Alberta Government

Climate Leadership Plan

Progress Report

2016-17

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CLP PROGRESS REPORT 2016-17

The Climate Leadership Plan (CLP) is a made-in-Alberta strategy that brings together government, business, industry and the public to diversify our economy, create jobs and reduce greenhouse gas emissions (GHG) that cause climate change. The CLP Progress Report gives Albertans an update on the actions taken and the progress made towards achieving the goals set out in the CLP that was announced in November 2015.

The CLP is designed for Alberta's economy, and it is working. We're seeing success in reducing emissions, investments in innovation, energy efficiency, renewables, and good jobs that are putting Albertans back to work. This Progress Report includes:

- A description of what Alberta is working to achieve – CLP outcomes in the short, medium and long term.
- An update on what Alberta is achieving in its one to five-year action areas.
- An update on the programs and initiatives designed to move towards achieving the CLP outcomes.

This report outlines how the Government of Alberta will measure, evaluate and report on both progress made as we pursue our goal of reducing GHGs and other important outcomes.

As well, this report shows that the Government of Alberta has established rigorous monitoring and performance measurement for the CLP. As additional programs are implemented and more results are tracked, the measures and indicators will be refined to better meet the evolving needs of the public and decision-makers.

This report covers calendar year 2016 (with preliminary results for a few initiatives started in 2017). Investment dollars and program results tables are based on the fiscal year of April 1, 2016 to March 31, 2017.

ALBERTA'S CLIMATE LEADERSHIP PLAN

In November 2015, the Government of Alberta introduced the Climate Leadership Plan. It is a made-in-Alberta strategy to reduce carbon emissions while diversifying our economy, creating jobs and protecting our health and environment.

WHY ALBERTA MUST ACT

Alberta emitted 38 per cent of Canada's greenhouse gas emissions in 2015, the highest of any province. In addition to being a significant global environmental threat, Alberta's contribution to the climate change crisis had started to create reputation challenges that were impacting business: investment and market access were both threatened by continuing the status quo. Alberta took decisive action to curtail emissions—to protect the environment, and to create jobs by growing the modern Alberta economy, including improved access to world markets for our responsibly produced energy.

AN ALBERTA-FIRST STRATEGY

The government established a Climate Change Advisory Panel to advise it on the best way to take action. The Panel's report forms the foundation of the CLP and includes four main policy measures:

- Implement a new price on greenhouse gas emissions, or carbon pricing.
- Phase out pollution from coal-generated electricity by 2030 and triple renewable energy so by 2030, 30 per cent of electricity is generated from renewable sources.
- Cap oil sands emissions at 100 megatonnes (Mt) in any year.
- Reduce methane emissions from upstream oil and gas production by 45 per cent from 2014 levels by 2025.

MEASURING AND REPORTING PROGRESS

In 2016, mechanisms were put in place to ensure efficient and effective implementation of the CLP. The government, through various ministries and agencies, and reflecting recommendations in the Climate Change Advisory Panel's report, established a set of clearly defined outcomes and desired results. This outcome framework (included in the Appendix) forms the foundation for CLP programs and policies to:

- Map alignment to CLP's outcomes.
- Identify measures/indicators to monitor, report and evaluate progress.
- Evaluate relevancy and effectiveness of CLP funding requests, policies and programs.

The performance framework described below provides the structure for measuring and reporting progress on the CLP.

WHAT IS ALBERTA WORKING TO ACHIEVE?

The CLP ultimately aims to achieve **Reduced Greenhouse Gas Emissions** while also working towards a **Lower Carbon Diversified Economy** and **Increased Community Health and Wellbeing.**

HOW FAST? HOW FAR?

Reducing GHG emissions takes concerted effort by many contributors over many years. Recognizing that many of these factors are outside of its control, the government has set clear targets where it can make an impact.

Targets:

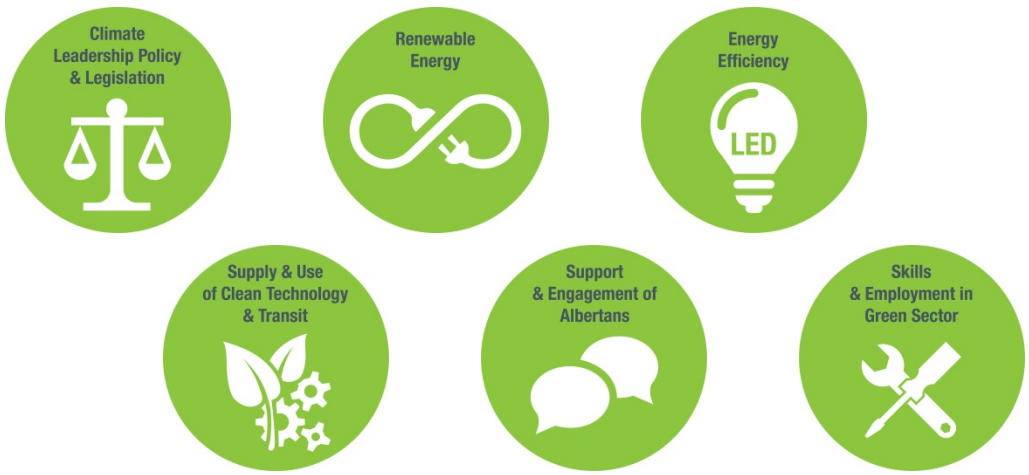
- 2017 and On – Annual **oil sands emissions are <100 Mt.**
- 2025 – Annual **methane emissions from upstream oil and gas are decreased by 45 per cent** from 2014 levels (14 MT GHG emissions ↓).
- 2030 – Pollution from **coal-generated electricity is ZERO** (17 Mt GHG emissions ↓).
- 2030 – **30 per cent** of electricity produced in Alberta is **from renewable energy sources** (7 Mt GHG emissions ↓).

Megatonne GHG emission reductions are estimated based on data and information available in the current reporting period. They may be updated in subsequent reporting.

HOW WILL WE GET THERE?

Achieving these targets and our ultimate outcomes depends on effort and change by us all: government, business, industry and the public. We all have a role. Government can establish Alberta as a **climate leader**, business and industry can **accelerate the adoption of clean innovation**, and Albertans can **actively participate in green practices**. To encourage these changes, the CLP focuses on six action areas:

Action Areas



CLP Programs and Policies

Each of the programs and policies links to one or more of the action areas and has defined accountabilities. Examples of CLP programs and policies include:

- Indigenous Climate Leadership Initiative.
- Emissions Reduction Alberta.
- Energy Efficiency Alberta.
- Renewable Electricity Program.

HOW WILL WE KNOW WE ARE ON THE RIGHT TRACK?

The performance framework mentioned above – the ultimate outcomes, action areas, and the contributing programs and policies – forms the structure for measuring and reporting progress. And the CLP Progress Report updates Albertans on how well we're doing to meeting the goals we set out to achieve.

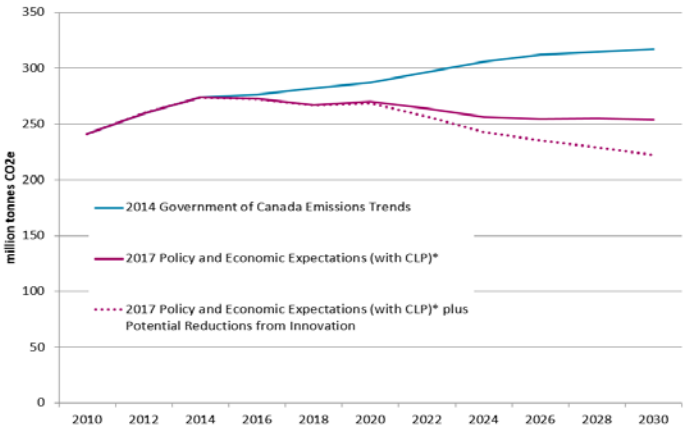
REPORTING OUR RESULTS

REDUCED GREENHOUSE GAS EMISSIONS

Alberta's CLP policies, legislation and programs all drive towards reduced greenhouse gas emissions and changing Alberta's emissions path. Progress on reductions is monitored through actual results reported in the Government of Canada's National Inventory Report on Greenhouse Gas Sources and Sinks, as well as modelled forecasts of future emissions. The historical results for Alberta's GHG emissions measured in megatonnes of carbon dioxide equivalent, as well as forecasted emissions, are shown in Figure 1. Forecasted emissions are based on the Alberta Climate Change Office's (ACCO) internal analysis and the methodology is described in the Appendix.

Impacts of CLP policies and programs are expected as early as 2017 with a decrease from Canada's Emissions Trends 2014 (blue line in Figure 1). The decrease in emissions (solid pink line) reflects changing expectations of Alberta's economy (such as impacts of lower world prices for oil) combined with the actions from the CLP and other federal climate change policies. Included in this is the impact of the CLP implemented carbon price rising from $30 to $50 for large industrial facilities and the application of the carbon levy to move towards economy-wide carbon pricing.

Figure 1. Actual and Estimated GHG Emissions for Alberta



* Includes Alberta's Climate Leadership Plan and federal climate policies.

Data source: Environment and Climate Change Canada – National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada; Environment Canada – Emissions Trends 2014; ACCO Internal Analysis

Table 1: Actual and Estimated GHG Emissions for Alberta (Megatonnes of CO_2 equivalent)

Year and Considered Policy/ Economic Expectations	Reported Results			Forecasted Results							
	2010	2012	2014	2016	2018	2020	2022	2024	2026	2028	2030
2014 Government of Canada Emissions Trends	241	260	274	277	282	287	297	306	312	315	317
2017 Economic Trends and Federal Climate Policies, 2014 Alberta Climate Policies (No CLP)	241	260	274	274	285	286	289	296	296	297	293
2017 Policy and Economic Expectations (with CLP)*	241	260	274	273	267	270	264	256	255	255	254
2017 Policy and Economic Expectations (with CLP)* plus Potential Reductions from Innovation	241	260	274	273	267	268	256	243	235	229	222

* Includes Alberta's Climate Leadership Plan and federal climate policies.

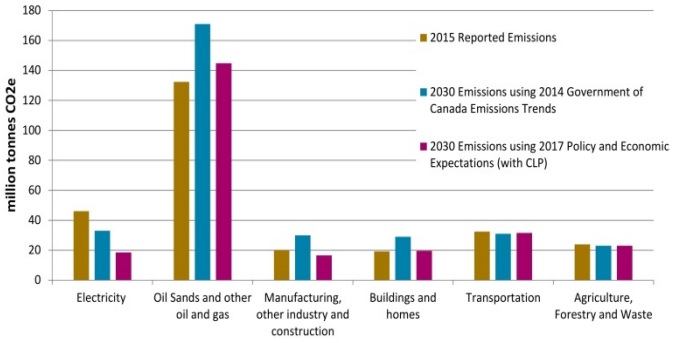
The downward trend in emissions is forecasted to continue with the expected decreases in the oil and gas sector's methane emissions and electricity sector emissions. These decreases are expected to be complemented by large industrial facilities' investment decisions in response to the incentive structure created by carbon competitiveness incentives, rising carbon prices up to $50 in 2022 (based on the rate identified in the Pan-Canadian Framework on Clean Growth and Climate Change) and the expiry of the carbon levy exemption for upstream oil and gas. Further reductions from building improvements in the residential, commercial and institutional sector and in transportation are expected to occur as a result of the carbon levy and program incentives. GHG emissions can be further reduced through the impact of clean technology investments, represented as a dotted line.

GHG EMISSIONS BY SECTOR

Alberta's GHG emissions reflect the structure of our economy. A substantial share of our emissions is from oil and gas and other large industrial sources. Changing Alberta's emissions path requires strategies aimed at these sectors, while recognizing that they compete in international markets and are therefore trade-exposed.

Figure 2 compares Alberta's emissions by sector for 2015 to projected 2030 emissions under Canada's Emissions Trends 2014, along with the current forecast considering today's economic outlook and the expected impacts of the CLP (pink bars). The difference between the heights of the blue and pink bars reflects a combination of the decrease due to changed economic growth, impacts of federal policies and the projected GHG emissions reductions from the CLP. The potential emissions reductions from research and innovation (not shown in Figure 2) would further reduce the height of the pink bars. Ongoing monitoring and reporting of results will inform how closely we are moving towards these forecasted reductions.

Figure 2. Alberta's Annual Emissions by Sector – Comparison of 2015 Actuals to 2030 Forecasts



* Includes Alberta's Climate Leadership Plan and federal climate policies.

Data source: Environment and Climate Change Canada - National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada; Environment Canada – Emissions Trends 2014; ACCO Internal Analysis

Table 2: Alberta's Annual GHG Emissions by Sector – Comparison of 2015 Actuals to 2030 Forecasts (Megatonnes of CO_2 equivalent)

Sector	2015 Reported Emissions	2030 Forecasted Emissions	
		2014 Government of Canada Emissions Trend	2017 Policy and Economic Expectations (with CLP)
Electricity	46	33	19
Oil Sands and Other Oil and Gas	132	171	145
Manufacturing, Other Industry and Construction	20	30	17
Buildings and Homes	19	29	20
Transportation	32	31	32
Agriculture, Forestry and Waste	24	23	23
Total Provincial Emissions	274	317	254

ADDITIONAL BENEFITS

Although the CLP's primary outcome is reduced GHG emissions, its strategies also generate additional benefits. For example, by investing in and incenting the development of clean technology and fostering the growth of an energy efficiency industry, the CLP contributes to a more diversified lower carbon economy. Likewise, phasing out coal emissions reduces pollutants and contributes to improved air quality and associated health benefits. In the following sections, results associated with all three of these ultimate outcomes are reported on.

ACTION AREAS

There are six action areas where Alberta will focus its efforts over the next few years. The Action Areas section provides the following information for each area (with the exception of Skills and Employment in Green Sectors).

OBJECTIVES AND TARGETS

'Objectives and Targets' describes specific objectives that further define each action area and identifies any associated CLP targets most directly attributable to the action area.

STRATEGIC INVESTMENTS

Strategic Investments identifies the 2016-17 fiscal year expenditures allotted to help achieve the relevant action area. The estimated impacts of this investment on supported jobs for 2016-17 and cumulative GHG emissions reductions to 2020 are also provided. This illustrates how carbon levy revenue is being invested to support the achievement of the CLP. The methodology for the calculated estimates is included in the Appendix.

PROGRESS SUMMARY

Progress Summary provides the suite of measures/indicators/information that helps monitor progress towards achieving the action areas. Where available, the progress summary identifies the CLP baseline, the current result, the target or desired result, the trend and status. Targets include only those CLP-specified targets. Trends are calculated using the reported historical and actual data for each associated measure. Status is calculated using linear projections to the target year and comparing the projected result against target, except where there is a known target profile that is non-linear (for example, legislated requirements). Where historical data are not available, year-over-year change is used.

PROGRESS DETAIL

For each of the measures/indicators/information included in the Progress Summary, the Progress Detail includes:

- A description of the measure/indicator including methodology and data source.
- The importance and significance of each measure/indicator.
- The associated target or desired result. Targets are the four identified CLP commitments. Desired results reflect positive performance and in some cases may refer to a milestone.
- A description of progress.

PROGRAM RESULTS

Programs contributing to the action areas are identified as primary, supporting or additional. Primary contributors are those programs included in the particular strategic investments. Program milestones, 2016-17 investments, next steps and estimated cumulative GHG emissions reductions are provided for the programs within the relevant action area.

POLICY AND LEGISLATION

OBJECTIVES AND TARGETS

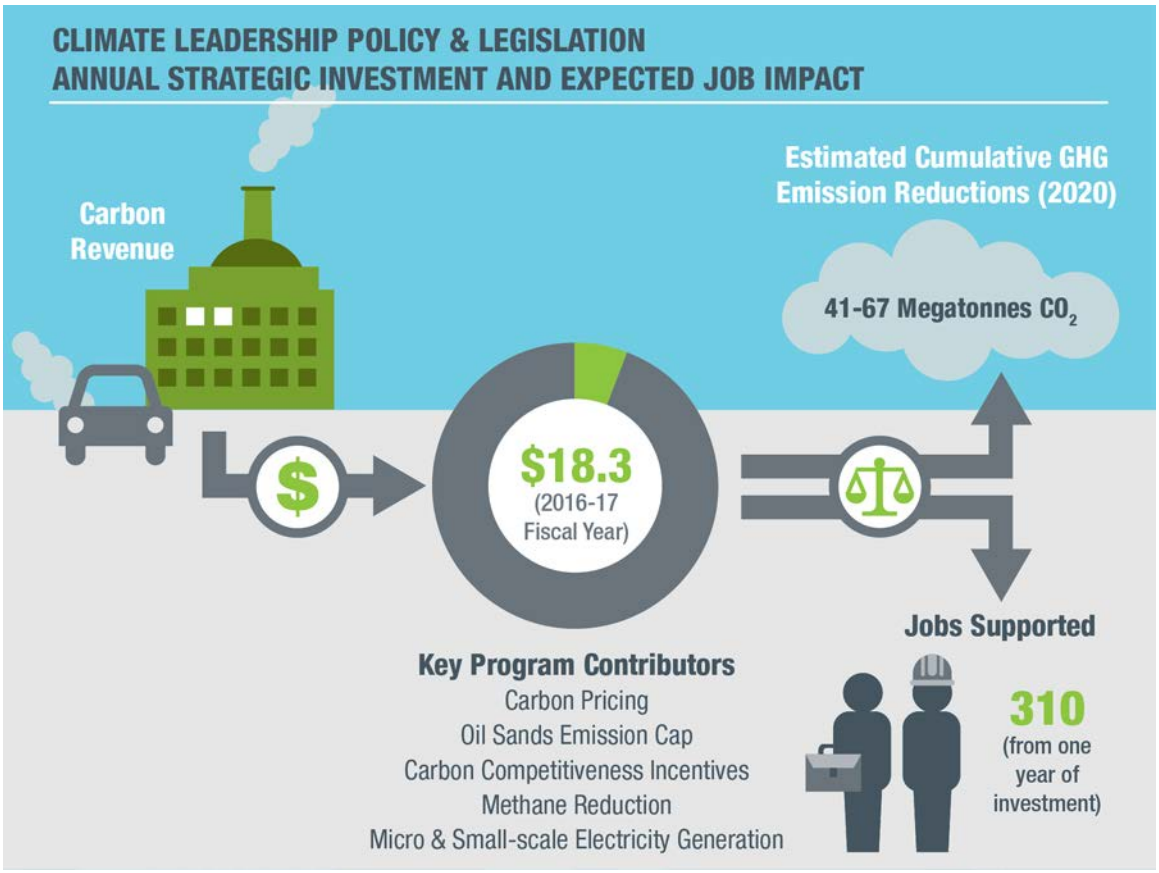
Climate policy and legislation are the Government of Alberta's key tools to both encourage behavior change and enable the delivery of programs designed to reduce GHG emissions. As a jurisdiction rich in fossil fuels, and an energy sector that plays such a large role in our economy, Alberta must demonstrate leadership in addressing climate change, while recognizing the significance of the implications of climate policies. Strengthened climate leadership policy and legislation focus on the following objectives and targets:

- **Incent and enable emissions reductions in a consistent, integrated and predictable approach.**
  - Policy suite includes carbon pricing, oil sands emissions limit, methane emissions target and complementary legislation.
- **Reduce greenhouse gas emissions** in Alberta and specifically from regulated sectors while maintaining competitiveness.
  - Target: **45 per cent reduction in methane emissions from oil and gas operations by 2025** (from 2014 levels).
  - Target: **Limit oil sands emissions to less than 100 Mt in any year.**
- **Ensure a collaborative approach to the design and application of policy and legislation.**
  - Regulatory alignment with the federal government.
  - Industry and other regulated sectors and groups understand and comply with regulations.

The CLP takes action to mitigate climate change by reducing GHG emissions. We also recognize that there are real-time effects of climate change being experienced by Albertans. The government is currently working with partners to build an adaptation strategy that focuses on resiliency and preparing for the impacts of climate change.

STRATEGIC INVESTMENTS

$18.3 million was invested in 2016-17 towards achieving this action area. This investment supports the delivery of carbon pricing, methane reduction, carbon competitiveness incentives and the oil sands emissions cap. It is estimated that this investment supported approximately 310 jobs and will result in a range of 41 to 67 Mt of cumulative emission reductions by 2020.



PROGRESS SUMMARY

The following suite of measures, indicators and information helps monitor progress towards achieving strengthened climate leadership policy and legislation.

Performance Measures/Indicators	Baseline (2015)	Result (2016)	Target/ Desired Result	6-Year Trend	Status
1. Incent and Enable Emissions Reductions					
1.1 Priced Greenhouse Gas Emissions *(% of priced provincial CO_2 equivalent emissions*)	45	45*	70 (2018)	▲	●
1.2 Schedule of Carbon Price over Time	Table 1.2 Carbon Price Over Time				
1.3 Complementary Climate Change Legislation	Table 1.3 Complementary Climate Change Legislation				
2. Reduce Greenhouse Gas Emissions while Maintaining Competitiveness					
2.1 Commercial and Residential Greenhouse Gas Emissions (*Mt of CO_2 equivalent emissions from carbon-priced sectors excluding large industry and exempted sectors*)	54.5	Available April 2018	Decreasing trend	▲ (5 year)	TBD
2.2 Large Industry Emissions *(Mt of CO_2 equivalent emissions from oil and gas, electricity and heavy industry sectors*)	195.8	Available April 2018	Decreasing trend	▲ (5 year)	TBD
2.3 Methane Emissions Reductions *(% of methane emission reductions achieved by Alberta upstream oil and gas sector as compared to 2014 levels*) (in development)	TBD	TBD	45 (2025)	TBD	TBD
2.4 Oil Sands Emissions (*Mt of annual CO_2 equivalent emissions as outlined under the Oil Sands Emissions Limit Act*) (in development)	TBD	TBD	< 100	TBD	TBD
3. Ensure Collaborative Approach					
3.1 Alberta's Participation in Pan-Canadian Framework on Clean Growth and Climate Change	3.1 Narrative Results				
3.2 Climate Change Regulatory Compliance Rate *(% of regulatees that meet compliance requirements - common metric across all climate regulations*) (in development)	TBD	TBD	TBD	TBD	TBD

* Estimated result due to lag in data availability, actual result available April, 2018.

▲ Positive upward trend ▼ Positive downward trend ▲ Negative upward trend ▼ Negative downward trend
● Projected to meet or surpass target ● Projected to be near target ● Projected to be off target – Steady trend

PROGRESS DETAIL

1.1 PRICED GREENHOUSE GAS EMISSIONS

Description

Priced Greenhouse Gas Emissions measures progress toward pricing a broader range of provincial GHG emissions through legislation and regulations. It compares, as a percentage, the tonnes of provincial CO_2 equivalent emissions that are covered by a carbon price to the total tonnes of provincial CO_2 equivalent emissions.

Priced emissions include economy-wide emissions from the combustion of transportation and heating fuels (excluding certain fuels such as marked gas and diesel used on farms), as well as priced emissions of large industrial facilities (those emitting over 100,000 tonnes per year). For economy-wide priced emissions, total carbon levy revenue from combustion fuel pricing is divided by the carbon levy price per tonne.

Total tonnes of provincial CO_2 equivalent emissions includes emissions from agriculture, energy, industrial processes, solvent and other product use and waste source categories, but excludes those from biomass combustion, land use, land-use change and forestry. Data are from the Government of Canada's National Inventory Report, Greenhouse Gas Sources and Sinks in Canada 1990-2015 Part 3.

Importance

A price on carbon provides a market-based incentive for families, businesses and communities to lower their emissions. Carbon pricing systems are broadly understood to be effective and efficient means of reducing emissions. Pricing coverage is important as it reflects the breadth of the incentive and reductions that will be pursued. Incenting behavior changes through a carbon price ultimately contributes toward achieving reduced GHG emissions in Alberta. Environmental and ecosystem health and integrity are impacted by GHG emissions, as they are major contributors to climate change.

