IMPACT AND PROCESS EVALUATION REPORT

INTERIM FRAMEWORK ENERGY PERFORMANCE PROGRAM PY2021

Date: 31 August 2022

Prepared for: Independent Electricity System Operator (IESO)

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ACKNOWLEDGEMENTS

EcoMetric would like to thank Jessei Kanagarajan, Alice Herrera, and Jimmy Lu from the Independent Electricity System Operator (IESO) for their assistance in managing this evaluation effort. With their support and guidance, the evaluation team was able to complete their activities as efficiently and successfully as possible.

EcoMetric would also like to thank all the program participants and energy service providers that the evaluation team interviewed. Their insights have been invaluable to the evaluation team's efforts to improve the Conservation Programs and have produced high quality data that will serve Ontario conservation efforts for years to come.

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This report documents the findings from the impact, process and cost effectiveness evaluation conducted for the Energy Performance Program (EPP) in Program Year (PY) 2021.

E.1 PROGRAM DESCRIPTION

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 Energy1. 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. Due to disruptions at participant facilities caused by the COVID-19 pandemic, the IESO has extended the IF EPP program through December 31, 2021.

EPP provides a performance-based whole-building approach to incenting energy efficiency improvements, giving customers greater flexibility in measure selection. In this pay-for-performance (P4P) model, building-specific energy models are used to determine a baseline, which is then compared to metered consumption to determine a performance payment. The consumption data is robust in the program, as twelve continuous months hourly interval data along with 12 previous month's energy bill is a program requirement, and the participants are required to use a Savings Report developed by the IESO.

EPP was initially designed to provide solutions for multi-site customers with a large geographical footprint to the historical challenges of participating in Save on Energy programs. The IESO added single-site commercial customers as eligible to participate in the program in PY2019 of the IF. Measures in EPP include capital and non-capital efficiency measures, with performance being rewarded at the same rate. With measure savings being calculated at the whole-building level for customers, the cost of implementing the program and administrative burden are significantly reduced. Following the transition to the IF, the length of the performance period was reduced from four years to two.

[1] The Ministry was known as the Ministry of Energy, Northern Development and Mines at the time of the directive.

E.2 EVALUATION GOALS AND OBJECTIVES

The goals of the PY2021 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_2 equivalent using IESO's Cost-Effectiveness Tool.
- Estimate job impacts of the program.
- Monitor the overall effectiveness and comprehensiveness of key program elements.
- Analyze and make recommendations to improve the program.

E.3 EVALUATION RESULTS

This section summarizes the results of the PY2021 EPP impact and process evaluation.

E.3.1 IMPACT EVALUATION RESULTS

The PY2021 EPP gross verified savings are summarized in Table 1 and Table 2. In total, three facilities were evaluated and reported as part of the sample frame. All three facilities began their first performance period (Year 1) in PY2020. Two of these facilities had their second performance periods (Year 2), completed in PY2021 and were ready for evaluation. The remaining facility had not yet submitted their Year 2 Savings Report in time for inclusion in this evaluation. EPP provides incentives for both performance years based on savings over the baseline. However, to avoid double counting of savings achieved in Year 1, Year 2 savings are expressed as incremental over Year 1 throughout this report.

In Year 1 (PY2020), the three EPP facilities achieved 1,414 MWh of gross verified energy savings. In Year 2 (PY2021), the two EPP facilities achieved 50 MWh of energy savings. When combined, the total gross verified energy savings for EPP in PY2021 are 1,464 MWh, representing 100% of reported savings. Total gross verified summer peak demand savings for EPP are 0.18 MW, representing 100% of total reported savings.

The program-level NTG for EPP was 38% for the PY2021 sample frame, reflecting a free-ridership score of 62%. There is no spillover as all savings are captured in the facility-level meter-based

analysis. Total net first-year savings for EPP were 555 MWh, and net peak demand savings were 0.07 MW. One-hundred percent of the energy savings achieved by the sample frame persist to 2022.

Table 1: PY2021 EPP Energy Savings Summary

Program Year	Performance Periods Evaluated & Reported	Energy Realization Rate	Gross Verified Energy Savings (MWh)	NTG Ratio	Net Verified Energy Savings (MWh)	Net Verified Energy Savings Persisting to 2022 (MWh)
2020 – Year 1 Performance	3	100%	1,414	37%	518	518
2021 – Year 2 Performance[2]	2	100%	50	75%	37	37
TOTAL	**5**	**100%**	**1,464**	**38%**	**555**	**555**

Table 2: PY2021 EPP Summer Peak Demand Savings Summary

Program Year	Performance Periods Evaluated & Reported	Demand Realization Rate	Gross Verified Summer Peak Demand Savings (MW)	NTG Ratio	Net Verified Summer Peak Demand Savings (MW)	Net Verified Summer Peak Demand Savings Persisting to 2022 (MW)
2020 – Year 1 Performance	3	100%	0.17	37%	0.07	0.07
2021 – Year 2 Performance	2	100%	0.01	75%	0.00	0.00
TOTAL	**5**	**100%**	**0.18**	**38%**	**0.07**	**0.07**

E.3.2 COST EFFECTIVENESS EVALUATION RESULTS

As shown in Table 3, EPP is not cost effective from the Total Resource Cost (TRC) test perspective using a benefit/cost threshold of 1.0. However, the program is cost effective from the Program Administrator Cost (PAC) test perspective. To calculate the program's cost effectiveness, EcoMetric used the net energy and summer peak demand savings from Year 1 and Year 2 performance periods summarized in Table 1 and Table 2. From the TRC test perspective, the ratio was negatively affected

[2] Year 2 performance savings are incremental over Year 1 performance savings.

by the two facilities' second year of performance, where increased project spending did not result in equal gains in energy and demand savings.

Table 3: PY2021 EPP Cost Effectiveness Results

TRC Costs	TRC Benefits	TRC Ratio	PAC Costs	PAC Benefits	PAC Ratio	LUEC $/kWh
$416,399	$261,688	**0.63**	$104,485	$227,554	**2.18**	0.02

E.4 KEY FINDINGS AND RECOMMENDATIONS

The key findings and recommendations derived from the impact and process evaluations are listed in this section.

Finding 1a: Summer peak demand estimates were not required per current program guidelines but were provided in the technical review reports for all three participant sites. Peak demand was calculated based on available load shape peak coincidence factors. Load shaped based peak demand reduction calculation methods will differ from those of meter based.

Finding 1b: Hourly whole-facility meter data was not consistently provided by participants. EcoMetric understood through communications with the IESO program team that the hourly data requirement in the program rules documents was not strictly enforced for participants. The three facilities EcoMetric evaluated in PY2021 used daily and not hourly models.

> **Recommendation 1:** Consider a consistent peak demand calculation methodology for future frameworks. With the focus on summer peak demand reductions in the 2021-2024 CDM Framework, require hourly data for all participants and a meter-based peak demand reduction calculation. This will encourage consistent and accurate summer peak demand reduction estimations.

Finding 8: One of the participating organizations in the PY2021 EPP sample frame had a free-ridership score of 100%. This organization expressed that they would have done the same project on the same timeline without the EPP program support or incentive. This organization also has a robust sustainability program where equipment is replaced at regular intervals to match the highest level of efficiency available at the time.

> **Recommendation 8:** Target sectors that do not regularly upgrade their facilities to maintain the highest levels of efficiency. In the commercial real estate sector, target

companies that own and manage mid-tier buildings often fall behind the market in terms of energy efficiency compared to Class A buildings.

Finding 10: All EPP participants interviewed would be interested in participating in a Strategic Energy Management program.

Recommendation 10: As the Energy Manager program shifts to an SEM framework later in the 2021-2024 CDM Framework, develop EPP and P4P program-focused training and resources so that participating organizations can take ownership of energy management at their EPP enrolled facilities.

Finding 11: EPP meets participating organization's needs for custom, non-prescriptive energy efficiency projects in the absence of PSUP and custom path for the Retrofit program in the 2021-2024 CDM framework.

Recommendation 11: In EPP marketing and outreach, highlight the ability and freedom to implement diverse and custom measures to achieve savings measured at the whole-building level. Target this outreach to past PSUP participants and Retrofit participants with a history of implementing custom projects.

Finding 12: EPP participants that were interviewed expressed that EPP fits well into their sustainability plans. No clear conflicts between decarbonization-driven electrification and EPP were found amongst the program participants. However, EPP program marketing, outreach, and documentation do not include sufficient resources focused on decarbonization opportunities afforded by the program.

Recommendation 12: In program marketing and outreach, highlight how EPP can be leveraged to meet decarbonization goals through the reduction of greenhouse gas emissions associated with the purchase of electricity.[3]

Finding 15: EPP participants continue to see the application and baseline modeling processes as complicated and time consuming. However, EcoMetric has seen the IESO take steps toward streamlining the processes in the 2021-2024 CDM Framework EPP offering. These steps include easing baseline model requirements, encouraging the use of automated M&V software, and providing incentives before project implementation to ease the financial burden of design, implementation, and M&V participants face before their first performance payment.

Recommendation 15: Consider hiring a consultant company with streamlined M&V software to handle the modeling for all EPP facilities. EPP participants would only need to provide data, and technical reviewers would have consistent models and outputs to review. This would remove the most impactful barrier to EPP participation, the baseline modeling and application woes.

[3] Emissions associated with the purchase of electricity are commonly referred to as Scope 2 emissions.

1 INTRODUCTION

1.1 PROGRAM DESCRIPTION

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. Due to disruptions at participant facilities caused by the COVID-19 pandemic, the IESO has extended the IF EPP program through December 31, 2021.

EPP provides a performance-based whole-building approach to incenting energy efficiency improvements, which gives customers with greater flexibility in measure selection. In this pay-for-performance (P4P) model, building-specific energy models are used to determine a baseline, which is then compared to metered consumption to determine a performance payment. The consumption data is robust in the program, as two years of M&V data is a program requirement, and the participants are required to use a billing analysis Savings Report developed by the IESO.

