

## CENOVUS ENERGY'S METHANE EMISSIONS REDUCTION PROGRAM TAKES FLIGHT

Submitted by | **CENOVUS**

**Summary:** Cenovus Energy is undertaking a large-scale methane emissions reduction program as part of its ambitious environmental, social and governance (ESG) targets.

Approximately half of Canada's methane emissions come from oil and gas production, and the upstream industry is required to reduce these emissions by 45 per cent by 2025 from 2012 levels to meet federal and Alberta regulations. It's a big shift that requires innovative thinking and measurable progress.

Cenovus recently launched an industry-leading project called Alt-FEMP (Alternative Fugitive Emissions Management Program), a low-cost, rapid screening approach that uses airplanes, as well as handheld devices and advanced software, to discover and document methane emissions at its facilities. This provides a 10,000-foot view of Cenovus's methane emissions faster and more accurately than before and is one way the company is tackling the greenhouse gas challenge.

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"With good information you can make good decisions," says Sean Hiebert, Cenovus Energy Emissions Management Engineer. "And this philosophy has been the foundation for how Cenovus is tackling our large-scale methane emissions reduction program. It's a key component of achieving our ambitious environmental, social and governance (ESG) targets released earlier this year."

"The best and most cost effective way to manage emissions is to first understand where your emissions are and the magnitude of them. From there, you can prioritize your efforts," Hiebert adds.

This was the motivation behind Cenovus's new industry-leading project referred to as Alt-FEMP. It's a low-cost, rapid screening approach that uses airplanes, as well as handheld devices (such as drones) and advanced software, to discover and document methane emissions at its facilities. This

provides a 10,000-foot view of Cenovus's methane emissions faster and more accurately than ever before and is one way the company is tackling the greenhouse gas (GHG) challenge.

These recent efforts support Cenovus's long track record of proactively working to reduce methane emissions, which dates back to 2010. But before examining Cenovus's program in more detail, it's important to better understand the key factors that made all of this a reality.

## METHANE 101

Knowing where methane emissions come from is the first step to reduce these emissions. Methane has 25 times the global warming potential (GWP) of carbon dioxide (CO<sub>2</sub>) over a 100 year period.



While some emissions come from naturally-occurring processes, it is estimated that 14 percent of GHG emissions come from methane, of which 44 percent is estimated to come from oil and natural gas activities.<sup>1</sup> Methane is released when natural gas is flared or vented or in small leaks (called fugitive emissions) from valves and other equipment used in drilling and production.<sup>2</sup> Nationally, the upstream oil and gas industry has committed to cut methane emissions by 45 percent by 2025 from 2012 levels to meet federal regulations. The same target is in place to meet Alberta regulations, though the province uses 2014 as the baseline year. It's a big shift for all upstream oil and gas producers that requires collaboration and innovative thinking.

<sup>1</sup> CAPP – Why global reduction of methane emissions is so important to Canada

<sup>2</sup> CAPP – Methane Emissions

## ALBERTA ENERGY REGULATOR (AER) PROVIDES AN ALTERNATIVE

Hiebert knows better than most what collaboration can accomplish, not just for Cenovus but for the industry as a whole. He was seconded to work with the AER in 2018 and 2019 and helped to develop a plan to bring technology to the forefront of Alberta's methane emissions reduction program.

"It is one thing to know in theory what regulations should look like, but it is all meaningless unless you have people involved who know what is actually possible," says Gerald Palanca, Manager of the Emissions Management Team at the AER. "Bridging the gap from theory to reality is important."

Palanca says one of his team's key considerations was that the provincial regulations had to balance a number of perspectives, considering various stakeholders and ensuring the regulations were operationally feasible for those in industry. The result of this work is Alt-FEMP and it's where Hiebert spent most of his time while at the AER.

"Without that regulatory framework in place, it's difficult to take advantage of innovation," says Hiebert. "The AER was open to augmenting the traditional process by taking the time to establish a risk-based framework that allows operators to trial novel Alt-FEMP methodologies upon approval."

## THE ALBERTA METHANE FIELD CHALLENGE

This is where multi-stakeholder groups such as the Petroleum Technology Alliance Canada or PTAC have stepped up to facilitate the process.

"Before these programs were announced with PTAC, it was kind of like the wild west, where you'd have a number of technology providers come in, make claims that their technology can solve every problem yet they hadn't been tested," says Palanca. "Now we've brought operators and technologies together to have a show down."

PTAC set up the Alberta Methane Field Challenge in 2019 to prove out the methane detection and quantification technologies in a way that gives companies a front-row seat to the results and helps them determine the best fit for their organizations.

Soheil Asgarpour, PTAC President, says the first field test in the Red Deer area involved 30 producers, over 190 facilities and conducted testing across 2,500 square kilometres. The second test area near Rocky Mountain House introduced new technologies such as drones, airplanes, trucks and stationary sensors.

