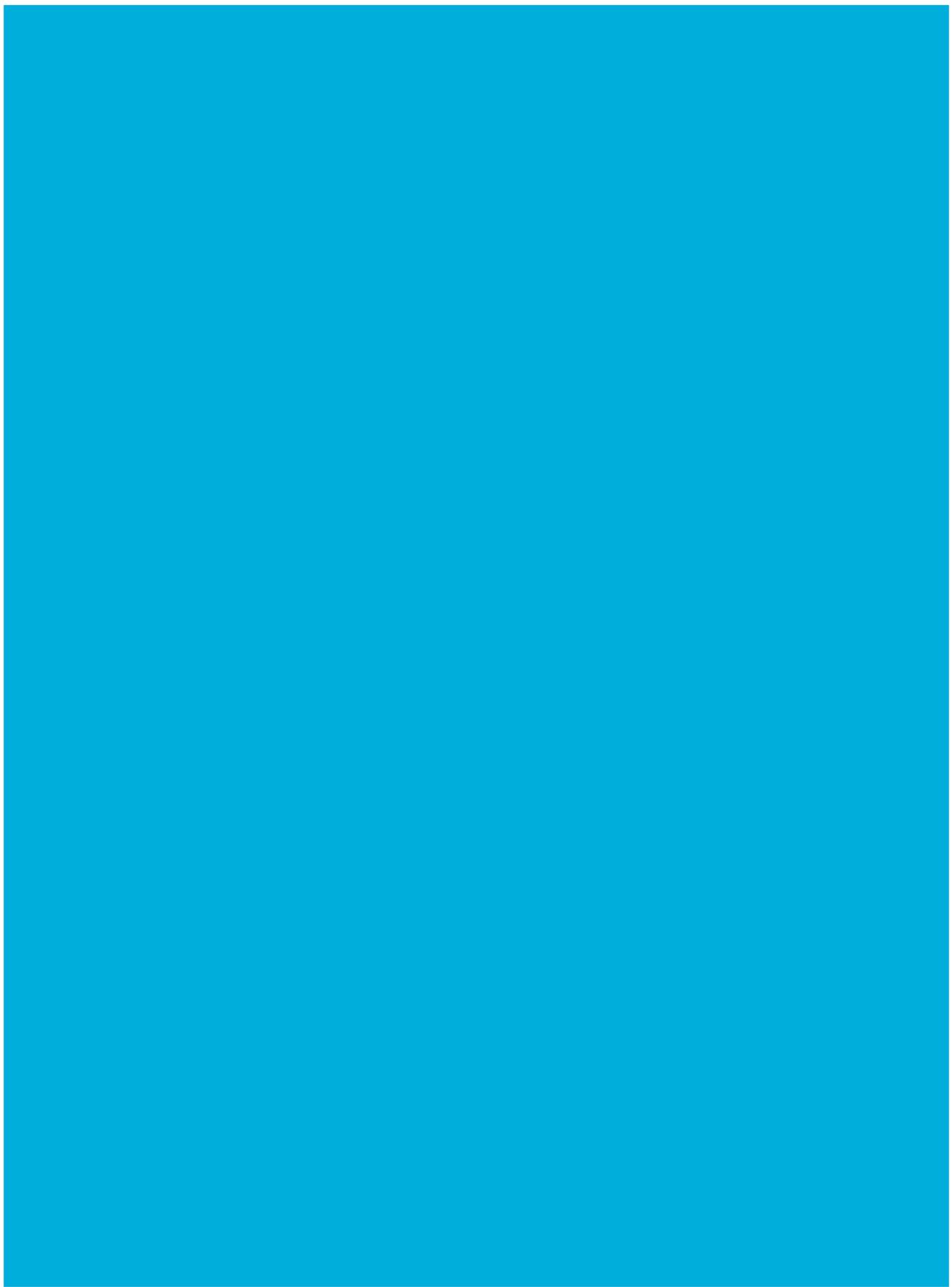


Business Plan

2015-2018



Business Plan 2015-18

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Executive Summary

Alberta Innovates-Technology Futures (AITF) is an integral part of the Alberta Innovates system and a key part of the overall innovation and entrepreneurial ecosystem in Alberta. Through the innovation support programs AITF delivers on behalf of the Government of Alberta and the applied research services AITF supplies to industry and government, AITF supports entrepreneurs, industry, academia (through Campus Alberta) and the government of Alberta to commercialize Alberta's most promising new technologies and innovations.

Last year AITF began the transition of its operating model to a more industry aligned, sector focused model that is intended to more effectively achieve its mandate and deliver upon its key desired outcome of Economic and Social Benefits to Alberta (ESBA). Guided by our five key strategic objectives of: Engaging our Stakeholders; Contributing to an Effective Innovation System; Focused Innovation; Operational Excellence; and a High Performance Culture; AITF's operations have been aligned in a matrix operating model which increases our effectiveness, allows for enhanced collaboration between our operational areas, focuses our investments on key challenges in each of our industry based sectors and improves our stewardship and governance of our investment portfolio.

2015-2016 will be another important year for AITF with a number of key initiatives to be commenced, continued or completed and a number of external factors which will influence the operations of AITF.

AITF is excited to work with Innovation and Advanced Education (IAE) to support their development of the five Collaboratories they are establishing in the Province's key focus areas of energy, environment, fibre, food and health. This collaboratory approach will inform and direct each of our established sectors thereby further aligning AITF's investments with the priorities of the Government of Alberta.

The required review of AITF's mandate & effectiveness will be conducted by IAE in 2015-2016. Given the changes AITF made last year, we are well positioned for this review and see it as an opportunity to showcase some of the recent improvements AITF has made to its operating model as well as provide clarity to our stakeholder's of AITF's mandate and how its operations support the achievement of that mandate in an effective and efficient manner.

Further refinement of AITF's operating model together with strong efforts to further strengthen the relationships with our key stakeholders, clients and innovation system partners will be a priority for 2015-2016.

Like the rest of Alberta, the dramatic collapse in global oil prices due to geopolitical forces and expanded oil supply has had a significant impact on all aspects of AITF's business. Our funding from the Government of Alberta has been reduced due to the current fiscal restraint required of all provincial agencies. In addition to this reduction, the oil & gas sector's pull back on innovation and research investments and budgetary pressures faced by our government clients is significantly impacting our contract revenue business. Currently, AITF is forecasting a \$6.6 million or 11% decline in contract revenue from the current year.

These economic factors have caused AITF's management to re-evaluate certain segments of its operations and strategically reduce its workforce by 28 employees. These staff reductions were carefully considered and implemented in areas where industry demand was seeing significant weakness. This was a difficult but necessary decision that helps position AITF to remain successful during this period of economic uncertainty.

This unexpected decline in Alberta's economic outlook underlines the importance of the work AITF conducts on behalf of the province. The commercialization of technology and application of new knowledge is essential to both the diversification of the Alberta economy and continued economic prosperity from the oil and gas sector where cost-effective methods of production will be centre stage.

