



ALBERTA INNOVATES



Water Innovation Program

**ADVANCING WATER KNOWLEDGE AND
TECHNOLOGY FOR SUSTAINABLE
ECONOMY AND ENVIRONMENT**

**Dr. John Zhou, VP, Clean Energy,
Alberta Innovates
PNWER – July 2017**

2016 Fort McMurray Fire

- May 1, 2016: wildfire started
- 65 days before under control
- 90,000 people forced from their homes
- 2,400 homes and buildings destroyed
- 590,000 hectares the fire spread across
- 996 kilometres: fire perimeter
- 9.5 billion dollars damage
- 31 days before a phased re-entry of residents into Fort McMurray

Safe, secure water supply after the fire





The new Alberta Innovates

ALBERTA INNOVATES AT-A-GLANCE

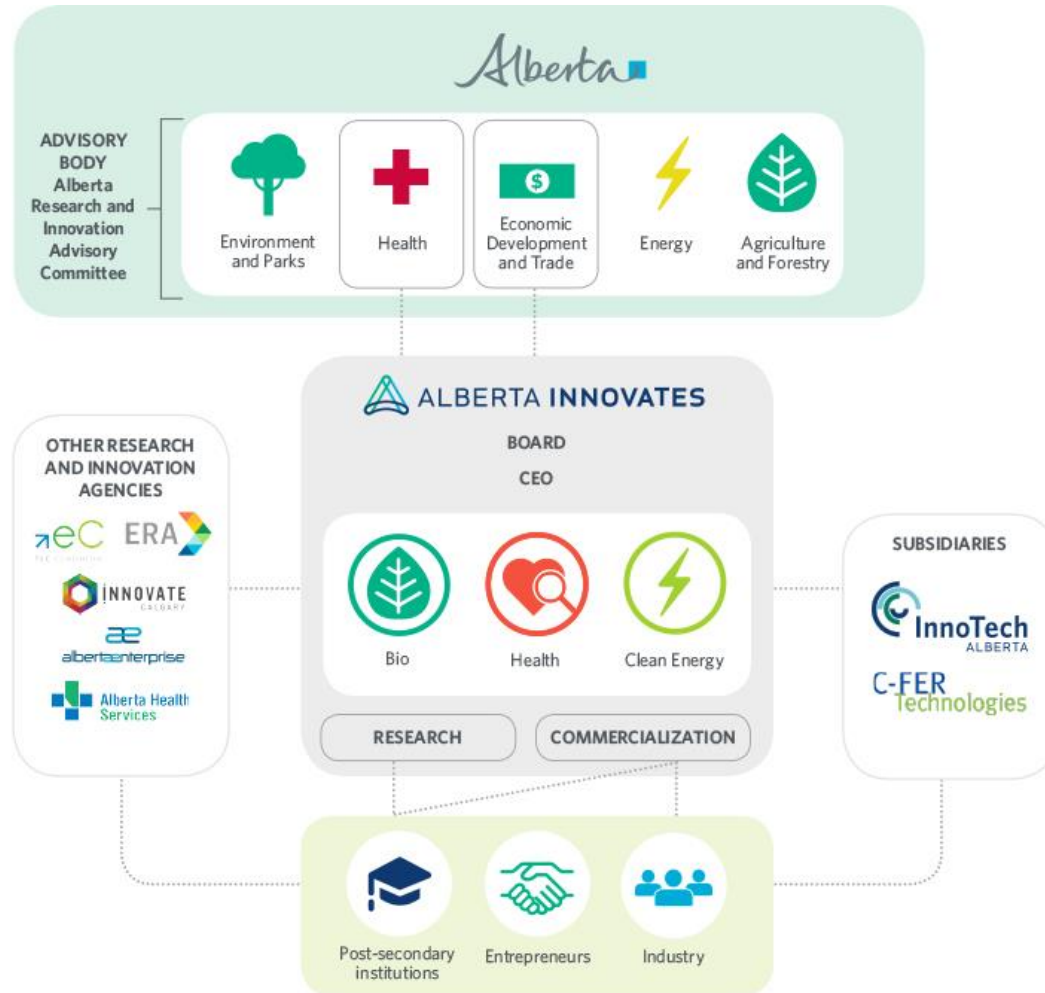


Role: Support economic diversification and job creation

Canada's largest provincial research and innovation agency: the catalyst in an environment where invention, innovation and industry thrive.