EPP was originally designed to provide solutions for multi-site customers with a large geographical footprint to the historical challenges of participating in Save on Energy programs. The IESO added single-site commercial customers as eligible to participate in the program in PY2019 of the IF. Measures in EPP include capital and non-capital efficiency measures, with performance being rewarded at the same rate. With measure savings being calculated at the whole-building level for customers, the cost of implementing the program and administrative burden are greatly reduced. Following the transition to the IF, the length of the performance period was reduced from four years to two.

1.2 EVALUATION GOALS AND OBJECTIVES

The Independent Electricity System Operator (IESO) retained EcoMetric Consulting, LLC, to evaluate the 2019-2020 Interim Framework (IF) Energy Performance Program (EPP) administered in Ontario.

The goals of the PY2021 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 CO2 equivalent using IESO's Cost-Effectiveness Tool.
- Estimate job impacts of the program.
- Monitor the overall effectiveness and comprehensiveness of key program elements.
- Analyze and make recommendations to improve the program.

This report contains the impact, process and cost effectiveness evaluation findings conducted for the EPP program in Program Year (PY) 2021.

2 METHODOLOGY

This section of the report outlines the methodologies used in the PY2021 evaluation of EPP. More detailed descriptions of the evaluation methodology are included in Appendix A.

2.1 EVALUATION APPROACH

Methods used to conduct this evaluation include energy modeling, engineering analysis, documentation review, best practice review, and interviews with program participants and their energy service providers.

One overarching theme guiding this evaluation is the limited number of program participants. Compared with other programs, participation in EPP is composed of a relatively small number of participants with one or more participating facilities. For the verification of gross energy and demand savings, EcoMetric evaluated all performance periods that had completed the required Savings Report by March 31, 2022. The Savings Report is a program document that summarizes the participant's annual savings and completed measures for their participating facilities. Along with the Savings Report, participants provide the whole-building meter data for the performance period. For the net savings analysis and process evaluation, EcoMetric attempted to interview all participants active in the program.

In total, three facilities were evaluated and reported as part of the sample frame. All three facilities began their first performance period (Year 1) in PY2020. Two of these facilities had their second performance periods (Year 2), completed in PY2021 and were ready for evaluation. The remaining facility had not yet submitted their Year 2 Savings Report in time for inclusion in this evaluation. EPP provides incentives for both performance years based on savings over baseline consumption. However, to avoid double counting of savings achieved in Year 1, Year 2 savings are expressed as incremental over Year 1 throughout this report.

Due to the nature of the year-long performance periods, there is a long time period between enrollment of facilities and technical review of savings for reporting and evaluation. As such, no EPP facilities were ready for evaluation in the PY2019 or PY2020 evaluation reports. It is expected that at least four more facilities will be ready for review and reporting as part of next year's PY2022 evaluation.

2.2 GROSS SAVINGS VERIFICATION

EcoMetric performed energy and peak demand savings analyses for all facilities and their performance periods in the sample frame. EcoMetric calculated energy and peak demand realization

rates, the ratio of gross verified savings to reported savings, at the facility-level. EcoMetric applied these facility-level realization rates to the reported savings for the corresponding facilities in the sample frame.

Due to the transition from the IF to the 2021-2024 CDM Framework, the second-year performance periods for most EPP participants will be cut off by the IESO on December 31, 2021—resulting in some partial year performance periods. To estimate gross and net savings for EPP, the technical reviewer and EcoMetric annualized the savings to represent a full year of performance.

A more detailed description of EcoMetric's gross savings verification methodology is included in Appendix A.

2.3 NET SAVINGS ANALYSIS

Net-to-gross (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 the program. The calculation of NTG factors includes *free-ridership*, defined as the savings customers would have achieved in the absence of the program's influence, and *spillover*, defined as energy savings influenced by the program but not formally incentivized and/or claimed by the program. The primary method of determining a program NTG ratio is through direct query telephone interviews with decision-maker(s) at participating customer organizations. EcoMetric combined the NTG data collection with the process evaluation data collection through in-depth interviews with program participants.

EcoMetric analyzed interview data to calculate two core components of free-ridership: 1) **Intention** to implement the energy efficiency measure(s) in the absence of program funds, and 2) **Influence** of the program in the decision to carry out the energy efficiency measure(s). Each of these components is scored from zero to 50, resulting in a combined free-ridership score between zero and 100.

$$\text{Total Free-ridership score} = \text{Intention score} + \text{Influence score}$$

To estimate spillover and any potential influence of participation on subsequent facilities that received incentive funding, EcoMetric asked participants and vendors about influenced projects, the degree of program influence, the project size, and whether they received program support.

The free-ridership (FR)[4] and spillover (SO)[5] factors will be used to estimate net savings using the following formula:

$$\text{Net savings} = \text{verified gross savings} * (1 - FR + SO)$$

EcoMetric calculated the aggregate results for free-ridership and spillover for each participant and applied the results to all of the participant's facilities in the sample frame.

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, measures' effective useful 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 PROCESS EVALUATION

The objectives of the PY2021 EPP evaluation were to:

- Assess participant experience with the program
- Assess the program's effectiveness in building internal capacity for commercial participants to pursue energy efficiency projects and practices
- Explore participants' decision-making criteria for participation in EPP versus other Save on Energy programs
- Assess participants' intentions in re-enrolling in the updated EPP in the 2021-2024 CDM Framework
- Assess the impact of COVID-19 on participants' energy efficiency plans
- Assess effectiveness of program processes

[4] The energy savings customers would have achieved in the absence of the program's influence
[5] The energy savings influenced by the program but not formally incentivized and/or claimed by the program

EcoMetric leveraged two data collection activities to explore key research topics and gather market actor perspectives to complete the process evaluation:

- **Participant interviews:** In-depth interviews over the phone were attempted with all current participating organizations.
- **Energy Service Provider (ESP) interviews:** In-depth interviews over the phone were attempted with all consultants hired by EPP participants to help with program participation.

Table 4: PY2021 EPP Process Interview Completions

Market Actor	Interviews Completed	Population	Response Rate
Participants	6	12	50%
Energy Service Providers	1	3	33%
TOTAL	**7**	**15**	**47%**

EcoMetric found that many of the participant representatives and their ESPs were difficult to contact and interview. This was an issue that EcoMetric also faced in the PY2019 evaluation. EcoMetric did not attempt to interview ESPs for participating organizations that had dropped out of the program due to the low response rate for these market actors. However, the one ESP that EcoMetric was able to interview was a high-level manager for an ESP that works with six active EPP participating organizations. This ESP representative was able to speak on the unique experiences of the different participating organizations and how they worked together throughout the program.

2.6 OTHER ENERGY EFFICIENCY BENEFITS

2.6.1 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.

2.6.2 JOB IMPACTS ESTIMATION

EcoMetric leveraged the Statistics Canada (StatCan) custom input/output (I/O) economic model to estimate the job impacts of EPP. The StatCan I/O model simulates the economic and employment impacts of economic activity related to the program. The economic activity related to the EPP 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 EPP:

- 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.

3 IMPACT EVALUATION

This section details the results from the impact evaluation of EPP in PY2021.

3.1 GROSS VERIFIED SAVINGS RESULTS

Gross verified savings results for the PY2021 EPP are summarized in Table 5. In Year 1 (PY2020), the three EPP facilities achieved 1,414 MWh of gross verified energy savings. In Year 2 (PY2021), the two EPP facilities achieved 50 MWh of incremental energy savings. When combined, the total gross verified energy savings for EPP are 1,464 MWh, representing 100% of reported savings. Total gross verified summer peak demand savings for EPP are 0.18 MW, representing 100% of total reported savings.

Table 5: PY2021 EPP Gross Verified Savings Results

Program Year	Performance Periods Evaluated & Reported	Energy Realization Rate	Gross Verified Energy Savings (MWh)	Gross Summer Peak Demand Savings (MW)
2020 – Year 1 Performance	3	100%	1,414	0.17
2021 – Year 2 Performance	2	100%	50	0.01
TOTAL	**5**	**100%**	**1,464**	**0.18**

The technical reviewer's baseline modeling, adjustments for non-routine events (NREs), and savings calculations were accurate and complete—represented by the 100% gross energy and demand savings realization rates.

Figure 1 depicts the gross verified savings for the three facilities in the PY2021 evaluation sample frame. All three facilities started their first performance periods (Year 1) in PY2020. Facilities 1 and 2 completed their second performance period (Year 2) in PY2021 and had their Savings Report and performance data ready for evaluation by the PY2021 evaluation sample cutoff date. The second performance period for Facility 3 will be included in the PY2022 evaluation sample frame and report.

As highlighted in Figure 1, facilities 1 and 2 made slight gains in gross verified energy savings in year 2 with incremental increases of 31 MWh and 19 MWh, respectively. Including both years of performance, facility 1 achieved 237 MWh, and facility 2 achieved 503 MWh savings compared to their baseline consumption.

