Carbon Management Technology Conference

Prit Kotecha, July 19, 2017

CANADA'S LEADING INTEGRATED ENERGY COMPANY

$81B ENTERPRISE VALUE[1]
MARCH 31, 2017

35+ YEARS 2P RESERVE LIFE INDEX[2]
AS AT DEC. 31, 2016

725 MBOEPD **99%** OIL PRODUCTION
Q1 2017

462 MBPD REFINING CAPACITY

1, 2 SEE *SLIDE NOTES* AND *ADVISORIES*.

Long History of Sustainable Development

1995	1998	2010	2016
First sustainability report	Introduction of seven-point climate action plan	Flu gas De-sulphurization	Founding Member of GRI
Signed Ceres principles	Reclaimed pond 1 Wapisiw lookout	CEO participation in EcoFiscal Commission	Call for a price on carbon. Support Alberta climate leadership
Commit to transparent carbon reporting and launch new GHG goal			

Suncor has a long, well established track record of being a leader on climate change issues

"*Climate change is happening. Doing Nothing isn't an option*"- Steve Williams, CEO Suncor

- Suncor believes that climate change is a real and growing global challenge and that human activity, including the burning of fossil fuels, is contributing to increased concentrations of GHG emissions in the atmosphere.
- Suncor has acknowledged that we are in the early stages of an energy transition and we also believe hydrocarbons are going to be part of the energy mix for many years to come.

See *Slide Notes* and *Advisories*.

Environmental leadership: aggressive goal setting 2009-15

Environmental performance goals
2015 versus 2007 baseline

Reduce air emissions by 10%

Increase reclamation of disturbed land area by 100%

Reduce freshwater consumption by 12%

Improve energy efficiency by 10%

Environmental performance results
2015 versus 2007 baseline

Reduced air emissions by 36%

Increased reclamation of disturbed land by 176%

Reduced freshwater consumption by 27%

Improved energy efficiency by 9%

See *Slide Notes* and *Advisories*.

GHG Goal to Lower Emissions Intensity 30% by 2030

2030 GHG Goal

Reduce the total emission intensity of the production of our oil and petroleum products by 30% by 2030

Energy efficiency	Transition to lower carbon fuels and power	Invest in Technology and Innovation	Participate in the low carbon future
• Facility Energy management plans • Improve reliability	• Fuel switching • Cleaner fuels and low carbon electricity (e.g. cogeneration	• Low carbon bitumen extraction technologies • Partial upgrading and crude oil decarbonization • Low carbon heat and power • Carbon capture, utilization and storage	• Low carbon power (cogeneration / solar / wind) • Renewable fuels and biofuels • Adapt to future transportation energy system

SUNCOR

Alberta Climate Leadership plan

Phase-out coal generated electricity by:

2030

Implement price on GHG's

$50 / tonne

by 2022

Oil Sands Emissions Cap of **100 Mt**

45% reduction in methane by **2025**

- The Climate Leadership plan will replace the current regulation which is called the Specified Gas Emitters Regulation (SGER). SGER has been in effect since July 2007.
- http://alberta.ca/climate/leadership-plan.cfm

Suncor's approach to technology: collaboration is key

Leveraging a world of external capability and focusing on a path to deployment

Venture capital

Selective investments into external venture capital funds

Role: Access companies for investment, partnership and leading edge knowledge and innovation trends

Emerald

Direct strategic investments

Investments in young and growing companies in exchange for equity

Role: Support development of and access to close-to-commercial technologies

Lanzatech / Benefuel

Technology partnerships

Partnerships with external innovation companies to develop/commercialize technologies

Role: Advance and test technology and commercialize within Suncor

EASE

Industry partnerships

Alliance sharing expertise, risk, and technology in the Oil Sands (eg. COSIA, Evok Innovations)

Role: Advance and accelerate industry performance.

