

Bioenergy and High Fire Risk Areas- Generation and Integration

EPIC Research Symposium

December 3, 2015

Lake Natoma Inn, Folsom, California

North Fork Community Power Forest Bioenergy Facility

PON 14-305: Demonstrating Bioenergy Solutions That Support
California's Industries, the Environment, and the Grid

EPC 14-033: May 2015 – September 2018

Outline

- Overview of project plans
- Preliminary results to date
- Core innovations
- Challenges research is addressing
- Recommendations on how project results complement ongoing state programs, and
- Recommendations on future technology needs and/or research beyond your project.



Overview of project plans

- Build, interconnect, and operate a forest biomass power plant
 - General Electric gasifier, gas cleaning system, GE Jenbacher engine
 - Community-owned former mill site with two existing tenants
 - Focus on hiring local contractors and long-term employees
- Research producer to synthetic gas process
 - Data set for each season to understand the effects of operating conditions
 - Extend the operational capacity to 7000 hours / year .
- Develop and share best practices

Progress to date

- Equipment to be delivered Q3 2016
- Fuel management plan completed
- Grading plans and permitting underway
- Site to be used for log deck, per Governor's Emergency Proclamation



Core innovations for bioenergy and high fire risk areas

Commercializing biomass gasification for forest biomass fuel

- Plant sited within the Wildland-Urban Interface
- Demonstrate economic viability by achieving at least 7,000 hours of operation per year
- Gasification of 8,000 bone-dry tons of forest source woody biomass results in emissions reductions over pile and burn disposal
 - 10 tons of nitrogen oxides(NO_x),
 - 38.2 tons of particulate matter (PM), and
 - 2,430 tons of Carbon dioxide equivalent (CO₂e)
- Working with a team of community, industry, and agency interests

Facility Research

Goal

- Assess and optimize the in-use plant, including measurement of installed reactor design; gas cleaning; automation and control; plant design.
- Two pre-research review meetings on site, start-up test, and four running tests.
- Performance results to show comparable reliability, efficiencies and economics against diesel-engine based systems.

Products

- Site Visit Status Reports
- Gasification System Test Plan
- Biomass Facility Performance Report
- Technical Paper For Publication

Facility Research

- **Activities**
 - Conduct preliminary assessment
 - Establish test and operation protocols including parameters to be tested, measured and analyzed
 - Undertake at least four test sessions as per the approved test plan and protocols and evaluate test results
 - Develop a comprehensive Biomass Facility Performance Report including lessons learned and recommendations
 - Publish at least one Technical Paper
- **Progress made:**
 - First inception meeting of the research team held on Aug 16 at University of CA, Merced.
 - Discussions held with GE Power to confirm system design and the requirements of test and operation. Research draft plan due March 2016.

Recommendations on how project results compliment ongoing state programs

- May contribute recommendations for future distributed generation research
- Interconnection will allow project to participate in BioMAT
- Would like to see research on water release around North Fork, CA



Recommendations on future technology needs and research beyond this project

- Improve interconnection literacy among stakeholders
- Bring additional developers, system integrators, and EPC firms into the forest biomass CHP industry in CA
- Modified fuel handling and processing equipment may be needed for some gasifiers- funds for testing will be needed

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