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# EVALUATION REPORT

INTERIM FRAMEWORK ENERGY MANAGER PROGRAM PY2022

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Prepared for: The Independent Electricity System Operator (IESO)

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# EXECUTIVE SUMMARY

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In April 2019, the IESO began to centrally deliver all provincial energy efficiency programs in Ontario by implementing a new Interim Framework (IF) following a directive from the Ministry of Energy, Northern Development and Mines. The IF replaced the Conservation First Framework (CFF) with an updated Save on Energy Programs portfolio and was in effect from April 1, 2019, through December 31, 2020.

This evaluation report represents the final evaluation of the Energy Manager program in the Interim Framework. As the program was in effect through the end of 2020, the measures reported in this report are all considered true-up measures. These true-up measures were implemented in previous program years and were not yet ready for evaluation and reporting until this year.

As part of the cost-effective wind down of the program evaluation in the Interim Framework, EcoMetric applied historical program-level realization rates and net-to-gross ratios to the true-up measures.

The Energy Manager program was delivered by the IESO in the 2021-2024 Conservation and Demand Management (CDM) framework from January 1, 2021 through December 31, 2022. The EcoMetric team conducted an in-depth evaluation of the program in PY2022. The key findings and recommendations from the 2021-2024 CDM Framework Energy Manager Program Evaluation Report can be leveraged to better understand the forces and factors behind the impacts and processes of the IF Energy Manager program, which was similarly designed and delivered.

## PROGRAM DESCRIPTION

The Energy Manager (EM) program subsidizes the salaries of trained energy managers to work directly with participating facilities to find energy savings, identify smart energy investments, secure financial incentives, and unleash competitive advantage. Energy managers can identify capital improvements eligible for incentive payments through the Process Systems Upgrades Program (PSUP), Business Retrofit, or Energy Performance Program (EPP). The savings from these projects accrue to the program that incents the improvement.

Energy managers can also identify and help implement non-incented improvements for the organizations they support. Since 2016, EM contracts require that 10% of the savings goal must be achieved through non-incented improvements. IESO tasked EcoMetric with verifying the energy savings from these non-incented projects while examining the EM cost-effectiveness and program processes. A broader perspective was taken to document the value of EM thoroughly since EM is an enabling program that drives participation and savings in other programs. These non-incented

projects are the focus of the Energy Manager program evaluation discussed in this section. Common non-incented measures include optimization, capital equipment upgrades, operational and maintenance (O&M), and behavioural measures.

## EVALUATION GOALS AND OBJECTIVES

This report documents the findings from the impact evaluation conducted for the EM program in Program Year (PY) 2022.

The goals of the PY2022 evaluation were to:

- ▶ Annually verify energy and summer peak demand savings.
- ▶ Assess program attribution (net-to-gross or NTG), including free-ridership.
- ▶ Conduct annual cost-effectiveness analyses and report on key indicators of cost-effectiveness, including the Total Resource Cost (TRC) test, Program Administrator Cost (PAC) test, and the Levelized Unit Energy Cost (LUEC) metric.
- ▶ Annually estimate the net greenhouse gas impacts in tonnes of CO<sub>2</sub> equivalent using IESO's Cost-Effectiveness Tool.
- ▶ Estimate job impacts of the program.

## EVALUATION RESULTS

This section summarizes the results of the PY2022 EM non-incented program impact evaluation.

### IMPACT EVALUATION RESULTS

The PY2022 EM non-incented gross verified savings are summarized in Table 1 and Table 2. In total, 19 non-incented measures completed in PY2022 were reported as part of the sample frame. An additional 257 non-incented measures completed between PY2019 and PY2021 are included in the PY2022 report as true-ups.<sup>1</sup>

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<sup>1</sup> Adjustment factors (realization rates and net to gross ratios) for true-up projects were calculated during the evaluation of the program year they were installed. EcoMetric applied these adjustment factors to the true-up projects in this report. As part of the IF EM evaluation wind down, EcoMetric applied PY2021 adjustment factors to the 19 measures implemented in PY2022.

The total gross verified energy savings for the EM non-incented program in PY2022 are 199 MWh, representing 105% of reported savings. True-up projects from PY2019 through PY2021 totaled 29,765 MWh of gross verified energy savings, representing almost 100% of reported savings. When combined, the total gross verified energy savings are 29,963 MWh—103% of reported savings. Total gross verified summer peak demand savings for the EM non-incented program are 6.12 MW, representing 104% of total reported savings.

The total net first-year savings for PY2022 non-incented EM projects are 161 MWh, and net peak demand savings are 0.03 MW. Including true-ups from PY2019 through PY2021, the total net first-year savings are 25,045 MWh, and net peak demand savings are 5.03 MW.