“The idea was that by combining these

“The vision is that by 2021, we want to be sure that industry has enough technological capacity to reduce methane emissions by 45 percent to give operators four years to implement these methodologies,” says Asgarpour.

### CENOVUS TAKES A LEADERSHIP ROLE

“If it wasn’t for the Alberta Methane Field Challenge, and the industry collaboration with PTAC, we wouldn’t have understood how good our current technology provider, Bridger Photonics, is and how they perform,” says Hiebert. “We are now actively performing aerial screening throughout our conventional operations twice per year.”

### Cenovus sets bold 2030 ESG targets

Focus area	2030 ESG targets
Climate & GHG emissions	• Reduce emissions intensity by 30 percent
	• Hold absolute emissions flat
	• <b>Ambition – reach net zero emissions by 2050</b>
Indigenous engagement	• Achieve a minimum \$1.5 billion of additional spending with Indigenous businesses
	• 100 percent of staff will have completed Indigenous awareness training by the end of 2020 and will update their training biennially
Land & wild-life	• Reclaim 1,500 decommissioned well sites
	• Complete \$40 million of caribou habitat restoration work
Water stewardship	• Achieve a fresh water intensity of maximum 0.1 barrel per barrel of oil equivalent

*GHG emissions targets and ambition include scope 1 and 2 emissions from operated facilities and use a 2019 baseline. Indigenous engagement target covers 2020-2030 and percentage of staff trained does not include people on leave. Reclamation target covers 2020-2030. Caribou Habitat Restoration Program covers 2016-2030. Water stewardship target set for December 31, 2030.*

technologies and working together, we’ll find a more accurate and more cost effective way of detecting methane,” says Asgarpour. “We have developed significant technologies through the collaboration of the PTAC consortia and Cenovus has been a big part of it.”

For Cenovus’s Alt-FEMP, Bridger Photonics has developed airplane sensors to detect methane emissions. A small aircraft – a Cessna 172 – flies over an operation and takes a series of snapshots, resulting in pictures specific enough to show the location and size of the methane leaks, enabling Cenovus to prioritize leak repairs.

“As they find emissions, they have the ability to visually overlay methane plumes on a high resolution image of our facilities,” adds Hiebert. “They have such good resolution that it allows us to see exactly where emissions are coming from.”

Cenovus is now actively screening its assets, identifying the challenge areas and prioritizing its efforts.



“The airplane has detected emissions at our facilities and we’ve ranked the top 10 percent and conducted ground-based “ground truthing” just to confirm and verify what the airplane saw, with people on the ground,” says Hiebert. “This is an exciting milestone for Cenovus as this program is helping us identify leaks at our operations more efficiently than the traditional monitoring methods.”



Those traditional monitoring programs require companies to conduct ground emissions detection surveys through Optical Gas Imaging (OGI) three times per year. This type of monitoring specifically targets areas where plumes may occur, but it does not provide the full picture of leaks on a site and requires extensive travel and hours to complete the surveys.

“This new technology allows us to find and respond to methane leaks faster and more accurately than we could previously,” says Marshall Wild, Operations Superintendent for Maintenance and Integrated Operations for Cenovus’s Conventional operations. “Seeing the big picture of all methane emissions at a site

allows us to focus on the large sources of methane emissions where we can really reduce our environmental impact, while being cost efficient.”

Bridger Photonics has completed two aerial surveys of Cenovus Alberta and B.C. sites and Cenovus teams are currently conducting follow up and prioritizing maintenance on methane leaks. Cenovus plans to continue this program through to the end of 2021 before reviewing results with the AER.

### MORE METHANE REDUCTION INITIATIVES

Cenovus is also taking strides to address methane by replacing thousands of older instruments, like transducers and pressure controllers, that run on pressurized natural gas. Many of these older instruments – so-called “high-bleed” instruments – normally emit high volumes of methane to the atmosphere. To reduce or prevent methane emissions, Cenovus is working towards swapping them out for new “low-bleed” or “no-bleed” devices.



“There is a big opportunity in converting these. We’ve switched out about 2,000 of these instruments and we have about 3,000 to go,” says Hiebert. “That has resulted in carbon dioxide savings equivalent to almost 22,000 cars taken off the road for a year.”

Cenovus has also been switching chemical injection pumps traditionally powered by natural gas to pumps powered by solar energy and installing various devices to capture natural gas that would otherwise be vented, to use as fuel.

“Our teams have already reduced methane emissions at our conventional assets by as much as 60 percent from 2014 levels, partly through our technology improvements, as well as through asset sales and by reducing the number of wells in operation,” says Hiebert. “Over the years, that’s added up to total CO<sub>2</sub> savings equivalent to almost 220,000 cars taken off the road. As we head into 2021, we plan to continue to upgrade our equipment to lower our methane emissions further.”