

# Genomic Innovations: Energy and Environmental Solutions

SPRING 2025

## BIO-BASED TECHNOLOGY SOLUTIONS

Genomics is a big data science that allows us to study the genetic material in all living things. Leveraging machine learning and AI tools allows us to understand how things function at a molecular level including how microbes contribute to environmental processes like remediation and reclamation or consume methane and convert it into less harmful emissions.

While genomics science continues to advance at a rapid pace the broadscale adoption of these technology solutions in the energy sector is growing but still limited. We are looking to accelerate the benefits and support a greener energy future.

**Genome Alberta, with support from the Government of Alberta, is investing in new research collaborations to close the gap in scaling genomic innovations in support of broader application in Alberta's energy sector for improved environmental outcomes.**



ALBERTA INVESTMENT  
**\$1.5M**

## BENEFITS OF ADOPTING GENOMIC TECHNOLOGIES



**Accelerate  
Environmental  
Remediation**



**Reduce GHG  
Emissions**



**Enhance Biodiversity  
Monitoring**



**Advance Clean  
Energy Tech**

## KEY OBJECTIVES OF THE INITIATIVE

- **Assess and reduce** the environmental footprint of energy operations with bio-based (-omics) technologies.
- **Bridge** the gap in scaling genomics solutions for broader adoption and benefits to the energy sector through field validation of technologies and tools.
- **Generate** near-to-mid-term outputs with measurable environmental benefits that are ready for deployment.
- **Promote** an open science approach for improved data sharing and interoperability to stimulate further innovation from large genomics data sets.

## DRIVING FOR OUTCOMES

Applications will be accepted for projects that:

### Offer solutions for environmental challenges including:

- Bioremediation and reclamation of contaminated sites
- GHG emission reduction via microbial processes or bio-based carbon capture
- Biodiversity assessment and ecological monitoring using eDNA tools
- Clean technology development (e.g. hydrogen production, carbon storage)
- Optimization of processes that limit environment risk (e.g. corrosion prevention, water treatment)

### Demonstrate strong research and industry collaboration:

- With industry contribution (cash, in-kind) towards project scope, defining measurable environmental benefit and adoptable output
- To advance the innovation at least on Technology Readiness Level (TRL)

## WORKING TOGETHER TOWARDS PRACTICAL SOLUTIONS

Working collaboratively with energy sector partners, the research community, and other innovation support organizations, Genome Alberta is a catalyst for advancing solutions with environmental, economic and social benefits for Alberta and beyond.

Eligible applications must include a project lead as an Alberta-based researcher (from an academic institution, provincial or federal government organization with an explicit research mandate or incorporated not-for-profit with an explicit research mandate) and a industry partner or end-user.

## KEY DATES

