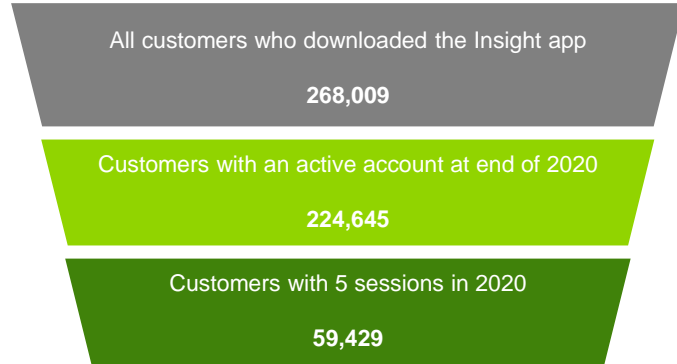


—◆— Participants —▲— Matched Controls

Verified Net Energy Savings

The regression model yielded an average annual savings per participant of 191 kWh (± 33 kWh) for the electric app.

In total, there were 59,429 active participants in 2020.



Total Savings:

191 kWh x 59,429 Participants = 11,360 MWh

02

03

04

PY2020 Savings Attributable to Other EWR Programs

PROGRAM	KWH
Appliance Recycling	-58,662
Audit and Weatherization	8,565
Energy Efficiency Assistance	-4,700
Home Energy Consultation	37,071
Home Energy Survey	257,817
HVAC	130,378
Online Marketplace	575,197
Total	945,666

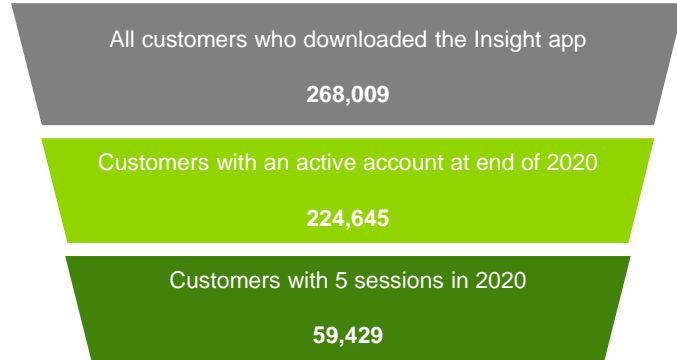
Total Savings with Uplift (Net Verified Savings):

11,360 MWh – 946 MWh = 10,415 MWh

Verified Net Demand Savings

The regression model yielded an average annual savings per participant of 0.06 kW (± 0.01 kW) for the electric app.

In total, there were 59,429 active participants in 2020.



Total Savings:

0.06 kW x 59,429 Participants = 3.66 MW

02

03

04

PY2020 Savings Attributable to Other EWR Programs

PROGRAM	KW
Appliance Recycling	-8.1
Audit and Weatherization	-10.5
Energy Efficiency Assistance	-0.2
Home Energy Consultation	4.6
Home Energy Survey	22.7
HVAC	41.5
Online Marketplace	51.7
Total	101.7

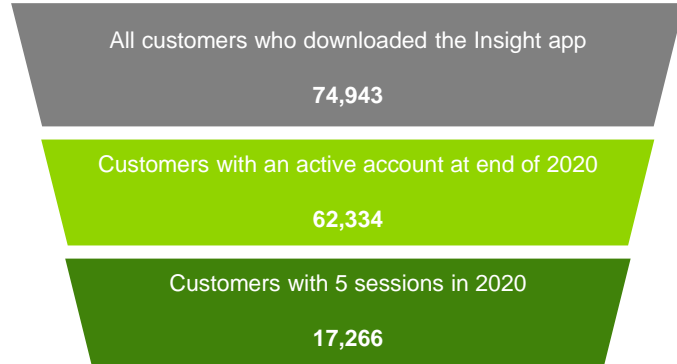
Total Savings with Uplift (Net Verified Savings):

3.66 MW – 0.10 MW = 3.56 MW

Verified Net Energy Savings

The regression model yielded an average annual savings per participant of 25 CCF (± 3 CCF) for the gas app.

In total, there were 17,266 active participants in 2020.



Total Savings:

25 CCF x 17,266 Participants = 42,762 MCF



PY2020 Savings Attributable to Other EWR Programs

PROGRAM	CCF
Audit and Weatherization	-256
Energy Efficiency Assistance	397
Home Energy Consultation	-3,461
Home Energy Survey	4,714
HVAC	-5,341
Online Marketplace	7,767
Total	3,820

Total Savings with Uplift (Net Verified Savings):

42,762 MCF – 382 MCF = 42,380 MCF

Verified Savings

In PY2020, the DTE Insight program resulted in Verified Net Savings of 10,415 MWh, 3.56 MW of coincident peak demand, and 42,380 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Savings	MWH	PEAK MW	MCF
Verified Net	10,415	3.56	42,380



Multifamily Program

Program Year (PY) 2020
Reconciliation Report

April 2, 2021



Report ID: DTE-PY2020-RECON-MF-01

Acknowledgements

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Guidehouse gratefully acknowledges the generous and timely assistance of DTE Energy staff that have provided guidance and input throughout the project including, but not limited to:

- › Jason Kupser
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- › Toben Galvin
- › Shalini Lawson
- › Rebecca Malfroid
- › Jeff LeBrun
- › Denise Allard

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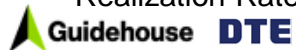
Program Savings Summary

In PY2020, the Multifamily program (including the Commercial, Residential, and Low Income sub-programs) resulted in Verified Net Savings of 6,218 MWh, 0.51 MW of coincident peak demand, and 54,793 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2018 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » The Implementation Contractor (IC) records did not match the demand savings for 193 measures compared with DTE’s Energy Optimization Program Tracking (EOPT) database. The IC confirmed the EOPT values for the 193 measures were correct and adjusted their database to reflect the same.
- » No discrepancies resulting in changes to savings were identified through the data tracking audit, resulting in Audited Gross Savings Realization Rates of nearly 100 percent.



	MWH	PEAK MW	MCF
Utility Reported Gross	6,559	0.53	60,145
Audited Gross Realization Rate ¹	100%	100%	~100%
Audited Gross ²	6,559	0.53	60,146
IRAF ³	0.97	0.98	0.92
Verified Gross	6,379	0.52	55,419
NTGR ⁴	0.97	0.98	0.99
Verified Net⁵	6,218	0.51	54,793

Measure-Level Verified Net Savings: Commercial

Verified Net Savings are 90 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 Multi-Family C&I 83 West Townhomes - Electric	112	-	-	101	-	-
2020 Multi-Family C&I Elmcroft of Downriver Lighting Upgrades - Electric	217	-	-	196	-	-
2020 Multi-Family- CLIFFS ON THE BAY - Lighting - Custom - Electric	32	-	-	29	-	-
2020 Multifamily Lighting Bonus - Commercial - Electric	-	-	-	-	-	-
2020 Sunrise Developments - CA Lighting - Electric	3	-	-	3	-	-
Boiler 95% plus AFUE	-	-	1,062	-	-	957
Boiler Tune-up	-	-	173	-	-	156
Chiller tune up	39	0.02	-	35	0.02	-
Exterior HID replacement LED/Induction	847	-	-	764	-	-
High Efficiency Indirect Water Heater	-	-	25	-	-	23
LED A-line 800-1099 Lumen output replacing CFL	1	0.00	-	1	0.00	-
LED A-line 800-1599 lumen output replacing Incandescent/Halogen	5	0.00	-	5	0.00	-
LED Downlight	27	0.01	-	25	0.00	-

Measure-Level Verified Net Savings: Commercial (cont.)

Verified Net Savings are 90 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
LED Exit Signs Electronic Fixtures (Retrofit Only)	8	0.00	-	7	0.00	-
LED Mogul Base lamps for Highbay (per kW reduced)	227	0.05	-	204	0.05	-
LED PAR/R/BR <= 15.5W	2	0.00	-	2	0.00	-
LED Tube Non Highbay Replacement - Per Watt Reduced	53	-	-	48	-	-
Pipe Wrap - DWH 120F - Conditioned - elec water heater	0	0.00	-	0	0.00	-
Pipe Wrap - DWH 120F - Conditioned - gas water heater	5	-	189	4	-	170
Pipe Wrap - Hot Water Boiler	-	-	2,323	-	-	2,094
Setback thermostat - moderate setback	-	-	21	-	-	21
Total⁴	1,579	0.08	3,793	1,423	0.08	3,421
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				90%	90%	90%

Measure-Level Verified Net Savings: Residential

Verified Net Savings are 89 percent of Utility Reported Gross electric, 88 percent peak demand, and 69 percent gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 Multi-family 40 Davenport - In-Unit HVAC- Electric	62	-	-	56	-	-
2020 Multi-family 40 Davenport - In-Unit Lighting - Electric	50	-	-	45	-	-
High efficiency 96 AFUE furnace NC or without ECM	-	-	123	-	-	111
LED A-line 1100-1599 Lumen output replacing Incandescent/Halogen	11	0.00	-	10	0.00	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	230	0.02	-	203	0.02	-
LED Candelabra <= 5W	17	0.00	-	15	0.00	-
LED Globe <= 8W	87	0.01	-	76	0.01	-
MF Low Flow Bathroom Faucet Aerators - 1.0 gpm electric water heater	2	0.00	-	1	0.00	-
MF Low Flow Bathroom Faucet Aerators - 1.0 gpm gas water heater	-	-	352	-	-	291
MF Low Flow Kitchen Faucet Aerators - 1.5 gpm electric water heater	6	0.00	-	5	0.00	-
MF Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	711	-	-	589
MF Low Flow Showerheads 1.5 gpm electric water heater	9	0.00	-	7	0.00	-
MF Low Flow Showerheads 1.5 gpm gas water heater	-	-	1,404	-	-	1,163

Measure-Level Verified Net Savings: Residential (cont.)

Verified Net Savings are 89 percent of Utility Reported Gross electric, 88 percent peak demand, and 69 percent gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
O&M Tune-up - furnace only	-	-	980	-	-	893
Pipe Wrap R3 - gas water heater	-	-	264	-	-	243
Setback thermostat - moderate setback	7	-	2,632	0	-	512
Setback thermostat - moderate setback-Tier 2	-	-	-	6	-	645
Total⁴	480	0.04	6,466	426	0.03	4,446
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				89%	88%	69%

Measure-Level Verified Net Savings: Low Income

Verified Net Savings are 97 percent of Utility Reported Gross electric, 98 percent peak demand, and 94 percent gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Custom Lighting	1,134	0.04	-	1,111	0.04	-
Custom HVAC	7	-	1,732	7	-	1,697
Boiler 92% plus AFUE	(23)	-	1,800	(23)	-	1,764
Boiler 95% plus AFUE	(42)	-	3,626	(42)	-	3,554
Boiler 95% plus AFUE 82 AFUE BASE	(46)	-	3,352	(45)	-	3,285
Boiler Tune-up	-	-	4,338	-	-	4,251
Energy Star Door	-	-	7	-	-	7
ENERGY STAR Medium Draw Water Heater <= 55 gallons	-	-	2,771	-	-	2,771
ENERGY STAR Room AC greater than 8,000 Btu hr	15	0.02	-	15	0.02	-
Exterior HID replacement LED/Induction	1,045	-	-	1,024	-	-
Furnace/AC - SEER 16	0	0.00	(30)	0	0.00	(29)
High efficiency 95 AFUE furnace NC or without ECM	-	-	1,530	-	-	1,499
High efficiency 95 AFUE furnace with ECM	45	0.01	2,347	44	0.01	2,300

Measure-Level Verified Net Savings: Low Income (cont.)

Verified Net Savings are 97 percent of Utility Reported Gross electric, 98 percent peak demand, and 94 percent gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
High efficiency 96 AFUE furnace NC or without ECM	-	-	2,523	-	-	2,472
High Efficiency Indirect Water Heater	-	-	560	-	-	560
Large High Efficiency Gas Water Heater	-	-	308	-	-	308
LED A-line 1100-1599 Lumen output replacing CFL	1	0.00	-	1	0.00	-
LED A-line 1100-1599 Lumen output replacing Incandescent/Halogen	4	0.00	-	3	0.00	-
LED A-line 1600-1999 Lumen output replacing CFL	1	0.00	-	1	0.00	-
LED A-line 1600-2600 lumen output replacing Incandescent/Halogen	0	0.00	-	0	0.00	-
LED A-line 800-1099 Lumen output replacing CFL	3	0.00	-	3	0.00	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	319	0.03	-	306	0.03	-
LED A-line 800-1599 lumen output replacing Incandescent/Halogen	12	0.00	-	12	0.00	-
LED Candelabra - 12/7	16	-	-	16	-	-
LED Candelabra - 24/7	2	0.00	-	2	0.00	-
LED Candelabra <= 5W	3	0.00	-	3	0.00	-

Measure-Level Verified Net Savings: Low Income (cont.)

