

InnoTech Alberta, a subsidiary of Alberta Innovates, is Alberta's leading research and technology organization providing innovative solutions to global challenges facing industry, business, and the public sector. With over 100 years of experience, our world-class expertise and industrial-scale research facilities can help you transform technologies into value-generating solutions. We are your innovation partner to help your business increase profitability, optimize processes, and create new market opportunities.

Bio-Industrial Service Offerings



FOR MORE INFORMATION, PLEASE CONTACT:

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Service Offering	Sub-Offerings	Key Activities
Bio-Industrial Product & Process Development	Biogas Innovation	Assess anaerobic digestion related operations, processes, and materials including support with analytical testing, pilot plant testing and process simulation. Support biogas industrial projects from a technical design, operations, and economic basis with a strong focus on GHG and clean fuel standard valuations.
	Thermo-Chemical Processing	Develop and optimize processes with lab and pilot scale pelletization, agglomeration, carbonization and hydrolyzation and evaluate produced materials with supporting analytical testing.
	Designer Carbon Development	Develop high value activated carbons generated from biomaterials targeted for use in supercapacitor and battery electrodes. Support other potential clients with the unique lab infrastructure associated with supercapacitor and battery production including non-biomass carbon feedstock projects.
	Fermentation Processes & Production	Optimize and scale fermentation processes from the development level to production scale, and toll produce fermented products through the production cycle which includes various downstream processing services.
Bio-Composite Material Development, Processing, Research & Analysis	Bio-Composite Material Development	Development of novel, eco-friendly, renewable and sustainable materials utilizing pilot infrastructure like extrusion, filament production, blending, compounding, electrospinning, and injection molding processes. Support clients with experience coupled with production process knowledge and equipment.
	Forestry Mill Process Support	Provide integration of artificial intelligence supported vision and data acquisition systems that aid and inform process control and production output at mills. Provide process simulations through software applications, and provide standard industry testing that measures material and product properties.
	Fibre Product Development & Assessment	Assess alternative materials and configurations associated with fibre processing via chemical, thermal and mechanical processes at the lab and pilot plant level and validate post processing properties with standard testing.
	Engineered Composites Development & Assessment	Assess alternative materials and configurations in engineered composite products/panels (ie. Strand-based board, Fibre-base board, laminated products, and oriented split straw board) under full scale process conditions and validate post-production properties with standard testing.
Plant Sciences	Agricultural Materials and Plant Evaluations	Evaluate new plants, new plant varieties, and associated plant treatments such as herbicides, insecticides, soil conditioners, or related equipment utilizing controlled environment trials in greenhouses and growth chambers or studies in traditional field plots.
	Industrial Hemp & Cannabis Breeding, Processing & Utilization	Advance technologies to support the industrial hemp and high THC cannabis industries from "seed to final product" including: <ul style="list-style-type: none"> • Assessment and enhancement of varieties through focused breeding programs. • Optimization and de-risking of plant fibre processing methods including decortication for biomaterial use. • Full regulatory suite of analyses for Health Canada compliance for commercial cannabis producers. • Health Canada Institutional Licence for hemp and cannabis that facilitates a diverse and rapid research/project opportunities.
	Genomics & Genotyping	Plant pathology and DNA related services for the characterization and evaluation of organic materials. Environmental DNA collection and analysis.
	Smart Agriculture	Use of digital technologies and systems (internet of things, sensors, robots, and artificial intelligence) in an agricultural context with the goal of increasing the quality and quantity of crops produced while increasing efficiency and productivity.

