

Learning from Finland

Report by Andrew Lang, Bioenergy Conference August 2015

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For the first days of September I will be in Finland to attend and present at a Bioenergy conference (www.bioenergyevents.fi). Finland is in a very interesting period of its development of renewable energy and also in development of a whole new way of dealing with putrescibles and combustible organic waste (from 2016 material able to be recycled or used for energy will no longer be able to be put in landfill). It is worth noting that Finland is very similar to Victoria in productive land area (about 22 million ha), and in population (about 5.5 million). It does differ in that growth rates of its main commercial tree species are less than half that of Victorian forestry species.

It also differs in its use of bioenergy and more recently development of waste to energy technologies, and in both these areas it is among world leaders. So it is presently getting over 20% of its electricity needs from biomass – with much of this being from black liquor from its large pulp and paper processing industry, and aims to have renewable sources providing 38% of utilised energy by 2020, with the majority being from biomass. Finland aims to cease imports of fossil fuels of all types by 2040, with advanced transport biofuels already being produced from biomass, domestic and industrial heat mainly from biomass, and biomass and biowastes being the source of at least 20% of electricity and up to 75% of heating.

Bioenergy has been derided in Australia by various lobby groups as ‘not a genuine renewable’, and as likely to contribute to some major pick-up in native forest logging. These viewpoints are based on ignorance and are quite counter-productive to achieving a better outcome in reducing the state or regional greenhouse gas emissions, and anyone who has studied how bioenergy and waste-to-energy works within a properly regulated and organised system knows this. The truth is that economic factors work against use of forestry residues as a biomass fuel in the Victorian and Australian context, and properly designed regulations at state level should ensure that any unsustainable use of forest biomass is prevented or severely penalised.

The fact is that bioenergy is our largest source of renewable energy as it is worldwide (to suggest otherwise shows evidence of pure blind ignorance) and properly regulated and genuinely sustainable use of all forms of biomass and bio-wastes can significantly displace fossil sources of energy, principally for production of heat energy, secondarily for production of transport fuels, and thirdly for production of electricity, and this is what I will be seeing in this coming week.

I will be taking the pre-conference tour as detailed below

1st site - Vantaa Energy waste-to-Energy Plant (commissioned March 2014)

This brand new 300 million Euro waste-to-energy plant takes in 320,000 tonnes of mixed MSW from the Uusimaa province, and from its two furnaces produces 920 gigawatt-hours (GWh) of district heat (so annual production of about 105 MW-th) and 600 GWh of electricity per year (production of 68.5 MW-e). These amounts correspond to about half of Vantaa's district heat requirement and about 30 per cent of the city's electricity need each year (Vantaa is Finland's fourth biggest city with 212,500 residents). The WTE plant output will cut Vantaa's fossil fuel use by over 30% and its GHG emissions by over 20%. See <https://en.wikipedia.org/wiki/Vantaa>, https://en.wikipedia.org/wiki/Vantaa_incinerator.

2nd site - Nurmijärven Lämpö Ltd. and Renewa Ltd

Klaukkala district heating plant was completed on September 1998. The first boiler is 4 MW grate boiler fueled with peat, wood industry by-products and forest chips. Flue gases are cleaned by multicyclone and fluegas condenser. The condenser has also combustion air moisturizer to improve the condenser performance. The condenser recovery capacity is 0,5 MW. The heating plant has also 300 kW biogas boiler, where the biogas is obtained from nearby sewage treatment plant.

During expansion in December 2014 a 10 MW bubbling fluidized bed boiler was started. Fluegas cleaning is by electrostatic precipitator. The efficiency is improved by fluegas condenser. 89 % of Klaukkala district heat is produced by local fuels (i.e., biomass), the remaining 2 % is low sulphur oil used in peak boiler.

Renewa offers advanced combustion solutions for local energy production using biomass in heat and power plants. The company's solutions combine innovative technology and solid project experience with maintenance and lifecycle servicing. Renewa supply biomass fired heat and power plants based on bubbling fluidized bed (BFB) boiler and grate boiler technologies as well as auxiliary plants and peak power plants using fossil fuels.

3rd site - Fixteri Ltd.

Fixteri Oy is a company specialized in the harvesting technologies and the development of a comprehensive logistics chain of small-dimensioned wood. For years, Fixteri have developed innovative felling technologies, which also offer many benefits to forest owners. With Fixteri's help you can increase the attractiveness, eco efficiency, and value of your forest, and enjoy the direct profit provided by your forest. As the first company in the world, they have developed a logistics chain solution for harvesting small-dimensioned wood, and the necessary technologies, which simultaneously benefit the forest and energy industries, harvesting entrepreneurs, forest owners, and nature alike. Cost efficient and flexible harvesting and logistics chain are enabled by the Fixteri baler, which is the result of years of product development and testing work, guided by long practical experience.

4th site - LHM Chipper Ltd.

The start of this chipping business goes back to the early 70's. The chipping activities were consolidated in 1987 in a new company, named "Kotimaiset Energiat Oy". By daily chipping experience it was very natural to the founder, Pekka Lahti to create new chipper models and to improve them. In 1999 he created the first Giant and LHM Hakkuri Oy started to manufacture the new Giant chippers.

Giant chipper highlights

- Powerful throwers (patented technology)
- Remote surveillance
- Remote programmable & controllable CAN technology
- Fast spare-parts delivery
- Low Life Cycle Cost (LCC)
- High Capacity - up to 300 loose-m³/hour of woodfuel chips.

The conference is held in Jyväskylä, the administrative capital of the province of Central Finland. This province is significant in that it gets over 50% of its energy needs from biomass and is aiming to reach 75% of utilized energy from biomass. The city is about the size of Ballarat or Launceston and is surrounded by forests and lakes. The maintenance of a pristine environment is of paramount importance for all Finns, and yet, in contrast to the attitudes of Australia's anti-native-forestry-management lobby groups, most of the biomass is coming from management of privately-owned native forests, either directly as thinnings and harvest residues, or as by-product or residues from timber processing.

Following the two-day conference, which covers the full spectrum of bioenergy technologies, wastes-to-energy management and processing, national and international policy, applied R&D developments, climate change issues, and biorefinery opportunities, I will do another day of visits to energy plants and processing sites in the region.

I will do my best to cover this conference and produce a comprehensive report. It is regrettable that a person from a Victorian government department who had had a paper accepted on Victoria's new development of waste management policies is unable to get leave to attend. It did seem that this would have been a golden opportunity for someone from the Victorian government with a strong interest in this area, to see the technologies in person, to hear from leaders in the field from across the EU, East Asia and North America, and to make valuable contacts.

The Victorian government has just released its new Renewable Energy policy. While on a first reading it is quite narrow and deficient one only hopes that it can help the state begin to move toward what the Finns are achieving, and that our overall objectives here can compare. One clear priority of the Finnish government within its energy policy is to stimulate regional economies and to boost the rural enterprises that form the base of the bioenergy and forestry sectors. It would be most desirable for policy makers from Victoria and other states to visit Finland and the other EU countries (such as Sweden, Austria, Portugal and Italy) that can demonstrate how this general approach has resulted in lowering rural unemployment rates, in improving environmental outcomes, and in bringing about a wider array of social benefits.