Office of the Auditor General of Ontario

Value-for-Money Audit:

Reducing Greenhouse Gas Emissions from Energy Use in Buildings

November 2020

Reducing Greenhouse Gas Emissions from Energy Use in Buildings

1.0 Summary

Greenhouse gases released into the atmosphere through human activity have resulted in increased global temperatures, contributing to melting glaciers and sea ice, rising sea levels, extended heat waves and droughts, and more frequent and severe storms, flooding and wildfires. This is known as climate change. Climate change has had major impacts on biodiversity and ecosystems, infrastructure (such as transportation systems), food and water supply, human health and tourism. In response, jurisdictions around the world have established goals to reduce emissions and help address climate change. In 2018, Ontario established a target to reduce greenhouse gas emissions by 30% below 2005 levels by 2030.

Greenhouse gases are generated through various activities, but the largest contribution is from burning fossil fuels, including coal, transportation fuels, heating oil and natural gas. In residential, commercial and institutional buildings, natural gas is the primary source of energy used to heat space and water. Since 2005, natural gas use in the province has increased by 4%, whereas its use in buildings has increased by 15% (see **Figure 1**). As a result, buildings are the third-largest source of emissions in Ontario, contributing 40 megatonnes (Mt) or 24% of the provincial total (see **Figure 2**). Of these emissions, about 76% result from the use of natural gas (see **Figure 3**).

Figure 1: Natural Gas Use in Ontario, 2005–2018

Source of data: Statistics Canada (2020)

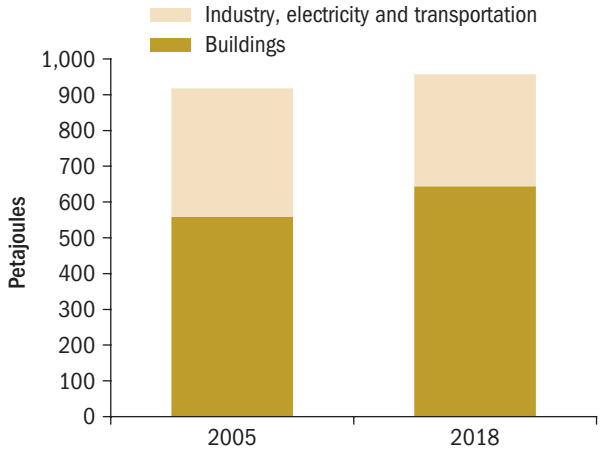


Figure 2: Ontario's 2018 Greenhouse Gas Emissions, by Economic Sector

Source of data: National Inventory Report, Environment and Climate Change Canada (2020)

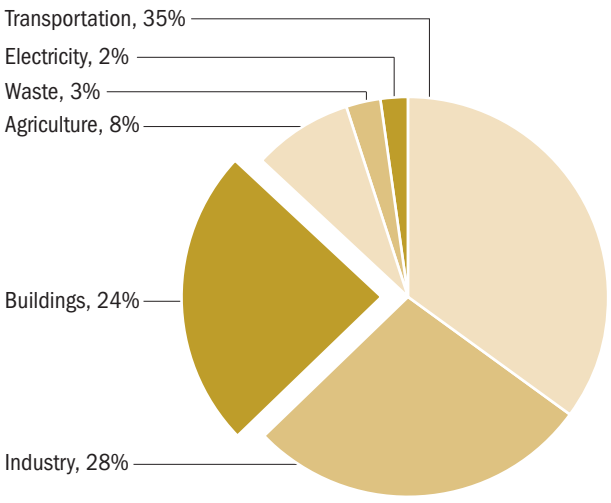
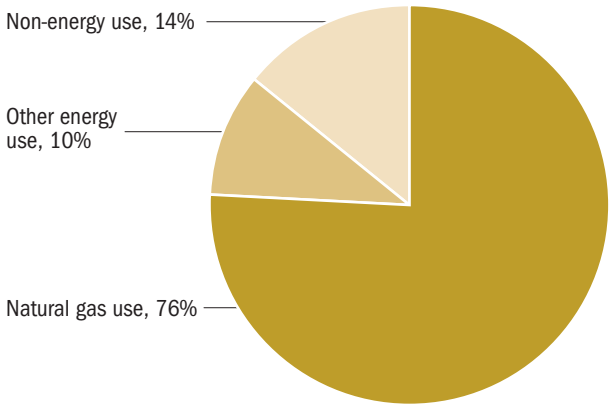


Figure 3: Breakdown of Greenhouse Gas Emissions from Ontario Buildings, 2017

Prepared by the Office of the Auditor General of Ontario based on data from Natural Resources Canada (2019) and Environment and Climate Change Canada (2019)



Responsibility for programs and oversight related to reducing energy use in buildings is shared across two ministries and two agencies; however, only one agency was subject to this audit due to its focus on natural gas conservation (see **Figure 4**):

- The Ministry of Municipal Affairs and Housing (Municipal Affairs Ministry) administers the *Building Code Act, 1992* and the Ontario Building Code (Code), which includes energy-efficiency requirements for buildings.
- The Ontario Energy Board (OEB) is a quasi-judicial adjudicative body that regulates natural gas utilities. As part of its mandate, the OEB is to promote energy conservation and energy efficiency in accordance with provincial policy.
- The Ministry of Energy, Northern Development and Mines (Energy and Mines Ministry) has oversight of the OEB and the Minister may, with the approval of the Lieutenant Governor in Council, direct the OEB to take steps to promote energy conservation. The Energy and Mines Ministry also has responsibility for two energy reporting programs that separately apply to private- and public-sector buildings, and for setting efficiency standards for appliances and products used in buildings.

Overall, our audit found that the province risks missing its 2030 emission-reduction target, in part because climate change and the reduction of greenhouse gas emissions is not yet a cross-government priority, even though there is a specific commitment in *Preserving and Protecting our Environment for Future Generations: A Made-in-Ontario Environment Plan* (Environment Plan) to make climate change a cross-government priority to meet the target. Although the 2018 Environment Plan was released by the Ministry of the Environment, Conservation and Parks (Environment Ministry), many programs and initiatives needed to reduce emissions and meet the target require action by other ministries and agencies. None of the three auditees (the Municipal Affairs Ministry, the OEB, and the Energy and Mines Ministry) focus on climate change or the reduction of greenhouse gas emissions in decision-making. As such, this will make it a challenge to reduce emissions in the buildings sector to a degree that could support achievement of the 2030 target.

Specifically, we found that:

- **The lack of an integrated long-term natural gas and electricity energy plan puts meeting Ontario's emission-reduction target at risk.** In November 2019, Environment Ministry staff proposed next steps to support the Environment Plan. One proposed option was for a long-term energy plan to be developed and aligned with the government's greenhouse gas emission-reduction target. The most recent Long-Term Energy Plan, which was released by the Energy and Mines Ministry in October 2017 and has since been marked online as archived, includes discontinued policies and does not integrate long-term natural gas and electricity planning. The absence of long-term planning to address the increase in natural gas use puts achievement of the province's 2030 target at risk.
- **Delay in the development and implementation of a new natural gas conservation framework may result in lost opportunities**

Figure 4: Reducing Emissions from Energy Use in Buildings, Initiatives Reviewed
Prepared by the Office of the Auditor General of Ontario

Initiative	Lead Responsibility	Findings	Report Section
Long-term energy plan	Energy and Mines Ministry	Ministry does not have an integrated energy plan aligned with Ontario's emission-reduction target	4.1
Environment Plan	Energy and Mines Ministry; Ontario Energy Board	Some actions not being implemented; goal of plan undermined	4.2, 4.3
Building regulation	Municipal Affairs Ministry (Oversees Building Code. Code is enforced by municipalities)	Ministry does not effectively oversee administration of Code energy-efficiency requirements	5.1
		Ministry does not evaluate Code performance	5.2
		Delay in Code updates means lost opportunities to save energy and reduce emissions	5.3
		Code lacks energy-efficiency requirements for renovations	5.4
		Building practitioners (e.g., inspectors) have energy-efficiency knowledge gap	5.5
		Builders lack training and oversight	5.6
Natural gas conservation	Ontario Energy Board (Oversees conservation programs offered by Enbridge)	OEB's natural gas conservation framework can evolve to achieve more cost-effective natural gas savings for the longer term	6.1
		OEB has not ensured accurate estimates are used to calculate natural gas savings	6.2
	Energy and Mines Ministry (Oversees Ontario Energy Board)	Ministry providing unclear guidance to the OEB on natural gas conservation	6.3
Energy reporting and benchmarking	Energy and Mines Ministry	Ministry data collection is inaccurate and incomplete	7.1
		Ministry does not ensure usefulness of public data	7.2
Energy efficiency standards for appliances and products	Energy and Mines Ministry	Ministry does not confirm compliance with energy efficiency standards	8.1

to reduce emissions. The Environment Plan includes an expected increase in natural gas conservation investment beginning in 2021 to achieve 3.2 Mt in reductions from natural gas conservation by 2030. Despite its authority to do so, as of August 2020, the Energy and Mines Ministry had provided no direction to the OEB on the goals and timing of a new framework to increase natural gas conservation. Further, while the OEB initiated a consultation for a new framework in May 2019, it had not started to draft one. In July 2020, the OEB approved a one-year extension of Enbridge's existing conservation programs to ensure program continuity. Simply continuing natural gas conservation efforts at existing levels will contribute to fewer energy-efficient building improvements than could have been achieved and therefore higher emissions for years, even if program investments are later increased. These lost opportunities impact Ontario's ability to achieve the emissions reductions from natural gas conservation estimated in the Environment Plan, which account for 18% (or 3.2 Mt) of the reductions needed to achieve Ontario's 2030 target.

- **The Municipal Affairs Ministry did not adopt proposals that would have strengthened energy-efficiency requirements and**

reduced emissions in new and existing buildings. Reducing emissions from buildings requires a shift away from using natural gas, both in terms of conservation and transitioning to lower-emission energy sources (e.g., solar, wind, geothermal, nuclear or hydro-generated electricity). The Ministry was directed in November 2018 not to proceed with proposed updates that would have reduced building energy use by 20% and required energy-efficiency upgrades during some renovations. Instead, the Ministry was directed to focus on harmonizing the Code with the updated National Construction Codes, which are expected to be released in late 2021. The National Codes are not expected to include energy-efficiency requirements for renovations until at least 2025, and the potential impact of harmonization on Ontario's energy-efficiency requirements is not yet clear.

- **The Energy and Mines Ministry is not implementing several initiatives it has been assigned in the Environment Plan to reduce building emissions.** The Environment Plan identifies the Energy and Mines Ministry as the lead ministry for several emission-reduction initiatives, including working with the OEB to increase natural gas conservation (see bullet above), working with the Ontario Real Estate Association to encourage the voluntary disclosure of home energy-efficiency information, and developing policy measures to encourage more renewable natural gas. (The Environment Plan expects 2.3 Mt in 2030 emissions reductions to come from the use of renewable natural gas to displace higher-emission non-renewable natural gas.) We found there has been little to no progress on these initiatives.

Our audit also found a general lack of effective administration, oversight and investment in programs to reduce energy consumption from buildings. Specifically:

- **The Municipal Affairs Ministry does not assess compliance with the Code's energy-efficiency requirements.** Although on paper the Code is considered to have some of the most stringent energy-efficiency requirements in North America, the Ministry does not collect information to assess builder compliance with these requirements. Low compliance levels with energy-efficiency building requirements in other jurisdictions, including Colorado, Connecticut, and Pennsylvania, have been found to result in lost energy savings estimated in the billions of dollars.
- **The Municipal Affairs Ministry does not evaluate whether the Code's energy-efficiency requirements produce the intended energy reductions.** The Code has been updated four times since 1975 to strengthen energy-efficiency requirements for new buildings. While multiple factors can affect the actual energy performance of a constructed building, the Ministry does not collect data on newly constructed buildings and energy use to determine whether energy-efficiency updates are in fact resulting in the intended energy-efficiency gains.
- **The Municipal Affairs Ministry's support to building officials is considered insufficient to ensure compliance with the Code's energy-efficiency requirements.** Municipal building officials (including building inspectors) are responsible for ensuring that buildings are constructed in accordance with the Code. While the Municipal Affairs Ministry supports Code interpretation by building officials on a regular and continuous basis, a survey we conducted of municipal building officials found that only 18% of respondents believe that the Ministry provides sufficient support to municipalities to ensure compliance with Code requirements for energy efficiency. A lack of technical support can result in incorrect or inconsistent interpretation and application of the Code.

- **The Energy and Mines Ministry's lack of enforcement results in inaccurate and incomplete data from its private-sector energy reporting program.** A key step toward improving the energy efficiency of buildings is to measure and track their energy performance. Energy reporting programs generate important decision-making information for building owners and managers, as well as government policy makers. Inaccurate and incomplete data sets reduce the usefulness of the energy reporting programs. Our audit found there are numerous errors and omissions in the data received by the Ministry. In 2019, 30% of the reported private-sector buildings had either missing or likely inaccurate data. We also found that, due to low compliance rates, private-sector energy-use data is incomplete. In 2019, data was received from just 45% of buildings.
- **The Energy and Mines Ministry does not ensure compliance with the energy-efficiency standards it sets.** The Ministry sets minimum standards for windows and 24 products (e.g., furnaces) that burn natural gas or oil and are used in buildings. The Ministry does not inspect the products for which it sets a standard, nor are there any monitoring or enforcement provisions for non-compliance with the standards. Our Office found two manufacturers advertising windows for purchase in Ontario with certification label information that did not match the certification organization's directory of officially certified products. A lack of enforcement means consumers face a risk of buying and installing non-compliant products that result in greater overall costs, energy use and greenhouse gas emissions.
- **A greater focus on cost-effective natural gas conservation can reduce long-term costs to natural gas ratepayers and greenhouse gas emissions.** One objective of the 2015–2020 Natural Gas Conservation Framework was to achieve all cost-effective conservation that results in a reasonable rate impact. A 2016 study released by the OEB to inform the mid-term review of the Framework examined how much natural gas conservation could realistically be achieved under different levels of investment. It found that if utilities had implemented all cost-effective programs that were realistically achievable between 2015 and 2020, the overall upfront investment of $3.3 billion—about five times current annual program costs charged to customers (ratepayers—would have resulted in a net benefit of $4.7 billion for ratepayers in long-term avoided natural gas costs. This higher level of investment in conservation could also have reduced greenhouse gas emissions out to 2045 by 27.3 Mt.
- **The OEB has not completed all identified evaluations to update assumptions used to estimate natural gas savings.** Calculations of the natural gas savings achieved through conservation programs are based, in part, on various assumptions. Assumptions are made, for example, about the number of program participants who would have undertaken a conservation initiative even without the program. One assessment of natural gas conservation programs for industrial facilities demonstrates the importance of having updated assumptions. The assessment found that the percentage of such participants in 2015 was much higher (92%) than previously assumed (54%). This resulted in a 35% overestimation of the annual natural gas savings achieved as a result of the program offered, for which the utilities were eligible to recover $4.3 million. In 2016, the OEB identified the need to conduct an assessment to update the assumptions for program participation in home retrofit programs, but the study still has not been completed. Without such an assessment, calculated savings attributable to the program may continue to be based on inaccurate inputs—affecting the ability to measure and improve conservation programs.

Overall Conclusion

We found overall that the programs and oversight of the Municipal Affairs Ministry, Energy and Mines Ministry and Ontario Energy Board focus on energy efficiency and reducing energy use. Based on our work, we found that there is not a focus on reducing fossil fuel use or greenhouse gas emissions. This matters because, for instance, while reducing the use of natural gas contributes to a reduction in emissions, conversion to a fuel source with lower emissions would contribute even more to emissions reductions. This lack of focus means the Municipal Affairs Ministry has not strengthened the Ontario Building Code to specifically reduce emissions, the Energy and Mines Ministry has not implemented initiatives in the Environment Plan to reduce building emissions, and the OEB has not developed a new natural gas conservation framework. This lack of prioritization and action hinders progress in reducing Ontario's emissions and poses a risk to Ontario's ability to meet its 2030 emission-reduction target.

Moreover, each of the Municipal Affairs Ministry, Energy and Mines Ministry and Ontario Energy Board lack sufficient systems and processes to effectively oversee, evaluate and improve the performance of programs to support and encourage the reduction of energy use in buildings.

This report contains 19 recommendations, with 31 action items, to address our audit findings (see **Appendix 1** for a summary of report recommendations).

OVERALL MINISTRY OF MUNICIPAL AFFAIRS AND HOUSING RESPONSE

The Ministry of Municipal Affairs and Housing welcomes the Auditor General's observations and recommendations regarding the Building Regulation Program.

The Ministry will need to consider the report and recommendations in the context of the government's commitments on housing mix and supply, the government's ongoing response to COVID-19 and the delivery of services that are critical to the health and well-being of the citizens of Ontario, as well as building-related initiatives that were mentioned in the report as follows.

On August 27, 2020, on behalf of the government, the Minister of Municipal Affairs and Housing and the Solicitor General signed an agreement with the federal government and other provinces and territories for closer cross-country harmonization with the National Construction Codes. Establishing standardized rules for construction practices and materials across Canada is intended to reduce inter-provincial barriers to trade, create a broader market for manufactured goods across the country, and make it easier for design firms and builders to operate in different jurisdictions. Harmonization of construction codes will also establish a more consistent framework for energy-efficiency requirements across Canada and support Ontario businesses within the building energy-efficiency sector to operate on an inter-provincial basis.

In addition, the Ministry is in the process of transforming and modernizing the delivery of building services in Ontario. Recent amendments to the *Building Code Act, 1992* enable the future establishment of an administrative authority to deliver certain building regulatory services. Discussions with sector stakeholders are continuing in fall 2020 into 2021 and will help inform future decisions about the administrative authority's scope of delivery. It is expected that the earliest an administrative authority would be implemented is 2022. The range of services offered by an administrative authority could address some of the issues identified in the report, from the qualification and registration of building practitioners to supporting Code interpretation by building officials.

