
CLEAN RESOURCES DIVISION

TIER Economic Recovery Program PROGRAM GUIDE

ALBERTA INNOVATES OVERVIEW

Alberta Innovates is a catalyst for innovation. As a Government of Alberta corporation and consistent with Government priorities, Alberta Innovates supports research and innovation that leads to economic growth & diversification, enhanced environmental performance, and social well-being.

Alberta Innovates has three core divisions within the Research, Innovation & Commercialization business line, which include Clean Resources (the combined legacy Clean Energy and Bio Sector), Health Innovation, and Investments, as well as two wholly-owned research subsidiaries: InnoTech Alberta and C-FER Technologies.

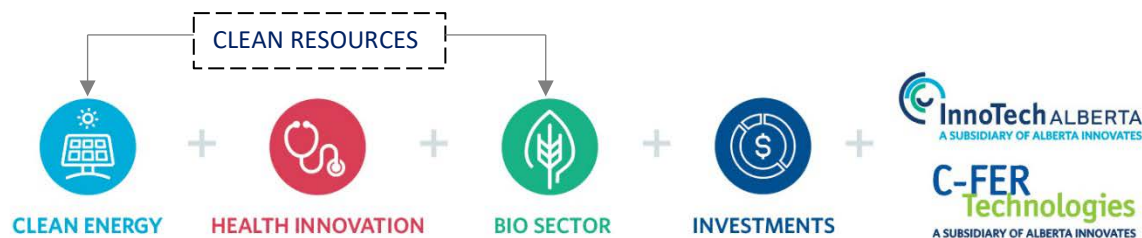


Figure 1: Alberta Innovates Divisions and Research Subsidiaries

Specifically, Alberta Innovates is pursuing a strategic direction that focuses on four emerging technologies that support multiple sectors across the province, see Figure 2 below. A key innovation strategy is to embrace the digital future while leveraging Alberta’s existing natural resources and human capacity, while continuing to enhance Alberta’s knowledge workforce to ensure sustainable growth in an increasingly digital based economy.



Figure 2: Alberta Innovates Emerging Technology Strategic Focus Areas

CLEAN RESOURCES OVERVIEW

Clean Resources helps technology developers and industry clients accelerate technology development and deployment, grow their businesses, and enhance the competitiveness of the resource sector. We provide scientific and technical insights to the Government of Alberta (GOA) energy and natural resource development, agriculture, economic diversification, emission reduction, and water/land policies. Clean Resources has five technology portfolios.

- **Advanced Hydrocarbons** supports economic, environmental, and diversification opportunities in Alberta's oil & gas sector. The Advanced Hydrocarbons portfolio consists of two programs: [Cleaner Hydrocarbon Production](#) and [Innovative Hydrocarbon Products](#).
- **Clean Technology** supports diversification of Alberta's economy through the development of clean technology. The Clean Technology portfolio consists of three programs: [Renewable and Alternative Energy](#), [Bioenergy](#), and [Carbon Capture and Utilization](#).
- **Environmental Innovation** supports economic development, environmental performance and healthy communities through investments in knowledge and technology gaps in two major programs: [Water Innovation Program \(WIP\)](#) and [Land and Biodiversity](#).
- **Smart Agriculture and Food** [\[link\]](#) invests in research and innovation supporting **data driven decision making** and automation for growth of Alberta's agriculture and food sector. Supporting development of a network of **Smart Farms** facilitates validation and demonstration of emerging technologies as well as education of the next generation of Alberta's agribusiness operators.
- **Bioindustrial Materials** [\[link\]](#) supports economic development and diversification by investing in **greener products and processes** using Alberta biomass (e.g. Alberta aspen utilization, value-added biomass, green construction). This portfolio supports the agriculture and forestry sectors to optimize sustainable resource use and develop new revenue streams for byproducts and residuals.

Together, our efforts are directed to sustain and grow Alberta's oil & gas, agriculture and forestry and clean tech industries, add value to enhanced and new energy products, reduce greenhouse gas emissions, and to protect Alberta's water and land resources.

