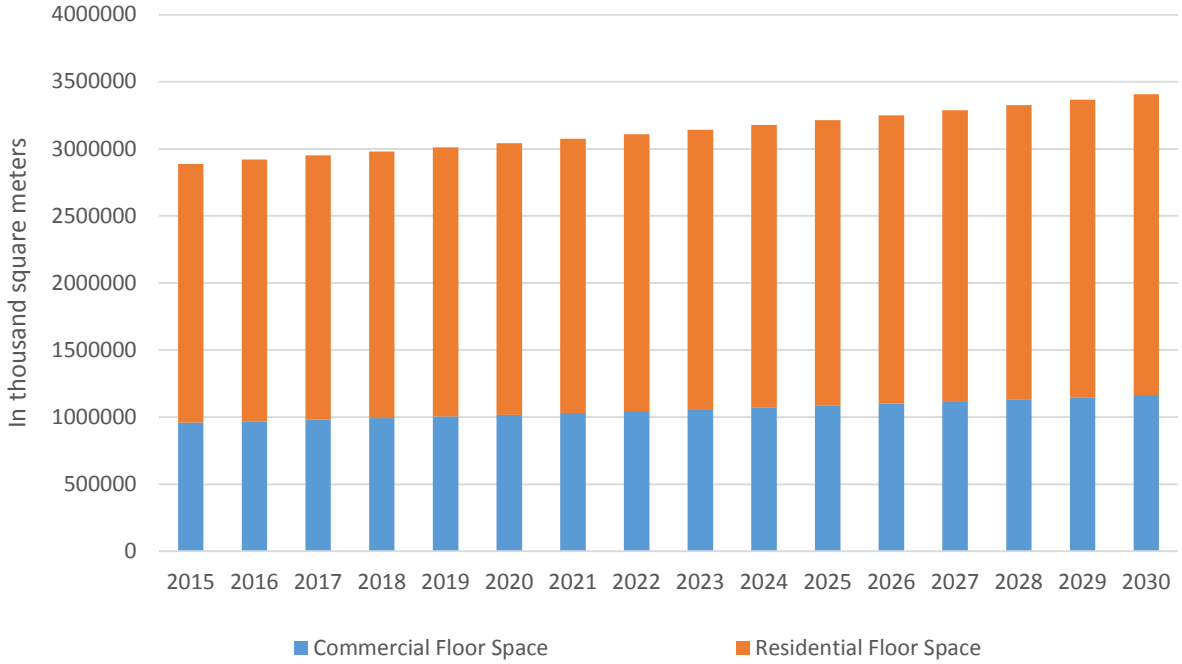
Senate Committee on Energy, the Environment and Natural Resources
Follow-up questions from September 19, 2017

1. Growth of floor space in commercial and residential buildings

The Committee was interested in whether increases in floor space offset energy efficiency gains. As stated by Sarah Stinson, Director, Buildings and Industry Division during her appearance before the Committee, measures such as more efficient building envelopes and heating equipment have resulted in a built-environment decrease in GHG emissions of 12 per cent between 2005 and 2013, despite a 17 per cent increase in total floor space.

Energy intensity is the amount of energy used per unit of measure, such as a household or floor space, and it is often used to measure energy efficiency. Between 1990 and 2013, energy intensity per residential household decreased by 24 per cent and for commercial and institutional buildings, energy intensity decreased by 15 per cent per square meter. Additional information about energy intensity and efficiency trends is available in Natural Resource Canada's publication Energy Efficiency Trends in Canada (https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/pdf/trends2013.pdf).

The figure below illustrates projected commercial and residential floor space growth to 2030. As stated in the Pan-Canadian Framework on Clean Growth and Climate Change (PCF), emissions from the buildings sector are projected to grow modestly by 2030 unless further action is taken. The PCF includes complementary climate actions to reduce emissions by addressing market barriers where pricing alone is insufficient, or not timely enough to reduce emissions in the pre-2030 timeframe. Tightening energy efficiency standards and codes for buildings to reduce emissions and help consumers save money by using less energy are among the complementary climate actions included the PCF.



Source: Environment and Climate Change Canada, E3MC model, 2016 reference case scenario
Note: Floor space estimates are derived using a function of household growth based on population and economic activities such as GDP

2. Data on shifts in energy use by consumers since Ontario implemented differential pricing

Ontario's Independent Electricity System Operator (IESO) balances the supply of and demand for electricity, directs its flow across Ontario and operates the province's electricity wholesale market. IESO also publishes information about Ontario's electricity sector.

