JUNE 16TH, 2026

# eDSM Cost-Effectiveness Methodology Update

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# Welcome and Introduction

- Today's session will be recorded and available for viewing online.
- The recording and presentation for this engagement can be found on the Electricity Demand Side Management (eDSM) Framework page.

# Shared Commitment to Respectful Participation

To support a focused and constructive discussion:

- We will take questions one at a time; please use the raise-hand feature to enter the speaking queue
- We encourage concise and focused comments to allow time for multiple perspectives
- Participants are encouraged to raise relevant points during the discussion and provide more detailed feedback through the Engagement Inbox (engagement@ieso.ca)
- We ask that all participants maintain a respectful and professional tone throughout the session
- Facilitators will guide the discussion and manage participation to stay aligned with today's focus and agenda
- Where necessary, we may disable a participant's microphone to manage participation

# Territory Acknowledgement

The IESO acknowledges the land from where we are delivering today's webinar is the traditional territory of many nations including the Mississaugas of the Credit, the Anishinaabeg, the Chippewa, the Haudenosaunee and the Wendat peoples, and is now home to many diverse First Nations, Inuit and Métis peoples. We also acknowledge that Toronto is covered by Treaty 13 with the Mississaugas of the Credit First Nation.

As we have attendees from across Ontario, the IESO would also like to acknowledge all the traditional territories across the province, which include those of the Algonquin, Anishinaabeg, Ojibwe, Cree, Oji-Cree, Huron-Wendat, Haudenosaunee, Métis, and Inuit peoples.

# Agenda & Purpose

1. Overview
2. What is electricity Demand Side Management (eDSM) Cost-Effectiveness (CE) in IESO
3. eDSM CE Methodology Update

***Purpose of Today's Meeting***

*To refresh attendees on how IESO cost-effectiveness is currently applied in eDSM and outline a suite of technical enhancements of the methodology to better incorporate the assessment of Distributed Energy Resources (DERs)*

# Background

- Electricity demand in Ontario is expected to grow more rapidly in the coming decades than in the recent past, because of both economic development and electrification of many sectors of the economy[1]
- Electricity demand-side management (eDSM) offers one of the lowest cost resources to address system needs; reduces the need for new supply resources and supports grid reliability
- The IESO is continuing to lead the way in energy-efficiency programming in North America through a $10.9 billion, 12-year funding commitment from the Ontario government that began in January 2025[2]

[1] https://www.ieso.ca/Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook/2026-APO-Summary
[2] https://www.ieso.ca/Sector-Participants/Energy-Efficiency/2025-2036-Electricity-Demand-Side-Management-Framework

# Overview & Context

- In response to new and evolving technologies, the IESO is implementing a suite of technical enhancements to its DSM Cost-Effectiveness (CE) Methodology.
- These updates improve the accuracy, flexibility, and robustness of CE modeling, enabling more **precise assessment of the dynamic grid impacts of behind-the-meter distributed energy resources (DERs) and demand response** (DR), in addition to conventional energy efficiency measures.
- The enhanced CE methodology is referred to a Program Administrator Cost Test (PAC 2.0) and the Participant Cost Test (PCT 2.0) and will be fully implemented for the 2028–2030 eDSM plan, beginning in 2028.
- The changes also support Ministerial directives, including the eDSM Directive (November 2024) and the Integrated Energy Plan Directive (June 2025).

# What is the role of DSM Cost-Effectiveness (CE) in IESO

DSM Cost-Effectiveness (CE) is an **industry standard forward-looking cost-benefit metric.**

**For the IESO, our primary cost-effectiveness test answers the question:**

*"What is the net benefit to the electricity system for every $1 spent on Demand Side Management?"*

CE serves two key purposes:

**1. Program & Measure Screening**

- Evaluates new DSM measures and program designs
- Inform Achievable Potential Studies (APS)

**2. EM&V (Evaluation, Measurement & Verification)**

- Validates **final reported program results**
- Confirms realized benefits vs. expectations

*DSM CE is NOT Intended For Valuing Front–of-Meter generation resources.*

# IESO Responsibility Around CE

- Under the most recent eDSM Directive, the IESO is required to deliver a cost-effective portfolio of programs.
- Cost-effectiveness (CE) is **independently evaluated each year** by third-party evaluators and reported in the Annual DSM Report that are published on the IESO EM&V website
- IESO must ensure its **CE methodology remains technically accurate and aligned** with government directives.
- IESO's DSM (formerly CDM) has been conducting and reporting CE since 2009, with several minor methodological refinements over time.
- The 2026 eDSM CE Methodology represents the **first major technical update in over 15 years** and is aligned with the National Standard Practice Manual (NPSM) guidelines and industry best practices.

