

Delivering Fairness and Choice LTEP 2017

Chapter 4. Enhancing our Commitment to Energy Conservation & Efficiency

Ontarians can be proud of what we have accomplished with conservation and energy efficiency. Between 2005 and 2015, we conserved 13.5 TWh of electricityⁱ, enough to have powered the cities of London, Kingston, Ottawa and Peterborough in 2015ⁱⁱ.

But that's just one way of measuring conservation. Another method is to measure how much we reduced the peak demand for electricity, and in 2015 we reduced demand by 4,439 MWⁱⁱⁱ. That's equivalent to more than the peak demand of the City of Toronto in 2015.

Energy efficiency is becoming more part of our everyday lives. According to the IESO's 2015 study on the province's conservation efforts, businesses are becoming more productive by investing in energy-efficiency upgrades, and residents are choosing to install energy-efficient equipment in their homes, some of them with the help of Ontario's suite of residential and business conservation programs. (see below).

Business

1,013 GWh
of energy savings
achieved

18,000 +
projects completed
through the
**Small Business
Lighting Program**

424
projects completed
through the
**Energy Managers
Program**

13,000 +
projects taken on
through the
Retrofit Program

Residential

268 GWh
of energy savings
achieved

4.1 million
coupons redeemed
across the province

6.4 million
energy efficient
products purchased

122,000 +
installations through
the **Heating and
Cooling Program**

With the *Long-Term Energy Plan* in 2013, the government put conservation and energy efficiency at the centre of its energy policy. Since then, the Ministry of Energy, its agencies, and and electricity and natural gas distributors, have been implementing the *Conservation First* policy.

Conservation and energy efficiency require a sustained commitment if we are to achieve persistent savings over the long-term. Looking forward, Ontario will enhance its *Conservation First* commitment to support affordability and choice for people, businesses and communities, and to align with Ontario's climate change objectives.

[CALL OUT BOX: Conservation and Energy Efficiency]

Electricity

- The province has historically avoided \$2 in added costs to the electricity system every time \$1 has been invested in energy efficiency^{iv}.
- Conservation costs about \$40 per megawatt hour (MWh), which is cheaper than most forms of new supply^v.

Natural Gas

- An investment of about \$790 million in efficiency programs between 2000 and 2014 saved about \$4.3 billion for natural gas ratepayers. [NTD: To add equivalency]
- In 2014, these programs cost about 3.0 cents per cubic metre saved. [NTD: to add benchmark against price of natural gas]

Getting More from Conservation

Ontario has a healthy supply of energy, with any added demand for electricity not expected to materialize until the mid-2020s. In this context, Ontario will continue to drive towards the long-term target established in the 2013 LTEP of 30 TWh of electricity savings in 2032, using conservation, energy efficiency programs and improved efficiency standards. Ontario and its agencies will continue to assess the achievable potential for energy conservation, and explore options to enhance the value of our conservation investments. These will take into account the reductions in energy use achieved through Ontario's *Climate Change Action Plan*.

The IESO and the OEB are currently conducting mid-term reviews of the *Conservation First Framework* for electricity conservation programs and the *Demand Side Management Framework* for natural gas programs. They are looking at the distributors' 2020 targets for conservation savings, program budgets and how programs are meeting customer needs.

Demand Response

Demand response (DR) refers to voluntary programs that reward electricity customers for reducing their electricity demand during peak periods. DR can enhance the reliability of the system, as well as reduce system costs and GHG emissions. Examples of DR are when a factory

Commented [YDT1]: We have added reference to electricity and natural gas distributors as the agents for program delivery.

2015 DSM program results are still draft and will not be finalized before August

Commented [AH(2)]: Could we add more on natural gas conservation? It seems like a throw-away comment, given all the context on electricity conservation.

Commented [YDT3]: For Musab on Tuesday to complete and provide sources

Commented [AH(4)]: Does this title make sense, since we're not setting new targets?

Commented [YDT5]: Yes as getting more does not necessarily mean increasing targets. We are exploring how to get more value out of conservation and making increase investments (including alignment with CCAP and other fuels)

temporarily halts a process, or a group of residential consumers reduce their use of air conditioning when electricity demand is high.

