



ENMAX will demonstrate on-site renewable electricity generation and lithium-ion battery storage at Keyera Corporation's Rimbey Gas plant (previous commercial project shown above).

ENMAX to test solar and battery storage at oil and gas plant

ENMAX is demonstrating the use of solar power and battery storage in industrial operations to offset peak power demand. This is the first large-scale demonstration of solar and battery storage for a midstream energy facility in Canada.

The project aims to reduce electricity consumption of the facility during peak periods—specifically, when loading product onto railcars.

“There is a spike of power demand when loading materials onto the railcars. This demonstration will help confirm that reduced electricity demand and cost savings from fewer emissions will result in the technology being economically viable,” said Chris McCleave, Manager, Public Policy and Government Relations, ENMAX.

Peak demand charges can be significant for oil and gas facilities and lead to rising distribution and transmission rates. Batteries are an important enabler for allowing renewable electricity to be used to displace grid power during periods of peak demand.

The anticipated capacity will be 1 megawatt of solar and 2 megawatt hours (MWh) of battery storage. The project also offers a significant GHG reduction opportunity, with the ability to reduce approximately 700 tonnes of CO₂e annually.

If successful, the technology could become a viable alternative for industrial customers across the province. ENMAX has identified roughly 500 facilities of similar size and consumption patterns. Other electricity distributors could also implement similar solutions if the model is proven to be economically viable.

ERA is investing almost \$2 million into the project. It is just one of the initiatives selected through ERA's BEST Challenge, a \$100 million funding initiative for biotechnology, electricity, and sustainable transportation innovations.

“We are actively exploring technology advancements and the potential they can create for our customers and our communities. The funding received from ERA enables us to test innovative and environmentally-responsible technology in a real life environment, providing learnings that can be transferred to broader applications,” said James McKee, Executive Vice President, Energy Services, ENMAX.

Since becoming a BEST Challenge recipient in March 2019, site selection has been confirmed and ENMAX is finalizing detailed site design and setting up suppliers to complete construction by March 2020. The facility will collect data for 12 months, followed by performance and economic assessments.



Construction of Inventys' 30-tonne per day carbon capture pilot plant at Husky Energy is almost complete.

Inventys to demonstrate carbon capture technology at Husky

Innovative technology aimed at dramatically reducing the cost of capturing CO₂ from industrial operations is in the final construction stages and due to begin collecting data in June. Inventys is currently installing a 30-tonne per day pilot plant for its patented technology at a Husky Energy site.

The project is the world's first pilot-scale plant using structured adsorbents to capture carbon from a once-through steam generator for use in heavy oil recovery. The VeloxoTherm™ System maximizes carbon capture productivity, cuts capital costs, and reduces energy consumption. The technology would be highly applicable to sites in Alberta's energy industry and for the global market.

Reducing the cost of carbon capture has been a barrier for the growth of a CO₂ marketplace. Inventys estimates its adsorption technology will cut the cost of carbon capture down to the \$30-\$50 per tonne range, around half of current costs with conventional liquid-based approaches. If successful, Inventys plans to commercialize by 2020.

“That's our goal, that's what we are going after, and that's what we believe the market needs to enable widespread CO₂ capture,” said Inventys Co-Founder and VP, Strategic Accounts & Government Affairs, Brett Henkel.

“We've been at this for more than 10 years. We started early with friends, family, and angel investors, and we believe that we are very close to commercialization. We are right in the heart of proving the technology at a significant scale.”

VeloxoTherm™ technology captures high purity CO₂ from diluted flue gas at coal and gas-fired power plants and industrial processes. Inventys commissioned a self-contained 0.5 tonne per day field demonstration plant at the same Husky site.

ERA provided over \$3 million to the project, valued at over \$20 million, through a 2012 funding opportunity focused on cleaner fossil fuel production and carbon capture. This demonstration is the final milestone of the project.

“The ongoing support we've received from funding partners like ERA continues to have a significant impact on our ability to commercialize our CO₂ capture technology as a low carbon-footprint solution for the energy sector,” said Henkel. “Obviously, there is a risk of going to the next stage and a lot more resources are required. So, you have to find the organizations and partners willing to take that risk with you.”