# How IESO DSM CE Works

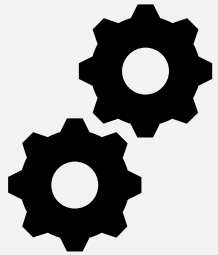
**Planning Economic Inputs (25-yr Outlook)**

- APO Marginal Capacity Cost (MW)
- 8,760 APO Marginal Cost of Energy Production (MCP) (MWh)
- Transmission & Distribution Line Losses

**DSM Measure Inputs**

- 8,760 Measure Level Load Profiles
- Annual Energy Savings/Consumption (kWh)
- Annual Peak Demand Impact (kW)
- Effective Usual Life (EUL) (e.g. 10 yr)
- DSM Non-Energy Benefits

**CE Tool Calculations**



**Static Economic Inputs for PV Calculations**

- Discount Rate (real): 4.0%
- Societal Discount Rate (real): 4.0%
- Inflation Rate: 2.0%

**Primary Outputs Metrics**

- $ — Net Benefit
- $/$ — Benefit / Cost Ratio
- $/kW — Levelized Costs or Benefits

All dollar values are presented as Present Value (PV) based on benefits and costs accrued over the Lifetime of a Measure.

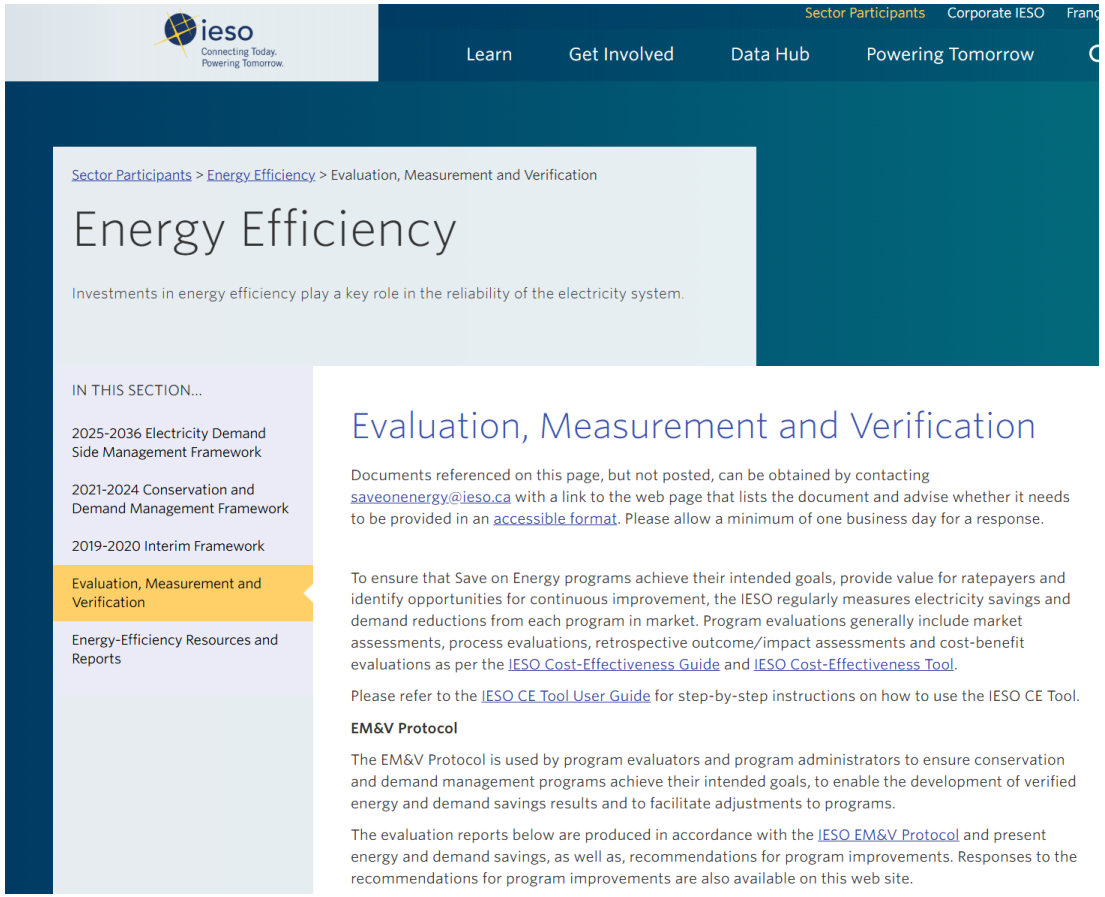
