



The title 'Action Plan' is rendered in a large, stylized font. The letters are filled with various images: 'A' shows a construction site with a ladder; 'c' shows green leaves; 't' shows a field of wildflowers; 'i' is a solid red dot; 'o' shows a computer keyboard; 'n' shows a blue keyboard; 'P' shows a field of yellow flowers; 'l' shows a blue DNA helix; 'a' shows green leaves; 'n' shows a laboratory flask. The word is flanked by two green shapes with white icons: a magnifying glass on the left and a lightbulb on the right.

# Alberta Research and Innovation Action Plan 2017-2020

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# NOTES

Prepared by the Government of Alberta.

For more information, visit the Ministry of Economic Development and Trade website at [www.economic.alberta.ca](http://www.economic.alberta.ca) or the Alberta Research and Innovation Framework webpage at [www.alberta.ca/alberta-research-innovation-framework.aspx](http://www.alberta.ca/alberta-research-innovation-framework.aspx).

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2017

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## Acronyms / Abbreviations

ARIF	Alberta Research and Innovation Framework
EDT	Economic Development and Trade
AER	Alberta Energy Regulator
GHG	Greenhouse Gas
CCITF	Alberta Climate Change Innovation and Technology Framework
AI	Alberta Innovates
AMII	Alberta Machine Intelligence Institute

# Executive Summary

Alberta's research and innovation system is a partnership between government, its agencies, post-secondary institutions and industry. These stakeholders play a key role in contributing to the 2030 innovation targets, as outlined in the Alberta Research and Innovation Framework (ARIF). The corresponding ARIF Action Plan identifies initiatives that will contribute to the targets and describes the reporting and accountability mechanisms for these initiatives.

The ARIF and ARIF Action Plan were developed in consultation with industry associations, business, post-secondary institutions and government partners and the innovation targets are grounded in government policies, strategies and business plans. As a result, the initiatives align with government work as well as with the Government of Canada's initiatives in health, smart agriculture and clean technology.

Success in each of the sectors identified in the ARIF means a competitive and diversified economy and a thriving environment for new and existing businesses and for job creation. Success also means new ideas and opportunities and an acceleration of ideas from infancy to commercialization.

The Government of Alberta ministries involved in research and innovation and in the development of the ARIF and ARIF Action Plan will monitor and report on any progress on their respective initiatives. As the co-ordinating ministry, Economic Development and Trade (EDT) will work with ministries, post-secondary institutions and government agencies (Alberta Innovates, Emissions Reduction Alberta) to report progress on the innovation targets.

# 1 Introduction

## 1.1 Background

The Alberta Research and Innovation Framework (ARIF) Action Plan 2017-2020 describes how the Government of Alberta will respond to the research and innovation needs and aspirations of Albertans over the next three years. It identifies key government priorities, corresponding initiatives, performance measures and the budgets that will support the 2030 innovation targets.

The Action Plan follows the development and release of the ARIF, which was developed collaboratively with research and innovation stakeholders. Stakeholders from post-secondary institutions, industry, agencies and associations were also consulted. This work informed the 2030 innovation targets.

The Government of Alberta, Alberta Innovates, post-secondary institutions and industry must all collaborate to contribute to the innovation targets and to make progress on the ARIF outcomes, shown below.



This Action Plan was developed with Alberta's areas of strengths in mind, as well as other potential areas of development. Additionally, some initiatives were developed in alignment with the Government of Canada's supercluster areas.

## 1.2 Purpose of the ARIF and the ARIF Action Plan

The ARIF will guide the Government of Alberta's research and innovation agenda. It informs post-secondary institutions, researchers, innovators, industry and other partners about government's research and innovation priorities.

The ARIF Action Plan identifies how the Government of Alberta and its agencies and corporations will contribute to the innovation targets through key initiatives.

The targets include specific and tangible results that stakeholders can achieve through the use of research and innovation. The targets also include a decision-making tool to support investments in new knowledge where it is needed.

Focus areas, identified by stakeholders, are the paths to advance the targets. These are areas where the province has strength and capability, demonstrates significant viability and greater investment or activity. Ministries and Alberta Innovates have identified their existing and proposed initiatives that further support focus areas.

There will be varying degrees of effort and investment to achieve the targets. Ministries and Alberta Innovates will make decisions about which initiatives and strategies will support the targets. The collaboratories (groups composed of senior members from Alberta Health, Alberta Energy, Alberta Environment and Parks, Alberta Agriculture and Forestry, Alberta Economic Development and Trade, Alberta Innovates, Emissions Reduction Alberta and Alberta Climate Change Office) will review and discuss focus areas and initiatives to determine where there is progress and where course corrections are needed.

## IMPLEMENTING THE ARIF



### 1.3 Methodology for Developing the Innovation Targets

The 2030 Innovation Targets were determined after several consultations with research and innovation stakeholders in Alberta. In total, at least 100 Government of Alberta staff and about 206 external representatives were consulted and commented on the ARIF and the targets. Specifically, government held roundtable discussions in cities across Alberta. The conversations focused on key areas such as health; energy and GHG mitigation; fibre and bioindustrial; food and agriculture; and environment and climate adaptation.



**84**

Industry  
associations



**74**

companies



**12**

post-secondary  
institutions



**36**

government  
partners

The innovation targets span the research and innovation spectrum and are grounded in government policies, strategies and desired outcomes.

## 1.4 Developing the Action Plan and Prioritizing Initiatives

This plan was developed with input from key stakeholders and government representatives who are members of or cross-ministry working groups referred to as “collaboratories.” The Government of Alberta and Alberta Innovates established five collaboratories to align with the five sectors: energy and GHG mitigation; environment and climate adaptation; food and agriculture; fibre and bioindustrial; and health. Notably, emerging technologies integrates with the collaboratories and contributes to the targets, as it stimulates growth and development through technology partnerships and investments.

Each collaboratory has a steering committee and working group comprising representatives from Alberta Innovates and government departments (from Economic Development and Trade; Agriculture and Forestry; Health; Environment and Parks; and Energy). An assistant deputy minister and a senior executive from Alberta Innovates co-chair the steering committees.

The collaboratories select and prioritize initiatives. Some are ongoing, and some are proposed to begin within the plan’s three-year timeframe. Initiatives are monitored, reviewed and updated continuously to reflect government’s agenda.

## 1.5 Structure of Action Plan

The Action Plan has two components:

- Background and Context include information about how the plan was developed. These sections also highlight the innovation targets and how they align with Government of Alberta business plans, strategies and policies.
- The Sector sections contain information about initiatives within each sector. They also highlight strategies, performance measures, participating organizations and fund allocations for each of the flagship initiatives.

The Action Plan will be implemented by way of initiatives in department business plans. The respective departments will assess their initiatives as per individual budgets.

## 1.6 Reporting Performance

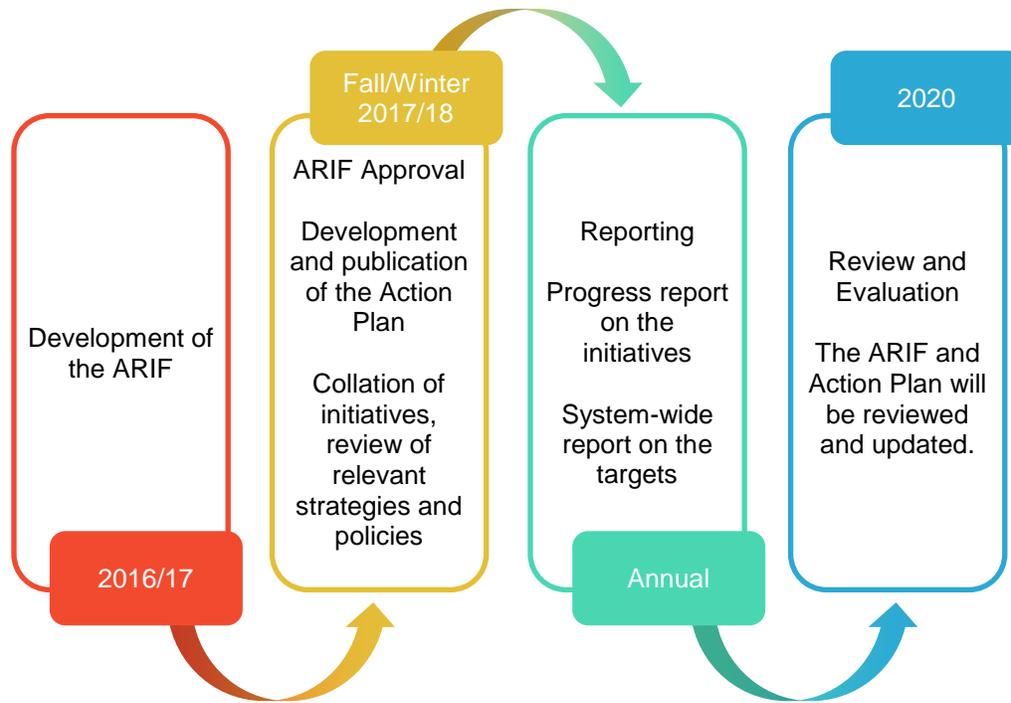
Departments will report progress on the targets following a two-pronged approach: through a progress report at the initiative level and a system-wide report on the innovation targets level.

**Progress Report:** An annual progress report on the development and execution of the initiatives within each of the five sectors will be prepared for internal use, following the publication of the ARIF Action Plan.

Progress reports will identify the various stages of the initiatives (e.g., started, in-progress, completed), including total investment and number of jobs created (where applicable), among others factors. The report will focus on initiatives of the Government of Alberta and its agencies, including Alberta Innovates and Emission Reductions Alberta. This internal report will help with the preparation of the system-wide report for public release.

Lead ministries and organizations will be responsible for reporting on the details and performance indicators/measures for their initiatives as part of their business plan reports. Economic Development and Trade (EDT) will be responsible for developing the progress report.

**System-wide Report:** An annual system-wide report on the contribution toward the targets will be publicly released. This report will encompass the work of government and its agencies, post-secondary institutions and industry. It will be based on data from key regulatory agencies and industry associations, including the Alberta Energy Regulator (AER) and Canada's Oil Sands Innovation Alliance (COSIA), among others.



## 1.7 Governance and Accountability

The table below shows the roles<sup>1</sup> and accountabilities of key stakeholders in developing and implementing the Action Plan.

Stakeholder/ Activities	EDT Ministry	Collaboratory Ministries	Collaboratories (GoA and AI)	Alberta Innovates (AI)	Post- secondary institutions *	Industry*
<b>Targets:</b>						
Develop/ revise innovation targets		Accountable Responsible	Responsible		Consult	Consult
Report progress towards innovation targets	Accountable	Responsible	Responsible	Responsible	Responsible	Responsible

<sup>1</sup> **Responsible:** those who do the work to achieve the task. There is at least one role with a participation type of responsible, although others can be delegated to assist in the work required. **Accountable** (also approver or final approving authority): the one ultimately answerable for the correct and thorough completion of the deliverable or task, and the one who delegates the work to those responsible. In other words, an accountable must sign off (approve) work that responsible provides. There must be only one accountable specified for each task or deliverables. **Consulted** (sometimes counsel): those whose opinions are sought, typically subject matter experts and with whom there is a two-way communication. **Informed:** those who are kept up-to-date on progress, often only on completion of the task or deliverable and with whom there is just one-way communication.

Stakeholder/ Activities	EDT Ministry	Collaboratory Ministries	Collaboratories (GoA and AI)	Alberta Innovates (AI)	Post- secondary institutions *	Industry*
<b>Initiatives:</b>						
Identify initiatives to support reaching the innovation targets		Accountable	Responsible	Accountable Responsible	Accountable Responsible	
Determine budget required for initiatives		Accountable Responsible	Inform	Accountable Responsible	Accountable Responsible	
Implement the initiatives		Accountable Responsible	Inform	Accountable Responsible	Accountable Responsible	Accountable Responsible
Identify measures for the initiatives		Accountable Responsible	Inform	Accountable Responsible	Accountable Responsible	Responsible
Report progress on the initiatives	Responsible	Accountable Responsible	Inform	Accountable Responsible	Accountable Responsible	Responsible

\*Role as it relates to joint projects with post-secondary institutions and industry.

