

Making a Difference

Energy Efficiency in Ontario 2021 Save on Energy Results

June 2023



Table of Contents

Glossary		2
Executive Summary		3
1.	Overview	5
	1.1 Energy Efficiency in Ontario	5
	1.2 2021-2024 Conservation & Demand Management Framework	6
	1.3 COVID-19	9
	1.4 Winding Down Legacy CDM Frameworks	10
	1.4.1 2019-2020 Interim Framework	10
	1.4.2 2015-2019 Conservation First Framework	10
2.	2021-2024 CDM Framework Performance	11
3.	2019-2020 Interim Framework Performance	12
4.	2015-2019 Conservation First Framework Update	13

Glossary

Actual Savings – energy or peak demand savings accounted for once energy-efficiency projects are completed, and then reported to and approved by the IESO.

Committed Savings – energy or peak demand savings accounted for once energy-efficiency projects have been pre-approved for implementation. Once projects are completed, and then reported to and approved by the IESO, committed savings become actual savings.

Levelized Unit Energy Cost (LUEC) – a metric that normalizes the costs incurred to design and deliver programs per unit of energy saved over the lifetime of the project.

Net Verified Energy and Peak Demand Savings – the energy or peak demand savings that result following evaluation of CDM programs. During the evaluation process, reported savings have an adjustment factor applied that determines the percentage of reported savings attributable to CDM programs.

Program Administrator Cost (PAC) Test – a CDM cost-effectiveness screening test that compares the costs incurred to design and deliver programs by the program administrator with avoided electricity supply-side resource costs (e.g., generation, transmission, natural gas, etc).

Savings Persistence – a measure of the length of time (measured in years) over which energy and/or peak demand savings will remain in effect, and therefore continue to provide benefit to the electricity system.

Total Resource Cost (TRC) Test – a CDM cost-effectiveness screening test that compares the costs incurred to design and deliver programs and customers' costs with avoided electricity and other supply-side resource costs (e.g., generation, transmission, natural gas, etc.)

Executive Summary

Today, Ontario is one of the cleanest electricity jurisdictions in the world. This is, in large part, because Ontario has been leading a transition over the past two decades that has been characterized by the opening of competitive electricity markets, phasing out of coal, managing nuclear refurbishments, incorporating renewable supply and decentralizing the grid. Energy efficiency as a resource has played a major role in contributing to this clean electricity supply.

The Independent Electricity System Operator (IESO) must be ready for an unprecedented increase in demand and economic growth as heavy industries and other sectors commit to electrification, which includes industrial sector development in mining, steel, electric vehicle battery and hydrogen production; agricultural sector greenhouse construction; and the transportation sector. As the grid operator and planner, it is critical that the IESO support economic growth and prosperity emerging from this transformation by ensuring adequate supply where and when it is needed most.

Energy efficiency and conservation and demand management (CDM) activities will continue to support this demand and economic growth, with many CDM programs already geared towards many of the sectors described above. Energy efficiency helps ensure the reliability of the electricity system in Ontario and is one of the most cost-effective resources, at three cents per kilowatt-hour (kWh). Other benefits include helping individuals and business reduce their electricity costs and achieve their decarbonization goals.

This report documents the progress made to the end of 2021 on achieving the IESO's forecasted CDM targets.

In 2021, the IESO was managing energy-efficiency programs under three distinct CDM frameworks, primarily because many projects from previous frameworks were delayed as a result of the impacts from the COVID-19 pandemic. Projects were winding down under the Conservation First Framework (CFF), which ran from January 2015 to March 2019, and under the Interim Framework, which ran from April 2019 to December 2020. In addition, the IESO launched a new framework in January 2021, the 2021-2024 CDM Framework.

