

Eavor-Lite Demonstration Facility, Condor, Alberta.



First-of-its-kind geothermal pilot to produce reliable baseload power

Eavor Technologies Inc. has developed the world's first closed-loop geothermal system. In a demonstration project near Rocky Mountain House, Alberta, the Eavor-Lite facility uses existing oil and gas drilling technology and expertise to facilitate the development of an innovative energy supply.

The technology—dubbed the Eavor-Loop™—circulates a proprietary fluid that collects heat from below the earth's surface in a multi-kilometre loop. Demonstration at this scale will provide the validation needed to de-risk identified commercial opportunities in Canada and around the world.

"The Eavor-Loop system incorporates the best of our province's energy technology skills and capabilities to provide a new and sustainable opportunity for our world-renowned drilling industry. The result is a uniquely scalable source of emissions-free baseload power," said John Redfern, President & CEO, Eavor Technologies Inc.

"While geothermal energy is not new, the technology is something that you can implement across 80 per cent of the world, instead of five per cent of the world like traditional geothermal," he added.

As a completely closed-loop system, there is no fracking, no GHG emissions, no earthquake

risk, no water use, no produced brine or solids, and no aquifer contamination. Unlike other renewable energy solutions, Eavor-Loop™ is not intermittent, producing reliable baseload power.

The \$10 million facility—a collaborative effort with Precision Drilling, Shell New Energies, and a number of other partners—began drilling in early August 2019. The pilot project will be completed by the end of the year. Once complete, it will serve as a testing site for ongoing research and development.

"The opportunity to take advantage of experience and capabilities, leveraging years of investment in our people, drilling rigs, and drilling technology, for the development of a sustainable zero emission energy alternative, is exciting for Precision Drilling," said Kevin Neveu, President & CEO, Precision Drilling.

Building on years of research and development, the proprietary technology has gained substantial support. ERA committed \$1 million to the project through its referral based Partnership Intake Program. This project is also being supported by ERA's trusted partners, Natural Resources Canada (NRCan), Sustainable Development Technology Canada and Alberta Innovates.



Kairos Aerospace's methane detection technology is easily mounted on light aircraft.

KAIROS exceeds targets for detecting fugitive methane emissions

The first completed project from ERA's Methane Challenge is now set for commercial operations following a successful field demonstration in Alberta. Kairos Aerospace's new methane detection technology, LeakSurveyor, exceeded performance targets—providing clear, actionable information about where, and how big, methane emissions are.

Enhancements in the technology have helped respond to the challenging operating conditions found in the province, including low lighting conditions, colder temperatures, and variable weather.

"Over the course of the project, we made numerous adjustments to the system to ensure reliability, reduce operating costs, enhance algorithms, enrich flight control software, and improve the tools used by our analysts. We believe the system is now ready for market rollout and ultimately wide-spread commercial implementation in Alberta," said Aaron Fitzgerald, Project Manager, Kairos Aerospace.

ERA committed \$263,000 to the project through its Methane Challenge, a funding opportunity that targets methane emissions in Alberta's oil and gas industry. The initiative aims to address the uncertainty in estimates of fugitive and vented emissions. It also works well with remote facility locations, which are difficult to travel between and require equipment that can be

powered without access to electrical grids.

Surveying frequently for large leaks is more effective and efficient at reducing methane than conducting infrequent ground surveys.

LeakSurveyor is easily mounted on light aircraft, making it faster and safer than helicopters or low-flying alternatives like commercially available drones. LeakSurveyor takes readings of methane that are used to construct a plume image that is superimposed over an aerial photo and stitched together with corresponding GPS maps as the plane flies over the survey area. This allows ground crews can go directly to a specific location to identify and repair leaks.

In one example during the field demonstration, imagery was collected over a period of three days in August 2018. Aerial surveys covered 675 square kilometres and took 12 hours to complete. Kairos identified five sites with potential emission sources; four were confirmed by an on the ground follow-up.

In 2020, Kairos expects to be performing monthly surveys for 40,000 wells, with a cumulative methane reduction potential of one million metric tonnes. It estimates LeakSurveyor can lead to reductions of 80 per cent of fugitive methane emissions from upstream oil and gas wells and facilities by 2025, with potential applications in midstream and other industries.

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 grow and create competitive industries in Alberta.
- ▶ 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.

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	12 projects funded worth \$92M in total project value
OIL SANDS INNOVATION	Late-stage, GHG-reducing technologies to help Alberta's oil sands industry remain competitive	\$61M	8 projects funded worth \$795M in total project value
INDUSTRIAL EFFICIENCY CHALLENGE	Technologies to increase efficiencies for Large Final Emitter (LFE) industrial facilities	\$69M	10 projects funded worth \$308M in total project value
BEST CHALLENGE	GHG-reducing technologies in biotechnology, electricity and sustainable transportation	\$92M	16 projects funded worth \$420M in total project value

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.

ALBERTA



CANADA

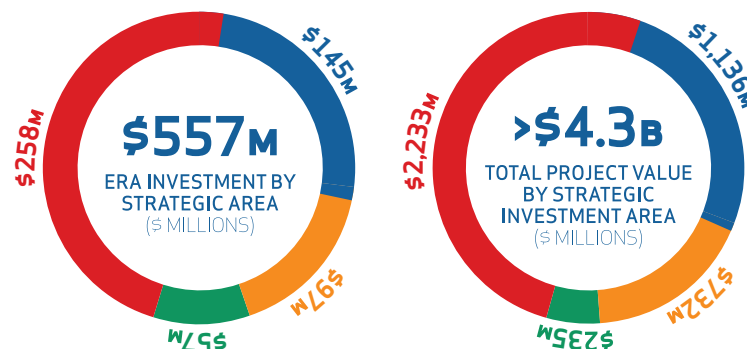


*A person-year is equal to one-year of employment for one individual.
Please note: economic impact is reported on a calendar year basis, not fiscal year.

INVESTING IN A DIVERSE PORTFOLIO

161 Projects

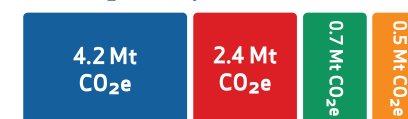
- ▶ **Cleaner Oil & Gas** (57 Projects)
- ▶ **Low Emitting Electricity Supply & Demand** (26 Projects)
- ▶ **Food, Fibre, & Bioindustries*** (44 Projects)
- ▶ **Low Carbon Industrial Processes & Products** (34 Projects)



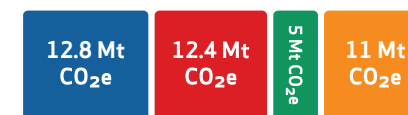
*In 2012, ERA provided funding for three adaptation projects in consultation with Alberta Environment and Parks.

CUMULATIVE PROJECT EMISSION REDUCTIONS

7.8 Mt CO₂e Total by 2020



41.2 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 the equivalent to removing 679,000 cars off the road for one year.

Note: 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.