As per the table, respective ministries are responsible and accountable for identifying and implementing initiatives. The collaboratories will continuously review information on initiative implementation and make recommendations, where appropriate, especially in light of issues or where targets, focus areas, or initiatives need to be reviewed. EDT will work with the collaboratories, ministries and Alberta Innovates to collate and report key information on an ongoing basis.

### 1.7.1 Ongoing Stakeholder Engagement

Throughout the ARIF implementation, EDT and key ministries that are members of the collaboratories will engage with stakeholders, including Alberta Innovates, post-secondary institutions, federal government and industry. The collaboratory process and membership will be updated to reflect ad-hoc memberships from industry and post-secondary institutions. In addition, other processes and avenues—including federal, provincial and territory meetings—will be used to engage and inform federal government representatives of the ARIF implementation and its alignment with the federal innovation agenda.

In addition, EDT will reinforce to stakeholders the Government of Alberta's commitment to Gender and Intersectional Analysis and measuring equity to ensure equality of outcomes in developing government programs. EDT will also encourage stakeholders to consult broadly when developing programs to ensure inclusive representation of Albertans.

### 1.7.2 Role of Economic Development and Trade

EDT is the co-ordinating ministry for the ARIF and the ARIF Action Plan. Once these two documents are approved, EDT will be responsible for co-ordinating progress reports and reporting success against the targets. Respective ministries will measure performance on initiatives against their business plans and provide information to EDT as needed.

In addition, EDT will work with Alberta Innovates, post-secondary institutions, and other stakeholders to track and monitor key developments and achievements against the targets. As ARIF is reviewed in the future, EDT will continue to consult with diverse populations to ensure their needs are being met.

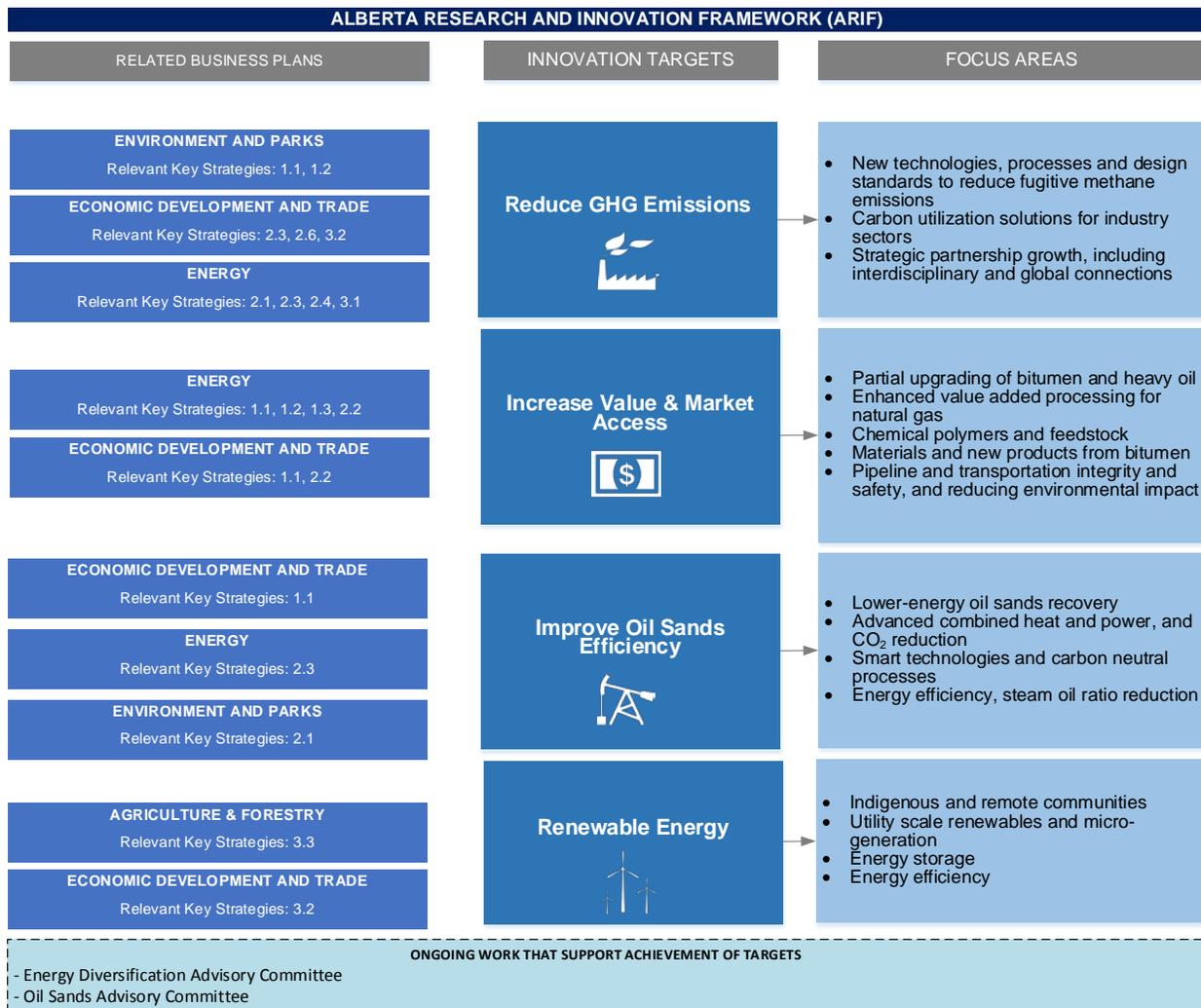
Advanced Education has a significant funding, policy and legislative role in the post-secondary system and in supporting post-secondary research institutions, which are essential contributors to the outcomes in the Action Plan. Advanced Education's operating grants provide and sustain a rich research environment, facilitate the development of skills and talent, provide modernized spaces and infrastructure and create conditions for forward-thinking research.

# 2 Alignment of 2030 Innovation Targets with Government Priorities

The 2030 Innovation Targets are strategically aligned with the Government of Alberta's priorities. Each target is anchored in existing or proposed strategies and policies and supported through department business plans. The diagram below shows how targets align with 2016/17 business plans.

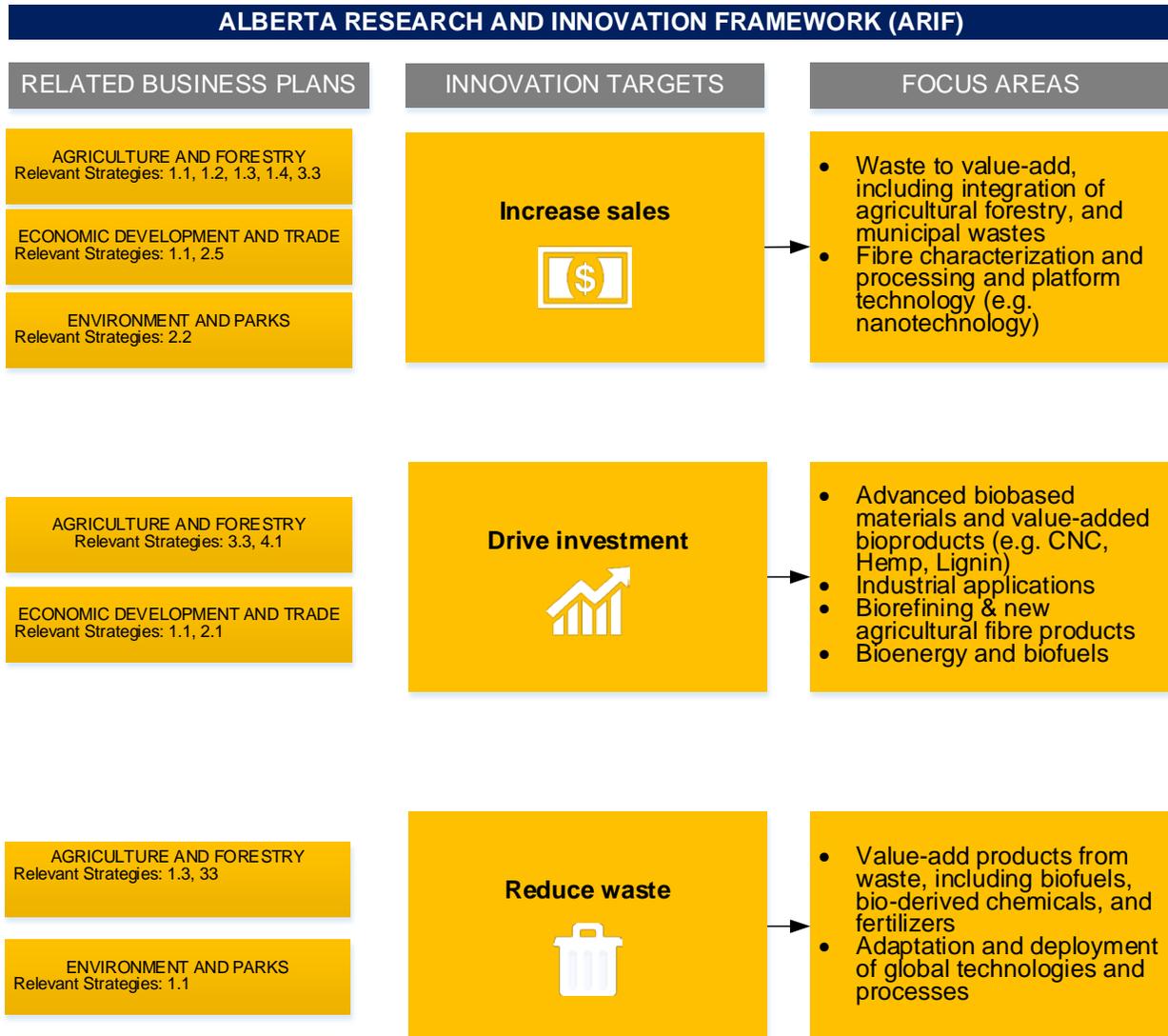
## 2.1 Energy and GHG Mitigation Sector

The targets in the energy sector align with key strategies across four government departments, creating opportunities for partnership and collaboration.



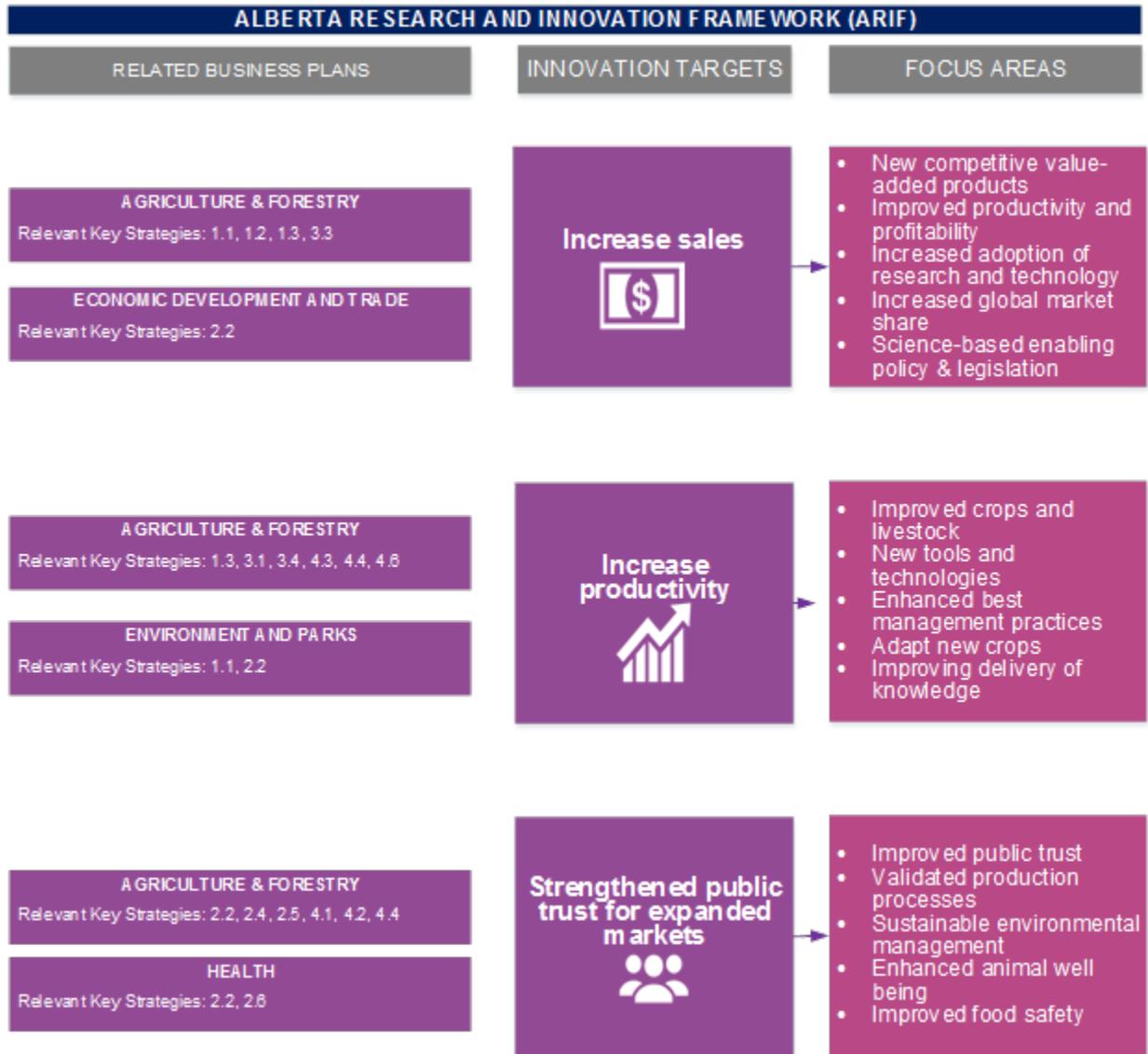
## 2.2 Fibre & Bioindustrial

The targets within the fibre and bioindustrial sector are integrated with the 2016/17 business plans of three ministries, as shown below.