The IESO has successfully transitioned DR away from contract-based procurements to a competitive auction. The two DR auctions held in 2015 and 2016 reduced the cost of providing DR by up to 27% compared to previous DR procurement contracts^{vi}. As part of the transition, the IESO is now using DR to better respond to system needs. In addition to reducing peaks in electricity demand, DR can now be used during the shift from periods of low to high demand.

The 2013 *Long-Term Energy Plan* set a long-term target to use DR to reduce 10% of the province's peak electricity demand in 2025. As Ontario transitions to a capacity market, Ontario will not pursue a long-term DR target, instead working with the IESO to transform the DR auction into a capacity auction, so that DR resources can compete directly with traditional generation.

The IESO is also assessing the impact the Conservation First Framework and Industrial Accelerator Program have on electricity planning and Ontario's climate change objectives, including the impact of energy-only savings targets and opportunities to align distributor targets with local and regional electricity needs.

Commented [AH(6)]: JM suggest clarifying or deleting.

Commented [SE(7)]: From IESO MTR Topic 5 Report: Planning Integration

Expanding the Scope of Conservation

Ontario is expanding the scope of conservation to ensure that all participants in the energy sector put *Conservation First* and help Ontario reach its greenhouse gas reduction targets.

Natural gas and electricity conservation should not be limited to the actions customers take in their homes or businesses; we need to make smart choices at all levels. The government is looking at using renewable natural gas (RNG) to lower the carbon intensity of our natural gas system. For electricity, we have been looking to further embed *Conservation First* in the planning and management of the entire electricity system. Innovative technologies can cost-effectively reduce line losses and optimize voltage levels on distribution networks, lowering the demand for electricity and peak demand.

Commented [AH(8)]: What about natural gas conservation?

Commented [YDT9]: The natural gas element is covered off in Chapter 6 on climate change through Renewable Natural Gas

Several pilots across North America, including pilots in Ontario funded by the Smart Grid Fund and Conservation Fund, have demonstrated the potential benefits of deploying energy efficiency technologies on distribution networks. A recent study commissioned by the Ministry of Energy estimated that energy efficiency technologies can be cost-effectively deployed on 30 per cent of Ontario's electricity distribution networks^{vii}.

The Ministry and its agencies will encourage distributors to increase the energy efficiency of their networks, by allowing them to count the electricity savings from these technologies towards their electricity savings targets under the *Conservation First Framework*. The OEB will

also explore ways to further encourage distributors to pursue energy efficiency on their distribution networks.

[CASE STUDY/VISUALS - a graph with the 30 TWh target and the progress to date.

[CASE STUDY: Toronto Cecil Transformer Station

Message: Conservation first before infrastructure investments

Content: Description of project's benefits and innovation and quote from Toronto Hydro CEO]

CASE STUDY: Enbridge Gas – KI industry

Message: Conservation helping industrial consumers

Content: Description of savings

Raising the Bar for Energy and Water Efficiency

Ontario continues to play a lead role in improving the energy efficiency of equipment in our homes, offices and factories. Since 2013, Ontario improved or set new energy efficiency standards for over 60 products. The gains in energy efficiency have not only been enduring, but economies of scale have lowered the cost of the technologies, ensuring they become more popular, affordable and widely available. Now that the *Green Energy Act, 2009* has been amended, the Ministry of Energy Plan is regulating the water efficiency of products that consume both energy and water. As a result, it is now on a path to achieve more efficient use of water and even greater energy savings and reductions in greenhouse gas emissions.

(Note: for consideration by comms – see below information for a call out box with an example of estimated water savings due to new water efficiency standards^{viii})

- Water efficiency standards for clothes washers are estimated to save **22 billion liters/year** of water in 2032, equivalent to:
 - 9000 Olympic-sized swimming pools
 - Amount of water that flows over Niagara falls in 2.75 hours
- New energy efficiency standards for clothes washers from 2015 are estimated to save 0.60 TWh/yr of electricity in 2032, equivalent to taking around 67,000 homes off the grid, or
 - The annual electricity consumed by all the private dwellings (residential homes) in the City of Kingston
 - The annual electricity consumed by the City of Stratford

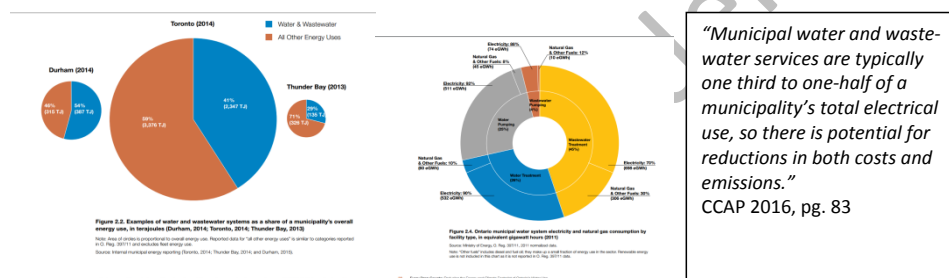


Commented [sk10]: Example was omitted in this version, so it has been reinserted for clarification.

