AUGUST 21, 2025

Toronto Local Achievable Potential Study (L-APS)

Webinar - Draft Findings

ieso
Connecting Today. Powering Tomorrow.

Traditional Territory Acknowledgement

The IESO acknowledges that Toronto is the traditional territory of many nations, including the Mississaugas of the Credit, the Anishnabeg, 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 signed with the Mississaugas of the Credit First Nation, and the Williams Treaties signed with seven First Nations.

Agenda

1. Ontario's Electricity Sector and the IESO's Role
2. Recap: Overview of Local Achievable Potential Study (L-APS) and How Feedback was Considered
3. Draft Study Findings
4. Considerations for L-APS and Toronto's Regional Plan
5. Next Steps & Discussion

ieso

Connecting Today.
Powering Tomorrow.

We work with:

Generators >>> **Transmitters** >>> **Local Distribution Companies** >>> **Energy Consumers**

<<< **Communities** >>>

Summary of Key Findings

- The draft Local Achievable Potential Study (L-APS) indicates that there is opportunity to cost-effectively secure **219 MW of incremental summer demand savings and 50 MW of incremental winter demand savings** from energy efficiency, demand response, and behind-the-meter DER programs.
    - This energy savings potential is incremental to the forecasted 847 MW summer and 757 MW winter of future eDSM program savings that are already captured in the Toronto IRRP demand forecasts.
- The study's findings will inform the Toronto IRRP recommendations for how non-wire alternatives can defer or reduce identified needs within an integrated approach with wire solutions - the results show that incremental eDSM alone is not able to meet Toronto's needs.
- The new and expanded, 2025-2036 electricity Demand Side Management (eDSM) Framework presents mechanisms to pursue additional savings opportunities identified by the study.

Seeking Input

Today the IESO is seeking your feedback on the following components:

- Perspectives regarding the draft L-APS findings.
- Additional information that should be considered before the L-APS findings are finalized.
- Specific modelling methodology or assumption topics that you would like to see discussed in the final public report.
- How the IESO can best communicate with communities and stakeholders on actioning the additional electricity demand-side management opportunities identified in the study.

The IESO welcomes written feedback to engagement@ieso.ca by September 11.

Re-cap: Local Achievable Potential Study

Background: Local Achievable Potential Study

- Building on the previous success of the IESO and Toronto Hydro initiatives, the Local Achievable Potential Study (L-APS) will identify how much incremental energy efficiency, load flexibility, and behind-the-meter distributed energy resources (DERs) can be cost-effectively implemented above and beyond what is already included in the IRRP's demand forecasts

- The IESO is working in close collaboration with Toronto Hydro to ensure the study's modelling reflects the characteristics of the city's built environment and electricity distribution system and is aligned with the IRRP's demand forecasts.

- The results from the L-APS will be used to inform the Toronto IRRP's recommendations regarding using incremental electricity demand-side management to reduce or delay electricity needs.

- Measures in scope include:
  - **Behind the Meter Distributed Energy Resources (DERs)*** including battery storage and solar.
  - **Energy efficiency** measures including heat pumps, HVAC, lighting, appliances, weatherization, and hot water.
  - **Demand Response** including EV charging, HVAC equipment, and water heaters.

*Front-of-meter DERS – including utility-scale solar, wind, and battery storage – are considered separately as solutions in the Toronto regional planning process. See the IESO's July 10 webinar materials on Toronto IRRP Options Screening for more information.

Background: L-APS – Forecast Scenarios

The L-APS uses two local load forecasts aligned with the Toronto IRRP forecasts:

- **Reference Scenario** – The base load for this scenario shows a steady increase in electricity use, based on current policies, steady growth of electrified heating (i.e., Business as Planned targets in TransformTO), a trending historical EV adoption and low/steady growth of data centers.
- **High Electrification Scenario** – The baseline load in this scenario aims to achieve the TransformTO Net-Zero targets for buildings by 2040, higher adoption of EVs (30% adoption by 2030 and 100% by 2040) and elevated growth rate of data centers.

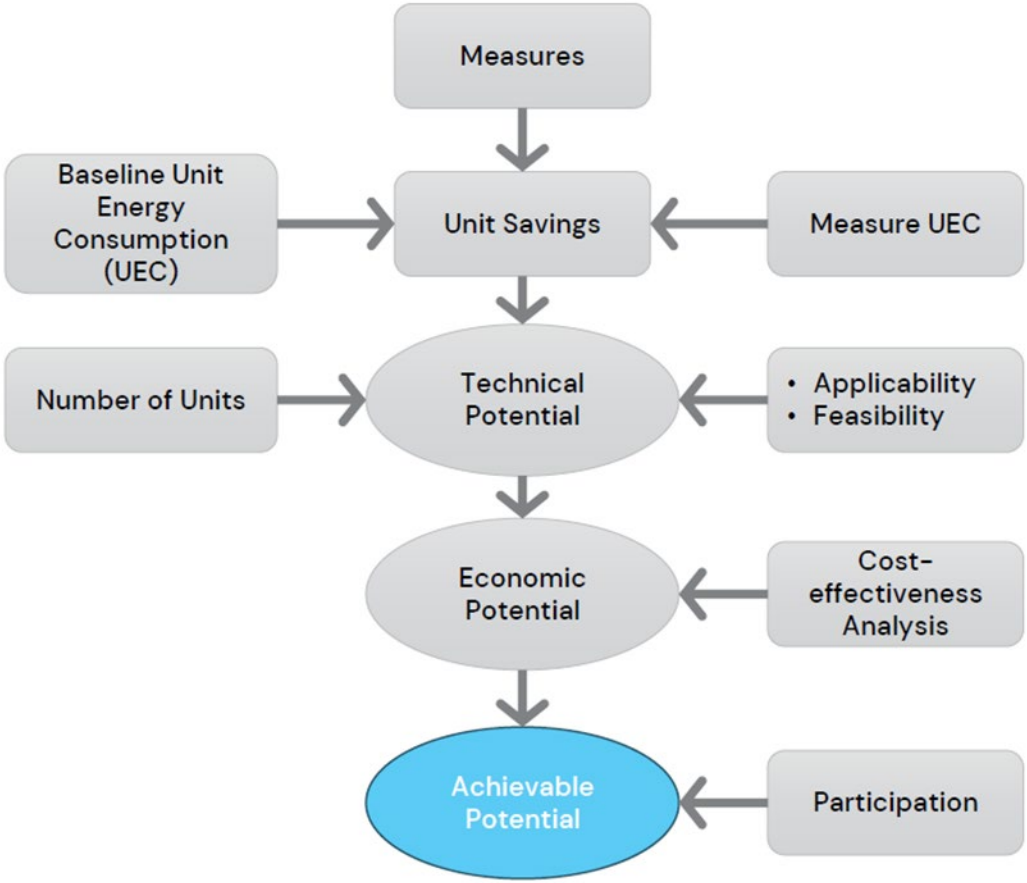
For each scenario, the study identifies the electricity savings potential from a technical, economic and achievable perspective:

- **Technical Potential** is the electricity savings resulting from the implementation of all technically feasible measures regardless of cost-effectiveness, customer awareness, etc.
- **Economic Potential** is the electricity savings resulting from the implementation of all technically feasible measures that pass the cost-effectiveness test.
- **Achievable Potential** is the electricity savings that can realistically be acquired after adoption rates over the period of the study are applied. Adoption rates are calculated considering market barriers, customer payback acceptance, perception of non-energy impacts and customer awareness of measures.

Background – Methodology

Methodology:

1. As shown on the graph, the L-APS will use a bottom-up approach to estimate the total electricity savings at the station level.
2. A "digital twin" of Toronto building stock is created and calibrated using utility and building characteristic data.
3. eDSM measures are applied to the digital twins.
4. The resulting savings are simulated at the building level and aggregated to the transformer station/municipal transformer station levels for each scenario.



Background: L-APS – Data Inputs/Sources

The following is a list of select key inputs and sources used in the LAPS.

Technical Potential

- Forecasted energy demand
- Historical energy consumption data
- IESO 2024 MAL Technical Supplement
- Building data (MPAC, Dunn & Bradstreet)
- SolarTO data
- Toronto Green Standard
- Energy Efficient Measure Database
  - ResStock
  - ComStock

Economic Potential

- Avoided Generation (Capacity & Energy) & Transmission Costs
- Forecasted Retail Rates

Achievable Potential

- Historical CDM program results
- Adoption Curves
- End-Use Surveys
- Network distributed energy resources hosting capacity

How Feedback has been Considered in L-APS

Key Areas of Feedback	Incorporating Feedback/Considering Feedback
Network hosting capacity	The network hosting capacity has been applied at the achievable potential level, not the technical potential level. The DER hosting capacity constraints reflect the latest information from Toronto Hydro on current and planned hosting capacity and is a critical consideration for understanding the amount of additional demand reductions that could be acquired through DER programs.
Avoided costs	The IESO has worked with Toronto Hydro to ensure that defensible avoided system costs are included in the study's cost-effectiveness evaluation, including distribution system costs associated with specific transmission infrastructure expansion. Discussion with Toronto Hydro and ICF has indicated that 1.) It is not feasible to credibly estimate a generalized avoided distribution cost for the entire region as these benefits can vary widely across the same distribution system based on differences in forecasted demand and existing/planned distribution infrastructure 2.) Related, inclusion of a generalized distribution avoided cost in the L-APS economic analysis would almost certainly result in over-estimating regional achievable potential (as the analysis would include benefits that are not actually applicable to the entire region).
Non-energy benefits	The L-APS uses the program administrator cost test (PAC Test) to assess the cost-effectiveness of measures. This aligns with the methodology the IESO uses to screen and evaluate electricity DSM programs. The PAC Test compares the program administrator costs incurred to design and deliver programs against the avoided electricity supply-side resource costs and the avoided transmission costs. The PAC Test does not reflect emissions reduction costs or potential resiliency benefits, however, community preferences may be qualitatively considered in the Options evaluation of the IRRP.

How Feedback has been Considered in L-APS

Key Areas of Feedback	Incorporating Feedback/Considering Feedback
Exclusion of Vehicle-to-Grid/Building (V2G/B) technology	After careful consideration and discussion with the L-APS consultant ICF and local utility partners Hydro Ottawa and Toronto Hydro, the IESO decided against including bidirectional charging measures in the Local Achievable Potential studies as it does not have confidence that V2G/B could be credibly modelled for the purposes of the study with currently available information, and more fundamentally, the IESO does not have confidence that a program of meaningful scale could be delivered cost-effectively in the near future due to: • Limited availability of vehicles capable of bidirectional charging and uncertain customer acceptance • Uncertain resource availability and performance • The full costs of operating a V2G program • Technology integration barriers The IESO has published a supplementary memo providing further details on each of these points and sharing information on IESO's efforts to advance V2G/B through the Grid Innovation Fund and other partnerships.

How Feedback has been Considered in L-APS

Key Areas of Feedback	Incorporating Feedback/Considering Feedback
District Energy Systems	The factors that influence the achievable potential of District Energy Systems (DES) are exceptionally locationally specific, consequently these systems are challenging to credibly model in larger geographic-scale achievable potential studies. The IESO has engaged Enwave and City of Toronto staff to better understand the opportunities for new/expanded DES in Toronto and the potential impact on forecasted demand.

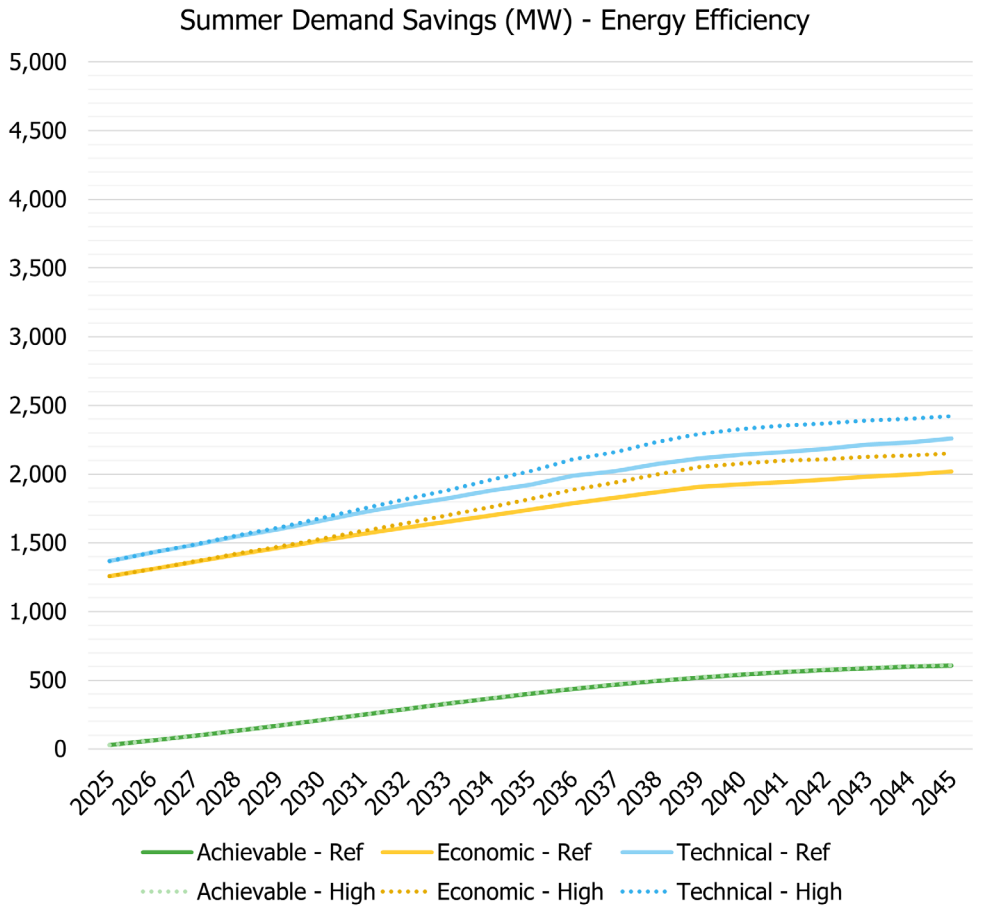
Local Achievable Potential Study – Draft Findings

