Module 4: CHP Qualifiers & Considerations

Module 4 Topics

- Goals
- Qualifiers
  - Size/Energy Costs
- Considerations
  - Space
  - Distribution Systems
  - Interconnection, Etc.
- Permitting
- Schedule
**CHP Project Goals**

- Increase Energy Efficiency
- Reduce Energy Costs
  - High Thermal Load Factor
- Minimize Operational Risk
- Reduce Carbon Footprint
- Other Issues
  - Reliability, Expansion, etc.

![Graph showing cost to generate power.]

**Qualifiers**

- Substantial Energy Costs – Thermal & Electric
  - > $100K p.a. to Self Perform (small project)
  - > $500K p.a. for 3rd Party Option (still small project)
  - > $2M p.a. for medium projects
- Substantial Operating Hours
  - > 5,000 hours per year system operation at Full Load
- Coincident Thermal & Electric Loads
  - Thermal Distribution System required
  - Thermal Loads must be ‘Addressable’
- Corporate Willingness & Desire for Benefits
Qualifiers

- Industrial Users
  - > 1 MW peak demand with process thermal loads
- Commercial Users
  - Office Buildings over 50,000 SF
  - Enclosed Shopping Malls with central utilities
  - Hotels with over 100 rooms
- Institutional Users
  - Colleges over 5,000 full time students
  - Hospitals over 100 beds
  - Multifamily Residential over 100 units

*Thermal distribution system required for all applications*

Considerations

- Physical Location & Space Availability
  - Fit equipment with service access
  - Adequate biomass handling/storage space
  - Fuel Transportation
  - Proximity to Switchgear & Thermal Loads is a Cost issue

- Thermal Distribution System
  - Type and Quality
  - Tie-in point at return line
  - Maximize load for all 12 months
  - Thermal Use all Operating Hours
Considerations

- Electric Distribution System
  - Tie-in prior to distribution
  - Only 1 Meter – Cannot back feed
  - CHP output at 480 – 13,000 V
  - Grid Interconnection – Parallel or Island Mode
  - Parallel \( \Rightarrow \) No Power Export/Simpler Interconnection

- Fuel Availability & Quality
  - Long term fuel supply necessary to cover at least the payback period
  - Fuel quality can have significant impact

Considerations

- Electric Issues
  - Facility Grid Reliability
  - ‘Black Start’ Capability – Emergency Circuits/Block Loading Capability
  - CHP System Parasitics

- Emissions
  - EPA Title 5 or Local Authority
  - Residue Disposal

- Noise
  - Mitigated with Enclosures & Silencers

- CHP System Control & Metering
  - Integrate with component controls, utility meters & BAS

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Permitting Issues

- Air Permits
- Electrical Interconnection
- City/State Construction Permits
  - Operating Personnel
- Grant Program Requirements
  - M&V

Project Schedule