Table 1: PY2022 EM Non-Incented Energy Savings Summary

Program Year	Qty. of Measures	Energy Realization Rate	Gross Verified Energy Savings (MWh)	NTG Ratio	Net Verified Energy Savings (MWh)	Net Verified Energy Savings Persisting at 2022 (MWh)
2022	19	105%	199	81%	161	161
2021 True-Ups	219	105%	22,019	81%	17,836	17,637
2020 True-Ups	34	100%	7,565	91%	6,884	6,884
2019 True-Ups	4	100%	181	91%	164	164
<b>TOTAL</b>	<b>276</b>	<b>103%</b>	<b>29,963</b>		<b>25,045</b>	<b>24,846</b>

Table 2: PY2022 EM Non-Incented Peak Demand Savings Summary

Program Year	Qty. of Measures	Demand Realization Rate	Gross Verified Peak Demand Savings (MW)	NTG Ratio	Net Verified Peak Demand Savings (MW)	Net Summer Peak Demand Savings Persisting at 2022 (MW)
2022	19	104%	0.03	81%	0.03	0.03
2021 True-Ups	219	104%	5.36	81%	4.34	4.34
2020 True-Ups	34	105%	0.71	91%	0.65	0.65
2019 True-Ups	4	105%	0.02	91%	0.02	0.02
<b>TOTAL</b>	<b>276</b>	<b>104%</b>	<b>6.12</b>		<b>5.03</b>	<b>5.03</b>

## KEY INTERIM FRAMEWORK RESULTS

As part of the IF, the EM program has achieved 70,082 MWh of net first-year energy savings through non-incented measures, representing 86% of gross verified energy savings. Eighty-seven percent of those savings persist through 2022, totaling 61,043 MWh.

Across the Interim Framework, EM non-incented projects resulted in 7,374 net first-year metric tonnes of CO<sub>2</sub>e reductions. Over the lifetime of these measures, net GHG reductions total 90,609 tonnes of CO<sub>2</sub>e.

The EM program in the IF has supported 958 jobs across Canada from 2019 through 2022, 852 of which were in Ontario.

**COST EFFECTIVENESS RESULTS**

As shown in Table 3, the EM program in PY2022 is not cost effective from the TRC or PAC test perspectives using a benefit/cost threshold of 1.0. However, this analysis only includes benefits from the 19 measures implemented in PY2022 as the program wound down and is not reflective of the program as a whole.

*Table 3: PY2022 EM Non-Incented Cost Effectiveness Results*

PAC Costs	PAC Benefits	PAC Ratio	TRC Costs	TRC Benefits	TRC Ratio	LC \$/kWh
\$3,602,005	\$91,139	0.03	\$3,982,889	\$104,810	0.03	\$2.67

As the program is wound down, EcoMetric conducted a holistic cost effectiveness analysis that includes all of the benefits and costs from the program throughout the entire IF, detailed in Table 4. **The EM program is cost effective from the PAC test perspective, with a ratio of 3.86. The levelized cost for the program is \$0.02/kWh.<sup>2</sup>**

*Table 4: IF EM Non-Incented Cost Effectiveness Results*

PAC Costs	PAC Benefits	PAC Ratio	TRC Costs	TRC Benefits	TRC Ratio	LC \$/kWh
\$9,371,541	\$36,127,744	3.86	\$94,342,938	\$41,546,906	0.44	\$0.02

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<sup>2</sup> IESO-funded energy managers provide value to participating organizations outside of kWh and kW savings including identifying natural gas and water savings, developing sustainability strategies, and improving energy data collection and analysis. The benefits of these additional services from IESO-funded energy managers were not quantified or included in this analysis, but they certainly provide value to the organizations the energy managers work in.

## 1.1 PROGRAM DESCRIPTION

The Energy Manager program subsidizes the salaries of trained energy managers to work directly with participating facilities to find energy savings, identify smart energy investments, secure financial incentives, and unleash competitive advantage. Energy managers can identify capital improvements eligible for incentive payments through the Process Systems Upgrades Program (PSUP), Business Retrofit, or Energy Performance Program (EPP). The savings from these projects accrue to the program that incents the improvement.

Energy managers can also identify and help implement non-incented improvements for the organizations they support. Since 2016, EM contracts require that 10% of the savings goal must be through non-incented improvements. IESO tasked EcoMetric with verifying the energy savings from these non-incented projects while examining the EM cost-effectiveness and program processes. A broader perspective was taken to document the value of EM thoroughly since EM is an enabling program that drives participation and savings in other programs. These non-incented measures are the focus of the Energy Manager program evaluation discussed in this section. Common non-incented measures include optimization, capital equipment upgrades, operational and maintenance (O&M), and behavioural measures.