Figure 1: Facility-level Gross Verified Savings Results

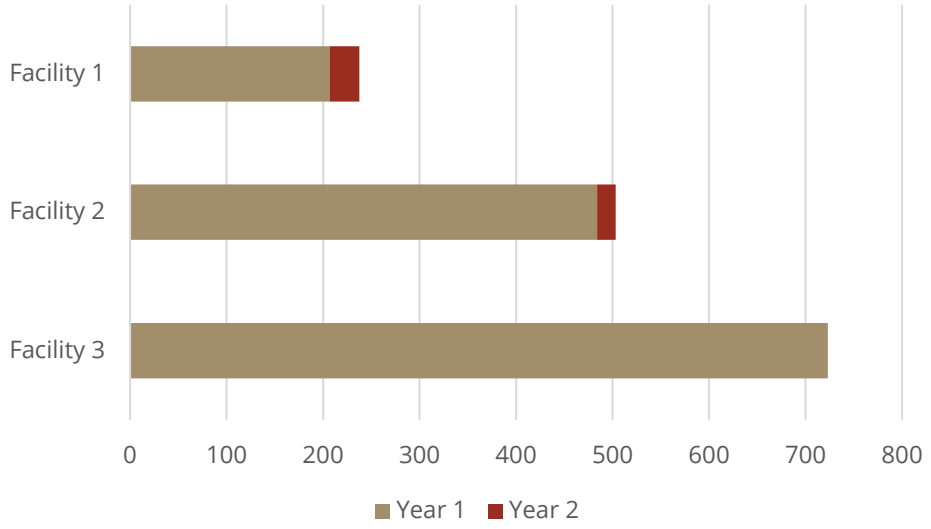
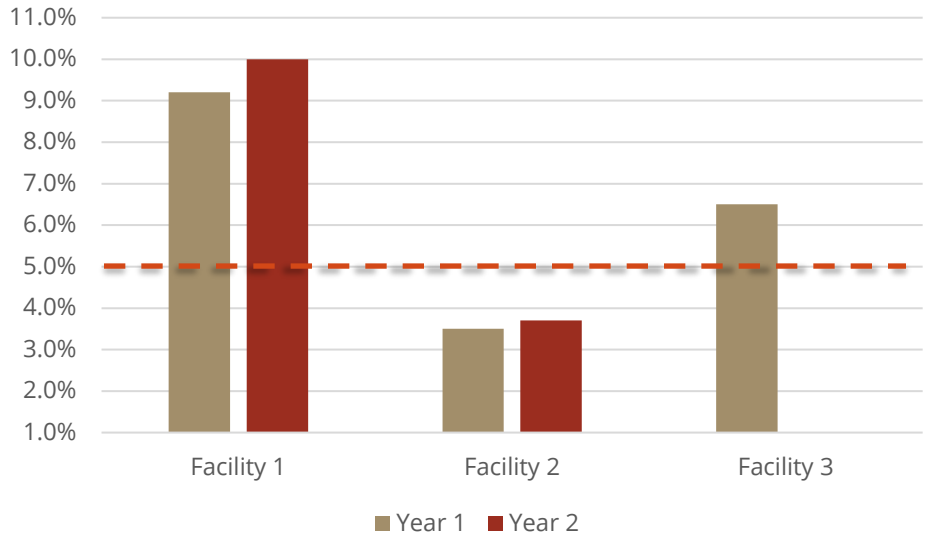


Figure 2 depicts the facilities' energy savings performance against their baseline energy consumption. EPP has a performance goal of 5% savings over baseline energy consumption by the end of the second performance year. Facilities 1 and 3 exceeded this goal, while facility 2 fell short of the 5% performance goal.

Figure 2: Facility-level Savings Performance



Current EPP participants include organizations from several commercial sectors in Ontario, including commercial real estate, universities, retail stores, and recreational buildings. For the PY2021 EPP

sample frame, 51% of gross verified savings came from universities, while the remainder came from commercial real estate-managed office buildings.

While the current methodology and process of estimating savings for EPP is strong and resulted in a 100% energy and demand realization rate, EcoMetric has a few findings and recommendations to improve the success of EPP.

Finding 1a: Summer peak demand estimates were not required per current program guidelines but were provided in the technical review reports for all three participant sites. Peak demand was calculated based on available load shape peak coincidence factors. Load shape-based peak demand reduction calculation methods will differ from those of meter based.

Finding 1b: Hourly whole-facility meter data was not consistently provided by participants. EcoMetric understood through communications with the IESO program team that the hourly data requirement in the program rules documents was not strictly enforced for participants. The three facilities EcoMetric evaluated in PY2021 used daily and not hourly models.

> **Recommendation 1:** Consider a consistent peak demand calculation methodology for future frameworks. With the focus on summer peak demand reductions in the 2021-2024 CDM Framework, require hourly data for all participants and a meter-based peak demand reduction calculation. This will encourage consistent and accurate summer peak demand reduction estimations.

Finding 2: Energy efficiency projects were implemented throughout the first performance period by all participating organizations in the sample frame, potentially limiting annual savings in those periods.

> **Recommendation 2:** Consider introducing an implementation period before the first pay for performance period starts to allow participants time to install measures. This will allow participants to achieve savings and earn incentives throughout the entire performance period, as opposed to spending much of the period implementing measures as experienced in the current program design. Implementing projects before the performance period also helps improve savings verification modeling where shutdowns to systems for upgrades occur outside the performance period and do not have to be controlled for in the model.

Finding 3: One participating organization did not provide project commissioning dates. The organization provided project start dates, but without the date of commissioning, it is challenging to understand cumulative savings trends across the performance period.

> **Recommendation 3:** Require that participating organizations provide project start and commissioning dates for all energy efficiency projects they complete while in the program.

Finding 4: Details on the project scale and installed measure quantities were not provided by the participating organizations during the application or savings review phases. These details were also not provided by technical reviewers.

> **Recommendation 4:** Require that participating organizations provide more project details in the Savings Reports, including quantity of measures and specifics on the baseline and efficient conditions.

Finding 5: The baseline models that EcoMetric reviewed in the PY2021 sample frame were created using the M&V software RETScreen. EcoMetric found these models easy to evaluate and validate. The version of RETScreen used by EPP participants does not allow for hourly modeling.

> **Recommendation 5:** EcoMetric encourages the use of hourly models for increased granularity and accuracy, especially in the 2021-2024 CDM Framework, where summer peak demand reductions are incentivized.

Finding 6: Technical reviewers accurately removed participant savings from projects incentivized through the Save on Energy Retrofit program—totaling 292,033 kWh between the three facilities. Simultaneous participation in EPP and Retrofit is not allowed, but there has been crossover participation in the IF. Two of the three facilities included in the PY2021 sample frame had Retrofit savings removed by the technical reviewers. Retrofit savings from previous participation must be removed from EPP facilities to avoid incentivizing the same savings twice. However, summer peak demand reductions from Retrofit projects were not removed from EPP summer peak demand reduction estimates.

Recommendation 6: Ensure that the EPP technical reviewer removes both energy savings and summer peak demand reductions that were incentivized by any IESO program at all facilities during their EPP participation. There is a strict rule for EPP participation in the 2021-2024 CDM framework that states Retrofit projects must be in-service before the commencement of the EPP baseline period. If correctly enforced, this rule will remove the risk of incentivizing the same savings twice.

3.1.1 NON ROUTINE EVENT ADJUSTMENTS

Accurately identifying and adjusting for non-routine events (NREs) is critical for a meter-based P4P program's success. This is especially true over the past few years, where the operations of businesses and their facilities have been significantly affected by the COVID-19 pandemic. To support non-routine adjustments (NRAs) affected baseline and performance periods, the IESO provided detailed guidance[6] and resources to participants to ensure a uniform and accurate NRA process for NREs that EPP participants faced throughout their participation. This guidance included references to the International Performance Measurement and Verification Protocol's *Guide to Non-Routine Events and Adjustments* (October 2020)[7].

Finding 7: The IESO's *EPP COVID-19 Guidance Document – March 2021* provided participants with clear guidance on their options to deal with major NREs resulting from COVID-19. Direct references to IPMVP protocols resulted in uniform and accurate NRAs for facilities in the PY2021 sample frame.

Recommendation 7: Consider holding interactive webinars for EPP participants and ESPs aimed at providing technical support to address COVID-related impacts to program performance. Being able to discuss common challenges, experiences, and solutions together should provide EPP participants with the tools and plans they need to handle NREs and NRAs in EPP models. For EPP participants in the 2021-2024 CDM Framework, their baselines will be heavily impacted by COVID-19. Providing enhanced

[6] https://saveonenergy.ca/-/media/Files/SaveOnEnergy/Industry/EPP/EPP-COVID-19-Guidance-Document.ashx
[7] EVO 10400 – 1:2020 https://evo-world.org/en/news-media/evo-news/1195-release-of-the-ipmvp-application-guide-on-non-routine-events-and-adjustments

support and holding interactive webinars for EPP participants early in their interaction with the program should help set them up for success.

3.2 NET VERIFIED SAVINGS RESULTS

Table 6 summarizes the EPP net verified savings below. The program-level NTG for EPP was 38% for the PY2021 sample frame, reflecting a free-ridership score of 62%. There is no spillover as all savings are captured in the facility-level meter-based analysis. Total net first-year savings for EPP were 555 MWh, and net peak demand savings were 0.07 MW. One-hundred percent of the energy savings achieved by the sample frame persist to 2022.

Table 6: PY2021 EPP Net Verified Savings Results

Program Year	Performance Periods Evaluated & Reported	NTG Ratio	Net Energy Savings (MWh)	Net 2022 Energy Savings (MWh)	Net Summer Peak Demand Savings (MW)	Net 2022 Summer Peak Demand Savings (MW)
2020 – Year 1 Performance	3	37%	518	518	0.07	0.07
2021 – Year 2 Performance	2	75%	37	37	0.00	0.00
TOTAL	**5**	**38%**	**555**	**555**	**0.07**	**0.07**

Finding 8: One of the participating organizations in the PY2021 EPP sample frame had a free-ridership score of 100%. This organization expressed that they would have done the same project on the same timeline without the EPP program support or incentive. This organization also has a robust sustainability program where equipment is replaced at regular intervals to match the highest level of efficiency available at the time.

Recommendation 8: Target sectors that do not regularly upgrade their facilities to maintain the highest levels of efficiency. In the commercial real estate sector, target companies that own and manage mid-tier buildings that often fall behind the market in terms of energy efficiency compared to Class A buildings.

EcoMetric completed net to gross analyses for several other participating organizations not in the PY2021 sample frame. Their NTGRs were between 60-80%, in line with historical values for this program.

4 COST EFFECTIVENESS EVALUATION

As shown in Table 7, EPP is not cost effective from the Total Resource Cost (TRC) test perspective using a benefit/cost threshold of 1.0 in PY2021. However, the program is cost effective from the Program Administrator Cost (PAC) test perspective in PY2021. To calculate the cost effectiveness of the program, EcoMetric used the net savings from Year 1 and Year 2 performance periods summarized in Table 6. From the TRC test perspective, the ratio was negatively affected by the two facilities' second year of performance, where increased project spending did not result in equal gains in energy and demand savings. Furthermore, the cost effectiveness was also negatively affected by the high level of free-ridership in the sample frame.

