ENERGY PERFORMANCE PROGRAM
Technical Guide

1. INTRODUCTION

This Technical Guide provides detailed information and instructions for Participants in the Energy Performance Program (EPP). The EPP is a pay-for-performance program offered by the IESO and delivered by a Service Provider.

The guide aims to provide the Program Applicants and Participants with a more detailed explanation of the Program Requirements, specifically as they relate to data collection and preparation; Baseline Energy Modeling; savings calculation; and outlier identification. In addition, the guide outlines the responsibilities of the EPP Applicant/Participant relating to Facility data as well as outlining the automated processes performed by the EPP Portal. It serves as a reference document to navigate through the Program and ensure compliance with the Program Requirements.

The Program is administered through the EPP Portal, which is designed to allow Applicants to input and upload data related to their Facilities. This includes information such as the building address, building type, total area, and other information required by the Program. Additionally, the EPP Portal allows Applicants to enroll their Facilities in the Program. The EPP Portal allows Program Participants to submit their Pay-for-Performance Period data, access results, and monitor their On-Peak and Off-Peak Electricity Savings. For each Facility that successfully enrolls in the Program, the Baseline Energy Model is automatically developed using the approaches outlined in this guide. The Baseline Energy Model is essential for evaluating the electricity savings achieved through the Pay-for-Performance Periods. The EPP Portal also tracks the Pre-Project and Performance Incentives for each Facility, the details of which are described in the EPP Portal User Guide.

Note that this document is to be interpreted in conjunction with the EPP Portal User Guide and EPP Participant Agreement. The User Guide functions as an instructional manual for the EPP Portal. The Participant Agreement specifies the criteria for participation in the Program and all other Program requirements, which are not covered within the scope of the Technical Guide.

Please note that capitalized terms used in this document are defined in Appendix A. The Technical Guide is subject to change from time to time.

2. EPP PORTAL OVERVIEW

2.1 EPP PORTAL

The EPP Portal is a custom-built, web-based, platform that streamlines the interaction between EPP Applicants/Participants and the Program. It offers a user-friendly interface where Applicants/Participants can register for the program, enroll their Facilities, view their estimated Performance Incentive, and monitor their incentive payments, including Pre-Project Incentives and Performance Incentives.

In addition to its front-end features, the EPP Portal is designed to perform Advanced Measurement and Verification[1] (AM&V) calculations. These calculations form the basis of accurately monitoring and assessing the On-Peak and Off-Peak Electricity Savings and Performance Incentives.

The EPP Portal can help Applicants/Participants with individual buildings, groups of buildings, or subsets of buildings (in a bulk-metered complex), to monitor and reduce their electricity consumption and benefit from the Performance Incentives offer by the Program.

2.2 FACILITY DATA

The EPP Portal is designed to import Facility data for the baseline period in order to establish the Baseline Energy Model and to import the data from a Pay-for-Performance Period, to assess the Total Electricity Savings in that period and to calculate eligible Performance Incentives. The Facility data includes electricity consumption data (kWh), at hourly or sub-hourly intervals, from an Approved Meter. This data, which should include at least 12 months of baseline history, is essential for enrolling the Facility in the Program. In addition, the Facility electricity consumption data from the same meter must be continuously available during the Pay-for-Performance Periods to evaluate On-Peak and Off-Peak Electricity Savings. When logs of operational parameters are accessible on an hourly or daily basis, such data can also be uploaded to the EPP Portal.

These operational parameters could serve as other independent variables for the Baseline Energy Model, if needed; however, this is not an initial requirement for the Baseline Energy Model.

The EPP Portal has functionality to retrieve the outdoor air temperature directly from Environment Canada weather stations. As a result, there is no need to manually input the

[1] Advanced Measurement and Verification (AM&V) methods also refers to M&V 2.0 methods, and uses automated analytics to quantify energy savings in near real-time.

weather data. Note that the outdoor air temperature is used as the first independent variable.