## 1.2 EVALUATION GOALS AND OBJECTIVES

The Independent Electricity System Operator (IESO) retained EcoMetric Consulting, LLC, to evaluate the 2019-2020 Interim Framework (IF) Industrial Programs administered in Ontario. The industrial programs incentivize equipment measures, engineering studies, and energy management services for commercial and industrial facilities in Ontario.

The goals of the PY2022 evaluation were to:

- ▶ Annually verify energy and summer peak demand savings.
- ▶ Conduct annual cost-effectiveness analyses and report on key indicators of cost-effectiveness, including the Total Resource Cost (TRC) test, Program Administrator Cost (PAC) test, and the Levelized Unit Energy Cost (LUEC) metric.
- ▶ Annually estimate the net greenhouse gas impacts in tonnes of CO<sub>2</sub> equivalent using IESO's Cost-Effectiveness Tool.
- ▶ Estimate job impacts of the program.



This report contains the impact and process evaluation findings conducted for the Energy Manager (EM) program in Program Year (PY) 2022. Energy managers identify and help to implement non-incented improvements for the organizations they support. These non-incented projects are the focus of the Energy Manager program evaluation discussed throughout this report.

In April 2019, the IESO began to centrally deliver all provincial energy efficiency programs in Ontario by implementing a new Interim Framework following a directive from the Minister of Energy, Northern Development and Mines. The IF replaced the Conservation First Framework (CFF) with an updated Save on Energy Programs portfolio and was in effect from April 1, 2019, through December 31, 2020. Energy managers started completing the non-incented measures in the second half of 2019. The IESO has sunset the program in the IF and is now delivering an updated version of the program in the 2021-2024 CDM Framework.

As the program has sunset, the PY2022 Evaluation Report will be the final evaluation for the Energy Manager program in the IF. The PY2022 sample frame consists of the final true-up projects for the EM program in the IF going back to PY2019. The impacts detailed in the report are the results of EcoMetric applying historical adjustment factors to the PY2022 sample frame.

## 2.1 EVALUATION APPROACH

This section of the report outlines the methodologies used in the PY2022 evaluation of the EM program. More detailed descriptions of the evaluation methodology are included in Appendix A.

### 2.1.1 SAMPLE DESIGN

EcoMetric's focus for the evaluation of the EM program is the non-incented measures completed by the energy managers. The sample frame for the PY2022 impact evaluation was all non-incented measures submitted by participating Energy Managers in the Interim Framework that had not yet been evaluated or reported. The source for this information was the technical reviewer's measure-level tracking system as of April 1st, 2023.

## 2.2 DATA COLLECTION

The primary data source for non-incented Energy Manager measures in the gross impact evaluation sample was the program tracking data, calculation workbooks, and other supporting documentation submitted by the participating organization's energy manager.

## 2.3 GROSS SAVINGS VERIFICATION AND NET SAVINGS ANALYSIS

EcoMetric applied historical program-level realization rates and net-to-gross (NTG) ratios corresponding to the evaluation for the program year the measures were implemented. For PY2022 measures, EcoMetric applied the PY2021 historical rates, as no new analyses were conducted as part of the PY2022 evaluation.

EcoMetric verified gross savings for the program throughout the IF by conducting in-depth engineering reviews of a sample of non-incented measures implemented and reported by EMs.

EcoMetric calculated net savings by utilizing historical net-to-gross (NTG) ratios to incorporate free-ridership factors for the projects evaluated. NTG is the process of determining what portion of project savings is attributable to the influence of the IESO programs versus what the customer would have done in the absence of incentive programs. The calculation of NTG factors typically includes free-ridership, defined as the savings customers would have achieved in the absence of the program's influence (commonly called the counterfactual condition), and spillover, defined as savings influenced by the program but not formally incentivized or claimed by the program.

For the PY2022 sample frame, the historical program-level NTG ratios corresponding to the evaluation for the program year the measures were implemented were applied.

For more information on the historical engineering review and NTG methodologies, please see the [PY2021 Interim Framework Energy Manager Evaluation Report](#) available on the IESO's website.

## 2.4 COST EFFECTIVENESS ANALYSIS

EcoMetric used the IESO Conservation and Demand Management (CDM) Cost-Effectiveness Tool to estimate measure-level costs and benefits, aggregated to program- and portfolio-level cost effectiveness. Program administrative costs were provided to EcoMetric by the IESO. Other key inputs for the cost effectiveness analysis include lifetime electric energy and demand savings, measure lives, energy savings load shapes, and incremental project costs.