Overall, the program has a strong LUEC $0.02/kWh. This metric compares the normalized costs incurred by the IESO per unit of avoided energy to the lifetime benefits of the avoided energy.

EcoMetric expects the cost effectiveness of EPP to improve as more facilities complete their performance period and the effects of free-ridership are diminished with the inclusion of more participating organizations.

Table 7: PY2021 EPP Cost Effectiveness Results

TRC Costs	TRC Benefits	TRC Ratio	PAC Costs	PAC Benefits	PAC Ratio	LUEC $/kWh
$416,399	$261,688	**0.63**	$104,485	$227,554	**2.18**	0.02

EcoMetric expects cost-effectiveness ratios for EPP to improve in the next evaluation period as more facilities complete their performance periods. Due to the transition from CFF to IF in PY2019 and impactful disruptions from the COVID-19 pandemic, the PY2021 sample frame does not represent the full performance of the program. EcoMetric expects the free-ridership level in the program to greatly decline in the next evaluation, which will result in higher levels of net energy and demand savings that support improved cost-effectiveness results.

5 PROCESS EVALUATION

This section details the results from the process evaluation of EPP in PY2021.

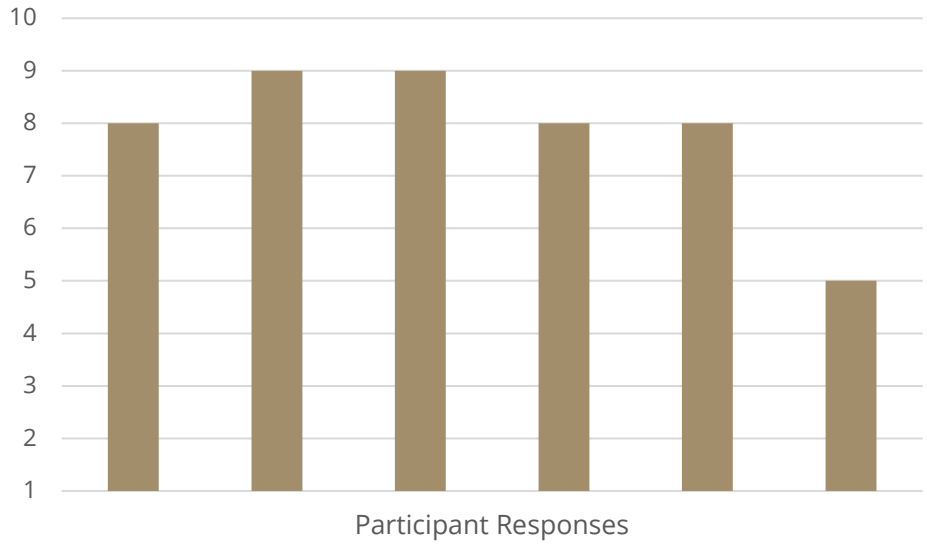
5.1 PARTICIPANT PERSPECTIVES

EcoMetric completed in-depth interviews with six active EPP participants. These participants were selected for interviews at each organization due to their experience with the program and interaction with the IESO and technical reviewers. This section details the learnings from those interviews.

5.1.1 PARTICIPANT EXPERIENCE

EcoMetric asked participants to rate their overall satisfaction with EPP on a scale of one to ten, with one as extremely dissatisfied and ten as extremely satisfied. Overall satisfaction scores ranged from five to nine. Five out of the six respondents provided a favorable satisfaction score of eight or higher. This aligns with the satisfaction scores from EPP participants in the PY2019 evaluation, where three of the four respondents provided a score of eight or higher. EcoMetric also asked participants if their participation in EPP met, exceeded, or did not meet their expectations. Five out of the six participants responded that the program met their expectations, with one participant responding that their experience exceeded their expectations.

Figure 3: EPP Customer Satisfaction



EPP participants were generally satisfied with their overall experience with EPP. The satisfaction results of the process survey align with the results from the PY2019 process evaluation, highlighting continued participant satisfaction with the program.

5.1.2 SAVE ON ENERGY PROGRAM PARTICIPATION

The IESO's Save on Energy portfolio of programs is designed to optimize customers' energy choices with the goal of making Ontario's energy systems more efficient. By design, there is overlap between the program to enhance participation and allow customers to find the best path for their organization towards efficiency upgrades and improvements. EcoMetric asked the participants if they were aware or heard of any active Save on Energy programs. Their responses are summarized in Table 8. All six participants were aware of Save on Energy programs, including Retrofit and Energy Manager. Five out of the six participants were aware of the Small Business program.

Table 8: Save on Energy Program Awareness

Save on Energy Program	Count of Aware (n=6)	Percent of Participants Interviewed
Retrofit	6	100%
Energy Manager	6	100%
Small Business	5	83%

All six participating organizations had received incentives from a Save on Energy program prior to their enrollment in EPP. Five out of the six participating organizations had received more than ten Save on Energy incentives before EPP. The two most popular projects that participants said they had received Save on Energy incentives for were lighting and HVAC. Participants also mentioned receiving incentives for variable frequency drive (VFD) and control projects.

All six participants interviewed are currently enrolled in the IESO's Energy Manager program. EcoMetric asked participants to rate the energy manager's influence on their organization's decision to complete energy efficiency projects through EPP on a scale of one to ten, with ten being extremely influential and one not at all influential. Four of the six participants responded with an eight, denoting a high level of influence from the energy manager. Two of the six participants responded that the energy manager had no influence on their EPP projects.

Finding 9a: All EPP participants interviewed are aware of other Save on Energy programs and had received incentives from the programs prior to their enrollment in EPP.

Finding 9b: All EPP participants interviewed are currently enrolled in the Energy Manager program. Energy managers were highly influential in most participating organizations' decisions to undertake energy efficiency projects for EPP.

Recommendation 9: Considering the high degree of crossover between the Energy Manager Program and EPP, enhance the IESO EM-focused training offered to develop

modeling skills essential for successful participation in EPP. IESO-funded energy managers are highly skilled professionals who can help participating organizations with identifying projects and modeling.

Four of the six participants interviewed plan on participating in EPP in the 2021-2024 CDM Framework. The IESO has a goal of achieving 440 MW of peak demand savings and 2.7 TWh of electricity savings through the new 2021-2024 CDM Framework. This framework is designed to have a greater focus on advancing energy management practices and empowering customers to drive efficiency measures to achieve their goals. The EPP model is an excellent fit to incentivize the development of energy management practices and reward customers for facility-level energy savings seen at the meter.

To gauge the market's interest and preference in CDM program designs, EcoMetric asked participants if their organizations would have interest in participating in programs with the following incentive structures:

- Energy Efficiency Auction, where your organization submits a proposal for an energy efficiency project(s) during a province-wide auction period, naming a $/kWh or $/kW savings incentive.
- Strategic Energy Management, where your organization leads a holistic approach to continuously improve energy performance and is supported by tools, education, and expertise provided by the IESO.
- Prescriptive incentives
- Other, please specify

Table 9 summarizes the participants' responses. All six participants were interested in participating in a Strategic Energy Management (SEM) program. Half of the participants were interested in participating in a program with prescriptive incentives. The least popular incentive structure was the energy efficiency auction, where only one participant showed interest. The IESO could create more interest for an energy efficiency auction in the commercial sector by promoting an aggregator model, where an experienced company attracts customers, develops energy efficiency projects, and monitors savings achieved. This type of model would ease the burden of participation for commercial customers, making the auction more attractive. None of the participants provided an "other" incentive structure, but two participants recommended blending the SEM and prescriptive structures into a single offering.

Table 9: Program Incentive Structure Interest

Incentive Structure	Count of Interested (n=6)	Percent of Participants Interviewed
Energy Efficiency Auction	1	17%
Strategic Energy Management	6	100%
Prescriptive Incentives	3	50%

Finding 10: All EPP participants interviewed would be interested in participating in a Strategic Energy Management program.

Recommendation 10: As the Energy Manager program shifts to an SEM framework later in the 2021-2024 CDM Framework, develop EPP and P4P program-focused training and resources so that participating organizations can take ownership of energy management at their EPP enrolled facilities.

The IESO's largest CDM program is Retrofit which provides incentives for prescriptive and custom energy efficiency measures. As detailed in Section 3.1, savings from Retrofit projects are removed from EPP savings to avoid incentivizing the same savings twice. Organizations are not allowed to concurrently participate in both programs. In the PY2021 sample frame, 292,033 kWh of gross energy savings incentivized through Retrofit were removed from EPP. Database reviews and interviews with participants conducted by EcoMetric show a high level of crossover between the Retrofit and EPP programs. Retrofit provides more certainty for incentive amounts, especially for prescriptive measures. There is also a lower level of M&V required for Retrofit projects than EPP. EPP, on the other hand, has the potential to be more rewarding if savings performance is strong and persisting at the meter, but a higher level of effort must be given to meet M&V standards for baseline and performance modeling.

EcoMetric asked EPP participants to describe their organization's decision-making process when deciding whether to pursue an energy efficiency project through Retrofit or to enroll the facility in EPP. Participants' answers varied, but a few common themes were revealed.

- Two participants specifically stated that they preferred EPP over Retrofit for larger projects due to the opportunity to be rewarded for their performance at the meter.
- Cost-benefit analysis. Most participants said that they calculate the expected incentives from each program against the costs to decide which program to pursue.
- Timing is important. The timeline of the EPP application process needs to align with organizations' project and budget timelines.

With the transition from IF to the 2021-2024 CDM Framework came the termination of the custom project track in the Business Retrofit program and the Process and Systems Upgrades Program (PSUP). PSUP provided incentives for engineering studies and implementation of large, capital intensive projects mostly in the industrial sector. EcoMetric asked EPP participants if EPP meets their organizations needs for custom, non-prescriptive energy efficiency projects in the absence of these program options. Half of the participants answered yes, that EPP does meet their organizations needs for custom projects. Two participants were not sure, and one answered that they did not have any custom projects planned.