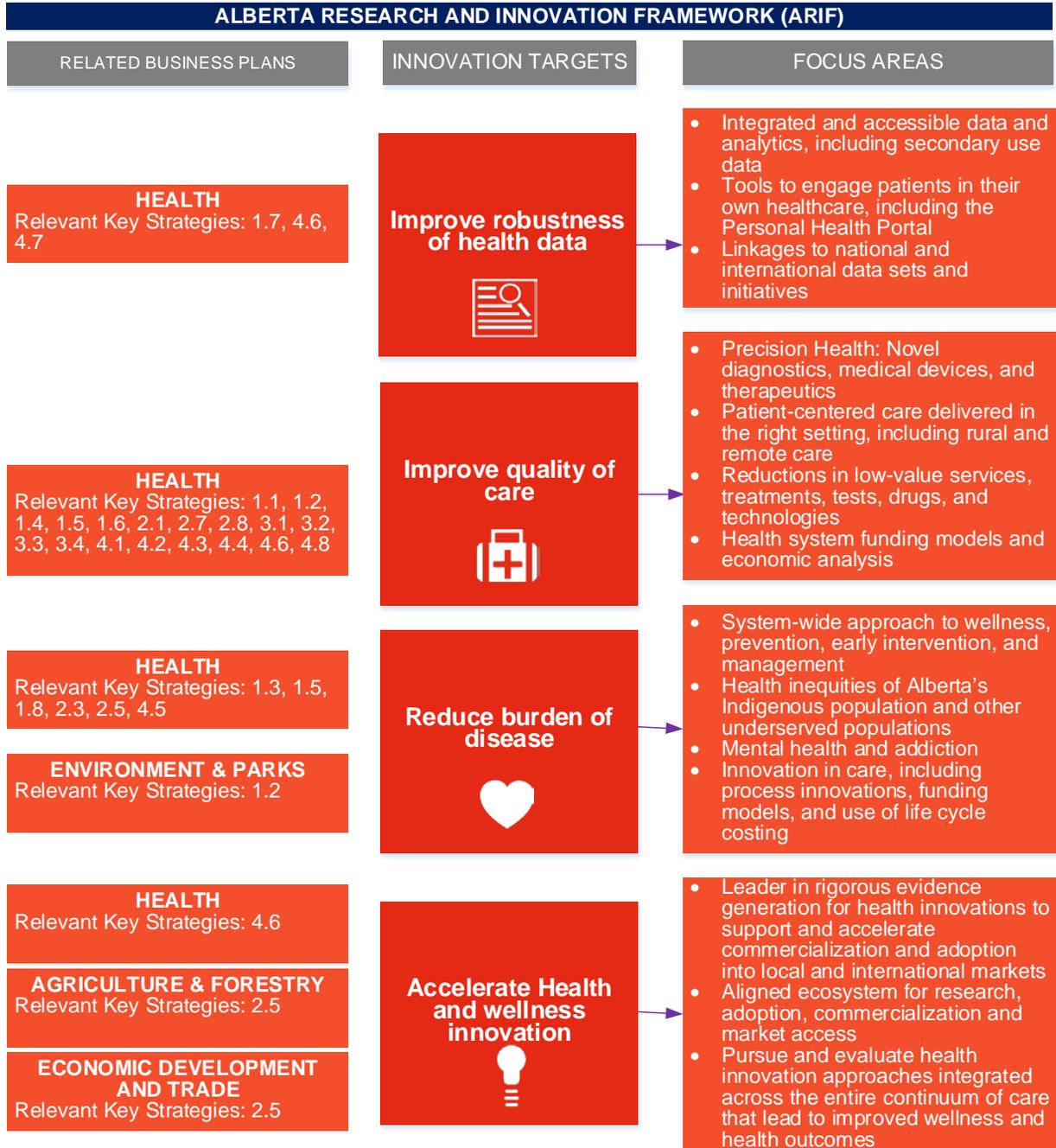
## 2.3 Food & Agriculture

The innovation targets within the food and agriculture sector align with the 2016/17 business plans of four ministries, as shown below.



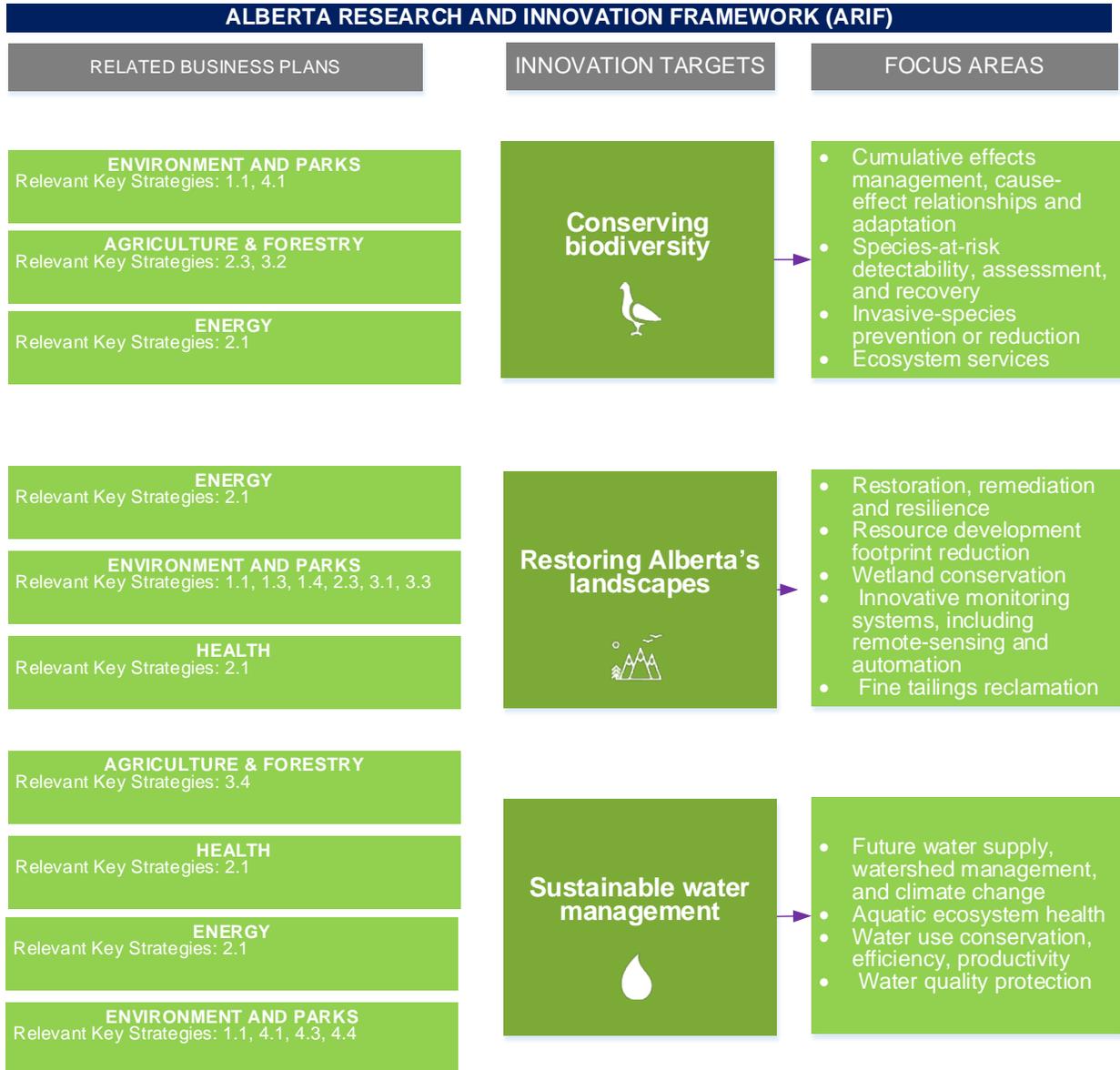
## 2.4 Health

The innovation targets within the health sector align with the business plans of four ministries, as shown below.



## 2.5 Environment and Climate Adaptation

The innovation targets within the environment and climate sector align with the business plans of four ministries, as shown below.



## 3 Industry-led Programs

This section describes some key industry-led strategic programs and how they contribute to the innovation targets. Some are supported by the federal government or other government agencies. These programs include the Alberta Jobs Plan, Alberta Climate Change Innovation and Technology Framework (CCITF) and the Government of Canada cluster initiatives.

### 3.1 Alberta Jobs Plan

The 2016 Alberta Jobs Plan is helping diversify the economy through investment in infrastructure, support for small businesses, improved access to capital and new training opportunities for Albertans.

### 3.2 Alberta's Climate Change Innovation and Technology Framework

Alberta's Climate Change Innovation and Technology Framework will guide investments and accelerate the development and use of innovative, game-changing technology. As a result, Alberta will reduce its GHG emissions while diversifying and growing the economy. CCITF builds upon past strengths, investments and programs, thereby leveraging the resources of multiple governments, industrial and academic partners.

### 3.3 Supercluster Initiative

The Government of Canada's Innovation Superclusters Initiative (ISI) offers a new opportunity to strengthen Canada's most promising clusters. It will accelerate economic growth in highly innovative industries, while positioning Canada's firms for global leadership. The ISI will invite industry-led consortia to lead and invest in bold and ambitious proposals that will supercharge their regional innovation ecosystems. This work will pull together large firms, innovative small and medium-sized enterprises and research institutions. Business leaders will be able to partner in new ways to build innovation superclusters at scale.

With support from the Government of Alberta, Alberta-based industries, Alberta Innovates, post-secondary institutions are collaborating to participate in the ISI. Based on letters of intent, the opportunities include health, smart agriculture and clean technology. Alberta's participation in the ISI will contribute to the 2030 innovation targets.

#### 3.3.1 Health

Key stakeholders in Alberta partnered with industry, through the Canadian Council of Innovators, to submit a Real-time Health Supercluster (RTHS) application. The RTHS will transform Canada's health sector from being the greatest consumer of public funds to being an economic engine that accelerates the creation of sustainable, knowledge-sector jobs, economic value for the Canadian economy and global competitiveness for Canadian companies. Given health is a predominantly human capital industry, job creation will be the principal economic investment and output of the RTHS, with approximately 75 per cent of health organizations' budgets devoted to payroll. Members will invest over \$700 million in cash commitments and \$100 million in in-kind commitments.

This cluster will help transform investments into healthy people, environments and food, as well as a knowledge-intensive and export-focused economy. Key opportunities include cross-sectoral innovation related to life/social sciences; agri-food; and environmental targeting prevention, chronic disease and aging.

The development and successful implementation of this supercluster and others will contribute to the targets.

### 3.3.2 The Smart Agri-Food Supercluster

The Smart Agri-Food Supercluster (SASC) envisions a conceptual hub based in Alberta with collaborating nodes across Canada. This concept could fuel transformational growth and increase economic activity by \$30 billion by 2027.