EcoMetric states benefits and costs in present value terms, using the appropriate discount and inflation rates conforming to the IESO's requirements outlined in the IESO CDM Cost-Effectiveness Guide.

## 2.5 OTHER ENERGY BENEFITS

### 2.5.1 AVOIDED GREENHOUSE GAS EMISSIONS ESTIMATION

EcoMetric estimated net greenhouse gas (GHG) impacts for each project by utilizing measure-level energy savings load shapes based on metered data and emissions factors (EFs) provided by the IESO at the annual and hourly level and aggregated to the eight IESO peak periods as defined in the IESO's Conservation and Demand Management Energy Efficiency Cost Effectiveness Tool.

### 2.5.2 JOB IMPACTS ESTIMATION

EcoMetric leveraged the Statistics Canada (StatCan) custom input/output (I/O) economic model to estimate the job impacts of the EM program. The StatCan I/O model simulates the economic and employment impacts of economic activity related to the program. The economic activity related to the EM program was leveraged as "shocks", which act as inputs into the model to show the direct, indirect, and induced impacts on the number of jobs created by the program. The I/O model uses regional and national multipliers to estimate the economy-wide effects of the economic activity induced by the program. The I/O model used three shocks to determine the job impacts of the EM program:

- ▶ Demand for goods and services related to the program
- ▶ Business reinvestment
- ▶ Program funding

EcoMetric and StatCan developed the shocks using the net verified savings for the sample frame summarized in Section 3.2. The output of the model expresses job impacts in “person-years”—representing a job for one person for one year.

This section details the results from the impact evaluation of the EM non-incented program in PY2022.

### 3.1 GROSS VERIFIED SAVINGS RESULTS

Gross verified savings results for the PY2022 EM program are summarized in Table 5. In total, 19 non-incented measures completed in PY2022 were reported as part of the sample frame. An additional 257 non-incented measures completed in PY2019 through PY2021 are included in the PY2022 reporting as true-ups.

The total gross verified energy savings for the EM program in PY2022 are 199 MWh, representing 105% of reported savings. True-up projects from PY2019 through PY2021 totaled 29,765 MWh of gross verified energy savings, representing almost 100% of reported savings. When combined, the total gross verified energy savings for the EM program are 29,963 MWh—103% of reported savings. Total gross verified summer peak demand savings for the EM program are 6.12 MW, representing 104% of total reported savings.

Table 5: PY2022 EM Non-Incented Gross Verified Savings Results

Program Year	Quantity of Measures	Energy Realization Rate (%)	Gross Verified Energy Savings (MWh)	Peak Demand Realization Rate (%)	Gross Summer Peak Demand Savings (MW)
2022	19	105%	199	104%	0.03
2021 True-Ups	219	105%	22,019	104%	5.36
2020 True-Ups	34	100%	7,565	105%	0.71
2019 True-Ups	4	100%	181	105%	0.02
<b>TOTAL</b>	<b>276</b>	<b>103%</b>	<b>29,963</b>	<b>104%</b>	<b>6.12</b>

### 3.2 NET VERIFIED SAVINGS RESULTS

Table 6 summarizes the EM non-incented net savings below. The program-level NTG for the EM non-incented measures was 81% for the PY2022 measures, reflecting a free-ridership score of 19%. EcoMetric did not assess spillover for the program as part of IF evaluations. The total net first-year savings for non-incented EM projects reported in PY2022, including true-ups are 25,045 MWh, and net peak demand savings are 5.03 MW.

Ninety-nine percent of the energy savings achieved by the PY2022 sample frame persist to 2022. Non-incented measures implemented by energy managers commonly include behavioural and O&M measures, which have a shorter persistence than equipment retrofit projects.

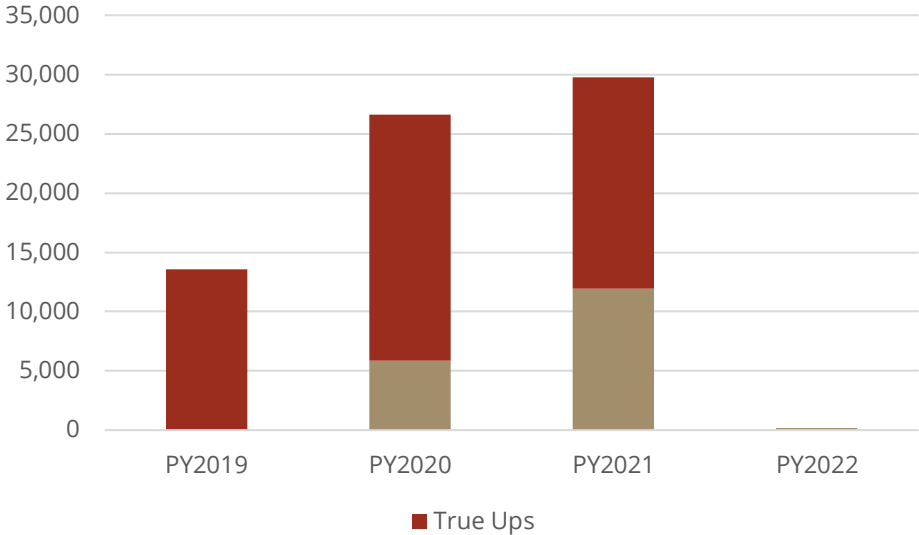
Table 6: PY2022 EM Non-Incented Net Verified Savings Results

