

Biomass is an important part of Avista's diverse energy portfolio. The recognition that the energy generated at Kettle Falls is renewable energy helps us continue to provide reliable, responsible energy while meeting mandates and being good stewards of our customers' energy dollars and the environment.

To learn more about Kettle Falls Generating Station, visit [www.avistautilities.com](http://www.avistautilities.com)



## Kettle Falls: Converting Wood to Watts



### FROM BIOMASS TO POWER

Turning wood waste from sawmills into renewable, dependable energy has been the job of Avista's Kettle Falls Generating Station since 1983. Located in Kettle Falls, Washington, the biomass plant is the first utility-owned electric generating station of its kind constructed in the United States for the sole purpose of producing electricity from wood waste.

The Kettle Falls Generating Station has received numerous environmental awards and was recognized as the Power Plant of the Year in 2000. The facility, combined with Avista's legacy hydro power projects, has contributed to the company being one of the lowest emitters of CO<sub>2</sub> among the nation's energy producers, making Avista among the greenest investor-owned utilities in the nation.

### QUICK FACTS

- ▶ The biomass plant generates a maximum of 53 megawatts (MW) of electricity. An additional 8 MW is generated from an on-site gas-fired combustion turbine. That's enough combined electricity to serve the homes of about 46,000 Avista customers.
- ▶ Cleaning equipment removes 99 percent of the particulates. That's the smoke you see such as from a campfire.
- ▶ The white plume that may be seen is created when the hot flue gas exits the stack and contacts the cold ambient air. The flue gas condenses into steam just as you can see your own breath on a cold day.
- ▶ About 1,600 tons of wood waste a day is used at the plant when it is in full operation.
- ▶ About a 90-day supply of fuel is kept in the main storage pile.
- ▶ Fuel is taken from a storage pile which has been compacted by a 75-ton bulldozer to minimize spontaneous combustion of the wood.



## KETTLE FALLS: HOW THE PROCESS WORKS

Wood waste moves from trailer to boiler in an efficient, smooth-flowing system.

**1** An average of 50 semi-truck loads of wood waste are unloaded each day the plant is in operation. Trucks are unloaded by tipping the 30-ton trailer to a 63 degree angle as the wood waste slides into a receiving bin.

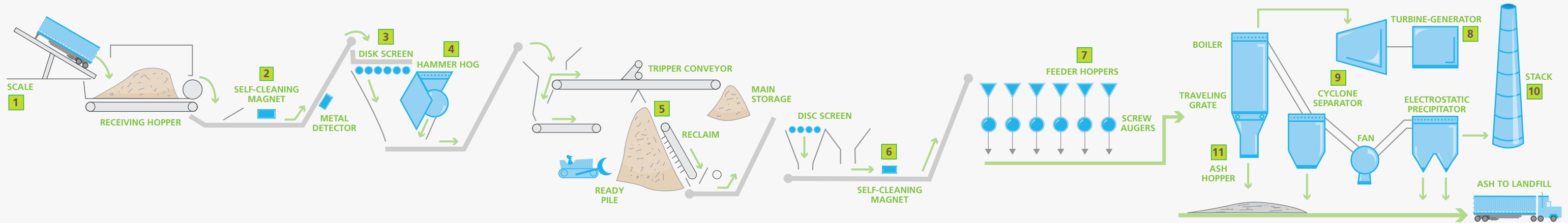
**3** The disc screen separates the wood waste according to size.

**5** A moving tripper conveyor system distributes the wood waste to the fuel-storage pile where a 73 ton bulldozer pushes the fuel into the storage area.

**7** A conveyor system carries the wood waste to six feeder hoppers mounted on the boiler.

**9** During the burning process, large particulates and char re-injected back into the combustion process are removed by the cyclone separator and smaller particulates are removed by the electrostatic precipitator.

**10** Clean flue gas is dispersed through a 180-foot high stack after the ash particles are removed.



**2** The wood waste passes under a self-cleaning magnet and metal detector to remove any iron on its way to the disc screen.

**4** Oversized material is rejected to a hammer hog where it is broken into small pieces.

**6** The wood waste passes through a second disc screen to remove any remaining large chunks of wood before it goes into the plant.

**8** The wood waste is burned in a seven-story furnace/boiler lined with pipes filled with a closed loop of water which creates steam. The steam drives a turbine which turns a generator, creating electricity.

**11** Ash that collects on the boiler grate and other equipment is removed by screw conveyors. The ash is then deposited at a solid-waste landfill operated by Avista.