

What a perfect day and place for growing biomass! Jönköping pronounced “yurn-shurping” lies on the southern shore of the dark, mysterious Lake Vättern amidst the mixed birch, pine and spruce forests of Småland..

On the train from Gothenburg to here Gustav Melin introduced himself. Gustav is the president of the Swedish Bioenergy Association, [www.svebio.se](http://www.svebio.se) . Gustav kindly gave me a ride to my accommodation, saving me a hot 3 km walk. On the first official day of the Nordic summer, Jönköping is like a Mediterranean town, baking in 30 degrees! Before the afternoon’s study tour I took a quick jog along the promenade to check out the Nordic biodiversity. In case, dear reader, this sounds too much like fun, rest assured I am referring to birch, pine and spruce.

I am not the only New Zealand delegate here at Elmia Woods. There are three directors, including Graeme Black and John Cowan of Southland wood processor Craigpine (see <http://www.craigpine.co.nz> ). They spoke highly of EECA’s support for a combined Southland sawmills energy audit a few years back. 50,000 more visitors are expected for the trade show which starts on Wednesday.

First up was a visit to Nässjö Affärsverk AB or NAV. ( [www.nav.se](http://www.nav.se) ). It is one of the oldest CHP plants in Sweden, and has a long experience of using forest fuels. Last year a new 12 MW boiler ( <http://www.saxlund-international.de/index.php?id=78> ) with flue gas condenser was commissioned and it was this boiler only that was running, as the demand at present is not enough to keep the bigger boiler and generator running. Across the whole site approximate heat production is 150 GWh plus 35 GWh electricity. The heat is supplied to the approximately 16,000 residents of Nässjö.

NAV pay about SEK200 per MWh for chip (€20) and sell heat for €55/MWh. They get a €30 feed-in tariff for the electricity they produce. Feed-in tariffs are not paid for in Sweden by the general taxpayer but by the energy consumer, through a €2 tariff on consumption. Everyone pays this except Swedish heavy industry.

Next up was a visit to Askungen Vital AB ( [www.askungenvital.com](http://www.askungenvital.com) ). 'Askungen' is Swedish for Cinderella, which makes sense when you know what their business is. Askungen specialises in wood fuel ash recycling – creating beauty amongst the ashes. A sort of Cinderella 'rags to riches' story for founder Bo Pedersen and his family. The company has developed its own machinery for spreading ash and today demonstrated a Rottne (remember them from day one????) powered unit. I have good pictures of the ash spreader in operation.

Today Askungen co-operates closely with forestry expert Gunnar Thelin of EkoBalans ( [www.ekobalans.se](http://www.ekobalans.se) ). Gunnar's aim is to develop methods for fertilisation of forests with ashes and nutrients. Gunnar's thesis is that all biomass harvesting results in removal of nutrients, so these must be returned. Ash recycling is the ideal way to make the system sustainable by compensating for nutrient removal. It is ideal for environments with high nitrogen deposition as ash contains no nitrogen, only Ca, Mg, K, and Ph plus traces of metals. The Swedish Forestry Board recommends maximum levels of these traces, and also permits the process of spreading, based on careful evaluation and measurement. Obviously these trace metals (plus boron) came from the biomass through uptake in the first place, but must not be allowed to bioaccumulate in increasing concentrations. The Swedish Forestry Board has a computer model for this evaluation.

Anyway, the fresh ash has a pH of 13+, so is 'hardened' with water to reduce the pH to around 10. Then it is crushed and sieved to make it spreadable, then analysed to ensure it is in specification. If not I guess they landfill it?? Then it is placed in bins near the site where it is to

be spread so the spreader can easily access it.

Here in Småland they are not recovering thinning residues, only harvesting residues. I spoke with Robert Prinz, a forestry engineering researcher for the Finnish Forest Research Institute, [www.metla.fi](http://www.metla.fi), and he said it was the same there in Finland. As Sweden and Finland must have one of the easiest stand management regimes in the world, perhaps if its not economic here, it can't be done anywhere. Perhaps a Kiwi might be able to, though.....

Incidentally, Robert told me about an ingenious piece of kit that sounds interesting for New Zealand cutover residue recovery. It's a forwarder with load compression capabilities and it's manufactured by Ponsse <http://www.ponsse.com/>

Then we headed to Stockarydsterminalen AB, [www.stockarydsterminalen.se](http://www.stockarydsterminalen.se), a newly opened mega-terminal for wood fuels and other forest processes. Cyclone Gudrun, on New Year's Eve 2004, felled in one night in southern Sweden the entire annual harvesting volume of Sweden. About 75,000,000 m<sup>3</sup>. So what to do? Govt and industry worked out logistically how to rail all the windfall logs to plants in central and northern Sweden for milling. Through this exercise they discovered that logistically it was quite cheap to rail logs and that this was far better than road. You can send a log here 600 km by rail for the same price that you can send a log 200 km by road. And a lot less cost to taxpayers for road maintenance. Incidentally you can send the same log 10,000 km by sea for the same price. At these distances the energy cost is still in the order of 1% of the biomass energy content.

Anyway having worked all this out, the local council, Sävsjö Kommun, in association with Stora Enso, [www.storaenso.com](http://www.storaenso.com) Sweden's second biggest wood processor, decided to invest SEK 73 million in a new 120,000 m<sup>2</sup> terminal. I saw one of their 'Green Cargo' line locomotives move 1,500 m<sup>3</sup> of pulp logs. The price is SEK5,000 per truck which holds 65 m<sup>3</sup> wood. Works out to about NZ\$18 per cubic metre. The chip trains shift 2,500 m<sup>3</sup> and can economically transport chips 400 k to Stockholm bioenergy plants. of

At the after-match function met folks from Inventia, [www.stfi-packforsk.se](http://www.stfi-packforsk.se), Elmia, [www.elmia.se](http://www.elmia.se), the Australian Bioenergy Association, the Danish Forest Association and Chrystelle Verhoest, a combustion optimisation specialist with Laborelec, the Belgian energy consultants (visit <http://www.laborelec.com/>

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Well it's 2245h and almost dark. I'm a little sunburnt from my time out in the forest today. Tomorrow is really my first inside day of the trip with a day of forest residue recovery presentations from leading Nordic experts. So the sunburn has a day to recover before I'm back into the forest on Wednesday.....as then next few days are really full days, don't expect a blog post for a while.