Setting efficiency standards for equipment found in drinking water and waste-water treatment plants

The Ministry of Energy is also exploring opportunities to set or update energy efficiency standards for key equipment using electricity in drinking water and waste water treatment plants, as highlighted in Ontario's Climate Change Action Plan. This will reduce one of the largest uses of electricity by municipalities and help them save on their electricity bills.

(Note: a graph to be added with a call out box with an example of estimated portion of electricity use by municipalities – consider adapting info graphics from Chapter 2 of ECO's 2017 Conservation report – Every Drop Counts)



Setting efficiency standards for near and net zero carbon emission homes and buildings

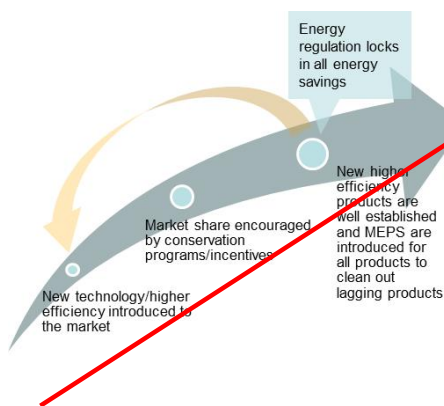
With advanced standards for space and water heating equipment, new and existing homes and buildings could significantly reduce their energy use and greenhouse gas emissions. High-efficiency and low carbon technologies can lead to net zero carbon emission homes and buildings.

In collaboration with other provinces and the federal government, Ontario is exploring opportunities and strategies to develop markets for high efficiency products and appliances to support future efficiency standards for near and net-zero carbon emission homes and buildings. For example, markets have to be developed for over 100% efficient space and heating technologies that would enable achieving one of Ontario's climate change action plan goals - net zero carbon emissions homes by 2030..

Commented [YDT11]: For consistency with chapter 6 on climate change.

Commented [YDT12]: This section could also fit under “Near and Net Zero Carbon Buildings” section of Chapter 6 on Climate Change.

Commented [AH(13)]: JM wants to know why this is important.



Ensuring a Customer-Centred Approach

The current conservation frameworks encourage electricity and natural gas distributors to collaborate to provide more efficient programs and a streamlined experience for customers. Such partnerships can provide energy consumers with a one-stop approach to meeting their energy management needs. Currently, 46 electricity distributors are involved in joint conservation plans, and electricity distributors are partnering with natural gas distributors to design and develop multi-fuel programs.

Distributors are encouraged to develop new and innovative programs for their customers. Utilities have launched new programs, for example Hydro One's Heat Pump Advantage pilot, Enersource's Small Business Refrigeration for small businesses, the Toronto Hydro Swimming Pool Efficiency Program with discounts on Energy Star rate pool pumps to customers, and the Enbridge Gas School's Energy Competition. The IESO helped by launching in 2016 the first full-scale "pay-for-performance" program in North America. The *Save on Energy Multi-Distributor Pay-for-Performance Program* rewards businesses for improving their overall energy performance over a number of years. Businesses are paid for each kilowatt hour they conserve, and are given flexibility on how they achieve those savings. Ratepayers benefit as well: participants are paid for savings at the whole building level through a single project application, reducing the number of project applications for customers and program administration costs.

Commented [AH(14)]: JM doesn't understand what this is saying.

