

Quantiam Technologies Inc's green methanol pilot reactor. The company is participating in ERA's Innovator Support Pilot to help commercialize the technology.

QUANTIAM bolsters business model to support technology

Making the leap from research and development to commercialization is no small feat. Innovators face several challenges that hinder technology advancement and adoption by industry.

To help commercialize promising projects, ERA's new Innovator Support Pilot (ISP) identified five previous proposals that showed technological promise but did not qualify for funding due to business-related challenges or barriers. The program connected these organizations with service providers to help strengthen key components of their business model.

For example, ISP has helped Quantiam Technologies Inc. connect with potential investors and end-users interested in its innovative approach to utilize captured carbon dioxide emissions, and hydrogen produced from sunlight and water, to produce methanol.

"It's been a really good opportunity to pivot and reassess our customer discovery model and our go-to market strategies and really optimize those for success," said Paul-Emile Trudeau, senior researcher and acting manager of technology and innovation for Quantiam. "We are a catalyst coating company, so our comfort zone is the chemical and petrochemical space. Our depths of contacts in the clean-tech space were shallow; plugging into that has been extremely useful."

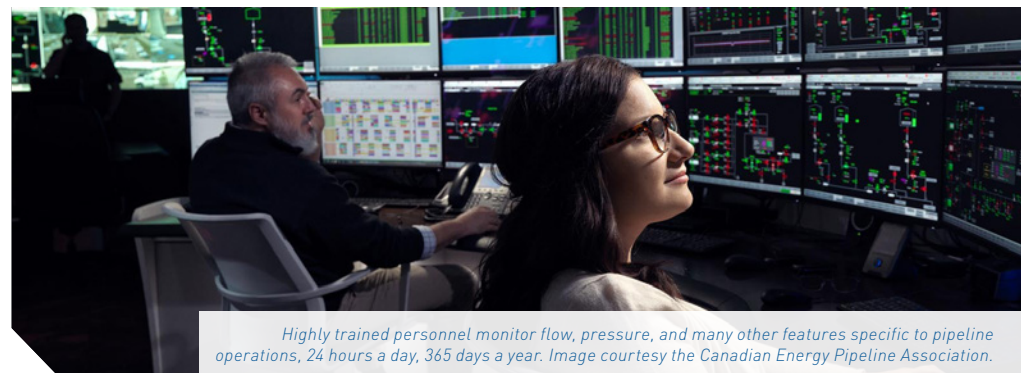
Prior to joining ISP, Trudeau's primary focus was on developing technology, not its business model. In May 2020, ERA matched Quantiam with Platform Calgary to do just that.

"I helped them focus on how they can improve internal processes and solve any challenges and hurdles they are currently running into, or may run into in the future, so that they are able to more rapidly commercialize their technologies," said Andrew Watson with Platform Calgary.

Participating in the ISP has helped Quantiam better understand its market niche, customer discovery model, structure agreements, and find vendors. They have built new partnerships and joined organizations like The Canadian Hydrogen and Fuel Cell Association.

In the next six months, Quantiam will focus on securing an end-user or a consumer of hydrogen and sign a contract with an electrolysis company that produces hydrogen.

"Within 12 months we want to have the consortium firm up, we want to have dollars firm up from both private and public sources, and we want to make modest advances on our technology." This would not have been an achievable goal without the support of ERA's ISP.



Highly trained personnel monitor flow, pressure, and many other features specific to pipeline operations, 24 hours a day, 365 days a year. Image courtesy the Canadian Energy Pipeline Association.

GAZODUQ aims to cut pipeline emissions with new technology

Adopting new electrification, artificial intelligence, and machine learning technologies can significantly reduce greenhouse gas (GHG) emissions in the pipeline transportation of Alberta's natural gas.

If proven successful, these technologies can help deliver more sustainable natural gas transmission infrastructure in Canada and around the world, leading to significant GHG reductions and substantial economic benefits for midstream oil and gas operators in Alberta. ERA has committed nearly \$2 million to Gazoduq's \$4 million project through its Partnership Intake Program.

"Since inception, Gazoduq has been developing an innovative underground natural gas transmission line project that will make use of cutting-edge technologies to deliver on its vision to reach net zero emissions. ERA's validation of our unique project is an important milestone," said Mel Johnson, senior director of project management for Gazoduq.

Gazoduq is assessing using renewable energy to power large scale electric drives for three compressors used in the transmission of natural gas. At 40 megawatts each, the electrification of compressors at this scale would be first of its kind globally. At compression stations where renewable electricity is not feasible, cogeneration (using waste heat) will be explored.

The company intends to use the technology for a proposed natural gas pipeline from Alberta to TC Energy's existing Canadian Mainline before connecting to a new transmission line proposed from Northern Ontario to a liquified natural gas (LNG) facility in Saguenay, Quebec.

