

Figures accurate as of: October 12, 2017

Emissions Reduction Alberta (ERA) accelerates development of innovative technologies that reduce greenhouse gas emissions (GHG) and secure Alberta's success in a lower carbon economy.

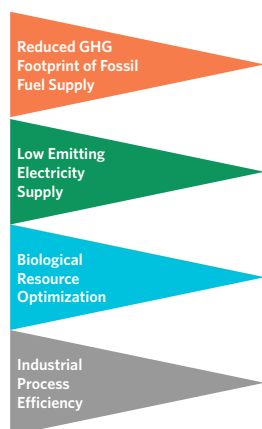
WE ARE EMISSIONS REDUCTION ALBERTA.

- ERA is a key partner in addressing Alberta's climate leadership priorities. We fund innovative technologies that reduce GHG emissions, and help Alberta build a sustainable economy that attracts investment, creates jobs, expands market access, and delivers improved environmental outcomes.
- Aligned with Alberta's Climate Leadership Plan, our portfolio reflects the province's policy direction. Government provides grants to ERA to enable us to fulfil our mandate. This funding comes from Alberta's large emitters who choose to pay into the Climate Change and Emissions Management Fund as a compliance option under the Specified Gas Emitters Regulation.

WE ARE PARTNERS.

- We work with industry, government and technology developers to make Alberta a hub for innovative new ideas that reduce GHG emissions.
- By working collaboratively, we help provide complete solutions to successfully advance promising innovative technologies towards commercialization. Complete solutions include the financing, policy, regulatory, program and business innovation required to successfully implement new technologies.
- With our stakeholders, we developed a Technology Roadmap to guide investment decisions and inform our portfolio mix. The Roadmap consists of four strategic focus areas, and helps to ensure that all partners are aligned to contribute to climate change and innovation goals that produce significant GHG reductions.

AREAS OF FOCUS



POTENTIAL INITIATIVES

- Advanced recovery
- Fugitive emissions
- Partial Upgrading
- Electricity- oil sands integration
- Beyond combustion
- Carbon capture utilization and storage
- Co-generation
- Advanced grid management technology
- Geothermal
- Wind, Solar
- Storage
- Hydropower
- Biofuels
- Bio-products - materials
- Bioenergy
- Carbon retention
- N₂O & CH₄ emissions
- Waste management
- Industrial efficiency
- Process improvements
- Low grade heat utilization
- Products of CO₂

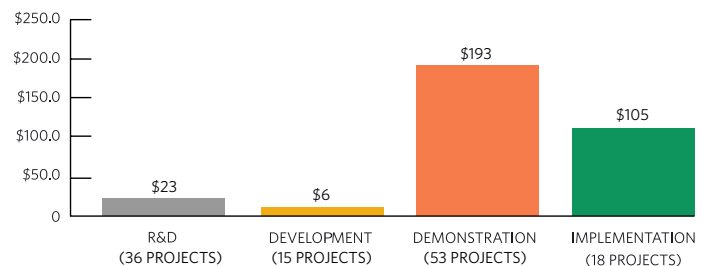
Note: Some initiatives could fall under multiple areas of focus.

WE ARE INNOVATORS.

- ERA invests in transformative technologies which have the potential to dramatically reduce GHG emissions across sectors and play a critical role in achieving the province's long-term reductions goals. We also fund demonstration and implementation projects that will result in substantial near-term emissions reductions. Our projects are estimated to produce cumulative reductions of 8 megatonnes by 2020 and 27 megatonnes by 2030.
- We have committed funding to 71 projects from Small and Medium Enterprises (SMEs). Included in that figure are four projects that ERA selected through a joint funding initiative with Sustainable Development Technology Canada (SDTC) to advance solutions from SMEs that are deployable in Alberta.

ERA INVESTMENT BY INNOVATION STAGE (ALL PROJECTS)

(\$ MILLIONS)



WE ARE GROUND BREAKERS.

- ERA is moving carbon dioxide from a waste product to an asset through the ERA Grand Challenge: Innovative Carbon Uses. Alberta has reached out to the world to support the development of carbon conversion technologies. In the first round of the competition, ERA made commitments to 24 projects. Four winners advanced in Round Two.
- ERA is helping Alberta to implement renewable energy technology and encourage adoption of low emitting electricity supply. ERA has contributed \$76 million to advance this strategic focus area, and our projects are valued at more than \$840 million. These projects combine to reduce GHG emissions by a cumulative 4 megatonnes by 2020 and 11 megatonnes by 2030.
- We are reducing methane emissions. ERA has funded a total of 28 projects to address methane emissions, including 13 new projects that were funded through the recent ERA Methane Challenge.
- We are advancing technology solutions that will reduce and potentially eliminate the need for steam in the in situ extraction process for oil sands. If successful, these technologies will result in significant reductions in GHG emissions per barrel of bitumen produced.



