

Alberta's Progress on Accelerating CCS Development

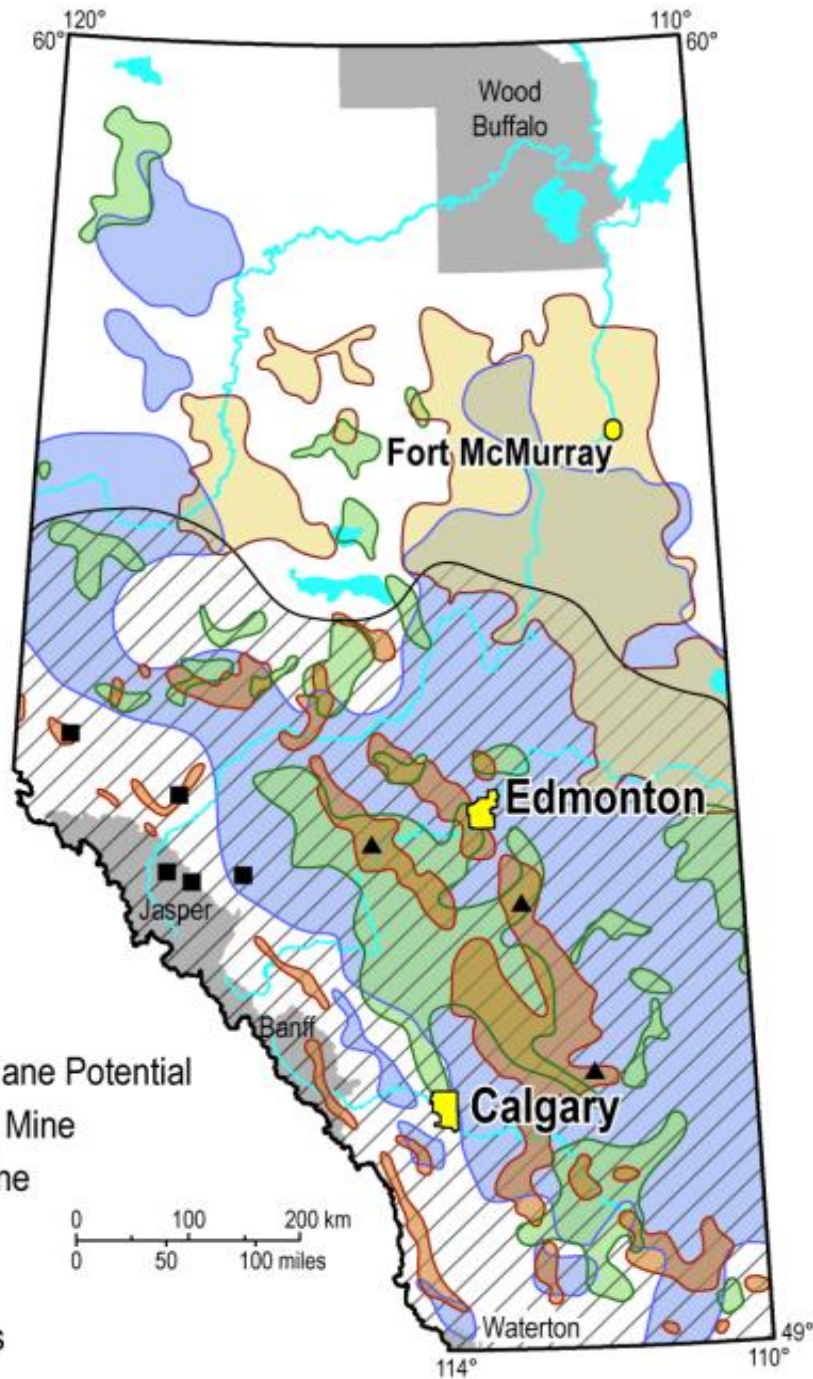