Verified Net Savings are 97 percent of Utility Reported Gross electric, 98 percent peak demand, and 94 percent gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
LED Downlight	310	0.06	-	304	0.06	-
LED Exit Signs Electronic Fixtures (Retrofit Only)	26	0.00	-	26	0.00	-
LED Globe <= 8W	22	0.00	-	21	0.00	-
LED Mogul Base lamps for Highbay (per kW reduced)	950	0.22	-	931	0.21	-
LED PAR/R/BR <= 15.5W	4	0.00	-	4	0.00	-
LED PAR/R/BR <= 9.5W replacing CFL	0	0.00	-	0	0.00	-
LED Tube Non Highbay Replacement - Per Watt Reduced	474	-	-	464	-	-
MF Low Flow Bathroom Faucet Aerators - 1.0 gpm electric water heater	9	0.00	-	8	0.00	-
MF Low Flow Bathroom Faucet Aerators - 1.0 gpm gas water heater	-	-	281	-	-	252
MF Low Flow Bathroom Faucet Aerators - 1.5 gpm gas water heater	-	-	58	-	-	52
MF Low Flow Kitchen Faucet Aerators - 1.5 gpm electric water heater	23	0.00	-	20	0.00	-
MF Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	1,044	-	-	940
MF Low Flow Showerheads 1.5 gpm electric water heater	45	0.00	-	40	0.00	-

Measure-Level Verified Net Savings: Low Income (cont.)

Verified Net Savings are 97 percent of Utility Reported Gross electric, 98 percent peak demand, and 94 percent gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
MF Low Flow Showerheads 1.5 gpm gas water heater	-	-	1,967	-	-	1,770
O&M Tune-up - furnace only	-	-	1,722	-	-	1,705
Occupancy Sensor less than 150 sq ft	16	0.00	-	16	0.00	-
Occupancy Sensors between 150 and 500 sq ft	1	0.00	-	1	0.00	-
Pipe Wrap - DWH 120F - Conditioned - gas water heater	3	-	151	3	-	151
Pipe Wrap - Hot Water Boiler	-	-	1,523	-	-	1,523
Pipe Wrap - Steam Boiler	-	-	75	-	-	75
Pipe Wrap R3 - electric water heater	8	0.00	-	8	0.00	-
Pipe Wrap R3 - gas water heater	-	-	176	-	-	176
PTHP 9.1 EER	8	0.00	-	8	0.00	-
Refrigerators Freezers ENERGY STAR - Top Freezer	23	0.00	-	23	0.00	-

Measure-Level Verified Net Savings: Low Income (cont.)

Verified Net Savings are 97 percent of Utility Reported Gross electric, 98 percent peak demand, and 94 percent gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Setback thermostat - moderate setback	62	(0.00)	3,242	28	(0.00)	735
Setback thermostat - moderate setback-Tier 2	-	-	-	6	(0.00)	618
Stairwell Bi-Level Control	20	0.00	-	20	0.00	-
Steam Traps	-	-	14,751	-	-	14,456
Vertical Unit EER 10 Et 90	-	-	2	-	-	2
Window Replacement	1	0.00	31	1	0.00	30
Total⁴	4,500	0.41	49,887	4,369	0.40	46,926
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				97%	98%	94%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data to audit Utility Reported Gross Savings.

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Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the IC database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

Installation Rate Adjustment Factor

Following the PY2020 DTE Energy Plan Filing, the evaluation team applied the fuel-specific measure-level IRAF from PY2018 to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings. There were a few exceptions:

- » An IRAF of 1.00 is applied to Tier 2 Thermostats based on guidance from MPSC staff.
- » The MEMD savings values for commercial Tier 1 Thermostats were developed based on a billing analysis, and as a result an IRAF is not applicable as the MEMD savings values represents Verified Net Savings.

	Measure	Electric	Gas
Commercial (including Low Income)	All Measures (excluding Thermostats)	0.98	0.98
	Thermostats	1.00	1.00
Residential (including Low Income)	Low Flow Fixtures	0.90	0.90
	LED Bulbs	0.96	N/A
	Tune Ups	N/A	0.99
	Pipe Wrap	1.00	1.00
	Tier 1 Thermostats	0.49	0.28
	Tier 2 Thermostats	1.00	1.00
	Refrigerators (Low Income Only)	1.00	N/A
	All Other Measures	0.98	0.98

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to all Standard Residential and Commercial Multifamily program measures, except for certain Thermostats, to determine the Verified Net Savings. The MEMD savings value for Commercial Thermostats is based on a billing analysis and represent Verified Net Savings, therefore a NTGR is not applied. A NTGR of 1.00 is applied to all Tier 2 Thermostats per guidance from MPSC staff.

The deemed NTGR of 1.00 is applied to the Low Income program component.

Track	Measure	NTGR
Commercial	All Measures <i>(excluding Thermostats)</i>	0.92
	Thermostats	1.00
Residential	All Measures <i>(excluding Tier 2 Thermostats)</i>	0.92
	Thermostats	1.00
Low Income	All Measures	1.00

Data Tracking Audit

The Guidehouse team compared DTE and IC databases to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD and agreed-upon custom savings values.

The Guidehouse team found 193 issues when comparing the IC and EOPT databases:

- » The IC does not have targets for demand savings, and therefore any savings reported are manually calculated. This led to the discovery of 193 discrepancies found between the IC and EOPT databases.

All the issues were resolved by the IC and DTE with no overall effect on savings.

Guidehouse split out Tier 2 Thermostats quantities and savings from Tier 1 Thermostats to apply the appropriate IRAF values based on guidance from the MPSC. This resulted in rounding discrepancies with no overall effect on total savings.

	IC ¹	EOPT	Action
Guidehouse discovered a discrepancy in the total amount of demand savings reported between the IC and EOPT data sets, which affected 74 Refrigerators, 115 Thermostats, one Furnace, and three custom projects	193	-	The IC resolved the issues and provided Guidehouse with an updated data extract.
Total Records	193	-	

Audit of Utility Reported Gross Savings: Commercial

The Data Tracking resulted in minor adjustments to Utility Reported Gross Savings, primarily for one measure.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
LED Mogul Base lamps for Highbay (per kW reduced)	227	0.05	-	-0.03	-	-
Audited Gross Savings Adjustments⁴				-0.03	-	-

Measure-Level Audited Gross Savings: Commercial

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 Multi-Family C&I 83 West Townhomes - Electric	112	-	-	112	-	-
2020 Multi-Family C&I Elmcroft of Downriver Lighting Upgrades - Electric	217	-	-	217	-	-
2020 Multi-Family- CLIFFS ON THE BAY - Lighting - Custom - Electric	32	-	-	32	-	-
2020 Sunrise Developments - CA Lighting - Electric	3	-	-	3	-	-
Boiler 95% plus AFUE	-	-	1,062	-	-	1,062
Boiler Tune-up	-	-	173	-	-	173
Chiller tune up	39	0.02	-	39	0.02	-
Exterior HID replacement LED/Induction	847	-	-	847	-	-
High Efficiency Indirect Water Heater	-	-	25	-	-	25
LED A-line 800-1099 Lumen output replacing CFL	1	0.00	-	1	0.00	-

Measure-Level Audited Gross Savings: Commercial (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
LED A-line 800-1599 lumen output replacing Incandescent/Halogen	5	0.00	-	5	0.00	-
LED Downlight	27	0.01	-	27	0.01	-
LED Exit Signs Electronic Fixtures (Retrofit Only)	8	0.00	-	8	0.00	-
LED Mogul Base lamps for Highbay (per kW reduced)	227	0.05	-	227	0.05	-
LED PAR/R/BR <= 15.5W	2	0.00	-	2	0.00	-
LED Tube Non Highbay Replacement - Per Watt Reduced	53	-	-	53	-	-
Pipe Wrap - DWH 120F - Conditioned - elec water heater	0	0.00	-	0	0.00	-
Pipe Wrap - DWH 120F - Conditioned - gas water heater	5	-	189	5	-	189
Pipe Wrap - Hot Water Boiler	-	-	2,323	-	-	2,323
Setback thermostat - moderate setback	-	-	21	-	-	21
Total⁴	1,579	0.08	3,793	1,579	0.08	3,793
Audited Gross Savings Realization Rates⁵				100%	100%	100%

Audit of Utility Reported Gross Savings: Residential

The Data Tracking resulted in minor adjustments to Utility Reported Gross Savings, primarily for two measures.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Setback thermostat - moderate setback	7	-	2,632	+6.11	-	+645.65
Setback thermostat - moderate setback-Tier 2	-	-	-	-6.11	-	-645.06
Audited Gross Savings Adjustments⁴				-	-	+0.59

Measure-Level Audited Gross Savings: Residential

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings, and nearly 100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 Multi-family 40 Davenport - In-Unit HVAC-Electric	62	-	-	62	-	-
2020 Multi-family 40 Davenport - In-Unit Lighting - Electric	50	-	-	50	-	-
High efficiency 96 AFUE furnace NC or without ECM	-	-	123	-	-	123
LED A-line 1100-1599 Lumen output replacing Incandescent/Halogen	11	0.00	-	11	0.00	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	230	0.02	-	230	0.02	-
LED Candelabra <= 5W	17	0.00	-	17	0.00	-
LED Globe <= 8W	87	0.01	-	87	0.01	-
MF Low Flow Bathroom Faucet Aerators - 1.0 gpm electric water heater	2	0.00	-	2	0.00	-
MF Low Flow Bathroom Faucet Aerators - 1.0 gpm gas water heater	-	-	352	-	-	352
MF Low Flow Kitchen Faucet Aerators - 1.5 gpm electric water heater	6	0.00	-	6	0.00	-
MF Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	711	-	-	711

Measure-Level Audited Gross Savings: Residential (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings, and nearly 100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
MF Low Flow Showerheads 1.5 gpm electric water heater	9	0.00	-	9	0.00	-
MF Low Flow Showerheads 1.5 gpm gas water heater	-	-	1,404	-	-	1,404
O&M Tune-up - furnace only	-	-	980	-	-	980
Pipe Wrap R3 - gas water heater	-	-	264	-	-	264
Setback thermostat - moderate setback	7	-	2,632	1	-	1,986
Setback thermostat - moderate setback-Tier 2	-	-	-	6	-	645
Total⁴	480	0.04	6,466	480	0.04	6,465
Audited Gross Savings Realization Rates⁵				100%	100%	~100%

Audit of Utility Reported Gross Savings: Low Income

The Data Tracking resulted in adjustments to Utility Reported Gross Savings across 19 measures.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Custom Lighting	1,134	0.04	-	-0.00	-	-
Boiler 95% plus AFUE	(42)	-	3,626	-	-	-0.00
Boiler Tune-up	-	-	4,338	-	-	-0.01
Energy Star Door	-	-	7	-	-	-0.00
Exterior HID replacement LED/Induction	1,045	-	-	-0.00	-	-
Furnace/AC - SEER 16	0	0.00	(30)	-0.00	-0.00	+0.00
High efficiency 95 AFUE furnace NC or without ECM	-	-	1,530	-	-	-0.00
High Efficiency Indirect Water Heater	-	-	560	-	-	+0.00
LED A-line 1600-2600 lumen output replacing Incandescent/Halogen	0	0.00	-	-	-0.00	-
LED A-line 800-1099 Lumen output replacing CFL	3	0.00	-	-	-0.00	-
LED Mogul Base lamps for Highbay (per kW reduced)	950	0.22	-	+0.05	+0.00	-
LED Tube Non Highbay Replacement - Per Watt Reduced	474	-	-	+0.00	-	-
Pipe Wrap - DWH 120F - Conditioned - gas water heater	3	-	151	-0.00	-	-0.00

Audit of Utility Reported Gross Savings: Low Income (cont.)