# DERs in eDSM

**In addition to conventional energy efficiency measures, this updated methodology supports behind-the-meter DERs & DR, which can provide the following Demand Side Management Benefits:**

| Grid Benefit | Examples |
|---|---|
|  **Generate electrical energy** | Solar PV, distributed wind |
|  **Store and discharge electrical energy** | Battery storage, thermal storage, vehicle-to-grid or vehicle-to-building |
|  **Dynamically modify electric load** | Smart thermostats / connected devices (demand response), EV managed charging |

# Publication of PAC 2.0 and PCT 2.0

## Evaluation, Measurement and Verification



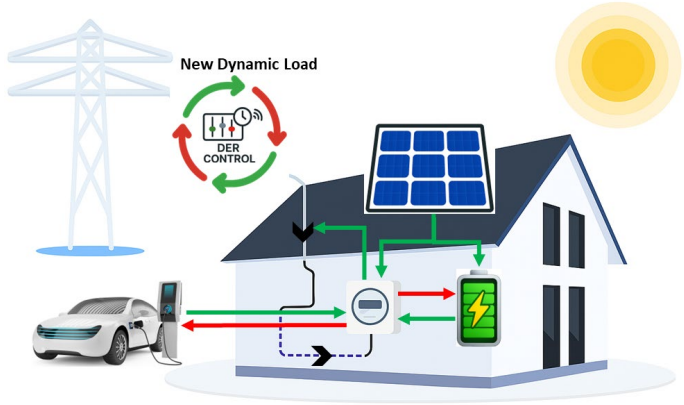

The IESO will be publishing a number of resources for the updated cost tests:

1. Updated Excel Cost-Effectiveness Tool
2. Excel Load Profile Aggregator Tool
3. Cost-Effectiveness Test Guide
4. Cost-Effectiveness User Guide

These resources are expected to become available shortly after this Stakeholder Engagement Session.