[CASE STUDY: Loblaw's Multi-Site P4P

Message: conservation is cost effective and builds capacity

Content: Details of pilot]

[CASE STUDY: Hydro One Heat Pump Advantage customer

Message: customer choice and helps reduce electricity bills

Content: what is the technology and how a participant benefitted from the program]

[CASE STUDY: Business Refrigeration Incentive - pub

Message: conservation helps manage energy use

Content: Measures and savings of a participating small business]

[CASE STUDY: DSM – Enbridge and University of Toronto

Message: conservation helps manage energy use

Content: details of a natural gas project]

Commented [SE(15): These seem to make more sense here

Expanding Home Retrofits

As part of its *Climate Change Strategy*, Ontario has invested \$100 million from its Green Investment Fund (GIF) to help eligible homeowners who primarily heat with natural gas, oil, propane or wood. They can upgrade their homes, reduce their energy bills and cut greenhouse gas emissions by participating in enhanced residential audit and retrofit programs offered by Enbridge Gas Distribution and Union Gas. Launched province-wide on October 31, 2016, the program is expected to enable about 37,000 additional homes to be audited and retrofitted by 2019, and cumulatively reduce approximately 1.6 megatonnes of lifetime greenhouse gas emissions.¹

The home energy audit and retrofit programs were further enhanced in May 2017 to include electricity incentives. Partnering with Enbridge Gas and Union Gas, the IESO has expanded the program to electrically-heated homes. This 'Whole Home' approach is now providing residential consumers with a simple, one-stop to energy efficiency improvements.

¹ "Helping Homeowners Cut Energy Bills with Retrofits and Renovations." October 31, 2016, <https://news.ontario.ca/opo/en/2016/10/helping-homeowners-cut-energy-bills-with-retrofits-and-renovations.html>

Energy Efficiency For Your Whole Home Case Study

Incentives from the *Home Energy Conservation Program* allow families like the O'Hara's to reduce their energy bills, increase their home comfort, and cut greenhouse gas emissions. The O'Hara's upgraded their furnace, hot water heater and windows, improving the efficiency of their more than century-old home. They also added basement insulation, and air sealed their home. The upgrades will reduce the O'Hara's consumption of natural gas by 36 per cent, and cut their greenhouse gas emissions by 1.67 tonnes annually. In addition to retrofitting their Home, the O'Hara's also installed a Smart Thermostat, which increases their savings by reducing home temperatures when they are away.



Smart Thermostats

Smart thermostats are the next important technology for homeowners looking to reduce the costs of heating and cooling their homes, and their carbon footprint. Smart thermostats:

- give consumers more information about their energy use;
- enable customers to use a smart phone app to remotely control the temperature of the home or small business; and
- automatically adjust the temperature to respond to changes in a customer's schedule, or seasonal changes.

The Ministry of Energy will work with the IESO to standardize incentive offerings and ensure smart thermostat incentives exist for homeowners across the province.

Innovative Pricing and Flexible Rate Plans

Together with the Ontario Energy Board, the Province is working on giving consumers more choice in their electricity price plans. The OEB is using pilot programs to test innovative time-of-use price structures, as part of its review of the Regulated Price Plan. Ontario is already a world

Commented [SE(16)]: I think there's broad comfort with the GOF amending direction to IESO so we can finish the sentence. The multi-ministry deck had:

•Work with the IESO and MOECC to standardize incentive offerings and ensure smart thermostats incentives exist for homeowners across the province.

Commented [AH(17)]: Should this section be in the innovation chapter, rather than conservation?

Commented [YDT18]: It could, although the innovation chapter is already 29 pages long. More balanced chapters if remains here.

leader in this area, offering time-of-use electricity prices to most of its residential and small business electricity customers.

The pilots will test a variety of innovative price structures, including:

- different ratios between on-peak and off-peak prices;
- different times for on-peak and off-peak periods;
- prices that kick in during critical peaks – the short time periods with extremely high demand; and
- seasonal pricing plans where spring and fall have a flat rate, and summer and winter have on-peak and off-peak price periods.

Some of the pricing pilots will be combined with smart technologies, like smart thermostats, energy use apps, and electric vehicles, to give customers further ability to manage their electricity use.

The pilots will help inform future OEB decisions on potential new price plans that could match a customer's lifestyle and give them more control over their electricity costs.

In addition to the above pilot programs, the OEB is also examining changes to the way Global Adjustment (GA) is charged to mid-sized commercial and industrial consumers, otherwise known as non-RPP Class B consumers. For these consumers, the GA cost is a fixed charge that is the same regardless of the time that they consume electricity. As outlined in the OEB's RPP Roadmap, a time-of-use shaped GA charge for non-RPP Class B consumers would be a potential means to bring about more equitable cost recovery from Class B consumers on a whole, including those on the Regulated Price Plan such as residential and small business consumers.

