



Viresco Solutions' large-scale demonstration of a feed additive is showing a 70 per cent reduction in enteric methane produced from cattle.

## NEW FEED INGREDIENT lowers methane emissions from cattle

Completed in the summer of 2020, a new project showed a 70 per cent reduction in enteric methane emissions from cattle, more than twice the level of reductions shown in 10 years of smaller scale trials.

Royal DSM, a global health and nutritional company, partnered with Viresco Solutions, a Canadian-based agriculture sustainability consulting firm, on a large-scale demonstration of an innovative feed additive at a feedlot in Alberta. ERA committed \$1.5 million to the \$3 million project through its Methane Challenge.

"A 70 per cent reduction in methane is really exciting," said Karen Haugen-Kozyra, president of Viresco Solutions. "We didn't expect to see such a large reduction."

Between beef and dairy, there are more than 3.5 million head of cattle in Alberta—that's over 40 per cent of Canada's national herd. Each one burps. And, each burp releases methane, a greenhouse gas (GHG) 30 times more potent than carbon dioxide.

On average, a single cow can produce 200,000 to 500,000 grams of methane a day. Enteric methane emissions, a by-product of the digestive process from ruminant animals raised for their meat and milk, account for as much as 30 per cent of global anthropogenic methane emissions.

Cattle were fed corn and barley along with different dosages of DSM's additive to adjust the digestive system. Research started with younger, lighter cattle and progressed to more mature, larger cattle.

Test feedlots were separated from regular feeding sites and lasers were used to measure emissions from each lot for comparison. Animal performance, health and carcass quality was also assessed to see how the product affects eating habits.

"Nowhere in the world has anybody measured a treatment like this at a feedlot level. Being able to measure methane release over top of a controlled group of cattle in a pen to understand the impact the additive can make has been really exciting," said Haugen-Kozyra.

"If future generations are to enjoy the foods we know and love, we need to move forward in ways that are farm-wise and climate-friendly. Cows provide nutritious dairy and beef products full of the high-quality protein, micronutrients, and essential fatty acids our bodies need. This is the most extensively studied and scientifically proven solution to the challenge of burped methane to date," said Mark van Nieuwland, DSM global program head.



By blending hydrogen into the natural gas stream, ATCO plans to help households reduce their greenhouse gas emissions.

## ATCO project blends hydrogen with natural gas to reduce emissions

A first-of-its-kind project for Alberta is poised to be Canada's largest hydrogen blending project, a big step toward decarbonizing the production of heat.

ATCO is moving forward with a project that will blend hydrogen into a subsection of its Fort Saskatchewan natural gas distribution system to lower the amount of carbon intensity.

The project will deliver gas comprising five per cent hydrogen to roughly 5,000 homes and businesses in the community.

"This project is an important first step for Alberta, which has all the ingredients to be a leader in the hydrogen economy—including the ability to produce near zero-emission hydrogen at a lower cost than most jurisdictions in the world," said George Lidgett, executive vice-president and general manager, Canadian Utilities Inc., an ATCO Company.

Emissions Reduction Alberta has committed \$2.8 million toward this project worth \$5.7 million through its Natural Gas Challenge.

Hydrogen blending is common in other countries, like Australia, where ATCO's Clean Energy Innovation Hub is generating hydrogen energy with the help of solar power.

In Alberta, ATCO will use hydrogen derived from natural gas, which supports the ongoing

exploration and production of Alberta's natural gas resources and demonstrates the safe and effective blending of hydrogen into the natural gas distribution system. The intent is to eventually leverage Alberta's existing carbon capture and sequestration infrastructure to store emissions associated with the production process.

"What we're doing is working with the community and ERA to determine how far we can go with hydrogen blending. Is it safe? What impact does it have to customers as well as what are the regulatory implications for our organization and for our customers?" says Greg Caldwell, ATCO's director of energy systems innovation.

Caldwell explains consumers will not be able to notice an impact on appliances with a five per cent hydrogen blend. The dark blue flame colour and noiseless effect of natural gas remains.

