



NATURAL RESOURCES CANADA - INVENTIVE BY NATURE

Canada Update: Select CCS Regulatory Developments

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Presentation Outline

- Review of CCS Context in Canada
- Select provincial developments
 - British Columbia (BC)
 - Saskatchewan
- Updates on federal activity



Energy – Important to Canada's economic prosperity

- One of the world's five largest energy producers
- Stable and secure energy supplier
- In 2012:
 - \$96 B in capex
 - \$119 B in exports, primarily oil and gas
 - ~ \$155 billion in GDP

Energy as a Percentage of Canadian Total (2012)

	Percentage (%)
Investment	24.6
Exports	27.8
GDP	9.1
Employment	1.9

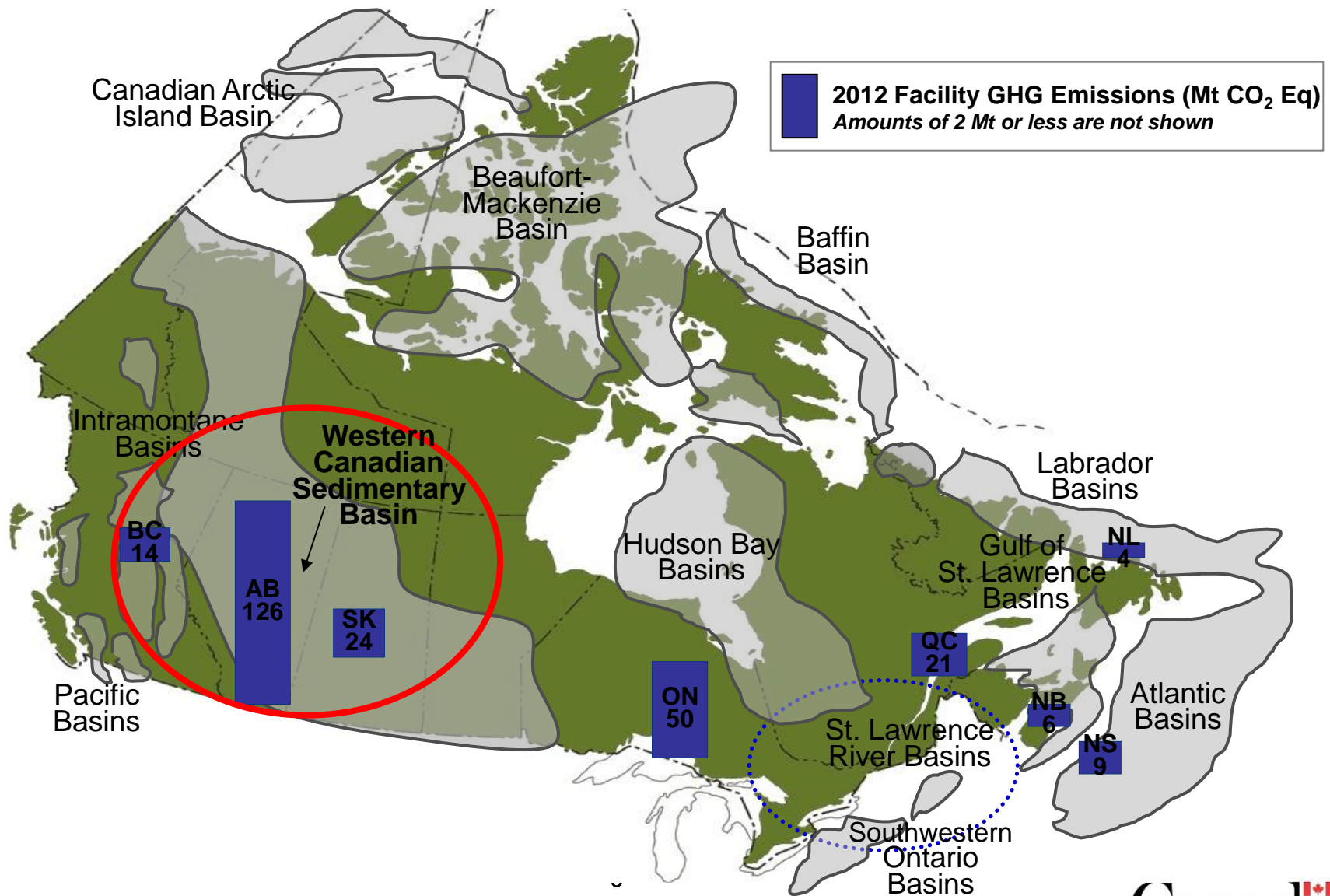


Canada's Approach to CCS

- Recognizes CCS potential to enable continued fossil fuels production and use in a way that:
 - Protects the environment by reducing GHG emissions;
 - Enhances energy security by enabling continued development of Canada's vast resources; and
 - Enables Canada to benefit from its natural advantage in CCS by promoting clean energy technology innovation.
- Targets investments and actions to facilitate CCS adoption in the medium to long term.
- Builds on domestic and international work.



Canada has a natural CCS advantage



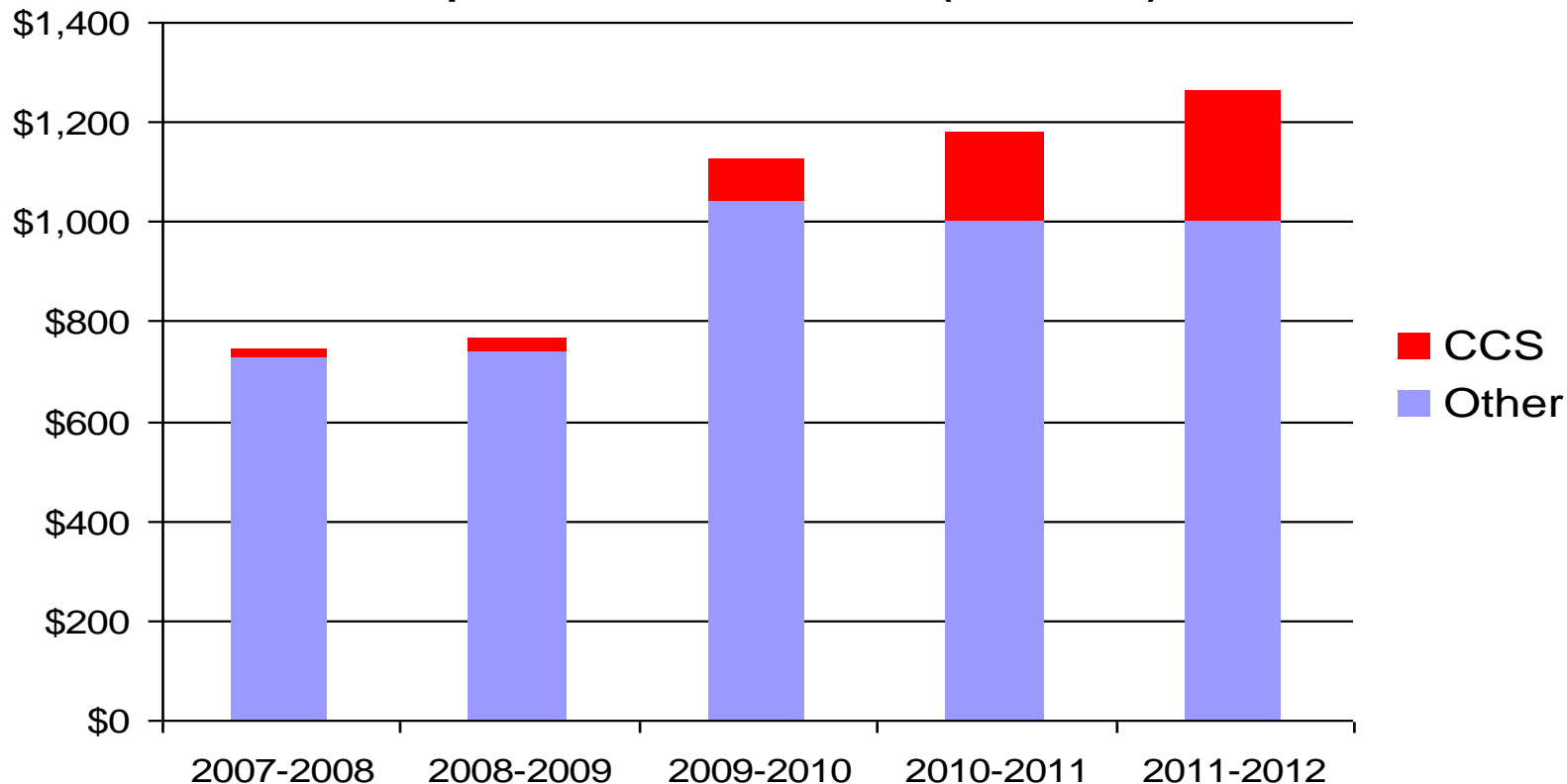
Canada is advancing CCS by focusing on four objectives:

1. Reducing technological risks;
2. Providing a stable regulatory framework;
3. Gaining public acceptance; and
4. Learning-by-doing to reduce the costs and risks – in particular understanding how to more efficiently capture CO₂ through next generation technologies.



Canada is reducing technological risks to CCS through investments in R,D&D

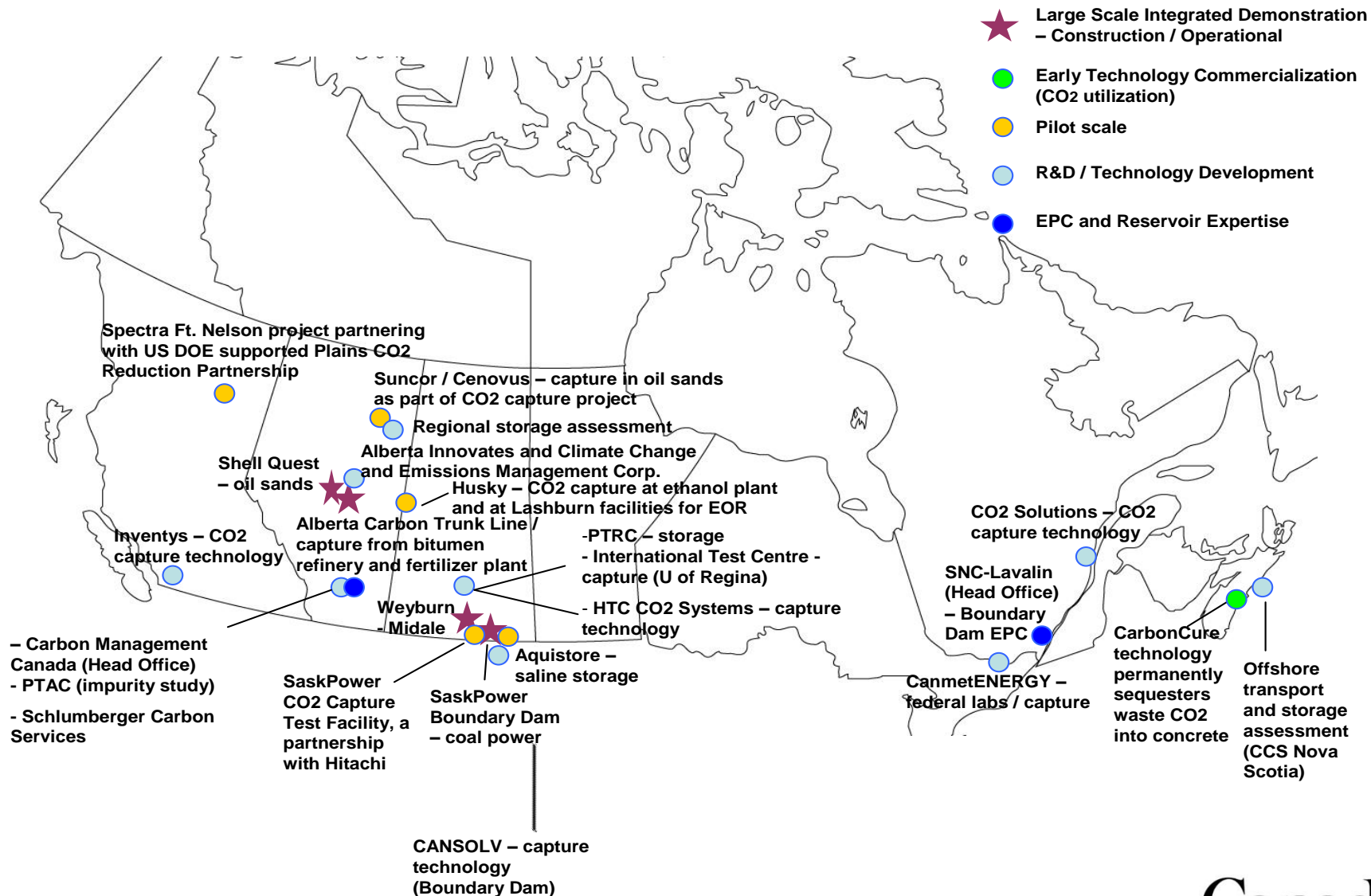
Federal and Provincial Government Expenditures on Energy Research, Development & Demonstration (\$ millions)