Table 10: Does EPP meet needs for custom energy efficiency projects?

	Participant Response (n=6)	Percent of Participants Interviewed
Yes	3	50%
No	-	-
Don't know	2	33%
No projects planned	1	17%

Finding 11: EPP meets participating organization's needs for custom, non-prescriptive energy efficiency projects in the absence of PSUP and custom path for the Retrofit program in the 2021-2024 CDM framework.

Recommendation 11: In EPP marketing and outreach, highlight the ability and freedom to implement diverse and custom measures to achieve savings that are measured at the whole-building level. Target this outreach to past PSUP participants and Retrofit participants with a history of implementing custom projects.

Commercial and industrial organizations have many diverse opportunities for support and funding in Ontario's sustainability landscape. Every year more federal and natural gas offerings are made available to organizations that help support their sustainability and decarbonization goals.

Decarbonization and sustainability have become a priority for the commercial sector in Ontario. EcoMetric investigated if electrification could conflict with electric energy focused programs like EPP. EcoMetric asked EPP participants how EPP fits into their organization's sustainability and decarbonization plans in comparison to other energy efficiency programs such as offerings from Natural Resources Canada (NRCan) and natural gas offerings from gas utilities. The common theme from participants was that they pursue the most financially attractive offering regardless of the source. They answered that they are participants in EPP because the program provided the best

incentives that aligned with their sustainability goals. One participant who was active in several programs had high praise for EPP.

> *[EPP] fits harmoniously into our energy efficiency plans. We utilize [the IESO's] program more effectively than with other incentive programs.*
>
> *- EPP Participant*

Finding 12: EPP participants interviewed expressed that EPP fits well into their sustainability plans. No clear conflicts between decarbonization-driven electrification and EPP were found amongst the program participants. However, EPP program marketing, outreach, and documentation does not include sufficient resources focused on decarbonization opportunities afforded by the program.

> **Recommendation 12:** In program marketing and outreach, highlight how EPP can be leveraged to meet decarbonization goals through reduction of greenhouse gas emissions associated with the purchase of electricity.

5.1.3 COVID-19 IMPACTS AND SOLUTIONS

EcoMetric also asked participants if COVID-19 had impacted their organization, specifically their energy efficiency and sustainability plans. Since the first stay-at-home and social distancing orders were implemented in Ontario in early 2020, commercial and industrial organizations have seen drastic changes to their economics and certainly facility operations. To no surprise, all participants said that COVID-19 had impacted their organization in one way or another.

When asked specifically how COVID-19 impacted participant organizations' energy efficiency and sustainability plans, there were positive and negative impacts.

Positive Impacts

- "Some cost savings from running equipment less"
- "Energy usage was down 25%"
- "We had more time to get projects done"
- Our sustainability plans did not change

Adverse Impacts

- "Cancelled projects"

- "We faced additional costs from increased ventilation needs"
- "Unpredictable occupancy"

Several participants responded that things were beginning to go back to normal. Participants also expressed that their organizations continued to focus on energy efficiency and sustainability throughout the pandemic, remaining flexible to achieve their goals.

> *At the beginning of the [pandemic], all of our major capital projects were put on hold. We switched our focus from capital-intensive [projects] to operational-intensive projects like Building Automation System (BAS) programming and operational improvements.*
>
> *- EPP Participant*

Finding 13: While all EPP participating organizations interviewed were affected by COVID-19, many participants maintained their focus on energy efficiency and sustainability. The most common solution to move forward with energy efficiency projects during the pandemic was to focus on operational and maintenance (O&M) measures.

> **Recommendation 13:** Target marketing and outreach for IESO's Capability Building Initiatives (CBIs) toward EPP participants. The CBIs provide enhanced training and resources to meet energy efficiency goals. In the 2021-2024 CDM Framework, the CBIs have evolved to include more in-depth training and a focus on low-cost, no-cost O&M measures as a solution for organizations who have seen their capital investment budgets shrink due to COVID-19.

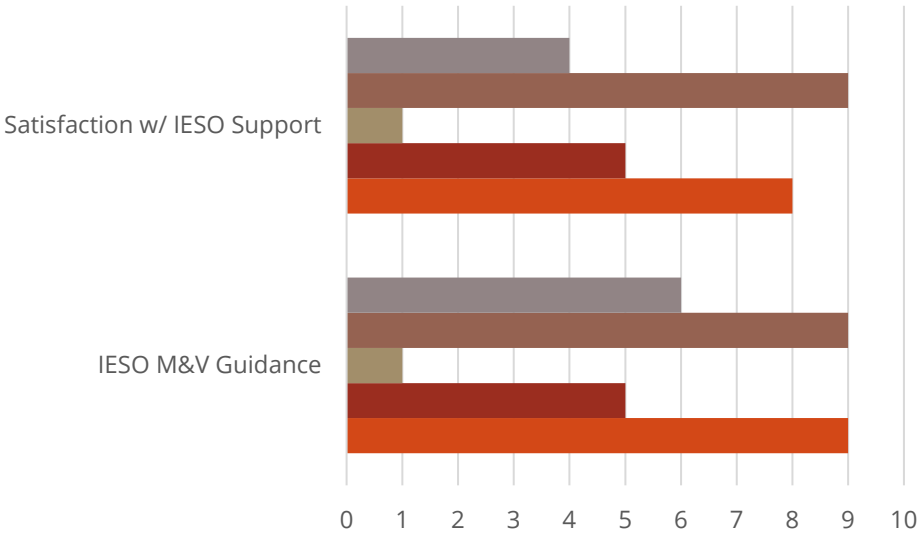
To support EPP participants through the pandemic, the IESO developed detailed M&V guidance[8] for participants impacted by interruptions and NREs. The IESO also provided enhanced support to EPP participants throughout the pandemic to help participants work through COVID-19 impacts on their baselines, performance periods, and measure implementation plans. This enhanced support

[8] https://saveonenergy.ca/-/media/Files/SaveOnEnergy/Industry/EPP/EPP-COVID-19-Guidance-Document.ashx

included resources on the Save on Energy website, direct emails and phone calls to participants, and meetings with IESO program staff.

EcoMetric asked EPP participants to rate the helpfulness of the IESO's M&V guidance on a scale of one to ten, with one being "extremely unhelpful" and ten being "extremely helpful". Further, EcoMetric asked EPP participants to rate their satisfaction with the IESO's support during the pandemic. Figure 4 details their responses.[9] For the M&V guidance and IESO support, answers ranged from one to nine. The average score for the M&V guidance was six out of ten, while the average score for the IESO's support was 5.4 out of ten.

Figure 4: Satisfaction with IESO COVID-10 Guidance and Support[10]



In terms of the M&V guidance, participants who answered less than 6 out of 10 said that the guidance was not helpful because their ESP handles all of the modeling work. As summarized in Section 3.1, EcoMetric reviewed the guidance document and concluded that it provides participants with strong guidance and options to handle NREs and NRAs connected to the pandemic. The low scores provided by these participants are not a sign of dissatisfaction with the guidance but an

[9] One participant was unable to answer the satisfaction questions on the M&V guidance and IESO support throughout the pandemic.
[10] Each colour represents the responses of a single respondent.

indication that they did not leverage the documents as they do not work on the modeling themselves.

Participants who were not satisfied with IESO support during the pandemic cited that they had active projects left with several outstanding questions. Another participant said that the time and cost of modeling and dealing with COVID-related NREs and NRAs was much higher than originally anticipated and cut into the benefits of program participation.

> *[Our] current problem [with EPP] is a result of the circumstances with COVID-19 and having to adjust. Having technical support [through] EPP to work through challenges over the next few years is really the critical thing to quantify savings.*
> *- EPP Participant*

Finding 14a: The IESO's M&V Guidance related to NREs and NRAs resulting from the pandemic provides participants and their ESPs with clear and sound strategies to address the impacts of the pandemic in their EPP models.

Finding 14b: A portion of EPP participants interviewed was not satisfied with the IESO's support during the pandemic, citing several unanswered questions and uncertainty surrounding active projects.

> **Recommendation 14.** Consider holding interactive webinars for EPP participants and ESPs aimed at providing technical support to address COVID-related impacts to program performance. Being able to discuss common challenges, experiences, and solutions together should provide EPP participants with the tools and plans they need to handle NREs and NRAs in EPP models. For EPP participants in the 2021-2024 CDM Framework, their baselines will be heavily impacted by COVID-19. Providing enhanced support and holding interactive webinars for EPP participants early in their interaction with the program should help set them up for success.

5.1.4 PROGRAM CHALLENGES AND IMPROVEMENTS

Understanding participants' perspectives on how to better meet their energy efficiency needs is an important step toward improving CDM program design and delivery. EcoMetric asked participants how EPP could be improved. They provided the following suggestions:

- Improve technical support to overcome COVID-19 related challenges

- Streamline the application process, reduce the baseline modeling red tape
- Advertise the support and services offered by the IESO better

The most common theme among the suggestions for improvement of EPP was around streamlining the application and baseline modeling process. In EcoMetric's PY2019 evaluation of EPP, participant satisfaction scores for the application and baseline modeling processes were mixed, and average response values trailed those for their overall satisfaction with the program. EcoMetric provided recommendations to streamline the application and baseline modeling process in PY2019, including dropping the rolling 28-day variance analysis report and removing the CUSUM baseline requirements.

Finding 15: EPP participants continue to see the application and baseline modeling processes as complicated and time consuming. However, EcoMetric has seen the IESO take steps toward streamlining the processes in the 2021-2024 CDM Framework EPP offering. These steps include easing baseline model requirements, encouraging the use of automated M&V software, and providing incentives before project implementation to ease the financial burden of design, implementation, and M&V participants face before their first performance payment.