2.3 BASELINE ENERGY MODEL

The Baseline Energy Model (BEM) is developed automatically, by the EPP Portal, using the provided raw data and outdoor air temperature from the nearest Environment Canada weather station. The BEM is used to predict what the electricity consumption would have been during the Pay-for-Performance periods if no energy efficiency measures or practices had been implemented. The BEM inputs/outputs time intervals can be either hourly or daily. If the BEM is set to an hourly interval, it will process hourly data including electricity consumption and temperature and generate prediction reports for every hour. On the other hand, if the BEM is set to a daily interval, it predicts the daily electricity consumption only.

2.4 SAVINGS CALCULATION

For the EPP Program, IPMVP Option C (Whole Facility Analysis Approach)[2] is used. The EPP Portal calculates On-Peak and Off-Peak Electricity Savings on a continuous basis during the Pay-for-Performance Periods and the results are presented through the EPP Portal to the Participant. For the purposes of incentive payments, Total Electricity Savings will be finalized and verified on an annual basis by the Service Provider. On-Peak and Off-Peak Electricity Savings will be calculated as per Equation 1.

Equation 1.

$$\begin{aligned} &Avoided\ Electricity\ Consumption\ during\ On\ Peak\ and\ Off\ Peak\ Hours\ (kWh) = \\ &\quad Routinely\ Adjusted\ Baseline\ Electricity\ Consumption - \\ &\quad Pay\ for\ Performance\ Period\ Electricity\ Consumption\ \pm \\ &\quad Non\ Routine\ Adjustment\ to\ Pay\ for\ Performance\ Period\ Conditions \end{aligned}$$

[2] Efficiency Valuation Organization, IPMVP Core Concepts (2002). https://evo-world.org/en/products-services-mainmenu-en/protocols/ipmvp

Note that the BEM is used to generate routinely adjusted baseline electricity consumption. Any Non-Routine Events (NREs) & Non-Routine Adjustments (NRAs) are performed in accordance with the IPMVP Application Guide on Non-Routine Events & Adjustments, October 2020 EVO 10400 – 1:2020, on a case-by-case basis by the Service Provider.

3. DATA PROCESSING

The data preparation and cleaning described in this section assumes that only electricity consumption and outdoor air temperature data are required for developing the BEM. If other independent variables are required to develop a BEM that meets program requirements, the Service Provider will request additional data from the Applicant. For greater clarity, non-weather-related, on-site data, (which may serve as independent variables impacting electricity consumption) should be comprised of measured values on a minimum of daily granularity. Monthly data is not acceptable in the EPP Program. These additional values must be recorded automatically and continuously, with the source data from the Facility readily available for verification by the Service Provider, if required. Examples of on-site data can be, but are not limited to, measured occupancy, measured process loads, or other measured manufacturing data.

3.1 RAW DATA

The outdoor air temperature data for the Facility will be sourced directly from the nearest Environment Canada weather station, as determined by the Facility's address. If data from the nearest weather station is inadequate, the second and third closest weather stations will be utilized as supplementary data sources for the purpose of completing any missing outdoor air temperature values.

At a minimum, the most recent 12-months of electricity consumption data is required for the BEM. However, in case of missing values or unusual consumption patterns, it is advisable to provide the most recent 18-24 months of electricity consumption data. The electricity consumption data needs to be provided as time-series data in 15-minute or hourly intervals. The electricity consumption data must be collected from an Approved Meter.

