



# **Commercial Food Service Impact Evaluation Report**

**Energy Efficiency Plan Year 2020  
(1/1/2020-12/31/2020)**

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**Nicor Gas  
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## Table of Contents

<b>1. Introduction</b> .....	<b>1</b>
<b>2. Program Description</b> .....	<b>1</b>
<b>3. Program Savings Detail</b> .....	<b>3</b>
<b>4. Program Savings by Measure</b> .....	<b>3</b>
<b>5. Impact Analysis Findings and Recommendations</b> .....	<b>4</b>
5.1 Impact Parameter Estimates .....	4
5.2 Findings and Recommendations.....	4
<b>Appendix A. Impact Analysis Methodology</b> .....	<b>7</b>
<b>Appendix B. Program Specific Inputs for the Illinois TRC</b> .....	<b>8</b>

## List of Tables, Figures, and Equations

Figure 5-1. Ontario TRM Underfired Charbroiler .....	5
Table 2-1. 2020 Volumetric Findings Detail .....	1
Table 2-2. 2020 Installed Measure Quantities .....	2
Table 3-1. 2020 Annual Energy Savings Summary .....	3
Table 4-1. 2020 Annual Energy Savings by Measure.....	3
Table 5-1. Verified Gross Savings Parameters.....	4
Table B-1. Verified Cost Effectiveness Inputs.....	8

## 1. Introduction

This report presents results from the 2020 impact evaluation of the Commercial Food Service (CFS) Midstream Pilot Program. It summarizes the gas savings impacts for the total program and broken out by relevant measure details. The appendices provide details on the impact analysis methodology and the total resource cost (TRC) inputs. Program year 2020 covers January 1, 2020 through December 31, 2020.

## 2. Program Description

The CFS Program is a joint pilot between Nicor Gas, ComEd, Peoples Gas, and North Shore Gas. The program incentivizes energy efficient commercial food service equipment using midstream delivery channels. The CFS Program was launched in September 2019 and has grown to 22 suppliers as of December 31, 2020.

GTI and Frontier Energy implement this pilot on behalf of the utilities, working with manufacturers and distributors by offering point-of-sale customer rebates, upstream incentives, and a simplified administrative process to obtain the rebates or incentives for cooking, refrigeration, and ventilation measures. The program's goal is to reduce barriers on food service operators for purchasing energy efficient equipment and to reduce energy usage in the commercial food service sector.

The program had 38 unique customer participants in 2020 and completed 40 projects as shown in Table 2-1. There are participants in both the Private and Public Sectors.

**Table 2-1. 2020 Volumetric Findings Detail**

Participation	Total
<b>Private Sector</b>	
Participants *	37
Installed Projects †	39
Measure Types Installed	9
<b>Public Sector</b>	
Participants *	1
Installed Projects †	1
Measure Types Installed	1
<b>Program 2020 Total</b>	
Participants *	38
Installed Projects †	40
Measure Types Installed	10

\* Participants are defined as the number of unique customers in the program

† Installed Projects are defined as the unique number of Project IDs in the program

Source: Nicor Gas tracking data and Guidehouse evaluation team analysis.

Table 2-2 summarizes the installed measure quantities that are the basis for verified energy savings.

**Table 2-2. 2020 Installed Measure Quantities**

Program Category	Measure	Quantity Unit	Installed Quantity (Units)
Private	Combination Oven	Unit	2
	Commercial Steam Cooker	Unit	1
	Conveyor Boiler	Unit	1
	ENERGY STAR Convection Oven	Unit	9
	ENERGY STAR Fryer	Unit	34
	Infrared Charbroiler	Unit	1
	Kitchen Demand Ventilation Controls	Unit	5
	Rack Oven - Double Oven	Unit	1
	Roll-In Rack Single Oven	Unit	1
	Public	ENERGY STAR Dishwasher	Unit

Source: Nicor Gas tracking data and Guidehouse evaluation team analysis.

### 3. Program Savings Detail

Table 3-1 summarizes the energy savings the CFS Program achieved in 2020, broken out by sector.

**Table 3-1. 2020 Annual Energy Savings Summary**

Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Private	53,565	102%	54,428	0.80	43,542
Public	545	100%	546	0.80	437
<b>Total or Weighted Average</b>	<b>54,110</b>	<b>102%</b>	<b>54,974</b>	<b>0.80</b>	<b>43,979</b>

\* Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.

† A deemed value. Available on the SAG web site: [https://www.ilsag.info/ntg\\_2020](https://www.ilsag.info/ntg_2020).

Source: Guidehouse evaluation team analysis.

### 4. Program Savings by Measure

The program includes 10 measures as shown in Table 4-1: nine in the Private Sector and one in the Public Sector. The Kitchen Demand Ventilation Controls and ENERGY STAR® Fryer measures contributed the most savings.