# eDSM CE Methodology Technical Updates

# Evolving IESO DSM CE Methodology for DERs

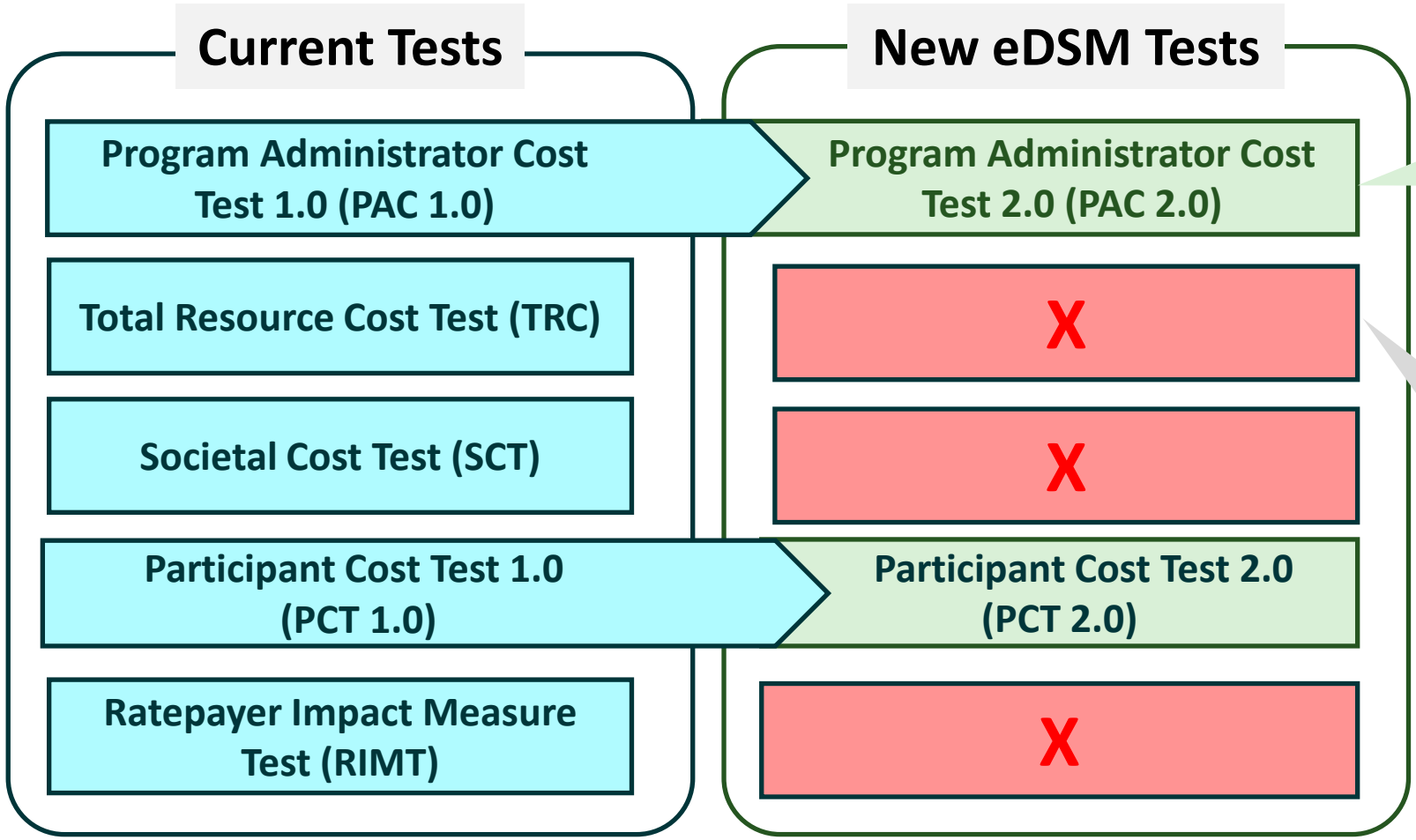



Behind-the Meter DERs modify the load of a building in various ways making it more **dynamic driving three technical enhancements.**

| | Need | CE Enhancement |
|---|---|---|
| 1 | Storage based DERs **add electricity demand to the grid due to charging needs and round-trip efficiency losses** | **Increases in electricity demand are captured as a cost** to reflect the increase in electricity demand created by DERs. |
| 2 | Technologies like battery storage or smart devices don't just change how much electricity is used—**they change when it's used, which affects how the grid operates**. This is referred to as **Hourly Load Shifting** | **Increase Granularity of Energy Calculations:** Transition from an 8-part TOU structure to a seasonal (Summer, Winter, Shoulder) 240-part Demand Day framework with daily (24-hour) average price curves to enable Hourly Load Shifting CE calculations |
| 3 | **DER Load Profiles account for dynamic grid impacts that could** include load displacement, charge/discharge cycles, grid injection & hourly load shifting | **Develop new CE Tools** that can model dynamic load impacts from DERs by relying more on Load Profiles |

# IESO is Both Retiring and Updating CE Tests

*The IESO is updating its methodology for calculating PAC and PCT, for new "2.0" versions.*




**PAC 2.0 will use IESO Marginal Capacity and Energy values published in the APO**

**IESO is Retiring TRC**

IESO has relied on PAC as its primary CE Test and has not used or reported TRC since 2018. Therefore, TRC will be retired in the new eDSM CE Methodology.

# Enhanced eDSM CE Tests and Inputs

## IESO DSM's Primary CE Test

### Program Administrator Cost Test (PAC 2.0)

Includes benefits and costs experienced by program administrator (IESO).

**PAC 2.0**

*IESO Perspective*

Value Streams

- Bulk Generation Capacity
- Bulk Energy Generation (Demand Days)
- IESO Incentives + Admin Costs (GA)
- OEB Distribution Service Test (DST) Value

## Affordability Screen

### Participant Cost Test (PCT 2.0)

Includes the benefits and costs experienced by program participants.