"What we're hoping to do by starting at a five per cent blend is work with customers to educate them on the safety and on the benefits of hydrogen—both the lower emissions, as well as the fact that it's just as safe as natural gas."

## 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

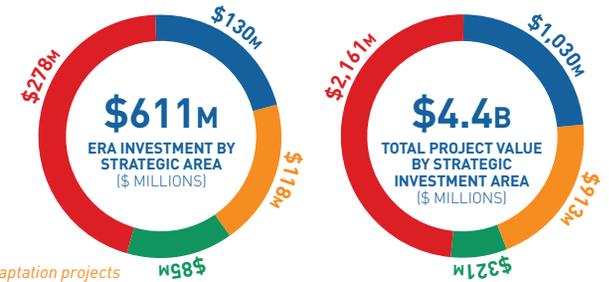
- ▶ The Government of Alberta provides grants to ERA. For more than 10 years, ERA has been investing revenues from the carbon price paid by Large Final Emitters (LFEs) to accelerate the development and adoption of innovative and clean technology solutions.
- ▶ We work with industry, government, and technology 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
<b>GRAND CHALLENGE</b>	Technologies to transform CO <sub>2</sub> from waste to value	\$31M	2 projects awarded \$5M each in the final round
<b>METHANE CHALLENGE</b>	New methane detection and reduction technologies	\$25M	11 projects funded worth \$66M in total project value
<b>OIL SANDS INNOVATION</b>	Late-stage, GHG-reducing technologies to help Alberta's oil sands industry remain competitive	\$61M	8 projects funded worth \$666M in total project value
<b>INDUSTRIAL EFFICIENCY CHALLENGE</b>	Technologies to increase efficiencies for LFE industrial facilities	\$59M	9 projects funded worth \$235M in total project value
<b>BEST CHALLENGE</b>	GHG-reducing technologies in biotechnology, electricity, and sustainable transportation	\$76M	13 projects funded worth \$282M in total project value
<b>NATURAL GAS CHALLENGE</b>	Unlocking innovation across Alberta's natural gas value chain	\$58M	20 projects funded worth \$155M in total project value
<b>FOOD, FARMING, AND FORESTRY CHALLENGE</b>	Accelerating innovation for sustainable growth	\$40M	116 Expressions of Interest worth \$1.3B currently being reviewed
<b>PARTNERSHIP INTAKE PROGRAM</b>	Evaluating promising GHG-reducing projects referred to ERA by Trusted Partners	\$54M	16 projects funded worth nearly \$1.2B in total project value

## INVESTING IN A DIVERSE PORTFOLIO

### 185 Projects

- ▶ **Cleaner Oil & Gas** (71 Projects)
- ▶ **Low Emitting Electricity Supply & Demand** (24 Projects)
- ▶ **Food, Fibre, & Bioindustries\*** (46 Projects)
- ▶ **Low Carbon Industrial Processes & Products** (44 Projects)



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

## CUMULATIVE PROJECT EMISSION REDUCTIONS

### 7.6 Mt CO<sub>2</sub>e Total by 2020



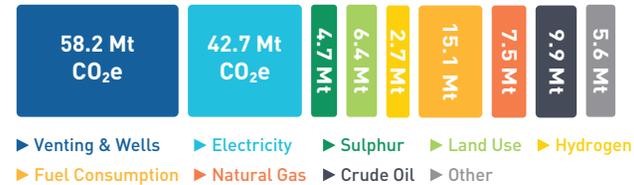
### 34.7 Mt CO<sub>2</sub>e Total by 2030



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.

## CUMULATIVE MARKET EMISSION REDUCTIONS

### 152.8 Mt CO<sub>2</sub>e Total by 2030



Market emission reductions is an estimate based on the potential reductions achieved with broader industry and market application of the technology beyond the initial project.

## LEVERAGING FUNDING AND CREATING JOBS

Technology is the engine of environmental and economic opportunity. For every ERA dollar we commit to advancing new technologies, over \$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.