



## **CCS to Decarbonize Cement**

COP25 Official CCUS Side Event  
December 4, 2019

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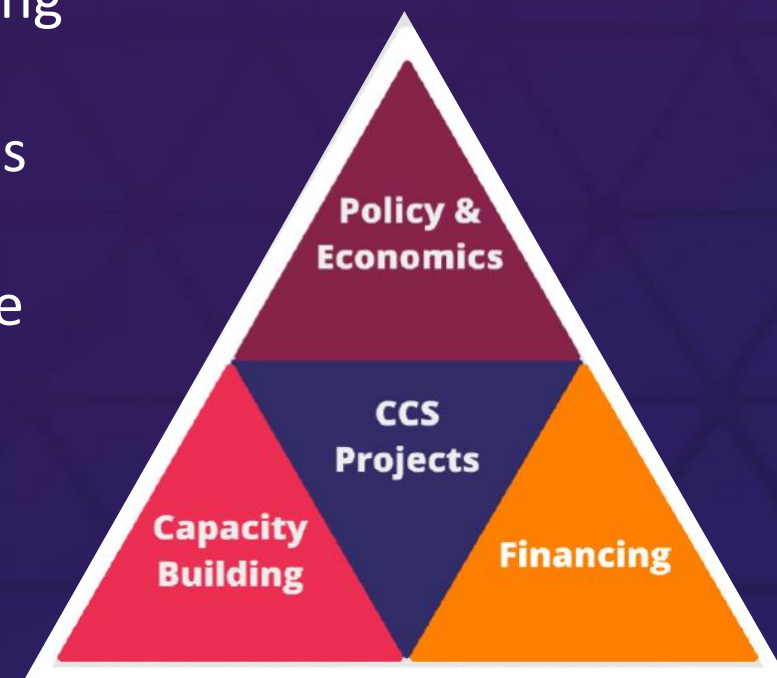
## THE INTERNATIONAL CCS KNOWLEDGE CENTRE



Facilitates in an  
advisory role  
Based on expertise  
and lessons learned

Mandate: Advance the understanding  
and use of CCUS as a means of  
managing greenhouse gas emissions

Sponsored jointly by global resource  
leader, BHP and CCUS pioneer,  
SaskPower



**“Real world” considerations for using  
CCS are important**



An aerial photograph of the Boundary Dam power plant. The central feature is a large, light-colored industrial building with "SaskPower Boundary Dam" written on its side. Several tall, red-and-white striped smokestacks rise from the building. To the left, a large electrical substation with numerous power lines and transformers is visible. The foreground is filled with parking lots packed with cars and several smaller industrial buildings. The background shows a wide river, likely the Saskatchewan River, and a vast, flat landscape with green fields and small ponds under a clear sky.

# BOUNDARY DAM

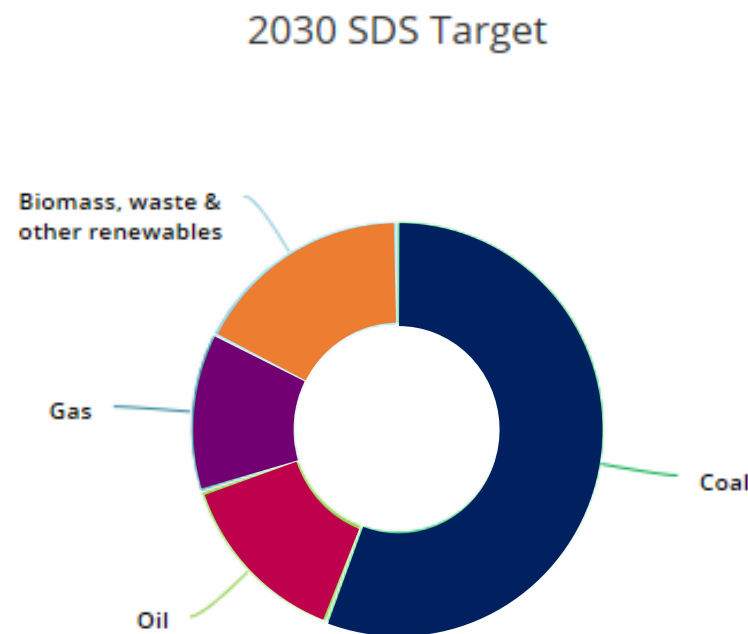
**LEARNING STARTS HERE**  
**THE WORLD'S 1<sup>ST</sup> LARGE SCALE POST-COMBUSTION CCS FACILITY**  
**with over 3 million tonnes captured & stored since 2014**