Target/Desired Result

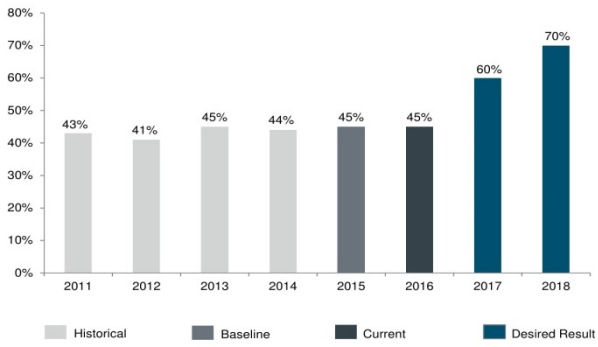
60 per cent by 2017 and 70 per cent by 2018.

Progress

Results from 2011 through 2016 indicate that Alberta has applied a carbon price to approximately 45 per cent of its total emissions.

This reflects results from the Specified Gas Emitters Regulation (SGER), which has implemented a price on emissions from large industrial emitters since 2007. The desired results of 60 per cent for 2017 and 70 per cent for 2018 reflect the carbon levy implemented on January 1, 2017, which broadens the carbon price to include emissions from the combustion of transportation and heating fuels. The approach to pricing of large industrial emitters will transition from a facility-specific one under SGER to an output- or product-based approach in 2018. This new framework sends a stronger emissions reduction signal to new and existing facilities and ensures Alberta and our industries thrive in a carbon competitive global market.

Figure PL 1.1: Priced Greenhouse Gas Emissions (% of priced provincial CO_2 equivalent emissions)



2016 result is estimated as there is a two-year lag in data from Environment and Climate Change Canada.

Data sources: Environment and Climate Change Canada - National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada; Alberta Treasury Board and Finance - Carbon Levy Data – ; Alberta Environment and Parks - Large Final Emitters data

The 2017 desired result is slightly lower than 2018, as 2018 introduces carbon pricing to industrial process emissions for industry.

1.2 CARBON PRICE OVER TIME

A carbon price is the amount charged for emitting one tonne of carbon dioxide into the atmosphere. Alberta has had a price on large industrial emissions since 2007. The CLP broadened this to an economy-wide price in 2017, as it is considered the most market-friendly and cost-effective way to reduce GHG emissions that cause climate change.

Table PL 1.2 Alberta's Carbon Price over Time illustrates how the incentive to reduce greenhouse gas emissions has broadened and increased over time.

Table PL 1.2: Alberta's Carbon Price over Time

Year	Regulation	Price (per tonne of CO_2 equivalent)	Applied to
2007	Specified Gas Emitters Regulation	$15	Larger final emitters
2016	Specified Gas Emitters Regulation	$20	Large final emitters
2017	Specified Gas Emitters Regulation	$30	Large final emitters
	Carbon Levy	$20	Economy-wide (excluding large final emitters)
2018 to 2020	Carbon Competitiveness Incentive Regulation	$30	Larger final emitters
	Carbon Levy	$30*	Economy-wide (excluding large final emitters)

* The price beyond 2020 will depend on the impact of the federal government's Pan-Canadian Framework on Clean Growth and Climate Change, which refers to a nationwide carbon price of $40 in 2021 and $50 in 2022.

1.3 COMPLEMENTARY CLIMATE CHANGE LEGISLATION

The CLP has an extensive suite of initiatives and policy that requires legislation in order to ensure that the initiatives can be implemented. For example, the CLP includes a target to increase renewable electricity sources to 30 per cent. One of the initiatives to achieve this target is to expand community and small-scale generation, which requires legislative changes. Table PL 1.3 identifies the statutes and regulations put in place to support the CLP in 2016 and early 2017.

Table PL 1.3: Complementary Climate Change Legislation

Statute/Regulation	What it Enables	Implementation Date
Climate Leadership Act and Climate Leadership Regulation	Carbon levy and approved exemptions, rebates, and refunds.	January 1, 2017
Alberta Personal Income Tax Act (Amendment)	The Alberta Climate Leadership Adjustment Rebates for lower and middle-income Albertans.	January 1, 2017
Alberta Corporate Tax Act (Amendment)	Small business corporate income tax rate reduction.	January 1, 2017
Micro-generation Regulation (Amendment)	Micro-generation up to 5 MW and Site Aggregation.	December 14, 2016
Energy Efficiency Alberta Act	New organization to support energy efficiency, energy conservation, micro-generation, and small-scale energy systems through education, outreach programs, and the development of an energy efficiency services industry.	October 27, 2016
Oil Sands Emissions Limit Act	Limit oil sands emissions to a maximum of 100 Mt in any year with provisions for cogeneration and new upgrading capacity.	December 14, 2016
Renewable Electricity Act and amendments to*:* • *Alberta Utilities Act* • *Electric Utilities Act* • *Environmental Protection and Enhancement Act* • *Hydro and Electric Energy Act*	• Renewable electricity target of 30 per cent of electricity from renewable energy sources by 2030. • Renewable Electricity Program.	March 31, 2017
Specified Gas Emitters Regulation (Amendment)	Option for facilities facing high carbon costs and vulnerability to competitive market conditions to “opt-in” to the Regulation (and no longer be subject to the carbon levy) in 2017.	March 30, 2017

In addition to the legislation that has already been implemented to support the CLP (Table PL 1.3), a number of other legislative initiatives are underway:

Carbon Competitiveness Incentives (CCIs) – Develop a regulation to transition from the existing facility-based approach in the Specified Gas Emitters Regulation to an output- or product-based approach that rewards facilities with best-in-sector performance, encourages innovation, and maintains industry competitiveness in a low-carbon global economy.

Methane Reduction – Develop and enhance regulatory standards for leak detection and repair, monitoring and reporting of methane emissions and requirements for new and existing facilities. This is necessary in order to implement government's commitment to reduce methane emissions from the oil and gas sector by 45 per cent from 2014 levels by 2025.

Coal Transition – Enshrine in law the government's commitment to phase out emissions from coal-fired electricity generation by 2030 and strengthen the commitments government and coal companies made in the Off-Coal Agreements.

Small-Scale Community Generation and Distributed and Renewable Generation – Develop a new regulation to enable forms of distributed alternative and renewable generation to encourage growth in small-scale community generation.

Oil Sands Emissions Limit – Develop a regulation to implement the 100 Mt oil sands limit with provisions for cogeneration and new upgrading capacity. The Oil Sands Advisory Group's advice to government on implementation of the limit was released to the public on June 16, 2017 and is being considered in the development of policy and regulation.

2.1 COMMERCIAL AND RESIDENTIAL GREENHOUSE GASES

Description

Commercial and Residential Greenhouse Gas Emissions measures the total megatonnes of CO_2 equivalent emissions from those sectors which use transportation and heating fuels and therefore pay the carbon levy. The measure excludes large industrial sector emissions and those sectors that are excluded from the carbon levy such as agriculture. It subtracts emissions from the large industry sector and exempted sectors from Alberta's total GHG emissions. Data are from the Government of Canada's National Inventory Report, Greenhouse Gas Sources and Sinks in Canada 1990-2015 Part 3. 2016 results are not available until April 2018 as there is a two-year reporting delay.

Importance

The CLP broadens and increases the financial incentive to reduce greenhouse gas emissions. In 2017 the carbon price was expanded beyond large industrial facilities through the application of the carbon levy on the combustion of transportation and heating fuels. Commercial and Residential Greenhouse Gas Emissions helps monitor whether the financial incentive to change behavior in these sectors is achieving its intended effect.

Target/Desired Result

Decreasing trend.

Progress

Although 2015 results in Figure PL 2.1 show a decrease of 3 Mt from 2014, likely due to the economic downturn, there is an increasing trend over five years. Emissions are expected to decrease more consistently beginning in 2017 as these sectors respond to the carbon price. When factoring in economic growth within the sectors included in this indicator, results are generally consistent over the five-year period. Figure PL 2.1.1 illustrates the emissions intensity of the residential and commercial sectors. The emissions intensity divides the emissions in CO_2 equivalent tonnes by gross domestic product (calculated in real price to adjust for inflation) for these sectors.

Figure PL 2.1: Commercial and Residential Greenhouse Gas Emissions (Megatonnes of CO_2 equivalent emissions from carbon-priced sectors excluding large industry and exempted sectors)

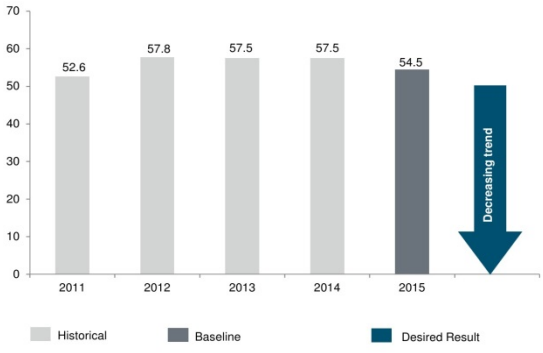
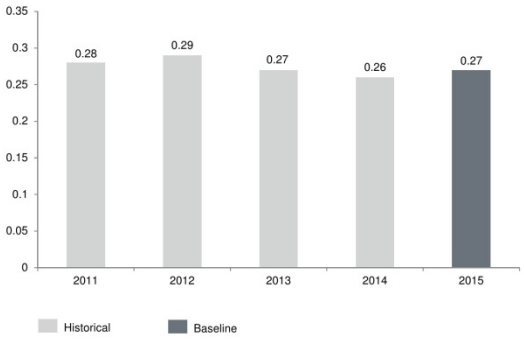


Figure PL 2.1.1: Commercial and Residential Greenhouse Gas Emissions Intensity (tonnes CO_2 equivalent/$1000)



Data sources: Environment and Climate Change Canada - National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada; Statistics Canada CANSIM Table 379-0030

2.2 LARGE INDUSTRY EMISSIONS

Description

Large Industry Emissions measures the total tonnes of CO_2 equivalent emissions from the oil and gas, electricity and heavy industry sectors, proportionally Alberta's highest emitting sectors. The heavy industry sector includes mining, pulp and paper, chemicals and fertilizers. Data are from the Government of Canada's National Inventory Report, Greenhouse Gas Sources and Sinks in Canada 1990-2015 Part 3. Data for 2016 are not available until April 2018 as there is a two-year reporting delay.

Importance

This indicator illustrates the trend in the amount of GHG released into the atmosphere in Alberta by Alberta's most emissions-intensive industries. Ultimately efforts to reduce emissions from these sectors have the most significant impact on Alberta's overall emissions. Tracking this indicator helps to determine how the industrial emissions pathway is being altered as a result of CLP policy and legislation, and in particular, the pricing of carbon from large industrial emitters.

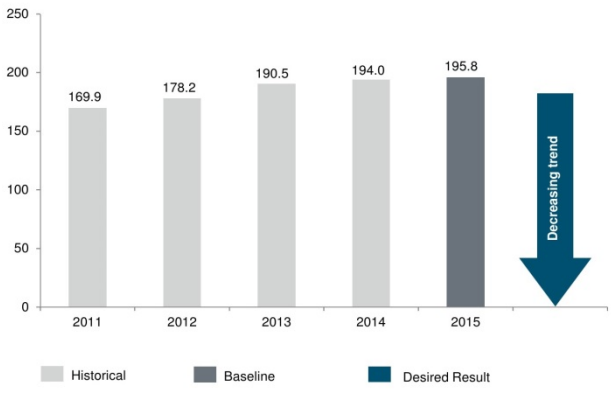
Target/Desired Result

Decreasing trend.

Progress

Results for 2015 show an increase in emissions of 1.8 Mt of CO_2 equivalents from 2014 results, reported at 195.8 Mt of CO_2 equivalents (Figure PL 2.2). The five-year trend for this indicator continues to reflect a general increase in emissions; however the pace of emissions growth decreased from 2013 to 2015 as compared to 2011 through 2013.

Figure PL 2.2: Large Industry Emissions (Megatonnes of CO_2 equivalent emissions from oil and gas, electricity and heavy industry sectors)



Data source: Environment and Climate Change Canada - National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada

It is likely that the economic slowdown in Alberta impacted this result and is not a result of the CLP, the impacts of which will not begin to be realized until the 2016 reporting year at the earliest. Changes in these sectors to less emissions-intensive processes, such as clean technology, will not be apparent in this indicator as emissions may increase as a result of production increases. For this reason, drilldown information on the emissions-intensity of these sectors is provided on Figures PL 2.2.1 through 2.2.3.

Figure PL 2.2.1: Oil and Gas Emissions Intensity (tonne/$1000)

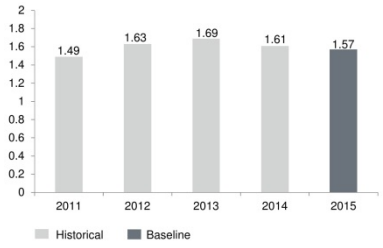


Figure PL 2.2.2: Electricity Emissions Intensity (tonne/$1000)

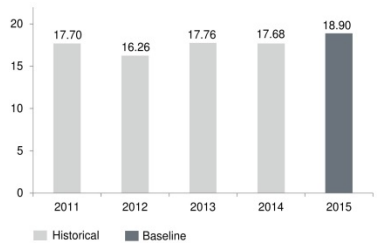
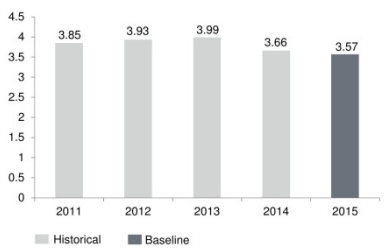


Figure PL 2.2.3: Heavy Industry Emissions Intensity (tonne/$1000)



Data source: Environment and Climate Change Canada - National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada; Statistics Canada CANSIM Table 379-0030

2.3 METHANE EMISSIONS REDUCTIONS

Measure/Methodology in Development

Alberta is targeting a 45 per cent reduction in methane emissions from upstream oil and gas operations (excluding oil sands mining) by 2025 from 2014 levels. This is one of the key strategies identified under the CLP as a cost-effective means to achieve significant GHG emissions reductions.

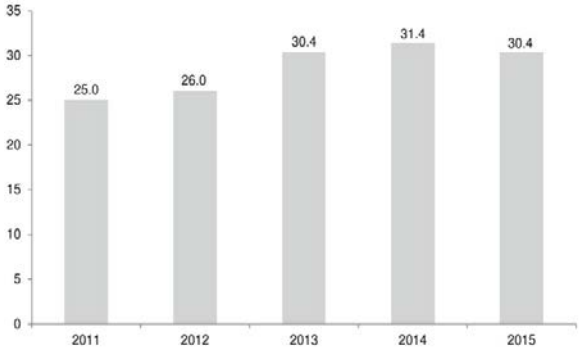
Methane is one of the most potent of the greenhouse gases, with a climate change impact 25 times greater than carbon dioxide over a 100-year period. In Alberta, the oil and gas industry is the largest source of methane emissions, accounting for over 70 per cent of provincial methane emissions and 25 per cent of all emissions from the upstream oil and gas sector.

Methane Emissions Reductions will measure the per cent reductions of methane emissions from Alberta's upstream oil and gas industry (excluding oil sands mining) as compared to the 2014 baseline year. One of the challenges in addressing methane emissions is the lack of quality data and information. A necessary step to achieve the methane target is the implementation of a new reporting system along with proposed requirements for metering, emissions testing and emissions factors to allow for better quality methane emissions data. A more effective monitoring system will also better inform approaches to capture emissions.

Data for Methane Emissions Reductions will be provided by the new measurement, monitoring and reporting system that will capture methane emission data from upstream oil and gas facilities. Figure PL 2.3 provides methane emission estimates from Canada's National Inventory Report on Greenhouse Gases and Sinks. As Alberta develops and implements methodologies to monitor and report on emissions, these numbers will change and therefore will not be the source data used for this measure during execution.

Based on the latest data that have yet to be published in the National Inventory Report, Alberta may have more opportunity to reduce methane emissions to meet its target.

Figure PL 2.3: Methane Emissions from Upstream Oil & Gas industry (Megatonnes of CO_2 equivalent)



Data source: Environment and Climate Change Canada - National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada

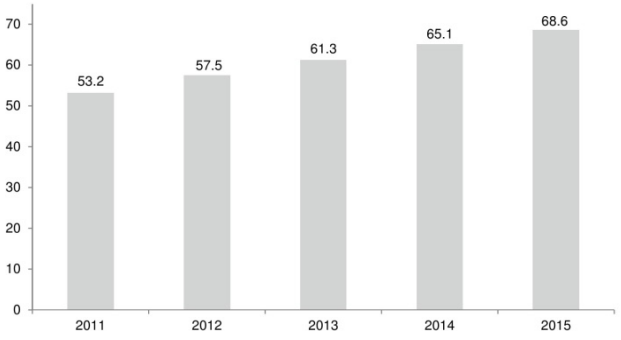
Alberta will achieve the 2025 target using the following approaches:

- Applying new emission reduction requirements on Alberta facilities.
- Improving measurement and reporting of methane emissions.
- Developing new leak detection and repair requirements.
- Phasing in the implementation of regulatory measures on new and existing facilities between 2018 and 2023, with a mandatory regulatory review by 2022 based on actual data collected during the first few years, to ensure optimization and efficiency in any regulatory measures going forward.

2.4 OIL SANDS EMISSIONS

The oil sands sector accounts for roughly one-quarter of Alberta's annual emissions, emitting 68.6 Mt in 2015. Passed in December 2016, the *Oil Sands Emissions Limit Act* established a first-ever cap on oil sands emissions in response to joint recommendations by Canadian and international leaders in Alberta's oil sands industry and environmental organizations. A cap increases the incentive to drive technological progress while ensuring Alberta's operators have the necessary time to develop and implement new technology to reduce the carbon output per barrel, helping drive reductions in Alberta's overall emissions trajectory.

Figure PL 2.4: Oil Sands Emissions (Megatonnes of CO_2 equivalent)



Data source: Environment and Climate Change Canada - National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada

Oil Sands Emissions will track Alberta's emissions under the 100 Mt cap. The methodology for this measure will be developed according to policy decisions under the *Oil Sands Emissions Limit Act.*

In 2016, the government established an Oil Sands Advisory Group composed of members from industry, regulators, environmental organizations, Indigenous, Métis and non-Indigenous communities to provide recommendations on the implementation of the 100 Mt limit, which will inform policy recommendations.

Figure PL 2.4 provides oil sands emissions from Environment and Climate Change Canada's 1990-2015 National Inventory Report. Results for the Oil Sands Emissions measure will differ based on policy decisions regarding any exclusions under the *Oil Sands Emissions Limit Act*.

3.1 ALBERTA'S PARTICIPATION IN PAN-CANADIAN FRAMEWORK ON CLEAN GROWTH AND CLIMATE CHANGE

In 2016, the Government of Canada ratified its commitments in the Paris Agreement, which features a commitment to reduce emissions by 30 per cent from 2005 levels by 2030. Accordingly, Canada must reduce its emissions from approximately 730 Mt in 2015 to 523 Mt in a little over a decade.

The federal government has announced that provinces must enact an emissions reduction plan, or Ottawa will impose a federal carbon tax in 2018 on provinces without. Fortunately, the CLP ensures our unique economy will be covered by an Alberta-first strategy designed specifically for us.

In 2016, Alberta actively engaged with the federal government to ensure our voice was heard in the development of the national strategy on climate change. The Pan-Canadian Framework on Clean Growth and Climate Change, released in early 2017, identifies the CLP as a key accomplishment in reaching national emission goals, and also notes some of Alberta's specific actions to reduce GHGs.

Alberta will continue to advocate for its own unique circumstances and is committed to continued climate leadership on the national as well as international stage.

3.2 CLIMATE CHANGE REGULATORY COMPLIANCE RATE

As CLP legislation and regulations are implemented, it's critical stakeholders understand and comply with them. A common measure of regulatory compliance across all climate regulations is in development as regulations are defined and implemented.

Methodology and interim results will be reported in future CLP Progress Reports.

POLICY RESULTS

Policy Initiatives	2016-17 Milestones/Results	2017-18 Actions/Next Steps
Carbon Pricing	Implemented legislation to enable carbon levy, carbon levy rebates to low- and middle-income households and small business tax cuts (2017). • *Climate Leadership Act*. • Climate Leadership Regulation. • *Alberta Personal Income Tax Act* (Amendment). • *Alberta Corporate Tax Act* (Amendment).	Ongoing monitoring and assessment of policy and legislation impact.
Oil Sands Emission Cap	Established Oil Sands Advisory Group (2016) with members from industry, environmental nongovernmental organizations, Indigenous and non-Indigenous communities. Legislated oil sands emissions limit of a maximum 100 Mt in any year (2016). Received Oil Sands Advisory Group Recommendations Report on implementation of the oil sands emissions limit (2017).	Expert workshops and plenary sessions to identify and develop policy options reflective of recommendations.
Carbon Competitiveness Incentive system (CCIs)	Held three rounds of technical workshops with industry groups on the design and thresholds for new CCI approach (2016, 2017). Engaged third-party technical experts and completed competitiveness assessment in collaboration with stakeholders and Alberta Climate Change Office staff (2016, 2017). Developed policy options for implementation of CCIs (2017). Engagement on CCI benchmarks.	Replacing Specified Gas Emitters Regulation with Carbon Competitiveness Incentive Regulation on January 1, 2018. Implementation of Carbon Competitiveness Incentive approach.
Methane Reduction	Announced methane emissions target of 45 per cent reduction in the upstream oil and gas sector by 2025 from 2014 levels (2016). Alberta Energy Regulator established Methane Reduction Oversight Committee (MROC) to develop recommendations and options to inform cost-effective regulations for new and existing facilities in the oil and gas sector. Members are from government, environmental nongovernment organizations, industry and technology groups (2016). MROC created two technical committees to provide technical support.	Engage stakeholders on draft requirements through AER's public feedback process. Revise and release directives by summer of 2018 for phase in between 2019 and 2023. Ongoing work on methane strategy including enhancements to existing directives, studies in partnership with other

	Initiated Methane Early Action Information Scan including engagement with stakeholders to identify barriers and opportunities for early action on oil and gas methane reductions (2017 and ongoing). Drafted methane reduction Alberta Energy Regulator directives. Discussed with MROC and technical committees for comment and advice (2017). Draft requirements finalized and being discussed within the AER and Alberta Energy. Released Quantification Program for Greenhouse Gas Emissions Reductions from Pneumatic Devices (offset protocol for replacement of high-bleed pneumatic instruments with low- or no-bleed devices) in January 2017. Engaging with Environment and Climate Change Canada on federal methane direction to inform and advocate Alberta's regulatory development (2016, 2017 and ongoing).	organizations, economic modelling to assess regulatory impacts, updates to the ST60B report and work in the following areas: • Fugitive emissions. • Measurement, monitoring and reporting. • Regulations for existing facilities. • Regulations for new facilities. Ongoing engagement with Environment and Climate Change Canada.
Micro and Community Energy Generation	Implemented Micro-generation Amendment Regulation (2016) increasing the size limit to 5 megawatts, allowing servicing to adjacent sites and providing for more flexibility and greater variety of configurations. Launched Community Distribution Generation White Paper (2017). Initiated online survey for stakeholders on Community Distributed Generation (2017).	Community Generation Regulation to be developed and implemented by 2018. (Micro- and small-scale generation programs are reported on in Increased Renewable Energy Section).