Academic partnerships

Collaborations with universities to advance technology research

Role: Support and direct research into basic and applied science that support/informs strategy

Innovation challenges

Competitions where external innovators submit solutions (eg. NRG COSIA Carbon XPRIZE)

Role: Tool for identifying technology partners

"Win-win" approach with entrepreneurs

- Enabled by an open and collaborative approach
  - Flexible with commercial structures and IP

Suncor's Approach to technology: Path to Deployment

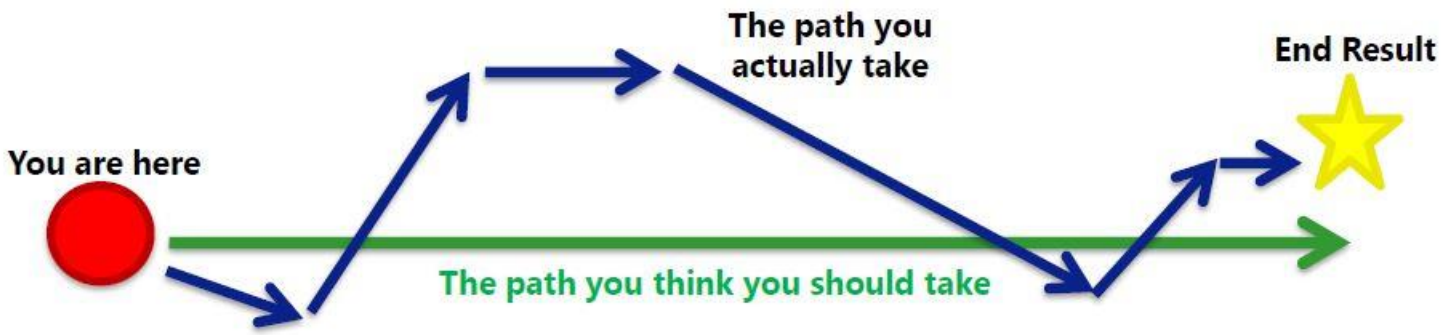
The process of moving from idea to commercialization
idea → concept → pilot → commercialization