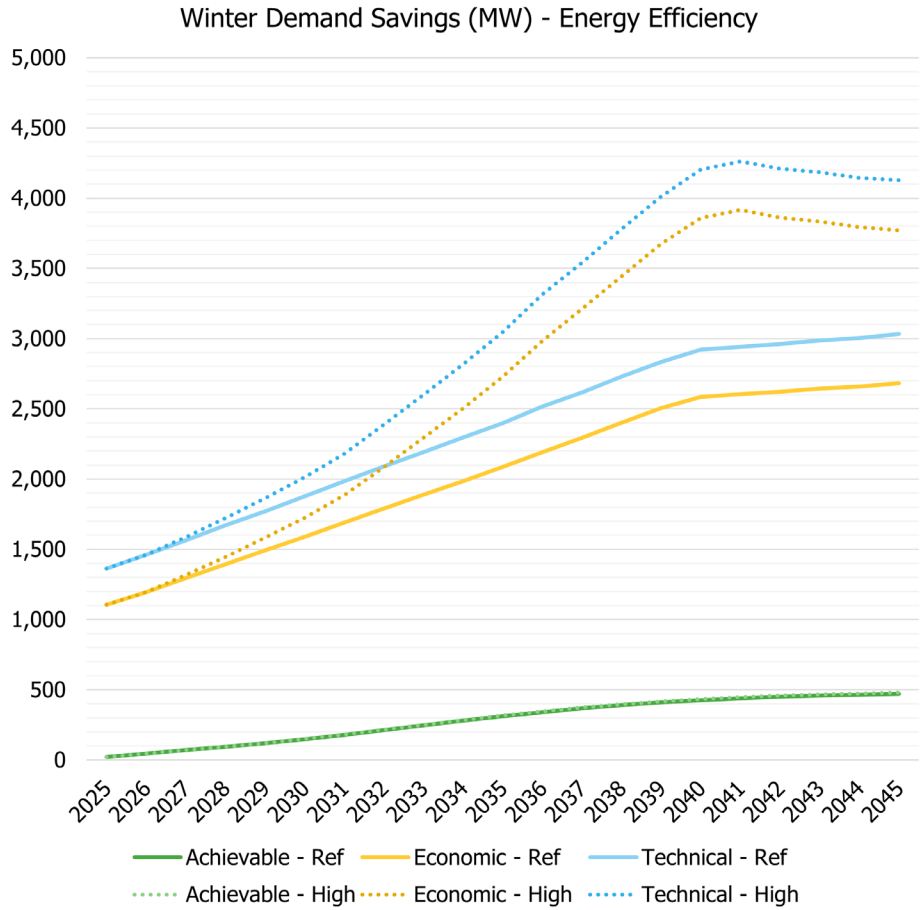
Contextualizing L-APS Draft Results

In interpreting the draft results of the Toronto region L-APS, it is important to consider a number of factors that affect achievable potential:

- The IESO and Toronto Hydro have delivered energy efficiency programs in the Toronto region for 15+ years generating more than 800 MW of peak demand savings (more than equivalent of London's entire peak demand) including local initiatives targeting Toronto-specific transmission needs, impacting remaining achievable potential in existing buildings
- Toronto Green Standard's high energy performance requirements affect the amount of additional cost-effective efficiency opportunities in new construction
- Robust existing participation in Net Metering, MicroFIT, and other DER programs impacts remaining rooftop solar potential
- The demand forecasts used to identify needs in the Toronto IRRP already incorporate the impacts of significant assumed future DSM programming.
- **The savings from the assumed future DSM must be subtracted from the achievable potential results to reveal the incremental opportunity for additional programming.**