When the data is uploaded to the EPP Portal, preprocessing is performed to clean the data and address any missing or duplicate values in the dataset and to conduct data integration. In general, missing values mean missing records or any non-numeric data such as null, NaN, or similar. Missing values can introduce bias, complicate the data handling process, and lead to misleading results. The data preprocessing goes beyond just handling missing values. Data integration includes combining data such as the outdoor temperature dataset with the electricity consumption dataset. Each of these steps helps to improve the quality of the data, making it more suitable for reliable analysis. The following specific actions are performed, as needed:

a. **Missing values in the electricity consumption data:** In the electricity consumption dataset, missing timestamps, non-numeric values as well as negative and zero values for electricity consumption, are treated as missing values. Where the available electricity consumption data is sufficient (please refer to Data Sufficiency for the details), the missing values will not hinder the construction of the BEM. However, if the data available to develop the BEM is deemed insufficient, the baseline period may be shifted, or alternatively, data from other periods may be selected instead. In these cases, the best approach will be determined on a case-by-case basis by the Service Provider. During the Pay-for-Performance periods, any instances of missing values could potentially impact the Energy Savings calculation. If this is the case, any period during which electricity consumption data is absent, is excluded from the Pay-for-Performance period. This approach ensures that the verification of Energy Savings is based on complete and accurate data, thereby enhancing the reliability of the results.

b. **Duplicate values in the dataset:** Duplicate timestamps are handled individually for both electricity consumption and temperature data. If there are instances where the same timestamp is repeated, and the differences between the corresponding electricity consumption or temperature readings are minor (as defined by a threshold established by the Service Provider), the EPP Portal will replace these duplicate values with their average. This ensures that each timestamp has a single, representative value for electricity consumption or temperature. If the differences are larger than the threshold, then the values are considered missing values and flagged in the dataset for either the Service Provider or the Applicant to address. This approach helps in maintaining the accuracy of the data while dealing with duplicate timestamps.

c. **Missing values in the dataset's timestamps:** If there are intervals where timestamps are missing, these intervals are automatically incorporated into the sequence of timestamps. However, the corresponding data for these added timestamps is treated as missing values. The next steps depend on whether the dataset is sufficient or not. In other words, while the timestamps can be filled in, the actual data for these timestamps is still missing. This approach ensures a consistent timestamp interval and verifies whether there is enough data to proceed.

d. **Missing values in the outdoor air temperature data:** If the outdoor air temperature changes smoothly from one hour to the next, interpolating over a 6-hour window around a missing observation is a widely acceptable approach for filling in the missing temperatures. The interpolation will be performed by the EPP Portal, and the filled data is flagged for future references. However, there may be instances where temperature data is missing for more than six consecutive hours. In such cases, the data from the selected weather station is compared with two nearby weather stations. If the temperature profiles from these stations align with the profile of the selected station before and after the period of missing values, the available metered temperature data is used to fill in the missing temperatures data. This ensures that the temperature data remains as accurate and complete as possible, even when some data is missing. If there is no alternative nearby weather station and the data is missing more than six consecutive hours, the Service Provider will investigate other possibilities to determine the missing values.

3.2 OUTLIER IDENTIFICATION

Outliers can be broadly classified into two types:

a. Local Outliers: These are data points that are significantly larger or smaller than their immediate neighbours. For example, in an electricity consumption dataset, a sudden spike for a short duration could be considered a local outlier.

b. Global Outliers: These are data points that are significantly different from the entire dataset. For example, if a Facility's electricity consumption for a particular month is consistently higher compared to all other months, despite no significant changes in outdoor air temperature or occupancy, this could be identified as a global outlier. This means that the data point is not just an anomaly in its immediate context but is unusual when compared to the entire dataset.

Identifying these outliers is crucial as they can impact the accuracy of Total Electricity Savings calculations and the development of Baseline Energy Models. However, not all outliers represent errors; some may provide valuable insights into variations in electricity consumption. The EPP Portal's approach identifies the outliers for further examination by the Service Provider. It's also important to note that the Service Provider treats the identified outliers differently, depending on the specific requirements of the analysis. Some methods may require the removal of outliers, while others may necessitate their inclusion or adjustment on a case-by-case basis.