RENEWABLE ENERGY

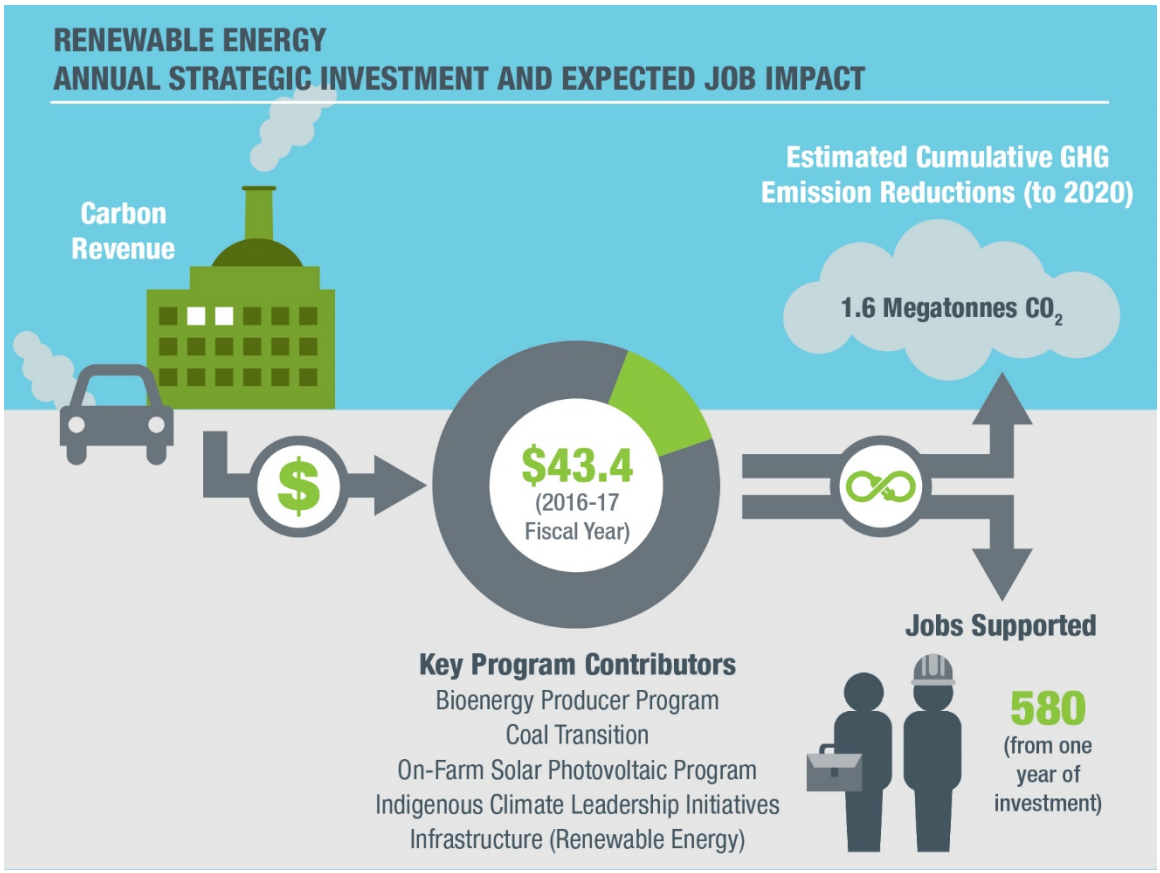
OBJECTIVES AND TARGETS

Alberta is committed to increasing renewable energy sources to transition to a cleaner electricity system that eliminates pollution from coal-fired electricity generation. Renewable energy programs, policies and investments are designed to achieve the following results:

- **Transition electricity** to a cleaner electricity system.
  - *Target:* **30 per cent electricity generated from renewable sources by 2030.**
- **Reduce greenhouse gas emissions** through electricity transition.
  - *Target:* **Zero emissions from coal-fired electricity generation by 2030.**
- Maintain **a reliable, cost-effective electricity system.**

STRATEGIC INVESTMENTS

$43.4 million was invested in 2016-17 towards achieving this action area. This investment supports the delivery of renewable energy programs, including the Bioenergy Producer Program, Alberta Indigenous Solar Program, infrastructure projects and the coal phase-out. It is estimated that this investment supported approximately 580 jobs and will cut 1.6 Mt of cumulative GHG emissions by 2020.



PROGRESS SUMMARY

The following suite of measures, indicators and information helps monitor progress towards generating more renewable energy.

Performance Measures/Indicators	Baseline (2015)	Result (2016)	Target/ Desired Result	6 Year Trend	Status
1. Electricity Transition					
1.1 Renewable Electricity Generation *(% of electricity generated from renewable sources)*	9.45*	9.97*	30 (2030)	▲	●
2. Greenhouse Gas Emissions					
2.1 Coal-fired Generation Emissions (*Megatonnes of CO_2 equivalent emissions*)	40.74	39.84	0 (2030)	▲	●**
2.2 Alberta's Electricity System Emissions Intensity (*grams of CO_2 equivalent emissions per kilowatt hour of electricity generated*)	790***	Available 2018	Decreasing trend	▲ (5 year)	TBD
2.3 Renewable Energy Emissions Reductions (*Mt of CO_2 equivalent emissions reduced or avoided by transitioning to renewable energy sources*)	9.10	9.89	Increasing trend	▲	●
3. Reliable, Affordable Electricity System					
3.1 Power Generation Margin (*difference in peak demand and firm generating capacity expressed as a percentage*)	31	29	Above 7	▲	●
3.2 Monthly Regulated Rate Option Electricity Rate (*cents per kilowatt hour*)	5.7	3.9	Max 6.8	▼	●

* A more comprehensive methodology is being developed and subsequent reported results will change accordingly.

** Based on signed and legally binding agreements in place.

*** Environment Canada has identified this as a preliminary result.

▲ Positive upward trend ▼ Positive downward trend ▲ Negative upward trend ▼ Negative downward trend

● Projected to meet or surpass target ● Projected to be near target ● Projected to be off target – Steady trend

PROGRESS DETAIL

1.1 RENEWABLE ELECTRICITY GENERATION

Description

Renewable Electricity Generation measures the total megawatt hours of electricity generated from renewable sources as a percentage of the total electricity generated over one-year. Renewable sources include hydro, wind, biogas, biomass, solar and geothermal. The share of renewable energy is determined from statistics from generators and distributors connected to the grid and which have a capacity of 500 kilowatts or more. These are collected and reported annually by the Alberta Utilities Commission (AUC). There is currently no methodology to collect data from systems that operate independently from the electricity grid. A more comprehensive methodology is being developed to capture off-grid generation and include facilities connected to the grid but using renewable sources for internal use (e.g. forestry facilities' internal use of biomass). The Alberta Electric System Operator reports on the number of micro-generation sites and installed capacity on a quarterly basis.

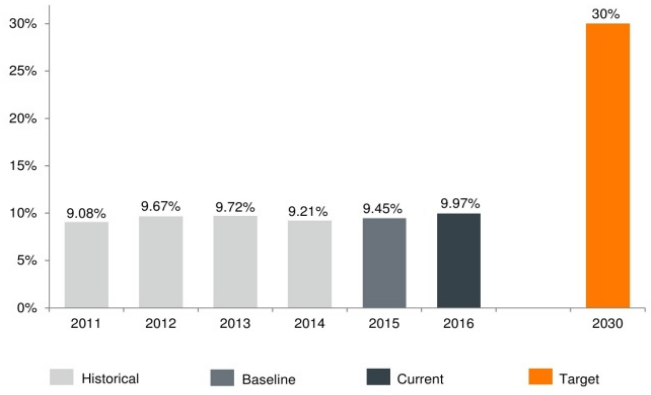
Importance

Moving to more renewable energy and natural gas and away from coal-fired electricity source is q key pillar of the CLP. Total life cycle GHG emissions from solar or wind power are about 20 times lower than coal-fired electricity (National Renewable Energy Laboratory, January 2013). Increasing renewable electricity generation lets Alberta reduce its GHG emissions.

Target/Desired Result

30 per cent by 2030.

Figure RE 1.1: Renewable Electricity Generation (% of electricity generated from renewable sources)



Data source: Alberta Utilities Commission

Progress

The 2011 through 2016 results show an upward trend in renewable electricity generation. This increase is primarily due to a steady increase in generation from wind sources, which increased by over 50 per cent from 2011 to 2016. It is expected that the pace of the upward trend will accelerate with the introduction of CLP initiatives

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Table RE 1.1 provides a breakdown of the measure results by each of the renewable sources.

Table RE 1.1: Percent of Electricity Generated from Renewable Sources

Resource	2011	2012	2013	2014	2015	2016
Wind	3.42%	3.62%	4.09%	4.32%	4.67%	5.24%
Hydro	2.88%	3.18%	2.67%	2.32%	2.14%	2.11%
Biogas/Biomass	2.79%	2.86%	2.96%	2.57%	2.63%	2.62%
Total	9.08%	9.67%	9.72%	9.21%	9.45%	9.97%

Renewable electricity generation results are expected to noticeably increase as key CLP initiatives roll out. In 2016-17, the Bioenergy Producer Program supported 1 million MWh of stable renewable electricity production within its first application period. As well, the first competition in Renewable Electricity Program will see companies bidding to provide up to 400 MW of renewable electricity which could be added to the grid by 2020. Energy Efficiency Alberta's Residential and Commercial Solar Program has pre-approved support to install 3.7 MW of solar electricity capacity as of August 31, 2017. Indigenous communities will see more opportunities to participate in the Alberta Indigenous Solar Program in late 2017, representing an expansion of the program pilot that supported the installation of 1.2 MW in 14 Indigenous communities.

2.1 COAL-FIRED GENERATION EMISSIONS

Description

Coal-Fired Generation Emissions measures the total GHG emissions in megatonnes of CO_2 equivalent from coal-fired power plants. It is a sum of the facility-measured direct, indirect, and industrial process emissions reported under Annual Specified Gas Emitters Regulation Compliance Reports.

Importance

Ending coal pollution is a key pillar of Alberta's CLP. Alberta produces more coal pollution than the rest of Canada combined. Coal plants are also a major source of air pollution, releasing pollutants like cadmium, lead, mercury, nitrogen oxides and sulphur dioxide. Eliminating emissions from coal-fired plants and transitioning to cleaner sources of energy will help protect Albertans' environment and health.

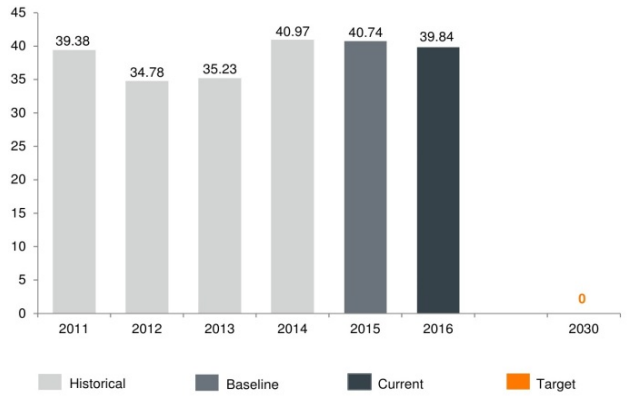
Target/Desired Result

Zero by 2030.

Progress

2016 saw two per cent lower emissions, the second straight year of decline. The trajectory towards zero emissions from coal-fired generation is not known as companies have until 2030 to decide when they will phase out coal. These coal generators are legally obliged to meet that deadline. Alberta Energy is working with the Government of Canada to develop enabling regulations for Alberta coal generators.

Figure RE 2.1: Coal-fired Generation Emissions (Megatonnes of CO_2 equivalent)



Data source: Annual SGER Compliance Reports (2011-2016)

2.2 ALBERTA'S ELECTRICITY SYSTEM EMISSIONS INTENSITY

Description

Alberta's Electricity System Emissions Intensity measures the total GHG emitted in grams of CO_2 equivalent for every kilowatt hour of electricity generated. Data are from Environment Canada's 2017 National Inventory Report, annexed data sets in Table A13-10 Electricity Generation and GHG Emission Details for Alberta[1]. GHG emissions include those directly related to electricity generation as well as on-site combustion of fuel. Results from 2016 results will not be available until 2018 due to an 18-month lag in data

Importance

One focus of the CLP is reducing emissions from the electricity sector. This indicator shows how GHG emissions are changing with a shift in the level of production. Although it does not show the total amount of GHGs released, the intensity will ideally decrease by enough to also reduce the system's total GHG emissions – even with increases in production.

Target/Desired Result

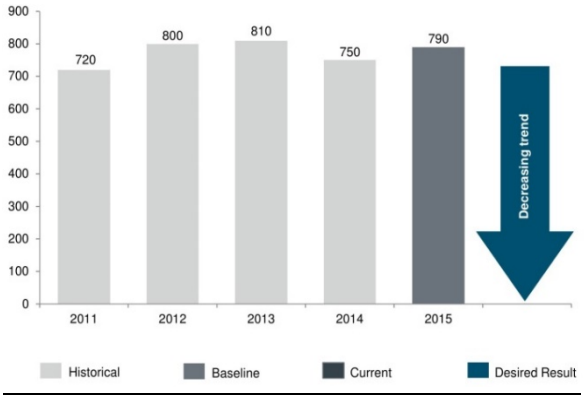
Decreasing trend.

[1] Statistics Canada defines "electricity system" emissions, generation and intensity as those facilities classified under North American Industry Classification System code 22111- Electric Power Generation.

Progress

Current emissions are down from their peak in 2013, and as CLP policies are implemented, emissions from coal-fired generation are phased out, renewable energy sources increase and cleaner technology is implemented, the trend will flatten and eventually decrease.

Figure RE 2.2: Alberta's Electricity System Emissions Intensity (grams of CO2 equivalent emissions per kilowatt hour of electricity generated)



Data source: Statistics Canada Report on Energy Supply-Demand in Canada: Catalogue No. 57-003-XIB; Environment Canada Data – National, Provincial and Territorial Greenhouse Gas Emission Tables: A-13 Electricity

2.3 RENEWABLE ENERGY EMISSIONS REDUCTIONS

Description

Renewable Energy Emissions Reductions measures the total GHG emissions reduced or avoided in megatonnes of CO_2 equivalent due to transitioning to renewable energy sources. It is the total of annual megawatt hours of electricity generation from hydro, wind, biogas and biomass resources multiplied by the emissions factor 0.59 tonnes/MWh. Generation data are from the Alberta Utilities Commission and the emissions factor, applicable to projects displacing grid-electricity with renewable energy, is extracted from the Carbon Offset Emissions Factor Handbook, Version1, ESRD Climate Change 2015, No.1. The calculation assumes the electricity generated by renewable resources would have otherwise been supplied through a mix of coal and natural gas-fired generation.

Importance

The intent of moving to 30 per cent of electricity generation from renewable sources is to reduce GHG emissions. This indicator tracks the impact of increasing renewable energy sources on Alberta's GHG emissions reductions.

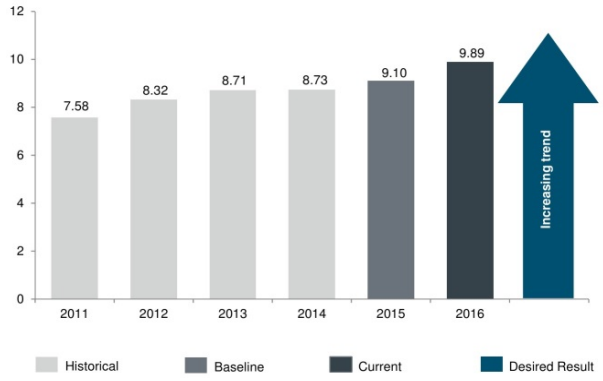
Target/Desired Result

Increasing trend.

Progress

Over the past five years, indicator results have been on an upward trajectory. These results are correlated to higher renewable electricity generation. As renewable energy sources increase, so will GHG emissions reductions. Continued emissions reductions are expected as programs to increase renewables generation are implemented.

Figure RE 2.3: Renewable Energy Emissions Reductions (Megatonnes of CO_2 equivalent reduced by transitioning to renewable energy sources)



Data source: Alberta Utilities Commission, Carbon Offset Emissions Factor Handbook

3.1 POWER GENERATION MARGIN

Description

Power Generation Margin measures the percentage megawatt difference between firm generating capacity and peak demand. The intent of the indicator is to show a sufficient difference, or margin, between firm electricity generating capacity and peak demand. In other words, ensuring demand will not exceed maximum supply. Peak demand is defined as the highest recorded hourly system demand in megawatts from October 1, 2016 to March 31, 2017 as recorded by the Alberta Electric System Operator. Electricity from all wind sources and those sources of hydro capacity that are not dispatchable (able to be turned on or off) on a consistent basis, are not counted as firm generating capacity and are excluded from the total installed generating capacity. The data source is the Alberta Utilities Commission and the Alberta Electric System Operator.

Importance

Alberta's economic prosperity and high standard of living rely on reliable and plentiful electricity. Maintaining a reliable and resilient electricity system, as measured by the power margin, is a key objective of every electric system around the world. As Alberta transitions its electricity system away from coal to renewable sources, it will be important to ensure that it remains reliable.

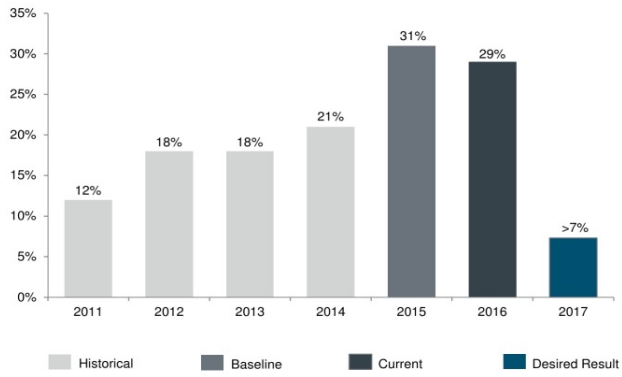
Target/Desired Result

Maintain a minimum seven per cent margin over peak demand. This desired result is a specific reliability requirement of the Western Electricity Coordinating Council, the regional entity responsible for coordinating system reliability in many Canadian, American and Mexican jurisdictions.

Progress

In 2016, Power Generation Margin surpassed the desired result, with a margin of 29 per cent. Softer growth in demand for electricity in 2016, due to lower economic growth, was the main external factor to achieving a high margin. The efforts of Energy Efficiency Alberta to reduce demand growth over time will also contribute to maintaining an adequate power generation margin in the province.

Figure RE 3.1: Power Generation Margin (the difference in peak demand and firm generating capacity expressed as a percentage)



Data source: Alberta Utilities Commission; Alberta Electric System Operator (AESO)

3.2 MONTHLY REGULATED RATE OPTION ELECTRICITY RATE

Description

Monthly Regulated Rate Option Electricity Rate measures monthly residential electricity costs in cents per kilowatt hour averaged across four electricity providers over the calendar year. Electricity providers are Direct Energy Regulated Services, ENMAX Energy, EPCOR Energy Services Edmonton and EPCOR Energy Services Fortis Alberta territory. The data source is the Alberta Utilities Commission's (AUC) Utility Sector Rates and Tariffs. 2016 results are preliminary, as the calculation assumes that approved values provided in AUC Monthly Energy Charges Approval documents dated March 2016 - July 2016 were the actual rate charged to consumers by electricity providers.

Importance

As Alberta transitions its electricity system to cleaner sources, it is important to monitor the impact on consumer electricity rates. The Government is committed to ensuring stable and affordable prices and has applied a price ceiling to protect consumers from price fluctuations from June 1, 2017 to May 31, 2021, during the shift from an energy-only market to a capacity power market. The price ceiling applies to those with a regulated rate option (RRO). If the RRO is below 6.8 cents, people pay the lower rate. If the RRO is higher, then carbon levy revenue will fund the difference

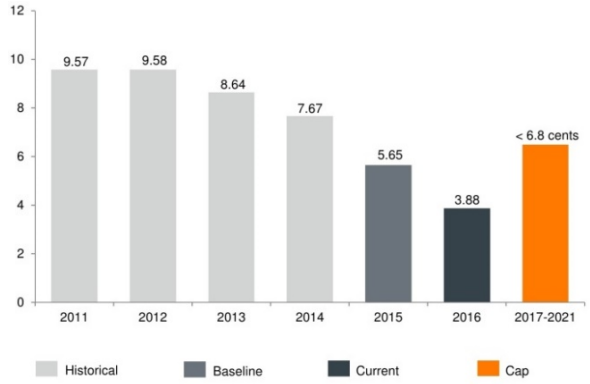
Target/Desired Result

Maximum of 6.8 cents for 2017 through 2021.

Progress

Albertan's Monthly Regulated Rate Option Electricity Rate has been on a downward trend over the last five years. Results from 2011 through 2014 are higher than the pricing cap that took effect in June 2017. In 2016, the rate decreased by 1.77 cents per kilowatt hour. The Government has not forecasted higher electricity rates but has applied a cap to ensure stable consumer prices as Alberta's electricity system transitions. Efforts of Energy Efficiency Alberta will also help reduce overall electricity costs for consumers over the long term.

Figure RE 3.2: Monthly Regulated Rate Option Electricity Rate (cents per kilowatt hour)



Data source: Alberta Utilities Commission monthly data – Residential Electricity Costs

RENEWABLE ENERGY PROGRAM CONTRIBUTORS

FUNDED IN 2016-17		
Primary	**Supporting**	**Additional**
• Coal Transition • Bioenergy Producer Program • Alberta Indigenous Solar Program • On-Farm Solar Photovoltaic Program • Renewable Energy Infrastructure Projects	• Residential and Commercial Solar Program • Emissions Reduction Alberta Grant	• Alberta Municipal Solar Program • Solar Technology Initiative

ANNOUNCED IN 2017-18 Preliminary 2017 – Includes programs announced as of August 31, 2017
Primary
• Renewable Electricity Program • Regulated Rate Option Price Ceiling • Alberta Indigenous Green Energy Development Program

PROGRAM HIGHLIGHTS

892,225 Watts — Solar electricity capacity installed on farms

14 — Indigenous community projects received Solar Program grants

1.1 Megatonnes — GHG emission reductions through Bioenergy Producer Program

400 MW — Renewable energy capacity issued for competitive auction (2017-18)

68 — Schools participating in Solar Technology Initiative

PROGRAM RESULTS

2016-17 Primary Contributors

Programs/Projects	2016-17		2017-18 Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
	Funding	Milestones		
Coal Transition This program supports companies adversely impacted by phasing out coal by 2030 that would be able to operate coal-fired facilties beyond 2030 were a phase-out not in place.	$1.1M	Coal facilitator appointed to lead discussions with coal-fired electricity generation owners. Coal transition payments negotiated with companies under Off-Coal Agreements.	First annual payments made to coal generators who have facilities with an end-of-life date beyond 2030 (Power CP, TransAlta, ATCO). Continue payments to coal generators who have facilities with end-of-life past 2030 as per stipulated in Off-Coal Agreements.	*Enables GHG emission reductions through electricity transition.*
Bioenergy Producer Program This program supports bioenergy producers in an effort to develop a sustainable bioenergy sector and capitalize on contributions towards a lower carbon economy.	$39.7M	Program Period 1 completed[2] • 30 Grant Agreements signed. • Supported production of 1M MWh of stable renewable electricity. • Supported production of 65M litres of biofuels. • Supported production of over 4M gigajoules of avoided natural gas consumption for process heat. • 1.1M tonnes of GHG emissions reductions.	Program Period 2 (April 1 – September 30, 2017) grant documents to be filed and reviewed and payments to be processed.	1.6M
Alberta Indigenous Solar Program (AISP) This program provides grants to Indigenous communities or organizations to install solar photovoltaic systems on	$ 1.8M	Program criteria developed (Fall 2016). Pilot program launched (October 2016): • Pilot program was oversubscribed. • Grants executed to 14 community projects. • Solar photovoltaic systems	Modifications to the pilot program criteria (May 2017). Funding approved for 2017-18 program (June 2017). Re-launch of the program (TBD 2017).	*Available in 2018.*

[2] Estimated numbers for the Bioenergy Producers Program Period 1 as final payments are being processed.

facilities, contributing to the target of 30 per cent renewable electricity by 2030.		installed.		
On-Farm Solar Photovoltaic Program This program provides grants towards installing solar photovoltaic (systems on farms, enabling producers to conserve fossil fuels and reduce carbon emissions, reducing the environmental footprint of Alberta's agriculture industry.	$416K[3]	• 50 grants paid to producers for incorporating solar panels into their operations. • 892,225 watts of solar electricity capacity installed. • 690 tonnes of GHG reductions per year.	Further approval and support to applicants to the program.	2,760
Renewable Energy Infrastructure Projects Individual projects provide opportunities to green public infrastructure by generating clean electricity, contributing to the target of 30 per cent renewable electricity by 2030.	$240K	Farm Stewardship Centre Showcase Solar Photovoltaic: • Contracted engineering design of grid-tied solar photovoltaic installation. • Installation of consumption and production metering with visitor display. • Retrofit lighting with energy efficiency LEDs. Miquelon Lake Provincial Park Centre Rooftop Solar System: • Contracted assessment and design. • Installation of solar photovoltaic panels and interpretative signage on visitor centre. High River Resource Centre: • Installation of solar photovoltaic panels on the roof of the Spitzee Crossing Provincial Building.	Heart Lake Firenet Master Site/Lookout Site Solar Project: • Approval of site plan from Lac La Biche Forestry district. • Site preparation and procurement of material and equipment. • Installation of solar panel grid. Martin Primary Fire Base Prime Power Solar Project: • Approval of site plan from Fort McMurray. Forestry district • Site preparation and procurement of material and equipment. • Installation of solar photovoltaic	172

[3] In 2016-17 the Government of Alberta spent $5.9M on the Farm Energy Program – Growing Forward to support cleaner agriculture activities in Alberta. This funding included four sub-programs: On-Farm Solar Photovoltaic Program, On-Farm Energy Management Program, Irrigation Efficiency Program, and the Accelerating Agriculture Innovation Program, Stream C.

			panel grid. More projects to be included post funding approval.	