L-APS Draft Results – Energy Efficiency

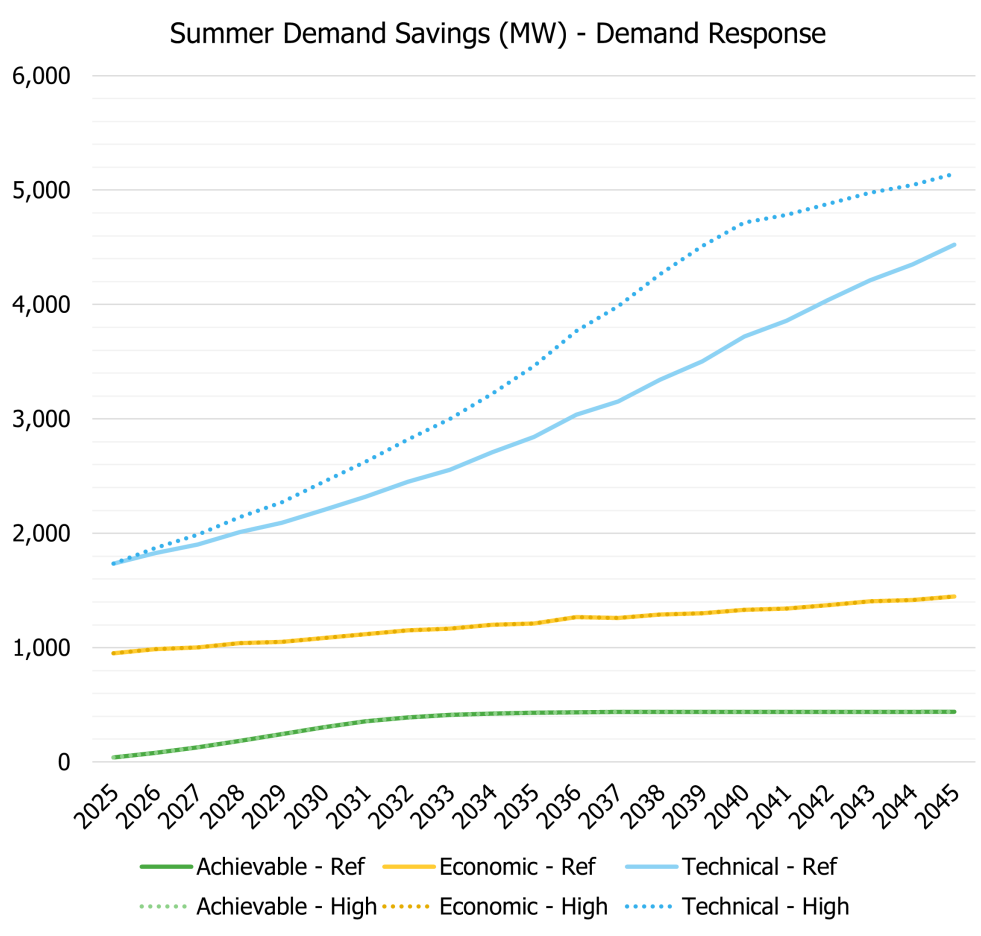


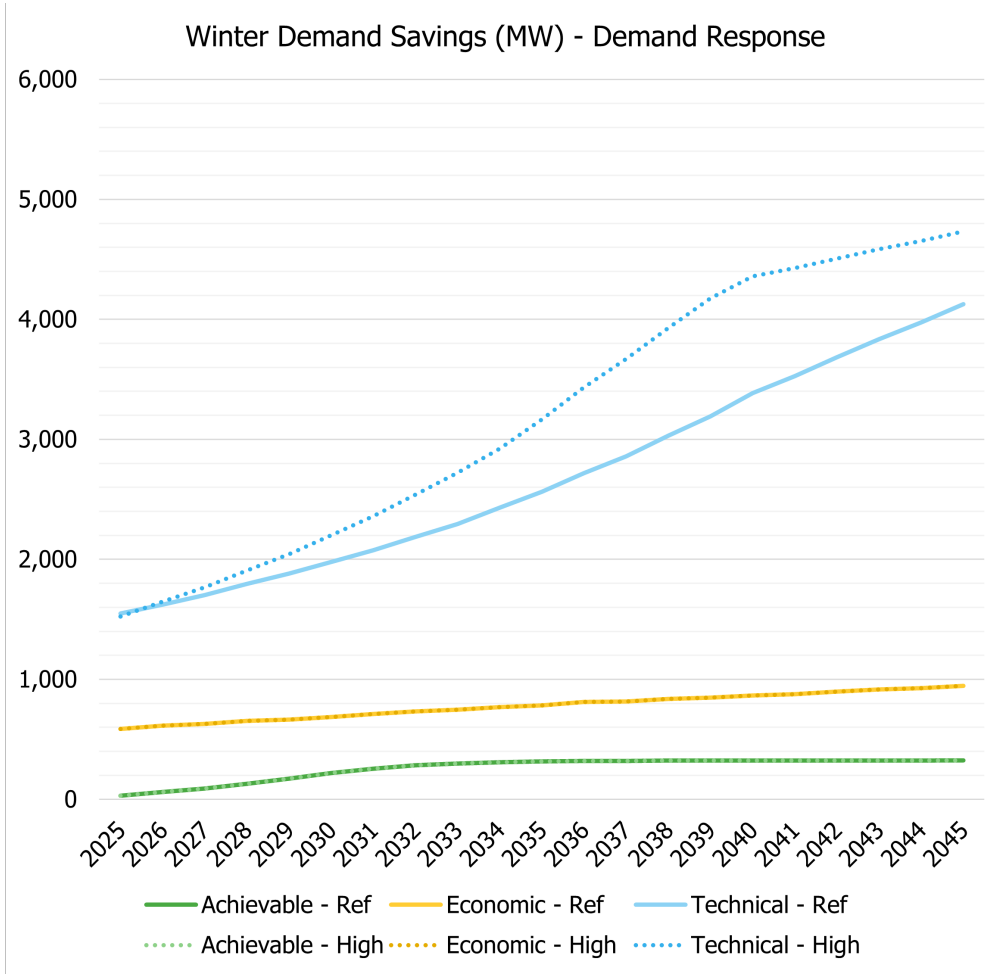


Energy Efficiency Potential - Observations and Notes

- Summer and winter energy efficiency achievable potential reaches 605 MW and 471 MW respectively in 2045 under the reference scenario.
- Forecasted changes to avoided generation energy and capacity costs over the study time horizon impacts the economics of new energy efficiency potential.
- Note that EV load, one of the primary differences between the IRRP's reference and high scenarios, does not have energy efficiency program opportunities (but is captured in the Demand Response potential).