The SASC would link supply chains by building data/information solutions coupled with a digital backbone to deliver new technologies and efficient practices that respond to economic, social and environmental market signals. SASC priorities will be guided by a “field-systems approach” that identifies opportunities and challenges in four pilot examples—digital backbone, crops, livestock and food processing—that can be addressed through research and innovation. This approach will help grow the agri-food value chain and position Canada as the preferred global supplier of sustainable, high-quality, safe food and nutrition.

### 3.3.3 Clean Technology

The clean technology cluster will build on ongoing work within EDT’s Clean Technology Roadmap and a consortium including the universities of Alberta and Calgary, Canadian Oil Sands Innovation Alliance and Petroleum Technology Alliance Canada. Key opportunities include: clean energy development; energy efficiency and environmental performance; bio-industrial technologies; water management technologies; and the transformation of Alberta’s energy system.

## 4 Emerging Technologies

Technology has and continues to transform the way Albertans live their lives. As new technologies emerge, the Government of Alberta, Alberta Innovates and key stakeholders will play a critical role in supporting growth in this area and knowing how best to use and integrate technology to solve problems. This sector focuses on new technologies either planned or under development. The development of emerging technologies supports the other five sectors identified in the ARIF.

Achievement within this sector means attracting more investment and creating jobs in new and growing sectors through innovation in clean technology; advanced materials; robotics; other nanotechnologies; genomics and other omics technologies; and high-value digital solutions. Some program investments are described below.

### 4.1 Discovery Support for Emerging Technology

These are supports provided to post-secondary institutions through the broader research and innovation funding system to explore enabling platforms that are sector neutral. As these platforms evolve, targeted initiatives move them into applications.

### 4.2 Alberta Machine Intelligence Institute (Amii)

Amii conducts cutting-edge research and development at the University of Alberta in the fields of artificial intelligence and machine learning, together often called machine intelligence. Areas of specialization include machine learning, reinforcement learning, natural language processing, deep learning, medical informatics, algorithmic game theory and data mining and analysis. Research projects are either curiosity-led (initiated by a researcher based on interests) or industry-led (driven by an external need).

Amii also works to boost Alberta's economic potential by applying machine intelligence in Alberta-based companies; facilitating knowledge transfer between industry and academia; training and placing highly qualified people locally; and by creating healthy, viable startup companies based on Amii technologies.

EDT provides the primary funding for Amii's research and administration through an annual grant of approximately \$2 million. The University of Alberta supplies workspace, organizational infrastructure, and 12 tenured or tenure-track positions.

### 4.3 Alberta Centre for Advanced MNT Products (ACAMP)

ACAMP is an industry-driven not-for-profit organization that provides support for manufacturing and commercialization in areas critical for the deployment of advanced technology products. The organization supports over 900 clients, 98 per cent of which are small and medium-sized enterprises (SMEs). In addition, about 60 per cent of ACAMP's clients are in the clean technology market, which includes the development and use of monitoring and control technologies. ACAMP will build on provincial infrastructure to act as a central point of contact, linking large multinational enterprises (MNEs) to Alberta-based SMEs and research institutions.

Both the provincial and federal government fund ACAMP. Recent funding from EDT will support the development of a product commercialization consortium of Alberta-based SMEs, MNEs and research institutions to develop new products and solutions in smart infrastructure and transportation.

# ENERGY AND GHG MITIGATION SECTOR

## 5 Strategies and Flagship Initiatives – Energy & GHG Mitigation

The implementation of existing and proposed strategies and their initiatives will contribute to the innovation targets. In the energy sector, the strategies below would contribute to the targets.

Innovation Targets	Strategies
Reduce GHG Emissions	<ul style="list-style-type: none"> <li>• Climate Leadership Plan</li> <li>• Clean Technology Roadmap</li> <li>• Climate Change and Innovation Technology Framework</li> <li>• Royalty Review Advisory Panel Report</li> </ul>
Increase Value & Market Access	
Improve Oil Sands Efficiency	
Renewable Energy	

### Measurement of Targets

The table below shows the measurement components of each of the targets within the energy sector. These components would contribute to the system-wide report, which indicates Alberta's progress on the targets.

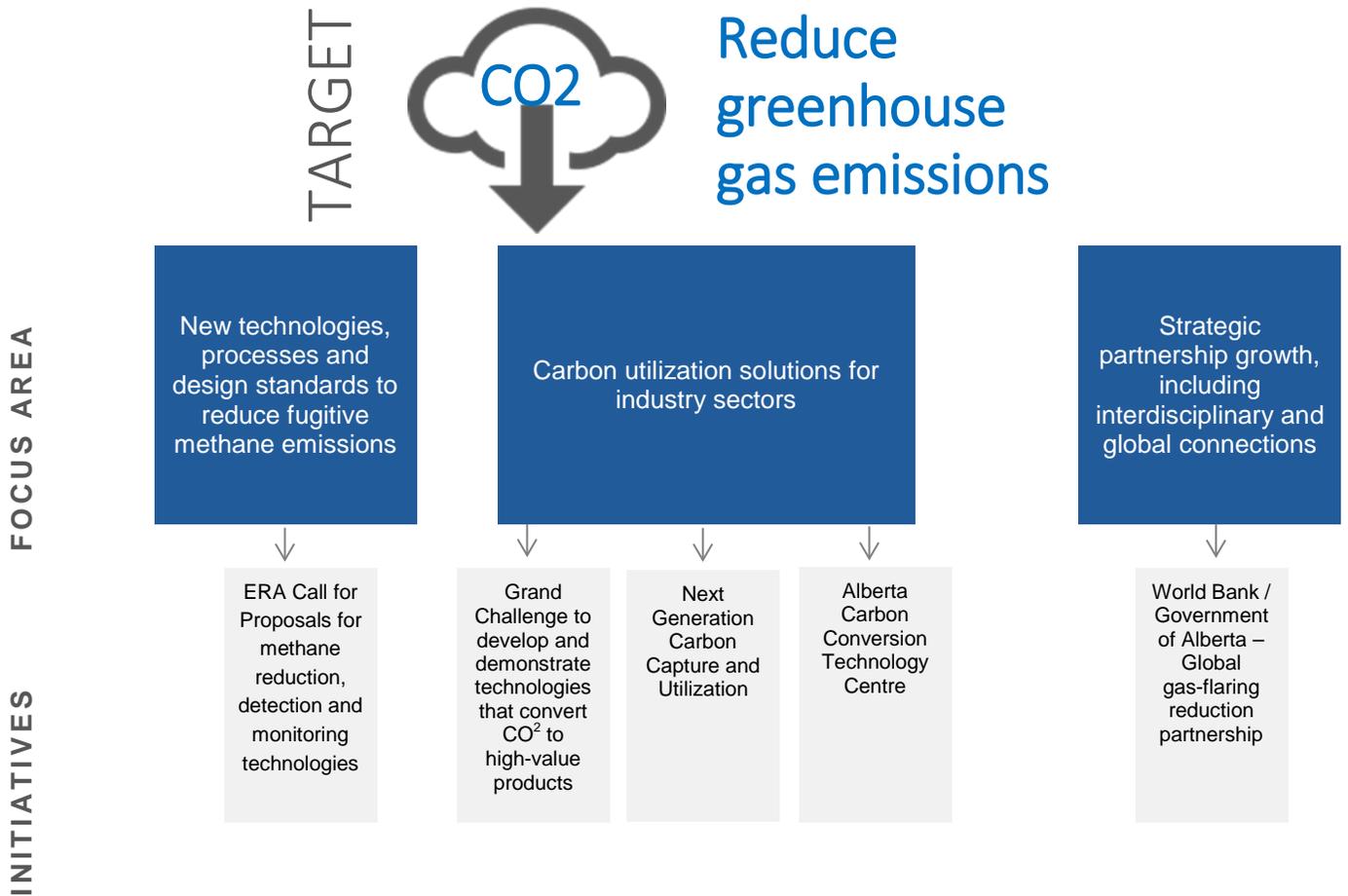
Target	Measure progress toward the target
Reduce GHG Emissions	<ul style="list-style-type: none"> <li>○ GHG emissions – intensity and absolute tonnes</li> <li>○ Methane emissions reduced by 45% by 2025</li> </ul>
Increase Value and Market Access	<ul style="list-style-type: none"> <li>○ Diluent volume required to transport bitumen by pipeline</li> <li>○ Partially upgraded crude volume</li> <li>○ Chemicals/polymers volumes</li> <li>○ New industries created for carbon based materials</li> </ul>
Improve Oil Sands Efficiency	<ul style="list-style-type: none"> <li>○ GHG emission intensity &lt; 40kg CO<sub>2</sub>eq/bbl</li> <li>○ Water use intensity reduced by 50%</li> <li>○ Bitumen supply cost reduced</li> </ul>
Renewable Energy	<ul style="list-style-type: none"> <li>○ Energy storage as reported in the <i>Alberta Electric System Operator Annual Market Statistics</i> report</li> <li>○ Renewable power percentage as reported annually by Alberta Energy</li> <li>○ Disposal rates of municipal solid waste reported annually by Statistics Canada and Alberta Environment and Parks</li> </ul>

The flagship initiatives identified for each target and focus area are described in the next section.

### 5.1 Reduce Greenhouse Gas (GHG) Emissions

Alberta wants to be a leader in reducing GHG emissions. Working with key stakeholders (including industry and post-secondary institutions), government plans to reduce methane emissions by 45 per cent by 2025 and to ensure a dynamic portfolio of GHG emission reduction technologies.

The focus areas are:



**PARTNERS AND FUNDERS**

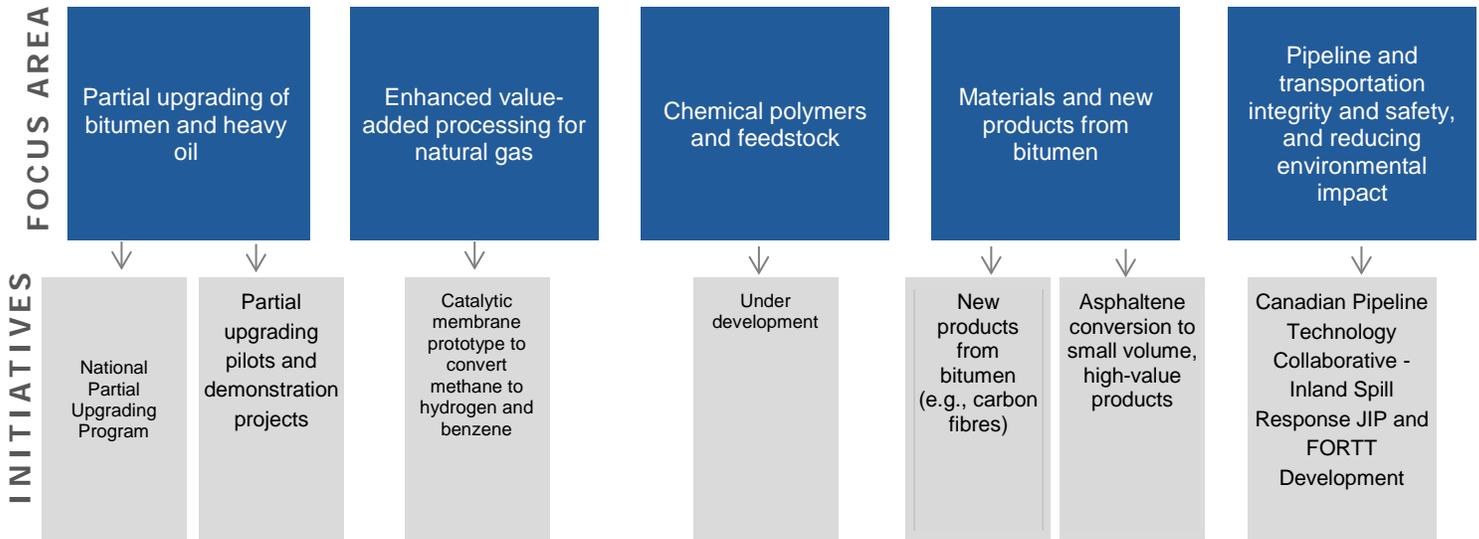
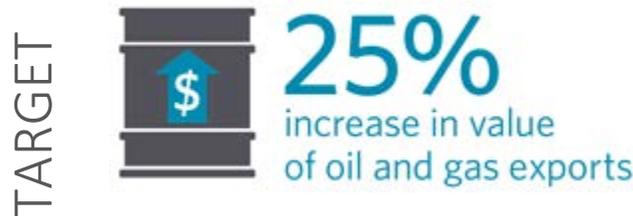