Energy Service Offerings



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Service Offering	Sub-Offering	Key Activities
In-Situ Recovery Process Development & Optimization	In-Situ Recovery Processability Assessment – Unconventional Resources	Develop novel solvent-based and improvements to commercially deployed bitumen and heavy oil in-situ recovery technologies through lab physical model experimentation, reservoir simulation, and field trial support.
	Near Well & Wellbore Flow Enhancement & Conformance in Heavy Oil Reservoirs	Assess and validate new in-well temperature monitoring techniques, flow control devices (FCDs & OCDs), and scaling prevention/remediation methods for well productivity improvement. Improve chemical-based heavy oil EOR through reservoir conformance control.
	Well Remediation & Testing Alternative Plugging Materials	Test & develop new products and emplacement methods to control well leakage.
Mined Oil Sand Bitumen Extraction & Processing	Assessment of Bitumen Extraction Processability	Develop novel technologies for non-aqueous extraction (NAE) of bitumen from mined oil sands.
	Emulsion and Froth Characterization & Treatment	Enhance processes and characterization methods for bitumen emulsion and froth treatment, separation, and equipment surface fouling.
	Improving Tailings Treatment	Enhance tailings treatment process in mined oil sand operations.
	Partial Upgrading Process Development and Validation	Develop and validate bitumen partial upgrading technologies for application at downstream processing facilities and upstream bitumen/heavy oil in-situ recovery operations.
	Bitumen Beyond Combustion	Develop and validate technologies for application of bitumen or bitumen-derived products in applications beyond combustion including development of carbon fiber from asphaltene-based feed stock, and asphalt binder from bitumen vacuum bottoms.
Advanced Materials and Asset Reliability Management	Multi-Phase Flow Monitoring	Evaluate and validate technologies for characterization of pipeline multi-phase flow regimes and dynamics, flow control and metering, leak detection, and pipeline component integrity monitoring leveraging our advanced flow loops of different scale and computational modeling capabilities.
	Energy Efficiency Technologies	Evaluate and develop novel solutions for flow improvement, measurement, and waste heat/energy recovery.
	Novel Materials Development	Develop novel materials, coatings, and manufacturing techniques to improve asset integrity, improve equipment performance, and lower environmental impacts.
	Materials Performance Assessment and System Integrity Solutions	Assess, characterize, and validate materials, coatings, and deposition techniques for industrial applications including: <ul style="list-style-type: none"> Assessment of component corrosion and wear resistance in actual field and simulated pilot and bench-scale environments including mechanism validation, integrity monitoring, mitigation technologies evaluation, and asset longevity solutions. Development and provision of specialized materials analytical methods to evaluate material performance in support of internal and client innovation pursuits and qualification requirements. Develop, evaluate, and validate advanced NDT technologies for material performance monitoring in niche applications.
Advanced Manufacturing	Additive Manufacturing	Advance and validate additive manufacturing technologies and processes for fabrication of wear resistant components for harsh environment applications.
	Welding Quality and Productivity	Enhance welding quality and productivity through advancement and de-risking of welding and inspection technology application, adaptation, and deployment and supporting procedure development.
	Sustainable Manufacturing & Circular Economy	Improve equipment performance and lower environmental impacts through advanced and sustainable manufacturing. Recycling and reuse of plastics.