L-APS Draft Results - Demand Response

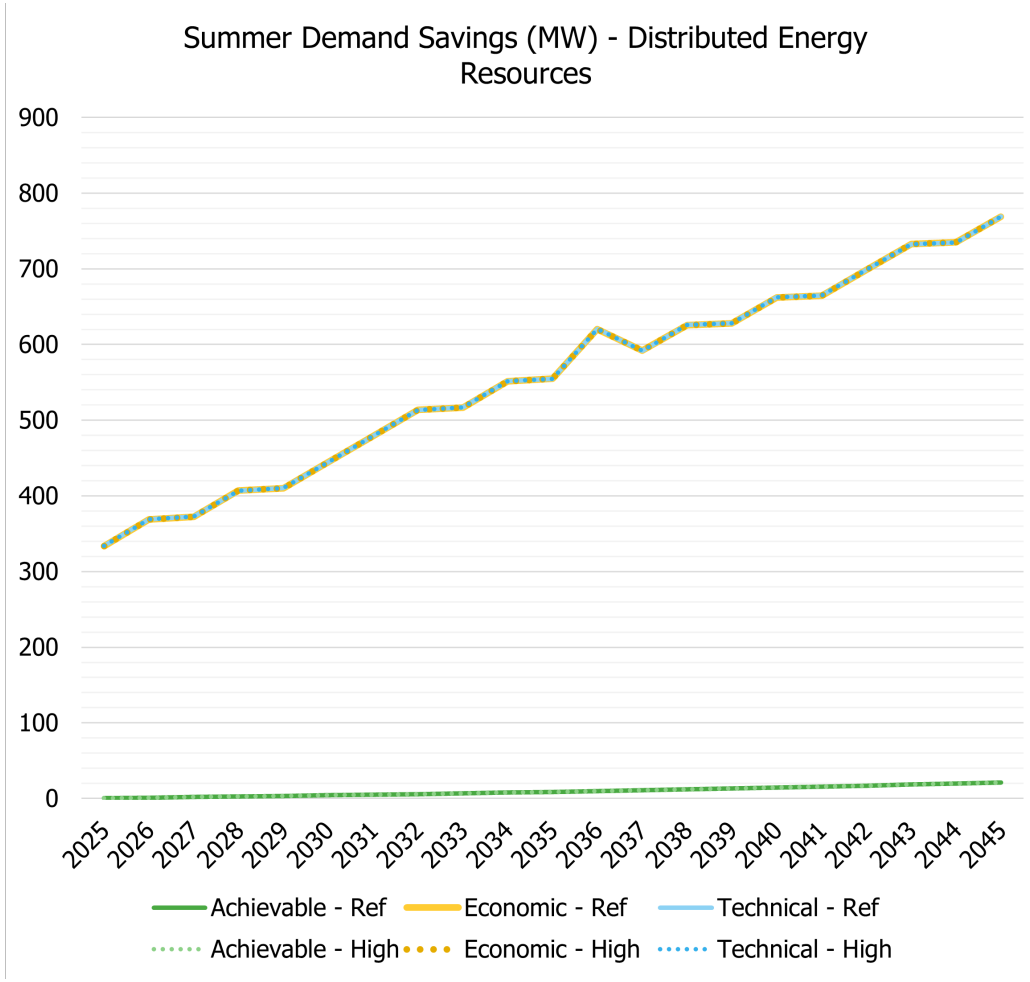


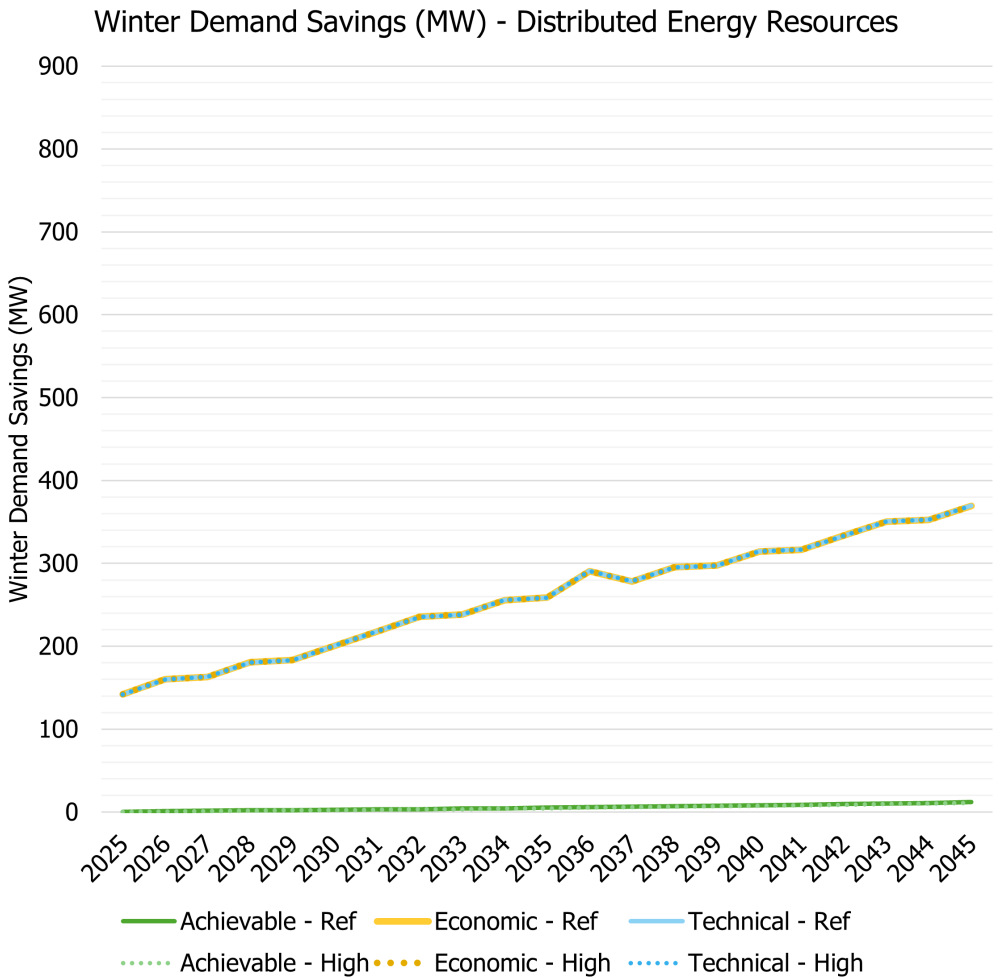


Demand Response Potential - Observations and Notes

- Summer and winter demand response achievable potential reaches 440 MW and 324 MW respectively in 2045 under the reference scenario.
- Note that standalone behind-the-meter storage is presently captured under demand response.
- Difference in achievable potential between the reference and high electrification scenarios is modest reflecting that the reference scenario also includes significant heating electrification and the poor cost-effectiveness of EV demand response programs (particularly in context of Time-of-Use pricing).