Begin with the end in mind – commercial deployment

Large systemic innovations are delivered through integrated programs

Programs require as much design and effort as the invention

Understand the constraints in a path to deployment



IN SITU TECHNOLOGY VIDEO

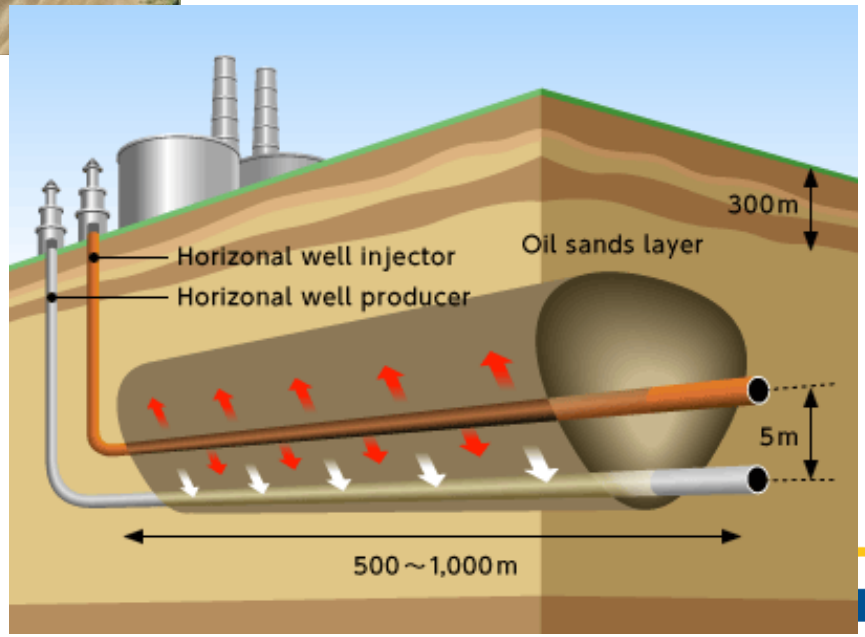
CARBON CAPTURE CHALLENGE AT NEXT SAGD FACILITY

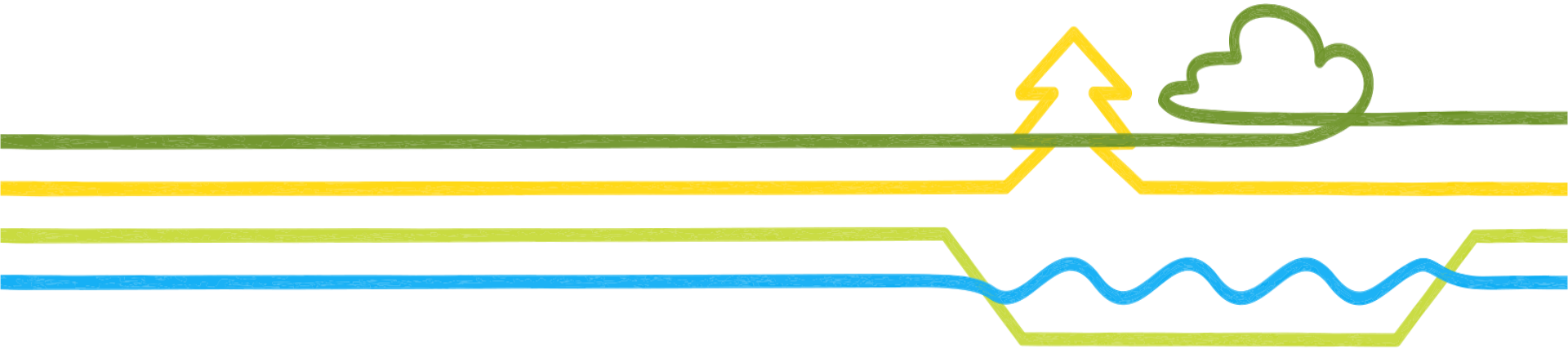
Typical 33,000 BPD facility

- Six gas fired once through steram generators (1600 GJ/h)
- 2200 metric tonnes / day of CO2e
- ~10-15 hectares (+laydown). Largest stack: 30 m high

Challenges:

- Capital Cost
- Footprint/ Height
- Use
  - EOR within SAGD?
  - Storage in local formation