OVERALL MINISTRY OF ENERGY, NORTHERN DEVELOPMENT AND MINES RESPONSE

The Ministry of Energy, Northern Development and Mines appreciates the comprehensive audit conducted by the Auditor General and welcomes the insights offered in the report. The Ministry acknowledges its relationship with the Ontario Energy Board (OEB), the economic regulator of the energy sector, and the importance of a governance framework that effectively addresses policy issues and preserves and protects the independence of the adjudicative functions of the OEB.

We recognize addressing climate change will require cross-government action and agree the Ministry's programs and initiatives will be an important contributor to the province's greenhouse gas emission-reduction goals.

The Ministry is committed to ensuring effective implementation of its programs that help reduce, support and encourage the reduction of energy use in buildings. Working with stakeholders, the Ministry will continue to identify opportunities for improvements in the energy data being submitted to the Ministry and ensure access of that data by the public.

The Ministry is committed to working with the Ministry of the Environment, Conservation and Parks to capture ratepayer-funded natural gas conservation in future iterations of the Environment Plan, and to continue to pursue other initiatives that contribute to the government's 2030 emission-reduction target. While the Ministry is supportive of efforts by the OEB to increase cost-effective natural gas savings, we recognize that the OEB must balance ratepayer interests with the level of natural gas savings pursued.

The Ministry will continue to evaluate the impact of efficiency standards on energy use and greenhouse gas emissions, and work with other regulators and industry stakeholders to ensure broad awareness of the Ministry's energy-efficiency regulations.

OVERALL ONTARIO ENERGY BOARD RESPONSE

The Ontario Energy Board (OEB) acknowledges the importance that the Auditor General places on reducing greenhouse gas emissions and appreciates the Auditor General's report. Through its policies and the independent adjudication of applications, the OEB has promoted natural gas conservation and energy efficiency in accordance with the policies of the Government of Ontario. The OEB will continue to do so, while at the same time also continuing to protect the interests of natural gas ratepayers with respect to rates and the quality of gas service, and with due regard to the Minister of Energy, Northern Development and Mines' priorities for the OEB as articulated in the Minister's October 2020 mandate letter to the Chair of the OEB's Board of Directors. The OEB looks forward to working with the Ministry of Energy, Northern Development and Mines on a new Memorandum of Understanding, and to working with both that Ministry and the Ministry of the Environment, Conservation and Parks with respect to the OEB's role in advancing the government's climate change agenda.

2.0 Background

2.1 Buildings Generate 24% of Ontario's Greenhouse Gas Emissions

Residential, commercial and institutional buildings generate a large portion of Ontario's greenhouse gas emissions, which contribute to global climate change. In 2018, these buildings were responsible for 40 megatonnes (Mt), or 24%, of the provincial total. The buildings sector contributes the

third-largest amount after the transportation and industrial sectors (see **Figure 2**). Most of these emissions are a result of burning fossil fuels, such as natural gas, heating oil and propane, to heat space and water. Of these, natural gas is the primary fuel used. According to the most recent data available, natural gas use was responsible for 76% of building emissions in 2017 (see **Figure 3**).

Reducing natural gas use from buildings of all types has other benefits besides contributing to a reduction in greenhouse gas emissions. Nitrogen oxides, which contribute to the formation of smog, are also produced when natural gas is burned. Therefore, reducing natural gas use improves air quality and human health. As well, natural gas customers can reduce their energy bills by improving the energy efficiency of their building. Finally, a reduction in the amount of natural gas used can help to limit the amount of costly infrastructure that is required to transport and distribute the gas across the province.

2.1.1 The Buildings Sector

The buildings sector contains two subsectors–residential, and commercial and institutional:

- **Residential buildings.** Ontario has about 5.4 million residences, including attached and detached single houses, apartments and mobile homes. To stay warm inside, and have hot water for cleaning, most Ontarians rely on natural gas. Of the total greenhouse gas emissions from the buildings sector, 60% comes from residential buildings due to their reliance on this type of energy.
- **Commercial and institutional buildings.** The commercial and institutional subsector consists of a range of buildings that includes offices, retail stores, restaurants, educational facilities, hospitals, and hotels. Similar to the residential sector, the main fuel used to heat water and space in these buildings is natural gas. Combined, these buildings contribute 40% of total emissions in Ontario's buildings sector.

2.1.2 Reducing Natural Gas Consumption in Buildings

There are several ways to reduce the amount of natural gas used in buildings, and thereby the greenhouse gases emitted. Switching the building's fuel source to a lower-emission energy source (e.g., solar, wind, nuclear, geothermal, or hydro-generated electricity instead of natural gas) can have major emission-reduction impacts.

A second means is to ensure the building envelope minimizes heat loss. (For the definition of building envelope and other terms, see the glossary in **Appendix 2**). This means increasing insulation in walls, sealing air leaks and installing high-efficiency windows and doors.

A third way is to install high-efficiency appliances and equipment, such as furnaces and boilers that require less natural gas to produce the same amount of heat. Not only do such efforts result in less energy used, but they can result in lower costs.

A further method is to change the behaviour of the buildings' occupants. For example, in colder weather, when natural gas is typically being used for heating, occupants can limit the amount of natural gas that is used by turning down the thermostat at night.

Payback periods for energy-efficiency retrofits for all building types can vary widely depending on many factors, including the cost and type of retrofit measure, occupant behaviour, and how payback is calculated. In Ontario, payback periods can range from zero to three years for simple retrofits (e.g., draft proofing and furnace upgrades), to over 10 years for more extensive measures that achieve greater energy and greenhouse gas emissions reductions (e.g., replacing insulation and windows). So-called deep energy retrofits, that cut energy use by 40% or more, often involve combining multiple measures. Due to high capital costs these can have payback periods of 15 years or more; municipal or utility programs can help reduce the barriers to uptake of such deep retrofits by providing low-cost financing to building owners. (See **Appendix 3** for examples of payback periods for energy-efficiency retrofits.)

2.2 Ontario Government Programs to Reduce Energy Use in Buildings

Various provincial programs currently exist to reduce energy use in buildings (see **Figure 4**). In November 2018, the Environment Ministry released *Preserving and Protecting our Environment for Future Generations: A Made-in-Ontario Environment Plan* (Environment Plan) outlining current and additional actions to reduce buildings' energy use. These actions are intended to contribute to Ontario's target of reducing emissions to 30% below 2005 levels by 2030.

2.2.1 Building Regulation Program

The *Building Code Act, 1992* (Act) and the Ontario Building Code (Code), a regulation under the Act, lay out rules for the construction of all new, as well as renovations of existing, buildings in the province. Part 12 of the current 2012 Code establishes minimum energy-efficiency standards that new houses and large buildings are required to meet.

The Municipal Affairs Ministry is responsible for overseeing the implementation of the Act, the Code and related policies and programs. The Ministry is responsible for maintaining a qualification and registration system for building practitioners (e.g., chief building officials, inspectors and supervisors), developing guidance materials and providing technical support. While the Ministry is responsible for enforcing the Code in unorganized territories, which are parts of the province that do not form part of a municipality or First Nations reserve, such as rural parts of northern Ontario, responsibility for enforcement elsewhere has largely been delegated to municipalities. Municipalities must appoint a chief building official and as many building inspectors as needed to enforce compliance with the Code. Chief building officials are responsible for co-ordinating and overseeing enforcement of the Code within the municipality.

2.2.2 Natural Gas Conservation Programs

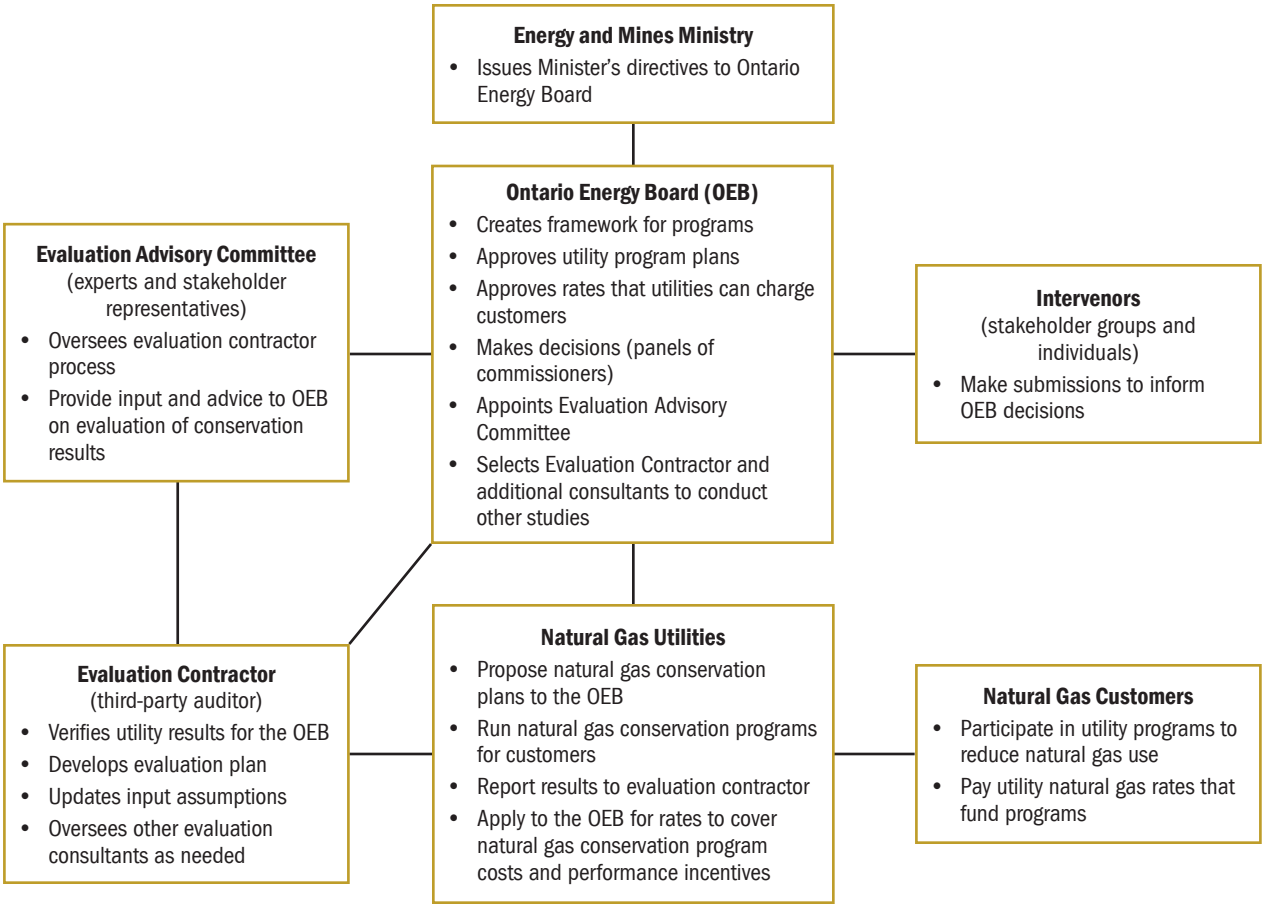
In 1993, the OEB established its first regulatory framework for natural gas conservation programs offered by the natural gas utilities to help their customers reduce their natural gas use. Since at least 1995, natural gas utilities have offered various programs. Many of these programs provide financial incentives (see **Appendix 4**). For example, through its Home Efficiency Rebate Program, Enbridge Gas Inc. (Enbridge) offers customers who heat their homes with natural gas up to $5,000 in rebates for attic insulation, or to purchase high-efficiency furnaces or boilers. By doing so, Enbridge helps its customers reduce the amount of natural gas needed. Enbridge and EPCOR are the two rate-regulated natural gas utilities in the province. Enbridge has over 99% of market share in terms of natural gas volumes, and is currently the only utility that provides natural gas conservation programs to its 3.7 million customers.

Under the *Ontario Energy Board Act, 1998*, the OEB regulates natural gas utilities. As such, the OEB serves an oversight role by approving the programs, energy conservation targets and budgets that are submitted by the utilities. The OEB conducts its regulatory oversight function through a quasi-judicial process. Panels of commissioners (formerly called board members) hold both oral and written proceedings and make decisions on utility applications. OEB staff support the panel in the process. Intervenors and OEB staff can participate and make submissions for panel consideration. Under the same legislation, the Energy and Mines Ministry oversees the OEB and the Minister, with the approval of the Lieutenant Governor in Council, may direct the OEB to take steps to promote energy conservation (see **Figure 5**).

Natural gas conservation programs that are offered by utilities, including those that affect the buildings sector, are expected to comply with OEB-approved frameworks. In 2014, the Energy and Mines Ministry directed the OEB to develop a 2015–2020 Natural Gas Conservation Framework

Figure 5: Natural Gas Conservation, Organizations and Responsibilities

Prepared by the Office of the Auditor General of Ontario



(Framework). In December 2014, the OEB released a Framework for gas utilities to follow when creating natural gas conservation programs.

The Framework includes financial incentives to encourage utilities to voluntarily offer conservation programs. Utilities are compensated for the costs of running programs and are also eligible to receive additional incentives depending on the results, as measured against performance (e.g., natural gas savings) targets established by the OEB. This funding is paid by customers through natural gas prices, which are regulated by the OEB.

The 2014 direction to the OEB requires that the Framework enable the achievement of all cost-effective natural gas conservation, as far as is appropriate and reasonable. Cost-effective programs are defined by the OEB as programs where the benefits of the program (e.g., avoided energy costs, capacity costs, transmission and distribution costs, avoided carbon costs, and other non-energy benefits) are equal to or greater than the net equipment and program costs. Cost-effective programs, therefore, result in a net financial benefit. For example, in 2018, every dollar invested in utility natural gas conservation programs resulted in over two dollars in savings.

As of October 2020, the Energy and Mines Ministry had not provided direction to the OEB on updating the current Framework, which will expire in December 2020. In May 2018, Enbridge indicated to the OEB that all parties would benefit if the development of a new framework was started as soon as possible—and certainly not later than early 2019—noting that the process to finalize programs took over two years under the current Framework. The OEB began consultations in May 2019 for a new framework that would begin in 2021.

2.2.3 Energy Reporting and Benchmarking Programs

A key step toward continuously improving the energy efficiency of buildings is to measure and track their energy performance. At least 25 North American jurisdictions have implemented energy benchmarking programs. Under these programs, building owners and operators report their building's energy use so that it can be compared with past performance and benchmarks that have been calculated based on comparable buildings. By doing so, building operators can identify opportunities to improve their own building's energy performance. Governments can also gain insight into how well energy-efficiency programs are working, and design programs that focus on areas of greatest opportunity and need. If the data is made publicly available, potential building buyers, tenants and financiers can take energy efficiency into consideration when making real estate decisions. Studies of reporting and benchmarking programs in other jurisdictions have found between 3% and 8% improvements in total energy use or energy intensity (e.g., the amount of energy used per square foot) within the two- to four-year period typically analyzed.

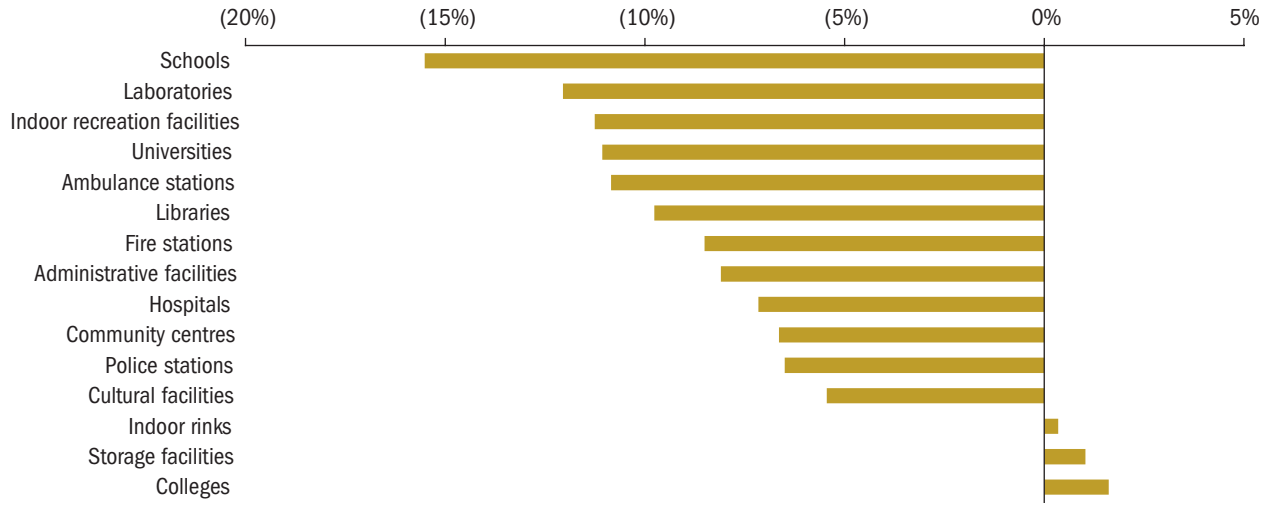
Under the *Electricity Act, 1998*, the Energy and Mines Ministry administers two building energy reporting regulations that are targeted at public- and private-sector buildings. Under the first program, broader-public-sector organizations—including municipalities, universities, colleges, school boards and hospitals—are required to annually submit their energy use and greenhouse gas emissions data to the Ministry and to develop an Energy Conservation and Demand Management plan every five years.