Alberta's Research and Innovation System

Working together – Cross-Ministry & Cross-Sector



VISION

To be indisputably recognized as a leader – provincially, nationally and internationally – in catalyzing research and innovation in Alberta.

WATER INNOVATION PROGRAM

Invest for Sustainable Economy and Environment

100+ projects, \$55M invested to date

Desired outcomes:

- Safe, secure and reliable water resources for six million people
- Enhance the health of aquatic ecosystems
- Improve the overall efficiency and productivity of water use by 30%



ALBERTA'S WATER CHALLENGES & OPPORTUNITIES: NOT UNIQUE...

- Droughts / floods
- Resource extraction
- Food production
- Urban expansion
- Reuse
- Invasive species
- Contaminants
-



RESILIENT COMMUNITIES & ECONOMIC – CLIMATE ADAPTATION



Calgary flood 2013



Fort McMurray fire 2016



Southern Alberta drought ~ 2000s



Mountain pine beetle ~ 2000s

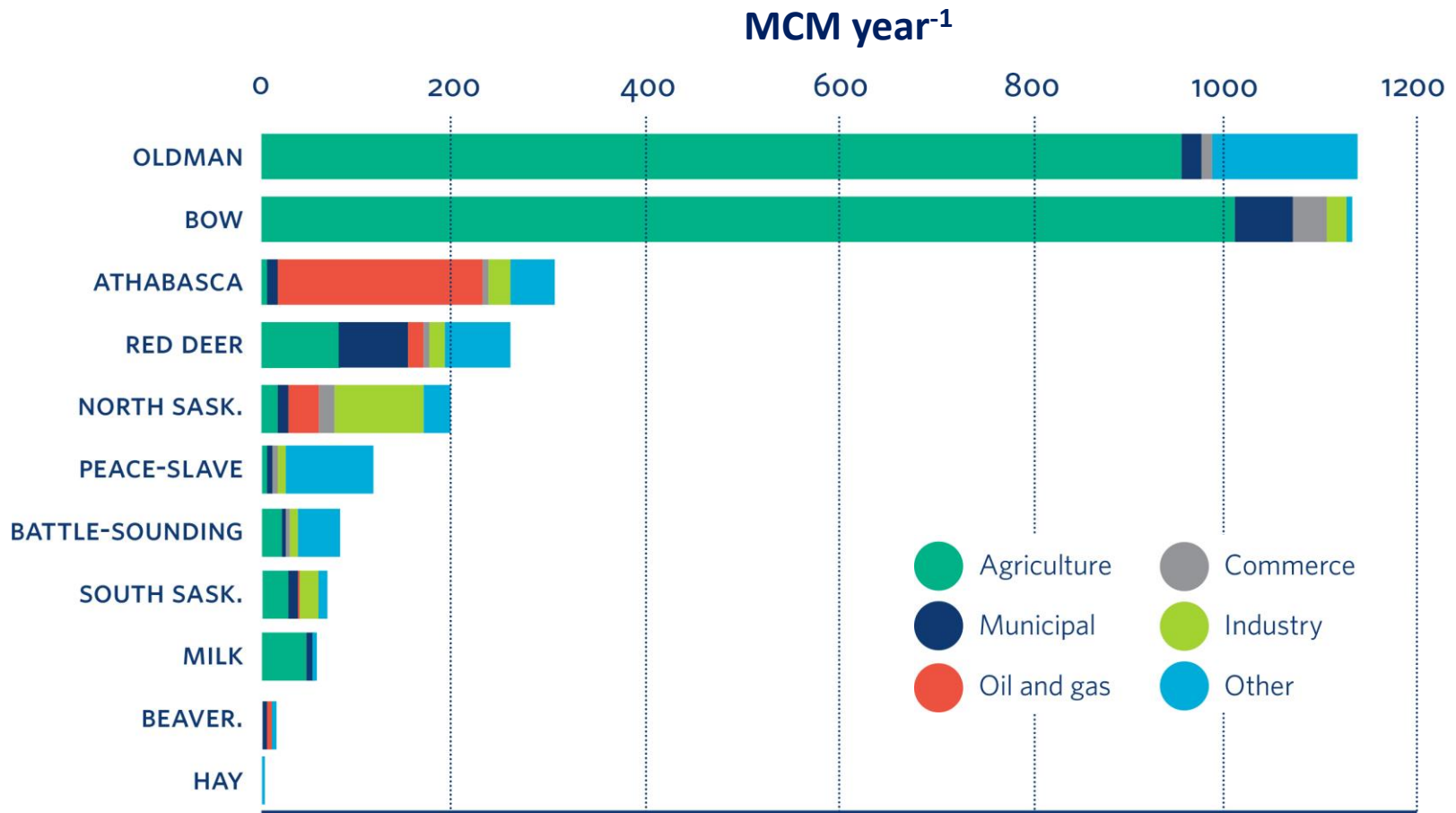
IN ALBERTA – WATER IS NOT WHERE THE PEOPLE ARE NOR IS IT WHERE THE DEMAND IS

87% of water
13% of demand
11% population

13% of water
87% of demand
89% population



PERCEPTIONS ABOUT WATER USE IN ALBERTA SOMETIMES DIFFER FROM REALITY...



Vic Adamowicz, Greg Goss, Monireh Faramarzi, U of Alberta

APPROACH – ADVANCE KNOWLEDGE AND TECHNOLOGY IN SUPPORT OF TARGETS



Future Water Supply and Watershed Management



Water Quality Protection



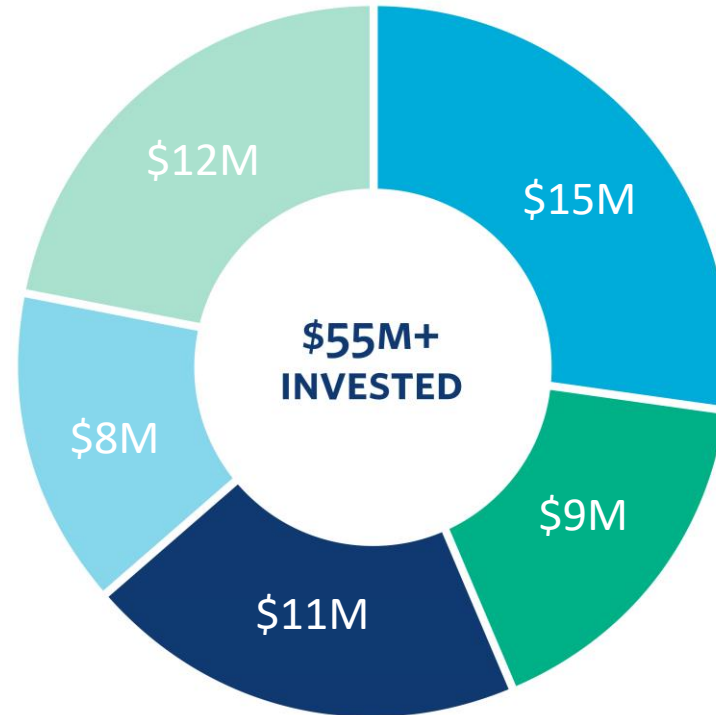
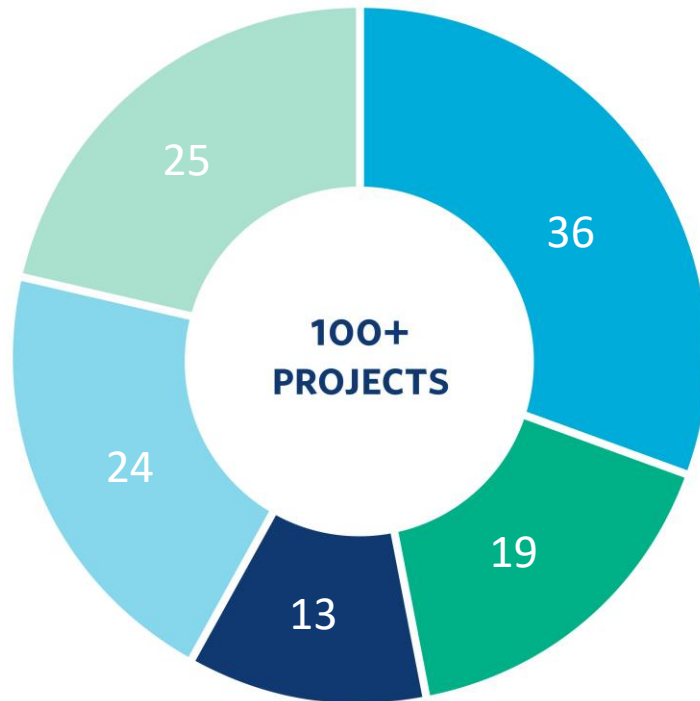
Water Use Conservation, Efficiency, & Productivity



