

# ALBERTA AND CLIMATE CHANGE

## Objectives/priorities

- Manage and reduce greenhouse gas emissions in-line with the following provincial targets:
  - » By 2020: reduce emissions by 50 megatonnes from business as usual.
  - » By 2050: reduce emissions by 200 megatonnes from business as usual.
- Increase the resilience of Alberta's communities and infrastructure to the impacts of climate change.

## Highlights/measures/actions

### Reviewing our approach

- Alberta is currently undertaking a comprehensive review of our approach to climate change and energy.

### Industrial emission reduction actions

- In 2007, Alberta was one of the first jurisdictions in North America to put a price on carbon and to regulate emission reductions from large industry.
- Under Alberta's Specified Gas Emissions Regulation, large industrial facilities must reduce their emissions intensity by 12% from an established baseline. Facilities may choose to make emissions reductions through facility improvements, purchase carbon offsets, purchase or use emission performance credits or pay a price of \$15 for every tonne over their target. Between 2007 to 2013, approximately 51 Mt of emissions has cumulatively been avoided through facility improvements or offset purchases.
- Alberta has had great success in limiting venting, flaring, and fugitive (methane) emissions. Alberta initiated work in flaring and venting along with the Alberta Clean Air Strategic Alliance starting in 1998, where Alberta's framework has been adopted by the Global Gas Flaring Reduction Partnership (led by World Bank). This framework resulted in conserving 95.3% of solution gas produced in Alberta in association with oil and bitumen in 2013.

### Reductions across sectors through offsets

- Alberta's carbon offset system provides the dual benefit of helping reduce greenhouse gas emissions while enabling emitters to make economically responsible choices. In turn, the ability to sell offset credits provides incentives for all areas of the economy to innovate and invest in activities that reduce their own greenhouse gas emissions.

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- From 2007 to 2013 (compliance years), approximately 22 Mt reductions have been retired through offset credits and 29 Mt have been registered. The majority have come from improved agricultural management practices. To note that Alberta's ability to enable aggregation of offsets, initiated in the agricultural sector, is unique and many jurisdictions have approached Alberta so we can share learnings and approaches to doing so, along with our expertise in protocol development and system implementation.
- Alberta has over 30 approved offset protocols, all founded in meeting international requirements including ISO-based verification by third parties.

**Bioeconomy advance**

- Alberta's Renewable Fuel Standard Regulation requires 5% ethanol and 2% biodiesel blending and has resulted in up to 1 Mt of reduced emissions per year.
- Alberta's Nine Point Bioenergy Plan was launched with \$240M in support.
- Alberta's Climate Change and Emissions Management Corporation launched the Biological Greenhouse Gas Management Program in 2012 to support development of technologies for agriculture, forestry and waste management sectors with a goal of reducing net emissions from the province by 50 Mt per year by 2020.
  - » An example of a project supported is the Enerkem project, located at the Edmonton Waste Management Centre, is the world's first commercial waste-to-biofuels facility which launched in June 2014. Ten years in the making to find a way to transform solid household waste into biofuels, the site will convert 115,000 tonnes of waste to 38 million litres of bioethanol per year once it is in full production by 2016.
- Alberta's Bioenergy Producer Credit Program supports bioenergy producers, and has provided hundreds of millions of dollars to drive bioenergy production, which now represents about 2.5% of Alberta's electricity supply.
- Alberta has several offset protocols and projects related to agriculture and forestry to advance the bioeconomy, including: Decomposition of Agricultural Materials (biogas), Dairy Farm Management, Including Edible Oils in Cattle Feeding Regimes, Reducing Age at Harvest of Beef Cattle, Reducing Days on Feed of Beef Cattle, Conservation Cropping, Feeding of Swine and Storing and Spreading of Swine Manure, Nitrous Oxide Emission Reductions, Biofuel Production and Usage, Non-Incineration Thermal Waste Conversion, Diversion of Biomass to Energy from Biomass Combustion Facilities, Changes in Forest Harvesting Practices, Biofuels.