The EPP Portal uses the interquartile range (IQR) approach to detect global outliers of electricity consumption. IQR is calculated as the difference between the 75^{th} and 25^{th} percentiles and is used in statistical analysis to measure variability and to identify outliers. Any electricity consumption value that is more than three times the IQR above the median is considered an extreme value and is flagged for manual review by the Service Provider. The Service Provider reviews all identified outliers and determines whether to incorporate them as regular data or tag them as outliers. Subsequently the tagged outliers are considered similar to missing values. The EPP Portal does not have a built-in mechanism for identifying and managing local outliers and only global outliers are treated.

3.3 DATA SUFFICIENCY

A sufficient historical dataset, including data that covers different seasons and operating conditions is essential to establishing a reliable BEM. This means that the dataset should capture electricity consumption patterns across various time periods, taking into account seasonal variations and different operational scenarios. The EPP Portal automatically checks the data sufficiency of the electricity consumption dataset in accordance with the required coverage. Coverage refers to the range of available data in the three following categories after the processing of missing value and outliers:

1. **Daily Coverage** is the percentage of days in a period that have valid daily values. Daily coverage is defined by dividing the number of valid daily values by the total number of days in the period and multiplying by 100. The daily coverage is applicable to daily Baseline Models with a threshold of 90%. The 90% threshold is set as the default in the EPP Portal and is subject to change by the Service Provider on a case-by-case basis.

2. **Hourly Coverage** is the percentage of hours in a period that have valid hourly values. Hourly coverage is defined by dividing the number of valid hourly values by the total number of hours in the period and multiplying by 100. The hourly dataset is considered sufficient for hourly Baseline Energy Models if at least 90% of the data for that period is available. The 90% threshold is selected as the default in the EPP Portal and is subject to change by the Service Provider on a case-by-case basis.

3. **Monthly Coverage** is essential for verifying the BEM and accounting for seasonal trends. The EPP Portal's default monthly coverage threshold requires at least 90% availability of hourly/daily data for each month. If the total number of invalid data points (i.e., missing or outliers) exceeds this 10% threshold, the EPP Portal will not proceed further. The entire dataset needs to be reviewed by the Service Provider, and any data sufficiency issues need to be addressed. If the data for a specific month fails to meet the threshold, the baseline period may be adjusted (at the Service Provider's discretion) until a continuous 12-month period of historical data, that meets all thresholds, is obtained. This process ensures the robustness and reliability of the data used in the models, leading to more accurate and dependable results. Note that the exact thresholds may vary based on the specific requirements of the EPP Portal and the discretion of the Service Provider.

4. BASELINE ENERGY MODEL DEVELOPMENT

Once the data sufficiency is dealt with, the next step in the process is the development of the Baseline Energy Model. The most recent 12 months of data will be used to reflect the operation of the Facility. Subject to the sufficiency of data, different baseline periods might be considered acceptable. These will be evaluated on a case-by-case basis by the Service

Provider. The EPP Portal will develop the BEM using either CalTRACK[3] or ASHRAE modeling approaches. The EPP Portal initially attempts to establish a Baseline Energy Model using hourly intervals by comparing a model's "goodness-of-fit". The goodness-of-fit is a set of parameters that measures how well a statistical model fits with observed data. It can be used to compare different models or to test how well a model's predictions match the actual values. If the model's goodness-of-fit does not meet the Program's acceptance threshold (refer to Section 4.4), the EPP Portal will try to establish a daily model using aggregated hourly values. In scenarios where a Facility's electricity consumption primarily depends on parameters other than outdoor air temperature and occupancy schedules, the EPP Portal will be unable to develop a satisfactory model in the absence of these independent variables. Subsequently, the Service Provider will request additional information from the Applicant to proceed with developing the BEM.

4.1 CALTRACK APPROACH

CalTRACK is a set of methods to standardize the AM&V calculation based on the Time-of-Week and Temperature (TOWT) modeling approach developed by Lawrence Berkeley National Laboratory[4]. The TOWT approach assumes a piecewise linear regression, based on the outdoor air temperature for each hour of the week. The model treats temperature dependence during occupied and unoccupied periods separately.