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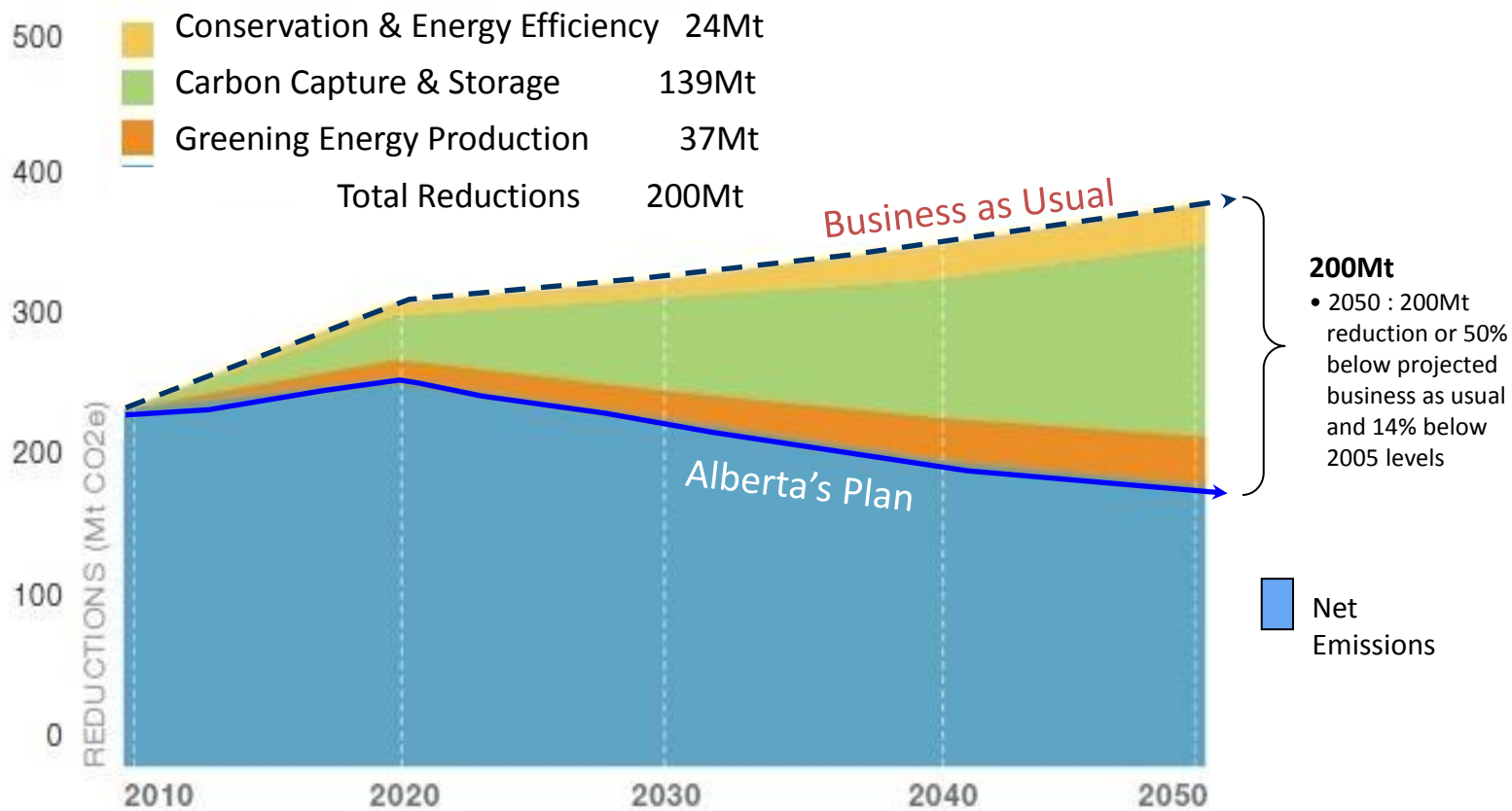
May 27, 2014