**Table 4-1. 2020 Annual Energy Savings by Measure**

Program Management	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
<b>Private</b>	Combination Oven	987	100%	988	0.80	790
	Commercial Steam Cooker	1,504	100%	1,503	0.80	1,202
	Conveyor Boiler	1	88400%	884	0.80	707
	ENERGY STAR Convection Oven	3,168	100%	3,166	0.80	2,533
	ENERGY STAR Fryer	17,272	100%	17,257	0.80	13,806
	Infrared Charbroiler	707	100%	707	0.80	565
	Kitchen Demand Ventilation Controls	27,995	100%	27,993	0.80	22,394
	Rack Oven - Double Oven	1,931	100%	1,931	0.80	1,544
	Roll-In Rack Single Oven	0	-	0	0.80	0
<b>Private Subtotal</b>		<b>53,565</b>	<b>102%</b>	<b>54,428</b>	<b>0.80</b>	<b>43,542</b>
<b>Public</b>	ENERGY STAR Dishwasher	545	100%	546	0.80	437
<b>Total or Weighted Average</b>		<b>54,110</b>	<b>102%</b>	<b>54,974</b>	<b>0.80</b>	<b>43,979</b>

\* Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.

† A deemed value. Available on the SAG web site: [https://www.ilsag.info/ntg\\_2020](https://www.ilsag.info/ntg_2020).

Source: Nicor Gas tracking data and Guidehouse evaluation team analysis.

## 5. Impact Analysis Findings and Recommendations

### 5.1 Impact Parameter Estimates

Table 5-1 shows the evaluated unit therm savings and realization rates for each measure. The realization rate is the ratio of the verified savings to the ex ante savings. Following the table are any findings and recommendations, including discussions, of all measures with realization rates above or below 100%. Appendix A provides a description of the impact analysis methodology. Table B-1 in Appendix B shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of producing this impact evaluation report.

**Table 5-1. Verified Gross Savings Parameters**

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	Realization Rate	Data Source(s)
Combination Oven	Unit	987.00	987.52	100%	Illinois TRM v8.0† Section 4.2.1, PGL/NSG Program Tracking Data (PTD*)
Commercial Steam Cooker	Unit	1,504.00	1,502.85	100%	Illinois TRM v8.0 Section 4.2.3, PTD
Conveyor Boiler	Unit	1.00	884.00	88400%	Illinois TRM v8.0 Section 4.2.4, Guidehouse research
ENERGY STAR Convection Oven	Unit	3,168.00	3,166.26	100%	Illinois TRM v8.0 Section 4.2.5, PTD
ENERGY STAR Dishwasher	Unit	545.00	546.00	100%	Illinois TRM v8.0 Section 4.2.6, PTD, Guidehouse Research
ENERGY STAR Fryer	Unit	17,272.00	17,257.07	100%	Illinois TRM v8.0 Section 4.2.7, PTD
Infrared Charbroiler	Unit	707.00	706.68	100%	Illinois TRM v8.0 Section 4.2.12, PTD
Kitchen Demand Ventilation Controls	Unit	27,995.00	27,993.00	100%	Illinois TRM v8.0 Section 4.2.16, PTD
Rack Oven - Double Oven	Unit	1,931.00	1,930.50	100%	Illinois TRM v8.0 Section 4.2.18, PTD
Roll-In Rack Single Oven	Unit	0.00	0.00	-	PTD, Guidehouse Research

\* Program Tracking Data (PTD) provided by Nicor Gas, extract dated January 28, 2021.

† State of Illinois Technical Reference Manual version 8.0 (TRM v8.0) from <http://www.ilsag.info/technical-reference-manual.html>.

### 5.2 Findings and Recommendations

#### 5.2.1 Conveyor Broiler

The realization rate for the Conveyor Broiler measure is 88400%. This is a result of a reported ex ante value of 1 therm and a verified ex-post value of 884 therms.

Savings for Conveyor Broilers are not included in the TRM v8.0. However, the TRM v8.0 includes savings assumptions for Conveyor Ovens in section 4.2.4, with deemed savings of 884 therms. Guidehouse researched other TRMs and identified a similar measure in the Ontario TRM, called Underfired Broiler with deemed savings of 881 therms. Figure 5-1 is the entry in the Ontario TRM with the three-foot size being most similar to the Conveyor Broiler measure in this program, which was 22" wide. Therefore,  $2511 \text{ m}^3$  divided by  $2.851 \text{ m}^3/\text{therms} = 881$  therms.<sup>1</sup> Since the savings using these two different references were close, Guidehouse concluded that TRM v8.0's Conveyor Oven measure savings can apply to the Conveyor Broiler used in this program.

**Figure 5-1. Ontario TRM Underfired Charbroiler**

Parameter	Definitions			
Measure Category	New Construction (NC) Time of Natural Replacement (TNR)			
Baseline Technology	A conventional under-fired broiler, see table 2			
Efficient Technology	A high-efficiency under-fired broiler, see table 3			
Market type	Commercial			
Annual Natural Gas Savings <sup>1</sup> (m <sup>3</sup> )	Three-foot 2,511 m <sup>3</sup>	Four-foot 3,347 m <sup>3</sup>	Five-foot 4,184 m <sup>3</sup>	Six-foot 5,021 m <sup>3</sup>
Measure Life	12 years			
Incremental Cost <sup>1</sup> (\$ CAD)	\$1,900			
Restrictions	Restricted to commercial/institutional food service broiler using natural gas, 3-feet or larger			

**OVERVIEW**

Under-fired broilers (often referred to as “charbroilers”) are used in commercial and institutional food service to do a range of tasks that range from melting cheese to cooking large cuts of meat. Under-fired broilers come in different sizes ranging from three-foot to six-foot. High efficiency broilers utilize improved radiant design and burner control to allow lower firing and gas input levels during both preheat and cooking modes.