> **Recommendation 15:** Consider hiring a consultant company with streamlined M&V software to handle the modeling for all EPP facilities. EPP participants would only need to provide data, and technical reviewers would have consistent models and outputs to review. This would remove the most impactful barrier to EPP participation, the baseline modeling and application woes.

5.2 ENERGY SERVICE PROVIDER PERSPECTIVES

Most EPP participants hire ESPs to help them identify and implement energy efficiency projects, as well as meet the program's M&V requirements. As summarized in Section 2.5, EcoMetric was only able to interview one ESP in the PY2021 evaluation. However, this ESP works with six active EPP participating organizations. The ESP representative was able to speak on the unique experiences of the different participating organizations and how they worked together throughout the program.

5.2.1 ESP EXPERIENCE

The ESP respondent rated their overall satisfaction with the program as a seven out of ten, with one being "extremely dissatisfied" and 10 being "extremely satisfied". However, the program did not meet the expectations of the ESP respondent. The source of dissatisfaction was the lengthy application and baseline modeling process. The ESP claimed they were still dealing with unapproved applications and

baseline models that first began more than two years ago. The overall application process was described as opaque and confusing, with program rules changing without proper notice to participants resulting in resubmittals of key documents and models. Further, baseline modeling decisions by technical reviewers were described as conflicting and inconsistent between facilities and participants.

When asked how EPP could be improved, the ESP suggested that baseline modeling requirements could be relaxed. To improve the application review phase, the ESP suggested that the technical reviewer provide a more consistent voice and decision-making process across all baseline models and applications. A central modeling consultant would help streamline the review process, and participants would not have to be involved in the back and forth of baseline modeling.

5.2.2 SAVE ON ENERGY PARTICIPATION

Similarly, to participants, EcoMetric asked the ESP what drives organizations' decision-making process when pursuing energy efficiency rebates through the Retrofit and when to enroll a facility in EPP. Supporting the findings from the participant interviews, the ESP responded that organizations do a cost-benefit analysis and compare the returns on a rebate versus performance payments.

In terms of opportunities in the 2021-2024 CDM Framework, the ESP agrees with the participants that an SEM program is a great fit for the commercial participants common to EPP.

[SEM] is great for the commercial sector. The more you can train energy managers in companies, the better for energy conservation. [Energy managers'] jobs are focused on energy efficiency. They don't get pulled into other things.

- EPP Energy Service Provider

EcoMetric also asked the ESP if EPP meets organizations' needs for custom, non-prescriptive energy efficiency projects considering that PSUP and the custom Retrofit path are not available in the 2021-2024 CDM Framework. The ESP responded that EPP does meet the needs for custom projects by covering all measure types and allowing M&V to focus on what savings show up at the meter instead of individual, complicated engineering calculations.

The EPP program in the CFF and IF has had trouble recruiting industrial customers. This is largely due to the complexities of energy consumption at many industrial facilities, resulting in difficulties in creating baseline models necessary for whole-building P4P programs. EcoMetric asked the ESP how EPP could be made more attractive to industrial customers. The ESP provided the following suggestions:

- Provide case studies on how industrial facilities develop baseline models with complex operations and up to three working shifts
- Develop guidance on how to leverage variables beyond weather in multivariate regressions, including production and occupancy

EcoMetric agrees with the multivariate regression approach to EPP modeling for industrial customers. Most commercial buildings with steady energy consumption patterns can develop models that pass program statistical requirements by using weather as a variable alone. However, industrial facilities often have complex operations and energy consumption patterns that are not affected by the weather. By leveraging multivariate regressions, industrial facilities can use several variables that correlate closely to energy use to create baseline models that meet EPP statistical requirements. This is also an issue that would be solved by using a central modeling consultant that would have the expertise to use multivariate regressions and create baseline models for industrial facilities with complex operations and energy consumption trends.

Finding 16: There are no industrial participants in EPP in the IF. This is mostly due to the difficulty of creating a baseline model that meets the program's requirements for industrial facilities with complex processes and systems.

Recommendation 16: Develop guidance and case studies for multivariate regressions of energy use in industrial facilities to be leveraged for baseline models that meet EPP statistical standards. Include details on how to leverage production and occupancy data for facilities that do not have energy consumption that is correlated to weather.

Refer to Recommendation 15. Bringing in a central modeling consultant would preclude the need to develop guidance and case studies on modeling for participants.

5.2.3 COVID-19 IMPACTS

EcoMetric asked the ESP the same questions about COVID-19 impacts as were asked to EPP participants. While COVID-19 did not affect the day-to-day interactions the ESP had with their EPP clients, the projects that their clients could implement were affected. Supporting the feedback from participants, the ESP detailed the struggles participants had with implementing capital-intensive projects due to the economic uncertainty caused by the pandemic. They cited several energy efficiency projects that were deferred until cash flows returned to pre-pandemic levels.

EcoMetric also asked the ESP about their satisfaction with the IESO's support throughout the pandemic on the same one to ten scale as the participants. The ESP ranked their satisfaction with the IESO support as a six out of ten. This was due to the timing of the publishing of the M&V guidelines more than a year after COVID-19 began to affect participating organizations.

6 OTHER ENERGY EFFICIENCY BENEFITS

The projects and savings incentivized by EPP have benefits beyond kWh and peak kW savings, including but not limited to greenhouse gas emissions reductions and economic impacts such as job creation. This section summarizes those other energy efficiency benefits.

6.1 AVOIDED GREENHOUSE GAS EMISSIONS

Net first-year greenhouse gas (GHG) reductions total 59 metric tonnes of CO_2 equivalent (CO_2e) for the PY2021 sample frame, as summarized in Table 11. As EPP projects focus on electricity savings, these GHG reductions are derived from the avoided generation of electricity. Over the lifetime of the PY2020 sample frame projects, net GHG reductions total 899 tonnes of CO_2e.

For the PY2021 sample frame, the cost of first-year GHG emissions reductions is $7,003 per tonne of CO_2e from the total resource cost perspective. Emissions reductions for the first performance periods only cost $2,009 per tonne. In the second performance period, facilities spent a higher amount on energy efficiency projects for a smaller incremental increase in energy savings that drive emissions reductions.

Table 11: PY2021 EPP Greenhouse Gas Emissions Impacts

Program Year	First Year GHG Impacts (tonnes CO_2e)	First Year GHG Reduction Costs ($/tonne CO_2e) (Total Resource Costs)
2020 – Year 1 Performance	55.16	$2,009
2021 – Year 2 Performance	4.30	$71,049
Total	**59.46**	**$7,003**

Finding 17: The EPP program has major potential to achieve GHG reductions through reduced electric energy use and summer peak demand reductions. However, GHG impacts are only calculated well after performance periods by the evaluation contractors. Many of the commercial participants that the EPP program target have decarbonization goals.

Recommendation 17: Provide EPP participants with an emissions tool to calculate their reduction of greenhouse gas emissions associated with the purchase of electricity. For simple emissions reductions calculations based on annual kWh and peak kW savings, the GHG module of the IESO CE Tool would be a good framework to leverage for the tool.

6.2 JOB IMPACTS SUMMARY RESULTS

As summarized in Table 12, EPP created an estimated six jobs in PY2021. Of these 6 jobs, two were direct jobs, two were indirect jobs, and two were induced jobs. Nearly all the jobs created from the program were local, with five of the six total jobs created in Ontario. In terms of full-time equivalent (FTE), the program created an estimated five FTEs.

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 EPP 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 EPP participation (i.e., the re-spending of income and benefits resulting from EPP program activity).

Table 12: PY2021 EPP Job Impacts

Job Impact Type	Ontario FTE	Canada Total FTE	Ontario Jobs	Canada Total Jobs
Direct	2	2	2	2
Indirect	1	1	2	2
Induced	2	2	1	2
Total	**5**	**5**	**5**	**6**

EPP PY2021 resulted in the creation of 6 jobs throughout Canada, five of which are in Ontario. EcoMetric expects the job impacts of the program to increase in the PY2022 evaluation when more facilities will be ready for reporting.

6.2.1 EPP JOB IMPACTS BY INDUSTRY

Table 13 summarizes the job impacts by industry for EPP in PY2021. Most jobs were created in the provincial and territorial government services, followed by retail trade and non-residential building construction. In the I/O model, the other provincial and territorial government services represent the administration of the program. Retail trade and non-residential building construction represent the jobs create to implement the EPP projects at the participating facilities.

Table 13: PY2021 EPP Job Impacts by Industry

Industry	Ontario FTE	Canada Total FTE	Ontario Jobs	Canada Total Jobs
Other provincial and territorial government services	2	2	2	2
Retail Trade	1	1	2	2
Non-residential building construction	2	2	1	2
Total	**5**	**5**	**5**	**6**

6.2.2 EPP JOB IMPACTS BY MODEL SHOCK

As described in Section 2.6.2, job impacts of EPP were estimated 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 EPP. As summarized in Table 14, the demand shock resulted in four jobs created in Ontario and five total jobs throughout Canada. Three other jobs in Canada were created by the program outside of the direct implementation of projects and program participation.

Table 14: EPP Job Impacts from Demand for Goods and Services Shock

Job Impact Type	Ontario FTE	Canada Total FTE	Ontario Jobs	Canada Total Jobs
Direct	2	2	2	2
Indirect	1	1	1	1
Induced	1	1	1	2
Total	**4**	**4**	**4**	**5**

The job impacts of the business reinvestment shock are summarized in Table 15. 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 one job created in Ontario.

In the process and NTG interviews with program participants, EcoMetric asked participants directly what percentage of bill savings they planned to reinvest. EcoMetric then applied this percentage to each participant's bill savings calculated based on net energy savings multiplied by IESO's retail electricity rate. All respondents in the PY2021 sample frame said their organization planned on reinvesting 100% of their bill savings. However, due to the relatively low participation in the program, this reinvestment did not result in major job impacts.