The temperature data is segmented into a maximum of seven bins. A "bin" refers to a specific time interval in which temperature data is grouped together. Bins with fewer than 20 hours are combined with the next closest bin by dropping the larger bin endpoint, except for the largest bin, where the lower endpoint is dropped. Assuming that the bins are created using N bin endpoints, the temperature bins are constructed as follows:

- If the temperature T is greater than $B1$, the first temperature bin is $T1=B1$ and the algorithm proceeds to the next step. Otherwise, $T1=T$ and $Ti=0$ for $i=2,\ldots,N$.
- For $i=2,\ldots,N$, if the temperature T is greater than Bi, then $Ti=Bi-Bi-1$ and the algorithm proceeds to the next i. Otherwise, $Ti=T-Bi-1$ and $Tj=0$ for $j=i+1,\ldots,N$.
- If the temperature T is greater than BN, then the last temperature bin is equal to $T-BN$, and all other bins are equal to zero.

Subsequently, each week is divided into 168 hourly time-of-week intervals starting from Monday. Interval 1 is from midnight to 1 A.M. on Monday morning, interval 2 is from 1 A.M. to 2 A.M. and so on. If more than the 65% of the data points that correspond to a specific time-of-week are above the fitted curve, the corresponding hour is flagged as "Occupied",

[3] https://www.caltrack.org/

[4] https://buildings.lbl.gov/emis/assessment-automated-mv-methods

otherwise it is flagged as "Unoccupied." The Facility is expected to have a different response to temperature in occupied periods versus unoccupied periods. The TOWT algorithm uses a simple method to separate occupied from unoccupied time periods. It develops a simple linear regression with all the Baseline Energy Consumption and temperature data to determine occupied versus unoccupied time periods. It defines occupied times as those times of the week where the differences between the data and simple linear model prediction are positive 65% of the time or more. The unoccupied periods tend to be nights, weekends, and holidays. Where daily data is used, unoccupied periods tend to be weekends and holidays. The Baseline Energy Model is the aggregation of the occupied and unoccupied time periods for each time interval.

4.2 ASHRAE RP 1050 APPROACH

The ASHRAE RP 1050 approach pertains to linear regression models, which are characterized by changes in slope at a change point and are often used to describe different types of building and system electricity consumption. Change-point models are characterized by their numbers of parameters. The simplest of these model types are one-parameter and two-parameter models, where the slope does not change. An average (one-parameter) model reflects a Facility in which electricity consumption does not vary with any independent variable.

A two-parameter model establishes a linear relationship with a single independent variable. The model's parameters (the slope and intercept) characterize this relationship. This model type is typically suitable for facilities where electricity consumption exhibits consistent temperature dependency across a wide temperature range.

A three-parameter change-point model incorporates change points, employing distinct slope coefficients for line segments divided by these change points. The model's parameters include a constant for the zero-slope segment on one side of the change point, the change point itself, and the slope coefficient for the line segment on the other side of the change point. This model type is especially beneficial for facilities where electricity consumption usage is influenced by ambient temperature within a specific temperature range but is otherwise not temperature dependent.

A four-parameter change-point model is defined by an intercept, a change point, and the slopes on either side of the change point. This model type is particularly effective when applied to facilities where electricity consumption varies in its temperature dependency across different temperature ranges.

A five-parameter change-point model is characterized by two change points, two slopes, and an intercept. The slope between the two change points is zero, represented by a constant value. This model type is advantageous for forecasting electricity consumption dependent on both heating and cooling loads.

Multivariable regression, also referred to as multiple linear regression, is the last change-point model type, and is used when it's necessary to account for multiple independent variables beyond just outdoor air temperature in order to effectively model the electricity consumption.