Since 2012, the majority of electricity utility customers in Ontario pay Time-of-Use (TOU) prices that reflect the cost of producing electricity at different times of day based on demand. TOU pricing in Ontario has three pricing periods: on peak, when energy demand and cost is high, mid-peak, when energy demand and cost is moderate, and off-peak, when energy demand and cost is low.

IESO reports evaluated the impact of TOU prices in Ontario over three years, with reports published in 2013, 2014 and 2016. TOU prices were intended to shift electricity usage from on-peak to off-peak times and also promote energy conservation. The final study concluded that residential customers responded by shifting their electricity usage from peak to mid-peak and off-peak periods, and that for "general service class customers" (non-residential customers with demands of less than 50kW) shifts were less evident.

Sources:
First Year Impact Evaluation of Ontario's Time of Use Rates – IESO
http://www.ieso.ca/-/medi a/files/ieso/document-library/conservation/emv/2012/preliminary-report-first-year-impact-evaluation-of-ontario-tou-rates.pdf?la=en

Year Two Analysis of Ontario's Full Scale Roll-out of TOU Rates - IESO
http://www.brattle.com/system/news/pdfs/000/000/777/original/Year_Two_Analysis_of_Ontario's_Full_Scale_Roll-out_of_TOU_Rates.pdf?1420755179

Analysis of Ontario's Full Scale Roll-out of TOU Rates – Final Study – IESO
http://www.ieso.ca/-/media/files/ieso/document-library/conservation-reports/final-analysis-of-ontarios-full-scale-roll-out-of-tou-rates.pdf

3. Analysis of the achievements of the ecoENERGY Retrofit Program

Natural Resources Canada's energy efficiency programs have been subject to periodic evaluation as part cyclic federal government program evaluation activities. A 2010 mid-program evaluation of Natural Resources Canada's Industry, Housing and Buildings programs over the 2004-05 to 2008-09 period found that, overall, programs contribute to adoption of energy efficient products and practices, reach their target audiences and result in energy savings and reductions in greenhouse gas emissions.

Under the PCF, provincial and territorial governments committed to work to sustain and, where possible, expand efforts to retrofit existing buildings by supporting energy efficiency improvements as well as fuel switching, where appropriate, and by accelerating the adoption of high-efficiency equipment while tailoring their programs to regional circumstances. The federal government is working closely with provinces and territories to further long-term energy efficiency efforts vital to supporting the transition to a clean economy. Budget 2017 invested in a wide range of initiatives to improve energy efficiency in homes and buildings. The federal government has also committed $2 billion to the Low Carbon Economy Fund to support provincial and territorial energy efficiency projects that will generate clean growth and reduce greenhouse gas emissions.

Source:
Evaluation of Energy Efficiency for Industry, Housing and Buildings
http://www.nrcan.gc.ca/evaluation/reports/2010/832

4. Cost per tonne of what it would take to achieve the reduction of 21.6MT of GHGs by 2030, as noted in slide 7 of the presentation by Sarah Stinson, Director, Buildings and Industry Division

Measures to improve the energy efficiency of buildings proposed under the PCF, and presented to the committee by Sarah Stinson, Director, Buildings and Industry Division, were developed through a process that included consultation with provinces, territories and stakeholders, and considered cost per tonne of implementation:

- In March 2016, Canada's First Ministers issued the Vancouver Declaration, which launched a series of working groups mandated to identify specific actions to grow Canada's economy while reducing GHG emissions and adapting to climate change.
- Environment and Climate Change Canada led the Working Group on Specific Mitigation Opportunities, tasked with developing a broad menu of policy options to reduce emissions across all sectors of Canada's economy. The Working Group received input from individual Canadians, civil society, academics, businesses and business associations
- In November 2016, the Working Group on Specific Mitigation Opportunities Final Report was published. Wherever possible, the report included greenhouse gas emissions reductions in 2030 estimated using Environment and Climate Change Canada's Energy, Emissions and Economy Model for Canada.
- The Working Group on Specific Mitigation Opportunities Final Report includes the policy options for the built environment proposed under the PCF, and presented to the committee by Sarah Stinson, Director, Buildings and Industry Division, as well as a range of GHG savings and estimated cost per tonne for each.

Costs for each policy option presented are outlined in Annex 1 of the Working Group on Specific Mitigation Opportunities Final Report under Built Environment starting on page 92.

Source:
Working Group on Specific Mitigation Opportunities Final Report
http://www.climatechange.gc.ca/Content/6/4/7/64778DD5-E2D9-4930-BE59-D6DB7DB5CBC0/WG_Report_SPECIFIC_MITIGATION_OPPORTUNITIES_EN_V04.pdf