AITF will also use this time to focus on strategic opportunities created by the current economic climate. For example, the low Canadian Dollar combined with increased attention from capital providers and investors has created significant potential in AITF's food and fibre sectors. Our work on the Canadian Pipeline Technology Collaborative (CPTC) is also yielding positive results: both in the rapid expansion of its operations but also in the province and industry looking to it as a potential model of how innovation infrastructure can be developed and operate in a collaborative and aligned manner with industry, government and academia.

2015-2016 will be an interesting year, with both new risks emerging but also opportunities. AITF is well positioned for the year given its new operating model and our focus on our key strategic objectives of: Engaging our Stakeholders, Contributing to an Effective Innovation System, Focused Innovation, Operational Excellence and a High Performance Culture.

Mandate

Alberta Innovates-Technology Futures is an integral part of Alberta Innovates—a strategically aligned and integrated provincial research and innovation system. The corporation works with key innovation support agencies, with publicly funded post-secondary institutions, industry and government to further research and innovation in the province and make Alberta more competitive in the global economy.

The purpose of the Corporation is to make strategic and effective use of Alberta Government funding to meet the research and innovation priorities of the Government. These priorities explicitly include:

- Fostering the development and growth of new and existing industries, and
- Supporting a balanced long-term program of research and innovation directed to the discovery of new knowledge and the application of that knowledge to improve the quality of life of Albertans.

The Government of Alberta has given the Corporation the following responsibilities:

- support, for the economic and social well-being of Albertans, research and innovation activities targeted at the development and growth of technology-based sectors and aligned to Government of Alberta priorities, including, without limitation, activities directed at the commercialization of technology and the application of knowledge.
- meet the research and innovation priorities of the Government in the following areas or in a combination of the areas:
 - agriculture;
 - forestry;
 - energy;
 - the environment;
 - health;
 - any other area determined under the regulations;
- foster the development and growth of new and existing industries through research and innovation.

AITF will create value through:

- Increased effectiveness and integration of planning, funding and service delivery.
- Alignment of programs and investments toward priority areas and outcomes.
- Improved coordination between business, technical and networking services.
- Increased program and investment focus on commercialization and product development.
- Improved facilitation of knowledge, intellectual property (IP) and skill transfer within the system, and between academia, industry and government.
- Improved accountability and outcomes through integrated performance monitoring and continuous improvement processes.

Planning Context

Competitive Context

The impact of depressed oil prices

The recent fall in the price of oil is the single largest issue facing Alberta, and has the following effects for AITF:

- The energy industry's need to find more cost-effective methods of production becomes more urgent; however
- A depressed economy will, in all likelihood, result in decreased revenues from all sources, both government and industry contract research.
- This will impede AITF's ability to invest in the development and testing of new technologies.

However, depressed oil prices are not bad news for all Alberta industries. The food and fibre sector is expected to deliver record-breaking growth in revenues and profits, due primarily to falling input costs and improved price-competitiveness resulting from a lower Canadian dollar. These factors will increase this sector's opportunities to capitalize on new technologies under development at AITF.

China—a window of opportunity

Canada is the largest exporter of lumber to China, and although Alberta producers have not been significant contributors to lumber exports to China, the expected growth in the China market will increase Alberta softwood lumber exports (directly to China markets, and to back fill BC lumber traditionally destined for US markets). Despite a large and growing shortage of wood in China, oriented-strand board producers have had little success in building markets for their products. Two factors could change this: (i) wood-frame housing construction in China could experience significant growth, increasing demand for Alberta lumber and sheathing grade panels, and (ii) the development of products for existing Chinese market needs. The latter has the greatest short term potential to increase Alberta's sales of panel products into China.

In light of the opportunities the China market represents, AITF is in the process of developing a China-specific strategic plan; the goal is to grow China into a market of similar importance to the Alberta economy as the US market.

Declining revenue streams

AITF funds its mandate for the province of Alberta through 2 revenue streams - contract research for commercial enterprises and government clients, and funding from the Government of Alberta which has seen a reduction of more than 10% since 2014. Contract research revenues account for almost 50% of the corporation's income, and has enabled AITF to maintain and improve its capabilities and capacities to perform its core mandate while providing critical services to Alberta industry and government.

In the face of declining contract research revenue streams due to the current economic environment, AITF will continue to showcase our unique capabilities. Examples include:

- The low volume manufacture and sale of sensors to the energy industry. These sensors have proven critical for improving production efficiency, however due to their niche application in oil sands operations they are not available from larger manufacturers;
- Development of orbital welding procedures on behalf of a large Alberta-based construction company;
- Small-scale production of a bio-insecticide on behalf of a leading provider of bio-based pest management and plant health products;
- Experimental and simulation evaluation of chemically enhanced heavy oil waterfloods;
- Fuel and lubricant testing and analysis performed for energy industry clients; and
- Wildlife monitoring performed on behalf of the Government of Alberta.

Mandate Review

Over 2015-2016, in partnership with Innovation and Advanced Education (IAE), AITF intends to review its mandate, funding model, and operations. The outcome of this review will provide the guidance necessary to refocus operations on the activities deemed critical to support the IAE's Research and Innovation Outcomes and Collaboratories, while at the same time ensuring that critical services continue to be available to industry and government.

Demographic challenges

150 out of approximately 500 AITF employees are at or near retirement age. We have identified this as a challenge as many of our staff have highly-specialized skills and experience which is not easily reproduced or replaced.

Strategic Collaboration

AITF has a long history of collaboration with industry and government, and views such collaboration as critical to the effectiveness of Alberta's innovation system.

Collaboratories

IAE is working to establish Collaboratories to develop and provide focused and effective direction to the innovation system. AITF is very supportive of this effort.

- Health Research and Innovation Collaboratory (HRIC): Established in the Fall of 2013, the HRIC provides general oversight and recommendations to the Minister of Health and the Minister of Innovation and Advanced Education on strategic policy matters related to research and innovation in the health sector. AITF's Health Sector VP is a member of the HRIC. Over the past year, AITF has taken a supporting role in collaboration with Alberta Innovates Health Solutions (AIHS) in developing an SME health strategy, and has participated in negotiating Health Accelerator funding agreements. AITF will continue to align programs and applied research capabilities to health system needs as identified by the HRIC.
 - Canadian Pipeline Technology Collaborative (CPTC): Established in 2014, the CPTC unites pipeline operators, researchers, technology providers and supply chain partners to pursue responsible advancement of pipeline operations and technology development. It functions as a hub to align and focus currently distributed resources to improve the reliability and safety of Canadian pipeline operations. The CPTC is co-founded by the Canadian Energy Pipeline Association (CEPA), Canadian Association of Petroleum Producers (CAPP) and AITF, and will build on decades of pipeline research, technology development, engineering and testing expertise at established Canadian research facilities such as AITF, C-FER Technologies, CANMET and various academic institutions.
- AITF is actively participating in the establishment of additional Collaboratories in the environment, energy, food and fibre sectors.

Industry Organizations

AITF has been very successful at establishing several industry consortia aimed at solving industry-specific challenges.