**Investing in technology to reduce emissions**

- Through the \$15/tonne price on carbon, \$503 million has been collected for the Climate Change and Emissions Management Fund - \$248.9 million has been invested into 100 innovative and clean energy projects, including 3 adaptation projects. The fund is accessible to innovative technologies being developed both across Canada and around the world. These investments are projected to achieve 10 Mt of reductions cumulatively by 2020. More notably, the investment is aimed at advancing step change technology for reduced emissions in Alberta and internationally.

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- Government of Alberta has committed \$1.3 billion to fund two carbon capture and storage projects – Shell Quest and the Alberta Carbon Trunk Line - which will be operational in 2015 and 2017. These projects will reduce greenhouse gas emissions by 2.76 Mt annually. Alberta is also supporting pilot and lab-based projects related to CCS deployment. In addition to investment in projects, Alberta has: strong scientific knowledge to support their deployment with detailed resource mapping and storage potential characterization; a robust regulatory and policy framework for CCS; and is a partner in various international organization sharing knowledge to accelerate the development, demonstration and deployment of CCS projects on a global scale.
- Alberta’s Climate Change and Emissions Management Corporation launched the Grand Challenge aimed at carbon use, with Round 1 of 3 complete and projects supported across Canada and internationally.

**Greening electricity**

- In Alberta, 47% or almost 7000 MWs of the province’s electricity generating capacity or comes from alternative and renewable energy sources, including wind, hydroelectricity, biomass generation and gas cogeneration. (Source: 2014 Alberta Utilities Commission)
- Of this, 19% is non-emitting renewables (5.5% Hydro, 9.0% Wind, 2.5% Biomass), with the other 28% low-emitting cogeneration. Additionally, low-emitting natural gas fired generation now exceeds the coal-fired generation capacity in Alberta’s electricity system.
- This is a significant shift from 20 years ago when we had a total of 8600 MW of generation capacity, of which 66% of our capacity was coal-fired generation and only 22% of the system was from alternatives and renewable energy sources.

**Facilitating personal emission reduction actions**

- Energy efficiency rebates of \$52 million were provided between 2009 and 2012, resulting in 2.6 Mt of reductions over the lifetime of the promoted technologies.
- Investing in public transportation, including but not limited to a \$2B GreenTrIP program.

**Greening Government**

- The Government of Alberta is reducing the environmental impact of its energy consumption and ensuring infrastructure is built, managed, and operated in a sustainable manner.
- Currently, 100% of the Government of Alberta’s power requirements are supplied by Alberta renewable sources. This amounts to approximately 159,000 tonnes/year of greenhouse gas emissions avoided.
- The Government of Alberta has provided \$4 million to the Municipal Climate Change Action Centre to help Alberta municipalities take action on climate change through reducing emissions or supporting adaptation.

**Adapting to a changing climate**

- The Climate Change and Emissions Management Corporation has supported three major adaptation projects that are increasing awareness of climate impacts on biodiversity, water

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and forests in Alberta. These projects are providing critical insights into the impact of climate change throughout the province.

- The Government of Alberta participates in the Prairies Regional Adaptation Collaborative with Saskatchewan and Manitoba. This creates opportunities to increase awareness and capacity for adaptation across the prairies.

**Opportunities for sustainable economic development**

- Drive investment in innovative climate change mitigation and adaptation projects by investing funds collected through the carbon price.
- Drive diversification of the economy through an established carbon offset system and investment in clean technology.
- Support a positive business environment and a culture that welcomes innovation and support commercialization of clean technologies.
- Enhance our universities with robust science and engineering faculties with globally-recognized strengths in areas of energy, environmental science and technology development.
- Develop world-class science and technology infrastructure and capabilities.
- Gain successful experience adapting and implementing technologies to meet Alberta needs.
- Leverage extensive experience with research and technology collaborations and partnerships (regional, national, and international).
- Advance key organizations and programs to directly fund the research and technology needed to improve Alberta's energy and environmental performance.
- Grow industry focused on new and emerging technologies – E.g., biomaterials, waste-to-fuels, nanotechnology, advanced energy recovery, water efficiency.
- Create green and sustainable jobs.