2016-17 Supporting Contributors

Programs/Projects	2016-17		2017-18 Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
	Funding	Milestones		
Residential and Commercial Solar Program This Energy Efficiency Alberta program supports the purchase and installation of solar photovoltaic systems on residential and commercial buildings.	Energy Efficiency Alberta provides programs that increase energy efficiency and generate renewable energy. Information on this program is provided as part of the primary program contributors in Energy Efficiency.			
Emissions Reduction Alberta Grant Emissions Reduction Alberta supports innovation as well as the research and development of clean technology.	Emissions Reduction Alberta supports projects that address many market demands, including those arising from the transition from coal-fired to renewable electricity generation. Information on this program is provided as part of the primary program contributors in Supply & Use of Clean Technology and Transit.			

2016-17 Additional Contributors

Programs/Projects	2016-17		2017-18 Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
	Funding	Milestones		
Alberta Municipal Solar Program This program provides rebates to municipalities that install solar photovoltaic systems on municipal facilities or land and complete public education programs on their project.	$2.3M	Program launch through the Municipal Climate Change Action Centre (February 2016): • 36 projects supported representing 23 municipalities. • Projects combined save municipalities $481,000 on power bills annually.	Continued delivery of the AMSP to new participants and support of existing projects through the Municipal Climate Change Action Centre.	20,400[4]
Solar Technology Initiative This program provides additional project grants to install solar photovoltaic systems on approved school capital projects.	$9M	68 schools participating in the program: • Solar photovoltaic systems are being installed. • Education and engagement plans developed for students.	Continued evaluation of the impact of the installations with the Government, expanding the initiative over time.	21,200

[4] Greenhouse gas (GHG) emission reductions represent conservative estimates from the Municipal Climate Change Action Centre (MCCAC) that range from 5,100 to 8,400 tonnes of reductions annually from installed systems.

Programs Announced in 2017-18 (preliminary as of August 31, 2017).

Programs/Projects	2017-18 Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
Renewable Electricity Program Alberta will add 5,000 MW of renewable energy capacity by 2030 through the Renewable Electricity Program, run by the Alberta Electric System Operator (AESO).	Alberta Electric System Operator (AESO) engaged with stakeholders on proposed commercial terms of the program. Renewable Electricity Program 1: • Competitive auction issued for up to 400 MW of renewable capacity, which could power up to 170,000 homes. • 80 submissions received. • 29 qualified for the Request for Proposal stage. • Selection of successful proponents and execution of the Renewable Electricity Support Agreement (Dec 2017).	724,000[5]
Regulated Rate Option Pricing Ceiling To ensure Albertans are not adversely impacted through the transition of the electricity system, the RRO rate cap ensures electricity costs are capped at 6.8 cents/kWh for the vast majority of customers including homes, businesses and farms until 2021.	Legislation passed that enables the implementation of the price ceiling. Alberta Energy to lead administration of the rate cap and payments required. Consideration to alternative RRO arrangement that may align with customer expectation as best limit cost to government.	*Enables GHG emission reductions through support of electricity transition.*
Alberta Indigenous Green Energy Development Program This program provides grants to Indigenous communities to develop commercial-scale renewable energy projects. The grants will allow Indigenous communities and	Program launch (June 2017). Approval of eligible projects and installation of commercial-scale renewable electricity generation systems. Ongoing support to Indigenous Communities.	*To be determined based on projects approved for funding.*

[5] Estimated greenhouse gas (GHG) emissions reductions are calculated with a capacity factor of 0.35 and emissions intensity of 0.59 tonnes/MwH.

organizations to acquire an ownership stake in Alberta's rapidly expanding renewable energy sector, as well as contribute to the target of 30 per cent renewable by 2030.		

ENERGY EFFICIENCY

OBJECTIVES AND TARGETS

Alberta is committed to the efficient use of its energy resources. Increased energy efficiency focuses on:

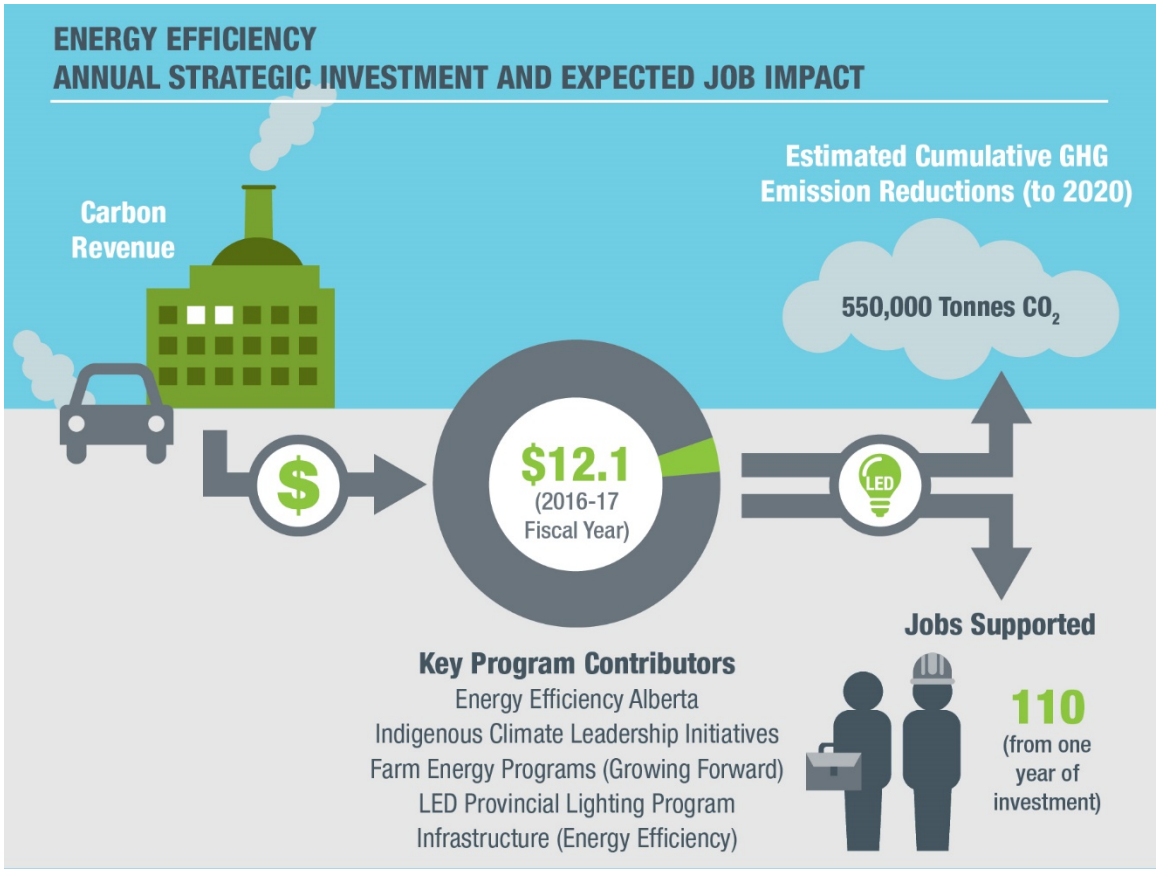
- **Improving the energy efficiency of homes, businesses, institutions, industries, and communities.**
- **Reducing/avoiding GHG emissions through decreased energy consumption and increased energy conservation.**
- **Improving Albertans' quality of life through costs savings and increased comfort and efficiencies.**
- **Fostering growth of an energy efficiency industry.**

The primary means of to achieving these objectives is the new agency, Energy Efficiency Alberta (EEA).

Note: Energy Efficiency Alberta also has a mandate to promote, design and deliver programs and activities to support the development of micro-generation and small-scale energy systems. Outcomes and results related to micro- and small-scale energy systems are included under the Renewable Energy action area.

STRATEGIC INVESTMENTS

$12.1 million was invested in 2016-17 towards achieving this action area. This investment supported the launch of EEA and its initial programs, as well as energy efficiency infrastructure and Indigenous programs. It is estimated that this investment supported about 110 jobs and will result in 550,000 tonnes of cumulative emissions reductions by 2020.



PROGRESS SUMMARY

The new Energy Efficiency Alberta agency was established in January 2017. As measures and indicators in the Progress Summary primarily report on EEA programs, results for 2016, prior to the existence of EEA, are zero; 2017 results are preliminary and include EEA program results through August 31. The Agency is in the process of further developing its measurement, reporting and evaluation systems. Future annual progress reports will reflect these developments.

Note: 2.1 GHG Emissions Reduction through Energy Savings includes both EEA programs and additional energy efficiency programs running before the launch of the Agency.

Performance Measures/Indicators	Result (2016)	Preliminary 2017 Result (to Aug 31, 2017)	Target/ Desired Result (2018)	Trend*	Status
1. Energy Savings					
1.1 Annual Energy Savings *(gigajoules of energy savings achieved by EEA programs)*	0	555,031	1,293,160	●	NA
1.2 Lifetime Energy Savings *(gigajoules of energy savings for all EEA programs over the life of the measures)*	0	TBD	TBD	TBD	TBD
1.3 Water Savings *(total cubic meters of water savings from EEA residential programs)*	0	547,700	Increasing trend	●	NA
2. Greenhouse Gas Emissions					
2.1 GHG Emission Reductions through Energy Savings *(total emission reductions in CO2 equivalent tonnes achieved from EEA and additional energy efficiency programs*)	NA	141,567	TBD	NA	NA
3. Improved Quality of Life					
3.1 Cost Savings/Effectiveness *(in development)*	0	TBD	TBD	TBD	TBD
3.2 Consumer Product and Service Rebates/Incentives *(total value of EEA associated rebates/incentives accessed by Albertans in millions of $)*	0	15.9	Increasing trend	●	NA
3.3 Value of Saved Energy to Electrical Grid *(in development)*	0	TBD	TBD	TBD	TBD
3.4 Customer Satisfaction Index *(Average ranking of customer satisfaction with Residential No-Charge Energy Savings Program)*	NA	4.66	> 4	NA	NA
4. Market Transformation – Growth of Alberta's Energy Efficiency Industry**					

4.1 Outreach and Awareness Proxy *(total # of household registrants and participants in EEA programs)*	0	182,432	Increasing trend	●	NA

* Year over year based on preliminary 2017 results.

**Additional market transformation indicators will be developed and reported on as the Agency further develops its performance management systems.

▲ Positive upward trend ▼ Positive downward trend ▲ Negative upward trend ▼ Negative downward trend
● Projected to meet or surpass target ● Projected to be near target ● Projected to be off target – Steady trend

PROGRESS DETAIL

1.1 ANNUAL ENERGY SAVINGS

Description

Annual Energy Savings measures the total gross savings in energy consumption that directly result from Energy Efficiency Alberta programs. Reported preliminary results are for the period March 28 to August 31, 2017. These savings, expressed in gigajoules, represent energy that would have been used were it not for the energy efficiency program. Savings are calculated based on deemed savings (product-specific, installation rates, net-to-gross ratio and line-loss factor or home heating system efficiency for each program and then aggregated for total results. This includes interactive effects (how a measure may relate to other measures); and take-back effects (instances where more energy efficiency could result in more energy use, for example leaving a low-efficiency light bulb on for longer). Data are from the Residential No-Charge Energy Savings Program, the Residential Retail Products Program, the Business, Non-Profit and Institutional Energy Savings Program, and the Residential and Commercial Solar Program progress reports as of August 31, 2017.

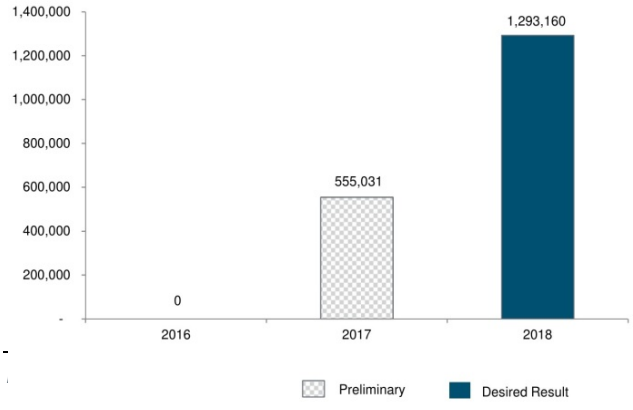
Importance

Consuming less energy is one of the most effective ways to lower our carbon footprint, and the Energy Efficiency Alberta was established to help. Using less energy reduces GHG emissions and helps Albertans save on energy costs.

Target/Desired Result

1,293,160 gigajoules saved by 2018.

Figure EE 1.1: Annual Energy Savings (achieved by EEA programs, in gigajoules as of Aug 31, 2017)



Progress

Based on the recommendations of the Alberta Energy Efficiency Advisory Panel report "Getting It Right - A More Energy Efficient Alberta", four EEA programs were launched in 2017:

- Residential No-Charge Energy Savings Program.
- Residential Retail Products Program including
  - Online Rebates
  - Instant Savings
  - Home Improvement Rebates
- Business, Non-Profit and Institutional Energy Savings Program.

- Residential and Commercial Solar Program.

The reported result includes energy savings achieved by these four programs. As these are preliminary and reflect only a partial year, the desired result it is expected to be achieved.

1.2 LIFETIME ENERGY SAVINGS

Lifetime Energy Savings measures expected energy savings over the life of all EEA programs. Methodology and data for lifetime energy savings will be provided and reported on in future CLP Progress Reports.

1.3 WATER SAVINGS

Description

Water Savings measures the total cubic metres of demand-side water that is saved as a result of the Residential No-Charge Energy Savings Program (RNCESP) for the period March 28 to August 31, 2017. Data are from RNCESP progress reports.

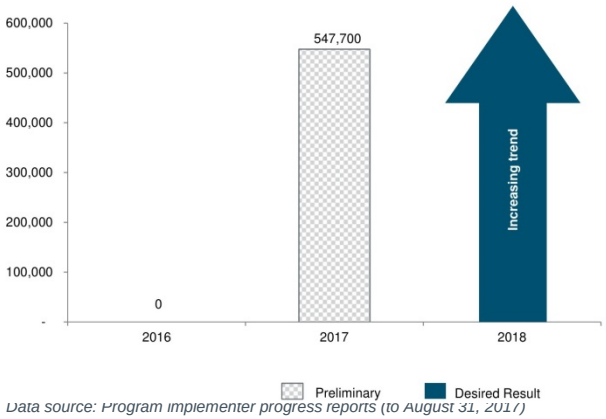
Importance

Reducing water consumption helps protect the environment and saves money. Water and energy are inherently linked on both the supply and demand side. On the supply side, a massive amount of water is needed for electricity generation; on the demand side, a massive amount of electricity is required to treat and deliver water to consumers. This means that any efficiency program that saves energy will most likely have direct or induced water savings as well and *vice versa*.

Target/Desired Result

Increasing trend.

Figure EE 1.3: Water Savings (total cubic meters of water savings from EEA residential program as of Aug 31, 2017)



Data source: Program implementer progress reports (to August 31, 2017)

2.1 GHG EMISSION REDUCTIONS THROUGH ENERGY SAVINGS

Description

GHG Emission Reductions through Energy Savings measures emissions avoided due to energy savings from EEA and additional energy efficiency programs in tonnes of CO_2 equivalent between March 28 and August 31, 2017. The measure is calculated by applying a GHG emissions factor that varies depending on the fuel source. Since the agency has a provincial mandate, results from Taking Action to Manage Energy (TAME+ and TAME Express) grants for 2015-18, Irrigation Efficiency and On Farm Energy Management programs are also included.

Importance

Avoiding GHG emissions through energy savings is one of the most cost-effective ways to reduce our carbon footprint. Establishing Energy Efficiency Alberta is a significant achievement of the CLP, which is why it is important to monitor the impact of its programs on reducing GHG emissions.

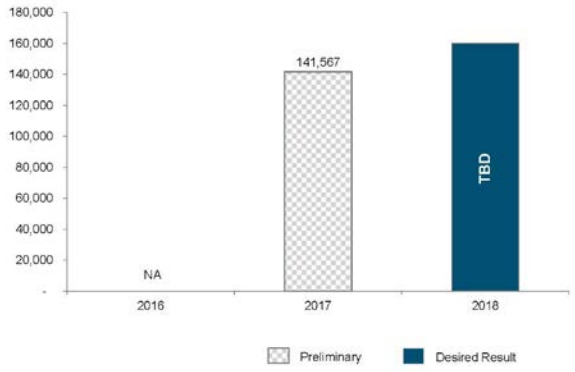
Target/Desired Result

TBD.

Progress

EEA and additional energy programs have saved more than 140,000 tonnes of GHG emissions through energy savings.

Figure EE 2.1: GHG Emission Reductions through Energy Savings (tonnes of CO_2 equivalent achieved as of Aug 31, 2017)



Data source: Program implementer progress reports (to August 31, 2017)

3.1 COST SAVINGS/EFFECTIVENESS

Cost Savings/Effectiveness refers to the costs and benefits of installing a given measure. This can either be from the perspective of the end consumer, the program itself, or the total costs and benefits to all parties. Methodology and data for cost savings will be provided and reported on in future CLP Progress Reports.

3.2 CONSUMER PRODUCT AND SERVICE REBATES/INCENTIVES

Description

Consumer Product and Service Rebates/Incentives measures the dollar value of rebates and discounts that Albertans received through EEA programs from March 28 to August 31, 2017. The measure is calculated from data reported by EEA's four current programs.

Importance

Rebates and discounts provided through energy efficiency programs help enable Albertans to upgrade their electrical equipment, fixtures and insulation systems and encourage them to shift to renewable sources of energy. These incentives complement government efforts to reduce GHG emissions, as well as provide Albertans some immediate economic benefits through reduction in their energy bills and related maintenance costs.

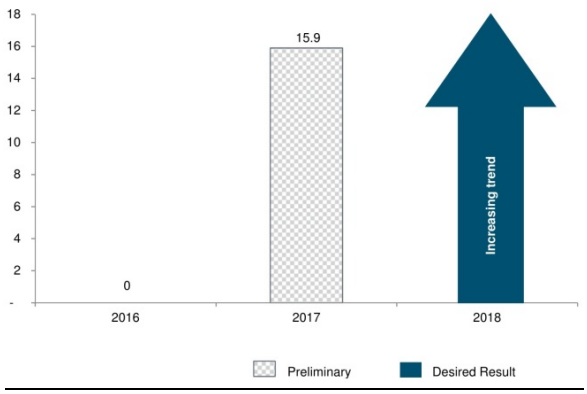
Target/Desired Result

Increasing trend.

Progress

As of August 31, 2017 Alberta households have received $15.9 million in rebates through home improvements, online rebates, solar system installations and energy-efficient residential retrofits. Businesses and non-profit organizations have received $476,310 in rebates for high-efficiency products to improve energy efficiency.

Figure EE 3.2: Consumer Product and Service Rebates/Incentives (total value of EEA rebates/incentives accessed by Albertans in millions as of Aug 31, 2017)



Data source: Program implementer progress reports (to August 31, 2017.)

3.3 VALUE OF SAVED ENERGY TO ELECTRICAL GRID

The definition, methodology and data for value of saved energy to electrical grid will be provided and reported on in future CLP Progress Reports.

3.4 CUSTOMER SATISFACTION INDEX

Description

Customer Satisfaction Index measures Residential No-Charge Energy Savings Program participants' satisfaction. It is calculated by post-program participation surveys that ask about available information, registration process, quality of products/services, as well as the knowledge and conduct of staff involved. Respondents rank survey questions on a scale of 1 to 5, where 1 is not satisfied and 5 is extremely satisfied. Reported results are from the Residential No-Charge Energy Savings Program progress report as of August 31, 2017.

Importance

Energy Efficiency Alberta is committed to ensuring a positive customer experience for all program participants. Customer satisfaction encourages ongoing energy efficiency participation and behavior changes.

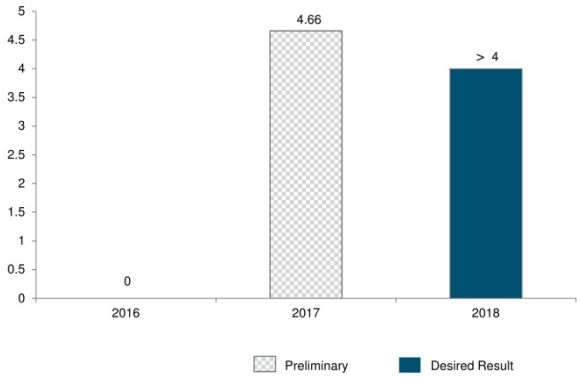
Target/Desired Result

Greater than four.

Progress

The Residential No-Charge Energy Savings Program has achieved a consumer satisfaction score of 4.66 out of 5, indicating that program participants are either satisfied or extremely satisfied with the program. Results for the Business, Non-Profit and Institutional Energy Savings Program will be included in the index and reported on in future CLP Progress Reports.

Figure EE 3.4: Customer Satisfaction Index (average ranking of customer satisfaction with Residential No-Charge Energy Savings Program as of Aug 31, 2017)



Data source: Program implementer progress reports (to August 31, 2017)

4.1 OUTREACH AND AWARENESS PROXY

Description

Outreach and Awareness Proxy measures the number of Albertans who have been engaged in pre-program consultations, as well as those who registered and/or participated in the four EEA programs as of August 31, 2017. Registration and participation are used as a proxy for awareness Results do not factor in the potential for households and registrants to participate in more than one program.

Importance

Increasing outreach and awareness of the available programs boosts participation in these programs and helps people use energy more efficiently. EEA residential programs allow Albertans to benefit from rebates and home improvement support, and access information on how individual energy conservation generates socio-economic and environmental benefits for individuals and the province as a whole.

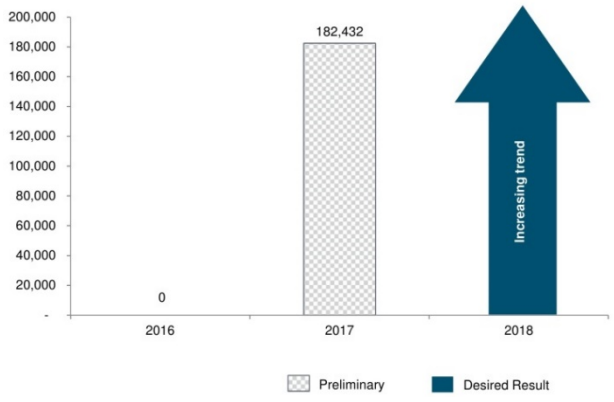
Target/Desired Result

Increasing trend.

Progress

Based on reported data as of August 31, 2017, Energy Efficiency Alberta's programs have reached 182,432 Albertans. Future programing will explore ways to target households that have not actively participated in programs to date.