- MARIOS (Materials and Reliability in Oil Sands): Established in 2009, MARIOS is a 30+ member R&D consortium managed by AITF and directed by the oil sands sector to tackle materials, equipment, maintenance and reliability issues. The goal of MARIOS is to develop knowledge and validate technologies to significantly reduce downtime, and improve operational reliability and productivity in the oil sands industry.
- AACI: Established in 1984, AACI is a world class, 20 member R&D consortium managed by AITF and directed by the oil sands industry with the purpose of developing and improving economically viable in-situ recovery technologies for heavy oil and bitumen resources. AACI is credited with creating over \$2 billion in annual economic impact for the Province of Alberta.
- AFMI (Alberta Manufacturing and Fabrication Innovation): Established in 2011, AMFI is a professional development program designed to enhance the understanding of modern fabrication technologies through hands-on demonstrations. The program has run successfully as a partnership between AITF and the University of Alberta's Canadian Center for Welding & Joining, along with support from the Government of Alberta. In 2015/16 an expansion to AMFI will commence, creating a technology transfer program designed to de-risk and screen advanced technologies for local manufacturers, fabricators, coatings applicators, service companies, and their supply chain partners. As an industry led consortium, AMFI will evaluate and facilitate adoption of new and existing technologies into the Alberta Energy Sector supply chain.

Joint Investment Programs (JIPs)

AITF has partnered with several industry participants to develop and test technologies relating to their operations. Some of these JIPs have been operating for several years.

- PICoM: In partnership with several pipeline industry participants, AITF is undertaking an evaluation of pipeline cleaning equipment, as well as developing recommended practices for pipeline sludge sampling and transport;
- MARS (Multi-Axis Robotic System): In partnership with NTL Pipelines, AITF is undertaking the evaluation of robotics as applied to pipeline welding;
- Heavy Oil Polymer Flooding: In partnership with energy industry participants, AITF is exploring the feasibility of applying polymers in heavy oil reservoirs;
- Microbial EOR (Enhanced Oil Recovery): In partnership with energy industry participants, AITF is assessing the applicability of this technology to Alberta reservoirs;
- Low-permeability Hydrocarbon Recovery: In partnership with energy industry participants, AITF is undertaking several research projects to enable and improve recovery from “tight” oil formations; and
- Steam Additives Testing: In partnership with energy industry participants, AITF is undertaking several research projects to validate the use of chemicals combined with steam for improved recovery of heavy oil and bitumen.

Regional Innovation Networks (RIN)

One of the most important facets of Alberta’s innovation system supported by AITF is the Regional Innovation Networks (RIN). These are like-minded people passionate about drawing innovation from Alberta’s small businesses and supporting their growth. Leveraging capabilities throughout the province, the RIN partners collaborate both in-region and across Alberta to ensure the appropriate resources are engaged to provide the best possible solution to the client, regardless of where they entered into the innovation system. These RINs are supported by AITF’s Technology Development Advisors who work with the RIN partners and clients providing mentoring and coaching while helping to navigate the innovation system to enable the optimum results for the client. There are six RINs in the province:

- Edmonton – TEC Edmonton, NAIT, and the Northern Alberta Business Incubator;
- Calgary – Innovate Calgary and SAIT;
- Red Deer – Red Deer College and the Central Alberta Regional Innovation Network;
- Grande Prairie – the Centre for Research and Innovation;
- Lethbridge – Lethbridge College, University of Lethbridge, tecconnect, and the Regional Innovation Network of Southern Alberta; and
- Medicine Hat – Medicine Hat College, Community Futures and APEX.

There are also two province –wide entities that support the RINs – CETAC-West (Clean Energy Small Business Support Services) and TRTech which focuses on technical ICT (Information and Communications Technology) related business development services.

AITF's Strategic Direction

In 2013 AITF's Executive and Board approved the following 5 long term strategic objectives which guide this three year business plan and ultimately AITF's contribution to the province in the form of research and commercialization outcomes meant to strengthen and diversify Alberta's economy.

1. Engaged Stakeholders

AITF effectively engages with its stakeholders: clients, shareholders, partners and employees.

Meaningful engagement within the innovation ecosystem and our industry partners is a critical factor to the organization's success, and applies to all of our strategic objectives. AITF works with many different groups and organizations within and across the innovation system. The company's ability to deliver on its mandate depends on the strength of its relationships and ability to collaborate with industry organizations, clients, government colleagues, partner organizations and the institutions, colleges and universities that comprise Campus Alberta.

2. Focused Innovation

AITF accelerates dialogue between stakeholders to select and focus on research and innovation priorities that deliver economic and social benefits to Alberta.

AITF has an important role to play in accelerating dialogue between stakeholders in government, industry and Campus Alberta to support the identification of key sector grand challenges. Early stakeholder engagement in strategy development is essential in creating market pull for the innovations, technical products and services generated through the system. This approach encourages greater technology adoption as the process verifies market demand for the innovation outcomes. Once these challenges are identified by the relevant stakeholders, we will have more focused research and commercialization activities thereby significantly increasing the likelihood of achieving the desired outcomes.

3. Contribute to an Effective Innovation System

AITF contributes to the alignment, relevance, effectiveness and efficiency of services provided through the Alberta innovation system.

AITF brings a unique focus in the innovation ecosystem on Alberta entrepreneurs, small and medium enterprises and key industry sectors, from research through to commercialization. From its unique position, AITF will facilitate connections

and supports linking clients to the right partner organizations at the right time. This includes supporting the creation of a more coordinated and effective innovation agenda.

Work undertaken by AITF in 2014-15 to identify initial grand challenges and the associated sector strategies will ensure meaningful contribution to the emerging collaborative model.

4. Operational Excellence

AITF successfully delivers relevant economic and social outcomes through its dynamic integration of people, processes and systems.

To deliver on its mandate and effectively function within the innovation system, AITF is aligning its operations with industry sectors to meet the needs of industry and government while supporting the diversification and strengthening of Alberta's economy. AITF's organizational structure, portfolio management process and governance will be adjusted to support the overall innovation ecosystem. Strong governance structures will support the effective stewardship of the programs AITF manages on the province's behalf.

5. High Performance Culture

AITF builds and maintains a sustainable organization with a diverse, high-performance culture. AITF is an exceptional place to build a career and make a difference.

AITF's success as an organization depends on its people. AITF will build a high-performance culture and establish an innovative and effective working environment. AITF aims to be a highly attractive organization to people who want to build a career and make a difference.