The reporting requirement has been in place since 2013, with annual compliance rates of at least 93%. Using this information, the Ministry has calculated that, for 12 out of 15 building operation types where there is a sample size over 100, there has been an improvement in energy intensity since reporting began (see **Figure 6**). For example, the Ministry found a 7% median improvement in hospitals between 2011 and 2017. Further analysis by our Office found a 16% improvement for facilities in the Greening Health Care Network—a network of hospitals (see **Figure 7**) that explicitly use benchmarking data to help inform energy-efficiency measures.

The second, newer program requires owners of large private-sector buildings to report their building

Figure 6: Change in Median Energy Intensity[1] by Broader-Public-Sector Building Type,[2] 2011–2017

Source of data: Ministry of Energy, Northern Development and Mines



1. Energy intensity refers to the amount of energy used per square foot, adjusted for local temperatures/heating requirements.
2. Sample sizes for each building type are over 100.

Figure 7: Greening Health Care Network, Hospital Members in Ontario

Prepared by the Office of the Auditor General of Ontario

Member	Location
Baycrest	Toronto
Centre for Addiction and Mental Health	Toronto
Credit Valley Hospital	Mississauga
Grand River Hospital	Kitchener
Halton Healthcare Services	Halton Hills, Milton and Oakville
Headwaters Health Care Centre	Orangeville
Humber River Regional Hospital	Toronto
Kingston General Hospital	Kingston
Mackenzie Health[1]	Richmond Hill
Markham Stouffville Hospital	Markham and Uxbridge
Muskoka Algonquin Healthcare	Huntsville and Bracebridge
Niagara Health System	Fort Erie, Niagara Falls, Port Colborne, St. Catharines and Welland
North York General	Toronto
Ontario Shores	Lindsay, Newmarket, Peterborough and Whitby
Orillia Soldiers' Memorial[1]	Orillia
Ross Memorial Hospital	Lindsay
Royal Victoria Regional Health Centre	Barrie
Runnymede Healthcare Centre	Toronto
Scarborough and Rouge Hospital	Toronto
SickKids	Toronto
Sinai Health System[2]	Toronto
Stevenson Memorial[1]	Alliston
Toronto East General Hospital	Toronto
Trillium Health Partners	Mississauga and Toronto
Unity Health Toronto	Toronto
Waypoint Centre for Mental Health	Penetanguishene
West Park Healthcare Centre	Toronto
William Osler Health System	Brampton and Toronto
Women's College Hospital	Toronto

1. 2017 energy use has not been reported to Energy and Mines Ministry.
2. 2011 energy use has not been reported to Energy and Mines Ministry.

energy and water use to the Ministry on an annual basis. The Ministry has not yet calculated energy intensity trends from this relatively new program, which began collecting data in 2018. Stakeholders, including the Building Owners and Managers Association of Toronto and the City of Toronto, have worked with the Ministry to develop the private-sector reporting program, and plan to use the data to support their energy conservation efforts.

2.2.4 Energy-Efficiency Standards for Appliances and Products

Governments establish minimum energy performance standards to help ensure that manufacturers design appliances and products in a way that reduces the amount of energy necessary for their use. Not only do more efficient products require less energy to operate or result in less energy used, they result in lower operational costs.

As required under the *Electricity Act, 1998*, the Energy and Mines Ministry sets minimum energy performance standards that must be met by the manufacturers of over 80 types of products that are sold or leased in Ontario. Included are 24 fossil-fuelled products (e.g., natural gas- and oil-fuelled furnaces, boilers and water heaters) that are used in buildings. There is also one standard that applies to windows. An increase in the minimum energy performance standards of these products will save Ontario consumers money on energy costs, and reduce energy use and greenhouse gas emissions in the province.

2.3 Improving Building Energy Efficiency through COVID-19 Recovery Spending

Governments around the world—including the European Union, France, Germany, New Zealand, South Korea and the United Kingdom—have announced significant investments in energy efficiency and climate change as part of their COVID-19 recovery packages. For example, the European Union is spending $1,135 billion Cdn over the next 10 years on climate change and other environmental measures, with 18% of the total earmarked for the buildings sector. According to research from the University of Oxford, building energy retrofits are one of the most cost-effective measures to deliver both economic and climate goals during the post-COVID recovery. Research by a global management consulting company has found that, following the 2008 recession, three times as many jobs were created by stimulus investments in low-carbon projects, such as building retrofits, compared to fossil-fuel projects (on a per-dollar basis).

The Task Force for a Resilient Recovery, an independent group of experts from business, industry, academia and non-government organizations, has proposed a series of measures to support an economically and environmentally resilient recovery for Canada. These proposals include: investing in building energy-efficiency retrofits to improve indoor air quality and comfort (using public investments to leverage private capital); expanding existing municipal retrofit programs; accelerating adoption of stringent, net-zero energy ready Building Codes; and providing training and workforce development programs focused on low-carbon building techniques.

3.0 Audit Objective and Scope

The objective of our audit was to assess whether the Ministry of Municipal Affairs and Housing (Municipal Affairs Ministry) and the Ministry of Energy, Northern Development and Mines (Energy and Mines Ministry) have effective systems and processes in place to:

- identify and implement programs that reduce, or support or encourage the reduction of, energy use in buildings, and confirm they are comprehensive and delivered efficiently and economically, in accordance with applicable legislation, regulations, directives and policies;
- reduce energy use in buildings, as applicable, in accordance with Ontario's legislation, regulations and policies; and
- measure, evaluate and publicly report on the results and effectiveness of programs and activities to reduce energy use in buildings.

In addition, a further objective was to assess whether the Ontario Energy Board (OEB) has effective systems and processes in place to:

- develop and establish natural gas conservation frameworks to increase energy efficiency and reduce energy use in buildings, and confirm they are comprehensive and implemented efficiently and economically, in accordance with applicable legislation, regulations, directives and OEB policies; and
- evaluate and publicly report on the results and effectiveness of conservation frameworks, as well as utility programs developed

under such frameworks, to reduce natural gas use in buildings.

In planning our work, we identified the audit criteria (see **Appendix 5**) we would use to address our audit objectives. These criteria were established based on a review of applicable legislation, policies and procedures, internal and external studies, and best practices. Senior management at each entity reviewed and agreed with the suitability of our audit objectives and associated criteria.

We conducted our audit between January 2020 and August 2020. We obtained written representation from management of the auditees that, effective October 22, 2020, they had provided us with all the information they were aware of that could affect the findings or the conclusions of this report.

Our audit work on the OEB, the Municipal Affairs Ministry and the Energy and Mines Ministry was conducted at each of their respective main offices in Toronto. At the OEB, we examined its oversight of natural gas utility conservation programs, including the evaluation, measurement and verification processes used to determine program results. At the Municipal Affairs Ministry, we examined its administration of the Ontario Building Code, with a focus on the energy-efficiency requirements. At the Energy and Mines Ministry, we examined its oversight of the OEB, as well as its energy reporting and efficiency standards programs.

We interviewed senior management and staff, and examined related data and other documents from the OEB, the Municipal Affairs Ministry, and the Energy and Mines Ministry to obtain an understanding of each entity's involvement in reducing energy consumption from buildings in Ontario. We also interviewed some members of the OEB's Evaluation Advisory Committee, including representatives from the University of Toronto, the School Energy Coalition and Energy Futures Group. We also interviewed members of the Energy and Mines Ministry's Stakeholder Working Groups, including representatives from Building Owners and Managers Association Toronto, and the City of Toronto.

We interviewed representatives of various groups, including the Association of Municipalities of Ontario, Canada Green Building Council, Canadian Home Builders Association, Efficiency Canada, Enbridge, Environmental Defence, Fenestration Canada, Housing Services Corporation, Ontario Building Officials Association, Pollution Probe, Siding and Window Dealers Association of Canada, The Atmospheric Fund, and York University. We also interviewed chief building officials and building inspectors from several municipalities, a net zero home builder and registered building energy advisors. With assistance from the Ontario Building Officials Association, our Office surveyed the association's approximately 1,800 members to understand the roles municipal building officials (chief building officials and building inspectors) play in enforcing the Ontario Building Code and the level of compliance with its energy-efficiency provisions.

We interviewed officials from other jurisdictions, including British Columbia, Manitoba and Quebec.

We conducted our work and reported on the results of our examination in accordance with the applicable Canadian Standards on Assurance Engagements—Direct Engagements issued by the Auditing and Assurance Standards Board of the Chartered Professional Accountants of Canada. This included obtaining a reasonable level of assurance.

The Office of the Auditor General of Ontario applies the Canadian Standard on Quality Control and, as a result, maintains a comprehensive quality-control system that includes documented policies and procedures with respect to compliance with rules of professional conduct, professional standards and applicable legal and regulatory requirements.

We have complied with the independence and other ethical requirements of the Code of Professional Conduct of the Chartered Professional Accountants of Ontario, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

4.0 Detailed Audit Observations: Climate Change and Reducing Greenhouse Gas Emissions Not Yet an Integrated Cross-Government Priority

In November 2018, the Ministry of the Environment, Conservation and Parks (Environment Ministry) released *Preserving and Protecting our Environment for Future Generations: A Made-in-Ontario Environment Plan* (Environment Plan). The Environment Plan commits to making climate change a cross-government priority.

As discussed in our *2019 Annual Report,* climate change needs to be embedded in all government decision-making to ensure progress is made in reducing greenhouse gas emissions. Best practices used by other jurisdictions to embed climate change in government decisions and operations include holding specific ministries and agencies accountable for climate change through regular reporting, greater transparency on spending and implementation plans, and clear responsibilities laid out in mandate letters.

Through our audit, however, we found that climate change is not yet a cross-government priority. Each of the auditees confirmed that the reduction of greenhouse gas emissions is not integrated within their mandate, and therefore not a priority. The Ministry of Municipal Affairs and Housing (Municipal Affairs Ministry), the Ministry of Energy, Northern Development and Mines (Energy and Mines Ministry) and the Ontario Energy Board (OEB) asserted that their programs, responsibilities and mandates relate to the use, conservation and efficiency of all energy types—not to specifically reducing fossil fuel use or greenhouse gas emissions in their program areas. While their efforts might slow the increase in natural gas use, and consequently, greenhouse gas emissions, they have not taken any responsibility for reducing emissions—for example, by prioritizing energy sources with lower emissions over natural gas. As a result, no Ontario ministry or agency is taking any responsibility for overseeing, co-ordinating, or monitoring emissions reductions in the buildings sector. Moreover, we found that the ministries do not prioritize or incorporate emissions reductions into their building-related programs and activities. Previously the Municipal Affairs Ministry made emissions reductions a priority; in 2018/19, the Ministry set an internal key performance indicator that the residential building sector would be more energy efficient as demonstrated by a decreasing rate in greenhouse gas emissions. However, more recently, the Ministry did not include energy efficiency or reductions in greenhouse gas emissions in its 2019/20 and 2020/21 key performance indicators.

4.1 An Integrated Long-Term Natural Gas and Electricity Energy Plan Could Assist in Achieving Emission-Reduction Target

Fossil-fuel energy use produces approximately 77% of Ontario's greenhouse gas emissions. The Environment Plan does not address whether a shift away from such fuels will be necessary in order to achieve its climate change targets. Manitoba, Quebec and British Columbia explicitly address this in their climate change plans.

In November 2019, Environment Ministry staff internally proposed next steps to support the Environment Plan, including the need for the development of a long-term energy plan that has an increased focus on non-electricity fuels (such as natural gas) and aligns with the government's greenhouse gas emission-reduction target. The Energy and Mines Ministry is responsible for developing Ontario's long-term energy plans. The most recent Long-Term Energy Plan, released in October 2017, includes discontinued policies and has been marked as archived. The Ministry is currently reviewing the process for long-term energy planning.

Ontario has not created an integrated natural gas and electricity plan to support industrial, commercial and housing development and expansion. Natural gas use has increased since 2005 (the baseline year for Ontario's emission-reduction target). In buildings, natural gas use has increased by 15%, while overall natural gas use in the province has increased by 4%. The share of natural gas use in buildings has increased from 61% to 67% over the same time frame (see **Figure 1**). Integrated natural gas and electricity long-term planning could help achieve the province's 2030 emission-reduction target.

RECOMMENDATION 1

To co-ordinate energy decisions across government, we recommend that the Ministry of Energy, Northern Development and Mines develop an integrated long-term energy plan that aligns plans for the use of Ontario's major sources of energy (including natural gas) with the government's emission-reduction target. The energy plan could incorporate and consider long-term industrial, commercial and housing development.

MINISTRY RESPONSE

The Ministry agrees that energy planning should be integrated, and energy policy decisions should be co-ordinated across government. The Ministry is currently reviewing the planning framework used to meet the province's long-term energy planning needs. A new framework, which could replace the current Long-Term Energy Plan process, would consider feedback provided in the Auditor General's report, as well as through broad consultation and engagement with Ontario residents and expert stakeholders, including through a public posting on the Environmental Registry. The Ministry anticipates that this review will be complete within the next year.

The Ministry of the Environment, Conservation and Parks co-ordinates climate change mitigation actions across government, which includes actions led by the Ministry of Energy, Northern Development and Mines. The Energy and Mines Ministry will work closely with the Environment Ministry on energy-related climate change mitigation activities, including as they relate to integrated energy planning.

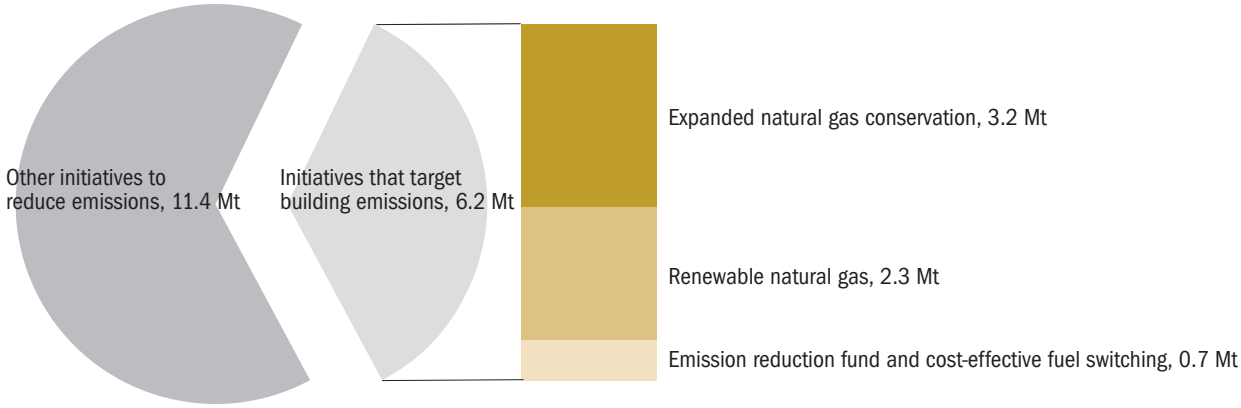
4.2 Energy and Mines Ministry Not Implementing Initiatives in the Environment Plan to Reduce Building Emissions

The Environment Plan lays out several actions to reduce greenhouse gas emissions from buildings, and other documents identify which ministry is responsible for implementing each of the Environment Plan's initiatives. We found that several of these initiatives are not being implemented.

The Environment Plan expects the largest contribution to emissions reductions, 3.2 Mt in 2030 (18% of the 2030 target), to come from the Energy and Mines Ministry working with the OEB and natural gas utilities to increase cost-effective natural gas conservation (see **Figure 8**). However, the Energy and Mines Ministry has informed the Environment Ministry to expect a continuation of current programs with no planned increase in conservation. The Energy and Mines Ministry has not provided direction to the OEB on updating the current natural conservation framework, which will expire in December 2020. Instead, the Ministry is deferring to the OEB, which regulates natural gas rates, on future natural gas conservation. In turn, the OEB itself relies on Enbridge to voluntarily offer conservation programs.

In November 2019, Enbridge applied for a one-year extension of the current Framework and OEB-approved programs. The OEB approved Enbridge's application to extend its programs in July 2020, and has informed us that it may approve a further extension into 2022 if needed. An extension will likely continue Enbridge's approved natural gas conservation programs without increasing the

Figure 8: Environment Plan Emission-Reduction Estimates to Achieve 2030 Target
Prepared by the Office of the Auditor General of Ontario



amount it may bill customers for such programs, and therefore maintain existing investments in conservation at current levels.

The OEB's decision to not require more cost-effective natural gas conservation means that less-than-optimal building investments now may lock in higher emissions for several decades. Although the OEB is consulting on the development of new guidelines for natural gas conservation programs that could be in place for 2022, less-than-optimal future investments in cost-effective natural gas conservation reduces the likelihood of achieving Ontario's 2030 emission-reduction target through this approach. A directive from the Minister could provide the OEB with direction, objectives and priorities to develop the next framework.

Similarly, the Environment Plan expects 2.3 Mt in 2030 emissions reductions to come from the use of more renewable natural gas (see **Figure 8**), a low-emission alternative to non-renewable natural gas. These reductions are to be achieved in two ways. The first is by requiring utilities to offer their customers the option of purchasing renewable natural gas, which would result in an estimated reduction of only 0.005 Mt of emissions because of the high purchase cost for this gas. However, no requirement has been placed on either utility to offer renewable natural gas. In September 2020, the OEB approved, on a pilot basis, Enbridge's application to offer a voluntary renewable natural gas program. The remaining emissions reductions are to come from the Energy and Mines Ministry and the Environment Ministry working together to develop additional policy measures. The Energy and Mines Ministry has asked the Environment Ministry to relieve it of any responsibilities related to renewable natural gas in the Environment Plan.

Finally, under the Environment Plan, the Energy and Mines Ministry is to work with the Ontario Real Estate Association to encourage the voluntary display of home energy-efficiency information on real estate listings, as is done in Vancouver and Nova Scotia. By making such information available, home buyers would be able to consider and value energy efficiency in their purchasing decisions. The Ministry has informed us that, as of September 2020, there has been no progress on this action.