Federal-Provincial investments in CCS of over \$1.8 Billion with potentially up to \$4.5 Billion in public-private investment in CCS initiatives



Canada home to 4 large-scale demonstration projects and numerous research- and pilot-scale projects

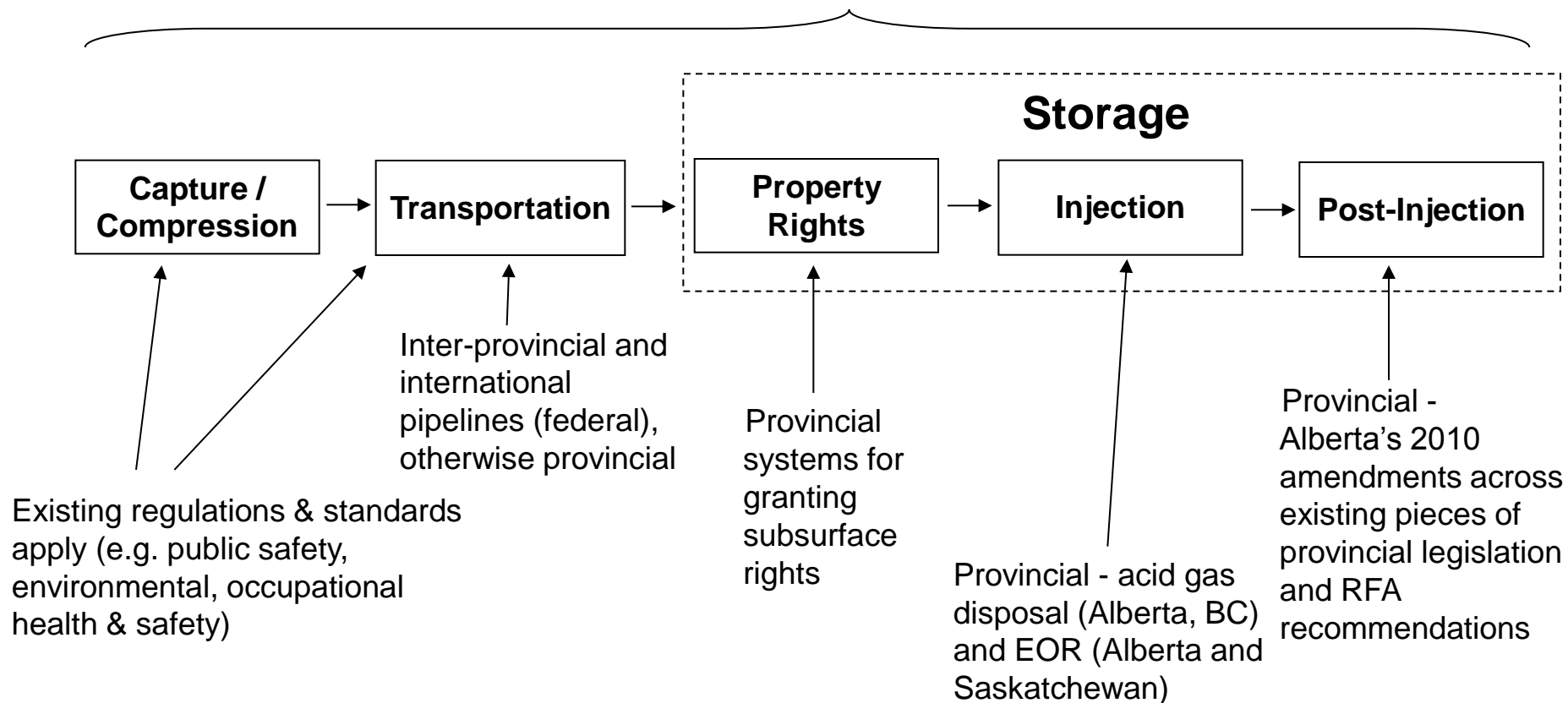


Existing Legal and Regulatory base – CCS Chain

Environmental Protection Regulation, including air emissions

e.g. Federal - GHG Regulations for Coal-Fired Generation

e.g. Alberta - Specified Gas Emitters Regulation



Provincial governments are proceeding with legislation/regulations for CCS projects

Building on a solid regulatory foundation in the oil and gas sector

British Columbia:

- Proposed CCS policy and regulatory framework under consultation

Alberta:

- *Carbon Capture Storage Statutes Amendment Act* (December 2010)
- Regulatory Framework Assessment completed and moving forward with further examination and implementation of recommendations
- Alberta and China co-lead ISO committee for CCS standard development.

Saskatchewan:

- Amended *Oil and Gas Conservation Act* to expand and clarify regulatory authority for CCS and considering if need additional requirements for saline disposal and compliance with emission reduction obligations.

Nova Scotia:

- Completed Regulatory/legal report for possible deployment of a pilot CCS project



The CCS Opportunity in BC

- BC has set into legislation ambitious targets for GHG emissions reduction through its *Greenhouse Gas Reduction Target Act*.
- CCS is part of a portfolio of emissions mitigation solutions underway in British Columbia to reduce global atmospheric CO2 levels and address the targets.
- Natural gas processing emissions are expected to increase as new shale gas development comes on line in Northeast BC.
- CCS provides the opportunity for BC to continue to grow production and extract the economic benefits of its natural gas resources without increasing process emissions.



