



**2011 Title:** **Superheater Modifications and Boiler Upgrades to Maximize In-House Power Generation**

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**ABSTRACT:**

Renewable energy incentive programs, greenhouse gas generation avoidance, and escalating fossil fuel and electrical power costs are motivating many pulp and paper mill utility managers to seek out ways to increase in-house power generation from their industrial boilers burning biomass fuels (bark, sawdust, hog fuel, agricultural byproducts, etc.). Recently, several mills have implemented or are considering projects to increase in-house power generation, especially from biomass fuel, by installing back-pressure or condensing/extraction steam turbine generators that take advantage of generating steam at higher pressures and temperatures than needed for process usage in papermaking. Many of these projects have included both increased biomass fuel firing capacity and raised operating steam pressure and temperature of their existing boilers to make power generation more economical.

In this paper, overviews of several boiler modification projects are presented that included increases in steam temperature, operating pressure, economizer surface area, and/or steam generation from biomass fuels; all with the target of generating more in-house power and reducing energy costs. It is the intent of this paper to present useful examples of boiler upgrade projects that will be illustrative to those in the industry that may be considering steps to increase in-house power generation from biomass-fired boilers. Investments to achieve steam generation improvements in support of increased power generation can have very attractive pay backs, particularly in boilers that burn low cost biomass fuels.