Figure EE 4.1: Outreach and Awareness Proxy (total # of household registrants and participants in residential EEA programs as of Aug 31, 2017)



Data sources: Program implementer progress reports (to August 31, 2017)
Alberta climate change office internal analysis

ENERGY EFFICIENCY PROGRAM CONTRIBUTORS

FUNDED IN 2016-17

Primary	Additional
• Start Energy Efficiency Alberta • Residential No-Charge Energy Savings Program • Residential Retail Products Program • Alberta Indigenous Community Energy Program • On-Farm Energy Management Program • Irrigation Efficiency Program • Accelerating Agriculture Innovation Program • LED Provincial Highway Lighting Program • Energy Efficiency Infrastructure Projects	• Taking Action to Manage Energy Program • Taking Action to Manage Energy Express Pilot

ANNOUNCED IN 2017-18
Preliminary 2017 – Includes programs announced as of August 31, 2017

Primary
• Business, Non-Profit and Institution Energy Savings Program • Residential and Commercial Solar Program • Non-Profit Energy Efficiency Transition Program • Alberta Indigenous Climate Planning Program • Alberta Indigenous Energy Efficiency (Retrofit) Program

PROGRAM HIGHLIGHTS

4.3 Million
Energy efficiency products purchased through Instant Savings Program

211
Grants paid to Alberta farmers and ranchers to improve energy efficiency

555,031 GJ
Annual energy savings

3,728
Households participated in Residential Retail Products Program

502,534
Light bulbs installed through Residential No-Charge Energy Savings Program

PROGRAM RESULTS

2016-17 Primary Contributors

Programs/Projects	2016-17		2017-18 Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
	Funding	Milestones		
Start Energy Efficiency Alberta Agency This program delivers activities required to establish Energy Efficiency Alberta including initial program delivery for:	$1.43M	Energy Efficiency Alberta established and programs developed.		487,300
Residential No-Charge Energy Savings Program (RNCESP) This Energy Efficiency Alberta program offers direct, no-charge installation of energy efficiency products in rural and urban houses, apartment & condominiums. Home owners and tenants are both eligible.		Residential No-Charge Energy Savings Program developed. Registration launched (February 2017). Program launched (March 2017).	Over 135,800 households have pre-registered. Installation of energy efficiency products in 17,526 Alberta households: • Changed 502,534 light bulbs. • 90,121 GJ of energy savings achieved. • 547,700 m^3 of water saving achieved. • 3,984 tonnes of GHG emissions reductions.	
Residential Retail Products Program This Energy Efficiency Alberta program offers point-of-sale rebates for the purchase of energy efficiency measures through participating retailers during four to six week spring and fall		Residential Retail Products Program developed.	Program launched (April 2017). Instant Savings Program Spring Campaign: • Albertans purchased 4.3 million energy efficient products from 526 participating retailers.	

campaigns. The program will also offer year-round rebates on selected measures that necessitate an immediate purchase (e.g. refrigerators, thermostats, clothes washers, etc.). It also offers rebates for Home Improvement measures installed.			• $14,063,837 rebates provided. • 422,807 GJ of energy savings. • 78,066 tonnes of GHG emissions reductions. Online Rebate Program: • 3,728 households participated. • $372,100 in rebates provided for high-efficiency thermostats and appliances. • 1,142 tonnes of GHG emissions reductions. Home Improvement Rebate Program: • 835 approved contractors in the program. • $984,715 in rebates provided for hot water heaters, insulation and windows. • 18,472 GJ of energy savings. • 1,745 tonnes of GHG emissions reductions.	
Alberta Indigenous Community Energy Program (AICEP) This program provides tools and support to help Indigenous communities understand how energy is used in buildings, as well as to conduct energy audits to identify opportunities to save energy and money.	$1M	Program criteria developed (Fall 2016). Pilot project launched (October 2016): • Pilot program was oversubscribed. • Grants executed to 11 community projects. • ASHRAE Level 2 building audits completed.	Modifications to the pilot program criteria (May 2017). Funding approved for 2017-18 program (June 2017). Re-launch of the program (TBD 2017).	*Available in 2018.*
On-Farm Energy	$4.2M[6]	211 grants to farmers and	Further approval and	20,470

[6] In 2016-17 the Government of Alberta spent $5.9M on the Farm Energy Program – Growing Forward to support cleaner agriculture activities in Alberta. This funding included four sub-programs: On-Farm Solar Photovoltaic Program, On-Farm Energy Management Program, Irrigation Efficiency Program, and the Accelerating Agriculture Innovation Program, Stream C.

Management Program The Growing Forward Farm Energy program shares the costs of investments that improve energy efficiency on farms, including the installation of on-farm sub-meters to make farmers better aware of their energy usage and how to manage it to improve their bottom line.		ranchers to purchase equipment to improve energy efficiency. 5,117 tonnes of GHG emission reductions.	support to program applicants.	
Irrigation Efficiency Program This Farm Energy (Growing Forward) program supports producers' investment in new or upgraded low-pressure centre pivot (LPCP) irrigation equipment for their operations, improving the energy efficiency and water use of farms.	$1M[6]	108 grants to farmers to upgrade irrigation equipment that increases the sustainability of water resources and reduce energy inputs. 1,300 tonnes of GHG emission reductions.	Further approval and support to program applicants.	5,200
Accelerating Agriculture Innovation Program This Farm Energy (Growing Forward) program supports late-stage activities on the innovation continuum of start-up/scale-up demonstration work and adoption of energy efficiency technologies for the agriculture sector.	$556K[6]	Stream C: • 27 grants paid to agri-processors to assist with retro-fitting their facilities and/or adopting new technologies and practices.	Further approval and support to program applicants.	30,000
LED Provincial Highway Lighting Program This program supports the upgrade of high-pressure sodium luminaires with LED luminaires	$1M	Pilot Program: • Approximately 600 luminaires replaced in Edmonton.	Phase 1: • Approximately 1,800 luminaires replaced in Edmonton. • Approximately 3,200 luminaires replaced in Calgary.	931

along the provincial highway system.			• Approximately 1, 000 luminaires replaced in Medicine Hat. Additional program phases to be developed.	
Energy Efficiency Infrastructure Projects Individual projects provide opportunities to green public infrastructure by reducing energy consumption and/or increasing energy efficiency, contributing to reducing emissions.	$2.76M	Mount Royal University Central Power Upgrades: • Replacement of 32-year-old heat exchangers and burners with high-efficiency technology. Central Region Energy Audit: • Pilot program contracted and completed an energy audit for the largest area of Alberta's park system. • List of recommended energy conservation initiatives compiled. Kananaskis Region Upgrades for Greenhouse Gas Reduction: • Pilot program contracted and completed an energy audit for the Kananaskis region park system. • List of recommended energy conservation initiatives compiled. Facility Energy Audits: • Contracted and completed the majority of energy audits of major sites in the community housing portfolio, including social housing and senior lodge buildings. • Recommended energy conservation initiatives identified. Lubicon Lake Band	Hospital LED Lighting: • Approval of hospital retrofitting program and schedule. • Installation of LED luminaires in hospitals. Hospital Rooftop Unit Logic Controller: • Upgrade existing rooftop ventilation with new technology that reduces energy use in hospitals. Hospital Utility Management Plan: • Develop a provincial utility management plan to provide a long-term strategy for hospitals to reduce energy consumption and emissions. Recommissioning Mechanical/Electrical Systems at Health Facilities: • Conduct energy audits of mechanical and electrical systems at health facilities to identify inefficiencies. Upgrade Variable Air Volume (VAV) Controller at Health Facilities: • Upgrade existing ventilation with new technology that	5,652 *Some projects enable GHG emission reductions by providing information on possible options for further investment.*

		Green Infrastructure Assessment: • Contracted and completed an energy audit and planning study to support the development of a state-of-the-art energy efficiency community for the Lubicon Lake Band. • List of recommended energy initiatives identified. Historical Building Grant Program: • Contracted and completed a planning study, including a working model to measure the impacts of historical building preservation and reuse on GHG emissions. LED Lighting Upgrade Program for Health Facilities: • This program was for the upgrading of existing T12 lamps and magnetic ballast with LED lamps and electronic lamps in health facilities. LED Lamp Replacement Program: • This program was to upgrade existing T8 lamps with LED lamps in health facilities.	reduced energy use in health facilities. More projects to be included post-funding approval.	

2016-17 Additional Contributors

Programs/Projects	2016-17		2017-18 Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
	Funding	Milestones		
Taking Action to Manage Energy (TAME+) Program This program provides support to municipalities for custom energy upgrades to municipal facilities as recommended in detailed energy audits.	$2.73M	Custom energy efficiency upgrades (funded) as recommended by detailed energy assessments completed by applicant municipalities. Program delivery through Municipal Climate Change Action Centre: • $2.73M allocated to approved projects. • 45 projects approved in 25 municipalities. • 35,078 tonnes of GHG emission reductions. Program fully subscribed and closed to applicants as of October 2017.	Ongoing program work to include disbursement of rebates to projects as they are completed.	35,000
Taking Action to Manage Energy (TAME) Express Pilot Program This program offers quick access to financial incentives to municipalities to implement high-efficiency lighting retrofits, including indoor lighting, outdoor building and parking lot lighting, lighting controls and exit signs.	$360K	Funding for the implementation of high-efficiency lighting retrofits completed by municipalities. Program delivery through Municipal Climate Change Action Centre: • $360,000 allocated to approved projects. • 56 projects approved in 29 municipalities. • 14,281 tonnes of GHG emission reductions. Program fully subscribed and closed to applicants as of October 2017.	Ongoing program work to include disbursement of rebates to projects as they are completed.	14,280

Programs Announced in 2017-18 (preliminary as of August 31, 2017)

Programs/Projects	2017-18 Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
Business, Non-Profit and Institutional (BNI) Energy Savings Program This Energy Efficiency Alberta program offers rebates to business, non-profits and institutions for choosing high-efficiency products, including lighting, cooling and hot water systems.	Program launched (May 2017). 1,047 businesses, 115 non-profits and 48 institutions have submitted applications to the program. As of August 31, 2017: • $2M in allocated program funding. • 2,940 GJ of energy savings. • 523 tonnes of GHG emissions reductions.	195,000 (lifetime)
Residential and Commercial Solar Program This Energy Efficiency Alberta program supports the purchase and installation of solar photovoltaic systems on residential and commercial buildings, contributing towards 30 per cent renewable electricity generation by 2030.	Updates to legislation and regulations to support micro- and small-scale generation capacity. Program launched (June 2017). Processed 301 pre-approved applications with potential installed capacity of 3.7 MW: • 280 residential applicants. • 20 commercial applicants. • 1 non-profit applicant. • $2.47M in allocated program funding. • 332 tonnes of GHG emissions reductions. Approval and processing of applications over two-year program.	500,000 (lifetime)
Non-Profit Energy Efficiency Transition (NEET) Program This Energy Efficiency Alberta program provides support to help non-profit and volunteer groups audit their facilities and determine how efficient their current lighting, heating, cooling and hot water	Program launch through the Municipal Climate Change Action Centre (January 2017). Program was initially oversubscribed based on expressions of interest: • 157 active applications. • 116 applications screened. • 50 audits approved. Completion of audits approved in 2016-17. Approval of additional funding for NEET under Energy Efficiency Alberta (June 2017).	*Enables GHG emission reductions by providing information on possible options for further investment.*

systems are.		
Alberta Indigenous Climate Planning Program (AICPP) This program provides grants to Indigenous communities to establish and understand energy conservation opportunities and set priorities to improve energy efficiency, reduce greenhouse gas emissions and support local development. Through this program, Indigenous communities will develop community energy plans and projects for the community.	Program launch (June 2017). Approval of eligible projects and completion of community energy plans and opportunity assessments. Ongoing support to Indigenous communities.	*Enables GHG emission reductions by providing information on possible options for further investment.*
Alberta Indigenous Energy Efficiency (Retrofit) Program (AIEEP) This program provides grants to improve the energy efficiency of Indigenous community and Indigenous organization-owned buildings, contributing to reduced GHG emissions. Grants can be applied to retrofit existing building or to upgrade the energy efficiency of new buildings.	Program launch (June 2017). Approval of eligible projects and installation of energy efficiency building upgrades. Ongoing support to Indigenous communities.	*To be determined based on projects approved for funding.*

CLEAN TECHNOLOGY AND TRANSIT

OBJECTIVES AND TARGETS

Clean Technology and Transit focuses on businesses and industry through Innovation and Clean Technology initiatives; and the general public through public transit initiatives. Innovation and Clean Technology and Transit programs, policies and investments are designed to achieve the following:

Innovation and Clean Technology:

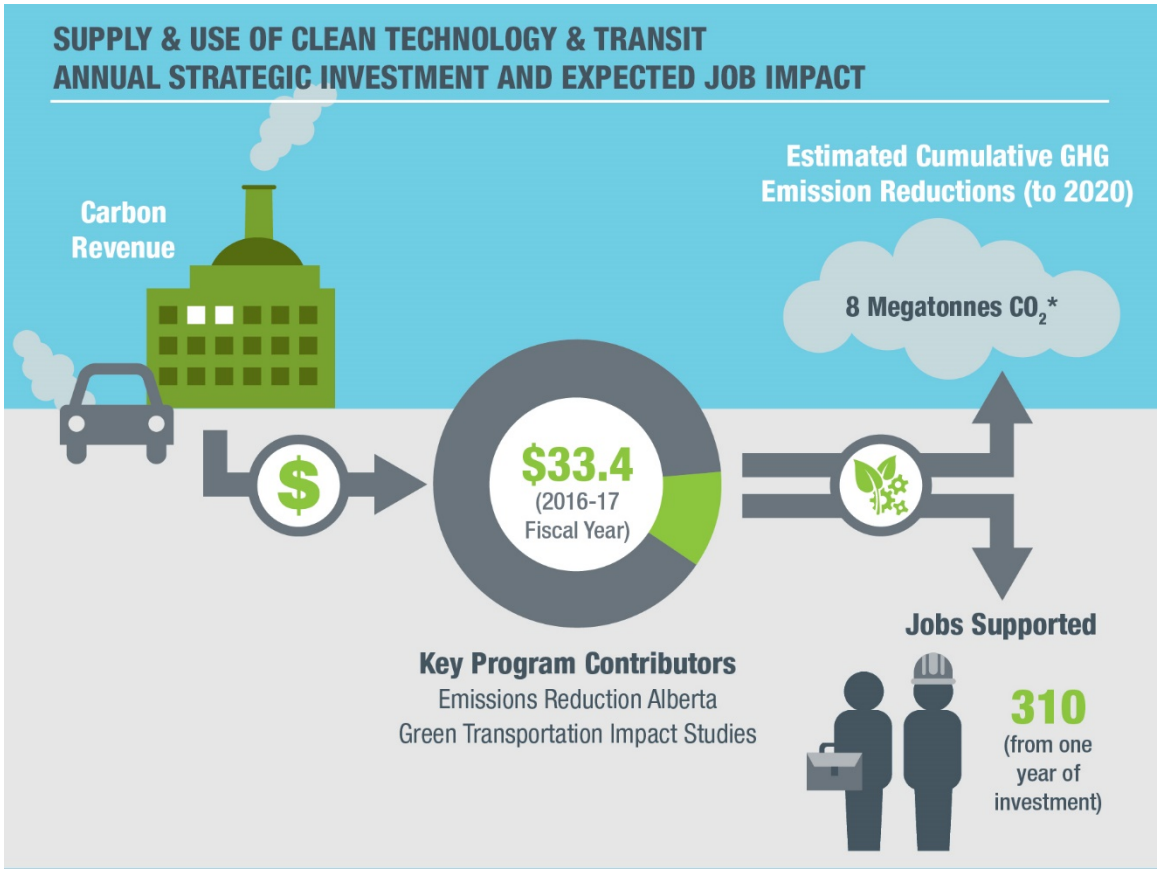
- Demonstrate innovation and clean technology **leadership & partnership** through actively leveraging collaboration and funding.
- **Reduce greenhouse gas emissions** through innovation & clean technology.

Transit:

- **Reduce greenhouse gas emissions** through increased usage of low-emission transport.
- Support **public well-being** through access to low-emission transportation.

STRATEGIC INVESTMENTS

$33.4 million was invested in 2016-17 towards achieving this action area. This investment supports the delivery of programs including Emissions Reduction Alberta (ERA) and transportation-related climate change programs. It's estimated that this investment supported approximately 310 jobs and will result in 8 Mt of cumulative emission reductions by 2020. *



* Estimated reductions are based on cumulative investments by ERA since 2011.

PROGRESS SUMMARY

Progress Summary and Progress Details for clean technology are currently based on available data and results achieved by ERA, an agency funded by the Climate Change and Emissions Management Fund to accelerate development of innovate technologies that reduce GHG emissions. ERA (formerly Climate Change and Emissions Management Corporation) has been in place since 2009. The CLP confirms the key role that innovation and clean technology play in achieving its outcomes and in 2016 began the development of the Climate Change Innovation and Technology Framework. Measures, indicators, information and associated results will be updated in future reporting to reflect the application of the Framework by ERA, the Ministry of Economic Development and Trade, as well as Alberta Innovates.

Performance Measures/Indicators	Baseline (2015)	Result (2016)	Target/ Desired Result	6 Year Trend	Status
1. Innovation Leadership and Partnership					
1.1 Clean Technology Investment *(total cumulative million $ invested in clean technology research & development, development, demonstration and implementation stages)*	270	294	NA	NA	NA
1.2 Leveraged Investment *(ratio of $ leveraged from additional funding partners for every $ invested by the Government)*	4.1	3.9	> 1.0	▼	●
1.3 Collaborative Partnerships (*qualitative results highlighting collaborative partnerships with governments, universities, research institutes/organizations, and industry)*	Table CT 1.3: Clean Technology Collaborative Partnerships				
2. Greenhouse Gas Emissions Reductions (Innovation and Clean Technology)					
2.1 Estimated GHG Emissions Savings – All Initiatives *(total estimated kilotonnes of CO2 equivalent GHG emissions savings from Innovation & Clean Technology initiatives)*	874.7	912.3	Increasing trend	▲	●
2.2 Estimated Methane Emissions Savings *(total estimated kilotonnes of CO2 equivalent methane emissions savings from Innovation & Clean Technology initiatives)*	74.9	53.8	Increasing trend	▲	●
2.3 Estimated GHG Emissions Savings – Electricity Initiatives *(total estimated kilotonnes of CO2 equivalent GHG emissions savings from Innovation & Clean Technology initiatives)*	595.3	605.5	Increasing trend	▲	●
3. Economic Development/Growth					
3.1 Innovation & Clean Technology Support of Oil Sands Emissions Reductions	3.1 Narrative Results				

3.2 Innovation & Clean Technology – Commercial Viability	3.2 Narrative Results				
4. Greenhouse Gas Emissions Reductions (Transit)					
4.1 Alberta Transit Ridership *(total # of public transit rides In millions aggregated for the province of Alberta)*	214.4	Available 2018	Increasing trend	▲ (5 year)	●
4.2 Alberta's Low-Carbon Fleet *(total number of non-diesel vehicles in Alberta's transit fleet as a percentage of Alberta's total transit bus fleet)*	5.6	Available 2018	Increasing trend	▲ (5 year)	●
4.3 GHG Emissions Savings from Transit initiatives *(total tonnes of CO2 equivalent GHG emissions savings from CLP-funded Transportation Initiatives)*	NA	TBD	TBD	TBD	TBD
5. Support Public Transit Accessibility					
5.1 Number of Affordable Housing Units within 1 kilometre of Major Transit Stations or Park and Rides *(in development)*	TBD	TBD	TBD	TBD	TBD

▲ Positive upward trend ▼ Positive downward trend ▲ Negative upward trend ▼ Negative downward trend

● Projected to meet or surpass target ● Projected to be near target ● Projected to be off target – Steady trend

PROGRESS DETAIL

1.1 CLEAN TECHNOLOGY INVESTMENT

Description

Clean Technology Investment measures the total invested by ERA in clean technology projects in millions of dollars over the calendar year. Results are rounded to the nearest million. Future CLP clean technology reporting will expand this definition and refine the associated methodology.

Importance

As an energyproducer, Alberta's success in reducing GHG emissions requires innovative processes and approaches that support lower costs while reducing emissions. The CLP is investing to accelerate the research, development and deployment of clean technology on which this innovation depends. It is important to monitor these investments and their associated results over time.

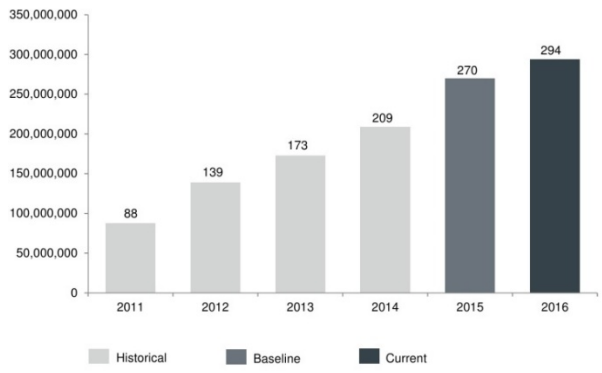
Target/Desired Result

NA.

Progress

From 2011 to 2016, ERA committed $294 million to 109 projects representing transformative technologies. These investments were distributed across all stages of innovation from R&D to implementation and represent potentially dramatic GHG emissions reductions. A large portion of funding committed to projects in the latter stages of innovation (demonstration and first-of-a-kind deployment) will achieve substantial emissions reductions in the near future. ERA funds projects in four areas: Reduced GHG Footprint of Fossil Fuel Supply; Low-Emitting Electricity Supply; Biological Resource Optimization; and Industrial Process Efficiency. In 2017, ERA committed a further $33 million to 13 methane-reducing projects from the ERA Methane Challenge. ERA also launched a $50 million Oil Sands Innovation Challenge in mid-2017, seeking innovative technologies to reduce GHG emissions and improve the cost competitiveness of bitumen production and processing.

Figure CT 1.1: Clean Technology Investment (millions of $ invested in ERA clean technology projects)



Data source: Emissions Reduction Alberta

1.2 LEVERAGED INVESTMENT

Description

Leveraged Investment measures investment by additional funding partners for every dollar invested by ERA as a ratio. A result greater than 1.0 means funding partners have invested more than 50 per cent of the total. This definition and methodology will expand for future reporting.

Importance

The government plays a key role in developing and commercializing clean technologies and innovation through investments. Partnerships maximizing the value of these investments, allowing for significant and sustained resources to support the development, implementation and commercialization of innovation and clean technology to make energy more efficient. These are particularly important where the advancement of certain technologies requires significant investment.

Target/Desired Result

>1.0.

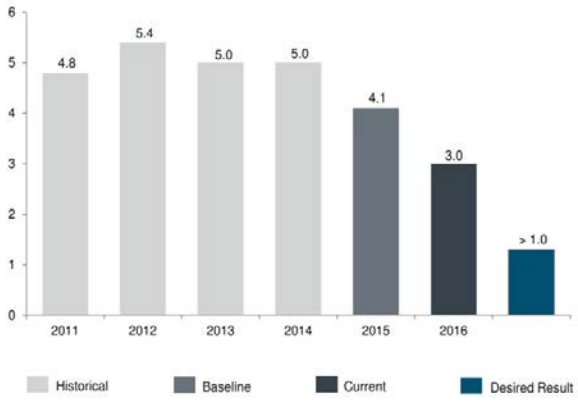
Progress

Illustrated results have been adjusted to exclude one outlier project from 2013. Blackspring Ridge Wind Project received $10 million from ERA to support total costs of approximately $600 million. Removing this project helps normalize the leverage figure for ERA's portfolio. The total investment of $294 million to 2016 contributed to projects valued at almost $2 billion. Removing the outlier means an investment of $284 million for projects valued at almost $1.4 billion. The decline in leverage reflects the economic slowdown and lower private capital availability, making ERA's investment even more critical.

The 2016 figure is still well above the 1.0 target, and represents a significant contribution to the economy.

The Department of Economic Development and Trade found that ERA's projects are expected to result in direct economic benefits, including supporting 1,400 jobs annually from 2011 to 2021, with a total cumulative impact of more than 15,000 person-years of employment. In addition, ERA projects are expected to add almost $1.8 billion to Alberta's GDP.

Figure ICT 1.2: Leveraged Investment (ratio of $ leveraged from additional funding partners for every $ invested by Government of Alberta)



Data source: Emissions Reduction Alberta

1.3 COLLABORATIVE PARTNERSHIPS

Collaborative and strategic partnerships are critical for the effective development and commercialization of clean technologies. And the Government, through its various initiatives, actively leverages domestic and international collaborations among inventors and research institutions, as well as industry and federal funders to accelerate technology development and address Alberta's market demands.