**ACTION PLAN PROGRESS UPDATE REPORT TO THE PUBLIC**



## 5.2 Increase Value and Market Access

This target is about expanding access to market and supporting the commercialization of new value-added products to increase the market value of Alberta's oil and gas exports by 25 per cent. Key investors and stakeholders include the provincial and federal government and industry. The focus areas are:



### PARTNERS AND FUNDERS

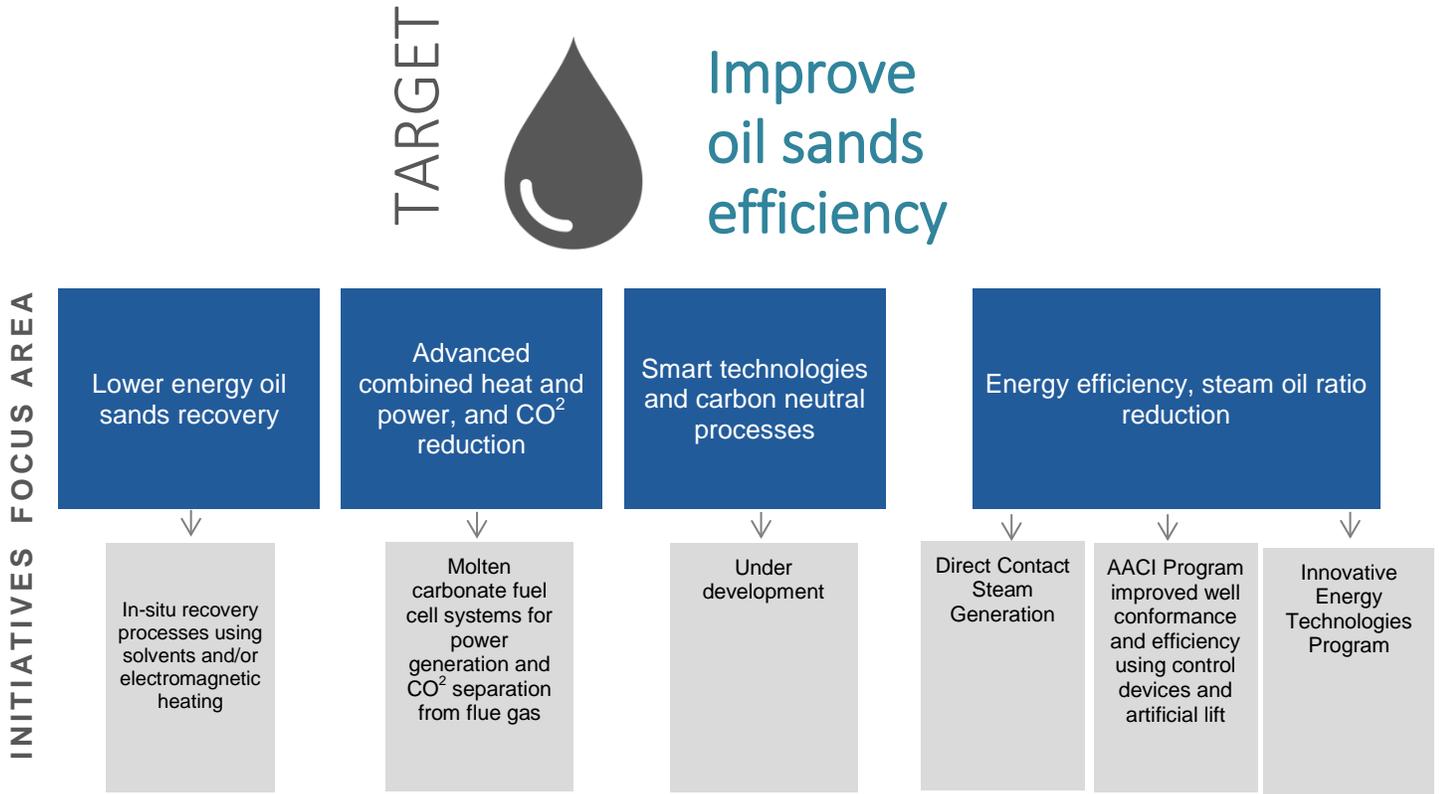


### ACTION PLAN PROGRESS UPDATE REPORT TO THE PUBLIC



## 5.3 Improve Oil Sands Efficiency

Alberta has the third largest oil reserves in the world, and the oil sands is a significant part of this. Resource development is important for the Alberta and Canadian economies. Oil sands growth will be limited by a carbon cap, water availability and access to markets as a low-cost feedstock. This target focuses on the improvement of oil sands production efficiency and economics by decreasing fresh water use by 50 per cent on a per barrel basis, and supply cost of bitumen to be globally competitive. The focus areas are outlined below.



### PARTNERS AND FUNDERS

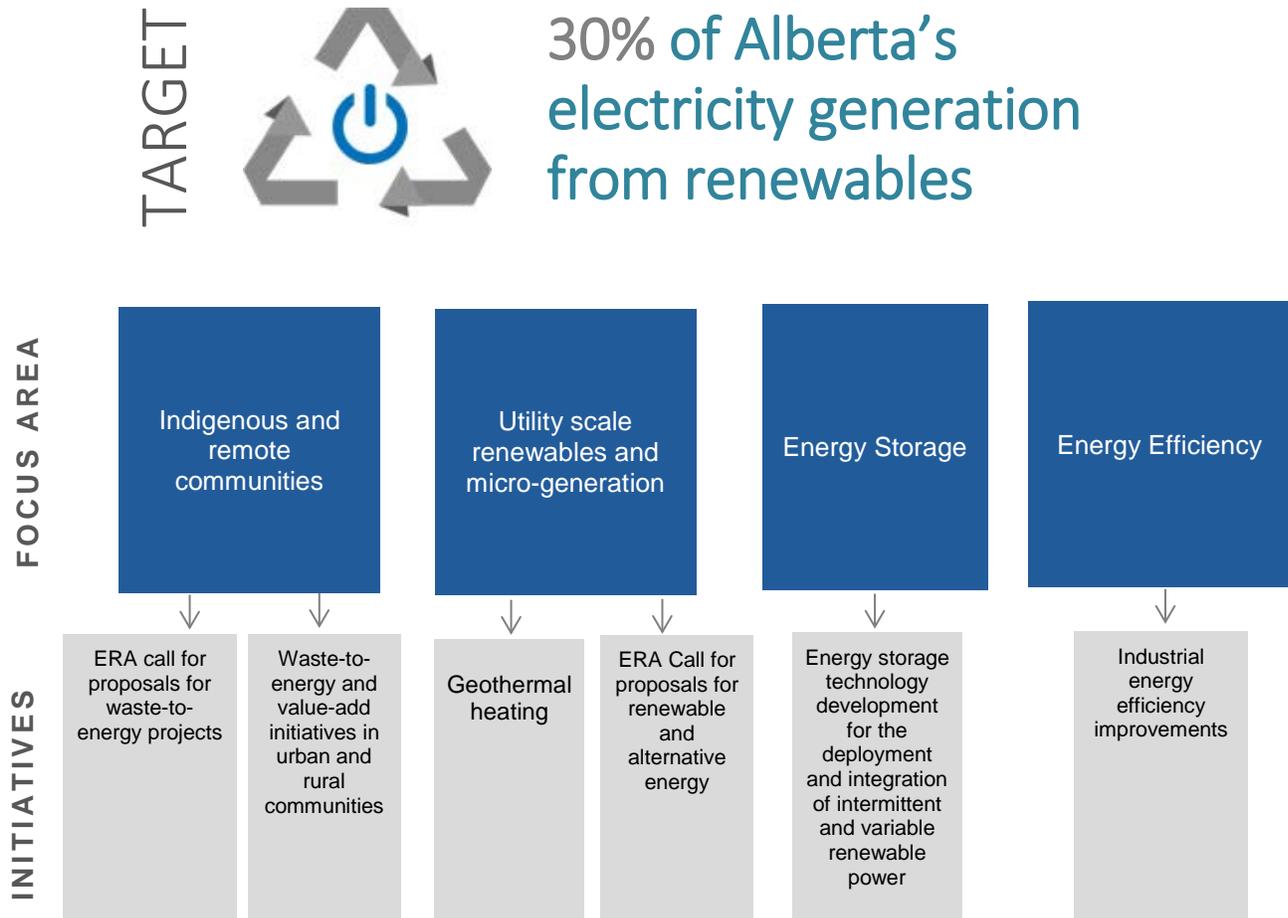


### ACTION PLAN PROGRESS UPDATE REPORT TO THE PUBLIC



## 5.4 Renewable Energy

Renewable energy sources like wind and solar power will contribute 30 per cent of Alberta's electricity generation.



### PARTNERS AND FUNDERS



### ACTION PLAN PROGRESS UPDATE REPORT TO THE PUBLIC



# FOOD & AGRICULTURE SECTOR

## 6 Strategies and Flagship Initiatives – Food & Agriculture

The implementation of existing and proposed strategies and their initiatives will contribute to the innovation targets. Achievement in this sector means Alberta's food and agricultural system can grow, diversify and increase the value of products to feed Albertans and others around the world.

In the food and agriculture sector, the strategies below would contribute to the targets.

Innovation Targets	Strategies
Increase Sales	<ul style="list-style-type: none"> <li>• Alberta Innovates Food Innovation Plan</li> <li>• Alberta Jobs Plan</li> <li>• Making the food-health connection</li> </ul>
Increase Productivity	
Strengthened public trust for expanded markets	

### Measurement of Targets

The table below shows the measurement components of each target. These components would contribute to the system-wide report, which indicates Alberta's progress on the targets.

Target	Measure Progress toward the target
Increase Sales	<ul style="list-style-type: none"> <li>○ Alberta's food and beverage manufacturing sales.</li> <li>○ Alberta's international agri-food exports (includes commodities).</li> <li>○ Alberta's valued-added exports.</li> <li>○ Labour productivity improvements for the food processing industry. Measured by Gross Domestic Product per hour worked.</li> </ul>
Increase Productivity	<ul style="list-style-type: none"> <li>○ Yield – increase in crop yield/production intensity (kilograms/hectare).</li> <li>○ Yield – increase in livestock production intensity (kg meat/hectare, L milk/cow).</li> <li>○ Efficiency – decrease cost of production (\$ saved per head livestock or per hectare cost of crop production)</li> <li>○ Number of new crop introductions to adapt to growing conditions.</li> <li>○ Quality – per cent of crop or carcasses meeting industry set grade parameters.</li> </ul>
Strengthened public trust for expanded markets	<ul style="list-style-type: none"> <li>○ Improved public perception of agricultural production and food production.</li> <li>○ Improved public perception of implementation of new technologies, including biotechnology.</li> <li>○ Number of programs and initiatives focused on landscape and biodiversity management.</li> <li>○ Number of new crop varieties with NUE, WUE and pest resistance traits. Number of new crops adapted to Alberta's changing climate.</li> <li>○ Number of adopted management practices to reduce waste (including wastewater) at the crop production, processing, packaging and distribution levels.</li> <li>○ Number of new and effective science-based processes or practices and diagnostic tests aimed to reduce pathogens and risk of food-borne illnesses</li> </ul>

<b>Target</b>	<b>Measure Progress toward the target</b>
	that are implemented by Alberta businesses.

The flagship initiatives for each target and focus area are described in the next section.