In the first year of the 2021-2024 CDM Framework, modest progress was made to the new set of provincial targets. Participation in Save on Energy programs is expected to increase throughout the remaining years of the framework and the IESO expects to achieve the framework targets. Overall, 451 gigawatt-hours (GWh) of energy savings (83 percent of the annual target) was achieved by the end of 2021, as well as 76 megawatts (MW) of peak demand savings (86 percent of the annual target). This involved 19,116 energy-efficiency projects across the suite of Save on Energy programs. These achievements include both "**actual** savings," which result from completed projects, and "**committed** savings," which represent projects that have been pre-approved for implementation but have not yet completed.

Under the Interim Framework, despite continuing COVID-19 delays, the IESO continued to work with participants in 2021 to bring projects into service and realize the energy savings. By the end of 2021, the IF achieved 733 GWh of actual energy savings (51 percent of the IF target) and 124 MW of

actual peak demand savings (65 percent of the IF target). A significant amount of savings and budget remains committed at the end of 2021; these represent projects that were expected to be in service in 2022.

Under the CFF, despite project completion dates being extended beyond the end of 2020, many projects were not yet in service by the end of 2021 because of the continuing impacts of pandemic delays. A total of 8.1 terawatt-hours (TWh) of actual energy savings were achieved by the end of 2021, which represents 109 percent of the target. In addition, 1,094 MW of actual peak demand reductions were also achieved (CFF did not have a peak demand savings target). Similar to the IF, there were outstanding CFF projects at the end of 2021, with these additional results expected to be realized in 2022.

1. Overview

1.1 Energy Efficiency in Ontario

For more than 14 years, the Ontario Power Authority and, beginning in 2015, the IESO, have delivered and supported energy-efficiency programs and services that have been instrumental in reducing energy costs for customers and providing a cost-effective way to offset electricity demand.

2006 - 2010	2011-2014	2015-2019	Interim	2021-2024 CDM
	Framework	Framework	Framework	Framework
 1-3 year funding commitments Every Kilowatt Counts brand Hybrid delivery by OPA and local distribution companies (LDCs) "Culture of Conservation" 	 Peak demand and energy targets, set by government Centralized program design (OPA) One key delivery channel (LDCs) Established Save on Energy brand to ensure customers receive consistent message 	 Energy targets only, set by government Decentralized LDC-led program delivery and joint LDC-IESO program design Regional collaboration and electricity-gas integration, where appropriate Introduction of risk-based financing Greater transparency in reporting and costs 	 Energy and peak demand targets, forecasted by the IESO Competitive mechanisms and procurements IESO program design and delivery Dedicated LDC Fund Driving cost-efficiencies 	 Energy and peak demand targets, forecasted by the IESO IESO program design and delivery Driving cost-efficiencies Focused on customers and areas with greatest needs Local Initiatives Program

Energy efficiency delivered through CDM programs is a key resource for maintaining a reliable, affordable and sustainable electricity system in Ontario. As electricity demand is forecasted to grow rapidly across the province and existing resources retire or enter refurbishment, the value of CDM to the system increases as a low-cost, non-emitting resource that can respond to changing system needs and support broader economic development and decarbonization objectives.

Energy efficiency remains one of the most cost-effective resources to help to meet Ontario's energy demands. Every dollar of energy-efficiency incentives offered by the IESO leverages two dollars of private sector investment.

Save on Energy is Ontario's recognized and trusted source for energy-efficiency opportunities and knowledge in the province. Through the Save on Energy brand, the IESO offers programs, incentives and educational content to help every customer segment use energy more wisely.

Changes to building codes and product standards also help contribute to the province's conservation savings. These savings are covered in the IESO's <u>Annual Planning Outlook</u>.

By achieving greater energy efficiency, individuals and businesses can realize significant cost savings. This also helps reduce the amount of energy the provincial electricity system needs to produce and deliver, which can defer or avoid the need for investments in new electricity supply or transmission line infrastructure. Investments in energy efficiency also make businesses more competitive and homes more comfortable to live in. It can also help reduce greenhouse gas emissions and drive economic prosperity by enabling jobs and purchases of new equipment.