Table 15: EPP Job Impacts from Business Reinvestment Shock

Job Impact Type	Ontario FTE	Canada Total FTE	Ontario Jobs	Canada Total Jobs
Direct	-	-	-	-
Indirect	-	-	1	1
Induced	1	1	-	-
Total	**1**	**1**	**1**	**1**

The final shock, program funding, represents the increase in Ontario residents' hydro bills from funding EPP. The IESO estimates that 35% of the portfolio's funding is supplied by the residential sector. EcoMetric applied this 35% to the total $37,049 administrative budget for EPP in PY2021, resulting in a shock of ~$13,000. As this shock represents less money available to the residential sector for spending throughout the economy, the job impacts are negative. However, as the EPP budget was so small in PY2021, the shock did not result in any job losses in Canada.

7 KEY FINDINGS AND RECOMMENDATIONS

Table 16 presents the key findings and recommendations from the PY2021 evaluation for EPP. While the realization rate for the gross energy and demand savings verification was 100%, EcoMetric's impact-focused recommendations are aimed at improving program documentation and processes to set the program up for success in the demand-focused 2021-2024 CDM Framework.

On the process side of the evaluation, EcoMetric's recommendations address feedback received from participants and the ESP. EcoMetric expects that the types of participating organizations interviewed for the IF evaluation will be representative of those participating in EPP in the 2021-2024 CDM Framework, including commercial real estate firms, office buildings, universities, retail stores, and other commercial buildings. Much of the feedback from participants was regarding the difficulties in baseline modeling and navigating the impacts of COVID-19. EcoMetric's recommendations to address these issues focus on leveraging the existing training and support IESO provides, which should dovetail nicely with the IESO's focus on more in-depth training in the Capability Building Initiatives and SEM offering in the 2021-2024 CDM Framework.

In the PY2019 evaluation, EcoMetric provided the IESO with several recommendations to improve the baseline modeling and application phase of EPP, which was also highlighted by participants then as a challenge to program participation. In a review of the EPP rules and requirements in the 2021-2024 CDM Framework, EcoMetric was pleased to see that many recommended program updates were made. These updates include:

- Providing an up-front incentive before the first performance period to help offset capital measure costs participants face early in program participation
- Streamlining the application and modeling processes by dropping the CUSUM and 28-day rolling variance report
- Looking to leverage automated and streamlined M&V software to reduce the modeling burden on participants
- Requiring hourly baseline and performance data that can be leveraged for accurate peak demand reduction estimations
- Requiring climate normalized data for performance period savings estimates

Table 16 presents the conclusions and recommendations from the PY2021 evaluation findings for the EPP.

Table 16: EPP Evaluation Findings and Recommendations

Findings and Conclusions		Recommendations	
EPP Impact Evaluation Results (Section 3)			
1a	Summer peak demand estimates were not required per current program guidelines but were provided in the technical review reports for all three participant sites. Peak demand was calculated based on available load-shape peak coincidence factors. Load shape based peak demand reduction calculation methods will differ from those of meter-based.	1	Consider a consistent peak demand calculation methodology for future frameworks. With the focus on summer peak demand reductions in the 2021-2024 CDM Framework, require hourly data for all participants and a meter-based peak demand reduction calculation. This will encourage consistent and accurate summer peak demand reduction estimations.
1b	Hourly whole-facility meter data was not consistently provided by participants. EcoMetric understood through communications with the IESO program team that the hourly data requirement in the program rules documents was not strictly enforced for participants. The three facilities EcoMetric evaluated in PY2021 used daily and not hourly models.	1	See Recommendation 1

Findings and Conclusions		Recommendations	
2	Energy efficiency projects were implemented throughout the first performance period by all participating organizations in the sample frame, potentially limiting annual savings in those periods.	2	Consider introducing an implementation period before the first pay for performance period starts to allow participants time to install measures. This will allow participants to achieve savings and earn incentives throughout the entire performance period, as opposed to spending much of the period implementing measures as experienced in the current program design. Implementing projects before the performance period also helps improve savings verification modeling where shutdowns to systems for upgrades occur outside the performance period and do not have to be controlled for in the model.
3	One participating organization did not provide project commissioning dates. The organization provided project start dates, but without the date of commission, it is challenging to understand cumulative savings trends across the performance period.	3	Require that participating organizations provide project start and commissioning dates for all energy efficiency projects they complete while in the program.
4	Details on the project scale and installed measure quantities were not provided by the participating organizations during the application or savings review phases. These details were also not provided by technical reviewers.	4	Require that participating organizations provide more project details in the Savings Reports, including the quantity of measures and specifics on the baseline and efficient conditions.
5	The baseline models that EcoMetric reviewed in the PY2021 sample frame were created using the M&V software RETScreen. EcoMetric found these models easy to evaluate and validate. The version of RETScreen used by EPP participants does not allow for hourly modeling.	5	EcoMetric encourages the use of hourly models for increased granularity and accuracy, especially in the 2021-2024 CDM Framework, where summer peak demand reductions are incentivized.

Findings and Conclusions		Recommendations	
6	Technical reviewers accurately removed participant savings from projects incentivized through the Save on Energy Retrofit program—totaling 292,033 kWh between the three facilities. Simultaneous participation in EPP and Retrofit is not allowed, but there has been crossover participation in the IF. Two of the three facilities included in the PY2021 sample frame had Retrofit savings removed by the technical reviewers. Retrofit savings from previous participation must be removed from EPP facilities to avoid incentivizing the same savings twice. However, summer peak demand reductions from Retrofit projects were not removed from EPP summer peak demand reduction estimates.	6	Ensure that the EPP technical reviewer removes both energy savings and summer peak demand reductions that were incentivized by any IESO program at all facilities during their EPP participation. There is a strict rule for EPP participation in the 2021-2024 CDM framework that states Retrofit projects must be in-service before the commencement of the EPP baseline period. If correctly enforced, this rule will remove the risk of incentivizing the same savings twice.
7	The IESO's *EPP COVID-19 Guidance Document – March 2021* provided participants with clear guidance on their options to deal with major NREs resulting from COVID-19. Direct references to IPMVP protocols resulted in uniform and accurate NRAs for facilities in the PY2021 sample frame.	7	Consider holding interactive webinars for EPP participants and ESPs aimed at providing technical support to address COVID-related impacts on program performance. Being able to discuss common challenges, experiences, and solutions together should provide EPP participants with the tools and plans they need to handle NREs and NRAs in EPP models. For EPP participants in the 2021-2024 CDM Framework, their baselines will be heavily impacted by COVID-19. Providing enhanced support and holding interactive webinars for EPP participants early in their interaction with the program should help set them up for success.
8	One of the participating organizations in the PY2021 EPP sample frame had a free-ridership score of 100%. This organization expressed that they would have done the same project on the same timeline without the EPP program support or incentive. This organization also has a robust sustainability program where equipment is replaced at regular intervals to match the highest level of efficiency available at the time.	8	Target sectors that do not regularly upgrade their facilities to maintain the highest levels of efficiency. In the commercial real estate sector, target companies that own and manage mid-tier buildings that often fall behind the market in terms of energy efficiency compared to Class A buildings.
	EPP Process Evaluation Results (Section 5)		

Findings and Conclusions		Recommendations	
9a	All EPP participants interviewed are aware of other Save on Energy programs and had received incentives from the programs prior to their enrollment in EPP.	9	Considering the high degree of crossover between the Energy Manager Program and EPP, enhance the IESO EM-focused training offered to develop modeling skills essential for successful participation in EPP. IESO-funded energy managers are highly skilled professionals who can help participating organizations with identifying projects and modeling.
9b	All EPP participants interviewed are currently enrolled in the Energy Manager program. Energy managers were highly influential in most participating organizations' decisions to undertake energy efficiency projects for EPP.		See Recommendation 9
10	All EPP participants interviewed would be interested in participating in a Strategic Energy Management program.	10	As the Energy Manager program shifts to an SEM framework later in the 2021-2024 CDM Framework, develop EPP and P4P program-focused training and resources so that participating organizations can take ownership of energy management at their EPP enrolled facilities.
11	EPP meets participating organization's needs for custom, non-prescriptive energy efficiency projects in the absence of PSUP and custom path for the Retrofit program in the 2021-2024 CDM framework.	11	In EPP marketing and outreach, highlight the ability and freedom to implement diverse and custom measures to achieve savings measured at the whole-building level. Target this outreach to past PSUP participants and Retrofit participants with a history of implementing custom projects.
12	EPP participants that were interviewed expressed that EPP fits well into their sustainability plans. No clear conflicts between decarbonization-driven electrification and EPP were found amongst the program participants. However, EPP program marketing, outreach, and documentation do not include sufficient resources focused on decarbonization opportunities afforded by the program.	12	In program marketing and outreach, highlight how EPP can be leveraged to meet decarbonization goals through reduction of greenhouse gas emissions associated with the purchase of electricity.

Findings and Conclusions		Recommendations	
13	While all EPP participating organizations interviewed were affected by COVID-19, many participants maintained their focus on energy efficiency and sustainability. The most common solution to move forward with energy efficiency projects during the pandemic was to focus on operational and maintenance (O&M) measures.	13	Target marketing and outreach for IESO's Capability Building Initiatives (CBIs) toward EPP participants. The CBIs provide enhanced training and resources to meet energy efficiency goals. In the 2021-2024 CDM Framework, the CBIs have evolved to include more in-depth training and a focus on low-cost, no-cost O&M measures as a solution for organizations who have seen their capital investment budgets shrink due to COVID-19.
14a	The IESO's M&V Guidance related to NREs and NRAs resulting from the pandemic provides participants and their ESPs with clear and sound strategies to address the impacts of the pandemic in their EPP models.	14	Consider holding interactive webinars for EPP participants and ESPs aimed at providing technical support to address COVID-related impacts to program performance. Being able to discuss common challenges, experiences, and solutions together should provide EPP participants with the tools and plans they need to handle NREs and NRAs in EPP models. For EPP participants in the 2021-2024 CDM Framework, their baselines will be heavily impacted by COVID-19. Providing enhanced support and holding interactive webinars for EPP participants early in their interaction with the program should help set them up for success.
14b	A portion of EPP participants interviewed was not satisfied with the IESO's support during the pandemic, citing several unanswered questions and uncertainty surrounding active projects.		See Recommendation 14
15	EPP participants continue to see the application and baseline modeling processes as complicated and time consuming. However, EcoMetric has seen the IESO take steps towards streamlining the processes in the 2021-2024 CDM Framework EPP offering. These steps include easing baseline model requirements, encouraging the use of automated M&V software, and providing incentives before project implementation to ease the financial burden of design, implementation, and M&V participants face before their first performance payment.	15	Consider hiring a consultant company with streamlined M&V software to handle the modeling for all EPP facilities. EPP participants would only need to provide data, and technical reviewers would have consistent models and outputs to review. This would remove the most impactful barrier to EPP participation, the baseline modeling and application woes.