## 6.1 Increase Sales

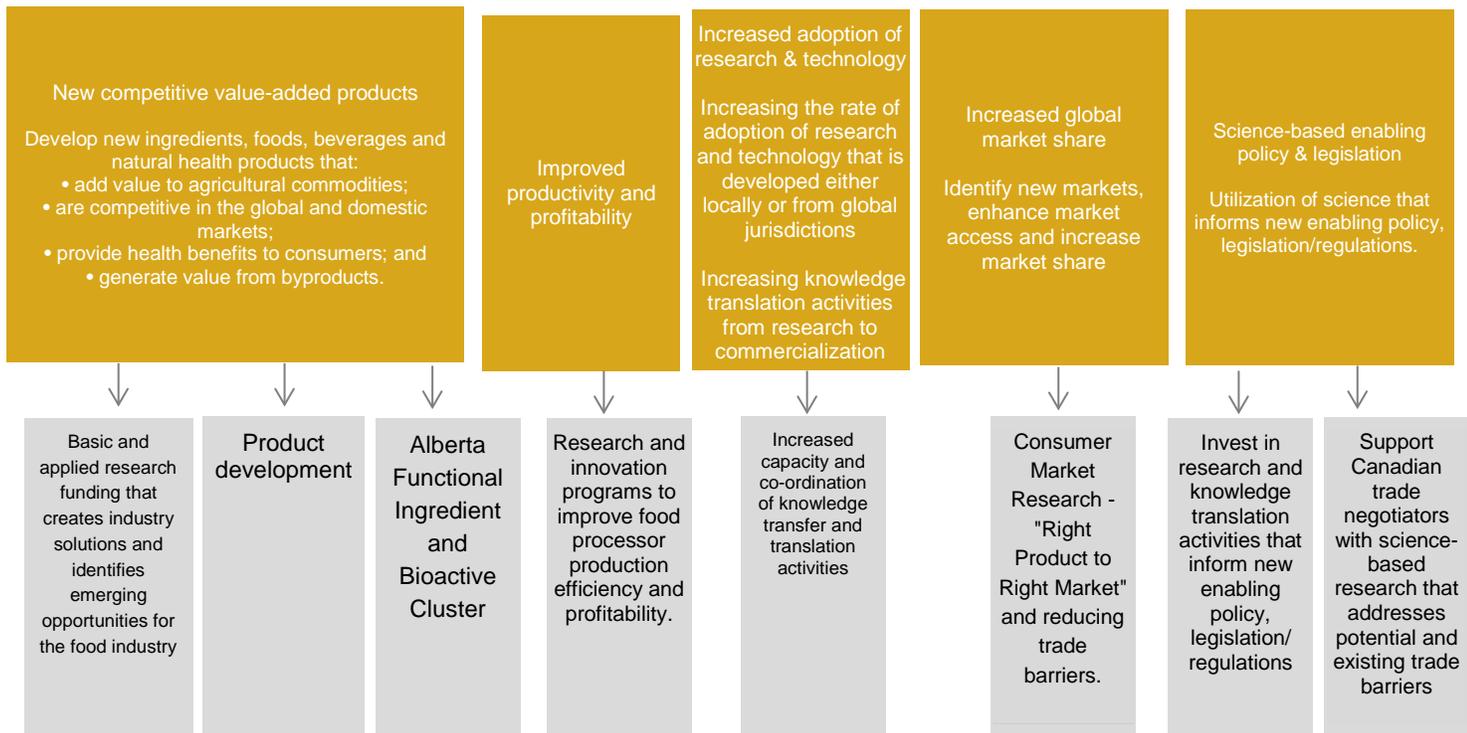
This target focuses on increasing sales from ingredient, food and beverage product manufacturing from \$13.7 billion (2014 base number) to \$25 billion.

TARGET



Increase sales from ingredient, food and beverage product manufacturing

FOCUS AREA



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## 6.2 Increase Productivity

Contribution to this target will increase crop and livestock quality and productivity by 30 per cent, while ensuring natural resources are managed responsibly (2013 base).



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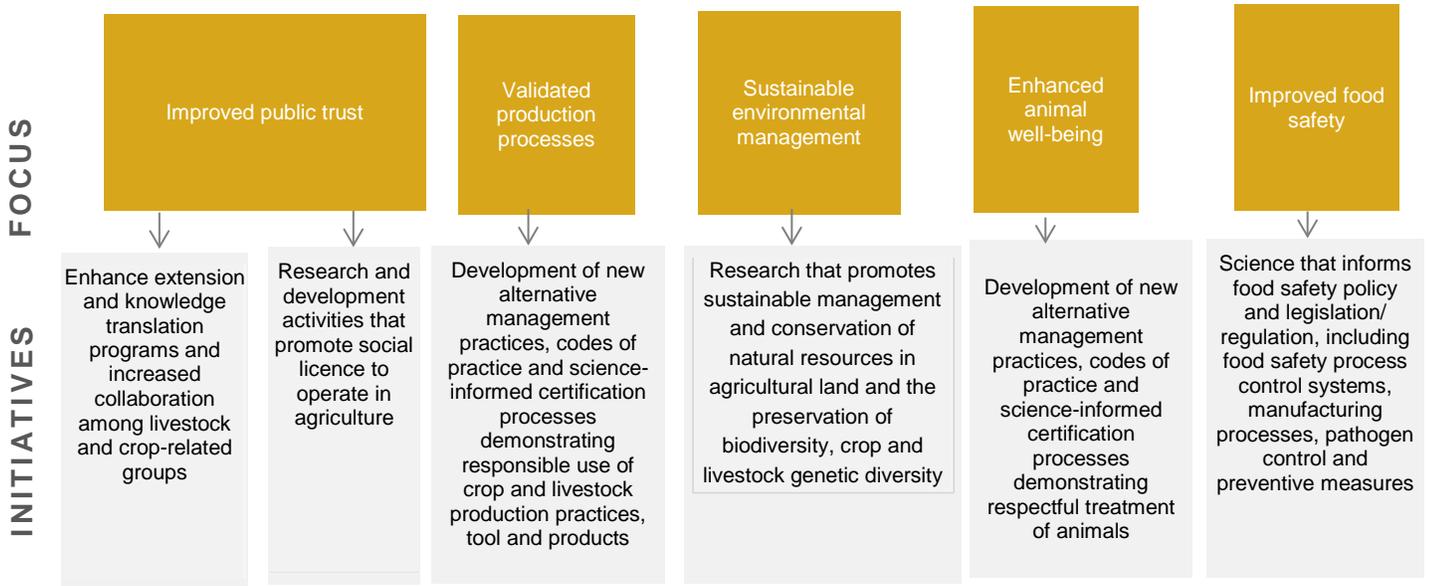
## 6.3 Strengthened Public Trust for Expanded Markets

Contribution to this target will ensure agriculture, food and beverage production meets or exceeds public expectations and values by 10 per cent by 2030, using the 2016 base number.

TARGET



## Strengthened Public Trust for Expanded Markets



### PARTNERS AND FUNDERS



### ACTION PLAN PROGRESS UPDATE REPORT TO THE PUBLIC



# FIBRE & BIOINDUSTRIAL SECTOR

## 7 Strategies and Flagship Initiatives – Fibre & Bioindustrial

The implementation of existing and proposed strategies and their initiatives will contribute to the innovation targets. Achievement in this sector means the growth and efficiency of the bioindustrial sector helps diversify Alberta's economy, increase exports and increase investment in the rural economy.

In the fibre and bioindustrial sector, the strategies below would contribute to the targets.

Innovation Targets	Strategies
Increase Sales	<ul style="list-style-type: none"> <li>• Fibre Roadmap</li> <li>• Clean Technology Roadmap</li> </ul>
Drive Investment	
Reduce Waste	

### Measurement of Targets

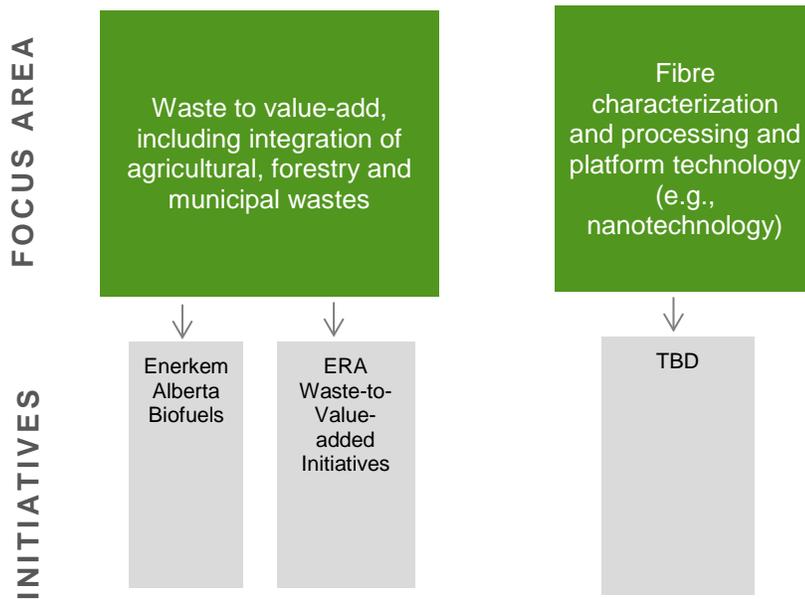
The table below shows the measurement components of each of the targets. These components would contribute to the system-wide report, which indicates Alberta's progress on the targets.

Target	Measure progress toward the target
Increase Sales	<ul style="list-style-type: none"> <li>○ Alberta's bio-based biomaterials/bio-products sales.</li> <li>○ Alberta's value-added products exports.</li> <li>○ Growth in revenues generated from Alberta-based biomaterials/bio products companies.</li> <li>○ New and/or enhanced bio-based products, tools and technologies in the market place (e.g., new CNC-based products, lignin-based products).</li> </ul>
Drive Investment	<ul style="list-style-type: none"> <li>○ Investment Leverage (GoA/industry/other).</li> <li>○ Investment attracted from the industry.</li> </ul>
Reduce Waste	<ul style="list-style-type: none"> <li>○ Landfill-free Alberta: Disposal rates of municipal solid waste are reported annually by Statistics Canada and Alberta Environment and Parks.</li> <li>○ GHG emissions reduction (waste source-biannual survey ECCA).</li> <li>○ Waste processing costs.</li> <li>○ Marketable products.</li> <li>○ Number of jobs created.</li> </ul>

The flagship initiatives for each target and focus area are described in the next section.

## 7.1 Increase Sales

TARGET  Exports from bioindustrial sectors increase by 5x



### PARTNERS AND FUNDERS



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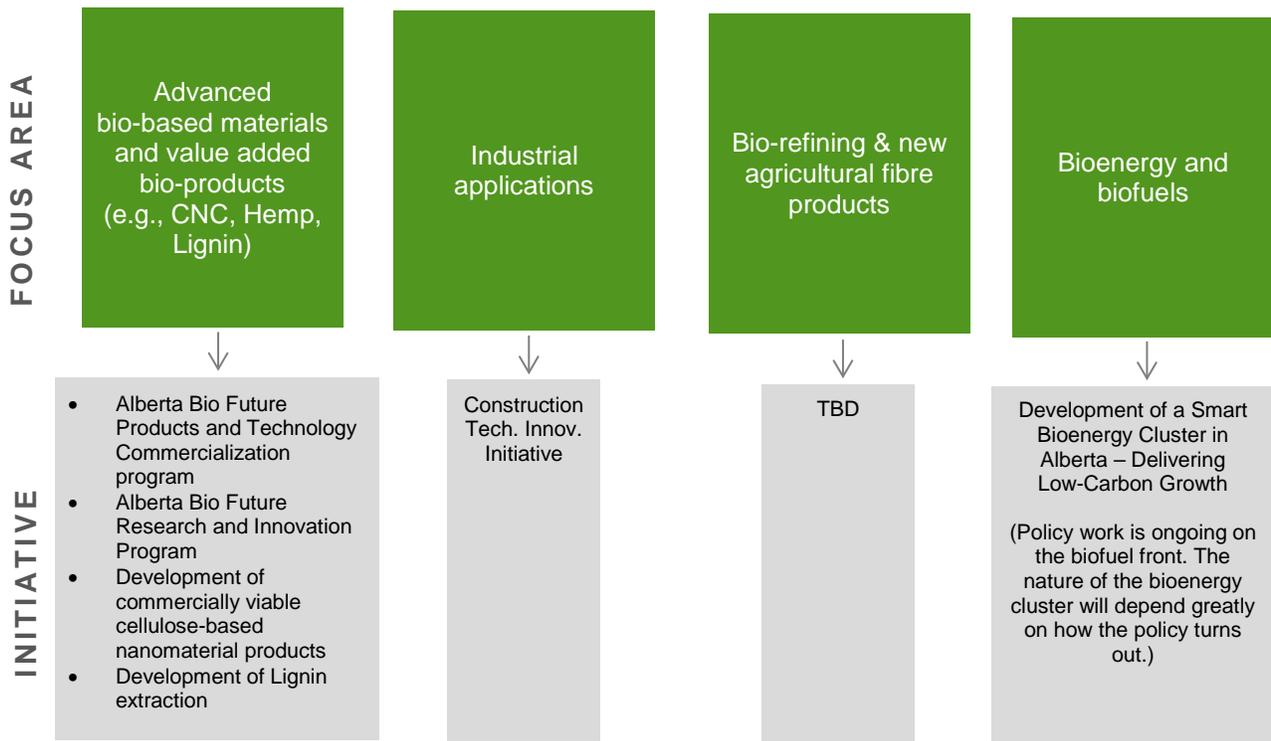


