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Seattle Steam Powers Downtown Buildings

By [Lisa Gibson](#) | January 10, 2011

Weaving their way through a maze of piping, knobs and gauges, tour participants at the Pacific West Biomass Conference & Trade Show saw firsthand how steam is produced and distributed to more than 200 downtown Seattle buildings.

The conference takes place Jan. 10 through 12 at the Sheraton Seattle Hotel and kicked off with a tour of three local biomass-related facilities, Seattle Steam being the first. The privately-owned district heating system has the capacity to supply 600,000 pounds of steam per hour to hospitals, hotels and other structures through an 18-mile pipeline to Seattle Central Business District and First Hill Neighborhoods. The plant uses a 60 percent waste wood feedstock, the rest comprised of natural gas and oil.



Pacific West Biomass Conference & Trade Show tour attendees saw a maze of pipes, valves and gauges during a tour of Seattle Steam which distributes steam to more than 200 downtown buildings.

Seattle Steam president Stan Gent first took his guests to a map showing the plant's distribution and explained that high pressure steam--about 150 pounds--is easier to move quickly than low-pressure steam--15 pounds. Therefore, the red lines on the map notating high-pressure steam extended farther into the city, while the green lines representing low-pressure steam had a broader base and wove around each other closer to the plant. The rates are the same for high- and low-pressure steam, Gent added.

He then took the participants to the large, round combustion chamber, warning them of the high temperature even on the outside of the chamber. A glimpse of the combustion process was allowed through a small window opened by a blue lever. Inside, sparks flew against a bright orange and yellow background and a wood particle was occasionally flung up against the glass, quickly disappearing back into the flame. "The combustion of the fuel is probably the easiest part of what we do," Gent said.

Next, he led his audience across the street to the plant's storage, handling, grinding and screening processes. The giant grey silo dwarfing all the buildings around it holds 250 tons of wood, roughly one day's worth of feedstock. Each truck load brings in about 20 to 25 tons, emptying it inside the cemented and unheated drop-off area adjacent to the silo. The facility also controls odor and dust, Gent added.

Attendees descended a grated stairway into a noisy area that smelled strongly of wood and was packed with enormous blue machinery to grind and screen the biomass until all chunks are three inches or smaller. From there, participants continued through a tunnel to see where the feedstock is blown under the street to the combustion chamber. The pressure, power and force of the equipment could be felt through vibrations throughout the room.

Seattle Steam also has a natural gas-fired plant just blocks away that Gent hopes will be an operating combined-heat-and-power plant by December of 2012. The company has a federal grant for \$19 million to help with the costs and hopes to produce 35 megawatts of electricity and 25 megawatts of heat at about 90 percent efficiency, Gent said. Seattle Steam will use the heat, but is in negotiations with a utility for the sale of the electricity. Thermal energy can be transferred in the form of steam or hot water, and Gent said all Seattle Steam's expansion plans are in hot water. "I don't know anyone building steam heating systems, and if they are, they're nuts," he said matter-of-factly.

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Tour participants also saw Qualco Energy's anaerobic digestion facility using primarily animal manure, as well as the Everett Utilities Complex, a 52-megawatt combined-heat-and-power plant operated by Kimberly Clark.

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