All about **COSIA**

Canada's Oil Sands Innovation Alliance

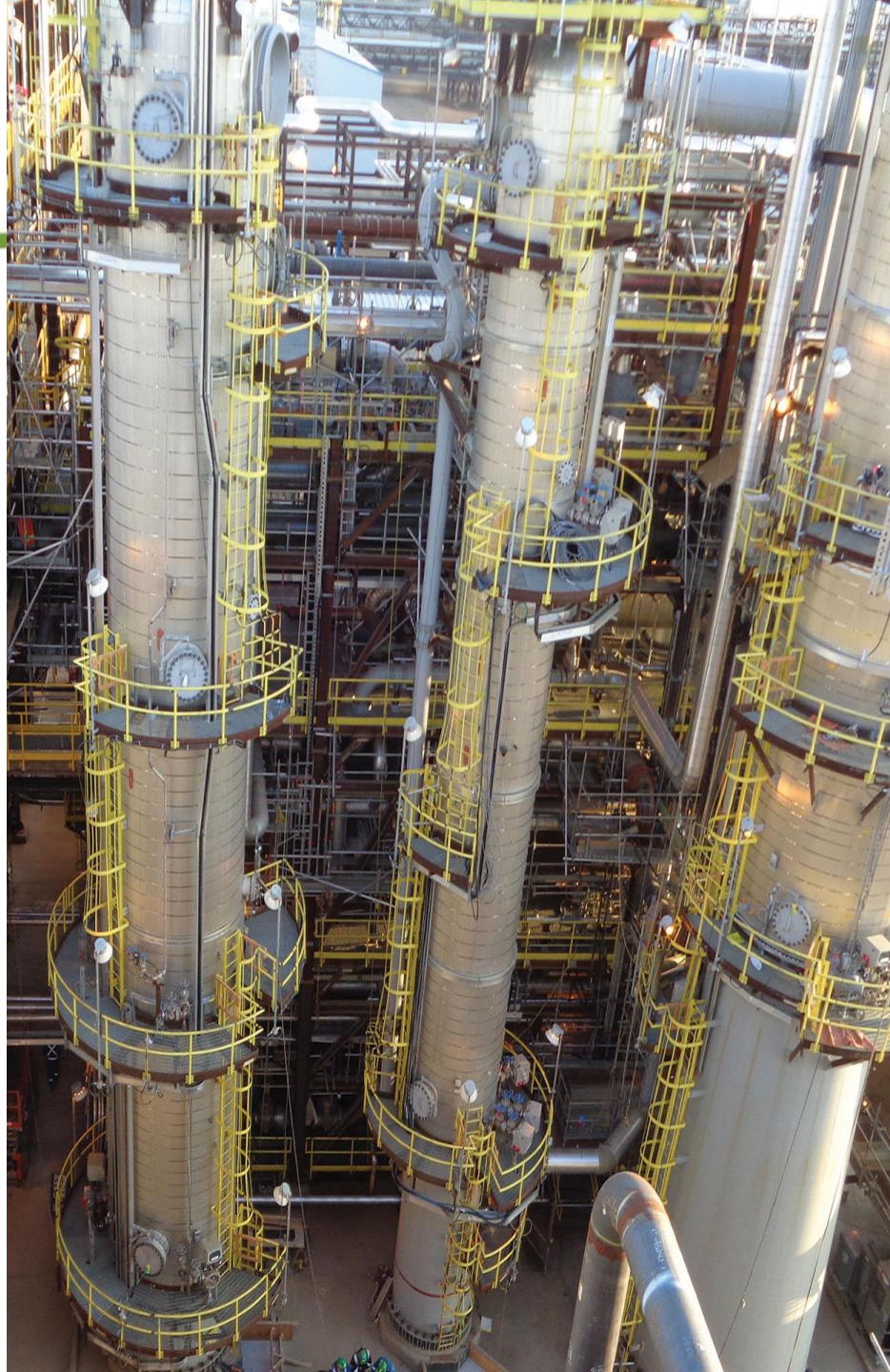
Our **Vision**

To enable responsible and sustainable growth of Canada's oil sands while delivering accelerated improvement in environmental performance through collaborative action and innovation.

GHG **Aspiration**

We will strive to…

“Produce oil with lower greenhouse gas emissions than other sources of oil.”



2016 GHG **Project Portfolio**

PROJECT PORTFOLIO

154 Contributed technologies
(18 obtained in 2016)

$208M Cost to develop technologies
($21.5 million in 2016)

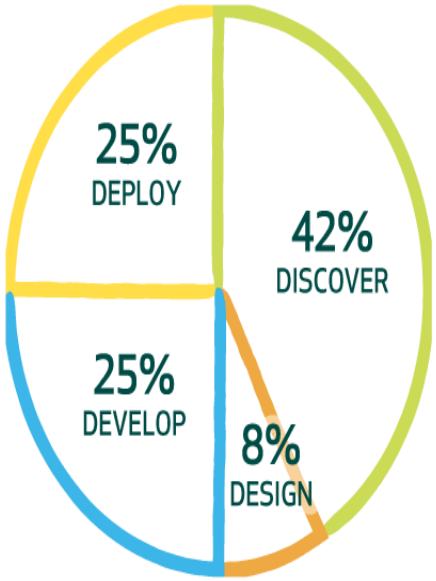
12 Current (active) projects
(7 obtained for 2016)

$15M Cost for current projects
($5.6 million in 2016)

42 Completed projects
(18 completed in 2016)

$25M Cost for completed technologies
($21.5 million in 2016)