## 7.2 Drive Investment

TARGET



Attract an additional  
\$3 billion in  
private sector investment



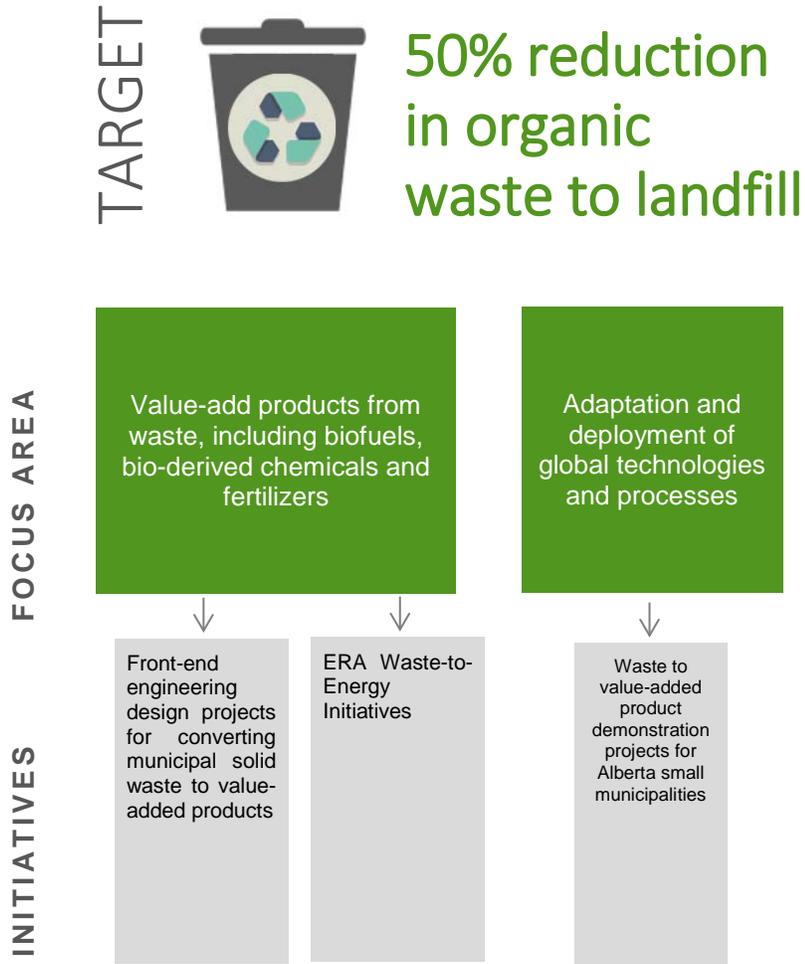
### PARTNERS AND FUNDERS



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## 7.3 Reduce Waste



### PARTNERS AND FUNDERS



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# HEALTH SECTOR

## 8 Strategies and Flagship Initiatives – Health

The implementation of existing and proposed strategies and their initiatives will contribute to the innovation targets. Achievement in this sector means advances in health, quality, wellness and value (sustainability, economic growth and social benefit) through an aligned and focused research and innovation ecosystem.

In the health sector, the strategies below would contribute to the targets.

Innovation Targets	Strategies
Improve Robustness of Health Data	<ul style="list-style-type: none"> <li>• Changing Our Future: Alberta's Cancer Plan 2030</li> <li>• Health Research and Innovation Roadmap (under development)</li> </ul>
Improve Quality of Care	
Reduce Burden of Disease	
Accelerate Health & Wellness Innovation	

### Measurement of Targets

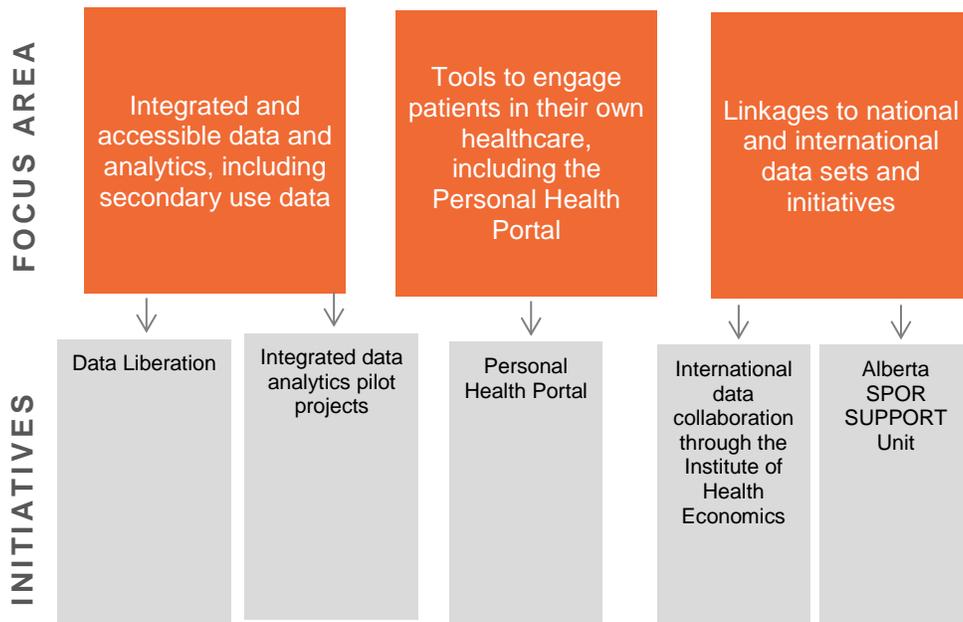
The table below shows the measurement components of each of the targets. These components would contribute to the system-wide report, which indicates Alberta's progress on the targets.

Target	Measure progress toward the target
Improve robustness of health data	<ul style="list-style-type: none"> <li>○ Number of requests for secondary use data met in a given period, including timelines.</li> <li>○ Number of industry-led data projects engaged with the health system</li> </ul>
Improve quality of care	<ul style="list-style-type: none"> <li>○ Evaluation of community-based healthcare initiative</li> <li>○ Number of technologies disinvested/dollars saved through disinvestment</li> <li>○ Number of system-tested technologies</li> <li>○ Outcomes – QALY for adopted pathways, innovations, or processes</li> <li>○ eHealth Innovations Partnerships Program (eHIPP) – activity-based reporting</li> <li>○ Avoidable ER visits</li> </ul>
Reduce burden of disease	<ul style="list-style-type: none"> <li>○ Avoidable mortality</li> <li>○ Patient-informed quality-adjusted life years for Albertans with chronic disease</li> </ul>
Accelerate health & wellness innovation	<ul style="list-style-type: none"> <li>○ Number of real-world evidence-generating projects for novel innovations</li> <li>○ Number of health companies supported by the Regional Innovation Networks and the Alberta Entrepreneurship Incubator Program</li> </ul>

The flagship initiatives for each target and focus area are described in the next section.

## 8.1 Improve Robustness of Health Data

TARGET  Improve **robustness** of health data



### PARTNERS AND FUNDERS



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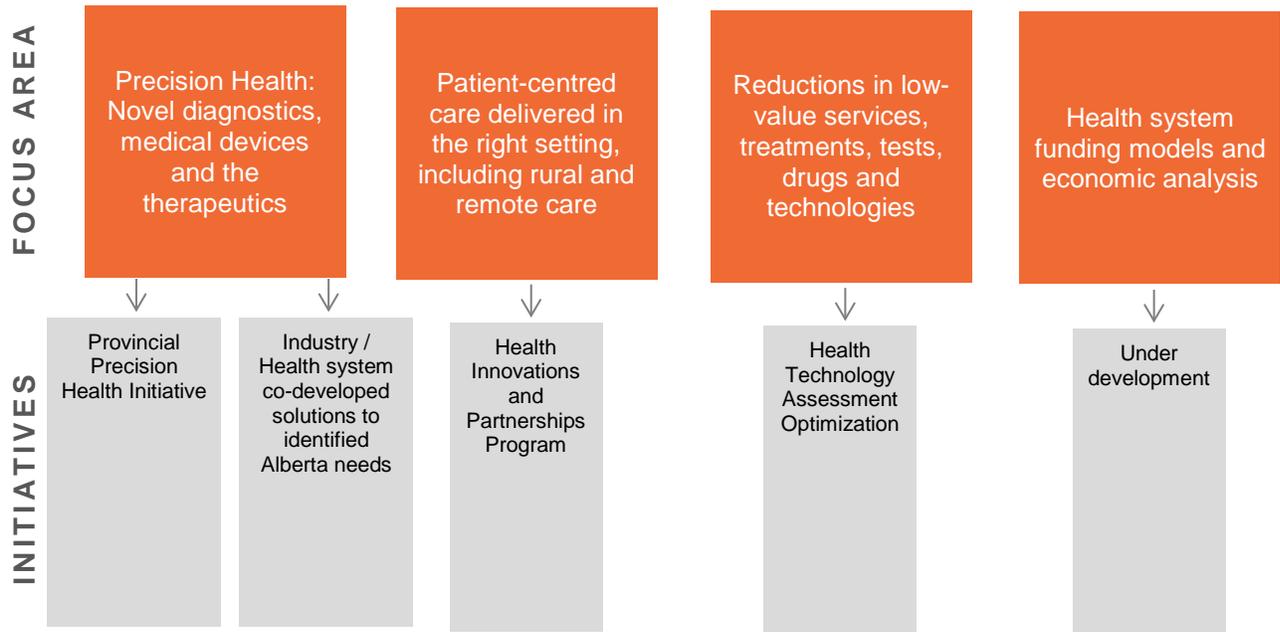


## 7.2 Improve Quality of Care

TARGET



High performing and equitable health care system



### PARTNERS AND FUNDERS



### ACTION PLAN PROGRESS UPDATE REPORT TO THE PUBLIC

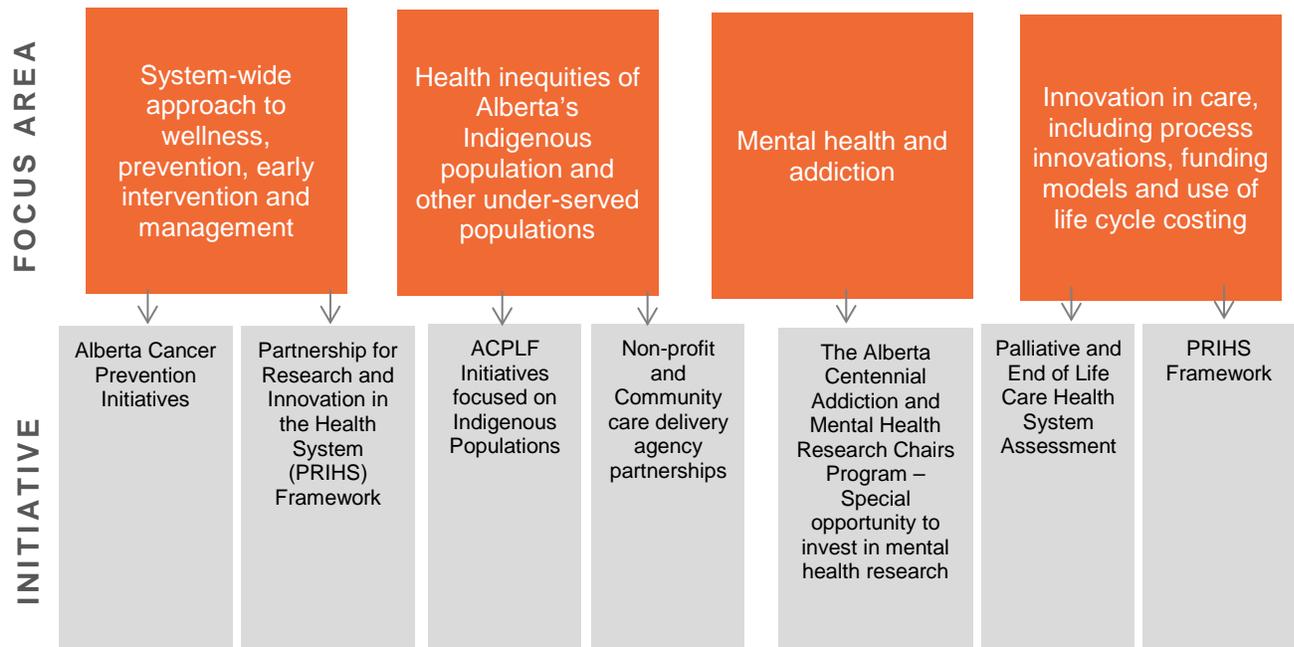


## 8.3 Reduce Burden of Disease

TARGET



25% decrease in avoidable mortality and 20% increase in patient-informed quality-adjusted life years



