

COSIA CHALLENGE

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



Enhancing SAGD performance through Inclined Heterolithic Strata (IHS)

<p>SOLUTION DESCRIPTION:</p> <p>Novel technologies that will improve Steam Assisted Gravity Drainage (SAGD) well performance in reservoirs impaired by Inclined Heterolithic Strata (IHS) layers.</p>	<p>INNOVATION OPPORTUNITY CHAMPION:</p> <p>COSIA's members have identified 'Enhancing SAGD performance through Inclined Heterolithic Strata (IHS)' innovation priority, which if realized, would help improved production efficiency and reduce the associated emissions per barrel of oil produced.</p>
<p>CREATED: (July 2023)</p> <p>All project proposals are evaluated and actioned as they are received.</p>	
<p>For more information on COSIA Innovation Opportunities, please visit www.pathwaysalliance.ca</p>	

SUBMIT YOUR IDEA [HERE](#)

Canada's Oil Sands Innovation Alliance (COSIA) is an alliance of oil sands producers, representing more than 90 percent of oil sands production, focused on collaborative action and innovation in oil sands environmental technology.

COSIA Challenges are one way we articulate an actionable innovation need, bringing global innovation capacity to bear on environmental challenges and opportunities in Canada's oil sands.



ENHANCING SAGD PERFORMANCE THROUGH INCLINED HETEROLITHIC STRATA (IHS)

WHAT TO SUBMIT TO COSIA

COSIA requires sufficient non-confidential, non-proprietary information to properly begin to evaluate the technology.

Some items that will be especially important to present in your submission are:

- Concept and basic unit operations
- Technical justification for the approach (e.g. laboratory batch or continuous experiments; pilot or demo plants; process modeling; literature precedent)
- Capital and operating cost estimates if available based on described capacity targets
- Basis of cost estimation, including estimation scope, contingency, etc.
- IP status of your proposed technology
- What operating environment restrictions might your technology face:
 - Explosive atmospheres
 - Severe weather
 - Power fluctuations

FUNDING, FINANCIALS, AND INTELLECTUAL PROPERTY

COSIA Members are committed to identifying emerging technologies, while protecting the Intellectual Property (IP) rights of the owner of the technology.

HOW TO SUBMIT TO COSIA

Submit a summary of your solution through the Foresight COSIA Challenge page at:

<https://foresightcac.com/cosia-challenge/>

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PROBLEM STATEMENT

SAGD production performance is negatively impacted by the presence of IHS, where steam growth and oil drainage are limited by low vertical permeability barriers. There is an opportunity to develop innovative technologies and/or strategies to enhance drainage through these interbedded intervals.

BACKGROUND

Low permeability barriers and baffles that exist within SAGD reservoirs inhibit the growth and conformance of steam chambers, resulting in reduced oil production rate, increased Steam Oil Ratio (SOR), and stranded resources.

Knowledge about the heat and fluid flow dynamics in IHS dominated reservoirs are not well established. Few practical solutions for improving the well performance have been proposed.

EXPECTED RESULTS

Industry is seeking an innovative solution to this challenge in the form of subsurface applications to enhance fluid flow in the zones with IHS to improve bitumen production rate without damaging caprock integrity.

The ideal solution:

- can be applied to IHSs with various characteristics: composition (sandy vs muddy), thickness, length, dip angle, permeability variation, etc.
- is practical and cost effective
- allows operations to be within the regulated Maximum Operating Pressure (MOP)
- could be at any Technology Readiness Level (TRL) or funding stage
- could be from any industry, e.g. medical, military, electrical, defence and aerospace

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CURRENT OR CONTEMPLATED PROJECTS

Non-standard SAGD well architecture, such as fishbone, multilateral, or undulating wellbores that provide wellbore access to split pay or increase the permeability across the barriers.

Mechanical methods that increase the permeability of the barriers, such as fracturing, shear dilating, perforating, etc.

NCG co-injection that may promote upward and lateral growth of the steam chamber through IHS beds and assist bitumen drainage.

Other possible solutions could include electrical, chemical, microbial, catalytic, electromagnetic, cryogenic, nuclear, and other means that can increase the permeability of the barriers through transformation, swelling/contraction, tunneling, desiccation, heave, etc.

OUT OF SCOPE/APPROACHES NOT OF INTEREST

Mapping of HIS.