Findings and Conclusions		Recommendations	
16	There are no industrial participants in EPP in the IF. This is primarily due to the difficulty of creating a baseline model that meets the program's requirements for industrial facilities with complex processes and systems.	16	Develop guidance and case studies for multivariate regressions of energy use in industrial facilities to be leveraged for baseline models that meet EPP statistical standards. Include details on how to leverage production and occupancy data for facilities that do not have energy consumption correlated to weather. Refer to Recommendation 15. Bringing in a central modeling consultant would preclude the need to develop guidance and case studies on modeling for participants.
	EPP Other Energy Efficiency Benefits (Section 6)		
17	The EPP program has major potential to achieve GHG reductions through reduced electric energy use and summer peak demand reductions. However, GHG impacts are only calculated well after performance periods by the evaluation contractors. Many of the commercial participants that the EPP program target have decarbonization goals.	17	Provide EPP participants with an emissions tool to calculate the reduction of greenhouse gas emissions associated with the purchase of electricity. For simple emissions reductions calculations based on annual kWh and peak kW savings, the GHG module of the IESO CE Tool would be a good framework to leverage for the tool.

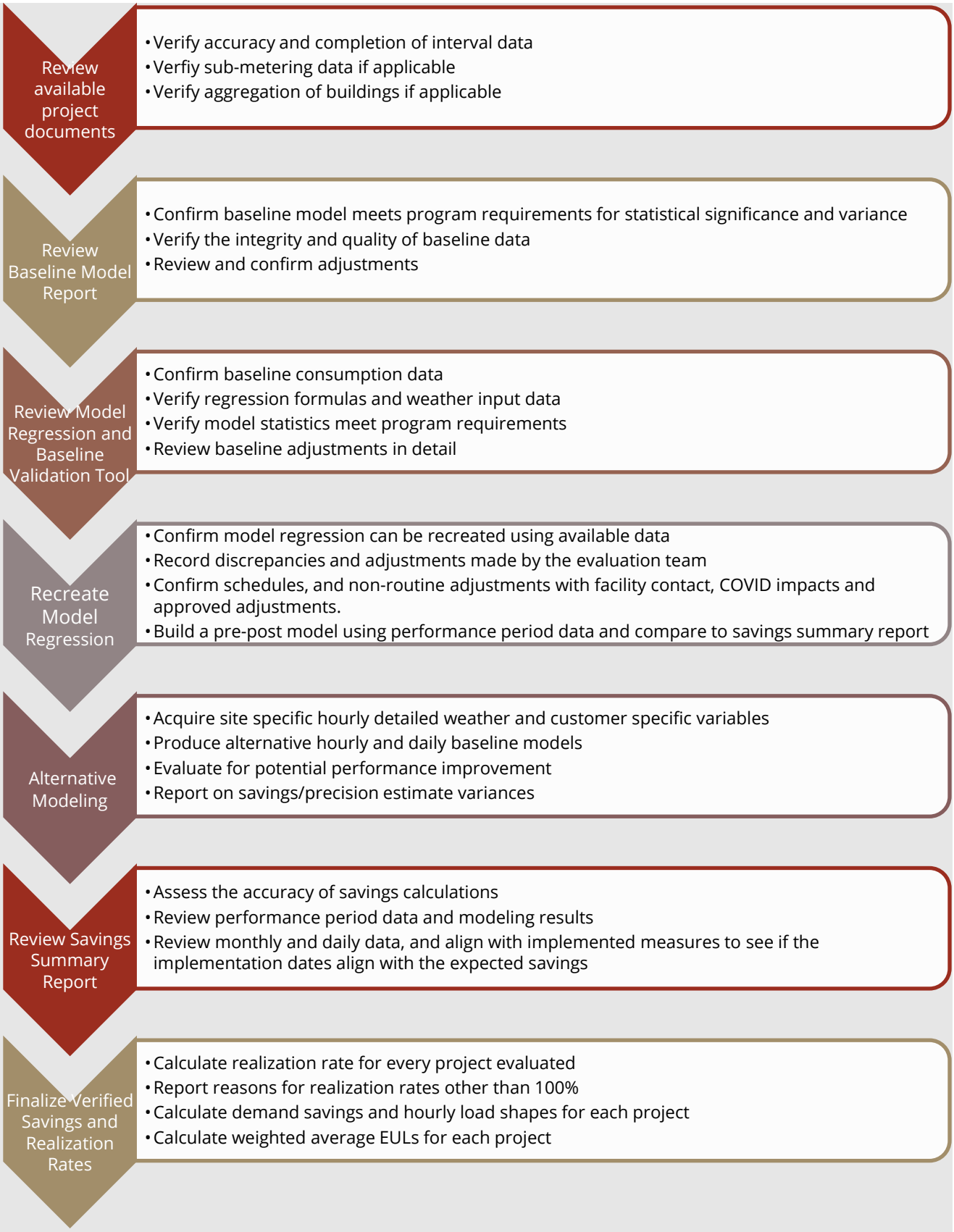
Appendix A DETAILED METHODOLOGIES

A.1 Gross Savings Analysis

Savings Reports and meter data submitted by the participants for each facility were the primary data sources for EPP project audits in the gross impact evaluation. Project verification audits are the key to the accurate evaluation of programs and an important task to verify the accuracy of the M&V conducted by the customer, contractor, technical reviewer, and other parties in the implementation process. The audits consisted of a desk review of project documentation available in the program database, such as applications, IESO savings worksheets, billing regressions performed by participants, third-party consultants, technical reviewers (if applicable), savings reports, invoices for equipment or contracting services, and any other documentation available to the IESO.

The protocol for the verification audits for all EPP facilities in the sample is summarized in Figure 5.

Figure 5: Project Audit Protocol



A.1.1 Data Sources

Table 17 contains a list of the data sources used from verifying gross savings.

Table 17: Data & Information Sources Used for Impact Evaluation

Item	Description	Source
Reported (Ex-Ante) participation & savings	Savings by facility	Technical Reviewer & IESO
Participant contact information	For survey administration	IESO
Project files	Including M&V data & documentation	Technical Reviewer & IESO
Reporting template(s)	For impact reporting	IESO
Cost-effectiveness parameters	Avoided costs, admin costs, discount rate	IESO
Greenhouse gas (GHG) factors	Emissions factors based on generation mix of the electrical grid	IESO

Savings reports and meter data submitted by the participants for each facility site will be the primary data sources for EPP projects in the gross impact evaluation.

A.2 Effective Useful Life Estimation

EPP projects at facilities can have several diverse energy-saving measures completed throughout the program's performance period. To assess the persistence of energy and demand savings resulting from EPP, EcoMetric a weighted average approach to develop a single Effective Useful Life (EUL) for the multiple measures completed at each facility. EcoMetric estimated measure savings using engineering algorithms and industry references. Each individual measure was assigned an EUL based on IESO Measure and Assumption Lists (MALs), Technical Reference Manuals (TRMs) in similar jurisdictions, or industry norms. Facility-level EULs allowed for the analysis of the long-term savings impact of EPP on a diverse set of projects and facilities. EcoMetric calculated a weighted average EUL for each facility based on the estimated savings for each individual measure.

As EPP awards savings from capital and O&M measures at the same rate, behavioural measures can be popular in the program. As these measures are dependent on human behaviour, such as remembering to turn off lights, it is often difficult to assign a measure persistence to determine

lifetime savings. EcoMetric followed the guidance provided by the IESO for evaluating behavioural measures implemented in non-residential sectors.[11]

A default EUL of one year was applied to behavioural measures. If the documentation provided by the customer proves the measure will persist longer than one year, it can be awarded an EUL greater than one. Typical documentation to prove measure persistence can include maintenance plans, training schedules, corporate sustainability plans, and other project documentation. EcoMetric will conduct a secondary review of measures awarded an EUL greater than one year at the savings termination year to assess whether the measure is still occurring. This secondary review will be completed on a sampling basis of similar measure types or groups. EcoMetric will identify groupings of behavioural measures with a higher likelihood of persistence, including key measure characteristics and documentation that successfully supports the award of persistence greater than one year. Throughout the evaluation of EPP in IF, EcoMetric will collect evidence to provide a recommendation of a deemed EUL for behavioural measure types.

A.3 Cost Effectiveness Assumptions

- Program administrative costs (CE Tool Budget Inputs) were provided by the IESO Evaluation Team for PY2021.
- EcoMetric utilized the most appropriate IESO-provided load shape based on measure technologies and premise type.

A.4 Job Impacts Methodology

EcoMetric leveraged the Statistics Canada (StatCan) custom input/output (I/O) economic model to estimate the job impacts EPP. The StatCan I/O model simulates the economic and employment impacts of economic activity related to the program. The economic activity related to EPP 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 EPP:

- Demand for goods and services related to the program

11 IESO Memorandum: "Non-Residential Behavioural Measure Persistence". September 18, 2019.

- Business reinvestment
- Program funding

The demand for goods and services related to EPP 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 EPP 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 types of job impacts: direct impacts, indirect impacts, and induced impacts. Direct jobs include all jobs created by EPP 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 EPP participation (i.e., the re-spending of income and benefits resulting from EPP 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. This is 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.