Advanced Hydrocarbons	Clean Technology	Environmental Innovation
<u>Cleaner Hydrocarbon Production</u> <ul style="list-style-type: none"> • Recovery Technologies • Methane Emission Reductions • Digital Oilfield <u>Innovative Hydrocarbon Products</u> <ul style="list-style-type: none"> • Partial Upgrading • Bitumen Beyond Combustion (BBC) • Natural Gas Value Add 	<u>Renewable and Alternative Energy</u> <ul style="list-style-type: none"> • Low Carbon Electricity • Grid Modernization • Low Emitting Alternative Generation <u>Bioenergy</u> <ul style="list-style-type: none"> • Diversion of Residues and Waste • Renewable Fuels <u>Carbon Capture and Utilization</u> <ul style="list-style-type: none"> • Carbon Capture • Carbon Utilization • Hydrogen 	<u>Land and Biodiversity</u> <ul style="list-style-type: none"> • Biodiversity • Environmental Monitoring • Oil Sands Tailings • Climate Change Adaptation • Abandoned Well Remediation and Reclamation <u>Water Innovation</u> <ul style="list-style-type: none"> • Water Supply and Watershed Management • Healthy Aquatic Ecosystems • Water Technologies • Water Quality Protection
<u>Smart Agriculture and Food</u> <ul style="list-style-type: none"> • Agriculture Biotechnology • Data Driven Decision Making • Automation and Smart Farms 	<u>Bioindustrial Materials</u> <ul style="list-style-type: none"> • Alberta Aspen Utilization • Value-added Biomass • Green Construction 	

Table 1: Clean Resources Portfolios, programs and Focus Areas

Applications to the TIER Program funding opportunity must align with AI Clean Resources portfolio / program focus areas (Table 1) and/or contribute to the four emerging technology focus areas (Figure 2) while also contributing to the following criteria: (i) GHG emissions reduction or enabled future reductions; (ii) increased Alberta industry competitiveness; (iii) creation or maintenance of skilled jobs within Alberta; (iv) enabled future economic growth; (v) TRL 4-7 at project commencement; (vi) maximized industry contribution where possible.

2030 INNOVATION TARGETS

In addition to specific focus areas, the Clean Resources business line supports projects that can help contribute to progress towards Alberta’s 2030 targets as identified in the [Alberta Research and Innovation Framework](#). The 2030 Innovation Targets are intended to inspire transformational solutions in the following areas of importance for Clean Resources programs: emerging technologies; energy and GHG mitigation; environment and climate adaptation; agriculture, food and fibre production; economic diversification and value-add.

Projects that are aligned with the program focus areas and contribute to 2030 Innovation Targets are prioritized for funding and support from Clean Resources.

The specific 2030 Innovation Targets of interest to the TIER Program are described in the following table:

Focus Area	2030 Innovation Target
Reduce GHG Emissions	Support Alberta's climate change goals by accelerating solutions to reduce methane emissions by 45% by 2025 and ensure a dynamic portfolio of GHG emission reduction technologies
Increase Value & Market Access	Support the successful commercialization of new value-added products to increase the market value of Alberta's oil and gas exports by 25% and expanding access to market
Improve Oil Sands Efficiency	Oil sands production efficiency and economics improve by decreasing fresh water use by 50%, GHG emissions by 50% on a per barrel basis, and supply cost of bitumen to be globally competitive
Renewable Energy	Renewable sources, like wind and solar, will contribute up to 30% of Alberta's electricity generation
Reduce Waste	50% reduction in organic waste to landfill through innovative technologies which produce value-added products.
Bio-Industrial Investment	Industry operating in the value-added bio-industrial sector will attract an additional \$3 billion private sector investment in Alberta.
Sustainable Water Management	Safe, secure, and reliable water resources, while enhancing the health of the aquatic ecosystems and improving overall water use efficiency by 30% (2010 base)
Restoring Alberta's Landscapes	Reduce landscape disturbance intensity by 20% and accelerate reclamation of disturbed lands to promote native habitat and species recovery
Conserving Biodiversity	Biodiversity is maintained or enhanced at levels relative to reference conditions
Grow Alberta's Green Economy	Support the Cleantech sector to increase industry sales revenue by 25%, thereby increasing Alberta's global market share by 20%
Advanced Manufacturing & Materials	The value of Alberta's manufacturing sector will increase from \$18.8 billion to \$40 billion through the development of advanced materials, instrumentation and repurposing jobs (2014 basis)
Digital Economy	The ICT industry in Alberta generates more than \$20 billion in annual revenues and the province is the best in Canada for digital literacy and connectivity
Food & Fibre Sales	Exports from Bioindustrial sectors increase by five times while maintaining environmental sustainability. Sales from ingredient, food, and beverage product manufacturing increases from \$13.7 billion to \$25 billion (2014 base).
Agriculture Productivity	Increase crop and livestock quality and productivity by 30%, while responsibly managing natural resources (2013 base).
Market Trust in Agriculture & Food	Ensure agriculture, food and beverage production meets or exceeds public expectations and values by 10% (2030) (2016 base).

APPLICATION REVIEW AND MANAGEMENT PROCESS

The TIER Program will require applicants to use the Clean Resources “continuous intake” application and management process – this process is delivered in three phases. Project applications will be reviewed on their merit and the potential for impacts aligned with TIER Program, Clean Resources Program focus areas, strategic priorities, and contribution towards 2030 Innovation Targets. Figure 3 below highlights the three phases of the Process. For more information on the application process and evaluation criteria, refer to the TIER Program Application Guide (“Application Guide”).



Figure 3: Continuous Intake Application Review and Management Process

During the Detailed Proposal review process, Alberta Innovates leverages internal staff and external expert reviewers to evaluate applications submitted. Alberta Innovates retains the sole right to determine the evaluation process and does not disclose the names of its external reviewers to ensure their objectivity and impartiality. All external parties are subject to confidentiality, non-disclosure and conflict of interest policies set by Alberta Innovates. For a more detailed account of the evaluation criteria for the TIER Program, see the Application Guide.

All decisions made by Alberta Innovates are final, non-appealable and binding on the Applicant. Any failure to inform the Applicant of the determination regarding an application, within the timelines provided above will not result in any obligation or liability of Alberta Innovates to the Applicant. Alberta Innovates may also, in its sole and absolute discretion, provide feedback to the Applicant.

TIMELINE FOR TIER APPLICATION AND REVIEW PROCESS

The time to develop, submit and have an application reviewed by Clean Resources has been accelerated for this funding opportunity. The timeline below is subject to change. Applicants will be notified of any changes accordingly.

- | | |
|---|-------------------------------------|
| • TIER Program Announcement | October 26th, 2020 |
| • TIER Program Details Released | October 26th, 2020 |
| • Applicant Webinar | Nov 04 th , 2020 |
| • Full Proposal Application Deadline (First Cohort) | Nov 30 th , 2020 5PM MST |

Note - Applications can be submitted anytime using our continuous intake process. Applications will be reviewed in batches. Reviews of full proposals for the first cohort will commence November 30th, 2020. Applications received after this date will be reviewed subject to availability of funds.

ELIGIBILITY CRITERIA & FUNDING

Eligibility Quick List

- Projects must be able to commence within 45 days of funding approval from AI
- Project must demonstrate immediate economic benefits including job creation
- Project must result in direct GHG emissions reduction or enables future reductions
- Project must be completed before March 2023
- $\geq 80\%$ of project expenses and jobs are created in Alberta
- Project is seeking Alberta Innovates funding between \$200,000 and \$5,000,000
- Projects can seek funding for up to 75% of eligible costs, though greater leverage is encouraged
- Project technology at the start of the project is between [TRL 4-7](#)
- Project aligns with AI Clean Resources portfolio / program focus areas or contributes to the four emerging technology focus areas
- Project results will lead to increased Alberta industry competitiveness and enable future economic growth

Applicant Eligibility Criteria

Applicants to the TIER Program funding opportunity may be comprised of technology developers, industry, industrial associations, small and medium-sized enterprises, research and development (R&D) organizations, post-secondary institutions, municipalities, not-for-profit organizations, government

research labs, and individuals. Applicants are not required to be based in Alberta but must demonstrate a clear value proposition for the province with most project expenses and jobs occurring in Alberta.