Table CT 1.3: Collaborative Partnerships identifies ERA's partners and collaboration by type. From supporting innovators to collaborating with government, investors and industry, ERA works with its partners to secure a lower carbon future.

Table CT 1.3: Clean Technology Collaborative Partnership

Partner Type	Organization	Collaboration Type			
		Funding	Strategic Alignment & Engagement	Proponent Training & Support	Conferences & Workshops
Federal Government	Sustainable Development Technology Canada (SDTC)	✓	✓	✓	✓
	National Resources Canada	✓	✓		✓
Provincial Governments & Agencies	Alberta Agriculture and Forestry		✓		
	Alberta Climate Change Office		✓		✓
	Alberta Economic Development and Trade		✓		✓
	Alberta Energy		✓		✓
	Alberta Energy Regulator		✓		✓
	Alberta Innovates	✓	✓	✓	✓
	Energy Efficiency Alberta		✓		✓
	MaRS – Discovery District		✓		✓
	Ontario Centres of Excellence	✓	✓		✓
Provincial Advisory Groups	Alberta Energy Efficiency Panel		✓		
	Alberta Diversification Advisory Committee		✓		
	Oil Sands Advisory Group (2017)		✓		✓
Municipal Agencies	Innovate Calgary		✓	✓	✓
	TEC Edmonton		✓	✓	✓
Academic	University of Alberta	✓	✓		✓

Institutions	University of Calgary	✓	✓		✓
	NAIT (2017)	✓	✓		
Industry, Organizations, Associations	Alberta Clean Technology Industry Alliance		✓		✓
	Canadian Association of Petroleum Producers		✓		✓
	Canada's Oil Sands Innovation Alliance		✓		✓
	EVOK Innovations	✓	✓		✓
	Energy Futures Lab		✓		✓
	Natural Gas Innovation Fund (Canadian Gas Association)(2017)	✓	✓		
Non-governmental Organizations	Pembina Institute		✓		✓

2.1 ESTIMATED GHG EMISSION REDUCTIONS – ICT INITIATIVES

Description

Estimated GHG Emissions Reductions – ICT Initiatives measures the estimated annual tonnes of CO2 equivalent GHG emissions that ERA initiatives have saved. ERA calculates two different but related emissions reductions projections for its investment portfolio. One is the total GHG emissions reductions expected from each project directly. This value is provided by the project proponents and reviewed by ERA. The other is the market potential for GHG reductions, and estimates total emissions reductions expected from commercialization of the technology.

A number of assumptions underpin this calculation, including policies and measures currently in place and arising from the successful commercial adoption of technologies, GHG emissions intensity, estimated market size, economic indicators and the lifespan of the technology.

ERA can make a significant impact through supporting the development of breakthrough technologies, but estimating the impact of new, game-changing technologies is difficult. While they can lower GHG emissions significantly in the long term, they also carry considerable risk, making it difficult to predict when a breakthrough may occur. To balance that risk, a large portion of ERA funding is committed to projects in later stages of innovation, and which result in substantial near-term emissions reductions. ERA continues to refine the methodology used for estimating market potential and is also working on longer projection timelines (to 2050) to allow for a more complete look at longer-term emission reductions.

Importance

Investment in innovation and clean technology is recognized as a key lever to helping industry

reduce GHG emissions while saving money. Since innovation and clean technology is a long term strategy, it's important to monitor the impact of investments over time as well.

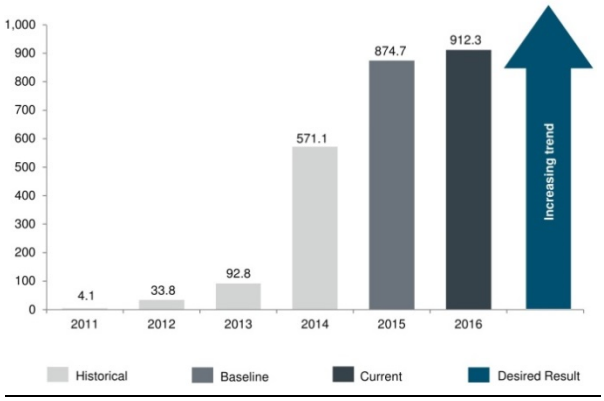
Target/Desired Result

Increasing trend.

Progress

Cumulative emissions reductions for projects funded since 2011 are estimated to be more than 2 Mt. Annual results in Figure CT 2.1 show a significant increase for both 2014 and 2015. This is largely explained by the Blackspring Ridge Wind Project, which was funded in 2013, became operational for part of 2014 with its first full year of production in 2015. These emission reductions account for over half the emissions reductions for those years. Less significant increases are noted in 2016 due to project completions, and projections for 2017 onwards are based on current forecasts of the project portfolio. Cumulative project-level emissions reductions are estimated to be 8 Mt by 2020 and 27 Mt by 2030 for the existing portfolio.

Figure CT 2.1: Estimated GHG Emissions Reductions – ICT Initiatives (estimated annual kilotonnes of CO_2 equivalent GHG emissions reductions from ERA's Innovation & Clean Technology Initiatives)



Data source: Emissions Reduction Alberta data collection

2.2 ESTIMATED METHANE EMISSIONS REDUCTIONS – ICT INITIATIVES

Description

Estimated Methane Emissions Reductions - ICT Initiatives measures the estimated annual tonnes of CO_2 equivalent methane emissions reductions from ERA initiatives. ERA has identified that these funded projects will specifically reduce methane gases and contribute to the target of reducing methane emissions by 45 per cent by 2025. A proportion of the reported emissions reductions are also attributed to this measure.

Importance

Investment in innovation and clean technology is a key lever for helping industry reduce GHG emissions while saving money. Since innovation and clean technology is a long-term strategy, it's important to monitor the impact of these investments over time.

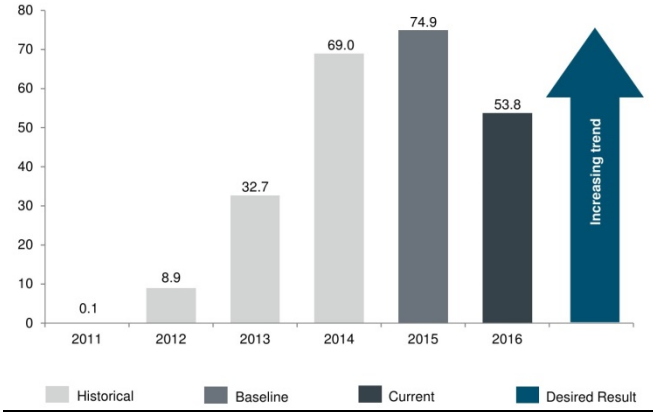
Target/Desired Result

Increasing trend.

Progress

While the results to date have been relatively modest for the methane component, it should be noted that in 2017 ERA funded 13 projects specifically targeted at methane reduction. These aim to accelerate the development of technologies that monitor, detect and reduce methane emissions. These new projects alone are estimated to lower emissions by 400 kilotonnes by 2020 and 2.4 Mt by 2030.

Figure CT 2.2: Estimated Methane Emissions Reductions – ICT Initiatives (estimated annual kilotonnes of CO_2 equivalent GHG emissions reductions from ERA's Innovation & Clean Technology Initiatives)



Data source: Emissions Reduction Alberta data collection

2.3 ESTIMATED GHG EMISSION REDUCTIONS – ELECTRICITY ICT INITIATIVES

Description

Estimated GHG Emissions Reductions - Electricity ICT Initiatives measures the estimated annual tonnes of CO_2 equivalent GHG emissions reductions from electricity projects funded by ERA.

Importance

Transitioning Alberta's electricity system to lower carbon is a key objective of the CLP. New technologies and innovation will play key roles in maintaining system reliability (smart-grid, energy storage, etc.) and diversifying the generation capacity.

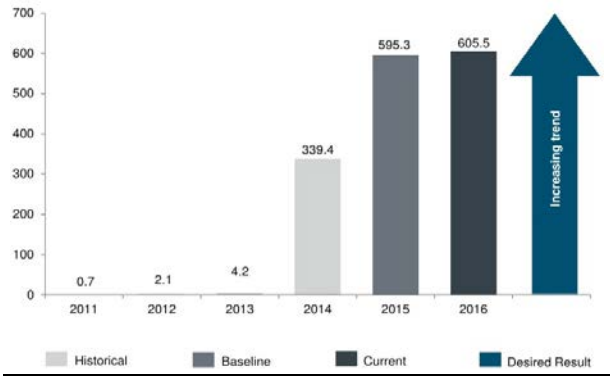
Target/Desired Result

Increasing trend.

Progress

There is a significant increase for 2014 and 2015, largely explained by the Blackspring Ridge Wind Project. It was funded in 2013, became operational for part of 2014, and has operated continually since 2015. These

Figure CT 2.3: Estimated GHG Emissions Reductions – Electricity ICT Initiatives *(estimated annual kilotonnes of CO_2 equivalent GHG emissions reductions from ERA's Electricity Innovation & Clean Technology Initiatives)*



Data source: Emissions Reduction Alberta

project-level emission reductions account for over 90 per cent of the total electricity emission reductions for those years. Projections for 2017 and beyond are based on current expectations of the project portfolio. Cumulative project-level emissions reductions are estimated to be 4 Mt by 2020 and 11 Mt by 2030 for the existing low-emitting electricity supply portfolio.

3.1 INNOVATION AND CLEAN TECHNOLOGY OF OIL SANDS EMISSIONS REDUCTIONS

ERA is responsible for projects that address climate leadership priorities, including the 100 Mt oil sands emissions cap. One key strategic focus is the reduced GHG footprint of fossil fuel supply, and as of 2016, ERA had committed $122 million this strategic area. It offers transformative technologies that can reduce GHG emissions over the long term and maximize the value of Alberta's resources. There are a total of 34 projects with a value of $631 million that represent estimated cumulative emissions reductions of 1.3 Mt by 2020 and 3.3 Mt by 2030.

ERA has partnered with 20 small- and medium-sized enterprises, and 21 of the projects are now complete. Looking forward to 2017-18, ERA has funded 11 more projects in the Methane Challenge, two of which focus specifically on the oil sands. A further $26 million has been committed with an estimated total project value of $59 million. And as well, ERA launched a $50 million Oil Sands Innovation Challenge seeking innovative technologies that reduce GHG emissions while lowering the cost of bitumen production and processing. Preliminary expressions of interest have been submitted and those shortlisted have been invited to submit a full proposal.

3.2 INNOVATION AND CLEAN TECHNOLOGY – COMMERCIAL VIABILITY

The development and acceleration of clean technology falls in four stages: research and development; development; demonstration; and implementation. Technologies in the development and implementation phases are closest to commercial viability. Table CT 3.2 identifies current ERA projects with the strongest likelihood for commercialization, though this depends on market need or uptake, funding, production and other factors.

Table CT 3.2: Innovation and Clean Technology – Commercial Viability

Organization	Project Title	Innovation Stage
City of Medicine Hat	Medicine Hat Concentrating Solar Thermal Power Demonstration Project	Demonstration
Enmax Coporation	ENMAX Micro Renewable Energy Program	Implementation
E-T Energy	Commercial Demonstration of ET-DSP ™ in the Athabasca Oil Sands	Demonstration

Evergreen Energy Technologies Inc.	Power Pod, Reliable Power for Remote Locations	Demonstration
Lethbridge Biogas Limited Partnership	Lethbridge Biogas/Cogeneration Project	Implementation
Suncor Energy Inc. Oil Sands	Alberta Oil Sands Energy Efficiency & GHG Mitigation Roadmap Program	Implementation
Suncor Energy Inc. Oil Sands	OTSG Oxy-fuel Demonstration Project	Demonstration
Alliance Pipeline (NR Green Limited Partnership)	Whitecourt Energy Efficiency Project	Demonstration
Cenovus Energy Inc	Installation of Air/Fuel Ratio Controllers and Vent Gas Capture on Engines	Implementation
ConocoPhillips Canada	Company-Wide Rollout of a Systematic Energy Efficiency Program Leading to Significant GHG Reductions in Alberta's Oil and Gas Industry	Implementation
EnCana Corporation	Vent Gas Capture for Engine Fuel Use	Implementation
Weyerhaeuser Company Limited	Weyerhaeuser Grande Prairie Evaporator Project	Implementation
West Fraser Mills Ltd	Bio-Methanation with Power Generation	Implementation
N-Solv Corporation	Solvent Based Gravity Drainage for SAGD Applications	Demonstration
Hi-Tec Fuel and Auto Ltd	Controller Systems to Utilize up to 50% NG with Diesel in Vehicles	Demonstration
Salt Canada Inc.	Air Injection into Ft. McMurray Landfill to Encourage CH4 to CO2	Demonstration
Saltworks Technologies Inc.	Low Severity ZLD using OTSG water	Implementation
Blackspring Ridge/Wind Project	300 MW Wind Energy Project – Utility Scale – Largest Wind Energy Project in Canada – Greengate Power Corporation	Implementation
Growtec	Source Separated Organics and Agricultural Waste Anaerobic Digester	Implementation
B&C Energy Services, Inc.	Innovative Enzergy™ Bio Enzymatic Coal Treatment Will Significantly Reduce GHGs and other Pollutants at Favorable Cost, Reduce Plant Life Cycle Costs, and Enable Alberta's Use of Lower Quality Coal	Demonstration
Canadian Fertilizer Institute I	Implementation of 4R Nutrient Stewardship and the NERP in AB	Demonstration
Canadian Fertilizer Institute II	Implementation of 4R Nutrient Stewardship and the NERP in Alberta (Phase 2)	Demonstration
Carleton University – Carlos Montreal	Intelligent NanoFertilizers - The Dynamics of Soil Bacterial Genomics Associated with Root Exudates and Nitogen Uptake by Wheat and Canola	Demonstration
The Prasino Group	Piloting the Days on Feed and Reduced Age at Harvest Protocols in Alberta /Piloting the Nitrous Oxide Emissions Reduction Protocol in Alberta	Demonstration

New Sky Energy	Soda Ash and Biocarbonate from a Low Energy Natural Gas Sweetening Process	Demonstration

4.1 ALBERTA TRANSIT RIDERSHIP

Description

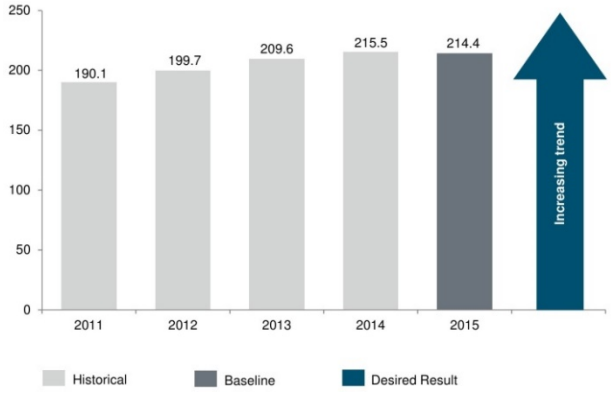
Alberta Transit Ridership measures the total number of conventional, auxiliary, and specialized trips, including reduced fare trips for seniors or students, in a year as reported by municipalities/regions to the Canadian Urban Transit Association (CUTA). Conventional transit services include regular scheduled bus and light rail. Auxiliary trips are defined as any transportation service where routes and schedules are arranged to meet the needs of passengers who sign up in advance, or which may cross municipal boundaries. Specialized service provides door-to-door demand response, such as transit for people with disabilities.

As data are dependent on reporting regions, there may be gaps. As an example, one community reported for only three of the five years. This does not significantly impact the results as the community in question represents about one per cent of ridership. 2016 results will not be available from CUTA until 2018.

IMPORTANCE

Using public transportation uses less energy and produces less pollution than travelling in private vehicles. By reducing the growth in private vehicle kilometers of travel, easing congestion and supporting more efficient land use patterns, public transportation reduces CO_2 emissions (American Public Transportation Association, The Benefits of Public Transportation). Increased use of public transit also indicates public behavior changes that help achieve CLP outcomes.

Figure CT 4.1: Alberta Transit Ridership (total # of public transit rides in millions aggregated for the province of Alberta)



Data source: Canadian Urban Transit Association: Canadian Transit Fact Book, Operating Data (2011-2015).

TARGET/DESIRED RESULT

Increasing trend.

PROGRESS

Results from 2011 through 2015 show an increasing trend in transit ridership. This reflects efforts and investment by municipal and the provincial governments to provide more options for public transportation.

4.2 ALBERTA'S LOW CARBON FLEET

Description

Alberta's Low Carbon Fleet measures the number of non-diesel vehicles as a share of the transit bus fleet as reported by municipalities/regions to the Canadian Urban Transit Association. Non-diesel vehicles include hybrid, biodiesel, gasoline, electric and compressed natural gas vehicles. As data are dependent on reporting regions, there may be gaps, and 2016 results will not be available from CUTA until 2018.

Importance

As Alberta focuses on boosting public transit use, it's important to ensure that public transit options also move towards lower emissions intensity. This indicator monitors Alberta's progress towards low-emission public transportation.

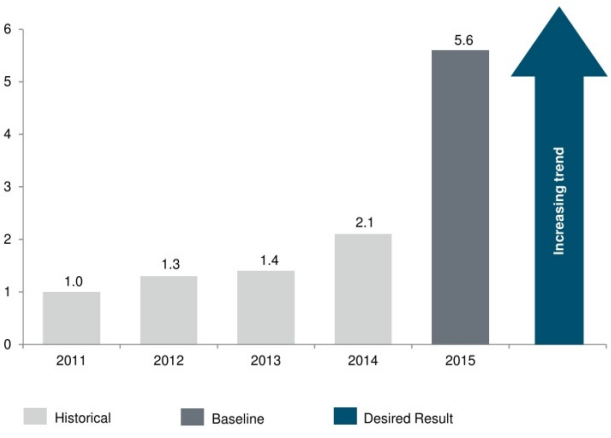
Target/Desired Result

Increasing trend.

Progress

The 2011 through 2015 results show an increasing trend in the low carbon fleet percentage with a significant increase in 2015. This increase is primarily due to adding 90 non-diesel vehicles to Calgary's public transit fleet, and Strathcona County adding five non-diesel vehicles. These results reflect the efforts and investment by municipal and provincial governments to provide more options for public transportation.

Figure CT 4.2: Alberta's Low Carbon Fleet *(total number of non-diesel vehicles in Alberta's transit fleet as a percentage of Alberta's total transit bus fleet)**



Data source: Canadian Urban Transit Association: Canadian Transit Fact Book, Operating Data (2011-2015)

**Numbers are based off of the total number of non-diesel vehicles, including gasoline, hybrid and biodiesel, electric and compressed natural gas (CNG)*

4.3 GHG EMISSIONS REDUCTIONS FROM TRANSPORTATION INTIATIVES

Greenhouse Gas Emissions Reductions (Transit) will measure the total tonnes of CO_2 equivalent GHG emissions reductions from CLP funded transportation initiatives. Methodology and results for this indicator will be provided and reported on in future CLP Progress Reports.

5.1 AFFORDABLE HOUSING UNITS PUBLIC TRANSIT ACCESSIBILITY

Affordable Housing Units Public Transit Accessibility will measure the total number of affordable housing units within one kilometre of major train stations or park-and-rides. Increasing the number of affordable housing units with good access to public transit options helps increase transit ridership, which reduces GHG emissions, and improved community wellbeing.

Methodology and results for this indicator will be provided and reported on in future CLP Progress Reports.

CLEAN TECHNOLOGY AND TRANSIT PROGRAM CONTRIBUTORS

FUNDED IN 2016-17

Primary	Additional
• Emissions Reduction Alberta Grant • Green Transportation Impact Studies	• Alberta Carbon Capture and Storage Program

ANNOUNCED IN 2017-18
Preliminary 2017 – Includes programs announced as of August 31, 2017

Primary
• Climate Change Innovation Technology Framework • Alberta Carbon Conversion Technology Centre • LRT – Calgary Green Line • LRT – Edmonton Southeast Valley Line Phase 1 • Green Transit Incentives Program

PROGRAM HIGHLIGHTS

8 Megatonnes

Projected cumulative GHG emission reductions from Emissions Reduction Alberta funded projects (2011 to 2020)

24 Projects

Awarded up to $500K under Emissions Reduction Alberta Grand Challenge: Innovative Carbon Use

$32.8 Million

Awarded to 13 projects through Emissions Reduction Alberta Methane Challenge (2017)

PROGRAM RESULTS

2016-17 Primary Contributors

Programs/Projects	2016-17		2017-18 Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
	Funding	Milestones		
Emissions Reduction Alberta Grant Emissions reduction Alberta supports the innovation as well as the research and development of clean technology. Funded projects address many market demands, including those in response to Alberta's methane reduction target and the oil sands emission cap. Funding comes from large final emitters who choose to pay into the Climate Change and Emissions Management Fund if they are unable to meet emissions reduction targets.	$33M	With stakeholders, roadmaps were developed to guide investment decisions and portfolio mix: • Technology Roadmap. • GHG Mitigation Roadmap. Completed a joint funding initiative with Sustainable Development Technology Canada (SDTC) to advance technology solutions that are deployable in Alberta. ERA Grand Challenge: Innovative Carbon Use: • Focus on technologies that transform carbon dioxide from waste material to an asset. • Round 1: 24 projects were awarded up to $500K each to develop their technologies. • Round 2: Four technologies were awarded up to $3M each to accelerate technologies over the next two years. • One of these projects will be awarded $10M in additional funding when the Grand Challenge concludes in 2019 to help commercialize their technology in	Ongoing support to funded projects. Continue to foster existing and forge new domestic partnership and collaborations. ERA Methane Challenge: • Focus on field-pilot and demonstration projects for methane monitoring, detection and reduction in the oil and gas, power generation, agriculture and forestry sectors. • 13 projects were awarded funding, totaling $32.8M. • GHG emission reductions projected to be 1.3 Mt by 2020. ERA Oil Sands Innovation Challenge: • Competition issued seeking innovative technologies that reduce GHG emissions and improve the cost competitiveness of bitumen production and processing within in situ or mined oil sands operations.	8 Mt (from 2011 to 2020)

		Alberta. • GHG emission reductions from winning projects are expected to generate 1 Mt of annual market emissions.	• $50M available to help the oil sands sector meet the province's cap on oil sands emissions at 100 Mt per year. • Winners to be selected and awarded funding. Shortlist applications invited to submit Full Project Proposals were notified in October 2017.	
Green Transportation Impact Studies These projects conduct impact and feasibility studies to identify the role that public and private investment can play in supporting reductions from passenger and freight transportation, as we provide guidance on future operating implications for the transportation network and estimate future consumer uptake in Alberta.	$180K	Electric Vehicle Impact Study: • Contractor selected to commission feasibility study. • Final report including recommendations to improve the update of lower emitting vehicles. Truck Stop Electrification Feasibility Study: • Contractor selected to commission feasibility study. • Final report including recommendations to improve the update of lower emitting vehicles.	Topics for additional feasibility studies will be selected as information is required.	*Enables GHG emissions reductions by providing information on possible options for further investment.*

2016-17 Additional Contributors

Programs/Projects	2016-17		2017-18 Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
	Funding	Milestones		
Alberta Carbon Capture and Storage Program The Alberta Carbon Capture and Storage (CCS) funding program supports the construction and operation of two large-scale CCS projects until 2025: the Quest CCS Project and the Alberta Carbon Trunk Line Project.	$49.3M	Quest CCS Project: • First Year of Commercial Operation - CO2 Injection Payment ($29.5M). ACTL CCS Project: • North West Redwater Partnership Construction milestone #2 ($19.8M).	Quest CCS Project: • Received a second injection payment for its net tonnes of carbon dioxide sequestered (Fall 2017). ACTL CCS Project: • No other construction milestone payment is due for the ACTL project in 2017. • Project expected to be operation in the fourth quarter of 2018/19 fiscal year.	2.8M/year[7]

Programs Announced in 2017-18 (preliminary as of August 31, 2017)