Source: Ontario TRM High Efficiency Underfired Broiler, <https://www.oeb.ca/sites/default/files/OEB-Natural-Gas-DSM-TRM-V5.0-20201112.pdf>

**Recommendation 1.** If significant participation in the Conveyor Broiler measure is anticipated, the implementer should work with evaluators to submit a workpaper to the TRM update process, otherwise, the Conveyor Oven in TRM Section 4.2.4 may be used until the measure is added to the TRM.

## 5.2.2 Roll-In Rack Single Oven

This measure was tracked as “Unk” in the program tracking database, but the evaluation team confirmed with the implementer that it was a Roll-In Rack Single Oven. The measure was reported with zero savings. The evaluation team determined no savings were realized and therefore, calculated zero realization rate. As an additional verification, the evaluation team

<sup>1</sup>  $2.851 \text{ m}^3/\text{therms}$  is a standard conversion rate between the two units.



found that the model number of this measure was not on the ENERGY STAR® Qualified Products List for ovens.

**Recommendation 2.** The implementation contractor should ensure the Roll-in Rack Single Oven measure is on the ENERGY STAR® Qualified Products List. This will confirm the eligibility of the measure, and allow energy savings to be claimed in the 2021 program if the measure is eligible.

### 5.2.3 Net-to-Gross Value

Nicor Gas applied a NTG value of 1.00 to calculate ex ante net therms. The evaluation team calculated verified net therms using the SAG recommended default NTG of 0.80 for pilot programs in 2020 CFS<sup>2</sup>. The Market Transformation Pilot Programs are deemed to be Pilot-Specific, with the following guidance:

*Pilot program-specific NTG values to be determined by evaluation early in each project. If that is not possible, default of 0.8 NTG to be used.*

The NTG value for CFS projects are addressed in the 2021 NTG recommendations, where a value of 0.86 is recommended<sup>3</sup>.

**Recommendation 3.** Apply a NTG of 0.86 for ex ante NTG for the 2021 CFS Program.

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<sup>2</sup> Available on the SAG web site: [https://www.ilsag.info/ntg\\_2020](https://www.ilsag.info/ntg_2020).

<sup>3</sup> Available on the SAG web site: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021/>.

## Appendix A. Impact Analysis Methodology

Guidehouse determined the verified gross ex ante savings for each measure of the program by first conducting a tracking data review. The evaluation team checked that measure names and inputs matched those in the TRM v8.0 algorithms and adjusted as necessary.<sup>4</sup> We then used the algorithms and TRM deemed values to calculate verified therms savings for the program. The team needed to conduct research into the Conveyor Broiler measure to determine its verified therms savings, and the Roll-In Single Rack Oven measure to determine its eligibility. The gross realization rates are calculated by dividing the verified ex-post gross savings by the reported ex ante gross savings. The evaluation team calculated verified net therms using a deemed NTG of 0.80 for the CFS Program for all utility partners<sup>5</sup>.

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<sup>4</sup> Illinois Statewide Technical Reference Manual for Energy Efficiency Version 8.0 from <http://www.ilsag.info/technical-reference-manual.html>

<sup>5</sup> Available on the SAG web site: [https://www.ilsag.info/ntg\\_2020](https://www.ilsag.info/ntg_2020).

## Appendix B. Program Specific Inputs for the Illinois TRC

Table B-1 shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of producing this impact evaluation report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in this table and will be provided to the evaluation team later. Guidehouse will include annual and lifetime water savings and greenhouse gas reductions in the end of year summary report.

**Table B-1. Verified Cost Effectiveness Inputs**

Research Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Combination Oven	Unit	2	12.0	987	988	790
Commercial Steam Cooker	Unit	1	12.0	1,504	1,503	1,202
Conveyor Boiler	Unit	1	17.0	1	884	707
ENERGY STAR Convection Oven	Unit	9	12.0	3,168	3,166	2,533
ENERGY STAR Dishwasher	Unit	1	20.0	545	546	437
ENERGY STAR Fryer	Unit	34	12.0	17,272	17,257	13,806
Infrared Charbroiler	Unit	1	12.0	707	706.68	565
Kitchen Demand Ventilation Controls	Unit	5	15.0	27,995	27,993	22,394
Rack Oven - Double Oven	Unit	1	12.0	1,931	1,931	1,544
Roll-In Rack Single Oven	Unit	1	12.0	0	0	0
<b>Total or Weighted Average</b>			<b>13.7</b>	<b>54,110</b>	<b>54,974</b>	<b>43,979</b>

Source: Nicor Gas tracking data and Guidehouse evaluation team analysis.