Save on Energy marked its 10th anniversary in 2021. Since the brand was first introduced in 2011, Save on Energy programs have provided energy-efficiency opportunities and resources to more than 250,000 residential and business customers across Ontario to help them better manage their electricity use, saving nearly 16 TWh of electricity. This is equivalent to powering 1.7 million homes for one year or a city the size of Ottawa for more than two years.

These 250,000 customers completed more than 80 million energy-efficiency actions over those first 10 years, which ranged from changing a light bulb to completing complex building retrofits.

Through the implementation of programs and pilots to help meet province-wide and local community needs, Ontarians have had the chance to participate in a wide range of programs that deliver real savings. These savings are robust and transparent, thanks to the IESO's industry-leading evaluation, measurement and verification processes, through which the IESO is able to continually learn and enhance the quality of programs.

1.2 2021-2024 Conservation & Demand Management Framework

In 2021, the IESO introduced a new framework for CDM programs. On <u>September 30, 2020</u>, the Minister of Energy, Northern Development and Mines directed the IESO to establish a 2021-2024 CDM Framework aimed at offering a suite of centrally delivered programs to help consumers manage their electricity use while meeting electricity system needs. This framework focuses on cost-effectively achieving provincial peak demand reductions, as well as targeted approaches to address regional and/or local electricity system needs.

The 2021-2024 CDM Framework leverages competitive procurements and calls for proposals to increase competition, improve cost-effectiveness and solicit consumer-based solutions. Programs continue to be targeted to those who need them the most, including industrial, commercial, institutional and on-reserve First Nations consumers, as well as income-eligible consumers. Recognizing limited forecasted needs in the CDM Framework's first two years, programs were designed to maintain program delivery capacity in the province and meet consumer needs, while enabling a ramp-up of program offerings in 2023.

The IESO developed a <u>CDM Program Plan¹</u> to implement the September 30, 2020, directive. The Plan detailed the programs to be delivered under the new Framework over the course of the four years, including their forecasted energy savings, demand savings and cost. Systems needs were taken into account in determining the original targets for the framework. The Directive and Plan established a target of 440 MW of peak demand savings and 2.7 TWh of energy savings, with an associated cost of \$692 million, for the four-year term of the Framework. As requested by the government in the September 30, 2020, directive, the IESO completed a <u>CDM Framework Mid-Term Review in 2022</u>. Subsequently, electricity system needs have been reassessed and changes have been considered to the programs, targets and budgets of the CDM Framework.

¹ The CDM Program Plan has been updated to reflect the enhanced budget and targets from the <u>September 29, 2022, ministerial directive.</u>

Overview of CDM Programs

CDM programs for industrial, commercial and institutional consumers continue to support business competitiveness and the province's economic recovery from the COVID-19 pandemic, helping businesses improve their productivity and manage costs.

Programming was renewed for income-eligible consumers and on-reserve First Nations across Ontario. For income-eligible consumers, access to energy-saving measures has been simplified as a single program to deliver the benefits of two previously existing programs, the Affordability Fund Program and the Home Assistance Program, to reduce confusion and enhance customer experience.

For on-reserve First Nations, programs under the previous Interim Framework that were suspended due to the outbreak of COVID-19 were relaunched to allow time for committed projects to be completed.

Residential and other consumers are supported with tools and guidance to help improve energy efficiency. These include tips and other educational resources to help better manage energy costs in homes and make smart buying decisions of energy-efficiency appliances and equipment.

Programs offered include those that provide incentives to help Ontario businesses of all sizes implement retrofits and other energy-efficiency projects to manage their energy costs, with the following included in 2021:

- Retrofit Program the framework's flagship program, participants can receive incentives for a variety of energy-efficient measures including lighting, HVAC and manufacturing. In 2021, the program was streamlined to an expanded list of prescriptive measures with faster application review processes.
- Small Business Lighting specifically for businesses with 50 or fewer employees, this
 program offered incentives of up to \$2,000 for the direct installation of eligible lighting
 equipment.²
- **Energy Performance Program** this program rewards business customers who can achieve continuous whole-building energy improvements under a pay-for-performance model.
- **Energy Manager Program** this program funded organizations that embedded Energy Managers into their organizations and provided support as they implemented strategic energy management best practices.³
- **Training courses** incentives of up to 50 percent are available to cover the cost of training programs that can build energy management expertise.