The Data Tracking resulted in adjustments to Utility Reported Gross Savings across 19 measures.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
PTHP 9.1 EER	8	0.00	-	+0.00	-	-
Setback thermostat - moderate setback	62	(0.00)	3,242	-5.69	+0.00	-616.87
Setback thermostat - moderate setback-Tier 2	-	-	-	+5.71	-0.00	+617.89
Stairwell Bi-Level Control	20	0.00	-	+0.03	+0.00	-
Vertical Unit EER 10 Et 90	-	-	2	-	-	-0.00
Window Replacement	1	0.00	31	-0.00	-	-0.00
Audited Gross Savings Adjustments⁴				+0.11	-0.00	+1.01

Measure-Level Audited Gross Savings: Low Income

Audited Gross Savings are 100 percent of Utility Reported Gross electric savings and nearly 100 percent of peak demand and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Custom Lighting	1,134	0.04	-	1,134	0.04	-
Custom HVAC	7	-	1,732	7	-	1,732
Boiler 92% plus AFUE	(23)	-	1,800	(23)	-	1,800
Boiler 95% plus AFUE	(42)	-	3,626	(42)	-	3,626
Boiler 95% plus AFUE 82 AFUE BASE	(46)	-	3,352	(46)	-	3,352
Boiler Tune-up	-	-	4,338	-	-	4,338
Energy Star Door	-	-	7	-	-	7
ENERGY STAR Medium Draw Water Heater <= 55 gallons	-	-	2,771	-	-	2,771
ENERGY STAR Room AC greater than 8,000 Btu hr	15	0.02	-	15	0.02	-
Exterior HID replacement LED/Induction	1,045	-	-	1,045	-	-
Furnace/AC - SEER 16	0	0.00	(30)	0	0.00	(30)

Measure-Level Audited Gross Savings: Low Income (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric savings and nearly 100 percent of peak demand and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
High efficiency 95 AFUE furnace NC or without ECM	-	-	1,530	-	-	1,530
High efficiency 95 AFUE furnace with ECM	45	0.01	2,347	45	0.01	2,347
High efficiency 96 AFUE furnace NC or without ECM	-	-	2,523	-	-	2,523
High Efficiency Indirect Water Heater	-	-	560	-	-	560
Large High Efficiency Gas Water Heater	-	-	308	-	-	308
LED A-line 1100-1599 Lumen output replacing CFL	1	0.00	-	1	0.00	-
LED A-line 1100-1599 Lumen output replacing Incandescent/Halogen	4	0.00	-	4	0.00	-
LED A-line 1600-1999 Lumen output replacing CFL	1	0.00	-	1	0.00	-
LED A-line 1600-2600 lumen output replacing Incandescent/Halogen	0	0.00	-	0	0.00	-
LED A-line 800-1099 Lumen output replacing CFL	3	0.00	-	3	0.00	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	319	0.03	-	319	0.03	-

Measure-Level Audited Gross Savings: Low Income (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric savings and nearly 100 percent of peak demand and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
LED A-line 800-1599 lumen output replacing Incandescent/Halogen	12	0.00	-	12	0.00	-
LED Candelabra - 12/7	16	-	-	16	-	-
LED Candelabra - 24/7	2	0.00	-	2	0.00	-
LED Candelabra <= 5W	3	0.00	-	3	0.00	-
LED Downlight	310	0.06	-	310	0.06	-
LED Exit Signs Electronic Fixtures (Retrofit Only)	26	0.00	-	26	0.00	-
LED Globe <= 8W	22	0.00	-	22	0.00	-
LED Mogul Base lamps for Highbay (per kW reduced)	950	0.22	-	950	0.22	-
LED PAR/R/BR <= 15.5W	4	0.00	-	4	0.00	-
LED PAR/R/BR <= 9.5W replacing CFL	0	0.00	-	0	0.00	-
LED Tube Non Highbay Replacement - Per Watt Reduced	474	-	-	474	-	-

Measure-Level Audited Gross Savings: Low Income (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric savings and nearly 100 percent of peak demand and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
MF Low Flow Bathroom Faucet Aerators - 1.0 gpm electric water heater	9	0.00	-	9	0.00	-
MF Low Flow Bathroom Faucet Aerators - 1.0 gpm gas water heater	-	-	281	-	-	281
MF Low Flow Bathroom Faucet Aerators - 1.5 gpm gas water heater	-	-	58	-	-	58
MF Low Flow Kitchen Faucet Aerators - 1.5 gpm electric water heater	23	0.00	-	23	0.00	-
MF Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	1,044	-	-	1,044
MF Low Flow Showerheads 1.5 gpm electric water heater	45	0.00	-	45	0.00	-
MF Low Flow Showerheads 1.5 gpm gas water heater	-	-	1,967	-	-	1,967
O&M Tune-up - furnace only	-	-	1,722	-	-	1,722
Occupancy Sensor less than 150 sq ft	16	0.00	-	16	0.00	-
Occupancy Sensors between 150 and 500 sq ft	1	0.00	-	1	0.00	-
Pipe Wrap - DWH 120F - Conditioned - gas water heater	3	-	151	3	-	151

Measure-Level Audited Gross Savings: Low Income (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric savings and nearly 100 percent of peak demand and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Pipe Wrap - Hot Water Boiler	-	-	1,523	-	-	1,523
Pipe Wrap - Steam Boiler	-	-	75	-	-	75
Pipe Wrap R3 - electric water heater	8	0.00	-	8	0.00	-
Pipe Wrap R3 - gas water heater	-	-	176	-	-	176
PTHP 9.1 EER	8	0.00	-	8	0.00	-
Refrigerators Freezers ENERGY STAR - Top Freezer	23	0.00	-	23	0.00	-
Setback thermostat - moderate setback	62	(0.00)	3,242	57	(0.00)	2,625
Setback thermostat - moderate setback-Tier 2	-	-	-	6	(0.00)	618
Stairwell Bi-Level Control	20	0.00	-	20	0.00	-
Steam Traps	-	-	14,751	-	-	14,751
Vertical Unit EER 10 Et 90	-	-	2	-	-	2
Window Replacement	1	0.00	31	1	0.00	31
Total⁴	4,500	0.41	49,887	4,500	0.41	49,888
Audited Gross Savings Realization Rates⁵				100%	~100%	~100%

Verified Savings

In PY2020, the Multifamily program resulted in Verified Net Savings of 6,218 MWh, 0.49 MW of coincident peak demand, and 54,793 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Program	Savings	MWH	PEAK MW	MCF
Commercial	Utility Reported Gross	1,579	0.08	3,793
	Audited Gross ¹	1,579	0.08	3,793
	IRAF ²	0.98	0.98	0.98
	Verified Gross	1,547	0.08	3,717
	NTGR ³	0.92	0.92	0.92
	Verified Net ⁴	1,423	0.08	3,421
Residential	Utility Reported Gross	480	0.04	6,466
	Audited Gross ¹	480	0.04	6,465
	IRAF ²	0.96	0.96	0.74
	Verified Gross	462	0.04	4,776
	NTGR ³	0.92	0.92	0.93
	Verified Net ⁴	426	0.03	4,446
Low Income	Utility Reported Gross	4,500	0.41	49,887
	Audited Gross ¹	4,500	0.41	49,888
	IRAF ²	0.97	0.98	0.94
	Verified Gross	4,369	0.40	46,926
	NTGR ³	1.00	1.00	1.00
	Verified Net ⁴	4,369	0.40	46,926
Total	Utility Reported Gross	6,559	0.53	60,145
	Audited Gross	6,559	0.53	60,146
	Verified Gross	6,379	0.52	55,419
	Verified Net	6,218	0.51	54,793



C&I Midstream Food Service Program

Program Year (PY) 2020
Reconciliation Report

April 30, 2021



Report ID: DTE-PY2020-RECON-MSFS-02

Acknowledgements

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- › Shannon Dorato
- › Andrew Nawrocki
- › Sahil Popli
- › Cherish Smith

DTE CONTRIBUTORS

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- › Sarah Tocco

IMPLEMENTER SUPPORT

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- › Josh Chanin



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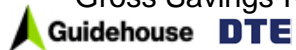
Program Savings Summary

In PY2020, the C&I Midstream Food Service program resulted in Verified Net Savings of 1,419 MWh, 0.31 MW of coincident peak demand, and 5,938 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2018 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » DTE's Energy Optimization Program Tracking (EOPT) and the Implementation Contractor (IC) records both contained small, non-zero demand savings for the Demand Commercial Kitchen Ventilation Hoods and the Top Freezer Refrigerators. These differences were small enough that they don't appear when values are rounded.
- » The MWh and MCF savings differences were small enough that they don't appear when values are rounded, resulting in Audited Gross Savings Realization Rates of ~100 percent.



	MWH	PEAK MW	MCF
Utility Reported Gross	1,545	0.33	6,471
Audited Gross Realization Rate ^{1,5}	100%	100%	100%
Audited Gross ²	1,545	0.33	6,471
IRAF ^{3,5}	~1.00	1.00	~1.00
Verified Gross	1,542	0.33	6,455
NTGR ⁴	0.92	0.92	0.92
Verified Net⁵	1,419	0.31	5,938

Measure-Level Verified Net Savings

Verified Net Savings are 92 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
CKV Hood with Demand Control	-	-	246	-	-	226
Combination Ovens	1,253	0.29	1,008	1,153	0.26	927
Custom DCKV - Average all Weather zones	17	0.00	1,286	16	-	1,183
ENERGY STAR Commercial Glass Door Freezers 15 to 30 ft3	1	0.00	-	1	0.00	-
ENERGY STAR Commercial Glass Door Refrigerators less than 15ft3	1	0.00	-	1	0.00	-
ENERGY STAR Commercial Glass Door Refrigerators 15 to 30 ft3	9	0.00	-	8	0.00	-
ENERGY STAR Commercial Glass Door Refrigerators 30 to 50ft3	1	0.00	-	1	0.00	-
ENERGY STAR Commercial Glass Door Refrigerators more than 50ft3	1	0.00	-	1	0.00	-
ENERGY STAR Commercial Solid Door Freezers less than 15ft3	1	0.00	-	1	0.00	-
ENERGY STAR Commercial Solid Door Freezers 15 to 30 ft3	5	0.00	-	5	0.00	-
ENERGY STAR Commercial Solid Door Freezers 30 to 50ft3	20	0.00	-	18	0.00	-
ENERGY STAR Commercial Solid Door Freezers more than 50ft3	21	0.00	-	19	0.00	-

Measure-Level Verified Net Savings (cont.)

Verified Net Savings are 92 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR Commercial Solid Door Refrigerators 15 to 30 ft3	12	0.00	-	11	0.00	-
ENERGY STAR Commercial Solid Door Refrigerators 30 to 50ft3	11	0.00	-	10	0.00	-
ENERGY STAR Commercial Solid Door Refrigerators less than 15ft3	2	0.00	-	2	0.00	-
ENERGY STAR Commercial Solid Door Refrigerators more than 50ft3	22	0.00	-	20	0.00	-
ENERGY STAR Convection Ovens	28	0.01	1,285	26	0.00	1,182
ENERGY STAR Dishwasher - elec water heater-CI	2	0.00	-	2	0.00	-
ENERGY STAR Fryers	3	0.00	404	2	0.00	372
ENERGY STAR Griddles	-	-	15	-	-	14
ENERGY STAR Hot Holding Cabinets Half Size	4	0.00	-	3	0.00	-
ENERGY STAR Hot Holding Cabinets Three Quarter Size	25	0.00	-	23	0.00	-
ENERGY STAR Ice Machines 500 to 1000 lbs	3	0.00	-	3	0.00	-
ENERGY STAR Ice Machines less than 500 lbs	5	0.00	-	4	0.00	-

Measure-Level Verified Net Savings (cont.)