BC CCS Regulatory Policy Framework

- The BC Natural Gas Strategy (2012) committed government to promote the use of CCS by completing the development of a regulatory framework.
- A CCS Regulatory Framework will:
 - Identify and address any regulatory gaps to ensure that CCS is done safely to protect the public and the environment.
 - Provide transparency in CCS development.
 - Address regulatory policy barriers to CCS projects and provide certainty to industry to ensure regulatory regime is in place for CCS projects to proceed and to ultimately reduce GHG emissions.



BC CCS Regulatory Policy Overview

- BC has a comprehensive regulatory regime that regulates all oil and gas industry activities including acid gas disposal and natural gas storage.
- A proposed CCS Regulatory Policy Framework (CCS RPF) has been drafted by a cross-government team which included BC's oil and gas regulator.
- The proposed CCS regulatory policy framework is a robust regulatory model that will address key issues such as reservoir selection, security of CO₂ storage, monitoring and long-term liability.



Principles of BC Framework

- Builds on the existing oil and gas regulatory framework currently in place
- Based on sound science and best practices
- Consistent, transparent and fair
- Outcomes and risk-based
- Long-term risk sharing between government and industry



Proposed BC CCS Regulatory Framework

The CCS Regulatory Policy Framework proposes to:

- Clarify and strengthen tenure processes for underground storage reservoirs and establish a rigorous site selection and project application process for CCS.
- Establish a Storage Reservoir Stewardship Board within the Oil and Gas Commission that, together with the Ministry, oversees the lease/project application process, reviews closure applications, conducts/reviews risk assessments and make decisions on long-term stewardship.