Project summary by strategic area	# of Projects	ERA Funds (\$Millions)	Total Project Value (\$Millions)	Cumulative Project Emission Reductions by 2020 (Mt CO2e) ¹	Cumulative Project Emission Reductions by 2030 (Mt CO2e) ¹	# of Projects Complete	# of SMEs
Reduced GHG Footprint of Fossil Fuel Supply	45	149	690	1.4	3.4	21	29
Biological Resource Optimization	37	71	406	1.7	10.7	17	15
Industrial Process Efficiency	25	24	127	0.7	2.1	19	16
Low-Emitting Electricity Supply	12	76	843	4.2	11.2	6	8
Subtotal	119	320	2,066	8.0	27.4	63	68
Adaptation Program ²	3	7	7	0	0	3	3
Total	122	327	2,073	8.0	27.4	66	71

¹We have estimated emission reductions for all projects with approved funding commitments and executed funding agreements and assumed the projects will continue successfully and as planned. Should circumstances change for these projects, emission reduction estimates may change materially.

²No new investments are planned for adaptation at this time. In 2012 ERA provided funding for 3 adaptation projects in consultation with Alberta Environment and Water (now Alberta Environment and Parks).

WE ARE LEADERS.

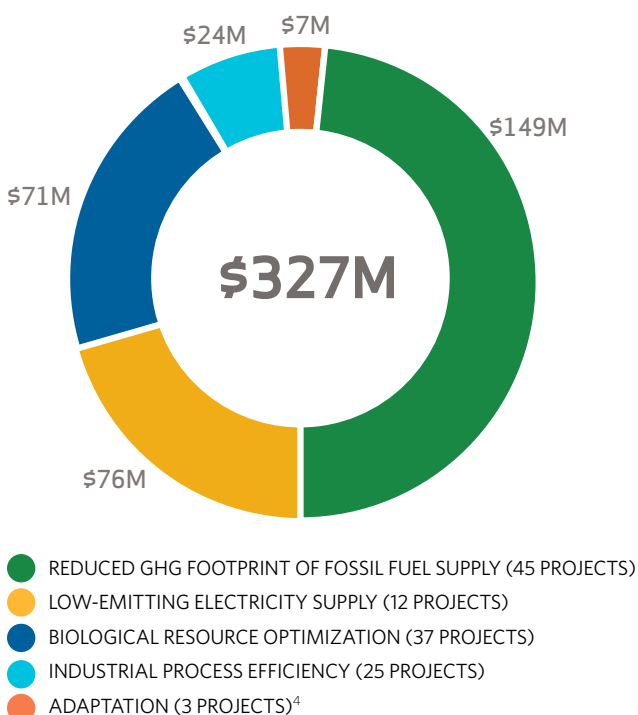
- ERA has committed \$327 million in funding to 122 projects, including three adaptation projects.² Our projects have a combined total value of more than \$2 billion.
- We have committed \$149 million to reduce the GHG footprint of fossil fuel supply. This focus area offers transformative technologies that can reduce GHG emissions over the long term and maximize the value of our resources. This area includes, as examples, partial upgrading technologies, and some carbon conversion projects from the ERA Grand Challenge.
- To date, ERA has committed \$76 million to advancing technologies that support low emitting electricity supply. This area of our portfolio includes renewable energy, and we project that this focus area will provide the most significant GHG emissions reductions by 2020.
- An additional \$71 million supports biological resource optimization, including biofuel development, bio-power and projects to reduce GHG emissions from waste management.
- ERA has committed \$24 million to support industrial process efficiency. This area includes initiatives like the Alberta Oil Sands Energy Efficiency and GHG Mitigation Road Map and the ERA Grand Challenge carbon conversion projects that reduce GHG emissions associated with production of concrete and cement.

WE ARE BUILDERS.

- Technology is the engine of environmental and economic opportunity.
- ERA spurs additional investment. For every ERA dollar we commit to advancing new technologies, more than another \$5 has been invested by funding partners.
- The Alberta Ministry of Economic Development and Trade recently carried out an analysis on behalf of ERA to better understand the economic impact of our investments. That work confirmed that our projects support an average of 1,400 jobs annually in Alberta from 2011 to 2021, with a total cumulative impact of over 15,000 person-year³ jobs. Across Canada, our projects result in an increase of employment to over 21,000 person-year jobs.
- ERA projects add almost \$1.8 billion to Alberta's GDP from 2011 to 2021, and \$2.3 billion to the nation as a whole.

³A person-year is equal to one-year of employment for one individual.

ERA INVESTMENT BY STRATEGIC AREA (\$ MILLIONS)



⁴ In 2012 ERA provided funding for 3 adaptation projects in consultation with Alberta Environment and Water (now Alberta Environment and Parks).



EMISSIONS REDUCTION ALBERTA

1109, 10104 - 103 Avenue
Edmonton, Alberta
T5J 0H8

Phone: 780-498-2068
Email: info@eralberta.ca

www.ERAlberta.ca

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