RECOMMENDATION 2

To help Ontario meet its 2030 greenhouse gas emission-reduction target, we recommend that the Ministry of Energy, Northern Development and Mines work with relevant ministries, agencies and stakeholders to implement initiatives in the Made-in-Ontario Environment Plan, including increased cost-effective natural gas conservation, increased uptake of renewable natural gas, and the voluntary display of home energy-efficiency information.

MINISTRY RESPONSE

The Ministry agrees that addressing climate change requires cross-government action and that cost-effective natural gas conservation is an important contributor to the province's greenhouse gas emission reduction goals. The Ministry will work with the Ministry of the Environment, Conservation and Parks to capture ratepayer-funded natural gas conservation in future iterations of the Made-in-Ontario Environment Plan, and continue to pursue other initiatives that contribute to the province's 2030 emission-reduction target.

In addition to its mandate to promote energy conservation and energy efficiency in accordance with government policies, the Ontario Energy Board (OEB) has a statutory obligation to protect the interests of consumers with respect to prices and the reliability and quality of natural gas service. While the Ministry is supportive of efforts by the OEB to increase cost-effective natural gas savings, we recognize that the OEB must balance ratepayer interests with the level of savings pursued.

The Ministry recognizes the benefits of encouraging the use of renewable natural gas. In September 2020, the OEB approved an application from Enbridge Gas to offer a voluntary renewable natural gas program for its customers.

The Ministry acknowledges the importance of providing energy-efficiency data that helps people make decisions regarding home purchases and will re-engage with the Ontario Real Estate Association to explore the voluntary display of home energy ratings on real estate listing services.

4.3 Recent OEB Decisions Could Undermine Environment Plan Goal to Cost-Effectively Switch Buildings from High-Carbon Heating to Electricity

The Environment Plan expects to achieve 0.2 Mt of greenhouse gas emissions reductions by 2030 through changing heating in buildings from high-carbon oil and propane to low-carbon electricity, where cost effective. However, recent decisions by the OEB could undermine this goal.

For example, in 2020, the OEB approved a utility proposal to construct a $10.1-million natural gas pipeline to connect new customers in North Bay. An Enbridge survey had indicated there was interest in doing so from homeowners who were using costly oil, propane or low-efficiency electric baseboards for heating. Once approved by the OEB, the project was eligible to receive a subsidy of $8.7 million to be paid by existing ratepayers. Without this subsidy the project was not economically feasible for the estimated 134 potential new natural gas customers. Even with an average subsidy of $65,000 per potential new customer, the utility estimated that the potential customers would have higher annual heating costs than if high-efficiency electric heat pumps were used. The OEB deemed the project as being consistent with government energy and economic development policies, despite the cost to existing ratepayers and the availability of an alternative that is both lower cost and consistent with the government's Environment Plan.

RECOMMENDATION 3

So that the Ontario Energy Board's decisions support the government's emission-reduction goals, we recommend that the Ontario Energy Board align its decisions with the Environment Plan and any other provincial climate change goals.

ONTARIO ENERGY BOARD RESPONSE

The Ontario Energy Board (OEB) agrees that there are opportunities to reduce energy use in buildings (and as a consequence, greenhouse gas emissions) through natural gas conservation programs. The OEB will continue to meet its legislative obligations in relation to natural gas in a manner that respects our mandate and the independence of our adjudication function.

In moving forward with energy conservation and other natural gas-related activities, the OEB will continue to act with due regard to our legislated objectives, the "just and reasonable" standard for natural gas rates, the public interest standard for approving the construction of natural gas infrastructure and applicable government policy as it may be articulated in legislation or directives.

5.0 Detailed Audit Observations: Building Regulation Program

5.1 Municipal Affairs Ministry Does Not Effectively Oversee Administration of the Building Code's Energy-Efficiency Requirements

The Ministry of Municipal Affairs and Housing has responsibility for administering the *Building Code Act, 1992* and Building Code. As the provincial administrator of the Act, the Ministry is uniquely positioned to assess and ensure that the Act and the Code, and how they are administered across the province, are effective. However, the Ministry exercises little oversight on whether the Code is being properly implemented across the province. It does not collect information to assess compliance with the Code's technical requirements, or whether the energy-efficiency provisions are having the desired results. While the *Building Code Act, 1992* has largely assigned inspection, compliance and enforcement activities to municipalities, the Ministry does not assess how effectively these activities are conducted.

5.1.1 Municipal Affairs Ministry Does Not Collect and Use Information to Assess Compliance with Building Code's Energy-Efficiency Requirements

The Municipal Affairs Ministry does not collect information or conduct assessments to determine whether the energy-efficiency requirements in the Ontario Building Code are being complied with. In fact, Ontario follows few of the best practices to improve energy code compliance (see **Figure 9**).

In 2016, the Ministry commissioned a review to compare energy and water conservation requirements in Ontario's Code with other jurisdictions. The review found that Ontario had more stringent requirements for energy conservation in new buildings than most leading North American jurisdictions. However, the Ministry has never assessed the level of compliance with the Code's energy-efficiency requirements. Low levels of compliance can reduce the expected benefits (energy and cost savings, and reduced greenhouse gas emissions) no matter how stringent the Code.

Studies from a number of US states, including Colorado, Connecticut, Nevada, Pennsylvania, and Vermont, have found that compliance with energy-efficiency requirements in building codes is often low. In many states, less than 50% of buildings were found to meet the requirements, leading to lost energy savings estimated in billions of dollars. The Global Buildings Performance Network estimates that energy code compliance for new buildings varies between 40% and 90% globally.

Building regulators in other jurisdictions have conducted compliance studies or audits to highlight similar issues and direct resources towards addressing them. For example, the Queensland Building and Construction Commission in Australia

Figure 9: Municipal Affairs Ministry's Adherence to Best Practices in Improving Energy Code Compliance

Prepared by the Office of the Auditor General of Ontario

Best Practice	Description	Related Actions by the Ministry
Compliance evaluations and studies	Many US states and cities regularly (every three to five years) evaluate energy code compliance in random samples of new buildings. Common tools include checklists, field audits, interviews and surveys, building plan reviews, and energy performance testing.	Ministry has never assessed the level of compliance with Building Code's energy-efficiency requirements.
Mandatory energy performance testing	Requires new buildings to be tested for air tightness to ensure they meet as-built code requirements.	Proposals in 2017 to include air tightness testing in the next Code update have not been adopted.
Provide tools and resources to support building officials and industry	The US Department of Energy provides technical assistance and funding through its Building Energy Codes Program to support states in improving code compliance.	Ministry provides some tools, such as compliance checklists for large buildings, and energy modeling guidelines.
Training and technical assistance for industry	Create training programs, including licensing, certification and professional development requirements, for practitioners to support better compliance across industry.	Online energy efficiency training provided through George Brown College; Ministry provides limited technical support to practitioners; publishes Building Code (no digital version).
Involvement of utilities in Code compliance	Work with energy utilities to promote and co-ordinate training and capacity building to support code compliance.	No co-ordination between Ministry and energy utilities.
Presence of stakeholder group prioritizing Code compliance	Governments partner with knowledgeable industry stakeholders to design effective and sustainable compliance programs.	Ministry has consulted with stakeholders through technical advisory committees and participation in industry working groups; in 2019, the Building Code Conservation Advisory Council was eliminated.
Gap analysis	Identify gaps in knowledge, capacity and implementation that can inform Code compliance strategies, including additional training and education.	Ministry has never performed a gap analysis.

proactively audits buildings under construction to assess how they comply with the National Construction Code. In 2018/19, the Commission audited 1,800 building sites, including residential high-rises, townhouses and single-detached residences. These audits found a number of Code issues that local or private inspectors had failed to address, such as structural and drainage problems. The Commission publishes an annual report in which it discloses these findings and tracks compliance metrics.

The U.S. Department of Energy has developed a methodology for states to assess energy code compliance and identify specific issues or areas of improvement. A simplified tool has been developed for use by cities. Washington, D.C., used this tool to assess compliance with its Energy Conservation Code in 2014 and, based on the initial assessment, instituted a number of strategies such as workshops and training, technical assistance, online resources and energy checklists. A follow-up assessment in 2016 found the compliance rate had improved from 74% to 99%. British Columbia is the only Canadian province or territory to have estimated code energy compliance in the past five years. Surveys by BC Hydro, a Crown corporation that supports research to update the British Columbia Building Code, estimated that between 61% and 67% of buildings comply with the energy-efficiency requirements of the provincial code.

RECOMMENDATION 4

To support the effective administration of the Ontario Building Code's energy-efficiency requirements across the province, we recommend that the Ministry of Municipal Affairs and Housing:

- collect, review and analyze information on inspections, compliance and enforcement from municipal building departments;
- undertake a pilot assessment of energy efficiency compliance, using best practices developed by other jurisdictions (e.g., a statistically representative sample of building types and sizes, and a range of data collection methods); and
- work with municipalities and other stakeholders to develop and implement processes to address identified inspection, compliance and enforcement issues.

MINISTRY RESPONSE

The Ministry does not have responsibility for implementing this recommendation. In the Ministry's opinion, this recommendation relates to enforcement, rather than administration, of the Ontario Building Code's energy efficiency requirements and therefore does not fit within the statutory responsibility of the Ministry under the *Building Code Act, 1992*.

The division of roles and responsibilities between the Ministry and principal authorities, such as municipalities, are directly assigned by the Legislature through the *Building Code Act, 1992*. The Ministry is responsible for the administration of the *Building Code Act, 1992* and the Building Code, which includes developing amendments to the Act and the Building Code, engaging with other ministries and building sector stakeholders and participating in the National Code development process. The Ministry does not have responsibility for assessing or overseeing compliance with the Building Code described in the recommendation above. This responsibility for assessing and overseeing compliance is assigned by the Act to municipalities and other local principal authorities, who are responsible for enforcement of the Act and the Building Code, including Building Code requirements for energy-efficiency.

Municipalities and their building departments are responsible for establishing their own operational policies and processes to fulfil their responsibilities under the current legislative framework for verifying and ensuring Building Code compliance. Their statutory responsibilities include reviewing building permit applications to determine if the plans comply with the Building Code and performing construction inspections to evaluate whether construction is carried out in accordance with the Building Code and building permit. Municipalities may implement different compliance verification policies and processes based on their access to resources, risk-management profile and the type and volume of new construction activity within their jurisdiction.

The Ministry will continue to support the Ontario Building Officials Association, the Large Municipalities Chief Building Officials, as well as individual municipalities and practitioners, to identify compliance verification policies and practices currently being used for the Building Code's energy-efficiency requirements and disseminate "best practices" among the broader community of building officials.

AUDITOR GENERAL'S RESPONSE

While principal authorities (e.g., municipalities) have been delegated responsibility for inspecting and enforcing compliance with the Ontario Building Code within their specific areas of jurisdiction, the Ministry, as the administrator of the *Building Code Act, 1992*, is uniquely positioned to assess and ensure that the Act, and how it is administered across the province,

is effective. This role necessitates that the Ministry: have a high-level understanding of the efficacy of inspection, compliance and enforcement activities across the province; identify systemic risks, issues and opportunities related to the effective administration of the Act; and take corrective actions to address identified issues, including through evidence-based legislative and regulatory amendments.

5.1.2 Municipal Affairs Ministry's Support to Building Officials Insufficient to Help Ensure Compliance with the Building Code's Energy-Efficiency Requirements

The Municipal Affairs Ministry provides tools to engineers, architects and practitioners—including building officials and other designers—to support compliance with the Code's energy-efficiency requirements. These tools include energy modelling guidelines and compliance checklists for large buildings. As well, it has engaged with industry during and after Code updates to provide information and respond to queries. The Ministry's Building and Development Branch also provides technical support and responds to queries from Code users through the Code Development and Advisory Services Unit. Internal documents indicate that Ministry resources and expertise to provide educational materials and information is insufficient to meet the needs of building regulatory stakeholders. The Ministry is considering delegating a number of Code-related services, including providing support to municipalities, to a new administrative authority. In July 2020, the *Protecting Tenants and Strengthening Community Housing Act, 2020* received Royal Assent. The Act included enabling amendments to the *Building Code Act, 1992*, that will allow the government to establish an administrative authority in the future once the amendments are proclaimed. A future administrative authority would be designated through a Lieutenant Governor in Council regulation. As of October 2020, the administrative authority had not yet been designated.

Through our survey of, and interviews with, building officials, our Office learned that many building officials, who formerly relied on the Ministry for technical Code advice, now instead rely on peer groups. Of the municipal chief building officials who responded to a question on whether the Ministry provides sufficient support for municipalities to ensure compliance with the Code's energy-efficiency requirements, 53% disagreed while 18% agreed that that Ministry support is sufficient. The lack of technical advice provided by the Ministry can result in inconsistent interpretations and application of the Code between municipalities, potentially deterring business investments.

In the past, the Ministry issued written opinions on Code technical requirements that were used by municipalities to clarify and inform their interpretation of the Code. This practice was discontinued in about 2005. *The Building Code Act, 1992* also gives the Minister the authority to provide provincial consistency and certainty for building practitioners through binding written interpretations of any Building Code provision. However, internal documents provided by the Ministry indicate this authority has not been exercised. Of the chief building officials who responded to our survey, 88% said that the Ministry should return to providing written Code opinions in order to improve consistency and compliance for energy efficiency and other Code requirements.

RECOMMENDATION 5

To help support consistent interpretation and implementation of the Building Code's energy-efficiency requirements across municipalities, we recommend that the Ministry of Municipal Affairs and Housing:

- consult with building officials to identify support gaps; and
- review and update the Ministry's support materials and advisory services to ensure that building officials receive the guidance materials and technical information they need.

MINISTRY RESPONSE

The Ministry agrees with this recommendation. The Ministry commits to continuing to work with the Ontario Building Officials Association and the Large Municipalities Chief Building Officials to learn about supports needed by building officials to interpret and apply the Building Code's energy-efficiency requirements in a consistent manner. The Ministry will also consider feedback from its ongoing consultations with stakeholders on building regulatory services to be potentially delivered by a new administrative authority. The Ministry will also review and update its guidance materials and advisory services to support the work of Ontario's building officials.

5.2 Municipal Affairs Ministry Does Not Evaluate Whether Building Code's Energy-Efficiency Requirements Produce Intended Energy Reductions

Although the Building Code has been gradually updated to incorporate stronger energy-efficiency requirements, the Municipal Affairs Ministry does not evaluate its effectiveness in producing the intended energy reductions.

The Code has been updated four times since 1975 to improve and strengthen energy-efficiency requirements for new buildings. As a result of these updates, houses built today are to be designed to use almost 50% less energy—in all forms—than those built prior to 2006, and all other buildings are to be designed to use 35% less energy.

There are multiple factors that affect the actual energy performance of a constructed building compared to what is intended, including its design, quality and reliability of construction, and occupant behaviour. Given this uncertainty, it is important to determine whether the Code's energy-efficiency updates are resulting in the intended energy reductions in newly constructed buildings. However, the Municipal Affairs Ministry does not collect data on newly constructed buildings and actual energy use to determine whether energy-efficiency updates are resulting in the intended energy-efficiency gains. Data collected through performance testing and building commissioning (i.e., systematic processes to ensure that building systems are performing as designed) would help confirm whether buildings are constructed, operating and using energy as intended and expected, and help inform improvements to the Code.

RECOMMENDATION 6

So that the Ministry of Municipal Affairs and Housing is aware of the effectiveness of the Code's energy-efficiency requirements at achieving the energy reductions expected, we recommend that the Ministry establish and implement processes and requirements, such as air tightness testing and updated key performance indicators, that evaluate and verify the efficacy of the Ontario Building Code's energy-efficiency requirements.

MINISTRY RESPONSE

The Ministry agrees with this recommendation. Ontario's Building Code includes a number of compliance options for its energy-efficiency requirements. Designers are required to demonstrate compliance with one of these options and municipal building departments are responsible for verifying compliance. This verification process does not include the energy-efficiency performance of the house or building after construction is complete.

The Ministry will work with building industry stakeholders and other experts to examine ways to assess energy performance outcomes of new houses and buildings. Plans to implement measures in the Building Code will take into account other government commitments/priorities, such as harmonization with the National Construction Codes and improving housing mix and supply.

5.3 Delay in Updating Energy-Efficiency Requirements in Building Code Means Lost Opportunities to Save Energy and Reduce Emissions

Rather than adopting measures that were proposed to be phased in by 2022—which would have increased the energy efficiency of houses and other buildings by approximately 20% and saved 4.3 Mt in emissions by 2050—the Municipal Affairs Ministry plans to harmonize the Ontario Building Code with the National Construction Codes. These are in the process of being updated by the federal government. At the time of our audit, it was not clear how these changes would impact Ontario's energy-efficiency requirements if the national standards were adopted.