4.3 BASELINE ENERGY MODELLING SEQUENCE

The EPP Portal attempts the CalTRACK approach first on an hourly basis. If the CalTRACK model does not meet the goodness-of-fit requirements, the ASHRAE RP 1050 approaches are attempted for hourly models. If the ASHRAE RP 1050 options still do not meet the goodness-of-fit requirements, then the ASHRAE multivariable regression approach is attempted on an hourly basis. This multivariable model can only be used if the Participant has provided independent variable data. This data will be requested from the Participant if needed.

If the hourly models do not yield a successful Baseline Energy Model, the process is then repeated with daily intervals following the same general sequence.

The EPP Portal has the capability to report the results of each model through a scorecard table. This table ranks the model's statistical metrics in comparison to the goodness-of-fit requirements.

4.4 BASELINE ENERGY MODEL REQUIREMENTS

The Baseline Energy Model must meet the following acceptance criteria for model goodness-of-fit:

a. The coefficient of variation of the root mean square error CV(RSME) shall be less than or equal to 25%. CV(RMSE) is calculated using Equation 2.

Equation 2.

$$CV(RMSE) = \frac{\sqrt{\frac{\sum_i^n \left(E_i - \hat{E}_i\right)^2}{n-p}}}{E_{avg}}$$

Where:

E_i is the measured electricity consumption in any time interval, in kWh

$\hat{E}_i$ is the model's predicted electricity consumption in any time interval, in kWh

E_{avg} is the average electricity consumption over all the time intervals, in kWh

n is the number of data points in the baseline period

p is the number of parameters in the model, e.g., *y = mx + b, p=2.*

b. The net mean bias error (NMBE) must be greater than -0.5% and less than 0.5%. NMBE is calculated using Equation 3.

Equation 3.

$$NMBE = \frac{\frac{1}{n}\sum_i^n (E_i - \hat{E}_i)}{E_{avg}} \times 100$$

Where:

E_i is the measured electricity consumption in any time interval, in kWh

$\hat{E}_i$ is the model's predicted electricity consumption in any time interval, in kWh

E_{avg} is the average electricity consumption over all the time intervals, in kWh

n is the number of data points in the baseline period

5. ENERGY SAVINGS

The Baseline Energy Model explained in Section 4 could be either a daily model or an hourly model.

When the BEM is an hourly model, the electricity savings calculated for each hour throughout the Pay-for-Performance Period are summed to yield the Total Electricity Savings. The On-Peak and Off-Peak Electricity Savings for this Program are determined by comparing the hourly electricity consumption, recorded during the Pay-for-Performance Period, with the expected hourly electricity consumption predicted by the BEM during on-peak and off-peak hours. The BEM predicts energy usage taking into account factors that impact energy use, such as change in the outdoor air temperature or occupancy. The avoided electricity consumption (as referred to in Equation 1) is calculated by subtracting the total electricity consumption during the Pay-for-Performance Period from the predicted electricity consumption according to the BEM. Results can be tabulated or charted with time series scatter plots, or with a cumulative sum (CUSUM) of savings plot, using the EPP Portal.

Given that the Pay-for-Performance Period Incentive Rates differ during on-peak and off-peak hours; it is important to note that the calculation of electricity savings is time specific. The On-Peak Electricity Savings are defined in the IESO EM&V Protocols[5] as the summation of the electricity savings occurring between 1:00pm – 7:00pm Eastern Daylight Time (EDT) during all days from June 1 through August 31, inclusive, that are not a weekend or Federal/Provincial holiday.