Generalized
Areas of
Hydrocarbon
Resources

- Oil
- Coal
- Gas
- Oil Sands
- Coal Bed Methane Potential
- Mountain Coal Mine
- Plains Coal Mine
- Municipality
- National Park
- Lakes & Rivers

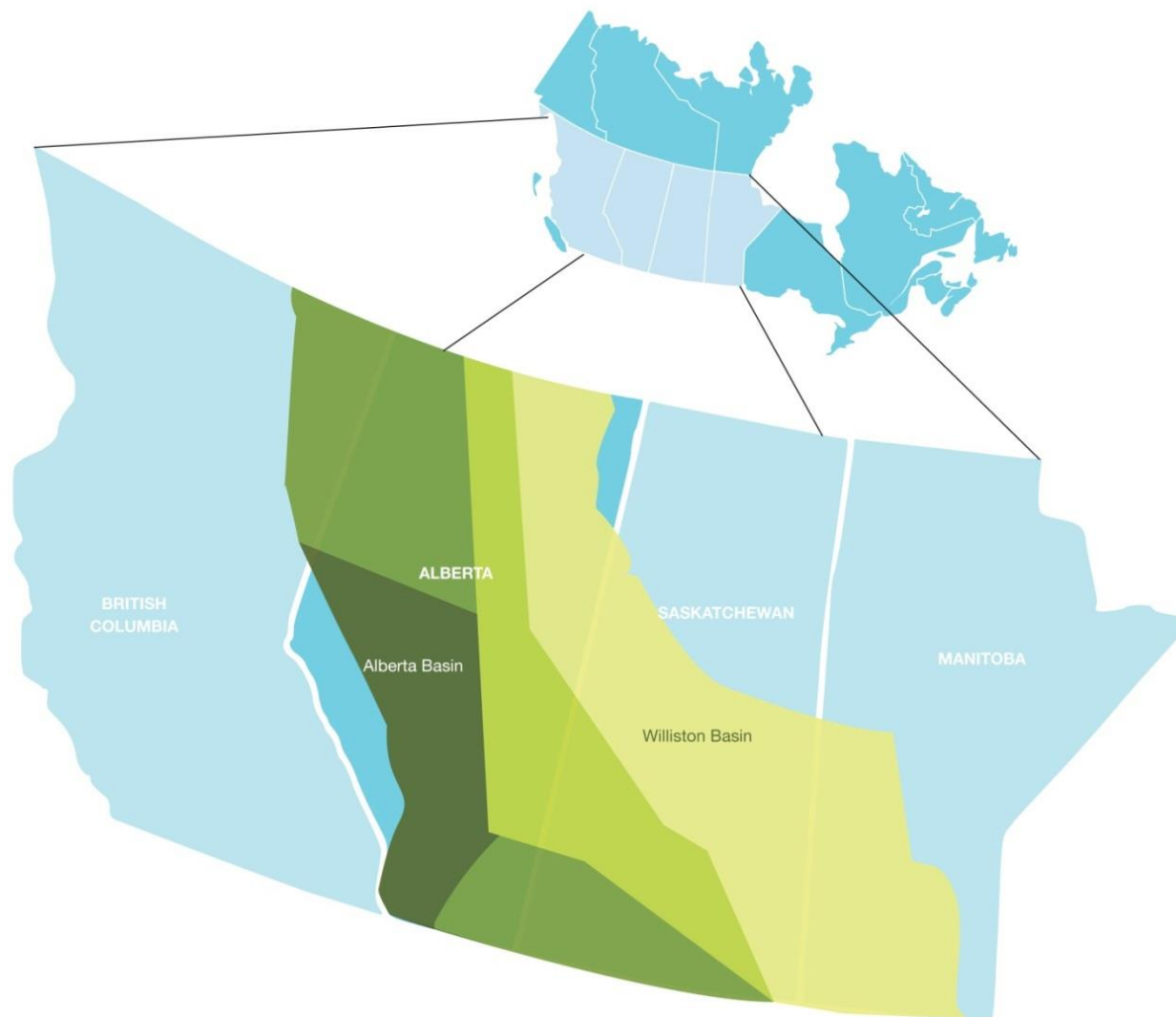


2008 Climate Change Strategy



Source: **Alberta 2008 Climate Change Strategy**

CCS Suitability in Alberta



BASIN SUITABILITY

Not Suitable Limited Good Very Good

Objectives of Alberta's CCS Program

- Demonstrate integration of CCS technologies at a large scale
- Build public confidence in technologies
- Contribute to global effort to close the cost gap – “learning by doing”
- Reduce Alberta's carbon emissions
- Develop a world class regulatory framework for CCS

Alberta's CCS Projects

- **Alberta Carbon Trunk Line**
 - Nov 2012 – North West Sturgeon Refinery announced formal approval of Phase 1
 - Construction for pipeline and refinery ongoing
- **Quest Project**
 - Sept 2012 – Project partners approved the final investment decision
 - Injection late 2015
- **2.76 Mt annual reduction**

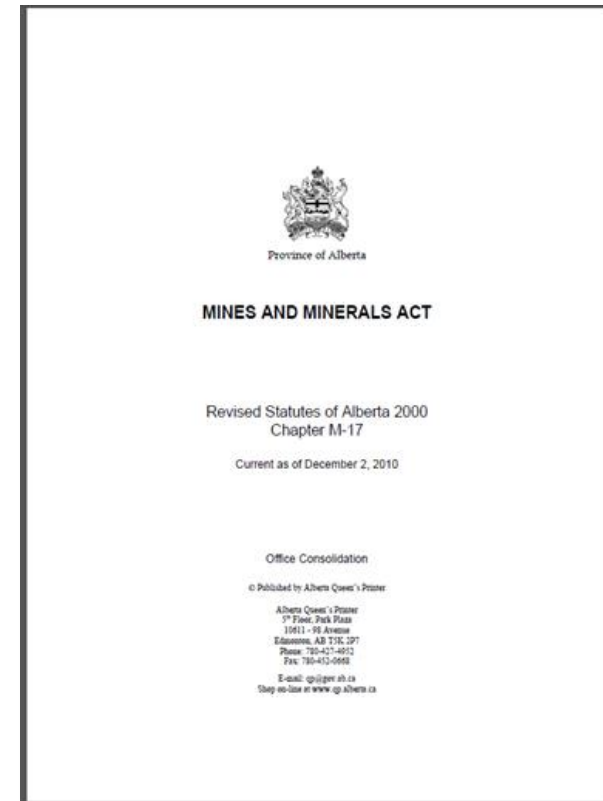


Alberta's CCS Funding Program

- 40/20/40 model
- All payments backed by financial security until commercial operation
- Milestones certified by third parties