Verified Net Savings are 92 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR Steam Cookers 3-4 Pan	-	-	94	-	-	86
ENERGY STAR Steam Cookers 6 Pan	76	0.02	1,876	70	0.02	1,726
ES Dishwasher, High Temp, Elec Heat, Elec Booster, Single Tank Conveyor	9	0.00	-	7	0.00	-
ES Dishwasher, High Temp, Gas Heat, Elec Booster, Single Tank Conveyor	-	-	160	-	-	133
ES Dishwasher, High Temp, Gas Heat, Elec Booster, Under Counter	-	-	5	-	-	4
ES Dishwasher, Low Temp, Elec Heat, Under Counter	10	0.00	-	8	0.00	-
Infrared Salamander Broiler - per unit	-	-	34	-	-	31
Large Vat Fryers	-	-	58	-	-	53
Pre-Rinse Sprayers CEE Tier 1 <= 1.13 gpm (Retrofit Only)	-	-	3	-	-	2
Refrigerators Freezers ENERGY STAR - Top Freezer-CI	4	0.00	-	4	0.00	-
Total⁴	1,545	0.33	6,472	1,419	0.31	5,938
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				92%	92%	92%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data to audit Utility Reported Gross Savings.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the IC database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

Installation Rate Adjustment Factor

Following the PY2020 DTE Energy Plan Filing, the evaluation team applied the fuel-specific measure-level IRAF from PY2018 to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings.

	Measure	Electric	Gas
	Freezer	1.00	-
	Refrigerator	1.00	-
	Ice Machine	1.00	-
Commercial & Industrial	Sprayer	0.86	0.90
	Holding Cabinet	1.00	-
	Oven	1.00	1.00
	Fryer	1.00	1.00
	Cooking	1.00	1.00
	Dishwasher	0.86	0.90

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the C&I Midstream Food Service program's measures to determine the Verified Net Savings.

Track	Measure	NTGR
Standard	All Measures	0.92

Data Tracking Audit

The Guidehouse team compared DTE and IC databased to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD and agreed-upon custom savings values.

The Guidehouse team found no issues when comparing the IC and EOPT databases.

01

	IC ¹	EOPT	Action
Number of Measure Lines	-	-	None
Total Records	-	-	None

Measure-Level Audited Gross Savings

Audited Gross Savings are 100 percent of Utility Reported Gross electric and gas savings, and nearly 100 percent for Utility Report Gross peak demand savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
CKV Hood with Demand Control	-	-	246	-	-	246
Combination Ovens	1,253	0.29	1,008	1,253	0.29	1,008
Custom DCKV - Average all Weather zones	17	0.00	1,286	17	0.00	1,286
ENERGY STAR Commercial Glass Door Freezers 15 to 30 ft3	1	0.00	-	1	0.00	-
ENERGY STAR Commercial Glass Door Refrigerators less than 15ft3	1	0.00	-	1	0.00	-
ENERGY STAR Commercial Glass Door Refrigerators 15 to 30 ft3	9	0.00	-	9	0.00	-
ENERGY STAR Commercial Glass Door Refrigerators 30 to 50ft3	1	0.00	-	1	0.00	-
ENERGY STAR Commercial Glass Door Refrigerators more than 50ft3	1	0.00	-	1	0.00	-
ENERGY STAR Commercial Solid Door Freezers less than 15ft3	1	0.00	-	1	0.00	-
ENERGY STAR Commercial Solid Door Freezers 15 to 30 ft3	5	0.00	-	5	0.00	-
ENERGY STAR Commercial Solid Door Freezers 30 to 50ft3	20	0.00	-	20	0.00	-
ENERGY STAR Commercial Solid Door Freezers more than 50ft3	21	0.00	-	21	0.00	-

Measure-Level Audited Gross Savings (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric and gas savings, and nearly 100 percent for Utility Report Gross peak demand savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR Commercial Solid Door Refrigerators 15 to 30 ft ³	12	0.00	-	12	0.00	-
ENERGY STAR Commercial Solid Door Refrigerators 30 to 50ft ³	11	0.00	-	11	0.00	-
ENERGY STAR Commercial Solid Door Refrigerators less than 15ft ³	2	0.00	-	2	0.00	-
ENERGY STAR Commercial Solid Door Refrigerators more than 50ft ³	22	0.00	-	22	0.00	-
ENERGY STAR Convection Ovens	28	0.01	1,285	28	0.01	1,285
ENERGY STAR Dishwasher - elec water heater-CI	2	0.00	-	2	0.00	-
ENERGY STAR Fryers	3	0.00	404	3	0.00	404
ENERGY STAR Griddles	-	-	15	-	-	15
ENERGY STAR Hot Holding Cabinets Half Size	4	0.00	-	4	0.00	-
ENERGY STAR Hot Holding Cabinets Three Quarter Size	25	0.00	-	25	0.00	-
ENERGY STAR Ice Machines 500 to 1000 lbs	3	0.00	-	3	0.00	-
ENERGY STAR Ice Machines less than 500 lbs	5	0.00	-	5	0.00	-

Measure-Level Audited Gross Savings (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric and gas savings, and nearly 100 percent for Utility Report Gross peak demand savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR Steam Cookers 3-4 Pan	-	-	94	-	-	94
ENERGY STAR Steam Cookers 6 Pan	76	0.02	1,876	76	0.02	1,876
ES Dishwasher, High Temp, Elec Heat, Elec Booster, Single Tank Conveyor	9	0.00	-	9	0.00	-
ES Dishwasher, High Temp, Gas Heat, Elec Booster, Single Tank Conveyor	-	-	160	-	-	160
ES Dishwasher, High Temp, Gas Heat, Elec Booster, Under Counter	-	-	5	-	-	5
ES Dishwasher, Low Temp, Elec Heat, Under Counter	10	0.00	-	10	0.00	-
Infrared Salamander Broiler - per unit	-	-	34	-	-	34
Large Vat Fryers	-	-	58	-	-	58
Pre-Rinse Sprayers CEE Tier 1 <= 1.13 gpm (Retrofit Only)	-	-	3	-	-	3
Refrigerators Freezers ENERGY STAR - Top Freezer-CI	4	0.00	-	4	0.00	-
Total⁴	1,545	0.33	6,472	1,545	0.33	6,472
Audited Gross Savings Realization Rates⁵				100%	100%	100%

Verified Savings

In PY2020, the C&I Midstream Food Service program resulted in Verified Net Savings of 1,419 MWh, 0.31 MW of coincident peak demand, and 5,938 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Program	Savings	MWH	PEAK MW	MCF
MSFS	Utility Gross	1,545	0.33	6,472
	Audited Gross ¹	1,545	0.33	6,472
	IRAF ²	1.00	1.00	1.00
	Verified Gross	1,542	0.33	6,455
	NTGR ³	0.92	0.92	0.92
	Verified Net ⁴	1,419	0.31	5,938



C&I Midstream HVAC Program

Program Year (PY) 2020
Reconciliation Report

April 30, 2021



Report ID: DTE-PY2020-RECON-MSHVAC-02

Acknowledgements

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- › Sahil Popli
- › Cherish Smith
- › Emily Cross

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- › Kyle Booth
- › Josh Chanin



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Program Savings Summary

In PY2020, the C&I Midstream HVAC program resulted in Verified Net Savings of 4,123 MWh, 1.98 MW of coincident peak demand, and 23,902 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2018 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational. During the reconciliation process, Guidehouse found:

- » The Implementation Contractor (IC) recorded custom demand savings calculations instead of deemed demand savings. DTE's Energy Optimization Program Tracking (EOPT) recorded deemed demand savings for measures listed correctly. The IC updated their database to apply a deemed savings value for these demand savings.
- » No discrepancies resulting in changes to MWhs or the MCF savings were identified through the data tracking audit, resulting in Audited Gross Savings Realization Rates of 100 percent.



	MWH	PEAK MW	MCF
Utility Reported Gross	4,482	2.23	25,981
Audited Gross Realization Rate ¹	100%	96%	100%
Audited Gross ²	4,482	2.15	25,981
IRAF ^{3,5}	1.00	1.00	1.00
Verified Gross	4,482	2.15	25,981
NTGR ⁴	0.92	0.92	0.92
Verified Net⁵	4,123	1.98	23,902

Measure-Level Verified Net Savings

Verified Net Savings are 92 percent of Utility Reported Gross electric and gas savings, and 89% of peak demand savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
AC Units	3,980	2.08	-	3,661	1.84	-
Air-Sourced Heat Pumps	282	0.06	-	260	0.05	-
Boilers	-	-	25,981	-	-	23,902
Water-Source Heat Pumps	219	0.09	-	202	0.08	-
Total⁴	4,482	2.23	25,981	4,123	1.98	23,902
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				92%	89%	92%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data to audit Utility Reported Gross Savings.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the IC database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

Installation Rate Adjustment Factor

The Midstream HVAC Program was commercialized in PY2019. Though the measures offered by the Midstream HVAC Program were already offered through other programs within the portfolio, PY2019 was the first time these measures were offered through a midstream delivery model. As such, an IRAF of 1.00 was applied in PY2019 with the expectation of applying an evaluated value in PY2020. However, due to low program participation in PY2019 IRAF was not evaluated. As a result, the evaluation team applied an IRAF of 1.00 in PY2020 based on the high installation rates for these types of measures across the portfolio.

Boilers were first introduced to the program in PY2020. Given this was the first-time boilers were offered through a midstream delivery model, the evaluation team applied an IRAF of 1.00 in PY2020.

	Measure	Electric	Gas
Commercial & Industrial	AC	1.00	N/A
	Heat Pump	1.00	N/A
	Boilers	N/A	1.00

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the C&I Midstream HVAC program's measures to determine the Verified Net Savings.

Track	Measure	NTGR
Standard	All Measures	0.92

Data Tracking Audit

The Guidehouse team compared DTE and IC databased to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD and agreed-upon custom savings values.

The Guidehouse team found two issues when comparing the IC and EOPT databases:

- » There were 199 projects in the EOPT that didn't match the ICs custom calculations or the appropriate deemed savings in the MEMD. To align with the deemed energy savings approach, Guidehouse updated EOPT demand values to deemed values.
- » All but two measure codes in the EOPT listed new construction or retrofit distinction. This caused a look-up error when matching the deemed savings per measures. Our audited savings updated the measure code for each project with this look-up error.

This was resolved with no overall effect on energy savings and a decrease in demand savings.

	IC ¹	EOPT	Action
Demand savings values did not match between EOPT and IC databases.	-	199	Updated the Audited Gross Savings with the deemed Demand Savings
Incomplete Measure Codes	0	2	No action
Total Records	0	201	

Audit of Utility Reported Gross Savings

The Data Tracking resulted in minor adjustments to Utility Reported Gross Savings, primarily for the AC measures.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
AC Units	3,980	2.08	-	±0	-0.08	±0
Audited Gross Savings Adjustments⁴				±0	-0.08	±0

Measure-Level Audited Gross Savings

Audited Gross Savings are 100 percent of Utility Reported Gross electric and gas savings, and 96 percent of peak demand savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
AC Units	3,980	2.08	-	3,980	2.00	-
Air-Sourced Heat Pumps	282	0.06	-	282	0.06	-
Boilers	-	-	25,981	-	-	25,981
Water-Source Heat Pumps	219	0.09	-	219	0.09	-
Total⁴	4,482	2.23	25,981	4,123	2.15	23,902
Audited Gross Savings Realization Rates⁵				100%	96%	100%

Verified Savings

In PY2020, the C&I Midstream HVAC program resulted in Verified Net Savings of 4,123 MWh, 1.98 MW of coincident peak demand, and 23,902 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Program	Savings	MWH	PEAK MW	MCF
MSHVAC	Utility Gross	4,482	2.23	25,981
	Audited Gross ¹	4,482	2.15	25,981
	IRAF ²	1.00	1.00	1.00
	Verified Gross	4,482	2.15	25,981
	NTGR ³	1.00	0.92	1.00
	Verified Net ⁴	4,123	1.98	23,902



New Homes Construction Program

Program Year (PY) 2020
Reconciliation Report

April 2, 2021



Report ID: DTE-PY2020-RECON-NHC-01

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- › Andrew Nawrocki
- › Jessica Minor-Baetens

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- › Toben Galvin
- › Shalini Lawson
- › Rebecca Malfroid
- › José Gonçalves

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- › Jenni Abraham



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Program Savings Summary

In PY2020, the New Homes Construction (NHC) program resulted in Verified Net Savings of 1,509 MWh, 0.94 MW of coincident peak demand, and 43,930 MCF.