### PARTNERS AND FUNDERS



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## 8.4 Accelerate Health and Wellness Innovation

TARGET



Become a top ten location for health and wellness innovations

FOCUS AREA

Leader in rigorous evidence generation for health innovations to support and accelerate commercialization and adoption into local and international markets

Aligned ecosystem for research, adoption, commercialization and market access

Pursue and evaluate health innovation approaches integrated across the entire continuum of care that lead to improved wellness and health outcomes

INITIATIVE

Health system and Industry partnerships to accelerate innovation into care

Multi-year Investments in Strategic Institutes – Genome Alberta

Multi-year Investments in Strategic Institutes – Alberta Prion Research Institute

Regional Innovation Networks and Alberta's Entrepreneurship Incubator Program

Research and Innovation focused on complex and high needs populations

PRIHS Framework

### PARTNERS AND FUNDERS



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# ENVIRONMENT & CLIMATE ADAPTATION SECTOR

## 9 Strategies and Flagship Initiatives – Environment & Climate Adaptation

The implementation of existing and proposed strategies and their initiatives will contribute to the innovation targets. Achievement in this sector means Alberta's natural resources—air, land and water—are protected in part through new and improved strategies and products to reduce the environment footprint and climate change impact of citizen and industrial activities.

In the environment and climate sector, the strategies below would contribute to the targets.

Innovation Targets	Strategies
Conserving biodiversity	<ul style="list-style-type: none"> <li>• Water for Life Strategy</li> <li>• Climate Leadership Plan (adaptation component)</li> <li>• Land Use Plan – Regional Plan Implementation</li> <li>• Water Research and Innovation Strategy</li> <li>• Clean Technology Roadmap (under development)</li> <li>• Biodiversity Management Frameworks</li> </ul>
Restoring Alberta's landscapes	
Sustainable water management	

### Measurement of Targets

The table below shows the measurement components of each of the targets. These components would contribute to the system-wide report, which indicates Alberta's progress on the targets.

Target	Measure progress toward the target
Conserving biodiversity	<ul style="list-style-type: none"> <li>○ ABMI biodiversity indices</li> <li>○ number of endangered species</li> <li>○ recovery plan implementation</li> <li>○ trends in invasive species</li> <li>○ trends in species and habitat intactness</li> </ul>
Restoring Alberta's landscapes	<ul style="list-style-type: none"> <li>○ disturbed hectares, restored hectares, restored ha/yr, disturbed ha/yr</li> <li>○ State of the environment reporting (oil and gas, coal, oil sands) on disturbance and reclamation</li> </ul>
Sustainable water management	<ul style="list-style-type: none"> <li>○ State of the watershed reports</li> <li>○ Trends in river and lake quality</li> <li>○ Wetland inventories</li> <li>○ Water use, efficiency and productivity trends by sector</li> <li>○ Drinking water advisories</li> </ul>

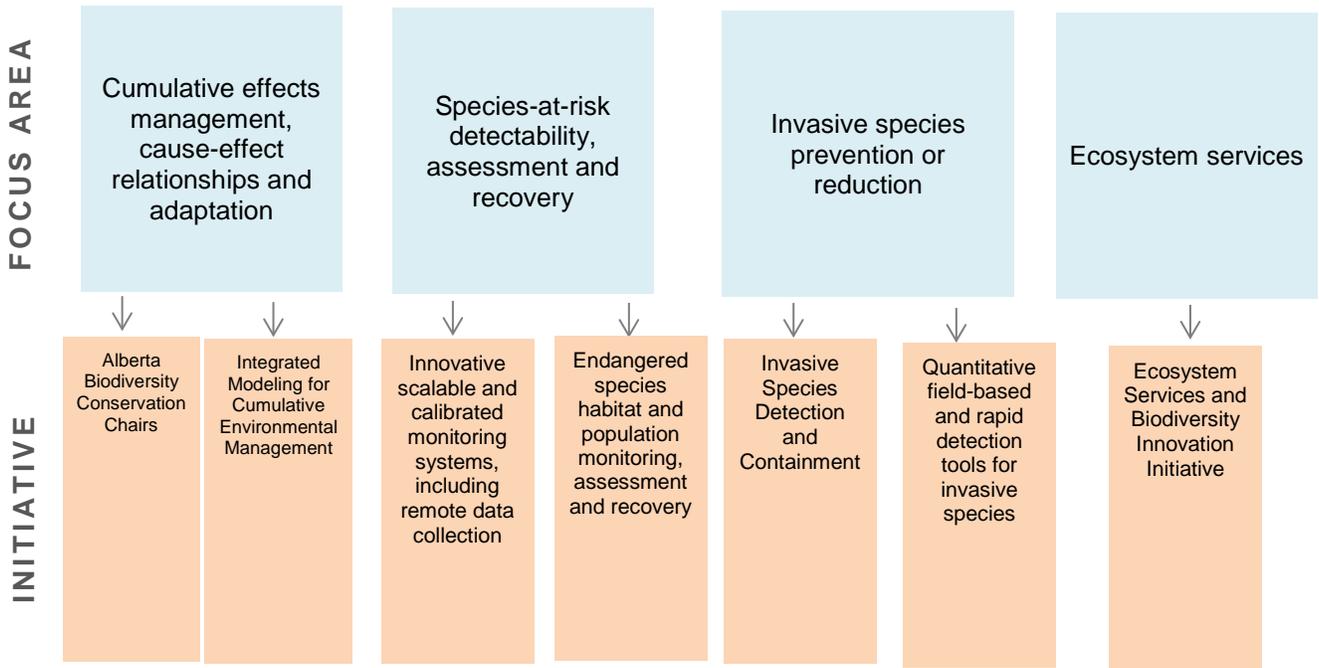
The flagship initiatives for each target and focus area are described in the next section.

# 9.1 Conserving Biodiversity

TARGET



Biodiversity  
maintained  
or enhanced



**PARTNERS AND FUNDERS**



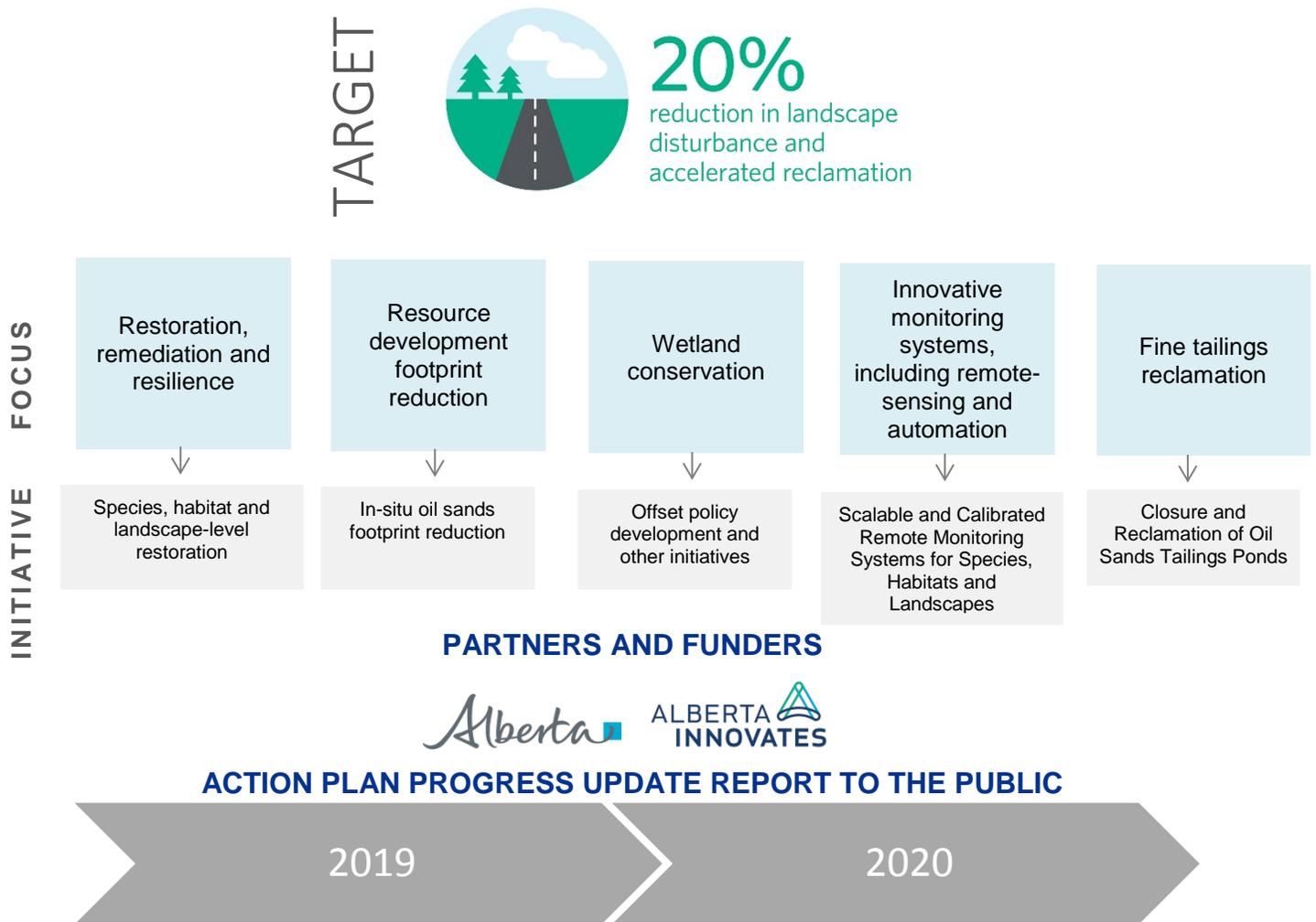
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## 9.2 Restoring Alberta's Landscapes

Alberta faces growing environmental challenges due to cumulative industrial development and associated land disturbance. Reclamation is pivotal in managing these effects and in regional/sub-regional planning. As Alberta's forests, grasslands and foothills become busier, reclamation is necessary as a means of supporting biodiversity and landscape management objectives. The first step in supporting these objectives is reducing industrial disturbance through integrated land management and implementation of best practices.

Following disturbance, reclamation includes managing landforms, soils and vegetation to re-initiate and restore ecological processes that assist habitats to develop. Without reclamation, the footprint from resource development would keep growing, thereby decreasing the ecological services Alberta's lands and waters provide.



## 9.3 Sustainable Water Management

By 2030, Alberta's population will increase substantially. According to growth estimates, the population will increase by an additional two million people. Climate change estimates suggest water supplies in Alberta will decrease in many basins and seasonal precipitation will change, challenging the resilience of ecosystems and communities that depend on water.

This target is focused both on quantity of water (i.e., having enough available water) and quality (e.g., contaminants, pathogen, algal blooms). The broad target also includes all water resources in the province: surface waters, including major rivers and streams; lakes; reservoirs; and wetlands. To achieve the 2030 target, Alberta must be more efficient and productive in water use while conserving minimum flows for healthy aquatic ecosystems.



## 10 Next Steps / Conclusion

The implementation of the initiatives identified in this Action Plan will help Alberta be more competitive, create jobs and lead to economic diversification. The Government of Alberta will work together with its agencies and key stakeholders, including post-secondary institutions, industry and industry associations, to reach the goals outlined in this plan.