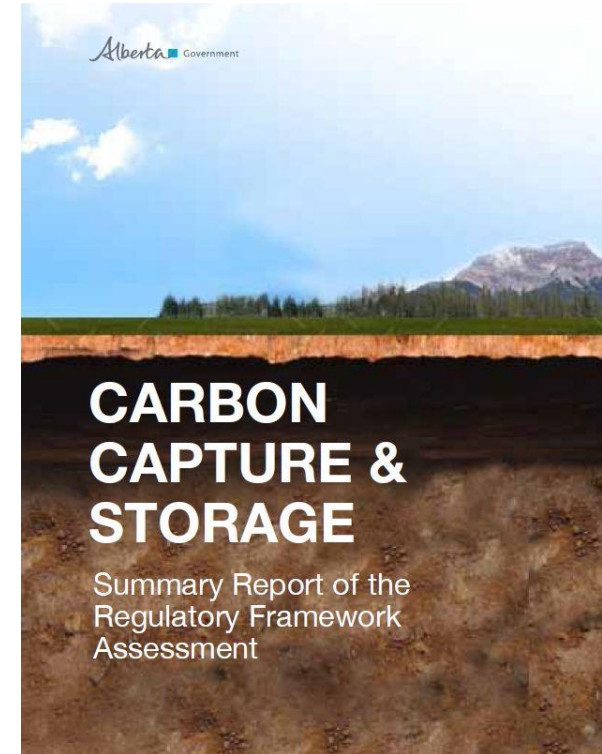
CCS Legislation in Alberta

- CCS Statutes Amendment Act, 2010
 - Pore space ownership
 - Tenure agreements
 - Long-term liability
 - Post Closure Stewardship Fund
- Carbon Sequestration Tenure Regulation
 - Evaluation permits
 - Carbon sequestration leases
 - MMV and closure plans



CCS Regulatory Framework Assessment

- 18-month review of our existing framework
- Assessed regulatory gaps:
 - Applications, Approvals and Regulatory Framework
 - Risk Assessment, Monitoring, and Technical Requirements
 - Public Consultation and Notification, Surface Access and Public Safety
 - Site Closure and Long Term Liability
- 71 recommendations to Alberta Government in 2013



RFA Recommendations – Site Selection

- Adopt general site selection criteria
 - Volume capacity
 - Sufficient injectivity
 - Suitable containment

RFA Recommendations – MMV and Closure Plans

- Based on project-specific risk assessment
- Use of best available technologies to monitor atmosphere, surface, ground and surface water, and subsurface
 - Shallow groundwater monitoring plans
- Be submitted in tandem with other regulatory approvals



Site Closure

- Performance criteria:
 - Conformance to regulatory requirements
 - Containment
 - Predictable CO₂ behaviour
 - Decreasing risk profile
 - Decommissioning is complete
 - Surface reclamation adequately complete
- Minimum 10 years

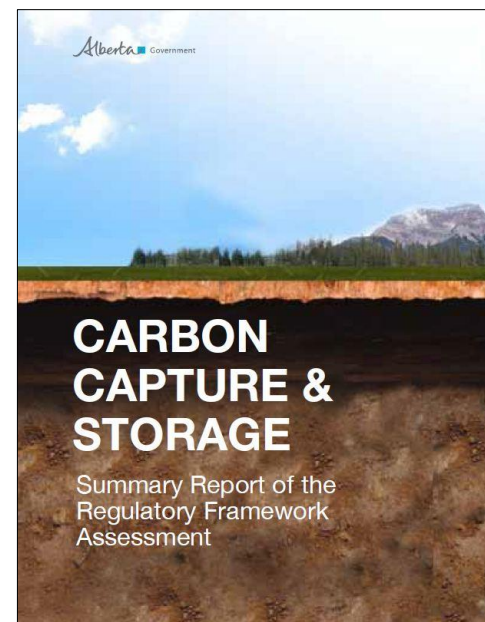


Post Closure Stewardship Fund

- Project-specific
- Rate components:
 - Long-term monitoring and maintenance
 - Unforeseen events - climate liability
 - Administration
- Pooled funds
- Methodology development underway

Path Forward

- Public release of final report
- Implementation of recommendations
 - PCSF rate
 - Improve inventory of pore space
 - Northern Alberta
 - Regulatory amendments?
- Knowledge sharing



Current and Future Focus

- Commercial operations
- ISO Standard (TC 265)
- Knowledge sharing
- International engagement

Please contact us!

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Thank You

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