Partners and/or End-Users

Applicants are not required to have a project partner; however, technology development projects must clearly demonstrate that a market exists for commercialization or implementation of the technology or knowledge solution. End-users must be identified and are preferably engaged with the project. Letters of support and/or confirmation of contributions from interested end-users are strongly encouraged to accompany the application.

Applicants with strong end-user partnerships and/or funding from other organizations are preferred. All applicants are required to provide a portion of funding to the project, either from their own funds or from partners. Collaboration between multiple organizations is encouraged to enhance and leverage the value proposition by demonstrating opportunities for technology validation, commercialization, and sharing of results.

Applicants are encouraged to engage and include Alberta’s post-secondary and research institutions in the project consortium where appropriate. It is desirable for projects to attract and train highly qualified personnel who can increase Alberta’s innovation capacity in the Clean Resources program focus areas. When the applicant is not based in the province, the applicant will be expected to have Alberta-based partners.

Project Eligibility Criteria

All projects must be aligned with Government of Alberta’s and Alberta Innovates’ strategic priorities and 2030 Innovation Targets. Funding made available through this process is provided for completion of projects with well-defined objectives, milestones, deliverables, and timelines. Applicants must clearly delineate the scope of the project for which the TIER program funding is being requested and the economic, environmental, greenhouse gas emissions reduction, and innovation potential associated with that scope of work. Any related work outside the scope of the project (e.g. before the project term or in parallel with the project) may be discussed in the proposal but should be clearly indicated as such.

Project Types

Technology Development and Deployment Projects that are shovel ready are eligible for this Program. These projects must focus on developing or advancing technology solutions that will be used by the applicant, their partners and/or identified end-users to advance commercialization and broad deployment of the solution in Alberta. The outcomes of the projects or the commercialization pathway of the technology solution should have direct impact on economic, environmental and social benefits.

Eligible Stage of Development

TIER Program funding will prioritize technology projects that show advancement along Technology Readiness Level (TRL) for projects having technologies ranging from [TRL 4-7](#) at the beginning of the project. The TRL definitions can be found [here](#) and are summarised below.

Research (TRL 1 – 3)	Research is primarily done in the lab and ranges from fundamental research to proof of concept in a lab setting. Theory and scientific principles are focused on knowledge and application to define the concept. Analytical tools are developed.
Development (TRL 4 – 5)	The basic technological components are integrated for testing in a simulated environment and include alpha testing of prototypes. Knowledge and operational practices (e.g., best management practices) are tested at small scales in the field. Typically, 0.1% to 5% of full-scale.

Field Pilot (TRL 5 – 7)	The prototype/knowledge is tested in the field in an operational environment and is well integrated with other systems. Typically, at 5% to 10% of commercial-scale.
Demonstration (TRL 8 – 9)	The technology/best management practice is scaled up and tested in its final form and under expected conditions. Activities include the development of handbooks, documentation and maintenance. Typically, at 10% to 25% of commercial-scale or at full scale but with minimal replication.
Commercial Deployment (TRL 10)	The first commercial application of the technology/best management practice is established, the technology is ready for licensing and widespread adoption by others.

Eligible Project Locations

All projects supported through the TIER Program must demonstrate a clear and justified value proposition in Alberta. Technology solutions must address challenges and opportunities of importance to Alberta. Projects must be piloted, demonstrated, or implemented in Alberta and demonstrate an immediate impact on jobs.