Program Year	Quantity of Measures	NTG Ratio	Net Energy Savings (MWh)	Net Energy Savings Persisting at 2022 (MWh)	Net Summer Peak Demand Savings (MW)	Net Summer Peak Demand Savings Persisting at 2022 (MW)
2022	19	81%	161	161	0.03	0.03
2021 True-Ups	219	81%	17,836	17,637	4.34	4.34
2020 True-Ups	34	91%	6,884	6,884	0.65	0.65
2019 True-Ups	4	91%	164	164	0.02	0.02
<b>TOTAL</b>	<b>276</b>		<b>25,045</b>	<b>24,846</b>	<b>5.03</b>	<b>5.03</b>

### 3.2.1 TOTAL IF ENERGY MANAGER NET SAVINGS

Figure 1 summarizes the net energy savings achieved in the EM program throughout the IF. As part of the IF, the EM program has achieved 70,082 MWh of net first-year energy savings through non-incented measures, representing 86% of gross verified energy savings. Eighty-seven percent of those savings persist through 2022, totaling 61,043 MWh.

Figure 1: Total IF EM Non-Incented Net Verified Energy Savings (MWh)



As shown in Table 7, the EM program in PY2022 is not cost effective from the TRC or PAC test perspectives using a benefit/cost threshold of 1.0. However, this analysis only includes benefits from the 19 measures implemented in PY2022 as the program wound down and is not reflective of the program as a whole.

*Table 7: PY2022 EM Non-Incented Cost Effectiveness Results*

PAC Costs	PAC Benefits	PAC Ratio	TRC Costs	TRC Benefits	TRC Ratio	LC \$/kWh
\$3,602,005	\$91,139	0.03	\$3,982,889	\$104,810	0.03	\$2.67

As the program is no longer offered in the IF, EcoMetric conducted a holistic cost effectiveness analysis that includes all of the benefits and costs from the program throughout the entire IF. Detailed in Table 8, the EM program is cost effective from the PAC test perspective with a ratio of 3.86. The levelized unit energy cost for the program is \$0.02/kWh.<sup>3</sup>

*Table 8: IF EM Non-Incented Cost Effectiveness Results*

PAC Costs	PAC Benefits	PAC Ratio	TRC Costs	TRC Benefits	TRC Ratio	LC \$/kWh
\$9,371,541	\$36,127,744	3.86	\$94,342,938	\$41,546,906	0.44	\$0.02

The full cost of the energy managers' salaries and administrative costs related to marketing and training of energy managers is included in the cost effectiveness of the EM non-incented program. Energy managers' main focus is to identify and implement projects through the IESO's incented programs, such as Business Retrofit and the Energy Performance Program (EPP).

<sup>3</sup> IESO-funded energy managers provide value to participating organizations outside of kWh and kW savings including identifying natural gas and water savings, developing sustainability strategies, and improving energy data collection and analysis. The benefits of these additional services from IESO-funded energy managers were not quantified or included in this analysis, but they certainly provide value to the organizations the energy managers work in.

### 5.1 AVOIDED GREENHOUSE GAS EMISSIONS

Net first-year greenhouse gas (GHG) reductions total 2,821 metric tonnes of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) for the PY2022 sample frame, as summarized in Table 9. As EM non-incented measures focus on electricity savings, these GHG reductions are derived from the avoided generation of electricity. Over the lifetime of the PY2022 sample frame measures, net GHG reductions total 37,447 tonnes of CO<sub>2</sub>e.

For the PY2022 sample frame, the cost of first-year GHG emissions reductions is \$1,277 per tonne of CO<sub>2</sub>e from the program administrator cost perspective.