COMMITTED TO ACTION

- ▶ ERA is a key partner in addressing Alberta's climate and economic priorities. We fund and de-risk late-stage technologies to reduce GHG emissions and help create competitive industries in Alberta.
- ▶ Our priority areas of investment allow Alberta to continue to grow its existing industries, create new ones, and help diversify our economy with a lower GHG impact.
- ▶ In October 2019, ERA will host its biennial conference, SPARK. This year's theme is Carbon Positive. The three-day event will bring together innovators and investors who want to re-imagine carbon.

CONVENING RESOURCES FOR COLLABORATION

- ▶ The Government of Alberta provides grants to ERA. 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 Alberta's Carbon Competitiveness Incentive Regulation.
- ▶ We work with industry, government, and technology developers to make Alberta a hub for innovative ideas that reduce GHG emissions and improve economic competitiveness.
- ▶ We convene the resources—policy, regulatory, and business development tools—to steward projects toward commercialization.
- ▶ With our stakeholders, we developed a Technology Roadmap to guide investment decisions and inform our portfolio mix.

LEVERAGING FUNDING AND CREATING JOBS

Technology is the engine of environmental and economic opportunity.



For every ERA dollar we commit to advancing new technologies, nearly \$7 has been invested by funding partners.

FUNDING OPPORTUNITY	WHAT'S IT ABOUT?	ERA FUNDING	HIGHLIGHTS
GRAND CHALLENGE	Seeking technologies to transform CO ₂ from waste to value	\$34M	\$10M Grand Challenge winner to be announced in 2019
METHANE CHALLENGE	New methane detection and reduction technologies	\$31M	\$89M total value and 12 projects supported
OIL SANDS INNOVATION	Late-stage, GHG-reducing technologies to help Alberta's oil sands industry remain competitive	\$61M	\$791M total value of 8 projects supported
INDUSTRIAL EFFICIENCY CHALLENGE	Technologies to increase efficiencies for Large Final Emitter (LFE) industrial facilities	\$69M	10 projects funded with a \$265M total project value
BEST CHALLENGE	GHG-reducing technologies in biotechnology, electricity and sustainable transportation	\$102M	Projects funded worth \$610M in total value

ALBERTA

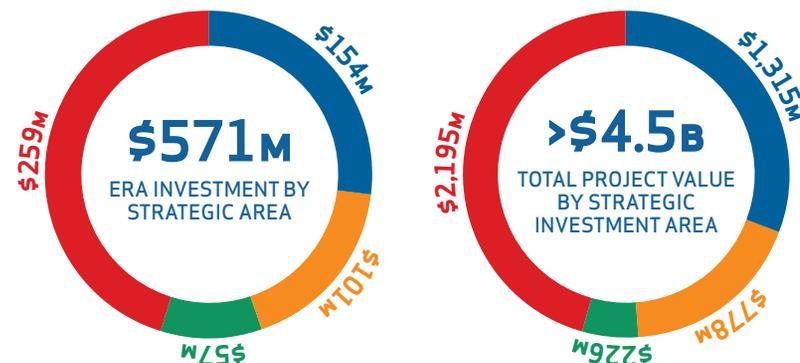


CANADA



*A person-year is equal to one-year of employment for one individual. Please note: economic impact is reported on a calendar year basis, not fiscal year.

INVESTING IN A DIVERSE PORTFOLIO



*In 2012, ERA provided funding for three adaptation projects in consultation with Alberta Environment and Parks.

163 Projects Total \$571M ERA Funding \$4.5B Total Project Value

- ▶ Low Emitting Electricity Supply & Demand (26 Projects)
- ▶ Cleaner Oil & Gas (57 Projects)
- ▶ Low Carbon Industrial Processes & Products (34 Projects)
- ▶ Food, Fibre & Bioindustries* (46 Projects)

CUMULATIVE PROJECT EMISSION REDUCTIONS

7.8 Mt CO₂e Total by 2020



42.7 Mt CO₂e Total by 2030



ERA estimates our investments will result in emissions reductions of an average of 3.2 million tonnes of CO₂e per year. This is equivalent to reductions achieved by switching approximately 121.5 million incandescent light bulbs in homes to LEDs, or bringing 678 wind turbines online.

*We 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.