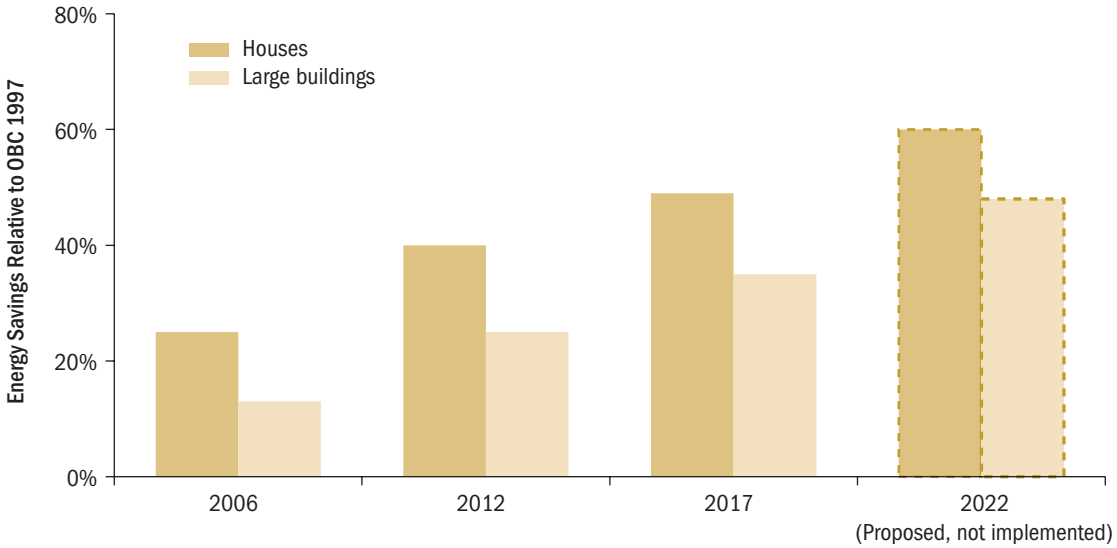
Prior to receiving direction to harmonize, the Ministry had done significant work to update Ontario's energy-efficiency requirements. During 2016/17, the Ministry developed and consulted on a set of energy-efficiency proposals that were to be phased in by 2022 but were never adopted. These proposals would have increased the energy efficiency of houses and other buildings by approximately 20% over the current Code, continuing the consistent and predictable Code improvements in energy efficiency since 2006 (see **Figure 10**). The Ministry estimated that the proposed changes would reduce cumulative greenhouse gas emissions in 2050 by 4.3 Mt, or 29% relative to current Code requirements.

The proposals were generally supported during public review and by the Ministry's technical advisory committees. Responses were mixed among key building industry stakeholders, with some industry groups requesting more time to study the costs and benefits, and to prepare for upcoming changes. In response to these requests, the Ministry recommended in January 2018 to delay implementing updates to green building standards and solar-ready roofs by one year and to relax some energy-efficiency related requirements. However, in November 2018, the Ministry received government direction to not proceed with the changes, and to instead focus on harmonizing the Ontario Building Code with the National Construction Codes (see **Appendix 6** for more detail on harmonization).

As a result, in May 2019, the Ministry made a number of amendments to the Code to more closely align it with the 2015 National Codes. The energy-efficiency requirements were not amended, despite the work the Ministry had done to develop and consult on updates over the previous three years.

Figure 10: Successive Energy Performance Targets in the Ontario Building Code (OBC)

Source of data: Ministry of Municipal Affairs and Housing



The Ministry also removed the legal requirement to review the energy-efficiency provisions of the Code every five years. Further, following a recommendation made by the Agency Review Task Force, the Building Code Conservation Advisory Council was dissolved in September 2019 even though the Ministry recognized that the Council, an expert advisory group, played an important role in improving Ontario's energy-efficiency requirements.

The Ministry has not conducted a detailed analysis of how Ontario's current energy-efficiency requirements compare to those proposed in the 2020 National Codes; Ministry staff told our Office they were waiting for the federal government to finalize its proposals before doing such an analysis. Whether harmonization improves the energy-efficiency requirements of Ontario's Building Code depends on how the province chooses to harmonize with federal requirements (see **Appendix 6**). If Ontario chooses to harmonize, and continue improving energy-efficiency requirements in line with past improvements, it would need to choose an energy tier that meets this objective.

Under a proposed agreement between the federal, provincial and territorial governments under the Canadian Free Trade Agreement, the Ministry would have two years to adopt the national requirements once they are made public. This would mean that any energy-efficiency updates may not come into effect before 2024, or seven years after the latest updates. Over 74,000 new houses undergo construction each year. About 39 million square feet of commercial and institutional floor space is also added annually. For every year that Ontario delays implementing more stringent energy efficiency Code requirements, higher energy use and greenhouse gas emissions will be locked in for thousands of buildings, likely for decades. Any further delay will also make it more difficult for Ontario to meet its commitment under the Pan-Canadian Framework on Clean Growth and Climate Change to adopt a net-zero energy ready building code by 2030.

RECOMMENDATION 7

So that there is a continued improvement in the energy efficiency of buildings, and reductions in the greenhouse gas emissions they produce, we recommend that the Ministry of Municipal Affairs and Housing:

- consult with experts to strengthen the requirements in the Ontario Building Code—including as part of any harmonization process; and
- ensure that harmonization continues to strengthen rather than weaken the Ontario Building Code's energy-efficiency requirements.

MINISTRY RESPONSE

The Ministry agrees with this recommendation. The National Research Council is currently in the process of finalizing its energy-efficiency proposals for houses and buildings that are planned to be included in the next edition of the National Building Code (anticipated for release in December 2021). The Ministry is waiting for this proposal to be finalized before it can be assessed and considered for adoption in Ontario's Building Code during its next code cycle. Prior to adopting more stringent requirements for energy efficiency into Ontario's Building Code, the Ministry will consider its leadership position on building energy-efficiency across North America, other government commitments/priorities and the impact of the global COVID-19 pandemic on municipalities and other building industry stakeholders. The Ministry will seek the advice of its building industry stakeholders as part of this process.

5.4 Lack of Energy-Efficiency Standards for Renovations Misses Opportunity to Reduce Energy Use and Greenhouse Gas Emissions

The exclusion of renovations from the Code's energy-efficiency requirements misses a substantial opportunity to reduce energy use and greenhouse gas emissions from the buildings sector.

Energy-efficiency requirements for new buildings have been improved since the Code was first introduced in 1975. However, most of Ontario's building stock is relatively old and predates current energy-efficiency standards. About 40% is more than 40 years old, and 82% of houses and 83% of large buildings were built before 2006, when major energy-efficiency updates were made to the Code. Many older homes have very low insulation levels, and windows and doors that leak air and heat. As a result, they are not very energy efficient, require more energy to heat, and result in more greenhouse gas emissions than newer buildings (see **Figure 11**). Although newer homes are more energy efficient on a per-square-foot basis, they are also generally larger. This increase in floor space per capita has limited some of the gains achieved through improvements in energy efficiency.

An estimated 1% to 2% of Ontario buildings are renovated every year. However, the energy-efficiency requirements of the Code do not apply to most renovations. They only apply to new additions and in cases where entire building systems—such as lighting—are replaced. This means that buildings can be renovated to an energy performance standard lower than that required for new builds. By contrast, the Code requires that buildings undergoing extensive renovations (i.e., removal and replacement of walls, ceilings and floors) meet Code requirements or compliance alternatives for other areas, such as fire and structural safety and accessibility.

Improving the energy performance of a building during a major renovation (or retrofit) is necessary to avoid locking sub-standard energy performance and high greenhouse gas emissions into the building stock for decades.

Analysis conducted by the Municipal Affairs Ministry recognizes that energy-efficiency

Figure 11: Residential Greenhouse Gas (GHG) Emissions in 2017[1] Per House Based on Period of Construction[2]

Source of data: Comprehensive Energy Use Database, Natural Resources Canada (2019)

Note: Although the general trend is for newer houses to produce fewer greenhouse gas emissions per house, the recent uptick is likely due to several factors, including increased floor space in newer houses.

1. The most recent data available.
2. Emissions data is grouped by periods of construction based on Statistics Canada survey data collected at different intervals.
3. t CO_2e refers to tonnes of carbon dioxide equivalent.

standards for renovations is a best practice. For example, it is a requirement in several US states (e.g., California, Illinois, Oregon, Vermont and Washington), and European countries (e.g., Denmark, France, Germany and Sweden). British Columbia plans to adopt energy-efficiency requirements for building renovations by 2024. Modelling by a third-party vendor retained by the Ministry in 2013 estimated that requiring energy-efficiency upgrades at the time of renovation has the potential to reduce greenhouse gas emissions by 4.8 to 9.4 Mt over 10 years.

In 2017, the Municipal Affairs Ministry also proposed and consulted the public on new energy-efficiency requirements for extensive renovations. These requirements would have applied to both houses and large buildings undergoing renovations, and to certain projects with a potential impact on energy use (e.g., major changes to the building envelope; replacing windows, skylights and sliding doors; or replacing heating or cooling equipment). The public expressed support and the Municipal Affairs Ministry's three technical advisory committees were also in favour of the proposal's intent. Some stakeholders raised concerns around implementation and enforcement issues, such as the need for training and capacity building, as well as an increased risk of illegal renovations. As a result of this mixed feedback, the Municipal Affairs Ministry proposed to delay implementing the requirements for renovations from 2019 to 2022 to provide time for the buildings sector to increase technical capacity.

In November 2018, the Municipal Affairs Ministry decided not to proceed with the proposed energy-efficiency requirements for renovations, and instead focus on aligning the Code with the National Construction Codes. Although the National Construction Codes are in the process of being updated, energy-efficiency requirements for renovations are not anticipated until the next update in 2025, further delaying opportunities to reduce Ontario's greenhouse gas emissions from the buildings sector.

RECOMMENDATION 8

So that energy and greenhouse gas reduction opportunities are realized on a timely basis, we recommend that the Ministry of Municipal Affairs and Housing, through consultation with stakeholders, assess opportunities to address emissions reductions through effective energy-efficiency requirements for renovations, including as part of any Building Code harmonization process, and put the effective requirements into place.

MINISTRY RESPONSE

The Ministry agrees with this recommendation. As a first step towards adopting potential energy-efficiency requirements for renovations in Ontario's Building Code, the Ministry will support the development of provisions for the National Building Code with information, advice and lessons learned from its own Code development process. Future adoption in Ontario's Building Code will consider previously mentioned factors, such as other prevailing government commitments/priorities and the impact of the global COVID-19 pandemic.

5.5 Registered Building Practitioners Have Knowledge Gaps on Energy Efficiency

Studies commissioned by the former Ministry of Advanced Education and Skills Development and the building industry have found that there are gaps in building practitioners' knowledge of energy efficiency and low-carbon building techniques. We surveyed members of the Ontario Building Officials Association, and found that 56% of the municipal building officials who responded indicated they struggle to stay up to date on energy-efficiency requirements and new technologies. We also found that 23% of respondents have had no energy-efficiency training of any kind. Furthermore, many

building officials expressed a concern that building designers lack skills and awareness related to energy efficiency in buildings, particularly when complying with the more complex energy-efficiency requirements for large buildings, and when modelling building energy use. During the course of our audit, we identified several contributing factors:

- **No mandatory training or continuous professional development requirements exist for registered building practitioners on energy efficiency:** Registered practitioners, such as municipal building officials and designers who are qualified and registered under the Ministry's Qualification and Registration program, are not required to take any Building Code training, either before qualification or afterwards, in the form of continuous professional development. Instead, to qualify and practice, these practitioners must pass at least one Building Code exam in the area they intend to practice, register with the Ministry and pay an annual fee. Other North American jurisdictions have mandatory continuous professional development requirements for building officials. British Columbia requires all qualified building officials to complete a minimum number of professional development credits each year, plus additional work experience requirements for certification. Minnesota requires building officials to take 38 hours of continuous professional development over a two-year period. The Ontario Building Officials Association offers a continuous professional development and certification program, but it is only mandatory for those building officials who choose to become certified. About 55% of its approximately 1,800 members have participated in the program.
- **A majority of practitioners qualified under earlier Building Code versions and very few have taken official Code energy-efficiency training courses:** The Code's energy-efficiency requirements have been updated three times since 1997. Our Office analyzed exam data from 2003 to 2020, and found that just 16% of passed exams reflected the current 2012 Code, and 6% reflect the energy-efficiency updates that came into effect in 2017. We also found very low enrolment in the official training courses on energy efficiency in the Building Code. These are part of 25 optional Code courses offered by George Brown College under an agreement with the Ministry since 2013. Between 2014 and 2020, there were 6,809 enrolments across all courses; just six students (less than 0.1% of the total) enrolled in the two online energy-efficiency courses.
- **The exams are not updated in a timely fashion to reflect changes made to the Building Code:** Municipal Affairs Ministry guidelines state that if an amendment to the Code, Act or supplementary standards may have an impact on exam questions, managers in the Building and Development Branch must decide whether and how the exam questions should be updated. The guidelines do not include a deadline by which exam updates should be completed after a Code change. We reviewed 18 years of examination data, from 2003 to 2020. Our analysis found that, on average, it took one year for a major Code update to be reflected in the exams.
- **The examination process does not effectively demonstrate an understanding of energy-efficiency requirements or their application in practice:** Our Office reviewed a sample of 40 of the open-book, multiple-choice exam questions related to energy efficiency to assess whether they test a basic familiarity with the Code, or a more in-depth understanding of energy efficiency and the ability to apply such an understanding in practice. We found that 85% of the energy-efficiency questions we reviewed required only basic familiarity with the Code. Over half of the questions (63%) could be

answered by performing a manual search in the Code or supplementary standard, with some knowledge of the Code's energy-efficiency requirements. If building officials and other practitioners are not tested on their understanding of the Code's energy-efficiency requirements, or their ability to apply them in practice, they may not possess the skills or knowledge needed to design, build and inspect in compliance with the Code.

RECOMMENDATION 9

So that building practitioners have the knowledge needed to ensure compliance with the Ontario Building Code's energy-efficiency requirements, we recommend that the Ministry of Municipal Affairs and Housing work with stakeholders to:

- develop a mandatory training and continuous professional development program;
- update exams in a timely manner to reflect energy-efficiency changes to the Code; and
- ensure that exams are designed to demonstrate a sufficient understanding of the Code's energy-efficiency requirements.

MINISTRY RESPONSE

The Ministry supports the Auditor General's recommendation and is currently in the process of transforming and modernizing the way in which building regulatory services are delivered. To this effect, the government amended the *Building Code Act, 1992* in July 2020, which included enabling provisions that will allow the government to establish an administrative authority in the future to deliver certain building regulatory services.

The Ministry publicly consulted on a number of transformation-related items in fall 2019, including training, examination development and delivery and continuing professional development. Discussions with sector stakeholders are continuing fall 2020 into 2021 and will help inform future decisions about the administrative authority's scope of delivery. It is expected that the earliest an administrative authority would be implemented is 2022.

The Ministry is committed to addressing the Auditor General's recommendations as the transformation of building regulatory services and their delivery continues.

5.6 Training and Oversight of Builders in the Code's Energy-Efficiency Requirements Is Lacking

Despite their critical role in ensuring construction meets energy-efficiency and other Code requirements, builders, general contractors and other construction trades are not included in the Municipal Affairs Ministry's Qualification and Registration program.

For residential construction, builders are instead licensed by the Tarion Warranty Corporation, which requires licensees to complete training in seven core competencies before registering. The competencies include the Code and construction technology, which covers a number of issues related to energy efficiency. As our Office reported in our Special Audit of Tarion in 2019, this educational program only began in September 2016 and exempted about 95% of licensed home builders in Ontario because they had received their first licences prior to 2016. In addition, only company directors or owners are required to complete Tarion's training requirements, whereas individuals in charge of overseeing construction sites, such as site supervisors and general contractors, as well as specific construction trades, have no requirements.

A 2018 report on energy-efficient buildings, commissioned by the Ministry of Advanced Education and Skills Development, concluded that 44% of contractors and supervisors have no formal trade or technology qualification. This proportion is higher for contractors doing residential renovations and upgrades. The report recommended that mandatory contractor certification requirements be

introduced. Mandatory training and certification requirements are also important if the province were to require renovations to meet current new construction energy-efficiency standards.

Several industry associations and municipalities offer voluntary training courses in building energy efficiency. For example, the City of Guelph reported a 180% improvement in compliance with Code energy-efficiency requirements for large buildings after providing training courses for builders, designers and others in 2017. While voluntary training courses can be effective, they have limited reach due to low demand from industry professionals, who may face barriers to participation such as cost, inability to take time off, or shortage of easily accessible training options. Surveys by the Canada Green Building Council have found that detailed, practical energy-efficiency content is lacking in both continuing education courses and apprenticeship programs.

Other jurisdictions, including British Columbia, Michigan and Minnesota, have addressed the lack of builder qualifications through mandatory training or continuing professional development requirements. The Ministry established the Building Regulatory Reform Advisory Group in 2000 to address reforms to the building industry. The advisory group recommended the creation of a licensing and certification program for general contractors and renovators in the residential, institutional and commercial subsectors, and regular continuing education requirements in Code competency. These recommendations have never been implemented.

Of the chief building officials who responded to our survey, 65% said that they supported mandatory continuous professional development in energy efficiency for builders and contractors, in particular for site supervisors who are responsible for co-ordinating multiple different trades and, unlike inspectors, are continuously present on site. Respondents noted several issues that were regularly encountered and might impact energy efficiency, including improper installation of insulation and wall systems, inconsistencies between different builders, and low levels of understanding of energy efficiency in large buildings. Building officials told us that, because they are generally only on site for short periods during construction, they rely heavily on site supervisors to ensure construction is of high quality and meets Code requirements.

RECOMMENDATION 10

So that builders, contractors and other skilled trades have the knowledge needed to ensure compliance with the Ontario Building Code's energy-efficiency requirements, we recommend that the Ministry of Municipal Affairs and Housing work with the relevant ministries (e.g., the Ministry of Labour, Training and Skills Development and the Ministry of Government and Consumer Services) to ensure that training and continuous professional development is required and provided for all building professionals.

MINISTRY RESPONSE

The Ministry supports this recommendation. While the Ministry does not have responsibility under the *Building Code Act, 1992* to regulate the training and continuing professional development of building practitioners, other than those specifically described in the Act and the Building Code (e.g., building officials, certain building designers), the Ministry is committed to working with its partner ministries to ensure the buildings sector (including builders, contractors and other skilled trades) has the support it needs to understand and apply Code requirements as part of the ongoing transformation of building regulatory services and their delivery.