Equation 4.

$$\begin{aligned} &On\ Peak\ Electricity\ Savings(kWh), Hourly\ BEM \\ &\quad = \Sigma\ Avoided\ Hourly\ Electricity\ Consumption \\ &\quad\quad from\ June\ 1\ to\ August\ 31, excluding\ weekends\ and\ holidays \end{aligned}$$

When the Baseline Energy Model is a daily model, the Energy Savings calculated for each day throughout the Pay-for-Performance are summed to assess the Total Electricity Savings. To calculate the total On-Peak Electricity Savings, the sum of the daily electricity savings from June 1 to August 31, excluding weekends and federal/provincial holidays, is divided by four (which represents the fraction of peak hours in a day, as there are 6 peak hours and 24 hours in a day).

Equation 5.

$$\begin{aligned} &On\ Peak\ Electricity\ Savings\ (kWh), Daily\ BEM \\ &\quad = \Sigma\ Avoided\ Daily\ Electricity\ Consumption \\ &\quad\quad from\ June\ 1\ to\ August\ 31, excluding\ weekends\ and\ holidays \\ &\quad\quad \times \frac{6\ peak\ hours}{24\ hours\ per\ day} \end{aligned}$$

[5] https://www.ieso.ca/en/Sector- Participants/Energy-Efficiency/Evaluation-Measurement-and-Verification

APPENDIX A – GLOSSARY OF TERMS

The following capitalized terms are used throughout this document. Note that these definitions are copied directly from the Participant Agreement and are placed here for ease of reference. Some of the definitions refer to "this document" or a specific section of the document, which in context, refers to the Participant Agreement and not this Guide:

"**Agreement**" means this Energy Performance Program Participant Agreement, including all recitals and Schedules, the Application and any additional documents approved by IESO hereunder, as it or they may be amended, restated or supplemented from time to time.

"**Application**" means a complete application for an incentive in respect of a Facility or Facilities under the Energy Performance Program submitted by a Participant via the EPP Portal to the IESO for approval.

"**Approved Meter**" means one of the following:

a) a meter that meets Measurement Canada requirements for revenue billing, including approval by type, has been tested and sealed by an accredited Measurement Canada meter shop, and has had a Measurement Canada S-E-04 inspection by a firm accredited by Measurement Canada for this work. The Measurement Canada meter requirements can be found here: Measurement Canada Meter Requirements

b) a meter that meets the following requirements:

   i. is a solid-state, true root mean square, electric meter or watt transducer;

   ii. has been calibrated and verified in accordance with the manufacturer's instructions to be accurate within +/- 0.5%;

   iii. and has been approved by the IESO, in its sole and absolute discretion, for use at the Facility and for the specific Eligible Measures being implemented as part of the Energy Performance Program.

"**Baseline Energy Consumption**" means the actual annual electricity consumption for a Facility in the absence of Eligible Measures that is used to establish the Baseline Energy Models.

"**Baseline Energy Model**" means a statistical model generated for a Facility via the EPP Portal that predicts electricity consumption for that Facility over a set period of time, in accordance with the Baseline Energy Model Requirements found in the EPP Technical Guide.

"**Baseline Energy Model Requirements**" are the requirements for the Baseline Energy Model as set out in the EPP Technical Guide.

"**Business Day**" means a day, other than a Saturday or a Sunday or statutory holiday in the

Province of Ontario or any other day on which banking institutions in Toronto, Ontario are not open for the transaction of business.

"**Eligible Measures**" means any Measure as defined in Schedule "B" – Eligibility Criteria.

"**EPP Portal**" means the IESO's online portal for the Energy Performance Program used for, but not limited to, applying to the Program, enrolling Facilities, Savings Submissions, Interim Savings Summaries and invoice submissions.

"**EPP Technical Guide**" means a document provided by the IESO that may be updated from time to time that outlines program methodologies, specifications, and guidelines, including but not limited to, the determination of the baseline energy model, goodness of fit of the model, treatment of adjustments, and estimated energy savings used within the EPP Portal.

"**Facility**" means the building(s), premises or lands, or part thereof, occupied by the Participant, and over which the Participant has all required authorization and consents to carry out its obligations under the Agreement and meeting the requirements in Schedule "B" – Eligibility Criteria.