Proposed BC CCS Regulatory Framework (2)

- Create requirements for CCS storage reservoir monitoring and post-closure assurance.
- Transfer long-term liability back to the Crown when performance measures are met.
- Create a reservoir stewardship fund from an industry injection levy to protect the public from costs associated with long-term liabilities and to provide for government's ongoing stewardship obligations.



BC Engagement Summary

- Goal to provide information and to obtain feedback on the proposed CCS RPF from key stakeholders and the general public.
- Targeted key regional stakeholders including aboriginal First Nations, communities and industry.
- Completed a web-based public consultation process to seek comments (www.gov.bc.ca/carboncapture).
- Greatest response received from industry.
- Local governments requesting additional educational information for communities.



CCS in Saskatchewan

- Saskatchewan is:
 - Responsible for 15% of the CO₂ being stored annually throughout the world.
 - One of only two jurisdictions globally that is constructing a commercial scale coal fired power plant that includes CCS.
 - Conducting a major saline aquifer disposal research project
 - Building a large scale test facility for carbon dioxide capture technology



Saskatchewan's CCS Regulatory Background

- Saskatchewan first was exposed to CCS in the early 1980's with a Shell proposal to undertake a small CO₂-EOR pilot project.
- Provincial oil and gas regulators concluded they could apply existing regulatory tools governing subsurface injection of fluids.
- This starting point has influenced Saskatchewan's approach to regulation of subsurface injection of carbon dioxide ever since.



Saskatchewan's CCS Regulatory Approach

- The injection of CO₂ into the subsurface has occurred under the province's standard oil and gas production regulations that govern injection of all fluids into the subsurface.
- Roughly 30 years of incident-free operating experience of CO₂ injection to enhance oil recovery has not produced any tangible evidence to indicate this approach is not working.
- In other jurisdictions, a different starting point could lead to a different regulatory situation than that which exists in Saskatchewan.



Saskatchewan-Current CCS Regulatory Efforts

- Oil and gas regulators in Saskatchewan are:
 - Considering what additional policy/regulatory requirements may be necessary to ensure sufficient measurement, monitoring, and verification is undertaken of the subsurface CO₂ injection to demonstrate compliance with emission reduction obligations.
 - Considering if additional policy/regulatory requirements are necessary for large saline aquifer disposal projects.
 - Reviewing the policies and regulations established by other jurisdictions to determine if any desirable revisions should be made to the policies and regulations currently applied to CCS field activity.



Federal government GHG regulations will have an important impact on CCS

- With the release in September 2012 of Canada's GHG regulations for coal-fired electricity, Canada became the first major coal user to ban construction of new coal builds using traditional technology.
 - These regulations, which contains provisions to support CCS, will foster a permanent transition towards lower or non-emitting types of generation
- The federal government will continue to work with the provinces on reducing emissions from the oil and gas sector while ensuring Canadian companies remain competitive



Ongoing Engagement with Provinces in CCS Regulatory Context

- NRCan was federal lead for Alberta's CCS Regulatory Framework Assessment (RFA)
- On the whole, RFA recommendations support the Government of Canada's interests that:
 - Regulatory barriers to CCS are examined and addressed
 - CCS is responsibly managed and provides confidence of CO2 storage permanence and integrity.
 - The public is consulted and kept informed
- NRCan continues to be involved in Alberta process (Post-closure Stewardship Fund Working Group).



Ongoing Engagement with Provinces in CCS Regulatory Context

- Information exchange on CCS regulatory issues through Federal-Provincial CCS Network
- Working with provinces in CCS regulatory context through international CCS engagements, such as:
 - U.S.-Canada Clean Energy Dialogue meeting in 2013 assembled project proponents, governments, and other stakeholders to share experiences on the management of a CCS project after CO₂ injection has ended
 - IEA Regulatory submissions and updates for Canada and monitoring global regulatory progress and leading practices



Thank you for your attention!

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