ACTIVE PROJECT PORTFOLIO BY 'D' PHASE



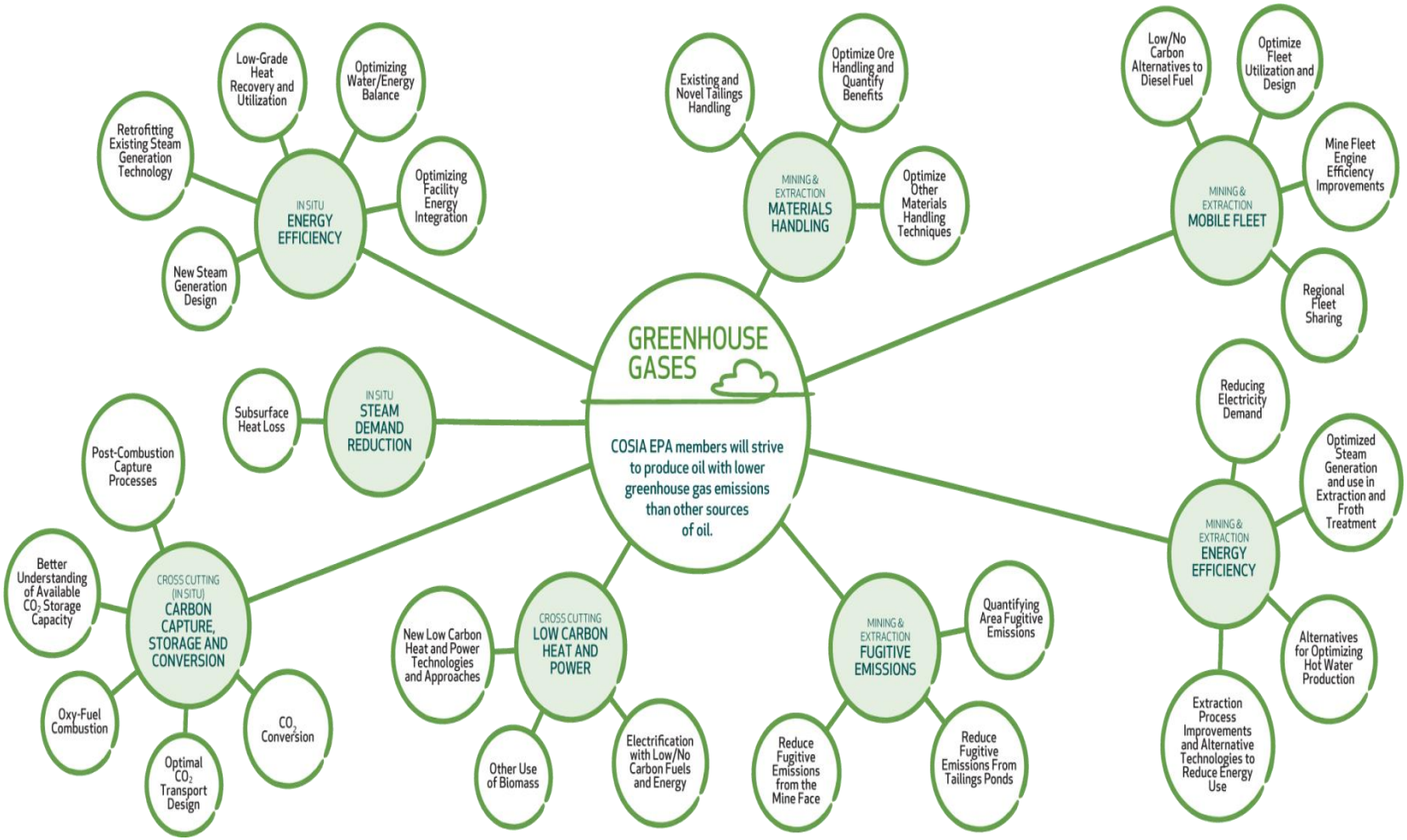
DISCOVER: Scientific research. Early translation to applied R&D. Application is speculative.

DESIGN: Proof-of-concept. Basic integration of pieces for component validation.

DEVELOP: System validation with testing in a relevant environment.

DEPLOY: System prototype at/near scale. Field demonstration. Integration into existing system.

GHG Opportunities Areas & Gaps



GHG **Challenges**

On-going GHG Challenges

- Direct Hot Water Production for an Oil Sands Mining & Extraction Process
- New High Efficiency Boiler
- Higher Value Use of Low Grade Heat
- Enriched Combustion Air
- Natural Gas Decarbonization
- Water and Energy Recovery
- New Heat Exchanger
- Pressure Let Down

