

PROJECT SUMMARY

50 MW CORINTH BIOMASS CHP PROJECT COMPREHENSIVE FEASIBILITY STUDY AND PROJECT DEVELOPMENT

PROJECT SUMMARY

Bridgestone Associates prepared a complete detailed feasibility study and performed early stage development for a 50 – 80 MW biomass fired plant located at a former paper mill in New York State. Work included assessment of suitability, if any, of existing on site equipment, conceptual design, preliminary layouts, preliminary specifications, detailed capital and O&M cost estimates, fuel supply assessment, fuel delivery and storage logistics, electrical interconnection assessment and analysis, permitting requirements, ash handling and ash disposal, project scheduling, power sales and renewable energy credit buyer identification and pricing, and complete financial and sensitivity analysis. Work also included the project development; meetings and negotiations with investors; and meetings with the local communities, potential fuel suppliers and equipment suppliers.



PROJECT STATISTICS

Client:	Philmet Capital Group
Project Type:	Biomass (whole tree chip) fired combined heat and power (CHP) plant
Size:	50 MWe at interconnection point (potential 80 MWe alternative)
Unit Sizes:	2 x 25 MWe if existing steam turbine generator is serviceable 1 x 50 MW if not
Estimated Project Cost:	US\$95.6 million
Plant Location:	Town of Corinth, New York, USA
Plant Elevation:	610 feet above sea level
Interconnection Voltage:	115 kV
Primary Fuel:	Whole tree wood chips and forest residue
Fuel Characteristics:	4,500 Btu/lb as fired with 4% ash content
Back-up Fuel:	Natural gas
Fuel Input:	653 MMBtu/hr; 5,320,116 MMBtu/yr
Fuel Use:	591,000 tons/yr
Plant Steam Conditions:	1,250 psig, 950 °F
Cooling:	Once through from adjacent Hudson River or evaporative
Combustion System:	Hydrograte stoker or fluidized bed
Steam Turbine Generator:	GE existing. Additional to be determined
On-Site Fuel Storage:	Chipped wood storage: silos 3 – 5 days; covered storage 1 – 2 weeks Round wood (logs): 2 weeks

Off-site Fuel Storage: Round wood: 6 – 12 weeks
Fuel Delivery: On site rail spur and truck delivery
Thermal Sales (CHP): Plastics manufacturing plant and others (to be built)

PROJECT DESCRIPTION

Bridgestone Associates was initially contracted to prepare a detailed, in-depth feasibility analysis of the potential to develop, finance, construct, own and operate a 50 MW biomass (wood) fired power plant at a former paper mill in Corinth, New York. The site had formerly been owned by International Paper. The plant received round wood by rail and truck and processed it into finished paper. Many of the buildings and the utilities related equipment, including an oil fired boiler and 25 MW steam turbine generator, remained at the site. Also at the site was a water intake structure from the adjacent Hudson River, a landfill that had been used for disposing of paper processing wastes, a rail spur, and a waste water treatment plant.



The initial feasibility study included an assessment of the site and the existing equipment with a view to its potential re-use in a new power plant. This included evaluating conversion of the existing oil-fired boiler to burn biomass, re-use of the existing 25 MW steam turbine generator, use and upgrading of the existing substation and utility interconnection, use of the waste water treatment facility, and re-use and conversion of the existing buildings.



Once the site assessment had been completed, preliminary plant configurations and designs, along with heat balances and performance charts were developed. A number of different technologies for energy conversion from wood chips to electricity were investigated including hydro grate boilers, fluidized bed boilers and gasification systems. The final selection was left to a choice between fluidized bed and hydrograte, with the choice going to be made during the development of the project based on price and performance. There was also an issue as to whether Renewable Energy Credits from a hydrograte boiler would be valid under then pending regulations.

A detailed wood supply assessment was conducted including discussions with local wood chip suppliers, chippers and landowners. A wood supply, transportation and storage plan was developed.