² The Small Business Lighting program has evolved and was re-launched in March 2022 as the Small Business Program, which now offers direct-install incentives on an expanded range of equipment – both lighting and non-lighting.

³ The Energy Manager program wound down at the end of 2022 and has been replaced by a new program called the Strategic Energy Management program, which is designed to help organizations improve their energy performance by implementing an integrated system of organizational practices, policies and processes to achieve persistent energy savings.

Programs that offered incentives for income-eligible electricity consumers and Indigenous communities in 2021 included:

- Energy Affordability Program available to income-eligible residents, energy-savings upgrades are tailored to the specific needs of participants' homes, at no cost. Two types of support are available: comprehensive support that includes a home assessment and the direct installation of energy-saving measures, and energy saving kits that includes measures to be installed by residents.
- Remote First Nations Energy-Efficiency Program this program provides funding support to remote First Nations to implement energy-efficiency projects that helps manage energy use more effectively to save on energy costs and increase the comfort of homes and businesses.

Additional Save on Energy programs were launched after 2021, including:

- The **Industrial Energy Efficiency Program**, which replaced the Process and System Upgrades Program, to support industrial customers in improving their industrial processes and implementing system optimization projects
- Local initiative programs, to facilitate implementing CDM solutions to address regional and local electricity planning needs
- Evolution of the Small Business Lighting to the **Small Business Program**, to include nonlighting upgrades such as energy-efficient refrigeration and smart thermostats to qualifying businesses in addition to the lighting upgrades offered in the earlier program
- Strategic Energy Management Program, an evolution of the Energy Manager Program, to help organizations improve their energy performance by implementing an integrated system of organizational practices, policies and processes to achieve persistent energy saving
- First Nations Community Building Retrofit Program, an initiative that aims to improve energy efficiency in band-owned commercial and institutional facilities located in on-reserve First Nations communities in Ontario.

More programs are planned to be launched in 2023, including:

- Existing Building Commissioning Program, to help owners, operators and managers of commercial and institutional buildings improve their energy management by implementing building management best practices
- **Commercial Midstream Lighting Program,** where incentives would be directed to the lighting distributors to increase sales of energy-efficient lighting through point-of-sale discounts, improved product stocking, marketing, and distributor training
- A new **residential demand response program** for homes with existing central air conditioning and smart thermostats to help lower energy use at peak times.

- **Targeted support for greenhouse growers** in Southwestern Ontario, including incentives to install LED lighting, advanced controls or behind-the-meter distributed energy resources (DER), such as combined solar generation and battery storage.
- Enhancements to the **Save on Energy Business Retrofit Program** for businesses, institutional and industrial customers to include custom energy-efficiency projects.
- Enhancements to the **Save on Energy Local Initiatives Program** to reduce barriers to participation and to add flexibility for incentives for DER solutions.

1.3 COVID-19

The COVID-19 pandemic and related measures had a material impact on the IESO's ability to deliver its planned programming and on customers' receptiveness to implementation in 2021. The IESO identified the following impacts on CDM program offerings because of the pandemic:

- Provincial lockdowns and supplemental safety protocols disrupted program delivery.
- Launch dates for some programs were delayed, while others were paused. For some programs, administrative costs still accrued despite not delivering savings due to requirements to maintain call centre and other capabilities.
- Participants managing uncertainty and shifting budget priorities reduced the number and timing of energy-efficiency projects. Industries also experienced challenges related to staffing and site access.
- Supply chain issues and inflation affected energy-efficiency projects, along with related increased time, costs and complexity for implementation.
- Changes to energy-use patterns introduced challenges to project measurement and verification for participants and program administrators. This led to increased program administrative costs along with decreased savings certainty.