## Cement Industry Emissions

- Cement manufacturing represents 8% of global emissions
- Global demand for cement is expected to increase 12-23% by 2050 (IEA)
- To produce cement two streams of emissions occur:
  - energy emissions (i.e. stationary combustion) and
  - industrial process emissions
- Energy emissions can be reduced by efficiency.
- Industrial process emissions **must** be captured to significantly lower emissions. They represent 5% of global emissions.

The International Energy Agency advises the use of alternative fuels in cement production must more than double by 2030

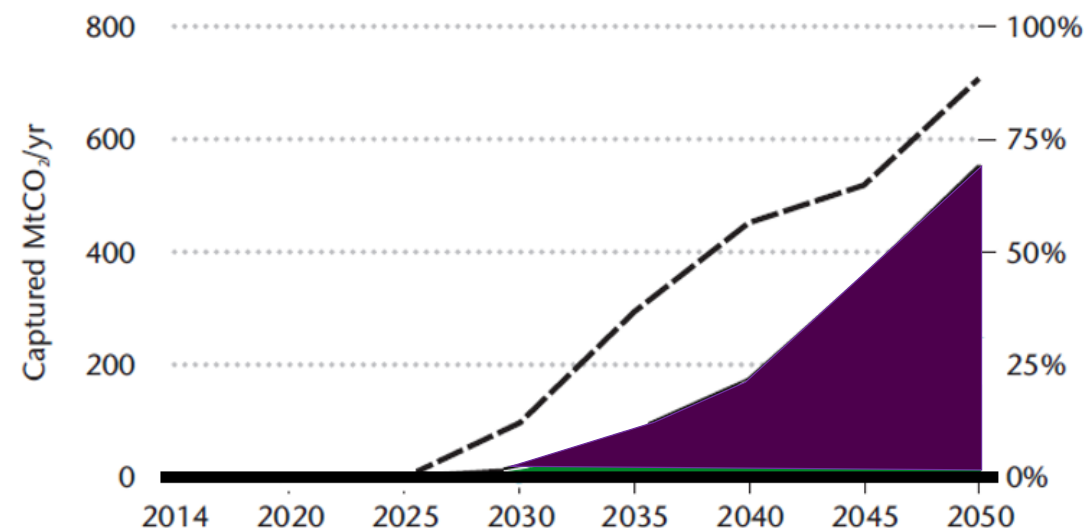


International Energy Agency, Cement (2019)  
<https://www.iea.org/tcep/industry/cement/>

## Integrating CCUS on Cement

- Post Combustion capture technologies are ideal for cement manufacturing
  - Flue gas is similar in cement to coal
- Can be applied to existing facilities
  - Occurs on emissions after being generated in the cement kiln
  - No fundamental modifications the kilns
- Has been proven at large scale
- Biomass firing with CCS can result is carbon neutral cement.

Global deployment of CCS required in the cement sector for permanent storage to reach 2 degrees  
(Low and high variability scenarios)



International Energy Agency, Technology Roadmap  
Low-Carbon Transition in the Cement Industry (2018)  
<https://webstore.iea.org/technology-roadmap-low-carbon-transition-in-the-cement-industry>

## Large-Scale Feasibility Study for CCS on Cement Announced

Lehigh Cement and the International CCS Knowledge Centre Announce Partnership

Receiving \$1.4M(CAD) from Emissions Reductions Alberta towards a \$3M(CAD) Study

600kt CO<sub>2</sub> per year (over 90% of the plant's emissions)

Near infrastructure hub – Alberta Carbon Trunk Line



## CCS on the Cement Horizon





# Thank You



For more information please  
visit our website at:

**[ccsknowledge.com](http://ccsknowledge.com)**



Contact us by email:

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