Alberta Innovates Program Opportunities

Supporting NRCan Clean Growth Program - Alberta

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ALBERTA **INNOVATES**

ALBERTA INNOVATES AT-A-GLANCE

Innovation is key to economic growth and job creation and is the cornerstone of Alberta's competitiveness in the global economy. Alberta's prosperity will no longer be solely derived from abundant natural resources, but rather the ingenuity of our people.

600 EMPLOYEES

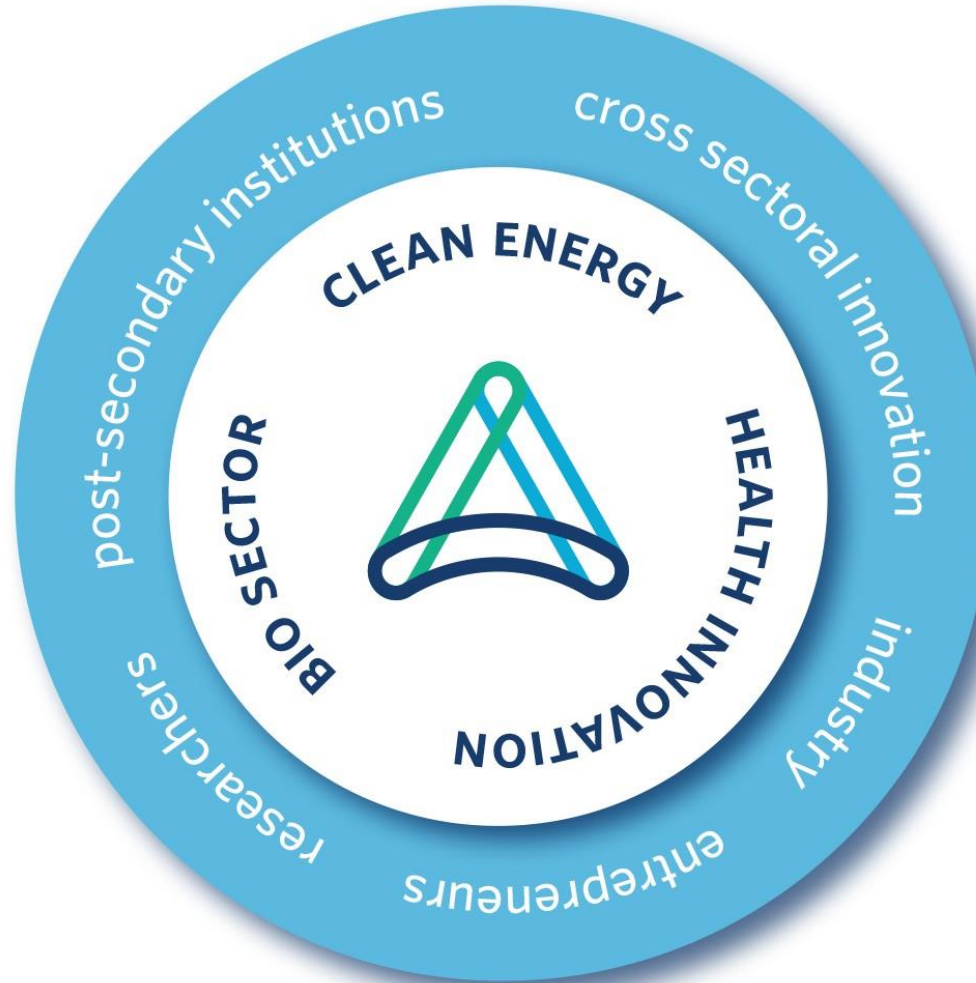**10** LOCATIONS

2 SUBSIDIARIES

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.