*Table 9: PY2022 EM Non-Incented Greenhouse Gas Emissions Impacts*

Program Year	First-Year GHG Impacts (tonnes CO <sub>2</sub> e)
2022	21
2021 True-Ups	2,058
2020 True-Ups	728
2019 True-Ups	13
<b>TOTAL</b>	<b>2,821</b>

Across the Interim Framework, EM non-incented projects resulted in 7,374 net first-year metric tonnes of CO<sub>2</sub>e reductions. Over the lifetime of these measures, net GHG reductions total 90,609 tonnes of CO<sub>2</sub>e.

### 5.2 JOB IMPACTS SUMMARY RESULTS

As summarized in Table 10, the EM program created an estimated 461 jobs in the PY2022 sample frame. Of these 461 jobs, 227 were direct, 45 were indirect, and 189 were induced. The majority of jobs (385) were created in Ontario. In terms of full-time equivalent (FTE), the program created an estimated 373 jobs. The creation of jobs across the years in the sample frame aligns with the number of measures, project spending, and impacts achieved. With just a handful of measures completed in PY2022, the job impacts were negative in 2022 as the impacts of funding the program on ratepayers outweighed the impacts created by the savings and spending on the PY2022 measures. However, the job impacts should be considered in aggregate across the sample frame, which includes the true-ups from PY2019 through PY2021.



Table 10: PY2022 IF EM Non-Incented Job Impacts

Job Impact Type	Ontario FTE	Canada Total FTE	Ontario Jobs	Canada Total Jobs
<b>PY2022</b>				
Direct	-3	-3	-4	-4
Indirect	-1	-3	-2	-3
Induced	0	0	0	0
<b>PY2021 Total</b>	<b>-5</b>	<b>-6</b>	<b>-7</b>	<b>-7</b>
<b>PY2021 True-Ups</b>				
Direct	219	220	225	224
Indirect	34	40	40	47
Induced	85	99	115	183
<b>PY2021 Total</b>	<b>338</b>	<b>359</b>	<b>380</b>	<b>454</b>
<b>PY2020 True-Ups</b>				
Direct	7	7	7	7
Indirect	1	1	1	1
Induced	10	10	3	5
<b>PY2020 Total</b>	<b>18</b>	<b>18</b>	<b>11</b>	<b>13</b>
<b>PY2019 True-Ups</b>				
Direct	0	0	0	0
Indirect	0	0	0	0
Induced	1	1	1	1
<b>PY2019 Total</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>GRAND TOTAL</b>	<b>352</b>	<b>373</b>	<b>385</b>	<b>461</b>

Jobs and FTEs are expressed in person-years, meaning each job or FTE represents one job for one person for one year.

Direct jobs include all jobs created by EM program activity, including the energy managers themselves, administrative jobs, contractors hired to complete projects, engineers, and inspectors, among many others. Indirect jobs include the additional jobs created from economic activity related to program participation, including equipment and supply distribution centers, delivery drivers, and manufacturing, among many others. Induced jobs include those supported by the “ripple effects” of economic activity from EM program participation (i.e., the re-spending of income and benefits resulting from EM program activity).

Table 11 summarizes the cumulative job impacts of the EM program in the IF, including the job impacts from the previous PY2020 and PY2021 Evaluation Reports. **In total, the EM program in the IF has supported 958 jobs across Canada, 852 of which are in Ontario.**

*Table 11: Cumulative IF EM Non-Incented Job Impacts*

Program Year	Ontario FTE	Canada Total FTE	Ontario Jobs	Canada Total Jobs
PY2022	-5	-6	-7	-7
PY2021	593	627	661	750
PY2020	150	158	155	169
PY2019	37	41	43	46
<b>GRAND TOTAL</b>	<b>775</b>	<b>821</b>	<b>852</b>	<b>958</b>

5.2.1 JOB IMPACTS BY INDUSTRY

Table 12 summarizes the job impacts by industry for the EM program PY2022 sample frame. Following a similar trend to the PY2021 evaluation, over half of the jobs created by the program are in the other provincial and territorial government services sector, where the I/O model places the IESO-funded energy managers and their energy management teams. Other industries where substantial jobs were created include retail trade, accommodation and food services, wholesale trade, and architectural and engineering services. In total, the jobs impacts from the EM program reached 39 different industries in StatCan’s I/O model.

