

The bioenergy adventures just don't stop! Went to Sandviksverket to see a 104 MW circulating fluid bed biomass boiler on a CHP plant that can chew through up to 50 tonnes of fuel per hour. 50% moisture (which seems to be standard). Right now it's running at 20 MW, because of recent warm weather. Much warmer and they will have to take it offline and start up a smaller, older one.

Lotta, the VEAB (check out <http://www.veab.se/>) chemical engineer who showed me around told me that they can keep it a constant 50% because the flora and fauna that make their home in the 6m pile of fuel compensate for the rain by using water. Sounds pretty technical. Well how's this for complicated then? Biomass boiler NO

<sup>x</sup>  
emissions across Sweden have been dropping, because the Swedish government say that those that have below average NOx emissions can get tax credits, paid for by those who have above average NOx emissions. The result - everyone races to be below the median, and total emissions drift down. Very Swedish policy. Last year VEAB earned SEK 3 million from the NOx they DIDN'T emit! Wonder who paid? They do this by using a catalyst.

Lotta posed for me in front of not one but two generators! Of the 104 MW capacity, 38 can be used for electricity. So they can sell when they want. The tax system is so strange (green certification) that sometimes it is even economic to burn wood to generate electricity to heat the water for the district scheme! Strange but true.....

OK brain dump.....One week fuel store. Fuel sourced from 100 km radius. Contracts are contestable and for one year only (Lotta says this is so the local council, Växjö Kommun, can be seen to give the open market a go. I wonder about such short contracts.) Fuel is 40% bark, 10% sawdust from wood processing, 40% forest residue and 10% peat. Every load that comes in is independently certified. They pay on heat value. Particle size and stones are the two other main parameters apart from water.

Forest biomass is still increasing in Småland, despite big growth since the 1970s in use of forest and wood processing residue for energy. Question to self - perhaps EU farming policies have an effect here - loss of crop and pasture land to forest?

There are two storage tanks, one 2,000 m<sup>3</sup> and one 40,000 m<sup>3</sup>. I went to the top of the 45

metre high Sandvik 2 boiler and felt the love in all that biomass combustion. I gazed down on the awesome beauty of the fuel pad and conveyer as the loader raced back and forth. I walked past the empty control room, as the shifts changed. Typical Swedish automation - nothing to do except play cards, while water at 100 degrees races around 365 km of network. Incidentally, there is fibreoptic and electricity laid in the same trench, at the same time - all owned by VEAB, in turn owned by the people of Växjö through the council.

Check out the flue gas condenser. The return temperature (45-50 degrees) gets a 5-7 degree boost just from this.

Winter demand peaks at 200 MW. Växjö has 14,000 detached houses, 1/3 of these are connected, plus just about all the apartments. Fly and bottom ash goes back into the forest.

There is a demonstration bio-DME plant in the woods nearby but Lotta thinks FT diesel is the better way to go.