



# 2020 Investment Day

## Decarbonizing Oil & Gas

### Operations

Suggested Target Areas

This document provides information and guidance for OGCI Climate Investment's 2020 Investment Day, and our suggested target areas for application.

In the technology arena, we encourage proposals where the technology has at-least been proven at a mini-pilot scale operating under realistic process operating conditions/environments (TRL 4+).

## Methane Mitigation & Utilization

- Preventing leaks, and Processes to capture and valorize methane that is currently being "lost"
  - Energy Efficiency in methane capture, compression, refrigeration/liquefaction
  - Routine Flaring elimination/complete combustion/venting avoidance
  - Avoiding "unlit flare" situations: technologies to keep them lit always under all conditions (weather, operational)
  - Methane powered Gas Pneumatics: replacement with air powered pneumatics, or electrification
  - Membranes for Separation (CH<sub>4</sub>/CO<sub>2</sub>)
  - Methane cracking to H<sub>2</sub> (and use the H<sub>2</sub> as fuel, make methanol with CO<sub>2</sub>, H<sub>2</sub> with CO<sub>2</sub> to C)
  - Technologies to minimize/eliminate fugitive emissions: AI, Sensors, high reliability process equipment and control devices
  - Sensors and Analytics for fault detection on equipment to reduce fugitives
  - Measuring fugitives
  - Other

## Low Carbon Power generation, and Electrification

- Reliable Remote Power
  - With sustainable fuel sources; renewables
  - Improved efficiency: e.g. combined cycle vs less efficient single cycle
  - Reliable fuel cells using available gas
  - Service offerings
- Diesel replacement for power generation
  - E.g. Power for Drilling
- Offshore Power with low carbon footprint:
  - 30+ MW reliable & low carbon footprint power generation
  - Offshore power as a service
  - Efficiency through Power integration between multiple offshore platforms that are close together, including concepts such as microgrids
  - Renewables integration with optimized storage (smaller footprint, smaller weight loads)

- Minimization of spinning reserves (offshore and onshore)
- Efficient, cost effective, low emissions long distance subsea transmission
- Use of low emission onshore power
- Sources of heat, example: efficient electric furnaces
- Service Vehicles:
  - Electrification,
  - Use of low-quality gas as fuel
- Low emission shipping for O&G products
- Other

## Reliability, & Process Optimization/Automation & Digitization

- Automation and Digitization (technology and services)
  - Predictive Maintenance
  - Integrated Energy management (also as a service)
  - Advanced Process control...operational stability to lower energy use/emissions
  - Sensors/Analytics for fault detection
  - Wireless Sensors (w/o security issues)
  - Retrofittable sensors: non-invasive installations
  - Digital tools for optimizing spinning reserves
  - AI for fracking, use in fracked wells, other processes from upstream to downstream
  - Robotics for energy efficiency
- Flowback reduction in fracking
- Extreme Temperature Reliable Operation
- Reduction of volume of gas to be flared (enhanced operational stability)
- Thermal imaging site surveys...identify heat losses
- Heat loss optimization
- Process Intensification
- Separation columns, Packing efficiency
- Catalyst advancements
- Waste water minimization
- Process optimization to minimize Petcoke, Petcoke disposal
- Alternate Processes with new feedstocks /new processes
- Other

## Waste Heat Recovery

- Waste heat to power (e.g. from turbines/compressor flue gases, flare gas)
- Heat integration within operations e.g. upgrading low quality heat
- Heat pumps for upgrading heat
- Technology to improve heat pump integration
- Other

## Equipment Efficiency

- More efficient & reliable compressors, turbines, pumps, agitators, & components
- Performance monitoring sensors
- Heat exchangers: Materials, coatings, surface texture, configuration
- Furnaces
- Heat loss minimization
- Other

## The Following Themes Are Excluded

- Bio-fuels, and new fuels (including Hydrogen)
- Waste to value
- Methane valorization technologies based on Fischer Tropsch
- Drilling muds, drilling fluids, lubricants, drag reduction
- Improving wind or solar or battery technology; **but we will consider** proposals that utilize wind/solar/storage for power integration.