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NEW STRATEGIC DIRECTION – FOCUSED, USER-CENTRIC CLUSTERS

Laura Kilcrease, CEO

CLEAN ENERGY

HEALTH INNOVATION

BIO SECTOR

post-secondary institutions

cross sectoral innovation

industry

entrepreneurs

researchers

SUBSIDIARIES

InnoTech ALBERTA

C-FER Technologies

PLATFORM TECHNOLOGIES

DIGITAL

OMICS

ADVANCED MANUFACTURING AND MATERIALS

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KEY PARTNERS IN CLEAN RESOURCE INNOVATION

NRCan CGP In Review

Five Focus Areas

1. Reducing greenhouse gas and air-polluting emissions

2. Minimizing landscape disturbances and improving waste management

3. The production and use of advanced materials and bioproducts

4. Efficient energy use and productivity

5. Reducing water use and impacts on aquatic ecosystems
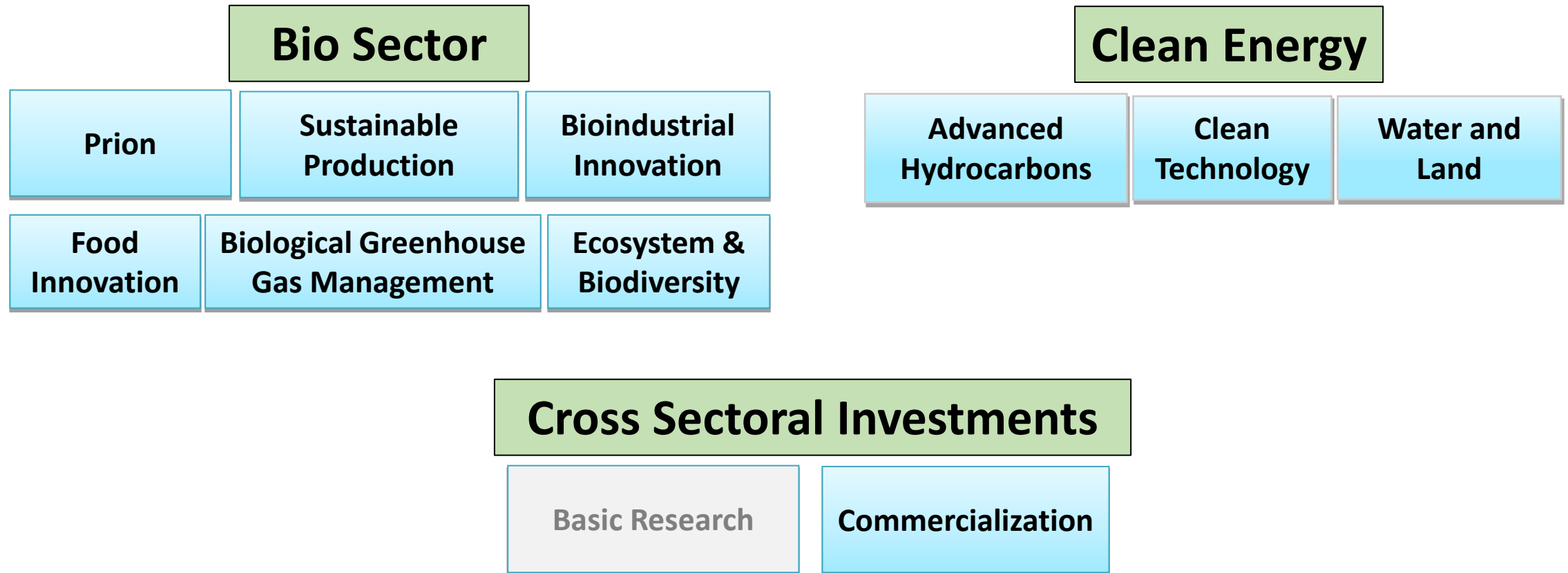
Three Resource Sectors
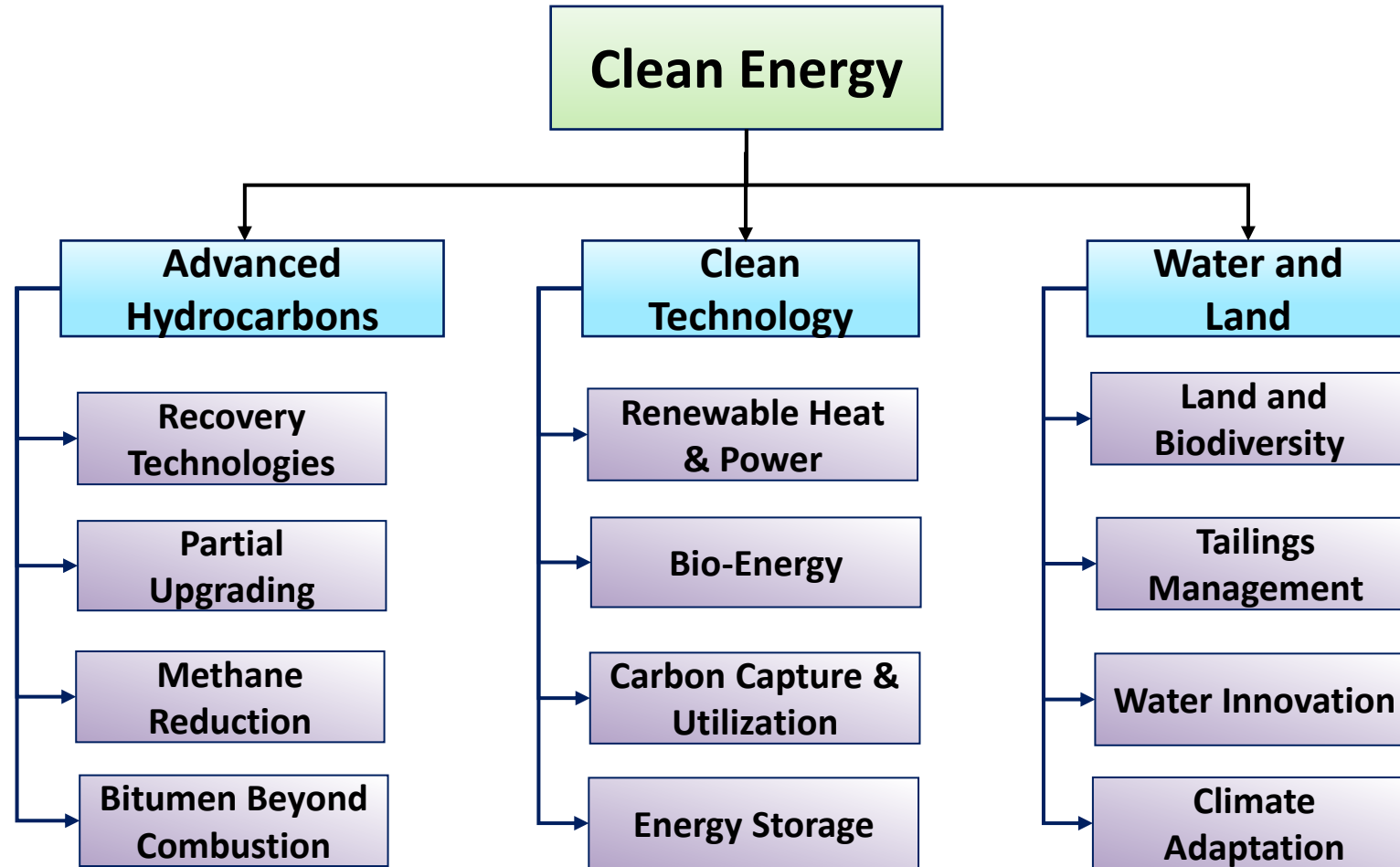
1. Energy