To determine Verified Net Savings the Guidehouse team performed a custom assessment of the reported savings values. This approach is necessarily different from other DTE Energy program evaluations, since the measures installed are not listed in the Michigan Energy Measures Database (MEMD). The team then applied a fuel-specific Realization Rate (RR) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » One Implementation Contractor (IC) and EOPT record contained higher peak demand values than Ekotrope, the software used to calculate savings for the NHC program.
- » One IC record contained higher kWh savings than the EOPT, due to an error in the extract sent to the EOPT. The error was corrected in the EOPT to match the IC database.

	MWh	PEAK MW	MCF
Utility Reported Gross	1,639	1.03	48,232
Audited Gross Realization Rate ¹	~100%	100%	100%
Audited Gross ²	1,640	1.03	48,232
RR ³	1.00	1.00	0.99
Verified Gross	1,640	1.03	47,750
NTGR	0.92	0.92	0.92
Verified Net⁴	1,509	0.94	43,930

Measure-Level Verified Net Savings

Verified Net Savings are 92, 92 and 91 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ²			Verified Net Savings ^{1,2}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 New Homes Construction - Electric - Custom	1,639	-	-	1,509	-	-
2020 New Homes Construction - Electric Peak Demand - Custom	-	1.03	-	-	0.94	-
2020 New Homes Construction - Electric Peak Demand (-0.02) - Custom	-	0.00	-	-	0.00	-
2020 New Homes Construction - Electric Peak Demand (-0.05) - Custom	-	0.00	-	-	0.00	-
2020 New Homes Construction - Electric Peak Demand (-0.17) - Custom	-	0.00	-	-	0.00	-
2020 New Homes Construction - Gas - Custom	-	-	48,232	-	-	43,930
Total³	1,639	1.03	48,232	1,509	0.94	43,930
Verified Net Savings as a Percent of Utility Reported Gross Savings⁴				92%	92%	91%

Determination of Verified Gross Savings

Unlike other DTE Energy programs that apply a fuel-specific Installation Rate Adjustment Factor (IRAF) from 2018, the determination of Verified Savings for the New Homes Construction program requires verification because the program targets measures without a deemed savings value by design.

The reconciliation of program impacts included a review of program tracking data to develop an Audited Gross Savings value, and a full custom assessment of reported savings impacts for a sample of projects to develop a RR. The evaluation team applied the RR to Audited Gross Savings to determine Verified Gross Savings.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the IC database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the database matched the correct unit-level savings values from Ekotrope, the modeling software used to calculate each home's energy savings.

02

Determination of Verified Gross Savings. The team conducted onsite fieldwork to verify savings for randomly sampled projects. The evaluation team verified equipment specifications and home characteristics against reported project details in Ekotrope. The team calculated RRs based on differences between reported and onsite verified savings and extrapolated the project-level RR findings to the population of projects to determine Verified Gross Savings.

Determination of Verified Gross Savings (cont.)

The sample design targeted a criterion of 10 percent absolute precision (AP) at the 90 percent confidence interval (CI) for the NHC program. For the population of 1,282 projects, a sample size of 57¹ was needed to meet the design criterion for AP and CI.

Guidehouse sampled, requested, and reviewed Ekotrope project files for the program. Guidehouse engineers and field technicians went onsite to verify measure installation and operation.

The evaluation team used data collected onsite and compared against Ekotrope project inputs to determine Verified Gross Savings for each sampled project, then extrapolated the project-level RR findings to the population of NHC projects to determine Verified Gross Savings.

Stratum	Population Size	Sample Size
NHC	1,282	57

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the New Home Construction program's measures to determine the Verified Net Savings.

Measure	NTGR
All Measures	0.92

Data Tracking Audit

The Guidehouse team compared DTE and IC databases to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020.

The Guidehouse team found one issue when comparing the IC and EOPT databases:

- » One record's electric savings did not match between the IC and the EOPT databases. The IC made an update to the lighting savings, resulting in higher savings, which was not reflected in their extract to EOPT.

The issue was resolved by the IC and DTE with an overall effect on savings of less than one percent.

	IC ¹	EOPT ¹	Action
One record's electric savings values did not match between the IC and EOPT database	1	1	The IC corrected the error in their database.
Total Records	1	1	

Ekotrope File Audit

Additionally, the Guidehouse team reviewed a random sample of 57 Ekotrope files, targeting 90 percent confidence and 10 percent precision. The sample was stratified by Home Energy Rating System (HERS) rater to verify the accuracy of savings reported in program tracking databases. Specifically, project files were reviewed to ensure calculated data was correctly transferred into the program databases.

Overall, the Guidehouse team found close agreement between the two databases and Ekotrope with the following exception:

- » One record's peak demand savings did not match between the databases and Ekotrope's calculated savings, due to a manual data entry error in the IC database.

02

HERS Rater	Records ¹	Sample	Action
DR Nelson & Associates	567	13	No Action
Energy Diagnostics Rater	324	11	No Action
Tacoma Energy	234	8	No Action
High Performance Homes	76	7	No Action
K. T. Group, Inc	38	5	Updated IC and EOPT databases
TopBuild Home Services, Inc.	33	3	No Action
Energy Auditors, LLC	5	5	No Action
The Home Energy Assessor	4	4	No Action
Building Efficiency Resources	1	1	No Action
Total	1,282	57	1

Audit of Utility Reported Gross Savings

The Data Tracking Audits resulted in minor adjustments to Utility Reported Gross Savings for electric measures.

	Utility-Reported Gross Savings ²			Audited Gross Savings Adjustments ^{1,2}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 New Homes Construction - Electric - Custom	1,639	-	-	+1	-	-
2020 New Homes Construction - Electric Peak Demand - Custom	-	1.03	-	-	-0.00	-
Audited Gross Savings Adjustments³				+1	-0.00	+0

Measure-Level Audited Gross Savings

Audited Gross Savings are ~100 percent of Utility Reported Gross electric savings and 100 percent of peak demand and gas savings.

	Utility-Reported Gross Savings ²			Audited Gross Savings ^{1,2}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020 New Homes Construction - Electric - Custom	1,639	-	-	1,640	-	-
2020 New Homes Construction - Electric Peak Demand - Custom	-	1.03	-	-	1.03	-
2020 New Homes Construction - Electric Peak Demand (-0.02) - Custom	-	0.00	-	-	0.00	-
2020 New Homes Construction - Electric Peak Demand (-0.05) - Custom	-	0.00	-	-	0.00	-
2020 New Homes Construction - Electric Peak Demand (-0.17) - Custom	-	0.00	-	-	0.00	-
2020 New Homes Construction - Gas - Custom	-	-	48,232	-	-	48,232
Total³	1,639	1.03	48,232	1,640	1.03	48,232
Audited Gross Savings Realization Rates⁴				~100%	100%	100%

Realization Rates by HERS Rater

The Guidehouse team calculated RRs of 100 percent for electric savings, 100 percent for peak demand savings, and 99 percent for gas savings. Drivers of variance were underreporting of LED lighting and overreporting of conditioned and window square footage.

HERS Rater	MWh		Peak MW		MCF	
	RR	Absolute Precision	RR	Absolute Precision	RR	Absolute Precision
DR Nelson & Associates	107%	10%	107%	10%	101%	14%
Energy Diagnostics Rater	71%	Undefined ¹	71%	Undefined ¹	99%	12%
Tacoma Energy	94%	1%	94%	1%	96%	Undefined ¹
High Performance Homes	NA	NA	NA	NA	100%	0%
K. T. Group, Inc	100%	0%	100%	0%	100%	0%
TopBuild Home Services, Inc.	100%	50%	100%	50%	NA	NA
Energy Auditors, LLC	100%	0%	100%	0%	NA	NA
The Home Energy Assessor	NA	NA	NA	NA	1.00	0%
Building Efficiency Resources	100%	0%	100%	0%	100%	NA
Total	100%	0%	100%	0%	99%	2%

Verified Savings

In PY2020, the New Homes Construction program resulted in Verified Net Savings of 1,509 MWh, 0.94 MW of coincident peak demand, and 43,930 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level RR to the Audited Gross Savings to account for differences between reported and onsite verified equipment details.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Savings	MWH	PEAK MW	MCF
Utility Reported	1,639	1.03	48,232
Audited Gross ¹	1,640	1.03	48,232
RR ²	1.00	1.00	0.99
Verified Gross	1,640	1.03	47,750
NTGR ³	0.92	0.92	0.92
Verified Net ⁴	1,509	0.94	43,930

Retro-commissioning Program

Program Year (PY) 2020
Reconciliation Report

April 2, 2021



Report ID: DTE-PY2020-RECON-RCX-01

Acknowledgements

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Program Savings Summary

In PY2020, the Retro-commissioning (RCx) program resulted in Verified Net Savings of 3,567 MWh, and 97 MCF.

The RCx program targets measures without a prescriptive incentive or deemed savings value. The measures reported in the RCx program are generally not listed in the Michigan Energy Measures Database (MEMD); instead, they have custom savings algorithms and inputs. The evaluation of the RCx program involved a full, custom assessment of the reported savings values for sampled projects. The resulting Verified Net savings are determined using the deemed Net-to-Gross Ratio (NTGR) value and the realization rate (RR) from the verification findings of the current year's projects.

During the reconciliation process, Guidehouse found:

- » No discrepancies in the tracking data audit, resulting in Audited Gross Savings Realization Rates of 100 percent.
- » Minor discrepancies in key input parameters from the implementation contractor's (IC's) custom savings calculator (setpoints, setback schedule) based on discussions with participants for a random selection of projects, resulting in an electric RR of 95 percent and gas RR of 101 percent.

	MWH	PEAK MW	MCF
Utility Reported Gross	4,062	-	104
Audited Gross Realization Rate ¹	100%	-	100%
Audited Gross ²	4,062	-	104
RR ³	95%	-	101%
Verified Gross	3,878	-	105
NTGR ⁴	0.92	-	0.92
Verified Net⁵	3,567	NA	97

Fuel-Specific Verified Net Savings

Verified Net Savings are 88 percent of Utility Reported Gross Electric and 93 percent of Utility Reported Gross Gas savings.

	Utility-Reported Gross Savings ²			Verified Net Savings ^{1,2}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020-DTE-RCx-Electric	4,062	-	-	3,567	-	-
2020-DTE-RCx-Gas	-	-	104	-	-	97
Total³	4,062	-	104	3,567	-	97
Verified Net Savings as a Percent of Utility Reported Gross Savings⁴				88%	NA	93%

Determination of Verified Gross Savings

Unlike other DTE Energy programs that apply a fuel-specific Installation Rate Adjustment Factor (IRAF) from 2018, per the PY2020 DTE Energy Plan Filing, the determination of Verified Savings for the RCx program requires a custom approach including measurement and verification (M&V) because the program targets measures without a deemed savings value by design.

The reconciliation of program impacts included a review of program tracking data to develop an Audited Gross Savings value, and a full custom assessment of reported savings impacts including onsite or remote M&V for a sample of projects. The evaluation team applied the resulting RR to Audited Gross Savings to determine Verified Gross Savings.

01

Phase 1 Audit. For Phase 1, the Data Tracking Audit, DTE Energy's Energy Optimization Tracker (EOPT) extract was compared to the IC database to ensure an accurate transfer of program data. The comparison included program savings, incentives, quantities, and invoice dates.

02

Determination of Verified Gross Savings. The evaluation team calculated the program-level Verified Gross Savings for PY2020 RCx projects using RRs developed from a representative sample of projects.

The team developed an independent estimate of fuel-specific project-level savings by conducting full, custom assessments of the projects using a custom approach including site-specific M&V and engineering calculations. The evaluation team extrapolated the project-level RR findings to the population of projects to determine Verified Gross Savings.

Determination of Verified Gross Savings (cont.)

The sample design targeted a criterion of 10 percent relative precision (RP) at the 90 percent confidence interval (CI) for the PY2020 RCx program. For the population of 18 projects, a sample size of 6 was needed to meet the design criterion for RP and CI.

Guidehouse sampled, requested, and reviewed the IC's project files for the program. Guidehouse engineers developed a project-specific M&V plan for each sampled project and review engineers contact program participants to verify measure installation and operation, utilizing customer-provided data trends where required to reduce uncertainty in savings estimates.

The evaluation team used site-specific data collected from program participants in custom, measure-specific savings algorithms to determine Verified Gross Savings for each sampled project, then extrapolated the project-level RR findings to the population of RCx projects to determine Verified Gross Savings.