6.0 Detailed Audit Observations: Natural Gas Conservation Oversight

6.1 Ontario Energy Board's Natural Gas Framework Can Evolve to Achieve More Cost-Effective Natural Gas Savings for the Longer Term

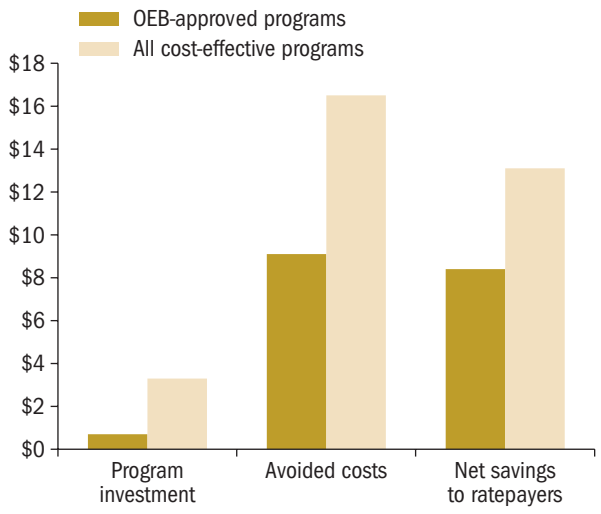
In developing the 2015–2020 Framework, the OEB considered options in setting annual natural gas reduction targets. The first was to let the utilities determine the amount that would be needed to reduce natural gas by a specified amount. The second was to select a budget cap, and have the utilities determine the amount of natural gas savings they could achieve within this limit. The OEB panel chose to set a budget cap, which then was used to set the limit on costs that could be charged at $2/month for the average residential customer. The utilities proposed reduction targets in April 2015. In a January 2016 decision, the OEB panel approved the programs, as well as the final targets and budget. The final approved budget was $699 million over the six years (2015 to 2020).

In June 2016, the OEB released a study to inform the mid-term review of the Framework. The study examined how much cost-effective natural gas conservation could realistically be achieved in the existing marketplace. It included the upfront investments in programs, as well as the estimated savings and avoided costs. The study estimated these for 30 years, from 2016 through 2045, to capture the long-term impacts of the natural gas conservation programs. The study found that, if utilities had implemented all cost-effective programs that could be achieved from 2015 to 2020, program spending would have been approximately $2.6 billion more than what the OEB approved under the Framework. But the study also estimated that, if utilities had invested this higher amount in natural gas conservation programs, natural gas costs to ratepayers could have been reduced an additional $7.3 billion by 2045. In total, despite initially investing more on conservation programs, ratepayers could have received a net benefit of $4.7 billion in avoided costs by 2045 associated with reduced natural gas use (see **Figure 12**).

Furthermore, the study estimated that if the OEB had approved the increased investment in conservation, the programs from 2015 through 2020 could have achieved an additional 14.5 billion cubic metres in natural gas savings by 2045. These savings would have resulted in 1.3 Mt fewer emissions in 2020 and 27.3 Mt in savings out to 2045. The OEB did not update the program budgets or targets as a result of the study.

While the OEB did not enable all cost-effective natural gas conservation to occur, the Energy and Mines Ministry informed our Office that it considered its 2014 directive to the OEB to have been met. The Ministry indicated that it had given the OEB the ability to determine how much natural gas conservation was appropriate and reasonable, even if this was less than all cost-effective conservation. Without clear direction from the Ministry to

Figure 12: Avoided Costs and Long-term Savings Associated with OEB-Approved Programs vs. All Achievable Cost-Effective Conservation ($ billion)
Prepared by the Office of the Auditor General of Ontario



Note: Estimates are derived from a 2016 ICF International study of achievable cost-effective programs.

maximize long-term natural gas conservation and savings, the OEB must consider immediate ratepayer impacts in its decisions as per the *Ontario Energy Board Act, 1998*.

We note that, by comparison, Massachusetts state legislation requires natural gas utilities to implement all cost-effective efficiency programs. In 2018, this resulted in Massachusetts utilities achieving annual savings equalling 1.12% of the state's total natural gas consumption. Ontario's 2018 annual savings made up 0.42% of total natural gas consumption in the province.

RECOMMENDATION 11

To achieve natural gas conservation savings and to minimize future costs, we recommend that the Ministry of Energy, Northern Development and Mines ensure that the Ontario Energy Board continue to work toward a natural gas conservation framework that balances the implementation of cost-effective natural gas conservation with the impact on ratepayers.

MINISTRY RESPONSE

The Ministry agrees that cost-effective natural gas conservation is an important way to achieve natural gas savings while minimizing future costs. The *Ontario Energy Board Act, 1998* requires the Ontario Energy Board (OEB) to promote natural gas conservation. However, as the regulator of Ontario's natural gas sector, the OEB also has an obligation to protect the interests of ratepayers and ensure cost-effective delivery of services when making policy decisions such as natural gas conservation budgets and targets.

The OEB-approved natural gas conservation budget under the current 2015-2020 Natural Gas Conservation Framework represents a 100% increase compared to the previous framework. However, in consultation with the OEB, the Ministry has analyzed that, based on 2019 Achievable Potential Study results, the achievement of the 2030 natural gas conservation target in the 2018 Environment Plan would reflect a five-fold increase in annual budget compared to 2015-2020 spending. The Ministry's perspective is that the estimated monthly ratepayer impact required to achieve this level of savings—from approximately $2 under the 2015-2020 Natural Gas Conservation Framework to $10 in 2030—would cause economic hardship to Ontarians. The Ministry will continue to work towards the gradual implementation of cost-effective natural gas conservation for the next multi-year framework in co-ordination with the OEB, in accordance with government policy to develop a safe, reliable and affordable energy supply across the province.

6.2 OEB Has Not Ensured the Most Accurate Estimates Are Used in Calculating Natural Gas Savings

Calculations of natural gas savings achieved by energy conservation programs are based, in part, on particular assumptions, such as consumer behaviour. A change in an assumption can have an impact on annual calculations of natural gas savings and, therefore, on the amount paid to utilities through charges to ratepayers. Our audit found that, although the OEB is aware that some assumptions it is using may be faulty, it has not yet completed the necessary studies to verify or change them.

Assumptions are used to account for the impact of program participants who would have installed a conservation measure (such as new energy-efficient windows) on their own initiative as opposed to doing so because of the program. If a large number of participants would have installed a measure regardless of the program, the utility receives a lower payment because some natural gas savings cannot be attributed to the program. Due to the impact that varying estimates of these participants has on the amount paid to utilities, in 2016, the OEB identified the need to conduct further multi-year assessments to update its estimates.

One of these multi-year assessments was completed in 2017 by the OEB's evaluation contractor and demonstrates the importance of having updated assumptions. This assessment examined a conservation program that targeted industrial facilities. It found that the percentage of program participants in 2015 who would have installed a measure regardless of the program was 92% rather than the previously assumed 54%. If this updated rate had been used, it would have reduced the estimate of annual natural gas savings achieved through the utility's program by 35% and reduced the 2015 amount paid to the utility by $4.3 million. There were different interpretations on when these updated assumptions were to be applied. The board accepted the utilities' argument to use the historical rate on the basis that 2015 was a transition year to the new framework. The utilities successfully argued that, because of the updated assumptions, the previously approved 2016 targets should be reduced by 14%.

As recommended by the evaluation contractor, the OEB has identified the need to assess the percentage of participants in residential programs who would not install a conservation measures unless provided with a program incentive. However, to date the OEB has not completed such a study for residential programs. This means that the estimates of natural gas saved due to a residential program may rely on inaccurate inputs. In addition, in 2016, the OEB's evaluation contractor recommended that the savings attributed to conservation program results be calibrated using an analysis of residential participants' natural gas bills starting in 2017. This would show how much participants' natural gas use may have decreased as a result of participating in a program, and would reduce the risk of miscalculations based on incorrect input assumptions or the incorrect installation of equipment. In turn, such an analysis could be used to calibrate the energy models used to determine savings achieved.

In August 2017, the OEB issued a request for proposals for a contractor to investigate both the rates of participants motivated by residential programs, and to calibrate natural gas savings. However, because no qualified bids were received to perform this work, the OEB instead continues to rely on the results from simulation models that estimate the amount of natural gas savings achieved in each retrofitted home. Without an assessment of program participation rates and a calibration of natural gas savings, calculated savings may continue to use inaccurate inputs—affecting the amount paid to utilities and the ability to measure and improve conservation programs.

RECOMMENDATION 12

To more accurately estimate the natural gas savings achieved through natural gas conservation programs, we recommend that the Ontario Energy Board:

- ensure the next framework is explicit on when to use updated assumptions (retroactively or not);
- complete all multi-year assessments that it has identified as high priority; and
- identify methods to further incorporate actual natural gas use data, as recommended by its evaluation contractor.

ONTARIO ENERGY BOARD RESPONSE

The Ontario Energy Board (OEB) agrees with the Auditor General's recommendation. Since taking on co-ordination of evaluation activities in 2015, the OEB has established a long-term evaluation, verification and measurement plan to evaluate programs based on priority level, and has overseen eight in-depth studies of commercial and industrial custom and prescriptive programs.

The OEB is developing activities in 2020 and 2021 that include an annual verification of all programs and a number of in-depth studies. The OEB will continue its work to improve the robustness of our policies regarding the evaluation, verification and measurement of savings achieved through natural gas conservation programs.

6.3 Energy and Mines Ministry Providing Unclear Guidance to the OEB on Natural Gas Conservation

The Energy and Mines Ministry is to provide direction to, and oversight of, the OEB through a variety of mechanisms, including through a memorandum of understanding (MOU), mandate letters, directives and reports on effectiveness. Our audit found that the Ministry has not provided clear guidance or direction to the OEB on natural gas conservation, nor has it assessed the OEB's effectiveness in achieving its mandate in this area.

6.3.1 Energy and Mines Ministry Has Not Ensured Guidance to the OEB is Up to Date

When MOUs and mandate letters are not up to date, the OEB lacks clear, transparent direction from the Ministry on its accountability framework, performance standards and priorities, including with respect to natural gas conservation and the development of a new conservation framework.

Under the *Ontario Energy Board Act, 1998*, the Energy and Mines Ministry must enter into an MOU with the OEB every three years (see **Appendix 7**). In addition, the Agencies and Appointments Directive, issued under the *Management Board of Cabinet Act*, reiterates that provincial agencies, like the OEB, must have a current MOU in place with the overseeing ministry. Among other things, the purpose of an MOU is to specify respective roles and responsibilities, the agency's accountability relationship with the ministry, reporting requirements, and performance standards. For example, the 2016 (most recent) MOU between the Energy and Mines Ministry and the OEB specified that:

- the OEB shall incorporate the Ministry's Conservation First energy conservation policy into distributor planning processes for natural gas and electricity utilities, and support the development and implementation of a natural gas conservation framework;
- the OEB's annual business plan must articulate how the OEB's activities are aligned with the government's energy policy objectives, including natural gas conservation; and
- the OEB shall provide an annual report on progress and results in meeting government energy public policy initiatives, including Conservation First.

However, the 2016 MOU between the Energy and Mines Ministry and the OEB expired in April 2019, and no new MOU has been signed. The Ministry had indicated that it would only finalize an MOU after amendments to the *Ontario Energy Board Act, 1998* that reform the OEB governance structure were proclaimed, and a new OEB governance structure is in place.

Under the Agencies and Appointments Directive, the Ministry has also been required since 2016 to issue an annual mandate letter to the OEB (see **Appendix 7**), outlining broad expectations with respect to service and performance priorities for the year. However, ministries are not required to provide a mandate letter in years when the agency undergoes a mandate review. The OEB had a mandate review in 2016/17 and continued to be reviewed by the OEB Modernization Review Panel in 2017/18. In October 2020, the new OEB governance structure came into effect and the Ministry issued the first mandate letter to the OEB.

RECOMMENDATION 13

To clearly and transparently outline its expectations of the Ontario Energy Board, we recommend that the Ministry of Energy, Northern Development and Mines:

- work with the Ontario Energy Board to finalize a new memorandum of understanding, as required by the *Ontario Energy Board Act, 1998* and the Agencies and Appointments Directive; and
- issue annual mandate letters to the Ontario Energy Board, as required by the Agencies and Appointments Directive.

MINISTRY RESPONSE

The Ministry looks forward to working with the Ontario Energy Board (OEB) to finalize a new memorandum of understanding. In March 2019, the government introduced Bill 87, *Fixing the Hydro Mess Act, 2019*, to reform the governance structure of the OEB. On October 1, 2020, these legislative amendments came into force and all senior roles were filled by appointment.

Given that the legislative process for reforming the governance structure of the OEB is now complete, the Ministry will begin its work in fall 2020 to renew the memorandum of understanding (MOU) and engage the OEB's new leadership team in the process. The renewed MOU will reflect the new OEB governance structure, the objectives of OEB Modernization, including strengthening public trust and transparency. The MOU will also clearly define roles, responsibilities and accountabilities consistent with the requirements of the Agencies and Appointment Directive. It is anticipated that the Ministry and OEB will conclude a new MOU in late 2020.

A Minister's mandate letter was provided to the Chair of the OEB on October 1, 2020, consistent with the requirements of the Agencies and Appointment Directive, and was posted on the OEB website. The Minister's annual mandate letters will communicate broad government policy priorities and the Ministry's expectations for the OEB going forward.

6.3.2 Ministry Has Not Thoroughly Assessed OEB's Effectiveness in Meeting Mandated Objectives

Before the *Ontario Energy Board Act, 1998* was amended in October 2020, the Minister of Energy and Mines was required to have a report prepared every five years on the OEB's effectiveness in meeting its legislated objectives, which include promoting natural gas conservation and energy efficiency. The Minister was required to table these reports in the Legislative Assembly. Despite these requirements and similar requirements in its 2016 MOU, the Energy and Mines Ministry, and the Minister, never thoroughly assessed the effectiveness of the OEB in meeting its legislated objectives regarding promoting energy efficiency and conservation.

Our Office noted this same observation in **Section 3.07** of our *2014 Annual Report*, and in our 2016 follow-up we noted that the Minister had still not requested a review of the OEB's effectiveness. In 2018, the Ontario Energy Board Modernization Review Panel also noted this failure and recommended that the Energy and Mines Minister commission and table a report on the OEB's effectiveness every five years, as was then required by the Act. Amendments made to the Act in October 2020 have removed the requirement that a report be prepared every five years. The OEB is now required to prepare and submit a report on its effectiveness in meeting its legislated objectives only when requested by the Minister.

Under the 2016 MOU, the OEB was also to provide the Energy and Mines Ministry with annual reports on the OEB's progress and results in meeting government energy public policy initiatives. However, the OEB has never produced a separate, stand-alone progress report. The Ministry and the OEB explained that the Ministry reviews the OEB's annual reports, business plans and outputs of specific policy initiatives to determine progress and results in meeting energy policy initiatives. We reviewed the OEB's annual reports and business plans from the past five years. We found that, while the OEB reports on performance measures (e.g., responding to consumers and industry enquiries, and issuing decisions) and indicators to support strategic goals, the OEB does not report on actual results, such as the amount of natural gas conserved, and performance against set targets. At the time of our audit, the Ministry was planning to again include a requirement in the MOU that the OEB provide the Ministry with annual reports on the OEB's progress and results in meeting government energy public policy initiatives.

RECOMMENDATION 14

To assess and monitor whether the Ontario Energy Board (OEB) is achieving its mandated objectives, particularly in the area of energy conservation as required under the *Ontario Energy Board Act, 1998*, we recommend that the Ministry of Energy, Northern Development and Mines:

- regularly request that the OEB prepare and submit a report on the effectiveness of its policies and initiatives in achieving desired outcomes and mandated objectives, including the promotion of natural gas conservation and energy efficiency; and
- table the OEB's effectiveness reports in the Legislative Assembly.

MINISTRY RESPONSE

The Ministry agrees with the importance of regularly assessing and reporting on the effectiveness of the Ontario Energy Board (OEB) at achieving its mandated objectives.

The 2018 OEB Modernization Review Panel reviewed the OEB and made recommendations to government to help the OEB more effectively deliver on its mandate. Those recommendations include reforms to the governance structure of the OEB that were effected between March 2018 and October 2020. With the OEB now operating under a new governance structure and moving forward with advancing the priorities outlined in the Minister's October 1, 2020, mandate letter to the Chair, the OEB will require time to transition, develop a new strategic vision and begin to implement a broad range of operations and policy changes.

The *Ontario Energy Board Act, 1998* now provides the Minister the discretion in determining when to request the OEB to prepare an effectiveness review report. The Ministry will consult with the OEB on an appropriate timeframe for when an effectiveness review would most effectively assess the OEB's progress towards modernization and in delivering its statutory objectives. The OEB is currently developing its 2021-2024 Business Plan, its first under the new governance structure. This Business Plan is due to the Ministry on March 1, 2021.

7.0 Detailed Audit Observations: Energy Reporting and Benchmarking Programs

7.1 Building Energy Reporting Programs Include Inaccurate and Incomplete Data

Our audit found that energy-use and building-size data received by the Energy and Mines Ministry from both broader-public-sector and private-sector buildings contains errors, affecting the utility and effectiveness of the programs.

In 2017, the Ministry conducted an analysis of reported broader-public-sector data and found 15% of reporting buildings have extremely low or high data points that were likely inaccurate. In 2019, the Ministry analyzed the self-reported private-sector data collected in 2018 and found that 30% of reported buildings had either missing or likely inaccurate data.

Neither reporting program requires that energy data be independently verified for accuracy before being submitted to the Ministry. While data from private-sector buildings over 100,000 square feet must be verified by an expert, this can include a certified, in-house, and therefore non-independent, energy manager. For data submitted in 2018, 67% of the building owners that were required to verify their data indicated they had done so. By contrast, Washington, DC requires third-party verification and New York City requires buildings in its energy reporting program to be independently audited every 10 years.