L-APS Draft Results – Distributed Energy Resources*



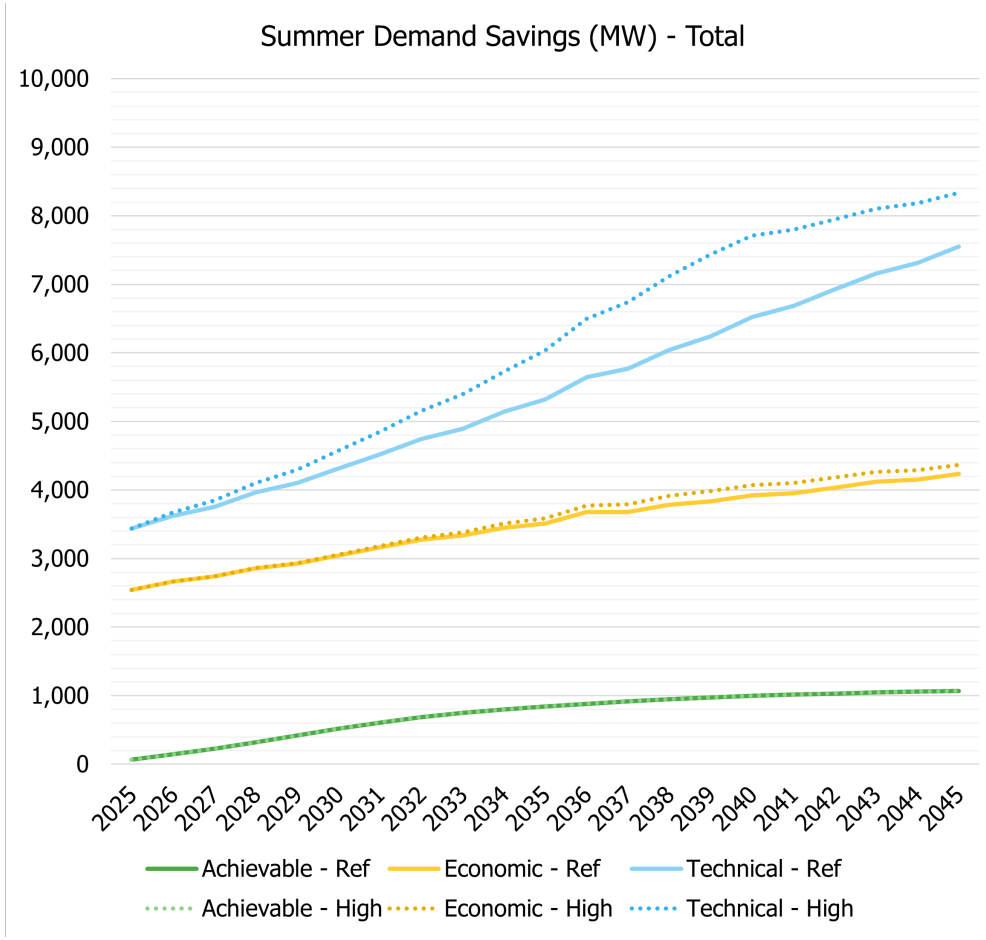


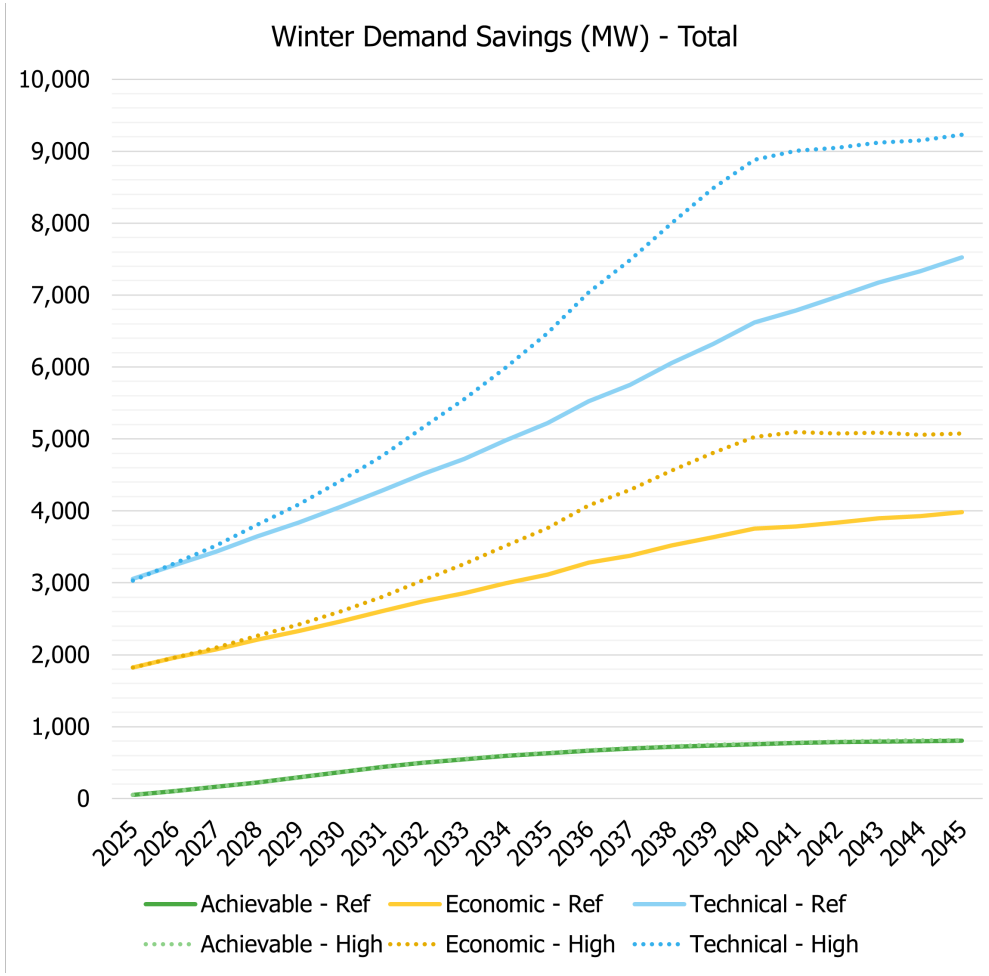
 *For DERs, the technical and economic potential are identical; lines overlap on chart.

