Biomass reservoir on the Baltic

Despite vast quantities of timber, Estonians, Latvians and Lithuanians are facing a lot of problems in creating a sustainable energy supply from their own resources because much of the wood fuel is exported to northern and western Europe.

The Baltic states are covered in forests and have a huge reservoir of solid biomass that should be more than sufficient considering the countries’ low populations. More than half of Estonia and Latvia is covered in forests, while in Lithuania they take up a third. Moreover, the three countries have entered into major international commitments, such as the United Nations Framework Convention on Climate Change and the renewable energy targets set by the EU. However, their governments mainly rely on conventional technologies instead of wood to generate electricity. In partnership with its Baltic neighbours, Latvia wants to build a nuclear power station, while just recently the cornerstone was laid for a new oil shale power station in Estonia. A considerable proportion of the Baltic’s biomass resources — timber and straw — is disappearing abroad. Only Lithuania is less export driven and uses its wood chips itself, whereas wood pellets are exported from all three states. After Germany, Latvia and Estonia are even the biggest pellet exporters in the EU, while biogas and biofuels are of no significance. In Latvia existing feed-in tariffs will be dropped by 2016.

Biomass company United Loggers Ltd. has found the right business model for exports. The company produces forest chips and also transports them to customers abroad. United Loggers does this using drum chippers and container trucks. Via partner firms, the company also has access to cargo ships with a storage capacity of up to 6,400 m³. “We ship around 200,000 t of wood chips per year”, says Peeter Volke, Chairman of United Loggers. He adds that in the previous year 40 % of this figure came from Estonia and Latvia respectively. Some 20 % of the raw timber for wood-chip retail came from south-west France, where wood from the 2009 storm (called Klaus) is still being processed. In addition, United Loggers also trades in roundwood to produce energy, as well as in wood from trunks. “Some 50 % of the goods are shipped to Denmark where a subsidiary called Green-Energy Ltd. is located”, says Volke. He adds that other target countries via the Baltic Sea route would be Sweden, Finland and Poland. He estimates woodchip consumption in Estonia to amount to approximately 750,000 t and that United Loggers accounted for 15 % of this figure.

Many resources untapped in Lithuania

According to biomass association Lithbioma, Lithuania has wood residues from forests of roughly 1 million m³/year. The potential for crop straw amounts to 2.4 million t/year. Some 0.5 million t/year could be commercially deployed to generate energy. Lithuanian pelleting systems manufacturer JSC Radviliskis has developed a complete production line, including straw-bale shredder and pelleting press, to use straw to produce energy. Short rotation coppice plantations could be cultivated on 400,000 ha of unused land that is not very fertile. Each year, 1.3 million t of municipal waste is primarily deposited on landfills instead of being used to generate energy.

The reason is that efforts to depart from conventional energy sources are not consistent enough. The Ignalina nuclear power station was shut down to meet obligations in the EU accession agreement in late 2009. However, by 2015 the new Visaginas power station is slated to go into operation in partnership with Latvia and Estonia. As the power supply system in all three countries dates back to the Soviet era, the electricity system has up till now been connected to the Russian and Belarusian, but not to the central European grid. Shortfalls in power generation therefore create unwelcome dependencies.

Therefore the prime goal of Lithuania’s energy strategy is to achieve energy independence before 2020. The strategy aims to significantly increase biomass from heating and cogeneration plants. The goal is to replace natural gas as a result. Extra money from...
EU funds will be available for the transition to a heating system using biomass. A feed-in tariff encourages the generation of electricity from renewable energy. The tariff for biomass and biogas plants below 30 kW amounted to the equivalent of 9 €-ct/kWh in 2011. For plants in excess of 30 kW, feed-in tariffs and incentives are auctioned for a limited amount of electricity. The grid operator awards a flexible bonus which results from the difference between the fixed remuneration identified in the auction and the sales price. The feed-in tariffs will then apply for 12 years.

According to the Lithuanian Energy Institute, Lithuania has ten pellet and about 15 briquette producers. About 95% of the pellets (133,000 t in 2010) are exported to Scandinavia, Germany or Italy. Due to its high price, pellet demand in Lithuania is low. By its own account, AS Graanul Invest is among Europe’s top five as it has a capacity of 500,000 t in six factories spread across the Baltic region.

### Strong natural gas lobby in Latvia

In Latvia, pellet-production capacity is 744,000 t. A major manufacturer of industry pellets is LatGran Ltd., which has three Latvian sites and a total capacity of 400,000 t. According to figures issued by the Central Statistical Bureau of Latvia, 684,000 t of pellets were exported from Latvia the previous year. In addition, 1.44 million m³ of wood chips, as well as 722,000 m³ of roundwood or logs were sold abroad.

From 2008 to 2011, total exports of firewood (roundwood and logs, wood chips and unprocessed scrap wood) rose by almost 50% (from 1.6 million m³ to 2.36 million m³). “Because of the price differences between the domestic market and foreign customers, it’s more economical for the industry’s companies to export biomass resources”, explains Liga Ozolina from the engineering consulting company Ekodoma. But Ozolina comments that the debate about a higher share of biomass in Latvia’s energy production has already been one of the most hotly contested issues for some time. The new draft of the “energy strategy 2030” does envisage extending biomass utilization. However, the industry is pitched against a strong natural gas lobby in Latvia.

### Oil shale obstructs Estonia’s shift to wood fuel

Estonia can export its biomass and is still self-sufficient in terms of energy supply. In Narva, in the extreme north east of the country, the two largest oil shale power plants worldwide are operated and cover more than 90% of Estonian electricity demand. Almost 18 million t of oil shale lumps are extracted in the Estonian mines each year. All current and former mines together cover an area of more than 400 km². Oil shale fuel is linked to high carbon dioxide emissions. However, in Estonia self-sufficiency is higher on the agenda than environmental protection. And its oil shale expertise could be worth a fortune to the Estonians should oil be in short supply.

In order to protect its oil shale energy production, the energy market in Estonia has not opened up to the extent it has where its Baltic neighbours are concerned. To date all relevant electricity production, grid operation and electricity supply companies have belonged to the Eesti Energia parent company, the former state monopolist. Complete opening up of the market in the energy sector is only scheduled to get underway in 2013. Eesti Energia operates the two power plants in Narva and has now started building the new oil shale power plant Auvere near Narva. In late 2015, the first of two possible 300 MW blocks is to go into operation. According to the energy utility, up to half of the oil shale is expected to be replaced by biomass. With these alternative options, Eesti Energia intends to remain competitive even when prices for CO₂ certificates are high. The new power plants will operate with circulating fluidised bed combustion technology, developed by the French power plant manufacturing company Alstom. Compared to the older technology, it is said that this procedure is more efficient and environmentally friendly when incinerating oil shale in pulverized form.

Eliis Vennik, Press Officer at Eesti Energia, points out that the power plant block that went into operation in Narva back in 2005 can co-fire more than 50% of biomass. She adds that currently the company intends to set up a biomass heating power plant in the Latvian border town of Valka. Moreover, she adds that in Paide Eesti Energia acquired a majority stake to build a further biomass-fired CHP unit using district heating. But Peeter Volke of United Loggers immediately knows how to put things into the right perspective. He says that with 10 MW firing capacity, the power plants in Valka and Paide were on the small side. He goes on to say that at the same time the Estonian online service E24 reported that biomass use in the Narva power plant’s 200 MW block would be reduced for cost reasons.