Programs/Projects	2017-18 Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
Climate Change Innovation Technology Framework Climate Change Innovation Technology Framework supports innovation, as well as the research and development of clean technology. Funded projects will support	Established the Climate Technology Task Force. The task force engaged with innovation system leaders and stakeholders and completed a report of recommendations to government to support the development of the CCITF. The development, approval and launch of the CCITF programs are in progress.	TBD

[7] 1 The Quest Project is expected to capture 1.08 Mt of CO2 each year for deep geological storage. Once operational, the ACTL Project is expected to capture approximately 1.68 Mt of CO2 from the Agrium fertilizer plant and the North West Refinery for enhanced oil each year.

and create the necessary pathways to achieving a lower carbon economy.		
Alberta Carbon Conversion Technology Centre The Alberta Carbon Conversion Technology Centre in Calgary will be a state-of-the-art research facility that will allow new carbon-use technologies to be tested on near-commercial scale. This initiative is additionally supported by the Government of Canada.	Secured funding from the Government of Alberta and the Government of Canada (Natural Resources Canada). Ministerial order enabling the acquisition of the Alberta Carbon Conversion Technology Centre by InnoTech Alberta Inc. signed. Construction started. Grant Agreement between Economic Development and Trade and InnoTech Alberta to be signed.	*Enables GHG emission reductions by supporting clean technology development and deployment.*
LRT – Calgary Green Line Alberta will expand the Calgary LRT network adding 20 kilometers of track and 14 stations from downtown Calgary towards the southeast. This initiative will be further supported by the Government of Canada and represents one of the largest infrastructure investments in Alberta's history.	Extensive engagement with the public in neighborhoods surrounding proposed LRT line: • Information sessions. • Guided walkabouts. • Community meetings. • Brochure distribution. Website development to provide public information. Land purchased for LRT line infrastructure (municipality funded). Continue public engagement activities to provide update on Phase 1 of the new LRT line. Execute funding agreement between Government of Alberta and City of Calgary for LRT Calgary Green Line. Construction will begin in late 2019 or early 2020. The LRT line is expected to be completed in 2026.	30,000/year[8]
LRT – Edmonton Southeast Valley Line Phase 1 Alberta will expand the Edmonton LRT network, adding 13 kilometers of track and 12 stations between Mill Woods	Construction of the LRT line under previously approved funding (April 2016). Previously approved loan converted into a grant. Continued construction of LRT line.	4,500/year[9]

[8] Estimated greenhouse gas (GHG) emission reductions starting post project completion. LRT expected to be operational by 2026.
[9] Estimated greenhouse gas (GHG) emission reductions starting post project completion. LRT expected to be operational by 2020

and downtown.	Phase 1 completion expected to be 2020.	
Green Transit Incentives Program (GreenTRIP) GreenTRIP supports capital projects in municipalities that lower greenhouse gas emissions by reducing reliance on single-occupancy vehicles such as the purchase of electric buses or transit facility upgrades such as LED lighting. Funded initiatives are further supported by the Government of Canada's Public Transit Infrastructure Fund.	Round 1 (not supported by Climate Leadership funding): • 49 projects supported in Calgary and Edmonton. Round 2 (not supported by Climate Leadership funding): 52 projects from across Alberta. Round 3 (partially supported by Climate Leadership funding): • Call for project applications executed. Round 3 Climate Leadership funding projects selected: • City of Red Deer purchase of 20 new CNG buses. • City of Cold Lake Bus Stop Enhancement and GPS Scheduling. • City of Grande Prairie Electric Bus Program – Replacement. • City of Grand Prairie purchase of 3 new electric buses. Additional GreenTRIP projects supported outside of Climate Leadership funding. Distribute payments to municipalities based on project delivery progress.	3, 400

SUPPORT AND ENGAGEMENT

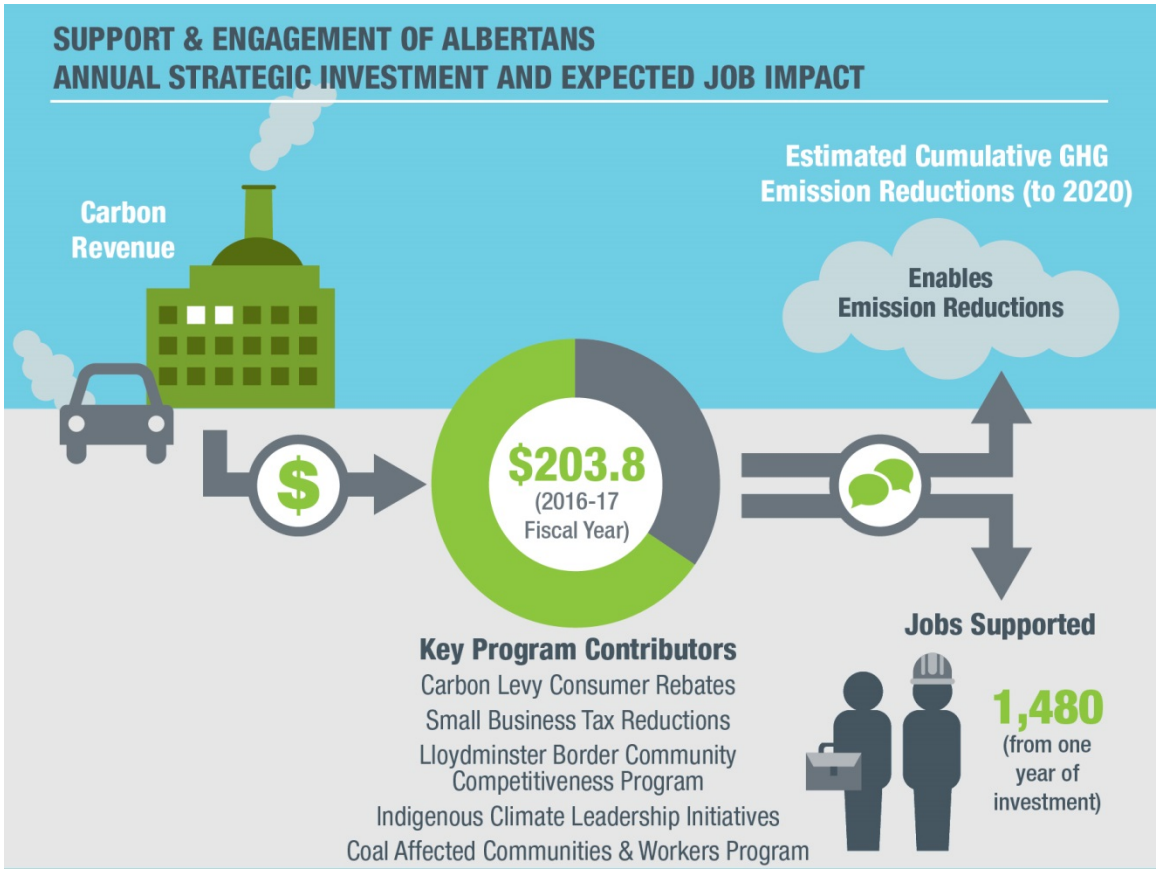
OBJECTIVES AND TARGETS

Throughout the development and implementation of the CLP, the Government is committed to supporting, engaging and collaborating with Albertans and key stakeholders, including representatives from potentially affected communities and Indigenous communities and organizations. Support and engagement focuses on the following objectives:

- **Support Albertans in the transition to a lower carbon economy.**
    - Low- and middle-income carbon levy rebates.
    - Small business tax cut.
- **Ensure meaningful inclusion and ongoing engagement of Indigenous communities and organizations in all aspects of the CLP.**
    - Enable Indigenous communities and organizations to develop green energy projects leading to an overall reduction in GHG emissions.
    - Support Indigenous communities and organizations to better understand how energy is used locally, and plan more effectively for opportunities and challenges related to renewable energy.
    - Create a new relationship between Indigenous peoples and the Government through potential opportunities such as an innovative joint decision-making governance model to develop and manage the Indigenous Climate Leadership Initiative.
    - Establish meaningful dialogue to support Indigenous participation in Alberta's electricity market, particularly in the Renewable Electricity Program.
    - Enhance climate literacy through the exchange of traditional knowledge and western science regarding climate change.
- **Ensure engagement of Albertans and key stakeholders along the engagement spectrum (share information, build awareness, build relations and collaborative partnerships).**

STRATEGIC INVESTMENTS

$203.8 million was invested in 2016-17 towards achieving this action area. The investment includes carbon levy rebates, the small business tax cut, and Indigenous engagement and capacity building. It is estimated that this investment supported about 1,480 jobs and will help reduce emissions.



PROGRESS SUMMARY

The following measures, indicators and information helps monitor progress towards achieving increased support and engagement of Albertans.

Performance Measures/Indicators	Baseline* (2015)	Result (2016)	Preliminary Result (2017)	6 Year Trend	Status
1. Support Albertans					
1.1 Climate Leadership Consumer Rebates *(millions of $ of carbon levy revenue provided to low and middle income Albertans)*	0	NA	152**	NA	NA
1.2 Small Business Tax Cut Contributions *(millions of $ of carbon levy revenue used to finance small business tax cut)*	0	NA	40**	NA	NA

*CLP applies a baseline of 2015. The carbon levy was not implemented until January 2017 so 2015 results are zero and 2016 results are not applicable.

** 2017 results are preliminary as carbon levy rebates are based on a benefit year of July to June and there is a lag in data from the Canada Revenue Agency.

Performance Measures/Indicators	Baseline (2015)	Result (2016)	Target/ Desired Result	6 Year Trend	Status
2. Ensure Inclusion and Engagement of Indigenous Communities and Organizations					
2.1 Indigenous Climate Leadership Investments *(millions of $ invested in Indigenous communities and organizations climate leadership projects)*	0	5.8	TBD	TBD	TBD
2.2 GHG Reductions from Indigenous Climate Leadership Programs *(tonnes of CO2 equivalent emissions) (in development)*	0	TBD	TBD	TBD	TBD
2.3 Indigenous Climate Leadership Engagement *(qualitative results)*	See 2.3 Narrative Results				
Additional/alternative measures/indicators are in development.					
3. Ensure Engagement of Albertans and Stakeholders					
3.1 Climate Leadership Engagement Activities *(# of climate leadership engagement activities delivered). Progress Detail provides a breakdown by AP2 spectrum levels – Inform, Consult, Involve,*	0	163	Maintain or increase	NA	●

Collaborate					
3.2 Climate Leadership Engagement Participants *(# of people who participated in engagement activities). Progress Detail provides a breakdown by AP2 spectrum levels – Inform, Consult, Involve, Collaborate*	0	24,316	Maintain or increase	NA	●

▲ Positive upward trend ▼ Positive downward trend ▲ Negative upward trend ▼ Negative downward trend
● Projected to meet or surpass target ● Projected to be near target ● Projected to be off target – Steady trend

PROGRESS DETAIL

1.1 CLIMATE LEADERSHIP CONSUMER REBATES

Description

Climate Leadership Consumer Rebates measures the total amount of carbon levy rebates provided to low- and middle-income Albertans in millions of dollars over a benefit year (July to June). Payments are delivered in four quarterly installments.

Full rebates are provided to single Albertans who earn $47,500 or less, and to couples, single parents and families who earn $95,000 or less. Additional households receive a partial rebate. The rebate is automatically given to Alberta residents who file a tax return and meet the income criteria. The data source is the Canada Revenue Agency and 2017 benefit year results will not be available until 2018.

Importance

Rebates are provided to lower and middle-income Albertans to offset costs associated with the carbon levy. The rebates protect those who spend a higher percentage of income on energy costs and have fewer financial resources to invest in energy efficiency products. The rebate is tied to income and household size. Since it is not tied to energy use, eligible recipients have an incentive to reduce emissions.

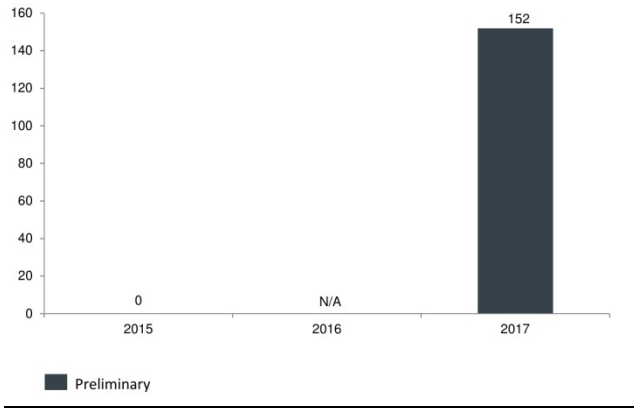
Target/Desired Result

NA.

Progress

The latest data indicate $152 million was provided to low and middle-income Albertans in the 2017 benefit year. Rebate amounts will increase in 2018 to coincide with the increased carbon levy rates.

Figure SE 1.1: Climate Leadership Consumer Rebates (millions of $ of carbon levy revenue provided to low and middle income Albertans)



Data source: Canada Revenue Agency

1.2 SMALL BUSINESS TAX CUT CONTRIBUTIONS

Description

Small Business Tax Cut Contributions measures the total amount of carbon levy revenue used to finance the small business tax cut in millions of dollars.

Importance

To help adjust to the carbon levy, small business corporate income tax rate was reduced by one third, from 3 per cent to 2 per cent effective January 1, 2017. While the carbon levy is intended to incent behaviour change, the Government is also committed to supporting small businesses as they transition to a lower carbon economy.

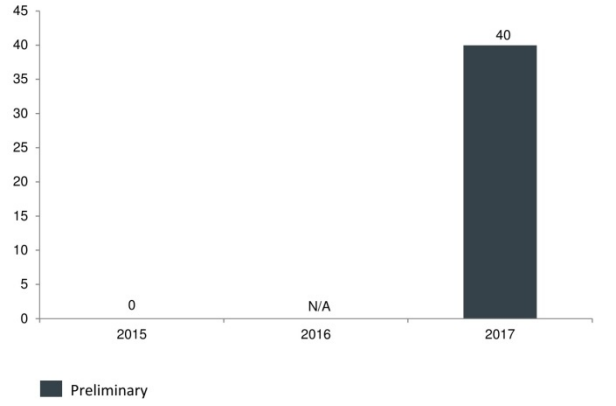
Target/Desired Result

NA.

Progress

The latest available data indicate $40 million of the carbon levy has been used to finance the small business tax cut. It is projected that the actual 2017 result will be approximately $185 million.

Figure SE 1.2: Small Business Tax Cut Contributions (millions of $ of carbon levy revenue used to finance small business tax cut)



Data source: Alberta Treasury Board and Finance

2.1 INDIGENOUS CLIMATE LEADERSHIP INVESTMENTS

Description

Indigenous Climate Leadership Investments measures the total amount invested in Indigenous communities' and organizations' climate leadership programs and their development over the course of the 2016-17 budget year (April - March) in millions of dollars. In 2016-17, program activities generally fell under four categories: planning, infrastructure, climate leadership awareness and training. All programs work to increase Indigenous peoples' awareness, capacity and participation in climate leadership initiatives that can reduce community GHG emissions and support communities' transitions to a lower carbon economy.

Importance

The Climate Leadership Advisory Panel report said it's expected that many Indigenous communities will experience more of the impacts of climate change due to factors including their locations, their economic situations and reliance on the environment. The Government is committed to ensuring this reality is expressly taken into account as carbon levy revenue is invested.

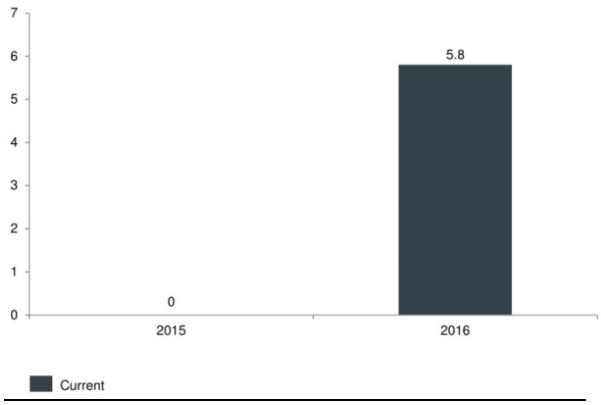
Target/Desired Result

TBD.

Progress

In the 2016-17 budget year, $5.8 million was invested in Indigenous communities and organizations. This funded two pilot programs (the Alberta Indigenous Community Energy Program and the Alberta Indigenous Solar Program), engagement and capacity building in Indigenous organizations, the Lubicon Lake Band Green Infrastructure Assessment, and supporting Indigenous communities adversely affected by the phase out of coal-fired emissions. The investment also supported engagement with Indigenous leaders on a joint decision-making body to lead the Indigenous Climate Leadership Initiative and to help develop seven transitional Indigenous climate programs launched in June 2017.

Figure SE 2.1: Indigenous Climate Leadership investments (millions of $ invested in Indigenous communities and organizations climate leadership projects)



Data source: Alberta Climate Change Office, Implementation Branch, Planning and Reporting

2.2 GHG REDUCTIONS FROM INDIGENOUS CLIMATE LEADERSHIP PROGRAMS

Description

GHG Reductions from Indigenous Climate Leadership Programs measures the annual GHG emission reductions in tonnes of CO_2 equivalent achieved by Indigenous climate leadership programs that directly reduce GHG emissions. While all Indigenous climate leadership programs support GHG emission reductions or the potential to reduce emissions, many will achieve this indirectly. GHG emissions reductions are calculated using methodologies specific to the project type (for example, solar projects) and the results aggregated for all direct emission reduction programs.

Importance

Indigenous peoples are at the forefront of the effects of climate change and the government is committed to ensuring they are able to participate in all aspects of Alberta's CLP. All Indigenous climate leadership programs work to help reduce GHG emissions and it is important to monitor their direct impacts on emissions reductions.

Target/Desired Result

TBD.

Progress

In 2016, one Indigenous climate leadership program was implemented which resulted in direct GHG emission reductions: the Alberta Indigenous Solar Program. Through the installation of solar photovoltaic systems in Indigenous communities, GHG emissions will be reduced or avoided. Projected GHG emission reductions or avoidance will be available in 2018.

2.3 INDIGENOUS CLIMATE LEADERSHIP ENGAGEMENT

Table SE 2.3 identifies and describes key Indigenous climate leadership engagement activities as well as the progress made and the importance of these activities.

Table SE 2.3: Indigenous Climate Leadership Engagement

Key Engagement Initiative	Description	Progress	Importance
Development of CLP	• Climate Change Advisory Panel held meetings with Indigenous communities in Calgary, Edmonton and Fort McMurray.	As a result, the panel incorporated the following key recommendations in the plan: • Concrete partnerships with First Nations and Métis communities on renewable energy and energy	Active engagement with Indigenous communities, organizations and members in the development of mechanisms devoted both to climate change mitigation and to future work on climate change adaptation. This

	• Panel met with 47 First Nation and Métis leaders. • Participants discussed outcomes, priorities and community interests related to climate change and Aboriginal peoples' perspectives.	efficiency. • Protecting vulnerable Indigenous communities from the impacts of carbon pricing. • Assistance in the development of a centre of Aboriginal peoples' knowledge to support implementation of climate change and adaptation policies.	is a key element of the CLP and aligns with the government's commitment to renew and improve its relationship with Indigenous people. The objective of this engagement is to ensure that Indigenous communities can be partners in advancing climate change outcomes and ensure that their unique needs and opportunities are understood and considered throughout the development and implementation of Alberta's CLP.
Advisory Panel on Coal Communities	Government formed an Advisory Panel on Coal Communities (APCC) to ensure workers and community members are consulted in order to understand their challenges and ideas for the long-term economic sustainability of their communities, and to provide comprehensive advice and options to the government on an approach to support affected workers and communities.	The APCC held facilitated discussions with stakeholders and First Nations in communities most affected by the retirements of coal-fired generation facilities and associated mining operations. The panel met with municipal leaders, First Nations, community economic development organizations and small businesses in order to: • Examine the potential effect of the retirement of coal-fired generation plants and associated mining operations on communities and workers. • Identify strategies to support worker transition. Panel recommendations were released November 10, 2017.	The panel's engagement meetings helped the panel understand the challenges and opportunities communities and workers are facing to ensure next steps are responsive to concerns and align with community priorities. Albertans and stakeholders were also able to share their feedback through an online survey, which closed May 31 2017 and through town hall meetings with Minister Bilous in August, 2017.
Oil Sands Emissions Limit Implementation	Government is gathering feedback on the Oil Sands Advisory Group's (OSAG) recommendations for implementation of the 100 Mt oil sands emissions limit. The objective of this engagement is to ensure First Nations and Métis peoples in the oil sands region have the knowledge and context needed to express interests and concerns surrounding the Oil Sands Emissions Limit.	There will be two opportunities for communities to take part in this engagement. The first phase is an information-sharing session that will generally introduce current information on oil sands production, a summary of OSAG's recommendations on the Oil Sands Emissions Limit and its potential impact to Indigenous communities. Community members will then have the opportunity to provide feedback on OSAG's recommendations	It is expected that the engagement process will strengthen government's relationship with Indigenous communities and provide government the unique perspectives of Indigenous peoples in Alberta. OSAG specifically recommended that Indigenous communities be consulted on their recommendations. Topics to consider for discussion include: a) how Indigenous communities may be affected should local oil sands

			projects fail to receive regulatory approval due to the proposed limit and b) how Indigenous communities can contribute to research and innovation in existing oil sands operations.
Other Engagement	Grants were provided to Indigenous organizations to increase climate literacy in Indigenous communities, build capacity and expertise in Indigenous organizations, and support opportunity studies for Indigenous communities. As part of the Government's commitment to the UN Declaration of the Rights of Indigenous Peoples, this engagement strategy has been developed to facilitate a collaborative environment for renewed relationships between government and Indigenous communities.	18 grants were provided to Indigenous communities and organizations, including: • 11 grants to provide capacity to Indigenous communities and organizations to participate in the CLP and build climate literacy. • Two grants to support Technical Working Groups comprised of First Nations, Métis and government representatives. • One grant to support a green infrastructure assessment in the Lubicon Lake Band. • Four grants to support opportunity studies for Indigenous communities adversely impacted by the phase out of coal-fired electricity generation in Alberta by 2030. More than 40 regional and community workshops, engaging more than 1,000 Indigenous people, were held across Alberta in Indigenous communities. Issued an online survey and written submission guidebook seeking feedback on opportunities and priorities for Indigenous people in a lower carbon economy. Four meetings have been held with Indigenous leaders to determine a potential joint delivery governance structure for future climate programs.	Active engagement with Indigenous communities, organizations and members in the development of mechanisms devoted both to climate change mitigation and to future work on climate change. Adaptation is a complementary element to the CLP and aligns with the government's commitment to renew and improve its relationship with Indigenous peoples. Engagement activities help ensure climate literacy and awareness is available to all Indigenous communities and organizations to facilitate equal benefit from all opportunities arising from climate initiatives and programs.

3.1 CLIMATE LEADERSHIP ENGAGEMENT ACTIVITIES

Description

Climate Leadership Engagement Activities measures the total number of reported climate leadership engagement events conducted in one year. Engagement information and data are provided to Alberta's Climate Change Office by CLP program leads and aggregated across all programs. Based on descriptions provided by the CLP program leads, data are sorted in five major categories of activities: public messaging, CLP/program feedback, information sessions, consultation sessions and leadership meetings.

Importance

It is important that Albertans have the opportunity to address an issue of such importance as climate change. Benefits of effective public engagement will help support the behavior change required to achieve CLP outcomes. Tracking engagement activities can help identify opportunities to increase their effectiveness.

Target/Desired Result

Maintain or increase.

Progress

In 2016, 163 engagement events/sessions were reported. This does not include the extensive engagement activities conducted by the Climate Change Advisory Panel that helped inform its recommendations in 2015. Preliminary results for 2017 show 135 engagement events through the end of August, on track to meet the year's desired results.