Stratum	Population Size	Sample Size
RCx	18	6

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the RCx program.

Measure	NTGR
All Measures	0.92

Fuel-Specific Audited Gross Savings

01

Audited Gross Savings are 100 percent of Utility Reported Gross electric and gas savings. The Guidehouse team found no issues when comparing the IC and EOPT databases, including program savings, incentives, quantities, and invoice dates.

	Utility-Reported Gross Savings ²			Audited Gross Savings ^{1,2}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020-DTE-RCx-Electric	4,062	-	-	4,062	-	-
2020-DTE-RCx-Gas	-	-	104	-	-	104
Total³	4,062	-	104	4,062	-	104
Audited Gross Savings Realization Rates⁴				100%	NA	100%

Gross Realization Rate Summary

The Guidehouse team calculated RRs of 95 percent for electric savings, and 101 percent for gas savings.

Program	Electric	Gas
2020-DTE-RCx-Electric	95%	NA
2020-DTE-RCx-Gas	NA	101%

Verified Savings

In PY2020, the RCx program resulted in Verified Net Savings of 3,567 MWh, and 97 MCF.

To determine Verified Gross Annual Savings the Guidehouse team applied the 2020 Gross Realization Rate to the Audited Gross Savings for 2020 projects.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Savings	MWH	PEAK MW	MCF
Utility Reported	4,062	-	104
Audited Gross ¹	4,062	-	104
RR ²	95%	-	101%
Verified Gross	3,878	-	105
NTGR ³	0.92	-	0.92
Verified Net ⁴	3,567	NA	97



Revolving Loan Fund Program

Program Year (PY) 2020
Reconciliation Report

April 2, 2021



Report ID: DTE-PY2020-RECON-RLF-01

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- › Toben Galvin
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Program Savings Summary

In PY2020, the Revolving Loan Fund program resulted in Verified Net Savings of 12 MWh, 0.00 MW of coincident peak demand, and 395 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2019 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational. During the reconciliation process, Guidehouse found:

- » Water heater measure entries with measure codes that did not match the latest version of the 2020 MEMD in both Implementation Contractor (IC) records and DTE's Energy Optimization Program Tracking (EOPT) database.

	MWH	PEAK MW⁶	MCF
Utility Reported Gross	13	0.00	430
Audited Gross Realization Rate ¹	100%	101%	~100%
Audited Gross ²	13	0.00	431
IRAF ³	0.96	0.98	1.00
Verified Gross	13	0.00	429
NTGR ⁴	0.92	0.92	0.92
Verified Net⁵	12	0.00	397

Measure-Level Verified Net Savings

Verified Net Savings are 88, 91, and 92 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Advanced Power Strip Tier 1 AV Systems	2	0.00	-	1	0.00	-
Airtight Can Lights	0	0.00	1	0	0.00	1
Boiler 87% plus AFUE	-	-	17	-	-	16
Crawlspace Wall Insulation	0	-	1	0	-	1
Door weatherstripping	0	-	0	0	-	0
Duct sealing 15% leakage base	0	0.00	7	0	0.00	6
Energy Star Door	0	0.00	9	0	0.00	9
ENERGY STAR High Efficiency High Draw Gas Storage Water Heater 0.68 UEF, <= 55 gallons Replacing Medium Draw	-	-	18	-	-	17
Exterior HID replacement 150 to 200W HID retrofit	2	-	-	2	-	-
Furnace/AC - SEER 14	0	0.00	0	0	0.00	0
Furnace/AC - SEER 14 with 95 AFUE furnace	0	0.00	7	0	0.00	6
Furnace/AC - SEER 15	0	0.00	(2)	0	0.00	(2)

Measure-Level Verified Net Savings (cont.)

Verified Net Savings are 88, 91, and 92 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Furnace/AC - SEER 15 with 95 AFUE furnace	1	0.00	21	1	0.00	19
Furnace/AC - SEER 17	0	0.00	(2)	0	0.00	(1)
High efficiency 95 AFUE furnace with ECM	0	-	15	0	-	14
High efficiency 96 AFUE furnace with ECM	2	-	108	2	-	100
Infiltration reduction - 10%	0	0.00	3	0	0.00	3
Infiltration reduction - 15%	0	0.00	13	0	0.00	12
Infiltration reduction - 15% and attic insulation	0	0.00	52	0	0.00	48
Infiltration reduction - 20%	0	0.00	5	0	0.00	5
Infiltration reduction - 20% and attic insulation	0	0.00	23	0	0.00	21
LED A-line 1100-1599 Lumen output replacing Incandescent/Halogen	0	0.00	-	0	0.00	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	2	0.00	-	1	0.00	-
LED Globe <= 8W	1	0.00	-	0	0.00	-

Measure-Level Verified Net Savings (cont.)

Verified Net Savings are 88, 91, and 92 percent of Utility Reported Gross electric, peak demand, and gas savings, respectively.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	6	-	-	4
O&M Tune-up - furnace only	-	-	4	-	-	3
R-38 Roof Insulation	0	0.00	1	0	0.00	1
R-38 scuttle hole Attic hatch	0	0.00	14	0	0.00	13
R-49 Roof Insulation	0	0.00	13	0	0.00	12
R0 to R19 kneewalls	0	0.00	40	0	0.00	37
Rim Joist Insulation	0	0.00	30	0	0.00	27
Setback thermostat - moderate setback	0	-	22	0	-	22
Wall Insulation	0	0.00	0	0	0.00	0
Window Replacement	0	0.00	3	0	0.00	3
Total⁴	13	0.00	430	12	0.00	397
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				88%	91%	92%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data and program applications to audit Utility Reported Gross Savings.

01

Phase 1 Audit. Typically for Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract is compared to the IC database to ensure an accurate transfer of program data. However, there is no IC database for RLF. Still, the Guidehouse team performed a check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

Installation Rate Adjustment Factor

The RLF program was first offered by DTE in PY2019. As such, the evaluation team applied the fuel-specific measure-level IRAF from PY2019 to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings. There were a few exceptions:

- » Exterior HID Lighting is a new measure beginning in PY2020. As a result, an IRAF of 1.00 is applied for one year.
- » LED Bulbs are a new measure beginning in PY2020. Because they are not new to the low-income market, the PY2019 EEA program IRAF is applied.
- » Advanced Power Strips are a new measure beginning in PY2020. Because they are not new to the low-income market, the PY2020 EEA program IRAF is applied.
- » The evaluated PY2018 IRAF from the EEA program is applied to the Aerators measure.
- » An IRAF of 1.00 is applied to Tier 3 Thermostats based on guidance from MPSC staff.

Measure	Electric	Gas
Aerators	N/A	0.68
Air Sealing ¹	1.00	1.00
Advanced Power Strips	1.00	N/A
Airtight Can Lighting	1.00	1.00
Building Envelope ²	1.00	1.00
Equipment ³	1.00	1.00
Exterior HID Lighting	1.00	1.00
LED Bulbs	0.76	N/A
Tier 3 Thermostats	1.00	1.00
Tune-Up	N/A	1.00

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the RLF program's Verified Gross Savings, except for Tier 3 Thermostats, to determine the Verified Net Savings. A NTGR of 1.00 is applied to Tier 3 Thermostats per guidance from MPSC staff.

Measure	NTGR
Tier 3 Thermostats	1.00
All Other Measures	0.92

Data Tracking Audit

The Guidehouse team compared DTE and IC databases to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD and agreed-upon custom savings values.

The Guidehouse team found one issue in the data tracking audit:

- » There were six Water Heater measure entries with measure codes that did not match the latest version of the 2020 MEMD.

The issue was resolved by the IC and DTE with an overall effect on savings of less than one percent.

	IC ¹	EOPT	Action
There were 6 water heater measure entries with measure codes that did not match the latest version of the 2020 MEMD.	6	6	DTE updated the measure codes and sent corrected data extracts.
Total Records	6	6	

Audit of Utility Reported Gross Savings

The Data Tracking Audit resulted in minor adjustments to Utility Reported Gross Savings to the gas water heating measure.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings Adjustments ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
ENERGY STAR High Efficiency High Draw Gas Storage Water Heater 0.68 UEF, <= 55 gallons Replacing Medium Draw	-	-	18	-	-	+1
Audited Gross Savings Adjustments⁴				-	-	+1

Measure-Level Audited Gross Savings

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings, and ~100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Advanced Power Strip Tier 1 AV Systems	2	0.00	-	2	0.00	-
Airtight Can Lights	0	0.00	1	0	0.00	1
Boiler 87% plus AFUE	-	-	17	-	-	17
Crawlspace Wall Insulation	0	-	1	0	-	1
Door weatherstripping	0	-	0	0	-	0
Duct sealing 15% leakage base	0	0.00	7	0	0.00	7
Energy Star Door	0	0.00	9	0	0.00	9
ENERGY STAR High Efficiency High Draw Gas Storage Water Heater 0.68 UEF, <= 55 gallons Replacing Medium Draw	-	-	18	-	-	19
Exterior HID replacement 150 to 200W HID retrofit	2	-	-	2	-	-
Furnace/AC - SEER 14	0	0.00	0	0	0.00	0
Furnace/AC - SEER 14 with 95 AFUE furnace	0	0.00	7	0	0.00	7
Furnace/AC - SEER 15	0	0.00	(2)	0	0.00	(2)

Measure-Level Audited Gross Savings (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings, and ~100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Furnace/AC - SEER 15 with 95 AFUE furnace	1	0.00	21	1	0.00	21
Furnace/AC - SEER 17	0	0.00	(2)	0	0.00	(2)
High efficiency 95 AFUE furnace with ECM	0	-	15	0	-	15
High efficiency 96 AFUE furnace with ECM	2	-	108	2	-	108
Infiltration reduction - 10%	0	0.00	3	0	0.00	3
Infiltration reduction - 15%	0	0.00	13	0	0.00	13
Infiltration reduction - 15% and attic insulation	0	0.00	52	0	0.00	52
Infiltration reduction - 20%	0	0.00	5	0	0.00	5
Infiltration reduction - 20% and attic insulation	0	0.00	23	0	0.00	23
LED A-line 1100-1599 Lumen output replacing Incandescent/Halogen	0	0.00	-	0	0.00	-
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	2	0.00	-	2	0.00	-
LED Globe <= 8W	1	0.00	-	1	0.00	-

Measure-Level Audited Gross Savings (cont.)

Audited Gross Savings are 100 percent of Utility Reported Gross electric and peak demand savings, and ~100 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Low Flow Kitchen Faucet Aerators - 1.5 gpm gas water heater	-	-	6	-	-	6
O&M Tune-up - furnace only	-	-	4	-	-	4
R-38 Roof Insulation	0	0.00	1	0	0.00	1
R-38 scuttle hole Attic hatch	0	0.00	14	0	0.00	14
R-49 Roof Insulation	0	0.00	13	0	0.00	13
R0 to R19 kneewalls	0	0.00	40	0	0.00	40
Rim Joist Insulation	0	0.00	30	0	0.00	30
Setback thermostat - moderate setback	0	-	22	0	-	22
Wall Insulation	0	0.00	0	0	0.00	0
Window Replacement	0	0.00	3	0	0.00	3
Total⁴	13	0.00	430	13	0.00	431
Audited Gross Savings Realization Rates⁵				100%	100%	~100%

Verified Savings

In PY2020, the RLF program resulted in Verified Net Savings of 12 MWh, 0.00 MW of coincident peak demand, and 395 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. Except for new measures not previously evaluated and Tier 3 Thermostats, the PY2019 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Savings	MWH	PEAK MW⁵	MCF
Utility Reported	13	0.00	430
Audited Gross ¹	13	0.00	431
IRAF ²	0.96	0.98	1.00
Verified Gross	13	0.00	429
NTGR ³	0.92	0.92	0.92
Verified Net ⁴	12	0.00	397



Small Business Focus Program

Program Year (PY) 2020
Reconciliation Report

April 30, 2021



Report ID: DTE-PY2020-RECON-SBF-02

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Program Savings Summary

In PY2020, the Small Business Focus (SBF) program (consisting of the Direct Install (DI) and Trade Ally (TA) sub-programs) resulted in Verified Net Savings of 7,332 MWh, 0.86 MW of coincident peak demand, and 14,381 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2019 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » Inconsistent application of per unit savings for prescriptive wattage reduction measures.