Table 12: EM Non-Incented Job Impacts by Industry

Industry	Ontario FTE	Canada Total FTE	Ontario Jobs	Canada Total Jobs
Other provincial and territorial government services	234	248	256	286
Retail trade (except cannabis)	26	28	29	33
Accommodation and food services	9	10	10	14
Wholesale trade	9	10	10	14
Legal, accounting, and architectural, engineering, and related services	9	10	10	13
Administrative and support services	5	6	6	8
Depository credit intermediation and monetary authorities	5	6	6	8
Other finance, insurance and real estate services and management of companies and enterprises	5	6	6	6
Health care and social assistance	5	6	6	6
Fabricated metal product manufacturing	3	3	3	6
Computer systems design and other professional, scientific, and technical services	4	4	5	5
Personal services and private households	4	4	5	5
Repair construction	3	3	3	5
Truck transportation	2	2	2	4
Other	30	27	28	48
<b>GRAND TOTAL</b>	<b>353</b>	<b>373</b>	<b>385</b>	<b>461</b>

### 5.2.2 JOB IMPACTS BY MODEL SHOCK

EcoMetric estimated job impacts of the EM program by leveraging three shocks in the StatCan I/O model: demand for goods and services related to the program, business reinvestment, and program funding. The shock that resulted in the largest number of jobs created was the demand for goods and services related to the EM non-incented program. As detailed in Table 13, the demand shock resulted in 400 jobs supported in Ontario and 478 throughout Canada. The primary jobs that were supported by the EM program were energy managers and other energy services professionals. Economic activity across the value chain serving the participants and supporting their projects resulted in 240 indirect and induced jobs across Canada.

Table 13: EM Non-Incented Job Impacts from Goods and Services Shock

Job Impact Type	Ontario FTE	Canada Total FTE	Ontario Jobs	Canada Total Jobs
Direct	230	230	238	238
Indirect	35	42	42	51
Induced	96	111	120	189
<b>GRAND TOTAL</b>	<b>361</b>	<b>383</b>	<b>400</b>	<b>478</b>

The job impacts of the business reinvestment shock are summarized in Table 14. This shock represents the amount of bill savings the participating organizations reinvest in their company to spur further economic activity. The business reinvestment shock resulted in 13 total jobs supported in Canada, 11 of which are in Ontario.

Table 14: EM Non-Incented Job Impacts from Business Reinvestment Shock

Job Impact Type	Ontario FTE	Canada Total FTE	Ontario Jobs	Canada Total Jobs
Direct	5	6	6	6
Indirect	2	3	3	3
Induced	2	2	2	4
<b>GRAND TOTAL</b>	<b>9</b>	<b>11</b>	<b>11</b>	<b>13</b>

The program funding shock represents the increase in Ontario residents' hydro bills from funding the EM program. EcoMetric estimates that \$1.26M of the \$3.6M PY2022 EM Program budget was supplied by the residential sector.<sup>4</sup> As this shock represents less money available to the residential sector for spending throughout the economy, the job impacts are negative. Summarized in Table 15, the program funding shock resulted in -30 jobs in Canada. These jobs were largely from the service industry—Ontario's largest industry in terms of number of jobs. However, compared to the jobs supported by the demand for goods and services and reinvestment shocks, the EM program's job impacts are net positive by a large margin.

Per \$1M in funding, the EM program in the Interim Framework supported 88 FTEs throughout Canada. Much of these job impacts were driven by the economic activity surrounding the design and

<sup>4</sup> The IESO estimates that 35% of the portfolio's funding is supplied by the residential sector.

implementation of the non-incented measures, especially larger capital-intensive HVAC, fans and motors, pumps, and building envelope projects.

Table 15: EM Non-Incented Job Impacts from Program Funding Shock

Job Impact Type	Ontario FTE	Canada Total FTE	Ontario Jobs	Canada Total Jobs
Direct	-12	-12	-16	-17
Indirect	-3	-7	-6	-9
Induced	-2	-3	-3	-4
<b>GRAND TOTAL</b>	<b>-18</b>	<b>-21</b>	<b>-26</b>	<b>-30</b>

Across the Interim Framework, the EM non-incented program achieved major energy and economic impacts for Ontario's businesses and residents.

**As part of the IF, the EM program has achieved 70,082 MWh of net first-year energy savings through non-incented measures, representing 86% of gross verified energy savings. Eighty-seven percent of those savings persist through 2022, totaling 61,043 MWh.**

Across the Interim Framework, EM non-incented projects resulted in 7,374 net first-year metric tonnes of CO<sub>2</sub>e reductions. Over the lifetime of these measures, net GHG reductions total 90,609 tonnes of CO<sub>2</sub>e.

**The EM program in the IF has supported 958 jobs across Canada from 2019 through 2022, 852 of which were in Ontario.**

The Energy Manager program was delivered by the IESO in the 2021-2024 Conservation and Demand Management (CDM) framework from January 1, 2021 through December 31, 2022. The EcoMetric team conducted an in-depth evaluation of the program in PY2022. The key findings and recommendations from the 2021-2024 CDM Framework Energy Manager Program Evaluation Report can be leveraged to better understand the forces and factors behind the impacts and processes of the IF Energy Manager program, which was similarly designed and delivered.