Healthy Aquatic Ecosystems

APPROACH

Balance the Portfolio to deliver on targets and outcomes



- Watershed Management
- Healthy Aquatic Ecosystems
- Conservation, Efficiency and Productivity
- Water Quality Protection
- Tailings Management



Outcomes and Impacts

Water Supply and Watershed Management

WATERSHED MANAGEMENT IN SOUTHERN ALBERTA

Stakeholder modeling to address issues

- ▶ current (basin management & allocation)
- ▶ emerging (flooding)
- ▶ long-term (climate change)



IMPACT – Hydroelectric dams are being operated to support province and community needs respecting flooding as well as drought

RESILIENT COMMUNITIES, FOREST DISTURBANCE & SOURCE WATER PROTECTION



IMPACT - World class research supporting source water protection





Outcomes and Impacts

Conservation – Efficiency - Productivity

WATER USE – IRRIGATION & AGRICULTURE

Irrigation Demand Model

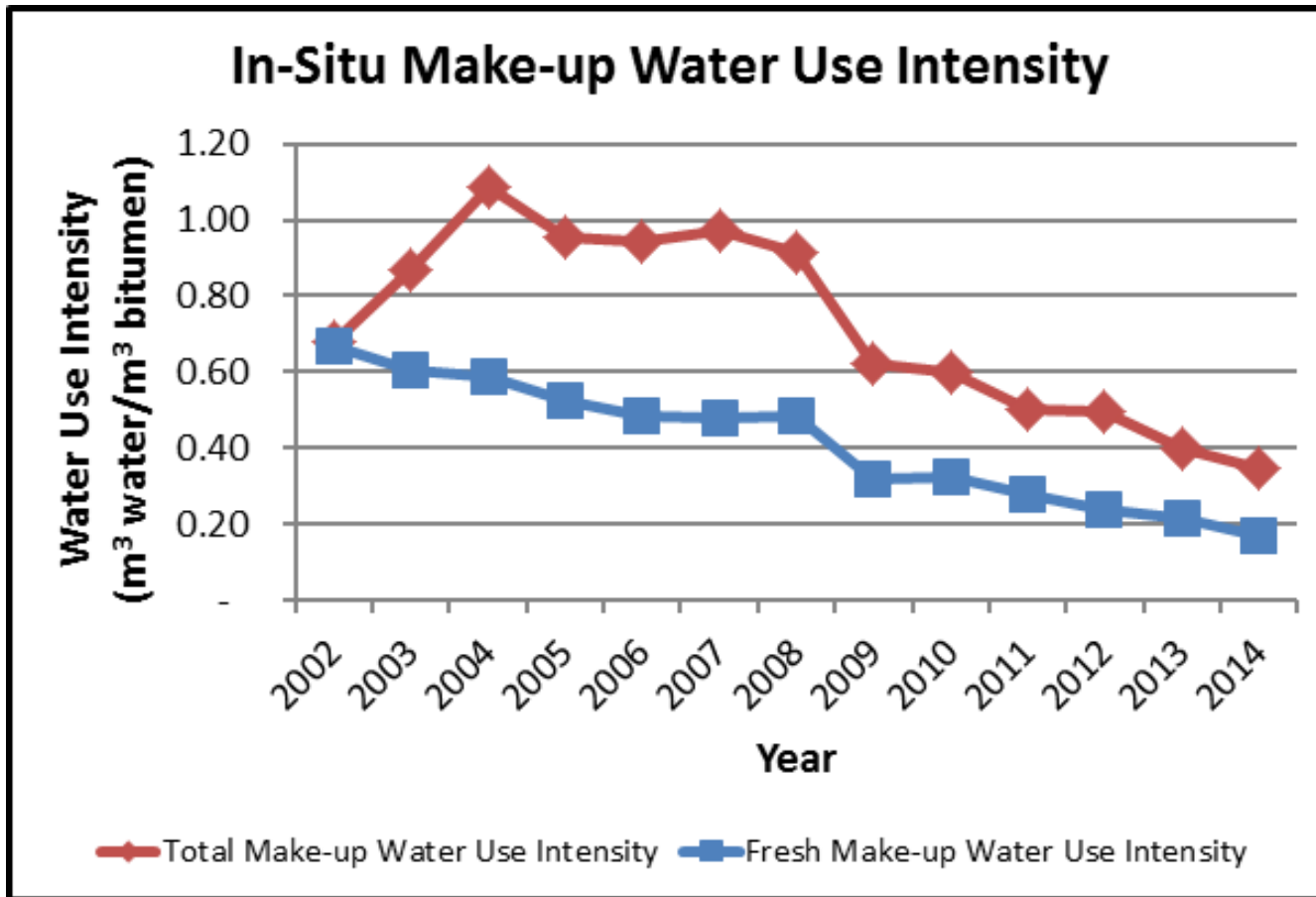


Enhanced Reservoir Management



IMPACT – Continue marked improvements in conservation, efficiency and productivity in agriculture sector which are significant since 2005 (48%)

Water Use Efficiency in Oil Sands Industry



Work with industry and improve SAGD water use efficiency; water use intensity reduced by more than 65%

INNOVATION IN SUPPORT OF ECONOMIC DEVELOPMENT

- Joint funding program with SDTC
- Advancing water treatment technologies
- \$8M available to SMEs in 5 key areas

Approved Projects

- SAGD (2)
- Hydraulic fracturing and enhanced oil recovery (3)
- Waste water treatment (2)
- Water distribution (1)





Outcomes and Impacts

Knowledge generation and training

WATER INNOVATION PROGRAM

Knowledge generation and training (2012 to present)

- Funded projects (65)
- Completed projects (22)
- Collaborators (81)
- Institutions (>20)
- Peer reviewed publications (165)
- Highly qualified personnel (257)

ALBERTA INNOVATES - OUTREACH

SPARK

CONNECTING INNOVATORS.
ADVANCING TECHNOLOGY.

November 6-8, 2017
Shaw Conference Centre, Edmonton, AB

LEARN MORE

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INNOVATION
SUMMIT 2017



MAR 21-22
CALGARY
ALBERTA

Key Messages

- Mission - economic development + environmental leadership
- Clear strategies, intentional (“targeted innovation”)
- Partnership for solutions
- Measureable impacts

Thank-you !