2. Mining

3. Forestry

Two Separate Funding Streams

1. R&D projects, from applied R&D to pilot projects

2. Demonstration projects, including up to first commercial installations

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Alberta Innovates Sectors Relevant to NRCan's CGP

Bio Sector

Prion	Sustainable Production	Bioindustrial Innovation
Food Innovation	Biological Greenhouse Gas Management	Ecosystem & Biodiversity

Clean Energy

Advanced Hydrocarbons	Clean Technology	Water and Land

Cross Sectoral Investments

Basic Research	Commercialization

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Alberta Innovates Programs Relevant to CGP

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                        Clean Energy
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Advanced              Clean                Water and
Hydrocarbons          Technology           Land

Recovery              Renewable Heat       Land and
Technologies          & Power              Biodiversity

Partial               Bio-Energy           Tailings
Upgrading                                  Management

Methane               Carbon Capture &     Water Innovation
Reduction             Utilization

Bitumen Beyond        Energy Storage       Climate
Combustion                                 Adaptation
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PROGRAM EXAMPLE: RECOVERY TECHNOLOGIES

Chart: GHG Intensity (kg CO_2/bbl) vs Projected Timeline for Commercial Deployment (2010–2050), with GHG Emission Reduction (0%–100%) on the right axis.

Regions:
- Emission-free recovery (top, ~100%)
- Low-carbon recovery (middle)
- Energy efficient recovery (bottom)

Labeled technologies:
- SMNR[8]
- New?
- Renewable Electric
- SAGD with CCU[7]
- In-situ Solvents[4]
- HBEP[6]
- ESEIEH[5]
- eMVAPEX[3]
- Direct Contact Steam Gen
- E-SAGD[2]
- E-Efficiency[1]
- SAGD[0] CHWP[0]

[0] SAGD: Steam assisted gravity drainage; CHWP: Clark hot water process; [1] Efficient H_2O treatment, heat recovery, infills, etc.; [2] Various solvent-assisted SAGD processes, and eMSAGP; [3] Enhanced modified VAPour EXtraction (AER 2016); [4] Pure solvent processes: N-Solv, CSP, etc.; [5] Enhanced Solvent Extraction Incorporating Electromagnetic Heating; [6] HBEP = Hybrid bitumen extraction process (surface mining); [7] SAGD with carbon capture and utilization; [8] Small modular nuclear reactors