Commented [K,M19]: ESP approved.

[CASE STUDY: TOU pilot
Providing consumers choice
Content: a description of existing TOU pilot]

[CALL OUT BOX: EcoSchools]

Ontario EcoSchools brings information about energy conservation to more of the province's students and teachers.

Ontario EcoSchools aims to give all members of the school's community the knowledge, skills, perspectives and desire to act as environmentally responsible citizens. The mission is to nurture environmental leaders, reduce the ecological impact of schools and build school communities that are environmentally responsible.



More than 800,000 students across the province are engaged in the program.²³

With support from the province, the program is expected to grow over the next two years to about 2,000 schools from 62 school boards, reaching approximately 1 million students from kindergarten to grade 12.

Integrating Conservation and Climate Change Programs

Ontario's *Climate Change Action Plan* emphasized the need to increase the use of low-carbon technology, such as solar panels, and heat pumps, in Ontario homes and businesses. Several programs to increase energy choices for Ontarians are being introduced this year, funded by the proceeds from the cap and trade program.

A new agency, the *Green Ontario Fund*, will help Ontarians in moving to a low-carbon technology future. Under the direction of the Ministry of Environment and Climate Change (MOECC), the Green Ontario Fund will offer incentives, financing and services to increase the use of low-carbon technologies that reduce greenhouse gas emissions.

[NTD: TBC], The Green Ontario Fund launched a website to provide a "one-window" approach for Ontarians seeking help, information and access to *Green Ontario Fund* programs, as well as other conservation and renewable energy programs in Ontario.

IESO's role to support the delivery of key Green Ontario Fund programs will help ensure a coordinated and customer-focused approach and build on the success of the province's existing energy efficiency programs to give Ontarians more opportunities to reduce both their energy costs and carbon footprints.

The Ministry of Energy will work with its agencies and MOECC to consider opportunities to move toward greater integration of conservation and low-carbon technology programs across fuels.

Under current conservation programs, natural gas-fuelled combined heat and power projects have been eligible for incentives, because of the significant reductions they cause in demand on the electricity grid.

To help meet Ontario's climate change goals, the province will not allow this type of project to enroll in the conservation programs, effective July 1, 2018. The timeframe coincides with the end of the mid-term review of the *Conservation First Framework* and the *Industrial Accelerator Program*. Customers currently developing such projects can apply until July 1, 2018.

Commented [SE(20): Please add in IESO's role in supporting program delivery, use language from amending direction for GOF programs. This should help with the transition to the next paragraph.

I would also add re: program integration:

- We will work with our agencies and MOECC to consider opportunities to move towards greater integration of conservation and low-carbon technology programs across fuels.

² Source: Ontario EcoSchools Annual Report to the Ministry of the Energy 2015-16

In recognition of their environmental benefit, the installation of renewable energy projects, such as solar thermal water heating or use of biomass fuel for boilers, will continue to be eligible for funding under the *Conservation First Framework* and *Industrial Accelerator Program*. Electricity distributors may also offer incentives for energy storage systems that are integrated with a customer's own renewable energy projects. When added to self-generation, energy storage systems provide reliability and can help customers reduce their grid demand when prices are highest. This can help reduce local and provincial system peaks.

Providing Choice through Information, Tools & Data

Ontario's energy benchmarking and rating initiatives give people and organizations the tools and information they need to understand the energy performance of their homes and businesses, and compare it with similar buildings. They can use this information to manage their usage and costs, and justify investments in energy efficiency. As of July 2017, 16 electricity distributors have social benchmarking programs in their Conservation and Demand Management Plans, with four programs currently available to customers.

Organizations in Ontario's Broader Public Sector must annually report their energy consumption and greenhouse gas emissions. They must also develop 5-year energy conservation and demand management plans to guide their energy savings. The data on usage has been posted on Ontario's Open Data website since 2014.

Building on this success, as well as the lessons learned from similar programs in the United States, Ontario has introduced an Energy and Water Reporting and Benchmarking requirement for large private sector buildings⁴. Starting in July 2018, and to be phased in over three years, owners of large commercial, multi-unit residential and some industrial buildings must annually submit information on their building's use of energy and water and its GHG emissions. Some of the data will be annually posted on Ontario's Open Data website so owners can compare the energy and water usage of their buildings with that of similar facilities, and identify where improvements can be made.