Environment Service Offerings

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Service Offering	Emphasis	Key Activities
Integrated Environmental Monitoring and Analysis	Remote and On-site Biodiversity Monitoring	Implement monitoring programs at site, local, regional, and provincial scales through collection of terrestrial and aquatic data and deployment of advanced sampling techniques and equipment.
	Monitoring Plans, Technology Development and Testing	Develop and advise on monitoring plans to inform outcomes and decisions with major emphasis on Environmental Effects and Adaptive Monitoring strategies. Develop, advance and de-risk novel monitoring technologies and applications.
Environmental Impacts Research and Risk Evaluation	Contaminant Fate and Behavior in the Environment	Evaluate contaminant fate and behavior and environmental impacts using progressive scales of simulated environments (bench scale microcosms and columns, greenhouse and growth chambers, above and below ground outdoor mesocosms), plot, and field investigations.
	Water Resource Investigations and Impact Assessments using Hydrology, Hydrogeology, Geochemistry, and Isotopic tools	Utilize hydrological, hydrogeological, geochemistry and stable isotope tools to inform geospatial models and predict impact of resource and infrastructure development on groundwater and surface flows/interactions, and local wetland health.
	De-risking Technologies and Processes	Develop research and testing plans to de-risk environmental sensors, contaminant management, and the impact of industrial wastes in the environment.
Asset Retirement and Environmental Management	Asset Decommissioning and Re-use	Develop technology solutions to support energy asset reuse in collaboration with relevant internal and external partners. Validate the market opportunity for technology solutions with clients and stakeholders. Assess the use of end-of-life oil and gas wells for CO ₂ sequestration/storage, hydrogen production through syngas process, and geothermal process evaluation.
	Restoration and Sustainability	Support sustainability in renewable energy production through integration of expertise and facilities related to native plants, climate change adaptation/mitigation and ecosystem management.
	Site Assessment, Reclamation & Remediation	De-risk, optimize and validate novel reclamation and/or remediation processes, technologies, and solutions. Address regulatory challenges preventing timely, cost-effective remediation and reclamation. Identify and enable technology-based solutions for optimizing efficiencies in environmental data management and reporting.
Carbon Capture, Utilization and Decarbonization	Technology Demonstration and Scale Up	Demonstrate and validate CO ₂ capture, CO ₂ conversion/utilization and methane decarbonization technologies in real-life conditions within a semi-commercial scale environment to support future commercialization.
	Capture, Utilization and Decarbonization R&D	Develop and/or de-risk solutions and technologies to address client challenges related to CO ₂ capture, CO ₂ conversion/utilization and methane decarbonization.
Hydrogen Technologies	Hydrogen End Use	End-use characterization and validation of industrial and commercial scale systems. Leak detection technologies, measurement / metering instrumentation, and safety processes development. Validation of methane decarbonization for end-use applications. Hydrogen and other CO ₂ end-user chemical processes.
	Hydrogen Infrastructure	New and legacy pipeline and storage tank materials integrity testing, certification to standards, and maintenance/safety practices. System-level hydraulic gas migration modelling and related software. Risk assessment of underground storage projects. Hydrogen / natural gas blends risks and validation assessment in pipelines and storage tanks. Leak detection technologies and measurement / metering instrumentation development & validation.
	Hydrogen Production & Conversion	New methane decarbonization validation. Oil and gas well hydrogen direct reservoir extraction. Hydrogen conversion for transportation.

Monitoring, Analytics & Informatics Service Offerings



FOR MORE INFORMATION, PLEASE CONTACT:

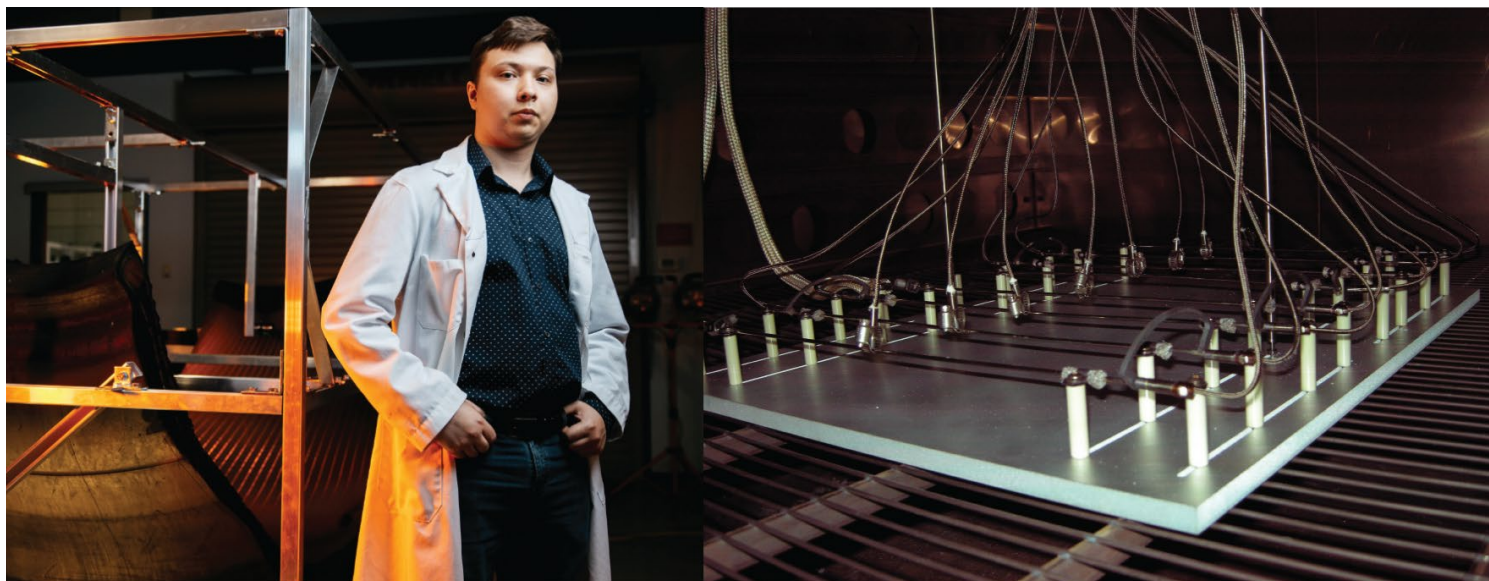
Julius Pretorius - Director

Monitoring, Analytics & Informatics Services

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Service Offering	Emphasis	Key Activities
Chemical Testing & Analysis	Environment and Agriculture	Determination of the physico-chemico properties of samples originating from environmental and agricultural matrices. Customize and develop novel analysis methodologies to suit client's specific needs including non-routine compounds and/or novel matrices.
	Industrial	Determination of the physico-chemico properties of feedstock, finished -and used product. Customize and develop novel analysis methodologies to suit client's specific needs including non-routine compounds and/or novel matrices.
	Proficiency Testing (IQAEP)	The International Quality Assurance Exchange Program (IQAEP) is an interlaboratory proficiency testing program consisting of a series of petroleum related tests, frequent exchanges of a wide range of energy products and rapid report turnaround times.
Smart Industrial Solutions	Applied Data Science	Application of data analysis techniques in the context of multiple domains.
	Digital and Industrial Optimization Services	Utilize smart analyzers and sensor data together with IIoT and Data Science principles to assist clients in achieving process efficiencies.
	Smart Monitoring Services	Develop, deploy, and maintain instrumentation systems and solutions for niche measurement and process control applications.



Pilot Trials and Lab Testing

DISCOVERY R&D TO COMMERCIAL DEPLOYMENT

InnoTech Alberta enables value generation and accelerates commercial development by providing access to world-class expertise and industrial-scale facilities needed to transition technologies to value-creating innovations.

Jobs Created

- > **311** jobs created and maintained in FY 2020-21
- > **95%** in Alberta
- > **3,985** total jobs since FY 2012

311

JOBS
FY 2020-21



3,985

JOBS SINCE
FY 2012

InnoTech Consortia

- > InnoTech brings together industry, government, and stakeholders to solve shared challenges and bring forward collaborative solutions.

36

LEVERAGED
INDUSTRY
CONSORTIA



19

JOINT INDUSTRY
PARTNERSHIPS



Technology Readiness Levels

- > TRL is a measure of technology advancement from discovery R&D to commercial deployment

1.3 AVERAGE TRL ADVANCEMENT



COMMERCIALIZATION

InnoTech by the Numbers

- > Over **1 million sq. ft.** of research and lab space.
- > Over **600 acres** of farmland for research and testing.
- > **\$118 million** in innovation infrastructure.

1M
+ SQ FT

221

TEAM MEMBERS
125 PhDs & MASTERS

Our Experts

- > **221 team members** with over **125 Masters and PhDs** with industry and sector expertise in scientific, engineering and technological R&D.
- > **426** lifetime patents
- > **84** active patents
- > **First patent** was issued to Karl Clark in **1929** for Bituminous Sand Processing.



84

ACTIVE
PATENTS



100
YEARS
OF TRANSFORMATION

FOR MORE INFORMATION, PLEASE CONTACT:

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