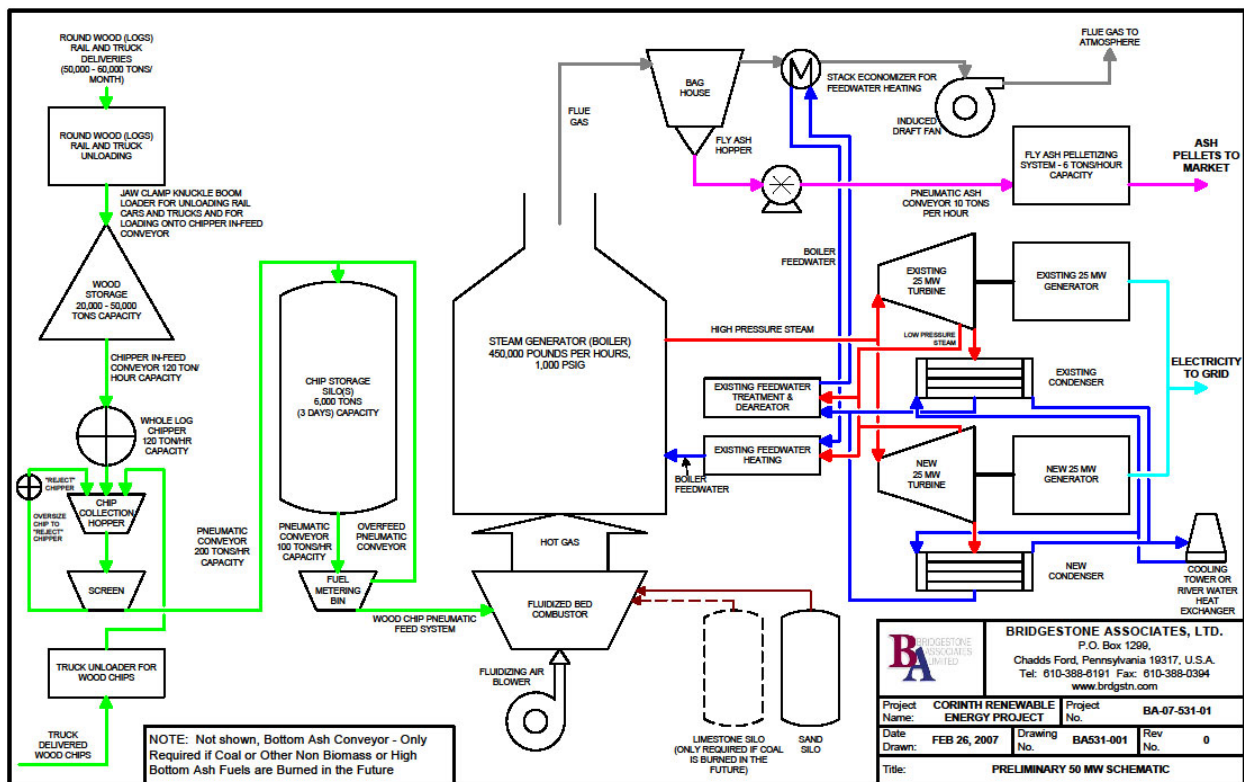
A preliminary plan for the disposal of ash and waste water was developed and the costs associated with these plans estimated for use in the economic analysis.

A preliminary assessment of the requirements for environmental permitting was developed. A schedule for permitting, the likely schedule, and the potential risks were developed.

The market for power and Renewable Energy Credit sales was assessed. A number of potential power purchasers were contacted in order to develop a reasonable estimation of the anticipated sales revenues that the project would receive.

The data from all of these investigations and assessments were used in a detailed economic and technical model developed by Bridgestone Associates for the project. This economic and technical model was used to evaluate the economic and technical viability of the project. Detailed sensitivity analyses were conducted to assess sensitivity to major assumptions and model input variables.

A detailed report with full economic, technical and environmental analysis was prepared. After review this report was used by the client as the basis to raise development and equity funds.



After the initial feasibility studies were completed and reviewed by the client, a number of variations and alternatives were discussed and evaluated. One major alternative was the potential to build a larger, 80 MW plant at the site. Bridgestone completed a full assessment of the feasibility for this larger plant. This larger plant assessment built on the work previously performed and showed the project was feasible but fuel supply logistics would be a major issue.

Bridgestone Associates took the technical lead in the development of the project, working with the client and other consultants (public relations, land surveyors, civil and site engineers, etc.) as part of the development team. This work included participating in local town meetings on site approvals, meetings with the environmental regulatory agencies, meetings with the former property owners, and meetings with a wide variety of potential thermal users interested in co-locating on the site. Bridgestone also worked with the local railroad for fuel delivery and major property owners and managers of fuel sourcing to further develop a detailed fuel supply plan.

Bridgestone prepared conceptual layouts, process flow (P&ID's), materials flow and electrical one-line drawings for use in the development process. Bridgestone also worked with a number of equipment suppliers to develop additional technical and cost details of their equipment and its applicability to the project.

Bridgestone assisted the client in numerous presentations to potential investors, providing technical, economic performance and development related input. After successful meetings and agreement to proceed with financing the development of the project, unfortunately, due to the financial crisis in late 2008, the project was put on hold indefinitely in October, 2008.