Behind-the-meter DER Potential - Observations and Notes

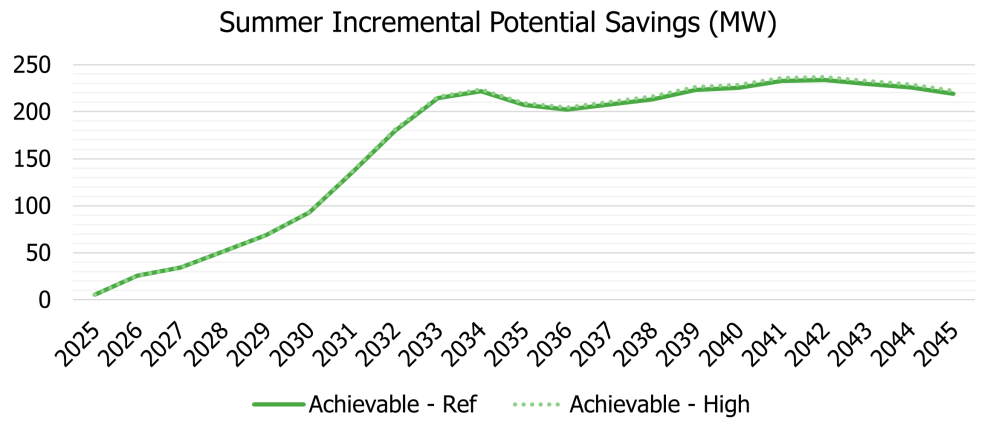
- Summer and winter distributed energy resources (DER) achievable potential reaches 21 MW and 11 MW respectively in 2045 under the reference scenario.
- DER MW figures reflect modelled impact on peak demand **not nameplate capacity** (nameplate approximately 114 MW summer and 73 MW winter).
- Low winter potential reflects limited value of solar to meeting winter needs.
- Technical and economic potential match as eDSM measures currently included in the Save on Energy programs were deemed cost-effective for the study (which includes solar and solar-plus-storage).
- Potential is identical for reference and high scenario, as technical potential impacted by factors like usable rooftop area for solar rather than load.

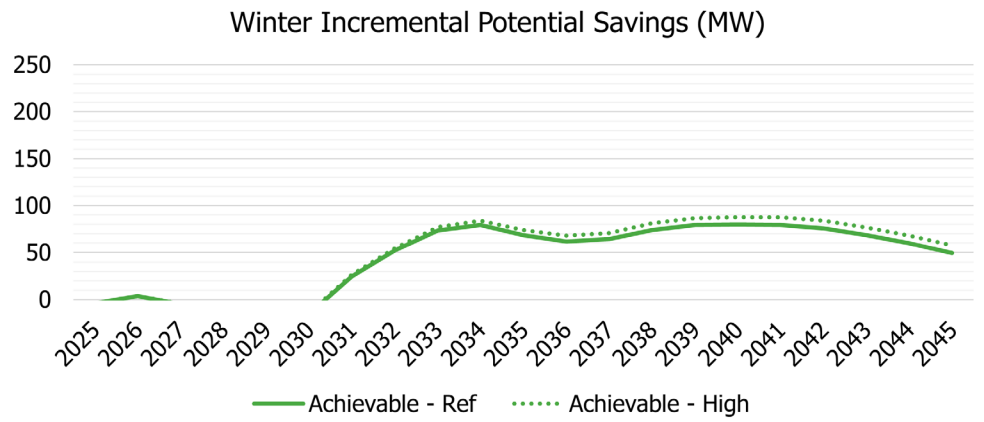
L-APS Draft Results – Total Savings (EE, DR, BTM DER)





L-APS Draft Results – Incremental Achievable Potential





Total eDSM Potential - Observations and Notes

- Total summer and winter achievable potential from EE, DR, and behind-the-meter DER reaches 1,066 MW and 806 MW respectively in 2045 under the reference scenario.
- The Toronto IRRP demand forecasts already assume significant quantities of new peak demand savings from eDSM programs - 847 MW of summer and 757 MW of winter peak demand savings in 2045.
- Deducting the planned eDSM savings from the draft total achievable potential reveals an incremental opportunity of 219 MW summer savings and 50 MW winter savings.
- For context, this summer incremental potential approaches the peak demand required to power the City of Oshawa (approx. 250 MW).

Actioning Additional Achievable Potential

- In January 2025, the Ontario government announced a new 2025-2036 eDSM Framework for the IESO with a $10.9B budget ceiling.
- With this mandate, the IESO is expanding the scope and scale of the Save on Energy programs, including energy efficiency, demand response, and behind-the-meter DER, and is continuing to enhance existing and introduce new programs.
- The IESO will consider how to best pursue additional opportunities identified in the L-APS, through targeted incentives and other approaches.

Actioning Additional Achievable Potential (cont'd)

- A key pillar of the eDSM Framework is collaboration. The IESO has been and is committed to continue working with sector partners like Toronto Hydro and the City of Toronto to realize the local achievable potential, with a focus on "one window" experience for customers, simplifying access to programs.
- Additionally, work at the Ontario Energy Board is in progress that will facilitate the IESO and local utilities to collaborate on and co-fund local eDSM programs that provide benefits to both local distribution networks and the regional/provincial electricity system.
- More information is available from the OEB here.

Considerations for L-APS Results and Toronto's Regional Plan

Considering Results in Planning Recommendations

In assessing whether the estimated incremental eDSM potential can address an identified need, planners will need to consider a number of factors, including:

- Can incremental eDSM satisfy both summer and winter needs?
- How much incremental achievable potential is available in the need area? (e.g., additional potential in Etobicoke cannot help a station capacity need in Scarborough).
- Are the profiles of the need and measures aligned? (e.g., if a local needs has a significant energy component, demand response cannot address the need on its own).
- How does the timing of incremental achievable potential becoming available align with the timing of the need?

Next Steps and Discussion

Next Steps - Local Achievable Potential Study

- The IESO will refine the L-APS modelling and results based on stakeholder feedback.
- The L-APS results will inform final IRRP recommendations and eDSM program activities.
- A final report and data appendices will be posted on the IESO's website in October 2025 providing the following deliverables:
  - electricity peak demand potential, energy potential, and associated costs for each year (2025-2045) for both reference and high electrification scenarios; and
  - detailed description of the methods, data sources, and input assumptions.

Engagement Next Steps

The IESO will continue to engage and inform. Participants can expect to hear from the IESO at these milestones:

	Toronto IRRP	Local Achievable Potential Study (L-APS)
August 2025	• Report back to the Ministry on preferred option for third supply line	• Draft L-APS study results shared in a public webinar on August 21 with an opportunity to provide feedback.
September 2025	• Options analysis and draft recommendations shared in a public webinar with an opportunity to provide feedback	• Feedback from August 21 webinar is due on September 11 • Update on L-APS shared in a public webinar
October 2025	• IRRP report will be completed and published on the Toronto Regional Planning website.	• Final L-APS study results will be completed and published on Toronto Regional Planning website.

Discussion

Today the IESO is seeking your feedback on the following components:

- Perspectives regarding the draft findings.
- Additional information that should be considered before the L-APS findings are finalized.
- Specific modelling methodology or assumption topics that you would like to see discussed in the final public report.
- How the IESO can best communicate with communities and stakeholders on actioning the additional electricity demand-side management opportunities identified in the study.

The IESO welcomes written feedback to engagement@ieso.ca by September 11.