If this approach is adopted in Alberta at six 30-megawatt compression stations, cumulative GHG reductions of approximately 440,000 tonnes of CO₂e could be achieved by 2030. If the technology is adopted at 26 units, a cumulative reduction of 6.7 million tonnes can be achieved by 2040.

The project could also provide an opportunity to deliver natural gas to remote communities along the route, with the participation of local distributors, and allow Alberta to export its natural gas to European and Asian markets.

The project is expected to result in capacity building for Universal Pegasus International's Alberta office, leading to increased job creation in the Alberta construction sector if the approach is adopted in-province.

"We are thrilled to have been selected for the Partnership Intake Program and are convinced that this collaboration will not only be beneficial for our project but also for the Canadian natural gas industry," said Johnson.

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.

CONVENING RESOURCES FOR COLLABORATION

- ▶ For more than 10 years, ERA has been investing revenues from the carbon price paid by Large Final Emitters (LFEs) to accelerate the development and adoption of innovative and clean technology solutions.
- ▶ 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 resources and facilitate strategic partnerships with industry, government, business, academia, and other funders to foster a suite of policy, regulatory, program and business innovation tools that will help address barriers to commercialization.
- ▶ With our stakeholders, we developed a Technology Roadmap that guides investment decisions and informs our portfolio mix.

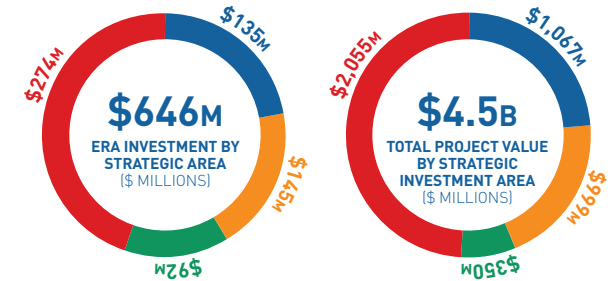
FUNDING OPPORTUNITY	WHAT'S IT ABOUT?	ERA FUNDING	HIGHLIGHTS
GRAND CHALLENGE	Technologies to transform CO ₂ from waste to value	\$31M	2 projects awarded \$5M each in the final round
METHANE CHALLENGE	New methane detection and reduction technologies	\$26M	11 projects funded worth \$65M in total project value
OIL SANDS INNOVATION	Late-stage, GHG-reducing technologies to help Alberta's oil sands industry remain competitive	\$56M	8 projects funded worth \$468M in total project value
INDUSTRIAL EFFICIENCY CHALLENGE	Technologies to increase efficiencies for LFE industrial facilities	\$59M	9 projects funded worth \$235M in total project value
BEST CHALLENGE	GHG-reducing technologies in biotechnology, electricity, and sustainable transportation	\$76M	13 projects funded worth \$283M in total project value
NATURAL GAS CHALLENGE	Unlocking innovation across Alberta's natural gas value chain	\$58M	20 projects funded worth \$155M in total project value
FOOD, FARMING, AND FORESTRY CHALLENGE	Accelerating innovation for sustainable growth	\$33M	17 projects funded worth \$107M in total project value
PARTNERSHIP INTAKE PROGRAM	Evaluating promising GHG-reducing projects referred to ERA by Trusted Partners	\$61M*	18 projects funded to date worth over \$1.3B in total project value
SHOVEL-READY CHALLENGE	Support for companies ready to implement leading-edge technologies in applications for both greenfield and brownfield operations	\$150M*	39 projects invited to submit Full Project Proposals; funding decision expected in Summer 2021
ENERGY SAVINGS FOR BUSINESS	Support for small- and medium-scale industrial and commercial businesses for cost-saving and emissions reducing projects	\$55M*	Applications opened on February 1, 2021; 661 applications submitted so far

*This program is funded in part by the Government of Canada's Low Carbon Economy Leadership Fund.

INVESTING IN A DIVERSE PORTFOLIO

204 Projects

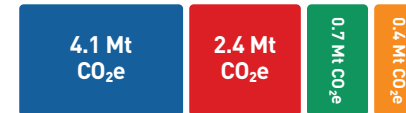
- ▶ **Cleaner Oil & Gas** (72 Projects)
- ▶ **Low Emitting Electricity System** (25 Projects)
- ▶ **Food, Fibre, & Bioindustries*** (58 Projects)
- ▶ **Low Carbon Industrial Processes & Products** (49 Projects)



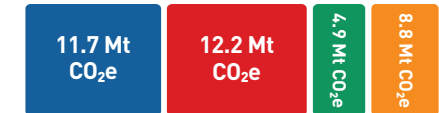
*In 2012, ERA provided funding for three adaptation projects in consultation with Alberta Environment and Parks.

CUMULATIVE PROJECT EMISSION REDUCTIONS

7.6 Mt CO₂e Total by 2020



37.7 Mt CO₂e Total by 2030



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.

LEVERAGING FUNDING AND CREATING JOBS

Technology is the engine of environmental and economic opportunity. For every ERA dollar we commit to advancing new technologies, almost \$6 has been invested by funding partners.



*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.