	MWH	PEAK MW	MCF
Utility Reported Gross	8,018	0.94	15,969
Audited Gross Realization Rate ¹	100%	100%	100%
Audited Gross ²	8,018	0.94	15,969
IRAF ³	0.99	0.99	0.97
Verified Gross	7,962	0.93	15,528
NTGR ⁴	0.92	0.92	0.92
Verified Net⁵	7,332	0.86	14,381

Measure-Level Verified Net Savings: SBF DI

Verified Net Savings are 88 percent of Utility Reported Gross electric savings, 87 percent of peak demand savings, and 89 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Commercial Smart thermostat	85	-	1,190	85	-	1190
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	126	0.02	-	112	0.02	-
LED Globe <= 8W	17	0	-	15	0	-
LED PAR/R/BR <= 15.5W	78	0.01	-	69	0.01	-
Low Flow Faucet Aerator - Private Restroom – 1.0 gpm	24	0	527	20	0	441
Low Flow Faucet Aerator - Public Restroom – 1.0 gpm	498	0.06	3,868	417	0.05	3,238
Low Flow Showerhead - 1.5 gpm	188	0.02	4,354	171	0.02	3,966
Pipe Wrap	14	0	144	13	0	131
Pre Rinse Sprayers CEE Tier 1 <= 1.13 gpm (Retrofit Only)	1	0	32	1	0	29
Total⁴	1,031	0.12	10,114	904	0.11	8,995
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				88%	87%	89%

Measure-Level Verified Net Savings: SBF TA

Verified Net Savings are 92 percent of Utility Reported Gross electric savings, 93 percent of peak demand savings, and 92 percent of gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
A-line	54	0.01	-	49	0.01	-
De-lamping	55	0.01	-	51	0.01	-
Downlight	51	0.01	-	47	0.01	-
Exterior Lighting	1,836	-	-	1,689	-	-
Flood	63	0.01	-	58	0.01	-
High/Low Bay	2,896	0.55	-	2,664	0.51	-
HVAC equipment	15	0.00	1,069	14	0.00	983
LED Tube	285	0.05	-	262	0.05	-
Occupancy Sensors	41	0.00	-	37	0.00	-
Other Measures (non-lighting)	1,615	0.16	(32)	1,486	0.14	(29)
Specialty Lighting	53	0.01	-	49	0.01	-
Thermostat	24	-	1,401	22	-	1,289
Tune-ups (boiler, furnace)	-	-	3,416	-	-	3,143
Total⁴	6,987	0.82	5,854	6,428	0.75	5,386
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				92%	92%	92%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data and program applications to audit Utility Reported Gross Savings.

The Guidehouse team conducted the audit of Utility Reported Gross Savings in two phases.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the implementation contractor's (IC) database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

02

Phase 2 Audit. The *Phase 2, the Application Audit*, a statistically significant sample of rebate applications was reviewed to ensure that information was correctly transferred in the IC's database. Adjustments were made to the sample of applications if discrepancies were identified. Second, Guidehouse tested whether Phase 1 and Phase 2 savings were statistically different. If significant differences were identified, the Phase 2 sample Realization Rate is applied to Phase 1 savings for the entire population (i.e., findings are extrapolated to the population).

Verified Gross Savings

With PY2020 being the first year of the SBF program, the evaluation team agreed with DTE to apply the IRAF values being used in the BEC program:

- » The BEC DI IRAF values obtained from PY2019 field work verification were applied to PY2020 savings.
- » An IRAF of 1.00 was applied to TA savings.
- » The MEMD savings values for Tier 3 Thermostats and commercial Tier 1 Thermostats were developed based on billing analysis, and as a result an IRAF is not applicable as the MEMD savings values represents Verified Net Savings.

	Measure	Electric	Gas
Direct Install	Thermostats	1.00	1.00
	Regular LED Bulbs	0.97	-
	Specialty LED Bulbs	0.96	-
	Faucet Aerators	0.91	0.91
	Other Measures (Pipe Wrap, Pre-Rinse Sprayers, Occupancy Sensors, Showerheads)	0.99	0.99
Trade Ally	All Measures	1.00	1.00

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the SBF program's measures, except for Tier 2 Thermostats and Tier 1 Commercial Thermostats, to determine the Verified Net Savings. A NTGR of 1.00 is applied to Tier 2 Thermostats per guidance from MPSC staff.

Track	Measure	NTGR
Direct Install	Thermostats	1.00
	Other Measures <i>(excluding thermostats)</i>	0.92
Trade Ally	All Measures	0.92

Data Tracking Audit

The Guidehouse team compared DTE's EOPT data to the IC's data to ensure an accurate transfer of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD.

The Guidehouse team found 276 issues when comparing the IC and EOPT databases:

- » The savings claimed for lighting measures using the prescriptive values for wattage reduction were inconsistent with the MEMD. There was no apparent systemic error in the IC's calculation, as the variance from the MEMD value differed between projects. Guidehouse referenced the deemed per-unit savings value to recalculate and update the electric savings for these projects.

All issues were resolved by the IC and DTE with an overall effect on savings of less than one percent.

	IC ¹	EOPT	Action
Inconsistent per unit savings claimed for prescriptive wattage reduction measures	276	276	Recalculated all savings using MEMD defined hours of use (HOU)
Total Records	276	276	

Application Audit

Guidehouse reviewed a sample of 27 applications as part of the Phase 2 audit. Six discrepancies were identified in this review, however, only one impacted savings.

The Guidehouse team reviewed a random, statistically significant sample of incentive applications targeting a criterion of 90 percent confidence and 10 percent precision by application type for each fuel type, to verify the accuracy of the IC program tracking databases.

Specifically, program applications were reviewed to ensure the following information was correctly transferred into the IC's database (where applicable): customer contact information, customer account number, and measure-level information used to map MEMD measures, including quantity, measure characteristics (such as HVAC system type or hot water heater fuel type), per-unit energy savings, and installation costs and incentive amounts.

Using findings from the application review, the Guidehouse team calculated energy savings for each application and reports them as Phase 2 Audited Gross Savings.

The Phase 2 audit of the SBF program found errors on six applications. Five of the errors indicated differences in the reported measure quantity compared to EOPT. One application claimed a different measure type than reported in EOPT.

	Records ¹	Sample
Measure type reported in EOPT does not match application	1	27
Incentive quantity or measure quantity reported in EOPT does not match application. Savings do match.	5	24
Total	6	27

The result of these errors was not statistically different than a Realization Rate of 100 percent. Therefore, no Realization Rate was applied and only the specific applications in question were adjusted.

Measure-Level Audited Gross Savings: SBF DI

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
Commercial Smart thermostat	85	-	1,190	85	-	1,190
LED A-line 800-1099 Lumen output replacing Incandescent/Halogen	126	0.02	-	126	0.02	-
LED Globe <= 8W	17	0.00	-	17	0.00	-
LED PAR/R/BR <= 15.5W	78	0.01	-	78	0.01	-
Low Flow Faucet Aerator - Private Restroom – 1.0 gpm	24	0.00	527	24	0.00	527
Low Flow Faucet Aerator - Public Restroom – 1.0 gpm	498	0.06	3,868	498	0.06	3,868
Low Flow Showerhead - 1.5 gpm	188	0.02	4,354	188	0.02	4,354
Pipe Wrap	14	0.00	144	14	0.00	144
Pre Rinse Sprayers CEE Tier 1 <= 1.13 gpm (Retrofit Only)	1	0.00	32	1	0.00	32
Total⁴	1,031	0.12	10,114	1,031	0.12	10,114
Audited Gross Savings Realization Rates⁵				100%	100%	100%

Measure-Level Audited Gross Savings: SBF TA

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
A-line	54	0.01	-	54	0.01	-
De-lamping	55	0.01	-	55	0.01	-
Downlight	51	0.01	-	51	0.01	-
Exterior Lighting	1,836	-	-	1,836	-	-
Flood	63	0.01	-	63	0.01	-
High/Low Bay	2,896	0.55	-	2,896	0.55	-
HVAC equipment	15	0.00	1,069	15	0.00	1,069
LED Tube	285	0.05	-	285	0.05	-
Occupancy Sensors	41	0.00	-	41	0.00	-
Other Measures (non-lighting)	1,615	0.16	(32)	1,615	0.16	(32)
Specialty Lighting	53	0.01	-	53	0.01	-
Thermostat	24	-	1,401	24	-	1,401
Tune-ups (boiler, furnace)	-	-	3,416	-	-	3,416
Total⁴	6,987	0.82	5,854	6,987	0.82	5,854
Audited Gross Savings Realization Rates⁵				100%	100%	100%

Verified Annual Savings

In PY2020, the Small Business Focus program resulted in Verified Net Savings of 7,332 MWh, 0.86 MW of coincident peak demand, and 14,381 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2019 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

		MWH	PEAK MW	MCF
Direct Install	Utility Reported Gross	1,031	0.12	10,114
	Audited Gross ¹	1,031	0.12	10,114
	IRAF ²	0.95	0.94	0.96
	Verified Gross	975	.012	9,674
	NTGR ³	0.92/1	0.92/1	0.92/1
	Verified Net ⁴	904	0.11	8,995
Trade Ally	Utility Reported Gross	6,987	0.82	5,854
	Audited Gross ¹	6,987	0.82	5,854
	IRAF ²	1.00	1.00	1.00
	Verified Gross	6,987	0.82	5,854
	NTGR ³	0.92	0.92	0.92
	Verified Net ⁴	6,428	0.75	5,386
Total	Utility Reported Gross	8,018	0.94	15,969
	Audited Gross¹	8,018	0.94	15,969
	IRAF²	0.99	0.99	0.97
	Verified Gross	7,962	0.93	15,528
	NTGR³	0.92/1	0.92/1	0.92/1
	Verified Net⁴	7,332	0.86	14,381

School Program

Program Year (PY) 2020
Reconciliation Report

April 2, 2021



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Program Savings Summary

In PY2020, the School program resulted in Verified Net Savings of 3,882 MWh, 0.35 MW of coincident peak demand, and 72,568 MCF.

To determine Verified Net Savings the Guidehouse team reviewed program tracking data, verified that the correct unit-level savings values from the DTE Energy Measure Library Report were used, and the correct Michigan Energy Measures Database (MEMD) values were referenced in the Measure Library Report, and applied PY2018 fuel-specific Installation Rate Adjustment Factor (IRAF) and deemed Net-to-Gross Ratio (NTGR) to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational.

During the reconciliation process, Guidehouse found:

- » No discrepancies resulting in changes to savings were identified through the data tracking audit, resulting in Audited Gross Savings Realization Rates of 100 percent.

	MWH	PEAK MW	MCF
Utility Reported Gross	6,484	0.61	170,692
Audited Gross Realization Rate ¹	100%	100%	100%
Audited Gross ²	6,484	0.61	170,692
IRAF ³	0.65	0.62	0.46
Verified Gross	4,220	0.38	78,879
NTGR ⁴	0.92	0.92	0.92
Verified Net⁵	3,882	0.35	72,568

Measure-Level Verified Net Savings

Verified Net Savings are 60, 57 and 43 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Verified Net Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
LED A-line Bulb	1,929	0.20	-	1,650	0.17	-
LED Night Light	597	-	-	494	-	-
Bathroom Faucet Aerators - electric water heater	585	0.06	-	232	0.03	-
Bathroom Faucet Aerators - gas water heater	-	-	22,747	-	-	8,999
Kitchen Faucet Aerators - electric water heater	748	0.09	-	268	0.03	-
Kitchen Faucet Aerators - gas water heater	-	-	29,108	-	-	10,444
Showerheads - electric water heater	1,317	0.10	-	678	0.05	-
Showerheads - gas water heater	-	-	51,116	-	-	26,335
Pipe Wrap R3 - electric water heater	1,308	0.15	-	518	0.06	-
Pipe Wrap R3 - gas water heater	-	-	67,721	-	-	26,790
Delayed Installation	-	-	-	42	0.00	-
Total⁴	6,484	0.61	170,692	3,882	0.35	72,568
Verified Net Savings as a Percent of Utility Reported Gross Savings⁵				60%	57%	43%

Audit of Utility Reported Gross Savings

The reconciliation of program impacts included a review of program tracking data to audit Utility Reported Gross Savings.