Thank You

ieso.ca

1.888.448.7777

customer.relations@ieso.ca

engagement@ieso.ca

@IESO_Tweets

facebook.com/OntarioIESO

linkedin.com/company/IESO

ieso
Connecting Today. Powering Tomorrow.

Appendix

JULY 10, 2025

Save on Energy Programs in Toronto

Evelyn Lundhild
Senior Manager, Demand Side Management

ieso
Connecting Today.
Powering Tomorrow.

SAVE ON ENERGY
POWER WHAT'S NEXT

About Save on Energy

- Delivered by the IESO, Save on Energy is Ontario's trusted source for energy-efficiency programs, education and awareness.
- Save on Energy has been delivering energy-efficiency programs to help Ontarians reduce their electricity costs and reduce demand on the province's electricity grid since 2011.
- Save on Energy programs, tools, product advice and purchasing guides help consumers use energy more wisely, save money and increase their home comfort.

SAVE ON ENERGY™
POWER WHAT'S NEXT

ieso Connecting Today. Powering Tomorrow.
SAVE ON ENERGY™ POWER WHAT'S NEXT

14+ Years of the Save on Energy Brand

19.5 TWh of energy saved since 2011 – This is equivalent to powering a city the size of Ottawa for more than two years.

Over 80 million energy efficient actions undertaken – includes products installed, purchased, or recycled through programs

Since 2011, customers in **Toronto** have received over $400M in incentives from Save On Energy Programs and generated more than **6TWh** of energy savings and 800 MW of peak demand savings

Save on Energy has proudly provided energy efficiency opportunities to all Ontarians to help them better manage their electricity use.

eDSM Framework for 2025 to 2036

- New **$10.9 billion**, **12-year** funding commitment from the Ontario government beginning January 2025
- **Flexibility** to adapt over time via rolling three-year program plans; first plan budget is $1.8B with target of 4.6 TWh and 900 MW of savings for 2025-2027
- **Program expansion** for residential and business offerings
- **New programming and offers** –
  - **Home Renovation Savings program**, jointly delivered with Enbridge Gas
  - Expanding **Peak Perks** to small businesses;
  - Installation of **solar PV systems** for businesses
- **Funding to LDCs** on an opt-in basis to support customer participation
- **Beneficial electrification measures** to promote the use of electricity to improve energy affordability, expand customer choice and reduce emissions in Ontario, while minimizing impacts to the electricity system.

Save on Energy programs for business

Save on Energy's business programs provide incentives to help Ontario businesses of all sizes implement retrofits and other energy-efficiency projects to lower their energy costs, including:

- Small Business Program
- Retrofit Program
- Instant Discounts Program
- Strategic Energy Management Program
- Existing Building Commissioning Program
- Energy Performance Program
- Industrial Energy Efficiency Program

Sign up for our quarterly business newsletter at https://www.saveonenergy.ca/en/Manage-your-subscriptions

Save on Energy Programs for Residential customers

- **Home Renovation Savings Program** offers rebates to homeowners on energy efficient upgrades
- **Peak Perks*** allows IESO to adjust smart thermostats for short periods on very hot summer days
- **Energy Affordability Program** provides support for income-eligible customers to receive no-cost energy upgrades

*Peak Perks has over 40,000 participants in Toronto

Indigenous Energy Support Program (IESP)

Funding for Community-Led Energy Capacity-Building Projects

Learn more at ieso.ca/IESP or contact the IESO's Indigenous Engagement team at iesp@ieso.ca

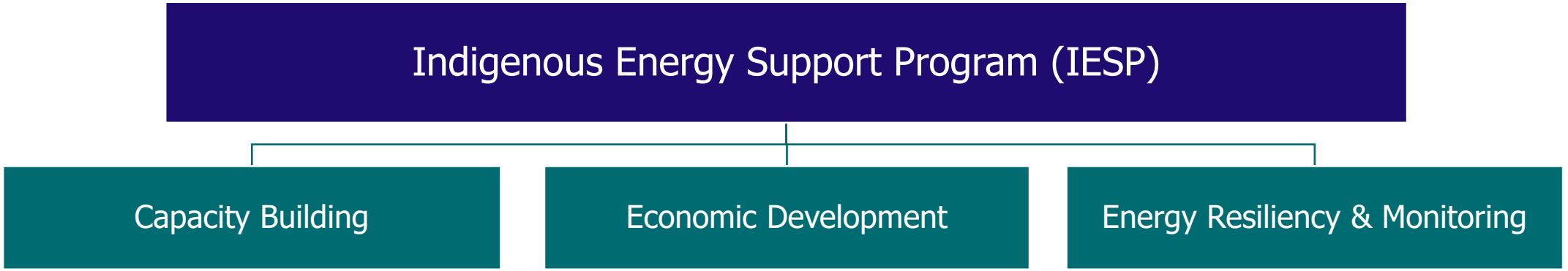
IESP Overview

The Indigenous Energy Support Program (IESP) promotes broad equitable participation in Ontario's energy sector by supporting community capacity building. Funding is available to eligible Indigenous communities and organizations across Ontario for:

- Community energy planning
- Energy skills-building, education and awareness
- Energy infrastructure development

IESP Areas of Funding

The IESP provides support through three Areas of Funding (AOF).



Support community capacity building initiatives and projects including training, community events, youth and elder workshops and hiring of a Community Energy Champion.

Support community energy infrastructure development projects, including procurements, renewable energy, transmission, battery storage, partnerships and capital projects.

Support development of strategies for community energy resiliency, readiness and monitoring, including community energy planning.

IESP Maximum Funding Amounts

Area of Funding	Capacity Building	Economic Development	Energy Resiliency & Monitoring
Maximum Funding Amount	**Part A: Up to $195,000**	**Up to $250,000**	**Up to $135,000**
	Part B: Up to $150,000		

IESP Project Types

Capacity Building (Part A) Up to $195,000	Capacity Building (Part B) Up to $150,000	Economic Development Up to $250,000	Energy Resiliency & Monitoring Up to $135,000
CEC Salary Up to $165,000 for 3 years	**Community Energy Engagement** Up to $75,000	**Feasibility Study** Up to $50,000	**New Community Energy Plan** Up to $135,000
Additional Qualification Top Up (if applicable) Up to $15,000 for 3 years	**Energy Skills Building** Up to $75,000	**Partnerships** Up to $85,000	**Update Community Energy Plan** Up to $75,000
CEC Expenses Up to $15,000 for 3 years	**Innovative Knowledge & Data Sharing** Up to $60,000	**Project Development** Up to $250,000	
		Innovation Up to $250,000	