As a result of these challenges, participants in some programs in the 2015-2019 Conservation First Framework and the 2019-2020 Interim Framework were granted extensions to complete their projects.

In response to COVID-19, in-person interactions between Save on Energy representatives and customers were temporarily suspended in 2020 and then again in 2021, including visits to home and businesses. New programs under the 2021-2024 CDM Framework have remained flexible to ensure safe delivery and have continued to provide opportunities to help those who need them most, as well as contribute to reduced energy costs as businesses and residents recover from the impacts of COVID-19.

1.4 Winding Down Legacy CDM Frameworks

1.4.1 2019-2020 Interim Framework

The Save on Energy programs under the 2019-2020 Interim Framework were focused on ensuring value for customers and the electricity system as a whole. The overall costs to deliver energy-efficiency programs in Ontario were reduced, compared to the investment under the previous Conservation First Framework, by streamlining the delivery of the programs and centralizing delivery with the IESO and focusing the designs of the programs to achieve the most impact.

The Interim Framework programs focused on consumers most in need, including businesses, Indigenous communities and income-eligible residents. Opportunities were also available for local distribution companies to pilot programs tailored to meet local energy and demand needs.

As of 2021, the Interim Framework was on course to achieve the CDM Plan energy savings target of 1,429 GWh and the peak demand savings target of 190 MW, when accounting for committed projects that were expected to complete in 2022.

1.4.2 2015-2019 Conservation First Framework

The 2015-2019 Conservation First Framework (CFF) established a partnership between the IESO and Ontario's local distribution companies to design and deliver electricity conservation programs to local distribution company (LDC) customers. The aim was to achieve a total of 7 TWh of reductions in electricity consumption between January 1, 2015, and December 31, 2020. In March 2019, the Ontario government directed the IESO to discontinue the CFF and replace it with a 2019-2020 Interim Framework that streamlined and centralized program delivery under the IESO.

In 2021, the IESO continued to work with LDCs as well as program participants to wind-down remaining project commitments. To date, CFF investments have totalled nearly \$1.7 billion and have resulted in 8.1 TWh of annual energy savings and over 1,000 MW of peak demand reductions. In light of the ongoing impacts of COVID-19, extensions have been issued to allow for project completions to take place into 2022; therefore, CFF commitments will continue to deliver results beyond 2021.

2. 2021-2024 CDM Framework Performance

In 2021, the first year of the 2021-2024 CDM Framework, Save on Energy programs made modest progress to the new set of provincial targets considering the continuing impacts of the COVID-19 pandemic. A total of 82.3 GWh of net verified energy savings (3 percent of the total framework target) and 15.7 MW of net verified peak demand savings (3.5 percent of the total framework target) were reported and evaluated in 2021. Based on these results, the business programs demonstrated cost-effectiveness at a Program Administrator Cost (PAC) ratio of 1.68, a Total Resource Cost (TRC) ratio of 1.38, and a Levelized Unit Energy Cost (LUEC) at 3 cents/kWh. Support programs are not screened for cost-effectiveness, because maintaining the cost-effectiveness thresholds of traditional CDM programs would impact the ability of the programs to support the most vulnerable.

In addition to the challenges presented by the COVID-19 pandemic, savings achieved in the first year of the new framework were also limited by the number of projects completed within the same year of application. More projects needed more time to be completed than in previous years. Therefore, when taking into account the volume of projects also committed in 2021 – with completion dates anticipated in 2022 and later – 2021 program activity improves:

Program	Energy Savings (GWh)	Peak Demand Savings (MW)	Budget (\$M)
Retrofit Program	416.5	70.2	\$62.6
Small Business Lighting	11.6	3.3	\$4.2
Energy Manager Program	0.8	0.1	\$0.4
Energy Performance Program	12.6	1.8	\$2.3
Energy Affordability Program	8.8	0.8	\$11.0
First Nations Programs	0.8	0.1	\$0.0
Total	451	76	\$80.4
2021 CDM Program Plan Targets	543	89	\$136
Progress to Annual Program Targets	83%	86%	59%

As the province continues to recover from COVID-19, the IESO expects to see continued increases in participation in Save on Energy programs and to achieve the framework targets.