## A.1 Gross Savings Verification Methods

### A.1.1 Project Documentation Review

Project documentation was provided mainly by the IESO’s technical reviewer and, in some cases, by the energy manager. Project files utilized for review and analysis included project incentive applications, quarterly and annual energy manager submission files, engineering workbooks, equipment cut sheets, invoices, email exchanges, technical drawings, M&V plans and reports, and digital photos.

### A.1.2 Summer Peak Demand Analysis

EcoMetric verified summer coincident peak demand impacts based on the IESO-defined peak periods summarized in Table 16.

Table 16: IESO EM&V Protocol Peak Period Definitions

Definition Source	Months	Days and Hours	Calculation of Demand Savings
EM&V Protocols: Standard Peak Calculation	Summer: Jun-Aug	Weekdays 1pm-7pm	Average over entire peak period
EM&V Protocols: Standard Peak Calculation	Winter: Jan-Dec	Weekdays 6pm-8pm	Average over entire peak period
EM&V Protocols: Alternative Peak Protocols for Weather-Dependent Measures	Summer: Jun-Aug	Weekdays 1pm-7pm	Weighted average of the top hour in each of 3 months per IESO weights
EM&V Protocols: Alternative Peak Protocols for Weather-Dependent Measures	Winter: Jan-Dec	Weekdays 6pm-8pm	Weighted average of the top hour in each of 3 months per IESO weights

## A.2 Cost Effectiveness Assumptions

- ▶ Project costs and benefits are included only for non-incented Energy Manager measures in-service starting in 2022.
- ▶ Incentives are not included for Energy Manager measures, as the only measures included in this analysis are non-incented. Incremental lifecycle measure costs (when provided) are

included at a measure-specific level. EcoMetric sourced the measure costs from project documentation, when available, and the technical reviewer's measure-level database.

- ▶ Program admin costs (CE Tool Budget Inputs) were provided by the IESO Evaluation Team for PY2022.

### A.3 Job Impacts Methodology

EcoMetric leveraged the Statistics Canada (StatCan) custom input/output (I/O) economic model to estimate the job impacts of the EM program. The StatCan I/O model simulates the economic and employment impacts of economic activity related to the program. The economic activity related to the EM program was leveraged as “shocks”, which act as inputs into the model to show the direct, indirect, and induced impacts on the number of jobs created by the program. The I/O model uses regional and national multipliers to estimate the economy-wide effects of the economic activity induced by the program. The I/O model used three shocks to determine the job impacts of the EM program:

- ▶ Demand for goods and services related to the program
- ▶ Business reinvestment
- ▶ Program funding

The demand for goods and services related to the EM program shock represents the spending on goods and services to participate in the program. This includes spending on capital measures, hiring contractors and consultants, all labor costs related to program participation, and the administrative costs for the IESO. EcoMetric derived the value of this shock from the estimated project costs for each project.

The business reinvestment shock represents the amount of savings from reduced energy bills that the participants reinvest in the local economy. The portion of project costs not covered by IESO incentives was deducted from the total bill savings for each facility. EcoMetric calculated the energy bill savings using the net energy savings from the impact evaluation and the IESO's electricity retail rates. As for the amount of reinvestment, the team collected primary data from the participants through the process and NTG interviews. EcoMetric asked participants what percentage of their bill savings they plan on reinvesting.

Finally, the program funding shock represents the incremental increase in electricity bills in Ontario's residential sector used to fund the program. EcoMetric sourced the EM program budget data from the IESO, as well as the assumption of the share of the residential sector's funding portion of the program.



The I/O model generates three job impacts: direct, indirect, and induced. Direct jobs include those created by EM program activity, including the energy managers themselves, administrative jobs, contractors hired to complete projects, engineers, and inspectors, among many others. Indirect jobs include the additional jobs created from economic activity related to program participation, including equipment and supply distribution centers, delivery drivers, and manufacturing, among many others. Induced jobs include the jobs supported by the “ripple effects” of economic activity from EM program participation (i.e., the re-spending of income and benefits resulting from EM program activity).

The model outputs job impacts in the total number of jobs and full-time equivalent (FTE). The total number of jobs does not take into account the number of hours worked. Total jobs are represented by full-time, part-time, and temporary jobs. FTEs, on the other hand, are total jobs converted to represent only full-time jobs and are determined by the average full-time hours worked in the business or government sectors. Both total jobs and FTEs are measured in person-years, meaning one job for one person for one year.