In order to help households and businesses manage and conserve their energy and water use Ontario's *Climate Change Action Plan* committed to expanding the province's Green Button Initiative.^{ix} Green Button Download My Data gives households and businesses easy electronic access to data on their energy and water consumption. Green Button Connect My Data lets households and businesses automate the secure transfer of their own data from their utility to applications of their choice. Greater access to data through Green Button will encourage

Commented [AH(21)]: Perhaps we should trim this chapter down a little? It's quite long at this point.

⁴ O.reg. 20.17

behavioural changes and energy efficiency improvements, support energy reporting and benchmarking, and create economic development opportunities. ^x

Ontario has taken steps to support the broader adoption of Green Button. Between 2013 and 2015, London Hydro and Hydro One successfully completed Green Button Connect My Data pilots, and in 2016 the Ministry completed a cost-benefit analysis and consulted with a broad range of stakeholders on a proposal to require Ontario's electricity, natural gas and water utilities to implement Green Button.

Ontario is committed to expanding Green Button province-wide and intends to propose legislation that would require electricity and natural gas distributors to implement Green Button Download My Data and Connect My Data. In addition, the Ministry will take a collaborative approach to adapt the Green Button Standard for natural gas and water as well as develop and update the guidance documents for electricity to support a standardized implementation across Ontario.

Commented [SE(22)]: If we say this, we can anticipate many follow-ups from distributors and solution providers to participate in the WG, and we will have to say no to most – who may then complain. Can this be reframed, e.g. “through a collaborative approach...”

[CASE STUDY: Green Button

Message: government leadership and innovation

Content: Budweiser Gardens accurately forecasts energy usage using event assist. Event Assist will help Budweiser Gardens to better understand their usage so they can cost-effectively analyse energy costs on an event by event basis]

Green Button

Message: government leadership and innovation

Content: Thames Valley District School Board uses Green Button to compare energy profiles of 165 schools, increasing efficiency and minimizing unnecessary costs

Ontario is also exploring how to increase corporate financing for energy efficiency projects. The Investor Confidence Project gives financiers the information and tools they need to assess energy efficiency projects. The Project was established by the Environmental Defense Fund in the United States in 2013, and Ontario, in partnership with the MaRS Advanced Energy Centre, is piloting Investor Confidence Project protocols in Ontario and exploring how they can be adapted for the Canadian market.

ⁱ IESO, Ontario Planning Outlook, Module 3

ⁱⁱ Electricity for Cities of Kingston and Stratford - 2015 OEB Yearbook of Electricity Distributors: http://cf.oeb.ca/oeb/Documents/RRR/2015_Yearbook_of_Electricity_Distributors.pdf

ⁱⁱⁱ IESO, exact document to be confirmed by Musab Qureshi

^{iv} IESO, 2015 Conservation Results Report

^v IESO 2015 Conservation Results Report

^{vi} February 6, 2017 DR Update Note from IESO – Verified by email on June 23, 2017

^{vii} 2017 Navigant Report – Considerations for Deploying IFMC Technologies in Ontario

^{viii} 22 billion liters/year - based on Ministry of Energy internal calculations, using data from U.S. Department of Energy.

9000 Olympic-sized pools – equivalency based on conversion factor provided by MOECC.

Water that flows over Niagara Falls in 2.75 hours – equivalency based on conversion factor from Niagara Falls website: https://www.niagarafallslive.com/facts_about_niagara_falls.htm

Estimated to save 0.60 TWh/yr of electricity in 2032 - based on Ministry internal calculations, using data from U.S. Department of Energy.

67,000 homes off the grid – equivalency based on OEB Report EB-2016-0153 (April 2016):

https://www.oeb.ca/oeb/_Documents/Documents/Report_Defining_Typical_Elec_Customer_20160414.pdf

Electricity for Cities of Kingston and Stratford - 2015 OEB Yearbook of Electricity Distributors:

http://cf.oeb.ca/oeb/_Documents/RRR/2015_Yearbook_of_Electricity_Distributors.pdf

^{ix} Ontario's Five Year Climate Change Action Plan 2016-2020, pages 29 and 69

^x Dunksy's Cost-Benefit Analysis Report