Final verified results are provided annually each fall as part of the evaluation, measurement and verification (EM&V) process. The EM&V process assesses the resource savings, cost-effectiveness and market impacts of each program, and reports are available on the <u>IESO website</u>.

3. 2019-2020 Interim Framework Performance

In recognition that COVID-19 began to cause disruptions in supply chains and labour shortages in March 2020, which resulted in delays to the anticipated completion dates of many energy-efficiency projects, project completion dates for certain energy-efficiency programs were extended beyond 2020. Therefore, the IESO continued to administer the Interim Framework in 2021 and worked with participants to realize incremental in-service project savings. The data below represents customer participation and net-verified actual costs and in-service project savings at the end of 2021.

Programs	Budget (\$M)	Energy Savings ¹ (GWh)	Demand Savings ¹ (MW)
Retrofit Program	93	585	93
Small Business Lighting Program	15	45	11
Energy Manager Program	7.7	45	13
Process & Systems Upgrade Program	6.5	18	1.5
Energy Performance Program	0.4	0.6	0.1
Home Assistance Program	34	25	2.5
Indigenous Programs	5.7	0.6	0.1
LDC Local Programs	11	14	2.4
Total	172	733	124
Interim Framework CDM Plan Program Targets	325	1429	190
Progress to Targets ²	53%	51%	65%

Cumulative (2019-2021)

¹100% of savings persist in 2021

² As of 2021, the Interim Framework was on course to achieve the CDM Plan energy savings target of 1,429 GWh and the peak demand savings target of 190 MW, when accounting for committed projects that were expected to complete in 2022.

In 2021, the Interim Framework remained cost-effective, demonstrated in the following results:

Cost-Effectiveness Metric	Cost-Effectiveness Result
Total Resource Cost (TRC)	1.0
Program Administrator Cost (PAC)	2.38
Levelized Unit Energy Cost (LUEC)	\$0.02/kWh

For additional detail regarding Interim Framework results, the 2021 EM&V report is available on the IESO website.

4. 2015-2019 Conservation First Framework Update

COVID-19 similarly caused supply chains disruptions and labour shortages to CFF projects that were expected to complete by the end of 2020. As a result, project completion dates for certain CFF energy-efficiency programs were also extended beyond 2020. By the end of 2021, progress under the CFF yielded the following results:

2015-2021 CFF Performance	Budget (\$M)	Net Energy (TWh) ¹	Net Peak Demand (MW) ¹
Framework Progress	1,674	8.1	1,094
Framework CDM Plan	2,455	7.4	N/A ²
Performance Against Plan ³	68%	109%	N/A ²

¹CFF savings are evaluated as persisting through 2020. Additional savings achieved in 2021 are not evaluated for persistence but would persist through 2021 at minimum.

²CFF did not include a peak demand reduction target

³CFF savings above <u>do not</u> include committed projects. As of the end of 2021, a portion of projects approved under the CFF remain incomplete. The IESO will continue to report on additional progress annually.

In 2021, the CFF also remained cost-effective, demonstrated in the following results:

Cost-Effectiveness Metric	Cost-Effectiveness Result
Total Resource Cost (TRC)	1.5
Program Administrator Cost (PAC)	3.3
Levelized Unit Energy Cost (LUEC)	\$0.02/kWh

For additional detail regarding CFF results, the 2020 EM&V report is available on the IESO website.

On December 9, 2021, the IESO received a Ministerial directive that enabled the IESO and LDCs to further extend timelines for the completion of certain projects under the CFF to August 31, 2022. The directive also provided for a further four-month extension to December 31, 2022, if certain conditions were met as defined in the directive. The additional extensions provided for in this directive are intended to offset the delays caused by COVID-19 disruptions. As such, the IESO continues to work with LDCs to wind-down the CFF, including the payment of participant incentives for completed projects and the completion of program administration activities.

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