

Challenge: LCBA Canada- Cosia Challenge on Solvent and Non Solvent Additives Measurement

Challenge Statement/Synopsis:

There is currently a lack of proven in-line multiphase measurement technology that that will accommodate the increasing measurement complexity of solvent and non-solvent steam additives.

COSIA's (Canada's Oil Sands Innovation Alliance) members are seeking a 'plug and play' inline multiphase measurement technology suitable for detecting solvent and other additives in produced bitumen-water emulsion. Industry is seeking a solution to well measurement that is cost effective and reliable, with reasonable accuracy and fit for solvent recovery processes surveillance.

Context for the Challenge:

COSIA's members have identified 'Reliable Solvent and Non-Solvent Additives Measurement' as an innovation priority, which if realized, would help accelerate adoption of solvent technologies and dramatically reduce the amount of water needed and emissions per barrel of oil produced.

Measurement of production rate and composition from a well is fundamental to effective reservoir management. It is used to identify optimization opportunities and impacts future performance predictions that underpin investment decisions. In addition to the flow rates of oil, water and gas, solvent recovery processes require measuring the solvent content of the produced hydrocarbon phase for surveillance and regulatory reporting purposes.

There are a variety of well measurement configurations deployed amongst industry such as 3 phase (gas, bitumen, water) separators, 2 phase (gas, liquid) separators with water cut sensors, Coriolis meters & water cut sensors, and Coriolis meters & sampling, among others.

Multi-phase Flow Measurement technology has improved yet there is still not an absolute, stand-alone, measurement device. Current technology requires clean separation and measurement of individual phases. Separating bitumen and water in a 3-phase test separator increase cost of already expensive vessel. In field deployments, separating gas from liquid to improve water cut sensor accuracy has been less accurate than needed. Sampling is a common fallback but is difficult logistically, expensive, time consuming, and has inherent accuracy concerns, as well as cost and safety implications.

Measurement technology is rapidly advancing, with many physical systems being replaced by advanced flow meters for phase measurement. As such, traditional measurement technologies are being replaced, which is driven by pad facility cost reduction initiatives that frequently target well measurement.

- Test separators & chemical injection are being increasingly replaced by multiphase flow meters (MPFM) & sampling
- Multiple MPFM vendor products available
- Alternative multiphase separation with reduced vessel size kits emerging



COSIA members wish to take advantage of new technology to allow for composition measurement in the oil phase and vapor phase.

Response Criteria:

COSIA requires sufficient non-confidential, non-proprietary information to properly 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)
- Energy inputs – quantity and type(s)
- 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

The Opportunity:

As part of the LCBA Canada program you may have the opportunity to:

- Bench test your solution with COSIA members to validate your solution for produced bitumen-water emulsion application
- Field test your solution with COSIA members, if your solution is selected, validated and deemed promising
- Meet new customers and explore new markets for your solution

About COSIA :

Canada's Oil Sands Innovation Alliance (COSIA) accelerates the pace of environmental performance improvement in Canada's oil sands through collaborative action and innovation. COSIA Members represent more than 90 per cent of oil sands production. We bring together innovators and leading thinkers from industry, government, academia and the wider public to identify and advance new transformative technologies. Innovation Opportunities are one way we articulate an actionable innovation need, bringing global innovation capacity to bear on global environmental challenges.