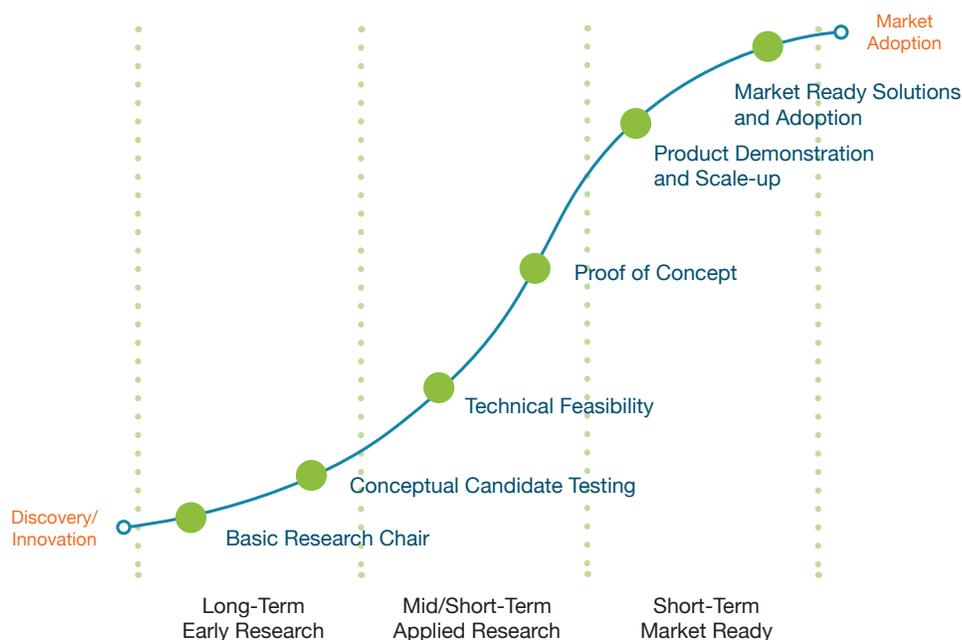
Our people will be supported by our processes. The impact of individual efforts will be evident as corporate outcomes link to tangible economic and social benefits; as sector strategies drive program priorities; and as individual performance plans directly link to corporate objectives.

Business Model & Operating Plan Summary

Introduction to AITF's Business Model

AITF is uniquely positioned within the Alberta Innovation System, with an investment portfolio that spans the breadth of the entire technology development lifecycle – from early discovery through to market adoption. The innovation curve starts with ideas that compel basic research, and extends to applied research and the many activities that ultimately lead to new products, services, and value-added outcomes. These outcomes, when supported through scale-up, commercialization and adoption, become the marketable products and highly productive businesses Alberta brings to the world.

To align with Government of Alberta priorities, and to ensure organizational focus, AITF has adopted a sector-based approach to defining strategy and directing investments. AITF examines sector requirements at each point in the innovation and technology adoption curve and ensures the alignment of the collective assets to solve the challenges facing Alberta's major industrial sectors. Through this coordinated and focused effort, we deliver economic and social benefits to Albertans (ESBA), at an accelerated pace.



Sector Strategies

Sector-based grand challenges have been developed and continue to be refined based on input from government and industry. The Department of Innovation and Advanced Education (IAE) is in the process of defining broad innovation system outcomes, to which AITF will align its grand challenges. Sector-specific strategies continue to be developed (and are discussed in greater detail).

The evolving Collaboratories framework brought forth by IAE is expected to play a leading role in the ongoing evolution of AITF's sector strategies. This work is already well underway within the Health sector, and there is a similar approach being adopted within the Pipeline sector.

Environment

Grand challenge: By 2030, Alberta is globally recognized as a leader in managing resource development to sustain environmental integrity.

To address this grand challenge, the following areas are of strategic focus:

1. *Environmental management:* AITF will support the Alberta government as it implements an Integrated Resource Management System (IRMS) for the province. This includes supporting the science, knowledge and information needs for policy, planning and regulatory decision-making, as well as the development of new models and decision-support systems for cumulative effects management, including the management of species at risk.
2. *Environmental monitoring:* AITF will work with our partners to advance innovative science-based approaches and technologies for monitoring environmental conditions, including technologies, protocols and standards for the acquisition of monitoring information, the integration of this data for decision-making purposes, and the assessment of cumulative effects.
3. *Climate change:* AITF works with industry, academia and government to identify, de-risk and pilot climate change response technologies of strategic importance to the province given the unique nature of our economy. With respect to government needs, AITF identifies policy, regulatory and information barriers related to the introduction and adoption of technologies (e.g. barriers to increase efficiency and utilization of waste heat) as well as the assessment of how future climate change will impact provincial resource and environmental management.

Food and Fibre

Grand challenge: Sustainably increase domestic and export revenue from Alberta's food and fibre manufacturing industries in response to domestic and Pacific North Rim market demand.

For 2015-16, a detailed plan and roadmap is under development, beginning with a market assessment and scoping study.

Grand challenge: Optimize and increase manufacturing productivity to reduce costs and improve competitiveness.

To address this grand challenge, the following areas are of strategic focus:

1. *Forest products*, which include strand-based wood products, pulp and paper, and lignin;
2. *Food safety*, pertaining to food processing and handling; and
3. *Emerging bio-industries*, adding value to Alberta's fibre resources through the development of biorefining and conversion technologies.

Building on Alberta's already established international wood and oriented strand board customer base, wood composites with value-added functional features represent a global market opportunity. Alberta's oil industries could realize synergistic cost and environmental benefits by utilizing forest-derived products (such as cellulose nanomaterials). To satisfy these opportunities, efforts are focused on improving cost and performance competitiveness of Alberta's forest product mills. These efforts include investigating the use of by-product streams to reduce waste, offset input costs, decrease environmental impacts and increase economic resiliency.

Food safety innovations will improve the quality and global competitiveness of Alberta's food products. These innovations will enable continuous progress in production, handling and processing knowledge. Food safety processes will not be considered an expense but a valuable point of differentiation for Alberta-based processed foods and commodities.

Bio-industrial development has been identified as a key contributor to rural economic diversification and resiliency. AITF supports Alberta companies who are pioneering bio-industrial product manufacturing from agricultural fibres and forest biomass, through the provision of pilot- and field-scale testing capabilities and the arrangement for operational and capital financial resources. These services are critical to enabling early-stage companies to survive long enough to establish the value-chains required to serve the emerging global bio-industrial market.

Grand challenge: Optimize food and fibre feedstock output while maintaining social license to operate.

Alberta possesses approximately 52 million acres of cultivated crops and 15 million acres of natural pasture, which supports a farm production and food processing industry generating approximately \$6 billion dollars in gross domestic product. Quality improvements, competitiveness and adaptability of food production are essential for the growth of manufacturing of value-added food.

To this end, the Food and Fibre sector is focusing on near term outcomes in three areas: 1) cereal and oilseed pre-breeding; 2) plant disease and implications; and 3) hemp and flax fibre development and utilization.

In the long term, optimized land use, waste reduction, increased value, and reduced environmental impacts are achievable through total biomass utilization. In support of this goal, technology development is planned in the areas of specialty chemicals, fibres for global panel, pulp and paper manufacturing, and soil amendments for domestic reclamation and sustainability.

Oil and Gas

Grand challenge: Increase Alberta's reserves by 30% by 2030.

To address this grand challenge, the following areas are of strategic focus:

1. *Increasing recovery factor for existing processes:* New technologies and variations can improve the recovery factor for certain reservoirs and recovery processes. Increases in recovery factors result in increases in proven reserves.
2. *New recovery processes for currently exploited reservoirs:* New recovery processes are under development for different geological zones. Secondary recovery processes (e.g. solvent- and combustion-based processes) are also under development.
3. *New recovery processes for unexploited reservoirs:* When a new recovery process can be implemented in a reservoir, the reserves can be increased substantially. A current example for this would be hydraulic fracturing of the reservoir, which has created production from reservoirs that were not exploitable using existing reservoir processes. A longer-term effort would be to develop a commercially viable recovery process for the bitumen resource in the carbonate trend, which has an oil-in-place equivalent to Athabasca.

