



Oil & Gas Cleantech Challenge: A Product Innovation Showcase

Instructions and Expectations

1. In order to be considered, completion of all application fields is required. You will find the application here: <http://oilandgascleantechchallenge.com>
2. Deadline for application submission: **Tuesday, July 31, 2018 at 5:00 p.m. MDT**
3. The review and selection committee is comprised of representatives from ConocoPhillips, BP, Noble Energy, Wells Fargo, Canadian Consulate of Colorado, Rocky Mountain Institute/Carbon War Room, Altira Group (Oil & Gas Venture Capital), Perkins Coie, and the Colorado Energy Office.
4. The expectation of the selection committee is that new strategic development partnerships, and/or potential investment targets will be identified through this process.
5. Please be prepared to attend the full day program on Thursday, September 6, 2018. This may include panels and/or one-on-one meetings with the oil and gas companies.
6. Companies selected to present, as well as those companies that are not selected to present, will be invited to attend the 5:00 – 7:00 p.m. VIP Reception at the Colorado Governor's Residence at Boettcher Mansion.

The Oil and Gas Cleantech Challenge: A Product Innovation Showcase and its partners would like to see: Innovative Products / Companies with \$500,000 - \$5M in revenue / Clean Technologies. Specific clean technology sectors include:

AIR, ESPECIALLY METHANE DETECTION OR CONTROL (including but not limited to): Methane emissions control/reduction/detection from valves, piping and vented sources; control of flashing emissions from tanks, improved pressure relief devices and new designs to contain flashing emissions; smokeless burners for flash emissions combustion; flare control and flare efficiency improvements; remote sensing; non-emitting field equipment such as chemical pumps. Specific interest in next generation technologies that can replace pneumatic control systems and pneumatic pumps to eliminate methane emissions and gas to liquid vaporization for emissions minimization and flare management.

BLOCKCHAINS

Utilization of large scale computing to solve technical problems.

Blockchains are an immutable, distributed database that opens up new use cases between trust boundaries, such as between disparate organizations. Applications of blockchain technology in mining could include the creation of efficient, trusted marketplaces; or distributed transactional platforms that can provide value in many areas of the business (such as compliance, CSR and

social engagement, supply chain efficiency and tracing, and commodity trading). A recent example is the creation of a consortium involving Shell, BP, and Statoil who are working on the development of a blockchain-based energy commodity trading platform, along with three large commodity traders. The common thread found in most emerging blockchain based solutions is increased efficiency between boundaries of trust- either through disintermediation of 3rd parties or by enabling the digitization of cross organizational processes.

UNMANNED AERIAL VEHICLES (including but not limited to): more energy efficient and safer operations, including inspection; environmental monitoring; supply delivery systems.

THE INTERNET OF THINGS/DIGITAL OILFIELD/BIG DATA

(including but not limited to): Utilization of large scale computing to solve technical problems. Low cost sensors and actuators with data collection, networked for monitoring, optimization and decision making to improve environmental monitoring; low cost hardware for problem detection and spill prevention. [Need to see applications, not just suggestions.]

ITEMS TO REDUCE TRUCK TRAFFIC (including but not limited to): technologies for more efficient supply use; technologies to reduce waste generation; beneficial use of drill cuttings and produced/flowback water.

SPACE SAVING ITEMS TO REDUCE FOOTPRINT (including but not limited to): more space efficient separators, treaters, drilling systems to reduce land footprint.

PLANT OR BIOLOGICAL SOLUTIONS (including but not limited to): salt tolerant vegetation or trees targeted for beneficial use of produced water; vegetation or trees targeted for growth in drill cutting based soils; site or spill remediation solutions. Biochar for produced/flowback water cleanup, soil remediation.

WATER (including but not limited to): real-time monitoring including efficient sampling, and analysis; beneficial re-use of produced water including recycling or conversion to solid salt suitable for winter road maintenance or dust control; recycling of flowback water; new disposal methods; minimization of water volumes; well bore integrity monitoring systems; alternative sourcing and processing to freshwater. Water-less fracking technologies (e.g. use of cold compressed natural gas or LNG in place of water).

REMOTE/DISTRIBUTED POWER (including but not limited to): rechargeable sources including batteries, fuel cells; modular combined heat and power; micro/islanded grid technology; field gas powered equipment. Specific interest in high efficiency, low-emissions, cold weather-tolerant small scale power generation technologies (50 watts to 1 megawatt) applicable to off-grid multi-well pads or other off-grid oil and gas facilities (e.g. methanol fuel cells that can use field-grade methanol, higher efficiency thermoelectric generators, micro-CHP systems).

POWER MANAGEMENT (including but not limited to): more energy efficient and responsive natural gas engines; efficient and clean generators; more efficient dual fuel (diesel and natural gas) engines that coordinate operations to provide power and response. Technologies that can economically convert waste heat sources (reciprocating engine exhaust heat and jacket water heat) into electricity at smaller scales (e.g. 20kW to 250kW). High efficiency engine technologies could include smaller scale natural gas fueled micro-turbine engines (<500kW).

ADVANCED MATERIALS AND CHEMICALS (including but not limited to): novel materials or chemicals comprised of no or fewer hazardous chemicals; advanced materials less likely to rust or corrode which will improve containment; improved treating chemicals and detection methods; chemicals to extract hazardous items from produced fluids; new products made from captured CO₂, new ways to capture/separate CO₂ and NGLs.

OTHER (including but not limited to): limiting water and energy usage in operational divisions; mitigating engine noise pollution; dust control; information technology applications that limit environmental impact. Sound attenuation systems for low frequency noise from drilling/completion sites in proximity to residents. Multi-phase gas compression technologies.

7. The top 10-12 companies will be notified by Wednesday, August 8 of invitation to the Thursday, September 6, 2018 showcase event in Denver, Colorado.
8. Selected companies will have until Monday, August 13 to confirm their attendance to Mary Austin at mary@coloradocleantech.com.
9. If your company is selected to present in person on September 6, a \$750.00 US Dollar presentation fee will be invoiced. 1-2 of your company executives are invited to attend the full day showcase program.
10. Your product/market-focused presentation (rather than an investor deck) should be no more than 10 minutes, and will be followed by 10 minutes of Q&A from the panel.
11. Travel and expenses to/from Denver will not be reimbursed.
12. You will be notified in advance of the order in which your company will present.