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Alberta Innovates Programs Relevant to CGP

STRATEGIC ALIGNMENT

Five Focus Areas in CGP

Relevant Programs in AI

1. Reducing greenhouse gas and air-polluting emissions

| Recovery Technologies | Methane Reduction | Biological GHG Management | BPU | Renewable Heat & Power |

2. Minimizing landscape disturbances and improving waste management

| Land and Biodiversity | Tailings Management | Ecosystem & Biodiversity |

3. The production and use of advanced materials and bioproducts

| Bitumen Beyond Combustion | Bio-Energy | CNC Challenge | Advanced Materials & Chemicals |

4. Efficient energy use and productivity

| Carbon Capture & Utilization | Energy Storage | Bioindustrial Innovation |

5. Reducing water use and impacts on aquatic ecosystems

| Water Innovation | Climate Adaptation | Alberta Bio Future |

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ALBERTA INNOVATES – NRCAN PARTNERSHIP

- CANMET/AI MOU National Program
- National Partial Upgrading Program (NPUP)

- Oil and Gas Clean Technology (OGCT)
  - Participate in proposal evaluation
  - Co-fund one FEED project
  - Co-fund four demonstration projects

- Energy Innovation Program (EIP)
  - Participate in proposal evaluation
  - Co-fund one technology development project

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Alberta Applicants for NRCan's CGP

Leverage

Climate Change Innovation and Technology Framework (CCITF) fund for provincial support

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Climate Change Innovation and Technology Framework (CCITF)

Innovation across sectors: $225 million

The innovation stream includes funding to support research, development and investment in new technologies that reduce industrial carbon emissions in two program areas.

- Emissions Reductions Alberta ($80 million): a continuation of funding for innovation grants.

- Climate Change Innovation and Technology Framework ($145 million): this new fund, administered through the Ministry of Economic Development and Trade and Alberta Innovates, will help manage government investments in research, innovation and technology and help commercialize these products.

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Alberta Innovates will
Deliver or Co-deliver Five CCITF Programs

CCITF Programs

1. Clean Technology Development

2. Clean Technology Networks/ Emerging Partnerships

3. Clean Technology Commercialization

4. Clean Technology Business Innovation

5. Clean Technology Facility Support

CCITF Focus "Sectors"

1. Cleaner Oil and Gas

2. Methane Emissions Reduction

3. Low Carbon Electricity

4. Waste to Value-Added

5. Green Buildings

6. Energy Efficiency

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CCITF Program Funding Allocation: AI Delivers $94.7M

Program	Program 3 Yr ($M)	2017-18	2018-19	2019-20
Clean Technology Development	43.2	8.5	25.0	9.7
Clean Technology Networks & Emerging Partnerships	3.0	1.0	1.0	1.0
Clean Technology Commercialization	15.0	5.0	5.0	5.0
Clean Technology Business Innovation	2.5	*0.5*	1.0	1.0
Clean Technology Facilities Support	31.0	0.0	10.0	21.0

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Application and Approval Processes

- Alberta Innovates (AI) is developing a consistent, unified application process for all sectors and divisions

- AI has developed draft Application Guidance and Application Forms for CCITF Programs. The documents cannot be released until AI's corporate application process is completed. This is to ensure AI's CCITF application process is consistent with AI's corporate application process.

- AI will provide more clarity before February 7, 2018 LOI for CGP deadline

- In interim, Alberta-based applicants for CGP funding may refer in their LOI: "Applicant is applying CCITF funding from AI as part of provincial support"

- Applicants who have been already working with AI on specific projects, please continue work with AI's project managers

AI CONTACTS FOR PROVINCIAL SUPPORT

Five Focus Areas in CGP

AI Contacts

John Zhou, Steve Price, Surindar Singh, Terry Rachwalski

Five Focus Areas in CGP	AI Contacts
1. Reducing greenhouse gas and air-polluting emissions	Bryan Helfenbaum, Candice Paton, Cornelia Kreplin
2. Minimizing landscape disturbances and improving waste management	Brett Purdy, Dallas Johnson, Richard Nelson Xiaomei Li, Christine Murray, Fulton Smyl
3. The production and use of advanced materials and bioproducts	John Zhou, Shunlan Liu, Tunde Olateju, Gordon Giles, Pat Guidera
4. Efficient energy use and productivity	Maureen Kolla
5. Reducing water use and impacts on aquatic ecosystems	Brett Purdy, Vicki Lightbown, Carol Bettac

ALBERTA INNOVATES

Alberta Innovates Key Contacts for NRCan CGP

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