

BOILER POWER/GENERATION

Evergreen Engineering has completed thousands of projects, ranging from numerous custom retrofits in existing industrial facilities to complete greenfield manufacturing plants. Of these projects, many have included boiler systems and related thermal and piping systems. In several instances, the boiler burners had to have the flexibility to operate with alternative fuels, e.g., natural gas, propane, oil, wood, etc. A few projects that illustrate our relevant experience are summarized below.

Snowflake White Mountain Power Company – Snowflake, Arizona

Evergreen valuated used power plant equipment for installation in a paper mill sludge- and wood waste-fired power plant. We developed preliminary scoping studies, preliminary design, and issued construction plans and specifications for this project. Plant includes a 200,000 PPH, 850 PSIG, 900°F bubbling bed boiler and a 24 MW extraction and condensing turbine/generator. Our work included selection of all equipment; determination of equipment required on the boiler to meet present DEQ & EPA requirements; complete engineering for power plant, sludge dewatering, and wood yard installation; project management; and construction management.

Southern Oregon University – Ashland, Oregon

We conducted a preliminary scoping study and follow-on detailed study for a 30,000 PPH hog fuel boiler with a 1.5 MW turbine/generator with campus heating cogeneration project. Evergreen provided the concept analysis through pro-forma analysis of the plant. Our preliminary scoping study looked at technology review and analyzed nine options. Option analysis included layout drawings with cost estimates and construction scheduling. Evergreen performed follow-on detailed study looking at pro-forma analysis and ROI.

Stimson – Gaston, Oregon

We conducted a preliminary scoping study and follow-on detailed study for three hog fuel, Dutch oven boilers producing 59,000 PPH each. Evergreen provided the concept analysis through pro-forma analysis of the plant. Preliminary scoping study performed examined hog fuel drying options and boiler replacement and upgrade. Option analysis included layout drawings with cost estimates and construction scheduling. Evergreen performed detailed study looking at pro-forma analysis and ROI.

Confidential Client – Springfield, Oregon

We conducted a preliminary scoping study of the present steam plant production and usage to confirm additional boiler requirements. Evergreen provided the concept analysis through complete engineering design for boiler installation and provided start-up assistance. Project responsibilities included project scheduling from boiler selection through start-up, budgetary costing, equipment selections, environmental performance, and multi-discipline design.

Thompson River Co-Gen, LLC – Thompson Falls, Montana

For this 17 MW coal-fired cogeneration project, Evergreen provided the design for the turbine island piping including extraction steam, hot well, feed water heaters, cooling tower, condensate, lube oil, and other systems. We also provided civil structural design of the cooling tower basin, utility tunnels, and various service platforms. In addition, we provided all the power distribution including the primary substation and overland transmission line to tie-in to the utility grid.

Forest County Potawatomi Community – Crandon, Wisconsin

Evergreen conducted a biomass power generation feasibility study for the Potawatomi Community in Forest County, Wisconsin. This study included a feedstock supply analysis, site and load analysis, review of base and peak loads including thermal and electrical, site review, including zoning land use, size and access, utility providers and environmental issues. Our scope also included technology review, modeling and both cost and economic modeling.

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Idaho Forest Group – Laclede, Idaho

At a specialty lumber production facility, Evergreen performed a study of the two boiler systems producing 90,000 PPH. Options included installation of a fuel dryer, converting one boiler to sander dust with natural gas co-fire and adding additional capacity to the system by adding an additional natural gas boiler. The study included cost analysis (operational, maintenance, capital, fuel, etc.) operation impacts, equipment layout, equipment selections, maintenance impacts, fuel handling systems, etc.

Wah Chang – Albany, Oregon

At a rare metals production facility, Evergreen provided electrical engineering and design for six 2.8 MW gas reciprocating engine generators with heat recovery steam generators (HRSG). Evergreen provided engineering and design of the HRSG and steam system.

Murphy Plywood – Sutherlin, Oregon

Evergreen performed several major retrofit projects for a 35,000 PPH, 250 PSIG boiler and ancillary systems. Projects included steam and condensate system modifications, burner replacement (gas and sander dust), piping, etc.

Confidential Client – Springfield, Oregon

For this 250,000 PPH package boiler, 650 PSIG/700°F, natural gas, with all auxiliary systems, Evergreen provided all engineering design and documentation, including design, drawings, specifications, bid packages, etc., as well as field technical supervision during construction. The project included new installation of a power boiler at the existing paper mill, tied in to existing steam systems to provide supplementary steam power. Evergreen also provided engineering design and documentation for burner conversion on a power boiler and prepared P&IDs for steam and condensate systems, including four steam turbine generators.

Confidential Client – Monticello, Georgia

For this greenfield medium-density fiberboard plant, Evergreen provided all engineering, including specification, selection, and design for installation of a 50,000 PPH/300 PSIG package boiler to provide process steam and thermal energy for the plant. Evergreen provided all engineering design and documentation, including design, drawings, specifications, bid packages, etc., as well as field technical supervision during construction.

Morgan Products – Springfield, Oregon

Evergreen provided all engineering, including design, equipment selection, and site installation support for temporary package boiler installation at an existing door manufacturing plant.

University of Oregon – Eugene, Oregon

Evergreen provided civil/structural and piping design support for multiple boiler and turbine installations at the university. Project included new 70,000 PPH boiler installed in existing power plant and tied into power generation systems.

Trus Joist – Stayton, Eugene, and Junction City, Oregon

Evergreen provided all engineering support for new thermal oil systems for process heat at three plants. Involved burner, piping, pumps, instrumentation, heat exchangers, etc.

Eagle Valley Clean Energy – Gypsum, Colorado

Evergreen provided conceptual engineering consulting, equipment selection, preliminary layouts, and detailed engineering for new woodyard including conveyors, log handling, wood chipping, and storage, as well as long-term construction management for the duration of the install.