Grand challenge: Decrease operational inputs for production by 1/3

To address this grand challenge, the following areas are of strategic focus:

1. *Reduction of energy for in situ processes:* while primarily addressing the reduction of steam-to-oil ratio for production by steam-assisted gravity drainage or SAGD processes, this activity also includes the optimization of other recovery processes. Two strategies are under investigation: substitution of steam by solvent (or a process that does not use steam); and control of steam within the reservoir (conformance). Energy companies are pursuing both of these strategies, with significant effort and investment being made at field scale.
2. *Increased reliability and run time for oil field processes:* This is of particular concern for the surface mining sector. The focus of AITF is primarily on the identification and testing of new, longer-wearing materials that will allow for longer run times.

3. *Improved process control:* This strategy is centered on the development and testing of new robust sensor technologies for the oil and gas sector. AITF has been successful in the development and sale of sensors into the surface mining sector.

Grand challenge: Increase the value of bitumen.

Research will be undertaken to develop new, non-traditional products that are based upon the advantages of heavy oil and bitumen. Possibilities include the use of asphaltenes as nanoparticles and the development of specialized plastic products. AITF is currently pursuing a co-development effort with the Heilongjiang Academy of Sciences in China, the outcome of which is complimentary research programs that take advantage of the heavy oil resources in each country.

Grand challenge: Decrease the environmental impact of production.

Efforts are focused on the remediation of environmental impacts that have already occurred (e.g. tailings and disturbed landscapes).

Pipelines

Grand challenge: Enhance and demonstrate integrity, safety, and environmental performance to make Alberta a global leader in pipeline construction and operations.

To address this grand challenge, the following areas are of strategic focus:

1. *Construction:* How do we build safer pipelines with improved quality and productivity?
2. *Integrity:* How do we better operate and maintain pipelines in order to eliminate all pipeline failures?
3. *Leak detection:* How do we develop better and faster leak detection systems to reduce the impact of pipeline failures?
4. *Spill response and environmental impact:* How do we develop better and faster spill response methods, and reduce the long-term environmental impacts of pipeline failures?

Health

Grand challenge: Transform a reactive system to a preventative health and wellness system by 2030.

To address this grand challenge, the following areas are of strategic focus:

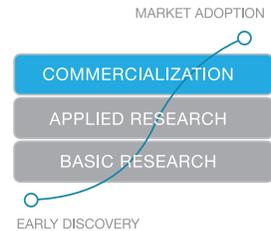
1. *Effectiveness:* AITF will support the Alberta health system to provide more effective health outcomes. AITF will work with Alberta Health Services (AHS) and Alberta Innovates Health Solutions (AIHS), and through the Strategic Clinical Networks, to develop, demonstrate, scale and spread the application of technologies, services and products that provide more effective delivery of health outcomes into larger markets.
2. *Efficiency:* AITF will work with the Alberta health system to provide more efficient delivery of health outcomes. This work will involve our partners, including those in the small and medium enterprise (SME) community to develop, implement, and adopt new technologies, protocols and products that facilitate more efficient health care delivery in the tertiary and primary health care systems. A long-term objective of efficiencies is to constrain and control health care costs that currently consume approximately half of Canadian provincial budgets.

Commercialization

The Commercialization team performs two functions: 1) implementation and management of Government of Alberta BTTM (Bringing Technology to Market) programs; and 2) support for the commercialization efforts of the priority sectors.

The following objectives have been defined for the 2015-18 timeframe:

1. Increase awareness of commercialization programs and support among the entrepreneur and SME communities. Continue efforts to establish and grow Connectica platform.
2. Define and establish outcomes-based performance metrics for the Regional Innovation Networks.
3. Establish mechanism for continuous commercialization-related input into the development and ongoing refinement of Sector strategies.
4. Refinement of the BTTM programs with Innovation and Advanced Education for continuous improvement and effectiveness.
5. Conduct an inventory of all commercialization capabilities in Alberta for the purpose of streamlining offerings to the small business community.
6. Build a mechanism to enable and encourage AITF stakeholders and recipients of program awards to tell the story and inform Albertans about the successes in the Innovation System.

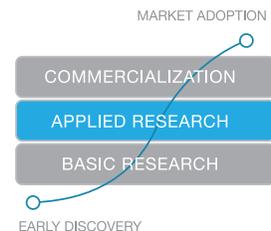


Applied Research

Applied Research provides critical support for technology development, leveraging AITF expertise and assets to prove out technologies at pilot and field scale. It is the bridge that supports the movement of ideas from discovery to market adoption. The majority of AITF resources are directed towards the following areas:

- *Reservoir and Geosciences*: oil sands and heavy oil; tight oil and water flood; production technologies; geosciences.
- *Processing Technologies*: fluid systems engineering; surface technologies; integrated energy systems; bio-processing; thermochemical processing; biomass conversion.
- *Ecosystems and Plant Sciences*: ecological conservation, reclamation and planning; biodiversity monitoring; biotechnology and genomics; feedstock development and microbial products; water characterization.
- *Materials and Manufacturing*: applied spectroscopy; surface engineering; corrosion engineering; welding engineering; engineered composites; measurement systems engineering.
- *Analysis and Testing Services*: environmental analysis; fuels and lubricants.

Applied Research capabilities are critical to the delivery of our programs and support multiple sectors in their efforts to solve Alberta's Grand Challenges. These capabilities are also leveraged to provide important services to various departments in government, as well as to Alberta-based industry. Almost 50% of AITF's revenues are derived from non-grant sources, e.g. industry-sponsored research programs and fee-for-service activity.



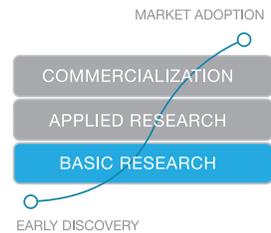
Specific objectives for Applied Research for the period of 2015 – 18 are:

1. Complete the transition to a matrix operational model.
2. Establish succession planning to address looming demographic challenge (150 personnel at or near retirement age).
3. Define and deploy a balanced score card report on key performance metrics.

Basic Research

Basic Research supports the creation of new science-based knowledge in the province of Alberta primarily through the establishment and funding of university centres of excellence and personnel, including strategic and industrial chairs, students, and visiting researchers. A majority of funding is focused on three “platform” technologies and guided by the correlating platform strategies defined by Innovation and Advanced Education. These platforms are:

- Nanotechnology: the manipulation of matter on an atomic, molecular, and supramolecular scale.
- Omics (e.g. genomics, proteomics): the collective characterization and quantification of pools of biological molecules that translate into the structure, function, and dynamics of an organism or organisms.
- Information and Communications Technologies (ICT): unified communications, telecommunications, computers, enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information.