Our audit also found that the Ministry does not have complete data sets, which reduces sample sizes and the accuracy of calculated benchmarks. Compliance rates have been low in the two years that energy data reporting has been required from private-sector buildings. In 2018, the first year that private-sector buildings were required to report, data was received from 56% of the approximately 990 buildings covered by the regulation. In 2019, the reporting requirement was expanded to include buildings smaller than 250,000 square feet, which increased the number of buildings required to report to approximately 8,500. That year, data was received from 45% of buildings. By comparison, the Ministry found first year reporting rates in Chicago and New York City to be 90% and 62%, respectively. New York City has since implemented program changes to increase compliance rates to over 90%. Unlike Ontario, both New York City and Chicago have financial penalties to help enforce compliance.

Higher reporting rates are also due, in part, to the ease of data collection. New York requires utilities to automatically upload data directly to a reporting platform that can be accessed by both the building owners and the government. Chicago's data collection process, established by the city's two utilities, is simple for building owners and therefore has helped attract over 1,000 voluntary participants.

By contrast, building landlords in Ontario have expressed difficulties obtaining tenant data. This is because there are over 370 utilities and there are inconsistent processes that they use to provide the data. Requiring utilities to submit data directly to the Ministry, using a consistent process, would help simplify the process and ensure greater accuracy of the data. Ontario utilities are also only required to provide data to mandatory participants. This further limits the completeness of Ontario's data on private-sector buildings by excluding information from buildings below the mandatory reporting size threshold, which is currently 100,000 square feet. Program stakeholders, including the City of Toronto, which actively supports Ontario's private-sector reporting program with local outreach efforts as part of its Better Buildings Partnership initiative, have asked the Ministry to expand utility data availability to include voluntary participants as well.

The Ministry also has incomplete data in its broader-public-sector reporting program because reporting is voluntary for some building types. For example, the Ministry received data in 2019 from just 44 of the approximately 100 public long-term care homes in Ontario. According to the limited data, these types of buildings are the third most energy-intensive in the broader public sector. The Ministry also only received data from 54 of the over 350 municipal social housing buildings. According to a study commissioned by the Independent Electricity System Operator, these buildings are estimated to be the largest municipal energy users. The Ministry has explained that reporting is not mandatory for these building types to reduce the burden on reporters.

Inaccurate and incomplete data sets reduce the usefulness of energy reporting programs, as it hinders valid comparisons of energy use over time and between buildings, and the implementation of measures informed by those comparisons.

RECOMMENDATION 15

To improve the accuracy of the energy-use data received, and the effectiveness of its energy reporting and benchmarking programs, we recommend that the Ministry of Energy, Northern Development and Mines require periodic third-party verification of submitted data, or conduct energy audits of building samples that include those with likely errors.

MINISTRY RESPONSE

The Ministry agrees with the Auditor General's recommendation and acknowledges the importance of ensuring the accuracy of the energy data submitted for effective energy reporting and benchmarking.

To improve the accuracy of the data reported to the Ministry under the energy benchmarking

programs, the Ministry will continue to work with building sector organizations to develop further data validation processes. These will include the Ministry identifying and addressing data outliers, providing building owners with typical energy intensity for their building type, and providing tips and best practices to help private and broader public sector building owners identify and address potential data quality issues.

Requiring all private and public sector building owners to periodically verify their submitted data by a third-party can be costly to building owners. The government is committed to achieving data integrity of the energy reporting and benchmarking initiative while reducing the potential financial burden on building owners. Similarly, conducting energy audits will also increase fiscal pressures for the province and could be explored in future if deemed necessary once the data validation exercise is in place.

RECOMMENDATION 16

To improve the completeness of the energy-use data received, and the effectiveness of its energy reporting and benchmarking programs, we recommend that the Ministry of Energy, Northern Development and Mines:

- implement best practices to enforce compliance with its private-sector energy reporting programs;
- expand the reporting requirements to include broader-public-sector buildings that have high energy consumption, such as social housing and long-term care homes; and
- ensure voluntary participants have access to their utility data.

MINISTRY RESPONSE

The Ministry supports this recommendation and recognizes the need to improve the completeness of the energy-use data received through its reporting programs. The year 2020 marks the third year that the regulation requiring private sector energy reporting has been in place. The phased-in implementation of the regulation was intended to balance the need for the data to be submitted in a manner that would not cause significant burden to building owners. The Ministry has also focused on developing supporting resources to make reporting easier. The Ministry has been actively working with regulated building owners to raise awareness of the benefits of energy benchmarking and is continually improving its resources and practices to assist energy reporters. The government is committed to reducing potential financial burden on building owners and therefore will continue to raise awareness as to the benefits of energy reporting and benchmarking.

The Ministry did not include social housing and long-term care homes in the scope of the broader public sector reporting regulation due to the potential burden to Ontario's hospitals and municipalities. In light of the current COVID-19 pandemic, the Ministry would not suggest including these sectors at this time. In future, the Ministry may consider expansion of the broader public sector regulation, and would work with relevant stakeholders and ministries.

The Ministry acknowledges the importance of comprehensive energy use and water consumption datasets of buildings. The Ministry is currently engaging with the utility sector to explore ways through which utility data could be made available to voluntary participants of the energy reporting programs.

RECOMMENDATION 17

To reduce the administrative burden on reporters, such as building owners, and help improve both the accuracy and completeness of the energy-use data received, we recommend that the Ministry of Energy, Northern Development and Mines require utilities to submit data directly to the Ministry using a consistent process.

MINISTRY RESPONSE

The Ministry supports this recommendation. Collaborative partnerships with key stakeholders, including building sector organizations, utilities and the municipal sector, are necessary to continue to ensure effective energy reporting and energy benchmarking. The Ministry has been engaging with the utility sector to initiate processes and explore options to make it easier for building owners to obtain their utility data and submit that to the Ministry. The Ministry will also explore the feasibility of having utility data submitted directly to the Ministry while balancing resources and fiscal issues.

The Ministry uses a consistent platform where private sector building owners upload their energy data. This platform is called Energy Star Portfolio Manager, a free online benchmarking software licensed to Natural Resources Canada. Uploading data to the Portfolio Manager was identified as the preferred process to benchmark utility data during stakeholder consultations that the Ministry undertook when developing the private sector energy reporting regulation. Utilities are required by the regulation to provide aggregated utility data to building owners who are required to report under the regulation. The Ministry is currently working with utilities to develop a range of *Best Practices and Helpful Hints* for utilities to make it easier for building owners to access their utility data for reporting.

7.2 Ministry Has No Plan to Ensure the Usefulness of Publicly Available Building Energy Data

Although the Energy and Mines Ministry has posted some annual energy data it collects on the publicly available Ontario Data Catalogue website, it has not developed an open data engagement plan that could ensure the data meets the needs of its users.

The Ontario Open Data Directive is a Management Board of Cabinet directive that requires ministries to make government data available to the public on the Ontario Data Catalogue website. According to the directive, making data publicly available supports government efficiency, effectiveness and innovation, as well as public engagement and participation. The Energy and Mines Ministry posts the annual energy data it collects under the broader-public-sector reporting program. To date, it has posted seven years of public-sector data that was collected from 2013 to 2019. Since 2016, public-sector building energy data has been downloaded almost 4,800 times. In August 2020, the Ministry posted data related to 2018 energy use in large, private sector buildings on the Ontario Data Catalogue (a digital platform).

The directive also states that ministries should develop plans to promote open data and communicate the strategic value of open data to stakeholders and the public. This includes developing and implementing an open data engagement plan, and working with the public and stakeholders to identify and prioritize the release of datasets to support research, planning and economic initiatives.

The Energy and Mines Ministry has not developed an open data engagement plan. To date, the Ministry's stakeholder outreach regarding building energy reporting has been focused on engaging data reporters, rather than other potential users of the open, public data. Making the data publicly available can allow prospective building buyers, tenants and financiers to value energy efficiency in real estate decisions, and researchers and other experts to identify and propose solutions to reduce building energy use. An open data engagement plan would help ensure that the Ministry has identified the data needs of all relevant stakeholders, and determined how to provide the data in an effective and appropriate way.

RECOMMENDATION 18

To improve program effectiveness, support transparency and innovation, and allow stakeholders to incorporate energy efficiency information into their decision-making, we recommend that the Ministry of Energy, Northern Development and Mines develop an open data engagement plan to explore ways to make data on the energy use of private- and broader-public-sector buildings useful and promptly available to relevant stakeholders.

MINISTRY RESPONSE

The Ministry agrees with this recommendation and is committed to helping building owners track and compare their energy usage data over time and identify opportunities to reduce their energy and water use and help them save energy costs. To this end, the Ministry has been publishing online its broader public sector annual energy usage data since 2011 on the government's Ontario Data Catalogue. Furthermore, 2020 marks the first year when the Ministry published annual energy usage data for private sector buildings, as the private sector reporting regulation has been in place for less than three years. Each time a new dataset is published on the government's Ontario Data Catalogue, the Ministry notifies the respective stakeholder groups and how they can access the dataset.

Working with relevant stakeholder groups, the Ministry will develop open data engagement plans to explore ways to make data on the energy use of private and broader-public-sector buildings more useful. The Ministry expects to have these plans in place by December 2021.

8.0 Detailed Audit Observations: Energy-Efficiency Standards for Appliances and Products

8.1 Energy and Mines Ministry Does Not Confirm Compliance with Energy-Efficiency Standards

The Energy and Mines Ministry does not inspect or enforce compliance with the energy performance standards it sets for many products that are sold or leased in Ontario, increasing the risk of non-compliance, and undermining the effectiveness of the standards at ensuring energy efficiency. Certification is to provide consumers assurance that products are energy efficient. By not enforcing compliance with its standards, the Ministry risks reducing consumer confidence in energy-reduction measures, potentially leading to otherwise avoidable greenhouse gas emissions and higher energy costs.

According to the Ministry, the energy performance standards it establishes are cost-effective. This means that any additional upfront costs associated with purchasing more efficient products are more than offset by lower costs to operate and use them, relative to less efficient alternatives. For example, an increase in the energy-efficiency requirements in the windows standard would increase the purchase price of the windows but reduce homeowners' heating and cooling costs over the window's lifetime. The Energy and Mines Ministry has estimated that a 2020 standard for residential windows will save buyers $115 million in energy costs by 2030 and reduce greenhouse gas emissions by 0.036 Mt in 2030.

The Ministry requires regulated products sold or leased in Ontario to display a label or other marking indicating that a certification company has tested and confirmed the product's compliance with energy-efficiency standards. However, certification companies such as CSA Group and

UL have warned consumers that their certification labels have been fraudulently used on uncertified products. Our Office also found two window manufacturers advertising with certification labels where the information on the labels did not match any windows in the certification organization's certified product directory.

The *Electricity Act, 1998* does not contain any inspection or enforcement provisions, or penalties for non-compliance with the standards. Although the Ministry previously had the ability to inspect, enforce and issue penalties under the *Energy Efficiency Act*, these provisions were removed when the Act was repealed in 2009. Other jurisdictions, including British Columbia, Manitoba and Quebec, have the power to monitor and enforce provincial energy-efficiency standards.

Industry groups have expressed concern over the Ministry's lack of monitoring and enforcement powers. For example, in its submission on proposed amendments to the residential window standards, Fenestration Canada, an industry association of window and door manufacturers, argued that the lack of enforcement creates an incentive for window installers to provide consumers with cheaper, non-compliant products. On its website, EcoLine Windows, an Ontario window manufacturer, warns consumers of potential fraudulent behaviour in the industry; this can occur when consumers receive unlabelled windows that do not perform as well as those they believed they were purchasing. A lack of enforcement means consumers face a risk of buying non-compliant products that result in higher overall cost, energy use and greenhouse gas emissions.

RECOMMENDATION 19

So that energy-efficiency standards achieve their intended energy, emission and cost savings, we recommend that the Ministry of Energy, Northern Development and Mines establish and implement processes to monitor and enforce compliance with its energy-efficiency standards.

MINISTRY RESPONSE

The Ministry is committed to promoting compliance with its energy-efficiency standards to achieve their intended objectives. The Ministry estimates the impact of efficiency standards on energy use and greenhouse gas emissions in a manner consistent with that used by other leading jurisdictions, such as Natural Resources Canada and the United States Department of Energy. The Ministry expects all manufacturers selling or leasing products in Ontario to comply with its regulations. We will continue to work with other regulators and industry stakeholders to ensure broad awareness of the Ministry's energy efficiency regulations.

Appendix 1: Summary of Report Recommendations, by Auditee

Prepared by the Office of the Auditor General of Ontario

Ministry of Energy, Northern Development and Mines

Recommendation 1: To co-ordinate energy decisions across government, we recommend that the Ministry of Energy, Northern Development and Mines develop an integrated long-term energy plan that aligns plans for the use of Ontario's major sources of energy (including natural gas) with the government's emission-reduction target. The energy plan could incorporate and consider long-term industrial, commercial and housing development.

Recommendation 2: To help Ontario meet its 2030 greenhouse gas emission-reduction target, we recommend that the Ministry of Energy, Northern Development and Mines work with relevant ministries, agencies and stakeholders to implement initiatives in the Made-in-Ontario Environment Plan, including increased cost-effective natural gas conservation, increased uptake of renewable natural gas, and the voluntary display of home energy-efficiency information.

Recommendation 11: To achieve natural gas conservation savings and to minimize future costs, we recommend that the Ministry of Energy, Northern Development and Mines ensure that the Ontario Energy Board continue to work toward a natural gas conservation framework that balances the implementation of cost-effective natural gas conservation with the impact on ratepayers.

Recommendation 13: To clearly and transparently outline its expectations of the Ontario Energy Board, we recommend that the Ministry of Energy, Northern Development and Mines:

- work with the Ontario Energy Board to finalize a new memorandum of understanding, as required by the *Ontario Energy Board Act, 1998* and the Agencies and Appointments Directive; and
- issue annual mandate letters to the Ontario Energy Board, as required by the Agencies and Appointments Directive.

Recommendation 14: To assess and monitor whether the Ontario Energy Board (OEB) is achieving its mandated objectives, particularly in the area of energy conservation as required under the *Ontario Energy Board Act, 1998*, we recommend that the Ministry of Energy, Northern Development and Mines:

- regularly request that the OEB prepare and submit a report on the effectiveness of its policies and initiatives in achieving desired outcomes and mandated objectives, including the promotion of natural gas conservation and energy efficiency; and
- table the OEB's effectiveness reports in the Legislative Assembly.

Recommendation 15: To improve the accuracy of the energy-use data received, and the effectiveness of its energy reporting and benchmarking programs, we recommend that the Ministry of Energy, Northern Development and Mines require periodic third-party verification of submitted data, or conduct energy audits of building samples that include those with likely errors.

Recommendation 16: To improve the completeness of the energy-use data received, and the effectiveness of its energy reporting and benchmarking programs, we recommend that the Ministry of Energy, Northern Development and Mines:

- implement best practices to enforce compliance with its private-sector energy reporting programs;
- expand the reporting requirements to include broader-public-sector buildings that have high energy consumption, such as social housing and long-term care homes; and
- ensure voluntary participants have access to their utility data.

Recommendation 17: To reduce the administrative burden on reporters, such as building owners, and help improve both the accuracy and completeness of the energy-use data received, we recommend that the Ministry of Energy, Northern Development and Mines require utilities to submit data directly to the Ministry using a consistent process.

Recommendation 18: To improve program effectiveness, support transparency and innovation, and allow stakeholders to incorporate energy efficiency information into their decision-making, we recommend that the Ministry of Energy, Northern Development and Mines develop an open data engagement plan to explore ways to make data on the energy use of private- and broader-public-sector buildings useful and promptly available to relevant stakeholders.

Recommendation 19: So that energy-efficiency standards achieve their intended energy, emission and cost savings, we recommend that the Ministry of Energy, Northern Development and Mines establish and implement processes to monitor and enforce compliance with its energy-efficiency standards.

Ontario Energy Board

Recommendation 3: So that the Ontario Energy Board's decisions support the government's emission-reduction goals, we recommend that the Ontario Energy Board align its decisions with the Environment Plan and any other provincial climate change goals.

Recommendation 12: To more accurately estimate the natural gas savings achieved through natural gas conservation programs, we recommend that the Ontario Energy Board:

- ensure the next framework is explicit on when to use updated assumptions (retroactively or not);
- complete all multi-year assessments that it has identified as high priority; and
- identify methods to further incorporate actual natural gas use data, as recommended by its evaluation contractor.

Ministry of Municipal Affairs and Housing

Recommendation 4: To support the effective administration of the Ontario Building Code's energy-efficiency requirements across the province, and identify compliance risks and issues, we recommend that the Ministry of Municipal Affairs and Housing:

- collect, review and analyze information on inspections, compliance and enforcement from municipal building departments;
- undertake a pilot assessment of energy efficiency compliance, using best practices developed by other jurisdictions (e.g., a statistically representative sample of building types and sizes, and a range of data collection methods); and
- work with municipalities and other stakeholders to develop and implement processes to address identified inspection, compliance and enforcement issues.

Recommendation 5: To help support consistent interpretation and implementation of the Building Code's energy-efficiency requirements across municipalities, we recommend that the Ministry of Municipal Affairs and Housing:

- consult with building officials to identify support gaps; and
- review and update the Ministry's support materials and advisory services to ensure that building officials receive the guidance materials and technical information they need.

Recommendation 6: So that the Ministry of Municipal Affairs and Housing is aware of the effectiveness of the Code's energy-efficiency requirements at achieving the energy reductions expected, we recommend that the Ministry establish and implement processes and requirements, such as air tightness testing and updated key performance indicators, that evaluate and verify the efficacy of the Ontario Building Code's energy-efficiency requirements.

Recommendation 7: So that there is a continued improvement in the energy efficiency of buildings, and reductions in the greenhouse gas emissions they produce, we recommend that the Ministry of Municipal Affairs and Housing:

- consult with experts to strengthen the requirements in the Ontario Building Code—including as part of any harmonization process; and
- ensure that harmonization continues to strengthen rather than weaken the Ontario Building Code's energy-efficiency requirements.