Funding Considerations

Project funding will range from \$200,000 up to but not exceeding \$5 million per project from the TIER Program. The program anticipates funding to support nominally 25 – 50% of total project costs, though we may support up to 75% of project costs if sufficiently justified, with remaining funding from other project partners and other funding agencies (including cash and in-kind support). Alberta Innovates encourages co-funding of projects with other funding agencies and does not limit the amount of stacking towards the applicant’s contribution.

All applicants are expected to provide a portion of the funding towards a project, which can come from project partners or other sources of funds (minimum 25% of total project costs).

Eligible and Ineligible Expenses

TIER Program funding can be applied to expenses directly attributable to the performance of agreed upon projects. Costs directly attributable to the project spent prior to Alberta Innovates approval may be included in calculations of total eligible project costs for this Program. All only funds reasonable costs incurred as defined in the investment agreement after it has been executed. A high-level summary of eligible and ineligible expenses is provided in Appendix A.

PERFORMANCE MANAGEMENT AND EVALUATION

Over the life of a project, Alberta Innovates employs an active project management philosophy, regularly monitoring performance and supporting the applicant to reach project outcomes. Funding is tied to outcomes and achievement of results and submission of progress reports. For this reason, Alberta Innovates funds on a milestone completion basis. This means that the applicant is expected to complete a task and submit a progress report before Alberta Innovates advances the next tranche of funds. Progress reports will be reviewed by the assigned Clean Resources Project Advisor (“Project Advisor”).

Regular project update meetings will be held with the applicant and the assigned Project Advisor to assess progress towards milestones. These Steering Committee Meetings can include other funding partners and agencies as necessary.

All investment agreements outline the intended outcomes of the program and the corresponding Clean Resources and Program performance metrics that will be tracked over the course of the project. Project specific performance metrics will also be developed in consultation with the Project Advisor. The Applicant is responsible for reporting on all required metrics to Alberta Innovates on the agreed to schedule. A sample of Clean Resources performance metrics are listed below.

Once projects are completed, Alberta Innovates continues to collection information from clients for up to five-years to assess the economic, environmental and social benefits realized for Albertans.

SAMPLE OF CLEAN RESOURCES PERFORMANCE METRICS

- # of jobs created during the project, # of jobs created from future deployment or implementation
- # of GHG emissions reductions during the project, # of GHG emissions reductions from future deployment or implementation
- \$ leveraged from other sources
- # of patents filed
- # of and \$ for increased highly qualified and skilled personnel (HQSP) support
- etc.

HOW TO APPLY FOR FUNDING

For details on the application form and evaluation criteria, refer to the Application Guide. Applicants will begin the application process through the [Alberta Innovates Application Portal](#).

CONFIDENTIALITY, IP, AND INFORMATION DISCLOSURE

Alberta Innovates is committed to protecting the confidentiality of application details. External experts who act as reviewers must sign a confidentiality agreement.

Project details are kept confidential during the application process. Following funding announcements, Alberta Innovates will publicly share a non-confidential summary of approved projects. Clean Resources does require public reporting of the final project outcomes and learnings, but business/competitive confidentiality is maintained.

Intellectual property (“IP”) will be addressed through an Investment Agreement between Alberta Innovates and each successful applicant and will be specific to the circumstances of each project. However, a few general principles apply:

- Under normal circumstances all IP remains with the original owner. Background IP (patents, copyright, software) and third-party technology remains with its original owner(s).
- Project technology developed as a part of the co-funded activities will be owned by the successful applicant and its partners, in accordance with the IP arrangement between project partners. However, successful applicants will be expected to commercialize and/or make the technology available through reasonable commercial terms for the benefit of Alberta.

- Alberta Innovates retains rights to project results, including without limitation the technical data, reports, analysis, and discussion. Project outcomes, results, and learnings will normally be made publicly available at the conclusion of the project.
- For greater clarity on standard reporting and IP expectations, links to standard investment agreements are provided: (i) [Industry template](#); (ii) [Academic template](#).