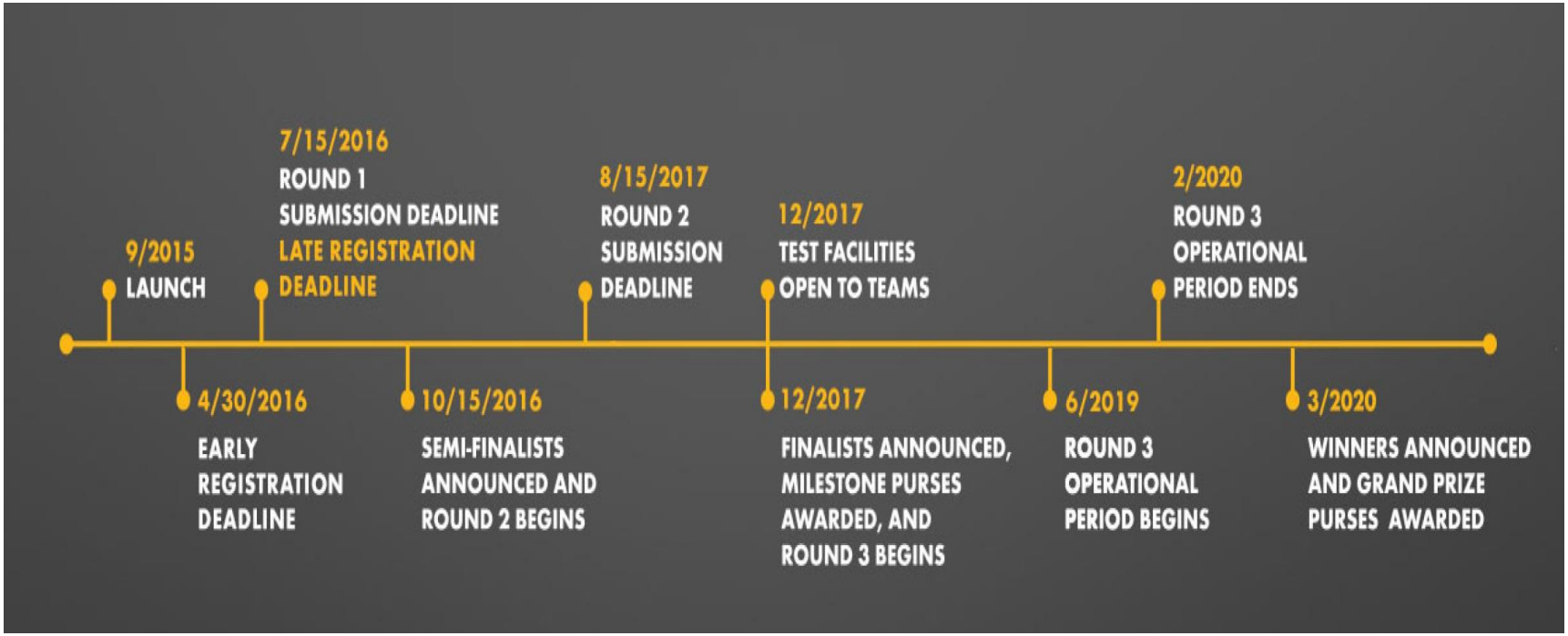
New Challenges

- Quantification of Area Fugitive Emissions
- Post Combustion CO_2 Capture from Natural Gas Combustion Flue Gas

COSIA CHALLENGE

Mobilizing the world's minds and resources to improve environmental performance.

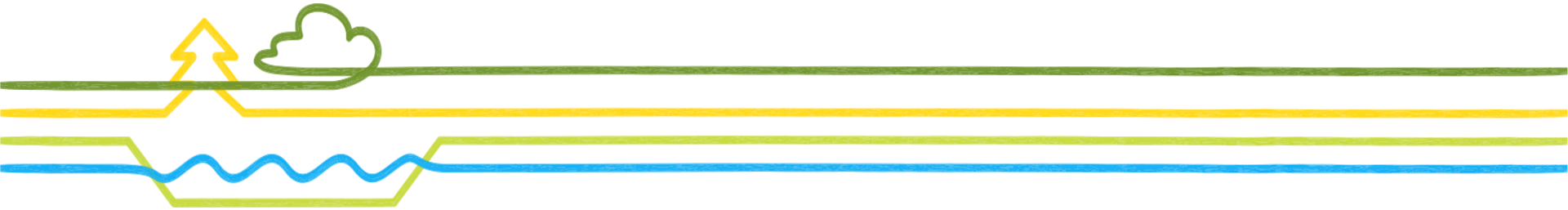
XPRIZE Competition Timelines: Good things happening !



Learn more at www.cosia.ca/carbon-xprize

Alberta Carbon Conversion Technology Centre

Innovation Infrastructure



Vision: Alberta Carbon Conversion Technology Centre

- Create an innovation space to bridge the gap between lab and commercial scale
- Support and accelerate carbon conversion technology development to reduce emissions
- Bring great minds together to spark innovative ideas

ACCTC: Specifications

- Five testing bays ~2,200 square meters (24,000 square feet) each
- Flue gas stream containing between 2 and 5 metric tons of CO_2 per day for each bay.
- Supply of electricity 600 V 3 phase 2MVA
- Supply of fresh water 5-20 m3/day
- Natural gas supply 400-1500 Sm3/day
- 400 bbl waste tank for each bay

ACCTC: Timeline

Nov 2016

Stack tie ins complete

Feb 2017

Detailed engineering complete

Sept 2017

Construction complete

Nov 2017

Ready for operations

Feb 2018

NRG COSIA Carbon XPRIZE teams move in

Q2 2020

Facility available for other technology testing

ACCTC Open for Testing After NRG COSIA Carbon XPRIZE

Technology Centre

- **Capitalize on technology centre successes** — create new industries and revenue streams for Alberta.
- Owned and operated by InnoTech Alberta, a subsidiary of Alberta Innovates