Recommendation 8: So that energy and greenhouse gas reduction opportunities are realized on a timely basis, we recommend that the Ministry of Municipal Affairs and Housing, through consultation with stakeholders, assess opportunities to address emissions reductions through effective energy-efficiency requirements for renovations, including as part of any Building Code harmonization process, and put the effective requirements into place.

Recommendation 9: So that building practitioners have the knowledge needed to ensure compliance with the Ontario Building Code's energy-efficiency requirements, we recommend that the Ministry of Municipal Affairs and Housing work with stakeholders to:

- develop a mandatory training and continuous professional development program;
- update exams in a timely manner to reflect energy-efficiency changes to the Code; and
- ensure that exams are designed to demonstrate a sufficient understanding of the Code's energy-efficiency requirements.

Recommendation 10: So that builders, contractors and other skilled trades have the knowledge needed to ensure compliance with the Ontario Building Code's energy-efficiency requirements, we recommend that the Ministry of Municipal Affairs and Housing work with the relevant ministries (e.g., the Ministry of Labour, Training and Skills Development and the Ministry of Government and Consumer Services) to ensure that training and continuous professional development is required and provided for all building professionals.

Appendix 2: Glossary of Terms

Prepared by the Office of the Auditor General of Ontario

Building envelope: The building "shell" that separates the indoors from the outdoors, including exterior walls, foundations, roofs, windows and doors.
Building official: A person appointed by a municipality or other principal authority to enforce the *Building Code Act, 1992*, the Ontario Building Code and applicable bylaws. Includes Chief Building Officials, building inspectors and plan examiners.
Building practitioner: *Registered*: Certain practitioners who must qualify and register with the Ministry of Municipal Affairs and Housing in order to practice. Includes building officials, designers, on-site sewage system installers, and registered code agencies (private enforcement firms). *Other*: These include, among others, architects, engineers, energy advisors, builders and contractors. While they may be registered with their own professional bodies, they are not necessarily required to register with the Ministry.
Chief Building Official: Appointed by municipal councils under the *Building Code Act, 1992*. Responsible for issuing building permits and overseeing Code enforcement. Must be qualified and registered with the Ministry of Municipal Affairs and Housing.
Energy conservation: Changes in behaviours and habits or the use of more efficient technologies to reduce energy use.
Energy efficiency: The use of more efficient technologies to reduce energy use.
Energy intensity: The amount of energy used per unit of building area (e.g., square metre). May be adjusted for local weather/ heating requirements.
Fossil fuels: Fuels, such as natural gas, formed through natural geological processes from the remains of living organisms, which release carbon dioxide and other greenhouse gases when burned.
Fuel switching: Switching a building's source of heating from high-carbon energy (e.g., natural gas, propane) to low-carbon energy (e.g., electricity, renewables).
Greenhouse gases: Gases produced by the burning of fossil fuels that contribute to global warming (e.g., carbon dioxide, methane, nitrous oxide).
Lifetime natural gas savings: The annual natural gas savings that are achieved in the year that a conservation measure is taken, as well as all the future annual savings resulting from that measure.
National Construction Codes: Codes that are developed by the federal government as a model for provinces and territories to adopt, either wholly or in part. There are five separate codes that comprise the National Construction Codes: National Building Code, National Energy Code for Buildings, National Fire Code, National Plumbing Code and National Farm Code. They are updated approximately every five years and the current version is from 2015.

Appendix 3: Examples of Energy Savings, Greenhouse Gas Reductions and Payback Periods Associated with Residential, Commercial and Institutional Energy-Efficiency Retrofits

Sources of information: City of Toronto; Clean Air Partnership; Federation of Canadian Municipalities; Natural Resources Canada; Ontario Energy Board; The Atmospheric Fund; York University

Residential

- The City of Toronto has two programs to finance retrofits for houses and apartment buildings. These programs help address key barriers to deep energy retrofits, such as long payback periods and high upfront costs. As of June 2019, 187 house projects had been undertaken. The most common measures were window and door replacements, heating system upgrades, insulation and air sealing. On average, annual energy use has been reduced by 30% and greenhouse gas emissions by 28%, saving participants $560 per year. A 2015 York University study of 31 projects found it took participants 10 years on average to pay back their initial investment.
- A social housing apartment built in 1967 in Hamilton began a retrofit project in 2019. Due for completion in 2020, the project is expected to reduce greenhouse gas emissions by 94% through a range of measures, including re-cladding the building to increase insulation and reduce heat loss, and installing new plumbing and electrical systems.
- A retrofit of a 45-year old apartment building in Burlington reduced natural gas use by 28%, and electricity use by 50%. The retrofit saves 300 tonnes of greenhouse gas emissions annually. All heating and hot water boilers, toilets and the cooling system were replaced for a cost of $677,720. The payback period for the project is four and a half years.

Commercial and Institutional

- Energy efficiency upgrades to the Mississauga Executive Centre, four buildings built in the late 1970s, reduced energy use by 30%. Capital costs were about $2.5 million with payback periods between three and four years. Retrofit measures included replacing a boiler with a high-efficiency model, and repairing air leaks in the building envelope.
- A Quebec school board invested $6.7 million in major energy efficiency retrofits, including upgrading boilers, and installing geothermal, air-source heat pumps and hybrid heating systems. The retrofits have payback period of 11 years, and have reduced natural gas use by 63% and energy costs by more than $370,000 per year. Additional benefits include a reduction in the deferred facility renewal backlog—paid for through energy cost savings—improved comfort, maintenance cost reduction, and greenhouse gas emissions reductions of 63%.
- A school in Laval, Quebec installed a geothermal system at a cost of $930,000 in 2011. Annual savings are $62,000 with a payback period of 10 years. One-third of the capital cost was provided through government and utility incentives.
- The Ottawa Board of Education has undertaken several retrofit measures throughout its facilities, including boiler and lighting replacement and building automation. The board has reduced its energy consumption by 24% and its energy costs by 30%. Overall savings exceed $1.8 million per year with an investment of only $500,000.

Payback periods for a list of residential and commercial retrofit measures range from 0 to nearly 19 years. Examples are included in the table.

	Length of Payback Period		
	0–5 years	**5–10 years**	**>10 years**
Residential Retrofit Measures	• Draft proofing kit • Clotheslines and drying racks • High-efficiency clothes washers • High-efficiency furnace replacement (90% Annual Fuel Utilization Efficiency) • Adaptive thermostat • Social benchmarking and home energy monitoring • Low-flow showerheads	• Super high-performance windows • Programmable thermostat • Professional air sealing/ weather stripping • Air leakage sealing and insulation in older homes	• ENERGY STAR for New Homes • Wall insulation • High-efficiency dishwasher • Hot water tank insulation • Attic/ceiling insulation • Basement wall insulation
Commercial Retrofit Measures	• ENERGY STAR clothes washers • ENERGY STAR convection ovens • ENERGY STAR dishwashers • Demand control kitchen ventilation • High-efficiency underfired boilers • High-performance glazing • High-efficiency boilers • Condensing boilers • Adaptive thermostats • Building recommissioning • Air curtains • Drain water heat recovery	• Gas-fired rooftop units • Heat reflector panels • Faucet aerators • Advanced building automation systems • Energy recovery ventilation	• Condensing unit heaters • Condensing storage water heaters • Condensing tankless water heaters

Appendix 4: Spending on, and Natural Gas Savings Achieved by, Utilities'[1] Conservation Programs, 2018

Prepared by the Office of the Auditor General of Ontario

Program	Description	2018 Program Spending ($ million)[2]	% of Total Spending on Conservation Programs in 2018[2]	% of Total Lifetime Natural Gas Savings Achieved in 2018
Commercial and Industrial Custom Projects	Financial incentives, technical expertise and guidance provided to customers to identify and implement natural gas savings.	16.08	15	45
Residential Home Retrofits	Financial incentives offered to residential participants for home retrofits, such as improving attic insulation or purchasing high efficiency furnaces.	48.56	45	19
Commercial and Industrial Prescriptive Projects	Financial incentives provided for a set list of natural-gas-reducing equipment, such as air curtains used to reduce heat escaping an entryway.	5.92	5	12
Low Income – Multi Residential	Financial incentives for social and assisted housing providers, and low-income households in market-rate buildings, to use toward energy efficiency upgrades such as improved boilers.	7.03	7	7
Commercial and Industrial Direct Install Projects	Financial incentives provided to small commercial customers for a set list of prescriptive projects, and the utility pays for the installation.	3.08	3	6
Large Volume	Financial incentives for operational studies and installation of new or upgraded equipment and operational changes.	2.34	2	5
Residential Thermostats	A $100 financial incentive for residential customers who have installed "smart" thermostats that help track energy use.	1.58	1	2
Energy Leaders	Financial incentives provided for commercial and industrial clients that have already undergone basic efficiency upgrades, and are looking to achieve harder-to-reach savings. For example, Enbridge offered incentives to install innovative ice resurfacing technology for arenas that do not require warm water.	0.32	0	2
Low Income – Single Residential	Home energy assessments and improved weatherizing services (such as installing insulation) for utility-identified, low-income participants.	12.27	11	2
RunItRight	Technical support and financial incentives for operational changes in facilities to lower natural gas use.	0.52	1	0
Participation-only Programs	Range of programs focused on changing customer behaviours and attitudes related to energy savings. The programs have participation targets, but do not have natural gas savings targets or measurements.	10.65	10	n/a

1. Union Gas Limited and Enbridge Gas Distribution merged to become Enbridge Gas Inc. in January 2019.
2. Not including overhead.

Appendix 5: Audit Criteria

Prepared by the Office of the Auditor General of Ontario

Ministry of Municipal Affairs and Housing	
1.	Efforts and programs to reduce energy use in buildings are effectively carried out in accordance with applicable legislation, policies, directives and government objectives.
2.	Evidence, expert advice, and best practices from other jurisdictions are used to identify, implement, regularly assess and improve the Ministry's programs that help reduce energy use in buildings.
3.	The Ministry's programs to reduce, support or encourage the reduction of energy use in buildings are monitored and evaluated, and corrective action is taken to maximize program effectiveness. Program results are communicated to the public.
4.	Effective processes are in place to ensure that building industry professionals (including builders, building inspectors and others) have sufficient training, capacity and skills to meet and enforce the energy efficiency requirements in the Ontario Building Code, and corrective action is taken if needed.
Ministry of Energy, Northern Development and Mines	
1.	Efforts and programs to reduce energy use in buildings are effectively carried out in accordance with applicable legislation, policies, directives and government objectives.
2.	Evidence, expert advice and best practices from other jurisdictions are used to identify, implement, regularly assess and improve the Ministry's programs that help reduce energy use in buildings.
3.	The Ministry's programs to reduce, support or encourage the reduction of energy use in buildings are monitored and evaluated, and corrective action is taken to maximize program effectiveness. Program results are communicated to the public.
4.	The Ministry has effective governance and oversight processes in place so that the Ontario Energy Board delivers on its legislated objectives with regard to energy conservation.
Ontario Energy Board (OEB)	
1.	Evidence, expert advice and best practices from other jurisdictions are used to develop, implement, regularly assess and improve natural gas conservation frameworks.
2.	Utilities' programs to reduce natural gas use in buildings are evaluated, measured, verified and assessed against targets. Program results are used to inform relevant decisions and are communicated to the public.
3.	The OEB has effective processes in place so that natural gas conservation programs are delivered efficiently and economically in accordance with legislative and OEB policy objectives and frameworks.

Appendix 6: National Construction Codes and Harmonization

Prepared by the Office of the Auditor General of Ontario

The National Research Council of Canada, a federal government agency, co-ordinates the development of a series of model National Construction Codes. These National Codes—which set minimum standards for buildings, plumbing, fire safety, energy, and farm buildings—are used as the basis for provincial and territorial building regulations. There are significant variations between Canadian jurisdictions regarding the degree of adoption and implementation of the model National Codes. For example, about 40% of the Ontario Building Code varies from the National Codes; this includes many of Ontario's energy-efficiency requirements. Other provinces that develop and issue their own building codes include Alberta, British Columbia and Quebec.

The National Codes are updated on a five-year cycle, with the 2020 update expected to be finalized and released in late 2021. The release has been delayed by at least six months due to COVID-19. The federal government is working with provinces and territories to harmonize building codes across the country. This forms part of a national effort to reduce barriers to movement and trade, under the Canadian Free Trade Agreement.

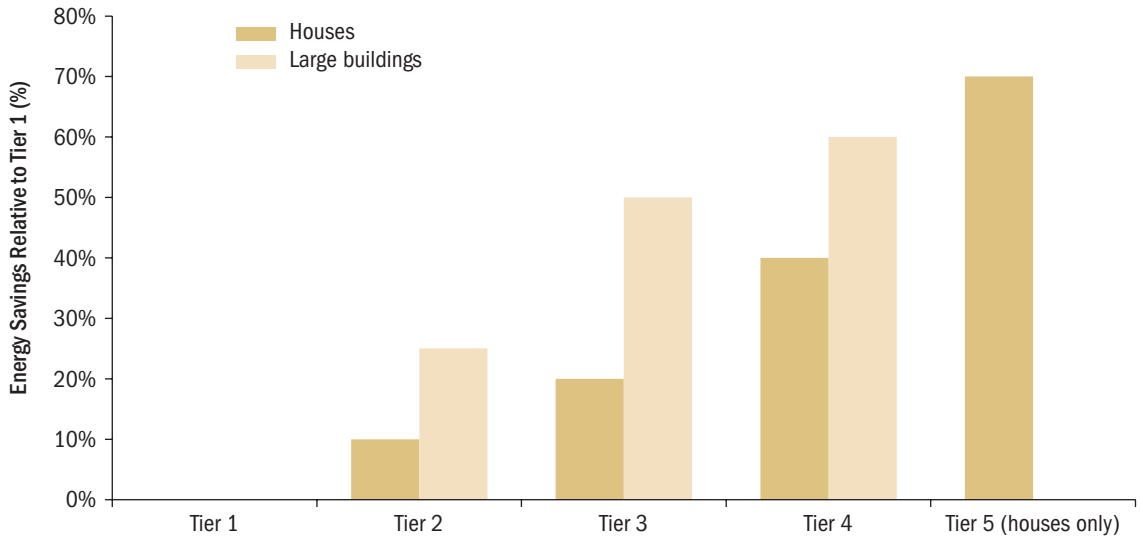
As part of Canada's commitment to adopt net-zero energy building codes by 2030, the 2020 update of the National Codes introduces a tiered approach to energy efficiency that outlines a path towards lower greenhouse gas emissions and energy use. There are five proposed tiers for houses and four tiers for large buildings, shown in the bar graph on the next page. Tier 1 sets a minimum standard for all provinces and territories to adopt. For houses, Tier 1 requires compliance with the 2020 National Building Code. For large buildings, Tier 1 may require a 15% energy efficiency improvement over the 2017 National Energy Code for Buildings—proposals are still being finalized.

The higher tiers set progressively more stringent energy efficiency targets, with the top tiers targeting net-zero energy performance in line with Canada's 2030 target. (Net-zero energy buildings are highly energy efficient and designed to produce as much energy as they consume, usually through on-site renewable energy generation). Compliance with the upper tiers may be achieved using prescriptive measures, energy modeling and air leakage performance testing. British Columbia is currently the only province or territory with a tiered approach to energy efficiency. In 2017, BC introduced the Energy Step Code, which allows municipalities to adopt more stringent standards than the provincial Building Code.

Ontario's current Code requirements for energy efficiency exceed the 2015 National Building Code by between 7% and 20% for houses, and are slightly below the 2017 National Energy Code for Buildings for large buildings. The Municipal Affairs Ministry has not yet decided how it will proceed with harmonizing energy efficiency requirements. An agreement signed by the federal, provincial and territorial governments allows jurisdictions to maintain certain variations and exceptions based on their own policy circumstances.

Proposed Energy Performance Tiers for Houses and Large Buildings in 2020 National Construction Codes

Source of data: Ministry of Municipal Affairs and Housing, National Research Council of Canada



Note: Under the current Ontario Building Code, houses use approximately 7% to 20% less energy than National Code Tier 1, and large buildings use approximately 17% more energy than National Code Tier 1. Proposed National Code tiers are still being finalized and are subject to change.

Appendix 7: Status of Energy and Mines Ministry's Oversight Mechanisms with Respect to the Ontario Energy Board (OEB)

Prepared by the Office of the Auditor General of Ontario

Mechanism	Frequency Required	Source	Who Initiates It	What It Does	Status
Memorandum of Understanding	Every three years	*Ontario Energy Board Act, 1998* (s. 4.6(1)) and the Agencies and Appointments Directive	Ministry and the OEB	Defines the OEB's mandate and the accountability framework between the OEB and Ministry, and includes reporting requirements from the OEB to the Ministry (including performance measurements).	Expired April 2019
Mandate Letters	Annually since 2016	Agencies and Appointments Directive	Ministry	Outlines the Ministry's expectations with respect to performance priorities in the upcoming year.	First mandate letter issued in October 2020
Energy Conservation Directives	At the Minister's discretion	*Ontario Energy Board Act, 1998* (s. 27.1(1))	Ministry	An Order-in-Council specifying the steps the OEB must take to promote energy conservation.	Current directive will expire December 2020
Reports on OEB Effectiveness	Every five years after 2003	*Ontario Energy Board Act, 1998* (s. 128.1(1))	Ministry	Assesses the OEB's effectiveness in meeting the objectives of the Act, including promoting natural gas conservation in accordance with the policies of the government of Ontario.	Never commissioned
Reports on OEB's Progress in Public Policy Initiatives	Annually	Memorandum of Understanding (2016) (s. 9.12.4)	OEB	Shows the OEB's progress and results in meeting public policy initiatives.	Never prepared

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