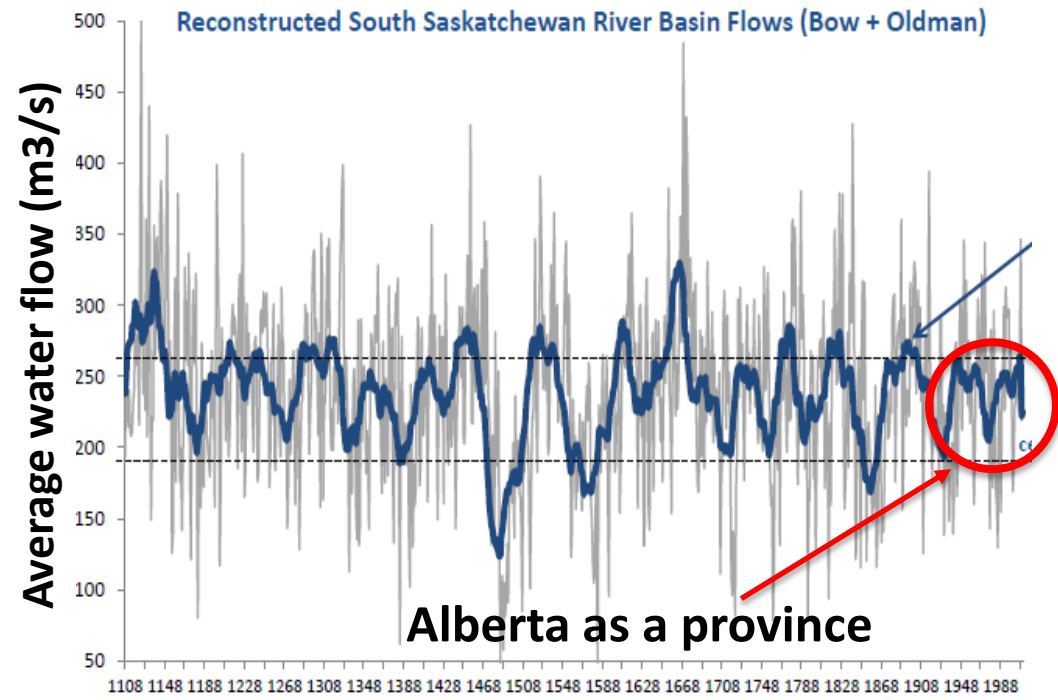
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CLIMATE VARIABILITY & WATER SUPPLY

A lens from the past



1100 AD to present



IMPACT - Alberta municipalities and industry are building more resilient infrastructure to deal with water supply in the face of climate variability and climate change

KEY MESSAGES

INVESTMENTS IN WATER INNOVATION

- Support environmental leadership & economic development
- Guided by *Water for Life and 2030 Innovation Targets* with a focus to deliver on outcomes
- Partnership for solutions
- Balanced portfolio
- Measured and significant impacts



WORKING TOGETHER CROSS-MINISTRY & CROSS SECTOR

Aligning with Government Priorities



FOCUSED ON SECTOR TARGETS, DRIVEN BY OUTCOMES

Environment and Climate targets



30%

increase in water
efficiency and safe,
secure water



20%

reduction in landscape
disturbance and
accelerated reclamation



Biodiversity
**maintained
or enhanced**

KEY PARTNERS IN CLEAN ENERGY, ENVIRONMENT AND WATER



WATER INNOVATION PROGRAM

Guided by GoA and Alberta water community needs

Water for Life Strategy

- Safe, secure and reliable water resources
- Enhance the health of aquatic ecosystems
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ALBERTA'S CLIMATE LEADERSHIP PLAN

Mitigation is all about
GHGs



Adaptation is mostly
about water