Specific objectives Basic Research for the period of 2015 – 18 are:

1. Continue to recruit and sustain the best researchers to support platform strategies and enable Sector strategies.
2. Create and implement processes for engagement between industry and the research community.
3. Continue to develop a culture of youth technopreneurship.
4. Create opportunities for the acceleration of technology translation from basic research toward utilization by creating and implementing programs and/or processes for delivering focused resources to research projects with commercial potential.
5. Develop processes and systems to engage and characterize the skills and capabilities of members of the ‘Academy’ (The cadre of AITF funded Centres of Excellence, chairs and graduate students).

Corporate Goals, Performance Measures, and Research and Innovation Initiatives with System Outcomes

Upon completion of the upcoming review of AITF's mandate and effectiveness, the Executive will review our current goals and measures to ensure continued applicability and alignment to the newly-defined Research and Innovation Outcomes as issued by the province.

Goals

Basic Research **GOAL 1: Alberta continues to attract and retain world class highly qualified and skilled people that form the foundation of an innovative jurisdiction.**

OUTCOMES: AITF accelerates innovation in Alberta through in early stage research by supporting the attraction, education, training, and deployment of HQ/SP into Alberta's key economic sectors, and through directed research activities that will accelerate basic and applied research deployment.

Performance Measure(s)	Forecast 2014-15	Target 2015-16	Target 2016-17	Target 2017-18
1a Retention of HQ/SP	60%	60%	60%	60%
1b Leverage of HQ/SP funding	3:1	3:1	3:1	3:1
1c Number of Chairs	40	35	35	35
1d Research teams supported by Chairs	700	665	610	610

Applied Research **GOAL 2: Alberta is a leader in applied R&D addressing both the immediate and long term needs of industry, as well as providing R&D capacity and expertise addressing key Government priorities.**

OUTCOMES: AITF's Applied Research function is aligned to industry sectors and works with customers to accelerate technology investments so they more quickly move into system/subsystem incorporation. AITF industry sectors create and develop technologies linked to Government of Alberta strategic research and development priorities and aligned to industry needs such that they are able to move out into industry within the next 3-5 years.

Performance Measure(s)	Forecast 2014-15	Target 2015-16	Target 2016-17	Target 2017-18
2a Contract Revenue	\$63M	\$57M	\$60M	\$63M
2b Account Retention	60%	55%	55%	60%
2c Investment Leverage	4.0	4.0	4.0	4.0

Commercialization **GOAL 3: Alberta leads Canada in the deployment and commercialization of innovative technologies by helping customers bring new products, technologies, and production methods to the market.**

OUTCOMES: AITF through the efforts of its Business Innovations Services and partners in the Regional Innovation Network will make it easier for technology companies to start and successfully grow their businesses here at home, versus believing they need to relocate to other jurisdictions to be successful. This will result in more competitive companies, improved employment opportunities, and economic sustainability for Alberta.

Performance Measure(s)	Forecast 2014-15	Target 2015-16	Target 2016-17	Target 2017-18
3a Number of Active Projects	400	400	400	400
3b Jobs Created	500	400	425	450

Alignment with the Alberta Research and Innovation Plan

Over the past year AITF has been working closely with IAE on the continued development of the Alberta Research and Innovation Plan (ARIP). The ARIP, while still in draft format, is attempting to guide the focus of publicly-supported research and innovation organizations to enable collaboration and alignment, and ultimately optimize the province's investments in innovation. It has been developed in collaboration with the Portfolio Advisory Committee ministries of International and Intergovernmental Relations, Treasury Board and Finance, Health, Energy, Agriculture and Rural Development, Environment and Sustainable Resource Development, and Innovation and Advanced Education, as well as Campus Alberta and all four Alberta Innovates corporations. AITF's portfolio of investments is wide reaching and crosses multiple platforms, sectors and the full spectrum of technology readiness. A review of AITF's planned investments in all three key areas – Applied Research, Basic Research and Commercialization- shows alignment to the ARIP's 4 Research and Innovation (R&I) Outcomes and most of the 13 Research and Innovation (R&I) Priorities, with the exception of:

- The Basic Research Portfolio has no planned or existing investments for the following R&I Priorities: (i) Waste Streams to Energy and Value-Added Products, and (ii) Resource Infrastructure.
- The Commercialization Portfolio has no planned or existing investments for the following R&I Priorities: (i) Decision-Making Support Tools, (ii) Innovation Health Service Delivery and (iii) Community Health, Wellness and Empowerment.

AITF's Research and Innovation initiatives are detailed in the Business Model and Operating Plan Summary (pages 8-13). Below are the draft ARIP pillars, outcomes and priorities.

ARIP Pillars, Outcomes and Priorities

Pillars		
Broadened Economic Base	Effective Resource and Environmental Management	Healthy, Resilient Communities
Outcomes		
Alberta's research and innovation system drives the growth and diversification of the economy.	Alberta's research and innovation system enables the cost-effective discovery, development, and production of natural resources.	Alberta's research and innovation system enhances the health and well-being of Albertans.
	Alberta's research and innovation system mitigates environmental impacts.	
Priorities		
Bioindustry Advancements. Energy Diversification. Food and Agriculture Innovation. Health Technologies.	Innovative and Clean Production Tech. Reduced GHG Emissions in Production. Optimised Water Use and Management. Waste Streams to Energy and Value-Added Products. Decision-Making Support Tools. Integrated Land Use and Management Resource Infrastructure.	Innovation Health Service Delivery. Community Health, Wellness and Employment. Environmental Health.

Performance Measure Definitions

Performance Measure	Definition
1a Retention of HQ/SP	Expressed as the % of HQ/SP, through HQ/SP programs, that were retained in Alberta.
1b Leverage of HQ/SP	Expressed as a ratio of AITF dollars to non-AITF dollars in HQ/SP funding areas.
1c Number of Chairs	AITF basic research chair contracts active in the current fiscal year
1d Research teams supported by Chairs	Research team members (e.g. Master's, PhD's, post-docs) associated with active Basic Research funded Chairs
2a Contract Revenue	Expressed as the dollar value of total R&D contracts and Product Sales.
2b Account Retention	Expressed as the % of accounts (by revenue) that was retained year over year.
2c Investment Leverage	Expressed as a ratio of provincial grant investment to total revenue.
3a Active Awards	Number of active commercialization awards.
3b Jobs Created	Direct jobs created in the year by AITF either through funding grant recipients or written attestations from industry clients.

