

### **Abstract for CRADA between Oxergy, Inc. and NETL**

The Raman Gas Analyzer (RGA) has been demonstrated to have an extremely fast response (<1 second), pressurized, multi-gas analysis capability. All but the noble gases are Raman active, although the Raman interaction is weak. The RGA uses a reflectively lined capillary as the optical cell, providing both a small sample volume for fast gas exchange, and a much greater Raman signal collection than traditional instrument configurations. This allows very fast measurement of fuel gases (hydrogen, methane, ethane, propane) as well as other common industrial gases (CO, CO<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>, H<sub>2</sub>O). This provides a new enabling technology for faster, smarter process control based on the chemical composition of the gases in the process – including improved fuel flexibility and efficiency for power generation systems.

Two pre-commercial field prototypes of the RGA have been constructed by NETL, which are being tested for potential use in energy applications such as coal gasification, turbine control, well-head monitoring for exploration or production, and non-conventional gas utilization, and chemical looping. The field prototypes were constructed to meet safety considerations such as operating in hazardous and potentially explosive environments, and high pressure process gases. The field prototypes have demonstrated remarkable success for the RGA. However, current designs are not yet optimized for manufacture. Plus, the bulky size and significant hazardous environment measures incorporated into the current system design impinge on broad-market applicability. NETL is collaborating with Oxergy Inc, to examine several commercialization options and address technical barriers to commercialization.