"**Facility Enrolment**" means providing Facility energy data and Facility characteristics via the EPP Portal when enrolling a Facility in the Program.

"**IESO**" means the Independent Electricity System Operator of Ontario established under Part II of the *Electricity Act, 1998* (Ontario), or its successor or authorized agent.

"**IESO EM&V Protocols**" means the methods and processes that the IESO develops for the evaluation, measurement and verification of conservation and demand management programs and initiatives, and which may be found at https://www.ieso.ca/en/Sector-Participants/Energy-Efficiency/Evaluation-Measurement-and-Verification as such methods and processes may be amended from time to time.

"**Measures**" means (i) any activity undertaken for the primary purpose of obtaining or effecting, directly or indirectly, conservation and demand management, including the installation, retrofit, replacement, modification, commissioning or re-commissioning of equipment, systems, processes or behaviours that consume or result in the consumption of electricity; or (ii) any equipment, system or product related to the foregoing.

"**Non-Routine Adjustment**" **or** "**NRA**" means a change to the Baseline Energy Models necessitated by a Non-Routine Event.

"**Non-Routine Event**" **or** "**NRE**" means those events as described in the EPP Technical Guide that necessitate a change to the Baseline Energy Model(s) through a Non-Routine Adjustment.

"**Off-Peak Electricity Consumption**" means electricity consumption that is not On-Peak Electricity Consumption.

"**Off-Peak Electricity Savings**" means the difference between the Off-Peak Electricity Consumption predicted for a Facility by the Baseline Energy Models over a Pay-for-Performance Period and the annual Off-Peak Electricity Consumption recorded by the Facility's Approved Meter for the same Pay-for-Performance Period in accordance with the EPP Technical Guide. In the event of a dispute, the IESO's evaluation of Off-Peak Electricity Savings will be final and binding.

"**On-Peak Electricity Consumption**" means electricity consumption, measured in kWh, during peak period hours, as defined in the IESO's Evaluation, Measurement and Verification Protocol V4.0. For clarity, this means energy consumed on weekdays between June 1 and September 30 (inclusive), during the hours of 3 pm and 9 pm (EDT).

"**On-Peak Electricity Savings**" means the difference between the On-Peak Electricity Consumption predicted for a Facility by the Baseline Energy Models over a Pay-for-Performance Period and the annual On-Peak Electricity Consumption recorded by the Facility's Approved Meter for the same Pay-for- Performance Period in accordance with the EPP Technical Guide. In the event of a dispute, the IESO's evaluation of On-Peak Electricity Savings will be final and binding.

"**Pay-for-Performance Period**" means each 12-month period during which the Participant implements and/or maintains Eligible Measures for a Facility and during which Off-Peak Electricity Savings and On-Peak Electricity Savings will be measured, with the first such period for a Facility commencing on the date that the Participant accepts the Baseline Energy Model for a Facility and the next such period commencing immediately after the expiration of 12 months.

"**Performance Incentive**" means the amount to be paid to the Participant for each Pay-for-Performance Period as defined in the Agreement.

"**Program**" has the meaning given to it in the preamble to the Agreement.

"**Program Requirements**" means the program requirements for the Energy Performance Program, as made available by the IESO on the Save on Energy website as updated from time to time.

"**Save on Energy Program**" means any energy conservation programs funded by the IESO pursuant to the Ministerial Directives dated September 30, 2020 or March 21, 2019 and as described on the Save on Energy web site found at https://www.saveonenergy.ca/.

"**Savings Report**" means a report generated by the EPP Portal based on the Facility energy data submitted annually by Participants evidencing the Total Electricity Savings achieved for a Facility during a given Pay-for- Performance Period.

"**Service Provider**" means a third party retained by the IESO.

"**Total Electricity Savings**" means the sum of the Off-Peak Electricity Savings and the On-Peak Electricity Savings.

DISCLAIMER

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