Alignment with the Provinces' Research and Innovation Outcomes

The Government of Alberta and the Alberta Innovates Corporations have identified a set of 4 outcomes for the provincial investments in research and innovation, all in support of Alberta's economic, environmental and social prosperity. The grand challenges identified by AITF all support these 4 outcomes as shown below:

			IAE Research and Innovation Outcomes			
			Alberta's innovation system drives the growth and diversification of the economy	Alberta's innovation system enables the cost-effective discovery, development and production of natural resources	Alberta's innovation system mitigates environmental impacts	Alberta's innovation system enhances the health and well-being of Albertans
AITF Grand Challenges	Oil and Gas	Increase Alberta's reserves by 30% by 2030	•	•		
		Decrease operational inputs for production by 1/3	•	•	•	
		Increase the value of bitumen	•	•		
		Decrease the environmental impact of production	•	•	•	•
	Pipelines	Enhance and demonstrate integrity, safety, and environmental performance to make Alberta a global leader in pipeline construction and operation	•	•	•	•
	Food and Fibre	Sustainably increase domestic and export revenue from Alberta's food and fibre manufacturing industries in response to domestic and Pacific North Rim market demand	•	•		
		Optimize and increase manufacturing productivity to reduce costs and improve competitiveness	•	•		
		Optimize food and fibre feedstock output while maintaining social license to operate	•	•	•	
	Health	Transform a reactive system to a preventative health and wellness system by 2030	•			•
	Environment	By 2030, Alberta is globally recognized as a leader in managing resource development to sustain environmental integrity	•	•	•	

Risk Assessment

As all entities are, AITF is exposed to many factors which could adversely impact the ability to deliver on this business plan. As part of AITF's Enterprise Risk Management process, the following significant risks were identified by senior management at AITF:

Declining revenue streams due to current economic environment from both industry and government clients

Given AITF's mandate and the long term nature of research and innovation, AITF must keep critical human and infrastructure assets in place as both industry and the province recover. This three-year business plan and budget were created with this balance in mind; cost reductions have been initiated, while trying to still nurture and protect the future research and commercialization outcomes which will strengthen and diversify the Alberta economy.

Aging workforce and succession planning in critical areas

With 150 people at or near retirement, succession planning in critical areas poses a challenge to AITF's continued success and sustainability as many of our employees have highly-specialized skills and experience that is not easily reproduced or replaced. Our operating plan and budget allows for replacement of key individuals as they choose to retire. In addition, management will continue to strengthen succession planning in the most vulnerable areas of our business.

Coordination of activities within Alberta's innovation system

As discussed throughout our business plan, AITF strongly supports the Collaboratory model. With representation on all five of the provinces Collaboratories, we look forward to raising awareness of potential areas of redundancies, duplication or insufficient allocation of resources within the innovation ecosystem.

Aging capital and technology infrastructure

As detailed in our Capital Plan, AITF has limited sources of capital and is heavily dependent on the Government of Alberta for capital funding to maintain the required facilities and infrastructure for the applied research side of our business. With the current economic downturn, and declining government funding, management has made the strategic decision to underinvest in capital in the current year, with an eye to reversing this trend in the near future. We will be using 2015-16 as a year to build a long term capital plan, and in partnership with IAE and Alberta Infrastructure start to address the issue adequate capital funding.

Budget

Alberta Innovates-Technology Futures

Consolidated Statement of Operations for all Funds

Three Year Financial Plan (\$ in thousands)

	2013-14 Actual	2014-15 Budget	2014-15 Forecast	2015-16 Budget	2016-17 Target	2017-18 Target
Revenues						
Government Transfers						
Government of Alberta Grants	45,590	41,940	41,940	41,722	43,391	45,127
Restricted Provincial Funds	38,083	54,482	48,182	55,678	57,905	60,221
Other Provincial Funds	5,963	9,725	7,337	10,230	10,639	11,065
External Contract Revenue	58,843	61,637	55,161	50,046	55,051	57,803
Contract Revenue from Province of Alberta	5,205	5,221	4,044	4,077	4,485	4,709
Product Sales	5,748	7,184	4,206	2,731	3,004	3,154
Other Revenue	2,149	700	887	790	790	790
Total Revenue	161,581	180,889	161,757	165,274	175,265	182,869
Expenses						
Priority Areas						
Applied Research	103,740	117,412	104,149	96,643	100,103	103,694
Basic Research	35,214	43,041	43,391	44,789	46,393	48,057
Commercialization	16,680	26,304	22,472	27,359	28,339	29,355
Total Expenses	155,634	186,757	170,012	168,791	174,835	181,106
Net Operating Surplus/(Deficit)	5,947	(5,868)	(8,255)	(3,517)	430	1,763
Loss (Gain) on Disposal of Capital Assets	45	-	54	-	-	-
Annual Operating Surplus/(Deficit)	5,902	(5,868)	(8,309)	(3,517)	430	1,763
Capital Investment and Net Change in Capital Assets						
New Capital Investment	5,557	6,860	5,627	4,796	6,000	6,000
Less: Amortization	(3,787)	(4,422)	(4,538)	(5,258)	(5,000)	(5,000)
Loss on Disposal/Write-down	45	-	54	-	-	-
Net Increase (Decrease) in Capital Assets	1,815	2,438	1,143	(462)	1,000	1,000
Change in Net Assets						
Net Assets at Beginning of Year	47,808	53,710	53,710	45,401	41,884	42,314
Net Operating Results for the Year	5,902	(5,868)	(8,309)	(3,517)	430	1,763
Increase (Decrease) in Net Assets	53,710	47,842	45,401	41,884	42,314	44,077

2015-16 Key Outcomes

\$ in thousands

Research and Innovation (RI) Initiatives	Total 2015-2016 Budget (\$'000)	Key Outcomes of the Alberta Research and Innovation System			
	Total Budget	Drives the growth and diversification of the economy (\$'000)	Enables the cost-effective discovery, development and production of natural resources (\$'000)	Mitigates environmental impacts (\$'000)	Enhances the health and well-being of Albertans (\$'000)
Commercialization	36,770	10,932	9,645	9,254	6,940
Applied Research	79,340	20,450	26,032	23,446	9,413
Basic Research	52,680	14,233	16,661	14,708	7,077
TOTAL	168,791	45,615	52,338	47,407	23,430

AITF Capital Plan and Leasing Arrangements

Capital Requirements

AITF's capital planning and investment needs are categorized into two streams at AITF – Applied Research and Corporate Capital.

- The Applied Research side of AITF's business is a capital intensive business. Our research facilities cover four locations – Edmonton, Calgary, Devon and Vegreville and over one million square feet of research space. AITF's industry and public sector clients come to AITF for access not only to world class scientists, but our facilities. Ongoing infrastructure support is vital to ensure Alberta maintains its unique Applied Research capacity, sustains program effectiveness and manages program growth aligned to provincial priorities.
- Corporate capital investments are needed to provide integrated systems (particularly IT systems) with the appropriate safeguards to support and sustain the ongoing operations of AITF.

To meet the funding needs of both categories of capital AITF can access 2 sources of funding (i) AITF operating funds or (ii) additional capital investment from the provincial government for major capital and accommodation projects.

Funding from Operating Funds

In recent years AITF has invested around \$6 million in capital annually out of operating funds for both Applied Research and corporate capital projects. Although, this funding stream is used to purchase equipment, fulfill minor program accommodation requests and support traditional IT systems needs of a corporation of AITF's size, it is insufficient to provide adequate annual maintenance capital support for the Applied Research facilities of AITF. We will be developing a long term capital funding strategy in conjunction with IAE to address this issue.

The 2015/16 business plan recognizes the challenges posed by the reduced operating funding from the government and the weakening in demand for contract research. As a result the operating capital budget has been reduced by 15% from the 2014/15 level to \$4.8 million. Of this amount, \$3.0 million of this funding is for AITF's Applied Research business, with the remainder to support corporate initiatives.

