

# CRIN SUCCESS STORIES AT A GLANCE



Look for the icon to find projects with a showcase video. Simply scan (or click) the QR code to watch and learn more about each one.



**Automatic Wildlife Detection Network and Robird Defense System. RoBird is a robotic bird reducing wildlife incidents at tailings facilities.**

CRIN funding \$1.0M | Project cost: \$2.6M | TRL 9

Through CRIN, AERIUM partnered with Imperial Oil for commercialization, building strong relationships with vendors in Canada, and internationally, enhancing capabilities, developing new IP, and expanding markets for visual sensors, aviation radars, machined components, and custom foam products.

*"The personnel, Network, and funding resources supplied through CRIN have been instrumental in AERIUM's ongoing development of the RoBird flapping wing ornithopter and associated technologies." - Jordon Cicoria, CEO*



**Contact-based robotic Inspection using tethered flying robots for industrial/hard-to-reach spaces where inspection is hazardous, expensive, and time consuming.**

CRIN funding \$750k | Project cost \$3.2M | TRL 8

Avestec offers intelligent flying robots, and the technology has gained significant traction from major asset owners around the world, including industry leaders such as Shell, BP, ExxonMobil, and Imperial. Additionally, Avestec has secured partnership agreements with some of the leading global service companies worldwide.

*"CRIN funding was a great accelerator for maturing our technology, helping us bring it to the market and accelerate our revenue growth. Through the project, we were able to secure clients from North America, Latin America, Eastern Asia, and the Middle East!" - Dr. Reza Tavakoli, PEng, CEO*



**Tailings Management Through Nano Technologies: Transforming oil sands mining tailings into high-value products and water treatment and remediation.**

CRIN funding \$0.9M | Project cost \$1.8M | TRL 8

Carbonix, an Indigenous Canadian company, creates advanced materials for resource extraction and energy transition, improving carbon scaffold technology, and expanding globally with partners like Suncor.

*"The financial support from CRIN enabled us to scale our production, significantly reducing the time required to bring our technology closer to full commercialization. Additionally, CRIN's collaborative network facilitated partnerships with key industry stakeholders." - Paul Pede, President & CEO*



ArmorFoam is using nanoparticle-based foam technology to improve the efficiency of CO2 Enhanced Oil Recovery (EOR) and CO2 storage.

CRIN funding \$0.9M | Project cost \$2.1M | TRL 8

ArmorFoam is a nanoparticle surfactant-based foam that enhances CO2 storage, pressure maintenance, and resource recovery in CO2 EOR processes. ArmorFoam can reduce GHG emissions, maximize underground CO2 storage, and reduce the carbon intensity of hydrocarbon extraction.

*"CRIN funding...was the catalyst that allowed us to bring our technology into the real world." - Ali Telmadarrieie, CEO*



Mannville Syngas Extraction Project with Integrated Carbon Sequestration: Enhanced hydrogen recovery for low-cost hydrogen from stranded hydrocarbons.

CRIN funding \$10M | Project cost \$44M | TRL 9

Cvictus is targeting commercial operation of its first 'small' plant that will produce clean hydrogen. This is a globally scalable solution that enables lower cost hydrogen than that from dominant steam methane reforming from natural gas, and lower emissions than electrolysis of fresh water with hydro-power, with onsite CO2 sequestration.

*"...[CRIN's] funding has been instrumental in commercial development of an emerging technology here in Canada that will be a game-changer in hydrogen extraction." - W. Robert Sturgess, VP*



Pulsed Methane Pyrolysis technology converts natural gas into hydrogen and solid carbon at costs comparable to incumbent steam methane reformers.

CRIN funding \$8M | Project cost \$29M | TRL 9

Ekona developed methane pyrolysis technology to convert natural gas into hydrogen and carbon, proven with a small batch reactor and a 200kg-H2/day system. They're now testing a 1TPD-H2 PMP pilot plant with a Canadian gas producer.

*"The funding that we have received from CRIN has significantly accelerated our technology development. This investment has also allowed us to foster a culture of continuous improvement and innovation." - Chris Reid, CEO*



1 kW Gas Wellhead Remote Power Unit

CRIN funding \$720k | Project cost \$3.8M | TRL 8

Second project: Thermo-Acoustic Wellsite Electrification for Methane Abatement

CRIN funding \$1.9M | Project cost \$3.8M | TRL 8

The first of two CRIN-funded Etalim projects completed successful field pilots conducted at two independent producer sites, where a 5-well and a 9-well pad were powered by Etalim's 1GEN for over 5,675 hours during extreme temperatures, ranging from -35°C to +33°C.

These field pilots demonstrated the efficacy of Etalim's thermo-acoustic technology as a climate solution to power pneumatic devices at well sites and optimize production efficiency without giving up reliability or contributing to methane emissions in the oil and gas sector.



**Direct Contact Steam Generation co-injector combusts pressurized air and fuel.**

CRIN funding \$1.6M | Project cost \$3.8M | TRL 7

Rather than venting the flue gas to atmosphere, these products of combustion are co-injected with steam into a well, simultaneously addressing the two fundamental needs of depleted heavy oil reservoirs: heat and pressure. Co-injecting steam and combustion gases allows for enhanced oil recovery.

*"CRIN has been able to connect us with the partners to support our technology development as well as the oil companies that will use our thermal technologies. CRIN support has helped bridge the technology risk barrier that stops so many companies from achieving commercialization." - Brian Kay, P.Eng, CTO*



## KATHAIROS



**Simple Methane Elimination Using Nitrogen**

CRIN funding: \$1.6M | Project cost \$3.7M | TRL: 9+

**Second project: Simple Methane Elimination Using Nitrogen Phase 2**

CRIN funding 554K | Project Cost 1.1M | TRL 9+

This successful project resulted in the significant expansion of Kathairos' methane-elimination technology, from operating on an initial six well sites to 1,500 over the two-year project duration.

Kathairos' technology uses liquid nitrogen to power pneumatic devices at remote oil and gas well sites. By using liquid nitrogen, the need for methane as an instrument gas is eliminated, as is the need to vent the harmful gas after use.



**EcoSeis reduces the land footprint of subsurface imaging associated with acquiring high-resolution seismic data.**

CRIN funding \$3.7M | Project cost \$11.2M | TRL 9

EcoSeis software ranks biological, ecological, and geographical surface information to automatically guide the creation of custom survey designs while reducing the land footprint of subsurface imaging and simultaneously maintaining data quality, enabling safe and efficient field operations, and reducing costs.

*"As a result of CRIN's extensive network and expert stakeholders from across the oil and gas industry, five key industry collaborators...along with 23 SMEs, two universities...and nearly two dozen additional support companies have been able to connect and collaborate with OptiSeis." - Andrea Crook, CEO*



**HipVap indirectly fired steam generator commercial pilot using untreated produced water for steam generation.**

CRIN funding \$3.4M | Project cost \$8.2M | TRL 8

This project demonstrated that untreated, produced water can economically be used directly in steam generation with minimal treatment, significantly reducing water treatment costs, freshwater consumption, and waste disposal needs.

The project set out to accelerate HipVap's Technology Readiness Level (TRL) from 6 to 8 by demonstrating its performance in a live SAGD environment. The HipVap unit was installed and operated at a SAGD facility near Bonnyville, Alberta. The collaborative project ultimately resulted in the creation of five new partnerships, including three industry partners.