As a provincial corporation, Alberta Innovates is subject to the protection and disclosure provisions of the Freedom of Information and Protection of Privacy (FOIP) Act. Personal information is collected pursuant to Section 33(c) of the Freedom of Information and Protection of Privacy Act as it relates to and is necessary for the program.

TRUSTED PARTNERS

Clean Resources works closely with other funding organizations, usually provincially or federally funded, that share the goals and outcomes of Alberta Innovates and our business unit. These *Trusted Partners* adhere to strict confidentiality guidelines. During the application process, you may be asked if we can share your application and our evaluation with our *Trusted Partners* for the sole purpose of determining their interest in funding the project with us. If the *Trusted Partner* is interested, they may request additional information.

Trusted Partners include Emission Reduction Alberta (ERA), Sustainable Development Technology Canada, and Natural Resources Canada. The *Trusted Partners* program is under continuous improvement and partners may change from time to time.

EQUITY, DIVERSITY AND INCLUSION

The Alberta research and innovation (R&I) ecosystem is stronger and more sustainable when it is broadly reflective of the overall diversity of our community. Alberta Innovates strives to ensure all interested and qualified parties have an equitable opportunity to participate and contribute. Historically, there have been several groups/populations that have been under-represented in the Alberta R&I landscape including:

- Women entrepreneurs/researchers;
- Indigenous entrepreneurs/researchers;
- Remote/small community entrepreneurs/researchers; and
- Immigrant entrepreneurs/researchers.

We are guided by the principles of:

- Equity – our processes support equal access across all demographics;
- Diversity – both internal and external participants to our processes are comprised of a varied composition of demographics; and
- Inclusivity – our processes proactively work to include underrepresented segments of the R&I landscape.

As part of its commitment to Equity, Diversity and Inclusion (EDI), Alberta Innovates will:



- Collect data in the application process on a voluntary basis to better understand diversity;
- Provide application navigation support to applicants from under-represented groups; and
- Integrate a DEI focus into its due diligence processes including striving to have diverse review committees to foster unbiased decision making.

TIER PROGRAM CONTACT

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APPENDIX A: SUMMARY OF ELIGIBLE AND INELIGIBLE EXPENSES

Category	Eligible Expenses	Ineligible Expenses
Labour	<ul style="list-style-type: none"> ✓ Salary and benefits for individuals who are specifically working on the project 	<ul style="list-style-type: none"> ✗ Overhead costs charged to employee labour rates ✗ Professional training & development ✗ Professional fees unless directly related to the project
Materials	<ul style="list-style-type: none"> ✓ Reasonable material costs 	
Capital Assets & Software	<ul style="list-style-type: none"> ✓ Capital improvements ✓ Capital equipment ✓ Software or information databases <p><i>Note: Eligible costs will be pro-rated to the project time frame based on the asset's expected economic life</i></p>	<ul style="list-style-type: none"> ✗ Acquisitions of land or buildings ✗ The undepreciated value of eligible capital costs which extends beyond the project timeframe
Travel	<ul style="list-style-type: none"> ✓ Travel, including mileage, low economy airfare, and accommodation for the purposes of executing the project 	<ul style="list-style-type: none"> ✗ Passport or immigration fees ✗ Reimbursement for airfare purchased with personal frequent flyer programs ✗ Commuting costs between place of residence and place of employment
Sub-contractors	<ul style="list-style-type: none"> ✓ Services or products of another entity 	<ul style="list-style-type: none"> ✗ Costs associated with applying for government grants and programs ✗ Provisions for contingencies, technical or professional journals ✗ Routine testing and maintenance
Other	<ul style="list-style-type: none"> ✓ Costs which Alberta Innovates pre-approves in writing as an eligible expense ✓ Costs directly attributable to the project spent prior to Alberta Innovates approval may be included in calculations of total eligible project costs 	<ul style="list-style-type: none"> ✗ Collection charges, allowance for interest on debt, fines and penalties ✗ Federal and provincial income taxes, goods and services taxes ✗ Expenses for projects or activities outside the approved Project