Funding Available from Major Capital Requests from GoA

AITF requests additional funding for major projects from IAE and Alberta Infrastructure through the annual Major Capital and Accommodation Processes; these additional capital requests are shown on the Three year Capital Funding Schedule.

In the 2015/16 planning cycle AITF has requested \$106 million for 3 major capital projects which are detailed in the Three Year Capital Summary of this business plan. At the time this business plan was written AITF was awaiting final consideration of this funding.

Looking to the future

Despite the limited dollars available for capital investment in the upcoming year AITF will be working on building an inventory of both corporate and Applied Research capital assets, determine the utilization of key assets and to build a long term capital plan with an eye to the direction and priorities of AITF, the larger innovation ecosystem and sustainability of Alberta's Applied Research capacity.

2015-2018 Three-Year Capital Plan Funding Schedule

\$ in thousands

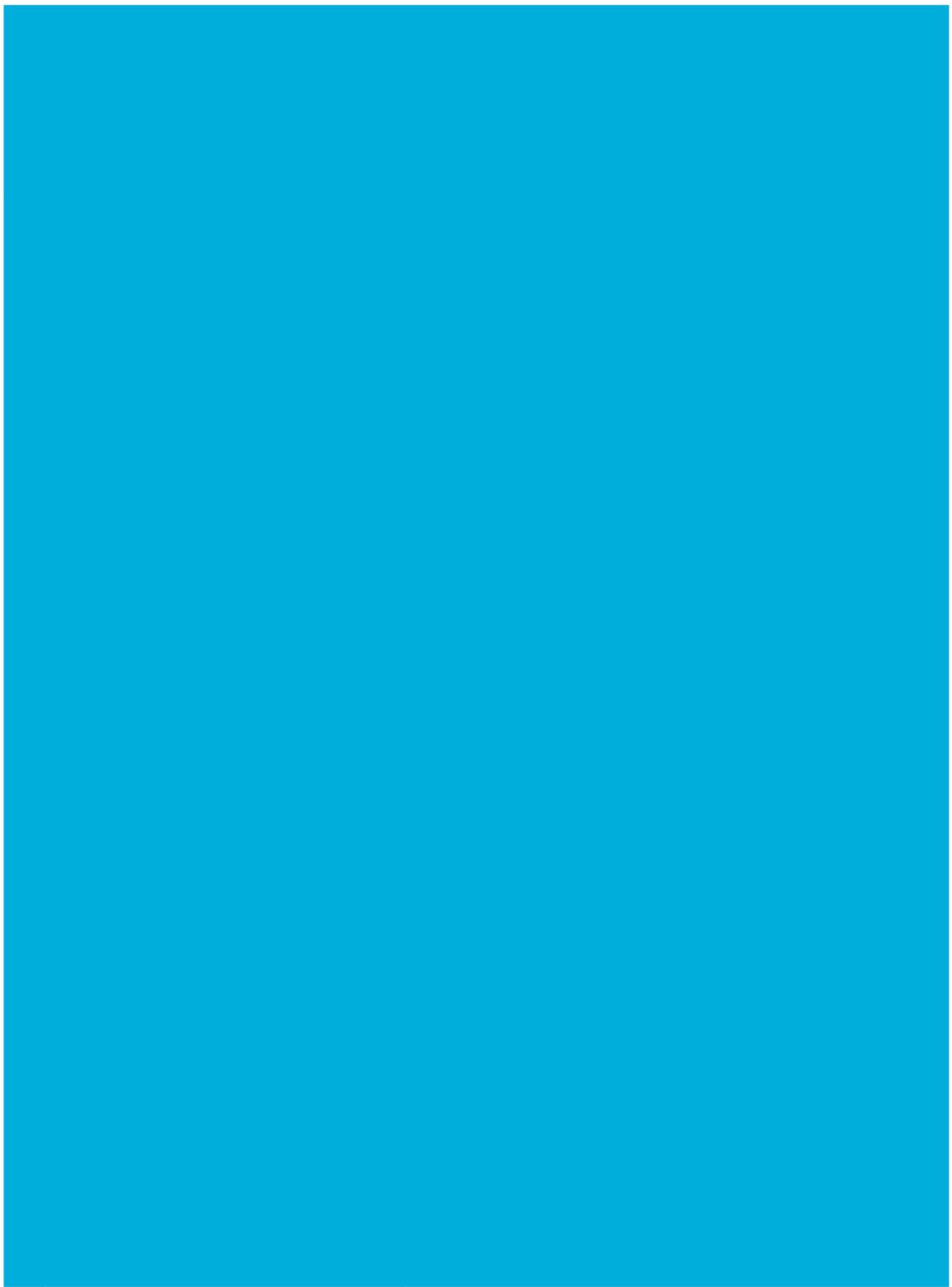
Projects by Location	Type of Project	Project Scope and Justification	Proposed Timeline	2015-16 Estimate	2016-17 Target	2017-18 Target	3-Year Total	Funding Sources
Devon – AITF								
Alberta – Canada Collaboratory in Cleaner Oil Sands Development Memorandum of Understanding	Major Capital	MOU strategic capital plan implementation to support programs and capital maintenance/renewal projects at Devon as required to address immediate and longer-term space requirements of AITF and NRCan. Note – MOU program and project details are still in development. Total Project Cost: \$103.5M (in current 2015 dollars)	36 to 60 months	\$6,000	\$24,000	\$58,000	\$88,000	- Potential - IAE, Alberta Infrastructure, other GOA
Edmonton – AITF								
Collaborative Work Environment Development	Major Capital	Redevelop all administrative spaces to mitigate ongoing space pressure, to create a work environment that engages people and inspires collaboration, and to provide a brand strategy aligned to AITF's vision and mission. Total Project Cost: \$10M (in current 2015 dollars)	12 to 48 months	\$0	\$2,500	\$5,000	\$7,500	- Potential - Alberta Infrastructure, GOA
Calgary – AITF								
AITF Calgary Program Expansion	Major Capital	Redevelop high head and administrative space to support the effectiveness and growth of Calgary programs aligned to provincial priorities in the SME's, Petroleum, Environment and Water Management programs. Total Project Cost: \$11.6M (in current 2015 dollars)	12 to 48 months	\$0	\$1,400	\$8,100	\$9,500	- Potential - IAE, Alberta Infrastructure, GOA
All Sites – Miscellaneous								
Program Equipment, Minor Facility Projects and Corporate Systems	Ongoing Capital Investment	Miscellaneous corporate systems and equipment identified from annual budgeting process	2 to 12 months (project dependent)	\$4,800	\$7,000	\$9,000	\$20,850	- AITF Operations - IAE, Alberta Infrastructure, GOA
				\$10,800	\$34,900	\$80,100	\$125,850	

Commercial Lease Arrangements

Location	Size	Termination date	Scope of Operations
1. Edmonton – Manulife	12,095sf	January 31, 2016	Subleased space from the former AB Ingenuity space.
2. Victoria	5,030sf	July 31, 2018	Water Characterization Group
3. Edmonton Pylypow	12,925sf	June 30, 2019	Space to support operations of AITF Industrial Sensors group.

Pre-approved Priority Projects

There are no pre-approved priority projects at this time.



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