**PCT 2.0**

*Participant Perspective*

Value Streams

- Electricity Bill Impacts
- Participant eDSM Non-Energy Benefits (NEBs)
- Incentive $$$
- Participant Incremental Cost

# In PAC 2.0 & PCT 2.0 Benefits & Costs Can Change to Reflect Dynamic Grid Impacts of DERs

| Value Streams | PAC 2.0 | PCT 2.0 |
|---|---|---|
| Bulk Generation Capacity | Benefit or Cost | N/A |
| Bulk Generation Energy | Benefit or Cost | N/A |
| Electricity Bill Impacts | N/A | Benefit or Cost |
| Individual NEBs | N/A | Benefit |
| Incentives | Cost | Benefit |
| IESO Program Costs | Cost | N/A |
| Participant Incremental Cost | N/A | Cost |

**To value dynamic load impacts of DERs, driven by:**

- Battery charge/discharge cycles
- Hourly load shifting,
- Bi-directional energy flow,
- Behind-the-Meter renewables

**PAC 2.0:** Bulk system Capacity & Energy can be positive (benefits = savings) or negative (costs = increases in electricity consumption)

**PCT 2.0: Dynamic load impacts** are reflected in customer bills impacts

# Enhanced Bulk System Energy Value Binning Approach

- Current CE Methodology bins energy cost following the **8 –part TOU periods with a single energy value across a fixed set of hours in each TOU period**.
- **The new eDSM CE Methodology bins** energy values into 10- **Seasonal Demand Days** each with **an average 24-hour price curve** creating **240-part avoided energy tables.**

| Season | Demand-Day Type | # Days /Year |
|---|---|---|
| **Summer (Dec – Mar) & Winter (Jun - Sep)** | Top 5% Demand Day | 12 |
| | 87%-95% Demand Day | 22 |
| | 26%-86% Demand Day | 174 |
| | Bottom 25% Demand Day | 60 |
| **Shoulder (Apr-May/Oct-Nov)** | Top 20% Demand Day | 25 |
| | Bottom 80% Demand | 98 |
| **Total** | | **365** |

*More Granular* — **Enhanced for PAC 2.0** — **Current PAC** — *Less Granular*

8,760 Hourly Profiles

! Overly granular for DSM CE calculations and Tools

! Can lead to false precision for DSM scale of impacts

**240-Part Demand Days**

√ Enables 24-hourly calculations that can value load shifting

√ Provides price curves that can be used to optimize DER operations

√ Balances need to increased granularity of calculation while avoiding risk of false precision

8-Part TOU

√ Sufficient for energy efficiency measures

! Undervalues energy benefits of DERs

! Does not value hourly load shifting of DERs

Annual

! Does not capture any time-based value from operation of a DERs

# Changes to CE Ratio & Net Bulk System Benefits

With the new eDSM CE Methodology treating increases in electricity use as a cost this means CE ratios and net benefit calculations needed to change.

**The change increases the transparency of results and ensures:**

1. A CE ratio >1.0 means all benefits outweigh all costs to ratepayers, and
2. Eliminates the possibility of negative ratios,
3. Can result in negative net benefits when CE ratio is < 1.0 → cost of operating DER outweigh the grid benefits

**Current CE Ratio**

$$\text{Ratio} = \frac{\text{Energy \& Capacity (Benefit)} + \text{Increase in Electricity Use (Negative Benefit)}}{\text{Incentive Costs + Program Admin Costs}}$$

**eDSM CE Ratio**

$$\text{Ratio} = \frac{\text{Only positive values (Benefits)}}{\text{Incentive Costs + Program Admin Costs + Increases in Electricity Use (Cost)}}$$

# Recap & Summary

With the technical updates implemented in PAC 2.0 and PCT 2.0, the IESO can better conduct detailed and robust CE analysis, in addition to conventional energy efficiency measures.

eDSM DER examples include:

- Battery storage and thermal storage
- Load shifting technologies (e.g. smart thermostats or controls, EV managed charging)
- Renewable energy (e.g. distributed solar or wind)
- Renewable energy + storage, and;
- New DER technologies

# For More Information

The recording and presentation for this engagement can be found on the Electricity Demand Side Management (eDSM) Framework page. Additional materials to be available later this month.

If you have any questions or are interested in training on the information shared today, please contact engagement@ieso.ca

# Thank You

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