01

Phase 1 Audit. For Phase 1, the *Data Tracking Audit*, DTE Energy's EOPT extract was compared to the implementation contractor's (IC) database to ensure an accurate transfer of program data. The Guidehouse team performed an additional check of savings estimates included in EOPT by validating that the correct unit-level savings values from the DTE Energy Measure Library Report were used and the correct MEMD values were referenced in the Measure Library Report.

Installation Rate Adjustment Factor

Following the PY2020 DTE Energy Plan Filing, the evaluation team applied the fuel-specific measure-level IRAF from PY2018 to the Audited Gross Savings to account for rebated measures that are no longer, or were never, installed and operational, to determine Verified Gross Savings. There were a few exceptions:

- » The Pipe Wrap measures were introduced late in PY2018, and thus not evaluated in PY2018. The PY2019 evaluated IRAF, 0.43, was applied to the pipe wrap measures.
- » LED A-line Bulbs incorporated delayed installation savings from the past two years and thus include an increased IRAF from the evaluated PY2018 value.

Measure	Electric	Gas
LED A-line Bulb	0.95	N/A
LED Night Light	0.90	N/A
Bathroom Faucet Aerators - electric water heater	0.43	N/A
Bathroom Faucet Aerators - gas water heater	N/A	0.43
Kitchen Faucet Aerators - electric water heater	0.39	N/A
Kitchen Faucet Aerators - gas water heater	N/A	0.39
Showerheads - electric water heater	0.56	N/A
Showerheads - gas water heater	N/A	0.56
Pipe Wrap R3 - electric water heater	0.43	N/A
Pipe Wrap R3 - gas water heater	N/A	0.43

Delayed Installations

The Guidehouse team tracked and applied verified gross savings due to delayed installations for certain LED measures. First-year savings are calculated based on a first-year IRAF for bulbs sold during a given program year, with delayed savings for future years projected based on the following methodology:

- » Second-year installation rate is estimated as 32 percent of the remaining bulbs after the first-year installations
- » Third-year installation rate is estimated as 18 percent of the remaining bulbs after the first- and second-year installations
- » Subsequent year installations are estimated at 18 percent each year of the remaining bulbs.

For PY2020 reconciliation, delayed installations of bulbs sold during the prior two years are credited to the PY2020 program as shown in the figure to the right.

	PY2018	PY2019
Audited Quantity	54,288	52,074
Installation Rate	0.01	0.02
Unit Savings (kWh kW)	28.5 0.003	28.5 0.003
Verified Gross (MWh MW)	15.5 0.00	29.7 0.00

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the School program's measures to determine the Verified Net Savings.

Measure	NTGR
All Measures	0.92

Data Tracking Audit

The Guidehouse team compared DTE and IC databased to ensure accuracy of program data. Program savings, incentives, quantities, and invoice dates were checked for consistency and to verify all savings occurred during 2020. Measure unit savings were checked against the MEMD and agreed-upon custom savings values.

The Guidehouse team did not identify any discrepancies between the databases or savings estimates.

01

	IC ¹	EOPT	Action
Total Records	0	0	N/A

Measure-Level Audited Gross Savings

Audited Gross Savings are 100 percent of Utility Reported Gross electric, peak demand, and gas savings.

	Utility-Reported Gross Savings ^{1,3}			Audited Gross Savings ^{2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
LED A-line Bulb	1,929	0.20	-	1,929	0.20	-
LED Night Light	597	-	-	597	-	-
Bathroom Faucet Aerators - electric water heater	585	0.06	-	585	0.06	-
Bathroom Faucet Aerators - gas water heater	-	-	22,747	-	-	22,747
Kitchen Faucet Aerators - electric water heater	748	0.09	-	748	0.09	-
Kitchen Faucet Aerators - gas water heater	-	-	29,108	-	-	29,108
Showerheads - electric water heater	1,317	0.10	-	1,317	0.10	-
Showerheads - gas water heater	-	-	51,116	-	-	51,116
Pipe Wrap R3 - electric water heater	1,308	0.15	-	1,308	0.15	-
Pipe Wrap R3 - gas water heater	-	-	67,721	-	-	67,721
Total⁴	6,484	0.61	170,692	6,484	0.61	170,692
Audited Gross Savings Realization Rates⁵				100%	100%	100%

Verified Savings

In PY2020, the School program resulted in Verified Net Savings of 3,882 MWh, 0.35 MW of coincident peak demand, and 72,568 MCF.

To determine Verified Gross Savings the Guidehouse team applied the fuel-specific measure-level IRAF to the Audited Gross Savings to account for program measures that are no longer, or were never, installed and operational. The PY2018 IRAF is applied to the PY2020 Audited Gross Savings per the PY2020 DTE Plan Filing.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Savings	MWH	PEAK MW	MCF
Utility Reported	6,484	0.61	170,692
Audited Gross ¹	6,484	0.61	170,692
IRAF ²	0.65	0.62	0.46
Verified Gross	4,220	0.38	78,879
NTGR ³	0.92	0.92	0.92
Verified Net ⁴	3,882	0.35	72,568



Strategic Energy Management Program

Program Year (PY) 2020
Reconciliation Report

April 30, 2021



Report ID: DTE-PY2020-RECON-SEM-02

Acknowledgements

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Reconciliation Report

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Program Savings Summary

In PY2020, the Strategic Energy Management (SEM) program resulted in Verified Net Savings of 6,057 MWh, and 69,456 MCF.

The SEM program targets measures without a prescriptive incentive or deemed savings value. The measures reported in the SEM program are generally not listed in the Michigan Energy Measures Database (MEMD); instead, they have custom savings algorithms and inputs. The evaluation of the SEM program involved a full, custom assessment of the reported savings values for sampled projects. The resulting Verified Net savings are determined using the deemed Net-to-Gross Ratio (NTGR) value and the realization rate (RR) from the verification findings of the current year's projects.

During the reconciliation process, Guidehouse found:

- » No discrepancies in the tracking data audit, resulting in Audited Gross Savings Realization Rates of 100 percent.
- » Discrepancies in key input parameters from the implementation contractor's (IC's) custom savings calculators (setpoints, fan speeds) based on discussions with participants and site-specific data collection for a random selection of projects, resulting in an electric RR of 98 percent and a gas RR of 93 percent.

	MWH	PEAK MW	MCF
Utility Reported Gross	6,727	-	80,917
Audited Gross Realization Rate ¹	100%	-	100%
Audited Gross ²	6,727	-	80,917
RR ³	98%	-	93%
Verified Gross	6,584	-	75,496
NTGR ⁴	0.92	-	0.92
Verified Net⁵	6,057	NA	69,456

Fuel-Specific Verified Net Savings

Verified Net Savings are 90 percent of Utility Reported Gross electric and 86 percent of gas savings.

	Utility-Reported Gross Savings ^{1,2,3}			Verified Net Savings ^{1,2,3}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020-DTE-SEM-Commercial-Electric	1,825	-	-	1,643	-	-
2020-DTE-SEM-Commercial-Gas	-	-	4,104	-	-	3,523
2020-DTE-SEM-Industrial-Electric	4,902	-	-	4,414	-	-
2020-DTE-SEM-Industrial-Gas	-	-	76,813	-	-	65,933
Total	6,727	-	80,917	6,057	-	69,456
Verified Net Savings as a Percent of Utility Reported Gross Savings⁴				90%	NA	86%

Determination of Verified Gross Savings

Unlike other DTE Energy program that apply a fuel-specific Installation Rate Adjustment Factor (IRAF) from 2018, per the PY2020 DTE Energy Plan Filing, the determination of Verified Savings for the SEM program requires a custom approach including measurement and verification (M&V) because the program targets measures without a deemed savings value by design.

The reconciliation of program impacts included a review of program tracking data to develop an Audited Gross Savings value, and a full custom assessment of reported savings impacts including onsite or remote M&V for a sample of projects. The evaluation team applied the resulting RR to Audited Gross Savings to determine Verified Gross Savings.

01

Phase 1 Audit. For Phase 1, the Data Tracking Audit, DTE Energy's Energy Optimization Tracker (EOPT) extract was compared to the IC's database to ensure an accurate transfer of program data. The comparison included program savings, incentives, quantities, and invoice dates.

02

Determination of Verified Gross Savings. The evaluation team calculated the program-level Verified Gross Savings for PY2020 SEM projects using RRs developed from a representative sample of projects.

The team developed an independent estimate of fuel-specific project-level savings by conducting full, custom assessments of the projects using a custom approach including site-specific M&V and engineering calculations. The evaluation team extrapolated the project-level RR findings to the population of projects to determine Verified Gross Savings.

Determination of Verified Gross Savings (cont.)

The sample design targeted a criterion of 10 percent relative precision (RP) at the 90 percent confidence interval (CI) for the PY2020 SEM program. For the population of 44 projects, a sample size of 19 was needed to meet the design criterion for RP and CI.

Guidehouse sampled, requested, and reviewed the IC's project files for the program. Guidehouse engineers developed a project-specific M&V plan for each sampled project and review engineers contact program participants to verify measure installation and operation, utilizing customer-provided data trends where required to reduce uncertainty in savings estimates.

The evaluation team used site-specific data collected from program participants in custom, measure-specific savings algorithms to determine Verified Gross Savings for each sampled project, then extrapolated the project-level RR findings to the population of SEM projects to determine Verified Gross Savings.

Stratum	Population Size	Sample Size
SEM	44	19

Net-to-Gross Ratio

As specified by the PY2020 DTE Energy Plan Filing, the deemed NTGR is applied to the program's Verified Gross Savings to determine Verified Net Savings.

A NTGR of 0.92 is applied to the SEM program.

Measure	NTGR
All Measures	0.92

Fuel-Specific Audited Gross Savings

01

Audited Gross Savings are 100 percent of Utility Reported Gross electric and gas savings. The Guidehouse team found no issues when comparing the IC and EOPT databases, including program savings, incentives, quantities, and invoice dates.

	Utility-Reported Gross Savings ²			Audited Gross Savings ^{1,2}		
	MWh	Peak MW	MCF	MWh	Peak MW	MCF
2020-DTE-SEM-Electric	1,825	-	-	1,825	-	-
2020-DTE-SEM-Gas	-	-	4,104	-	-	4,104
2020-DTE-SEM-Electric	4,902	-	-	4,902	-	-
2020-DTE-SEM-Gas	-	-	76,813	-	-	76,813
Total³	6,727	-	80,917	6,727	-	80,917
Audited Gross Savings Realization Rates⁴				100%	NA	100%

Gross Realization Rate Summary

The Guidehouse team calculated RRs of 98 percent for electric savings, and 93 percent for gas savings.

Program	Electric	Gas
2020-DTE-SEM-Commercial-Electric	0.89	NA
2020-DTE-SEM-Commercial-Gas	NA	1.00
2020-DTE-SEM-Industrial-Electric	1.01	NA
2020-DTE-SEM-Industrial-Gas	NA	0.93
Overall Program	98%	93%

Verified Savings

In PY2020, the SEM program resulted in Verified Net Savings of 6,057 MWh, and 69,456 MCF.

To determine Verified Gross Annual Savings the Guidehouse team applied the 2020 Realization Rate to the Audited Gross Savings for 2020 projects.

To determine Verified Net Savings, the Guidehouse team applied the deemed NTGR, as specified by the PY2020 DTE Energy Plan Filing, to Verified Gross Savings.

Savings	MWH	PEAK MW	MCF
Utility Reported	6,727	-	80,917
Audited Gross ¹	6,727	-	80,917
RR ²	98%	-	93%
Verified Gross	6,584	-	75,496
NTGR ³	0.92	-	0.92
Verified Net ⁴	6,057	NA	69,456

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter, on the Commission’s own motion,)
regarding the regulatory reviews, revisions,)
determinations, and/or approvals necessary for)
DTE GAS COMPANY)
to fully comply with Public Act 295 of 2008,)
as amended by Public Act 342 of 2016.)
_____)

Case No. U-20871
(Paperless e-file)

PROOF OF SERVICE

KARYN B. KAZYAKA served a copy of DTE Gas Company’s Evaluation and Reconciliation Reports for Plan Year 2020 in the above-captioned matter, via electronic mail upon the persons referred to in the attached service list.

KARYN B. KAZYAKA

SERVICE LIST
MPSC CASE NO. U-20871

ADMINISTRATIVE LAW JUDGE

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