Table SE 3.1 Climate Leadership Engagement Activities

Type	2016	2017 (Preliminary)
Public messaging	9	15
CLP/Program feedback	120	50
Information sessions	8	31
Consultation sessions	24	34
Leadership meetings	2	5
Total	**163**	**135**
Grand Total	**298**	

3.2 CLIMATE LEADERSHIP ENGAGEMENT PARTICIPANTS

Description

Climate Leadership Engagement Participants measures the number of people who participated in various engagement activities within the year. Engagement information and data are provided to Alberta's Climate Change Office by CLP program leads and aggregated across all programs. A household participating in an EEA program is equated to one individual. To align this process with leading practices, the participant's level of engagement is categorized according to IAP2's Public Participation Spectrum:

- Inform: To provide the public with balanced and objective information to understand the problems, alternatives, opportunities and/or solutions related to climate change policy and programs.
- Engage: To obtain feedback on analysis, alternatives and/or decisions related to climate change policy and programs.
- Involve: To work directly with stakeholders to ensure that concerns and aspirations are consistently understood and considered.
- Collaborate: To partner with stakeholders on decisions, including the development of alternatives and the identification of the preferred solution.
- Empower: To place final decision-making in the hands of stakeholders.

Importance

It is important to the success of the CLP that Albertans be actively engaged. Tracking the level of engagement helps assess where there may be gaps, and if the government is engaging at the appropriate level for the specific needs.

Target/Desired Result

Maintain or increase.

Progress

In 2016, more than 24,000 Albertans were engaged at some level in the CLP. This does not include the extensive engagement conducted by the Climate Change Advisory Panel to help inform the CLP's development in 2015. Preliminary results for 2017 show growth of more than seven times, with more than 200,000 CLP-engaged participants.

Table SE 3.2: Climate Leadership Engagement Participants provides a breakdown of the number of participants by IAP2's Public Participation Spectrum levels.

Table SE 3.2 Climate Leadership Engagement Participants

Intent (based on IAPS'2 Public Participation Spectrum)	2016	2017 (Preliminary)
Inform	15,632	42,364
Engage	7,946	145,815
Collaborate	575	7,281
Involve	113	639
Empower	50	75
Total	**24,316**	**196,174**
Grand Total	**220,490**	

SUPPORT AND ENGAGEMENT PROGRAM CONTRIBUTORS

FUNDED IN 2016-17

Primary

- Climate Leadership Consumer Rebates
- Small Business Tax Reduction
- Lloydminster Border Community Competitiveness Program
- Indigenous Engagement and Capacity Building
- Coal-Affected Communities and Workers

ANNOUNCED IN 2017-18
***Preliminary 2017 – Includes programs announced as of August 31, 2017**

Primary

- Alberta Indigenous Climate Capacity Program
- Alberta Indigenous Green Employment Program
- Community Environment Action Grant
- Greenhouse NG Rebate Program

PROGRAM HIGHLIGHTS

26 NGOs receive Community Environment Action Grant

$149 Million Rebated to low and middle income households

220,490 Albertans engaged in CLP engagement activities (2016 to Aug 2017)

2,238 Coal affected community telephone town hall participants

2% Small business tax rate

PROGRAM RESULTS

2016-17 Primary Contributors

Programs/Projects	2016-17		2017-18 Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
	Funding	Milestones		
Climate Leadership Consumer Rebates *Alberta is providing rebates to lower and middle-income Albertans to offset the costs associated with the carbon levy. The rebates protect those who spend a higher percentage of their income on energy costs and have fewer financial resources to invest in energy efficiency products.*	$149M	Legislative amendments to allow for rebates to be issued. Rebates issued starting January 2017.	Ongoing issuing of consumer rebate payments on a quarterly basis in January, April, July and October.	*Supports lower and middle-income Alberta households in the transition towards a lower carbon economy.*
Small Business Tax Reduction *Alberta reduced the corporate income tax rate effective January 1, 2017 to help the province's small businesses adjust to the new cost of carbon. The tax reduction will increase Alberta's tax advantage for small businesses.*	$40M	Legislative amendments to allow for tax rate reduction for small businesses. Small business tax rate reduced from 3 per cent to 2 per cent effective January 1, 2017.	Maintain reduced small business tax rate.	*Supports Albertans and Alberta businesses in the transition towards a lower carbon economy.*
Lloydminster Border Community Competitiveness Program *This program provides the Lloydminster Competitive Adjustment Grant to eligible retail fuel dealers in the border city of Lloydminster to cover the difference in total fuel tax and the*	$1M	Funding secured in reserve to be provided to eligible grant applicant. Applicants filing period began (January 2017). Applicants began filing claims for January – March 2017 as of March 31st, 2017.	April 1, 2017 – August 31st, 2017: • 10 Registrants have received funding totaling $1,169, 404. • Includes both payouts for the period of January – March 2017 as well as post April 1st, 2017.	*Supports Alberta in the transition towards a lower carbon economy.*

carbon levy imposed by Alberta, and fuel tax imposed by Saskatchewan on liters of qualifying fuel sold. The grants allow retail fuel dealers to offer fuel prices that compete with Saskatchewan-based retailers within the community.			Ongoing issuing of grants on a monthly basis.	
Indigenous Engagement and Capacity Building *This program provides grants to Indigenous communities to increase knowledge of climate leadership and lower carbon economic opportunities. The program increases awareness of available climate leadership programs and how local actions can be taken to decrease community and organization GHG emissions.*	$2M	17 grants were provided to Indigenous communities and organizations: • 11 grants to provide capacity to participate in the Climate Leadership Plan and build climate literacy. • Two grants to support Technical Working Groups comprised of First Nations, Métis, and government representatives. • Four grants to support opportunity studies for Indigenous communities adversely impacted by the phase-out of coal-fired electricity generated in 2030. More than 40 regional and community workshops, engaging more than 1,000 Indigenous people were held in Indigenous communities.	All program activities were completed in 2016-17.	*Supports Albertans in the transition towards a lower carbon economy.*

		Issued an online survey and written submission guidebook seeking feedback on opportunities and priorities for Indigenous peoples in a lower carbon economy.		
Coal-Affected Communities and Workers Program *Alberta is currently developing a transition plan for the communities and workers impacted by emissions from coal-fired electricity generation being phased out by 2030.*	$356K	Advisory Panel on Coal Communities (APCC) formed to gather information about challenges and opportunities, share information about current programs and generate ideas for training and new opportunities. The APCC has completed its mandate as of September 30, 2017. The report: "Phase-Out of Coal-Fired Emissions: Supporting Impacted Workers and Communities" officially submitted to Government October, 2017. Stakeholder engagement including: • Telephone Town Halls in May, 2017 (2,238 participants). • Minister Town Halls in August, 2017 (326 participants). • Minister meetings with coal community leaders in August, 2017.	Launch of the Coal Community Transition Fund In September, 2017, part of the Community and Regional Economic Support (CARES) program: • Hanna, Alberta awarded $450K through the program to stimulate economic diversification. • Application window open October 1 – November 30, 2017. Economic Development and Trade staff is providing hands-on assistance to coal communities scoping and acting on economic development opportunities.	*Supports Alberta in the transition towards a lower carbon economy.*

Programs Announced in 2017-18 (preliminary as of August 31, 2017)

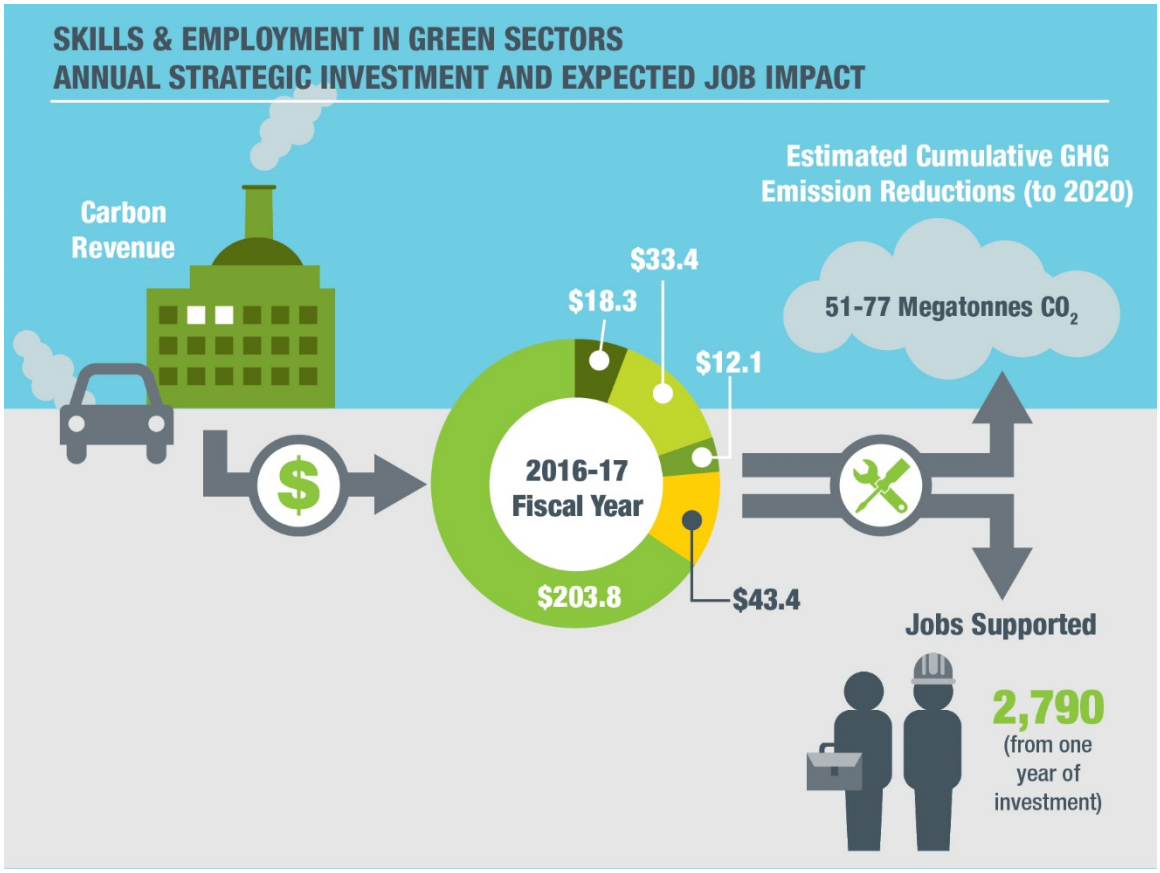
Programs/Projects	Actions/Next Steps	Estimated Cumulative GHG Reductions to 2020 (tonnes)
Alberta Indigenous Climate Capacity Program (AICCP) *This program provides grants to Indigenous communities to increase knowledge of climate leadership and lower carbon economic opportunities.*	Program criteria developed. Program launch (June 2017). Approval of eligible projects. Ongoing support to Indigenous communities.	*Supports Albertans in the transition towards a lower carbon economy.*
Alberta Indigenous Green Employment Program *This program provides grants to train Indigenous people for employment in the green economy. Skills are focused on building, maintaining or participating in innovative ways to reduce GHG emissions and provide Indigenous people with the skills to be employed through Alberta's transition to a lower carbon economy.*	Program criteria developed. Program launch (June 2017). Grants provided to Alberta Aboriginal Skills and Employment Training Strategy (ASETS) agreement holders for eligible projects. Ongoing support to Indigenous communities.	*Supports Albertans in the transition towards a lower carbon economy.*
Community Environment Action Grant *This program provides grants to non-profit groups to design and deliver evidence-based education projects to support Albertans, young and old, rural and urban, to better understand and address climate change.*	Application Round 1: • 62 applications received for grant amount ranging from $25,000 to $150,000 per applicant. Application Round 1: • 26 applications from non-profits selected for grant funding. Subsequent application rounds awaiting funding approval.	*Supports Albertans in the transition towards a lower carbon economy.*

Greenhouse NG Rebate Program *This program provides grants to eligible greenhouse operators equal to 80per cent of the carbon levy paid on their purchase of eligible natural gas and propane crop production related heating within their greenhouses. This program will reduce the impacts on cost competitiveness for greenhouse growers.*	Program development and approvals. Conducted an Online Webinar for Stakeholders. Program launch (July 2017). Application Period 1: • 119 applications submitted. • Applications currently being processed and over half the applicants have received grants. Application Period 2: (January 2018). Application Period 3 (July 2018). Application Period 4 (January 2019).	*Supports Albertans in the transition towards a lower carbon economy.*

SKILLS & EMPLOYMENT IN GREEN SECTORS

The CLP reduces GHG emissions while diversifying our economy and creating jobs. Recycling carbon levy revenue into CLP programs helps stimulate economic growth and provides new opportunities for Albertans to invest and work in green sectors.

The electricity transition from coal to renewables, residential and industrial energy efficiency programs, clean technology research, development and deployment and the construction of green infrastructure are all examples of CLP investments that contribute to diversifying the economy, while at the same time providing opportunities to grow the oil sands sector under the 100 Mt emissions cap. These program investments directly create jobs through implementation and indirectly through supply and access to clean products and services.



The following indicators helps monitor the market demand for environmental skills, knowledge, experience and/or competencies and the impact of CLP investments on supported jobs.

Performance Measures/Indicators	Baseline (2015)	Result (2016)	Target/ Desired Result	6 Year Trend	Status
1. Green Skills					
1.1 Green Skills Demand *(proxy: green job postings as a percentage of job postings in Alberta)*	1.50	1.60	Increasing Trend	▼	●
2. Jobs Supported					
2.1 Alberta Jobs Supported *(total direct, indirect and induced jobs created or maintained as a result of actual CLP investment annually)*	NA	2,799	NA	NA	NA

▲ Positive upward trend ▼ Positive downward trend ▲ Negative upward trend ▼ Negative downward trend
● Projected to meet or surpass target ● Projected to be near target ● Projected to be off target – Steady trend

PROGRESS DETAIL

1.1 GREEN SKILLS DEMAND

Description

Green Skills Demand measures the percentage of job postings that are categorized as green according to CEB Talent Neuron (CEB) definitions and methodology as a proxy for green skills demand. CEB defines green jobs as positions found at some level to be environmentally beneficial. This includes jobs that are purely green in focus, activities and skills (e.g. environmental sustainability planner), jobs that are primarily green in focus, activities and skills, (e.g. solar panel engineer), and jobs that are somewhat green in focus, activities and skills, (e.g. water plant operator).

Green skills demand is measured by extracting jobs postings from CEB's comprehensive database of job advertisements from 198 websites across Canada. Only job postings from known employers were considered.

Importance

As Alberta works towards a lower carbon economy, we can expect to see shifts in the skills required for existing occupations, as well new jobs. Estimating the demand for skills is essential for transitioning to a lower carbon, more diversified economy, as it helps prevent bottlenecks that may occur as a result of skills shortage.

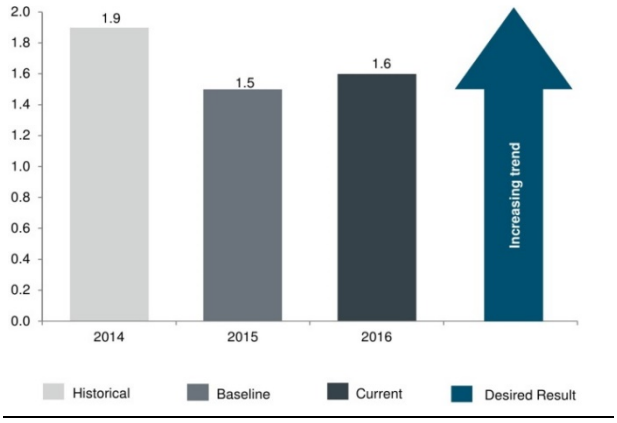
Target/Desired Results

Increasing trend.

Progress

The results show an increase in the percentage of green job postings in the last two years; however green job postings have not yet reached 2014 levels. This result reflects the downturn in the economy that resulted in an overall decrease in job vacancies (approximately 20 per cent decrease in overall job postings from 2014 to 2016). It is expected that as the economy recovers, the recent upward trend will continue as investments grow in lower carbon sectors including renewable energy and energy efficiency.

Figure SJ 1.1: Green Skills Demand (total percentage of green job postings in Alberta)



Data source: Gartner, Inc.

2.1 ALBERTA JOBS SUPPORTED

Description

Alberta Jobs Supported estimates the total direct, indirect and induced jobs created as a result of CLP actual investments in the reporting year. The measure is calculated by Statistics Canada using an input-output (IO) model. Direct jobs are those required to work directly on a project. Indirect are those created as a result of the project, for example new jobs at a firm that provides materials and induced jobs cover those additional jobs that result from the increased household spending. One supported job is equivalent to one person-year job, that is, one year of employment for an individual. Actual 2016-17 expenditures categorized by associated North American Industry Classification System codes for each of the CLP programs was provided to Statistics Canada by the Alberta Climate Change Office for use in the IO model.

Importance

The CLP moves Alberta towards a lower carbon economy. At the same time, CLP policies and investments provide additional benefits by boosting economic activity, increasing gross domestic product and supporting new jobs. Monitoring the number of jobs supported by CLP program investments using a common methodology and comparing results over time will help assess its effectiveness.

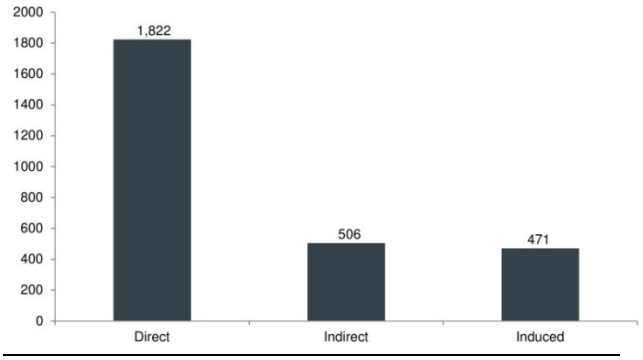
Target/Desired Result

NA.

Progress

In 2016-17, $311 million was invested back into the economy in programs and policies designed to reduce GHG emissions, support a lower carbon diversified economy and to support Albertans through this transition. This investment supported more than 2700 jobs. This is expected to increase as investment increases; and as many of the projects move into the implementation stages, increasing demand for construction-related jobs and then operational jobs.

Figure SJ 2.1: Alberta Jobs Supports (total number of direct, indirect and induced jobs for 2016)



Data source: Statistics Canada

WHAT'S NEXT

The Climate Leadership Plan is a vision for Alberta's future. And while it has already accomplished a great deal major milestones still lie ahead. In 2018, for example, the Government will bring forward regulations that fulfill its promise to limit emissions from the oil sands at 100 megatonnes.

Another milestone is the recent release of a formal framework for a carbon competitiveness incentive system, which improves upon the Specified Gas Emitters Regulatory system that applied to large industrial emitters. It rewards those with the best technology and systems, and protecting the competitiveness of Alberta's carbon-intensive and trade-exposed sectors. It will be covered in future reports.

In order to make sure Alberta is getting to that destination – and getting there in the most efficient and effective way possible – the government will continue to report publicly on its progress.

Alberta's journey down the road towards a cleaner and greener future is underway, guided by the Climate Leadership Plan.

APPENDIX

METHODOLOGY

Forecasted GHG Emissions for Alberta (Ultimate Outcome - Reduced Greenhouse Gas Emissions)

In collaboration with Navius Research Inc., the Alberta Climate Change Office (ACCO) has undertaken sector and economy-wide assessments of economic and environmental (GHG) impacts using an environmental integrated economic model. The economic model is a technology-rich computable general equilibrium model built by Navius Research Inc. and operated by ACCO staff. The model is built on Statistics Canada input-output tables (with some adjustments) with 2010 as a base year, and is calibrated to Environment and Climate Change Canada National Inventory Reports and internal Government of Alberta forecasts of energy production and economic activity. ACCO staff work continuously to improve the method used to forecast the impacts of policy scenarios and the resulting emission levels.

Strategic Investments

- **Investment $**

Investments are actual 2016-17 expenditures.

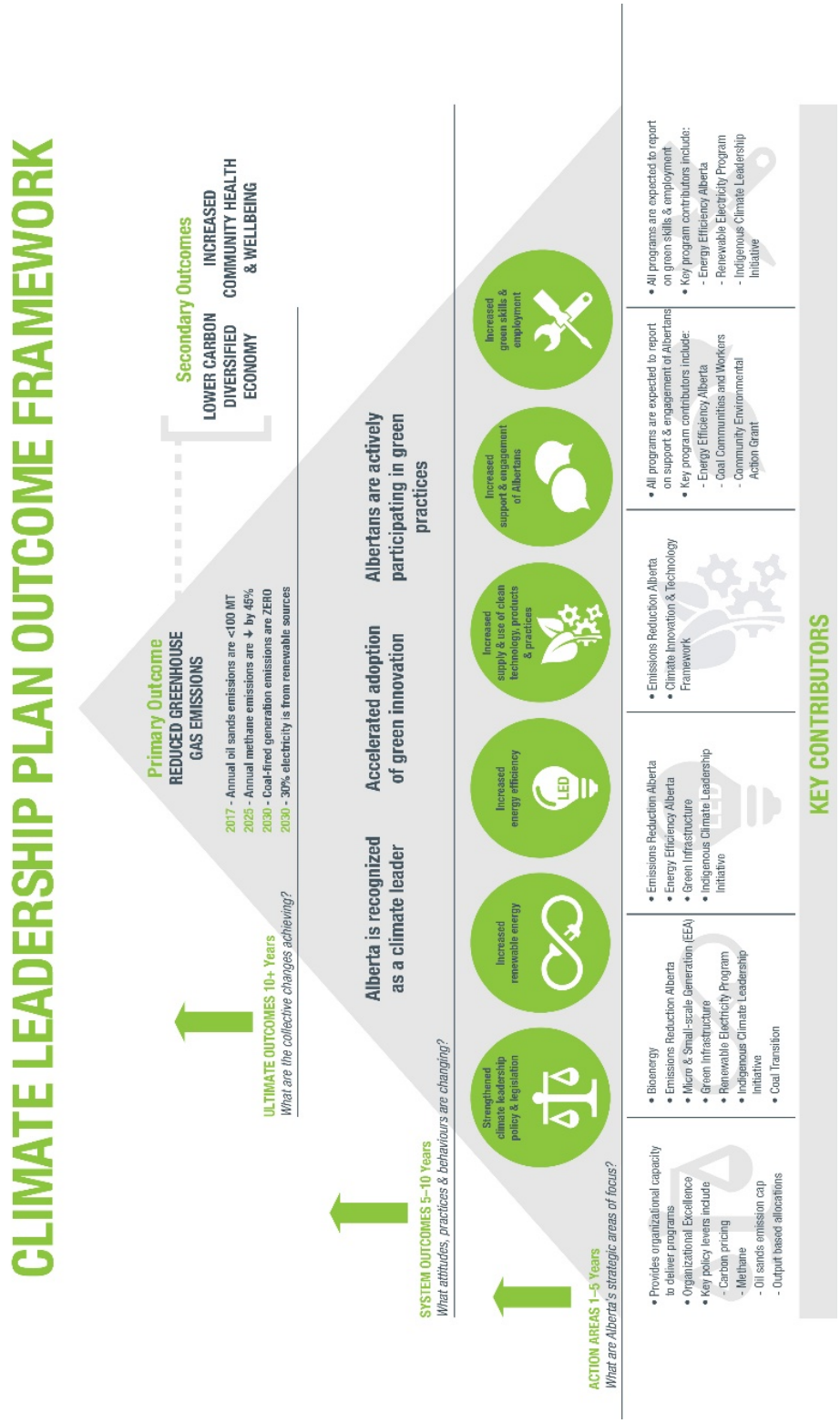
- **Expected Job Impact**

Jobs Supported is an estimate of the number of jobs that will be supported as a result of the one-year investment. The estimates are calculated by Statistics Canada using input-output models for 2016-17 actual spending as described in Green Skills and Employment, 2.1 Alberta Jobs Supported. Jobs have been rounded to the tens in the strategic investment infographic.

- **Expected Impact of Investment – Cumulative GHG Emissions Reductions to 2020**

Cumulative GHG emissions reductions to 2020 are estimated based on what is expected to occur as a result of the one year of spending with results cumulated from 2017 to 2020 inclusive. Policy and legislation emissions reductions are estimated using the Navius model described above. All other action area estimates are calculated based on an aggregate of estimated cumulative reductions from programs that received funding in 2016-17.

CLP OUTCOME FRAMEWORK



INDEX OF CLP PROGRAMS AND INITIATIVES (IN ALPHABETICAL ORDER)

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