Krista Grönlund, Wood chips in Finland

WOOD CHIPS IN FINLAND

Krista Grönlund, 267301

Edited: Anastasia Livitchuk, 300207

Description

Bioenergy is energy derived from biomass, which includes all plants and plant-based material, such as logging residues and wood, wood residue and wood-based waste liquors from the forest industry, community bio waste and cultivated plants. They can be used in energy production as such or processed into pellets, briquettes, or liquid or gaseous fuels, for example. (Finnish Forest Association 2016)

Forest chips are a remarkable source of energy in Finland. Stems, stumps, crowns and branches are usually chipped before use and are then called forest chips. They can not be used by industry to produce timber goods or pulp and paper, but they can be used to generate energy (Finnish Forest Association 2016, Ministry of Agriculture and Forestry of Finland). End use facilities and terminals have their own wood chippers or crushers, which handle the chipping process, but however, the most common method is to chip the wood at roadside landings (Figure 1) and transport the forest chips to a power plant by wood chip truck (LUKE 2017).

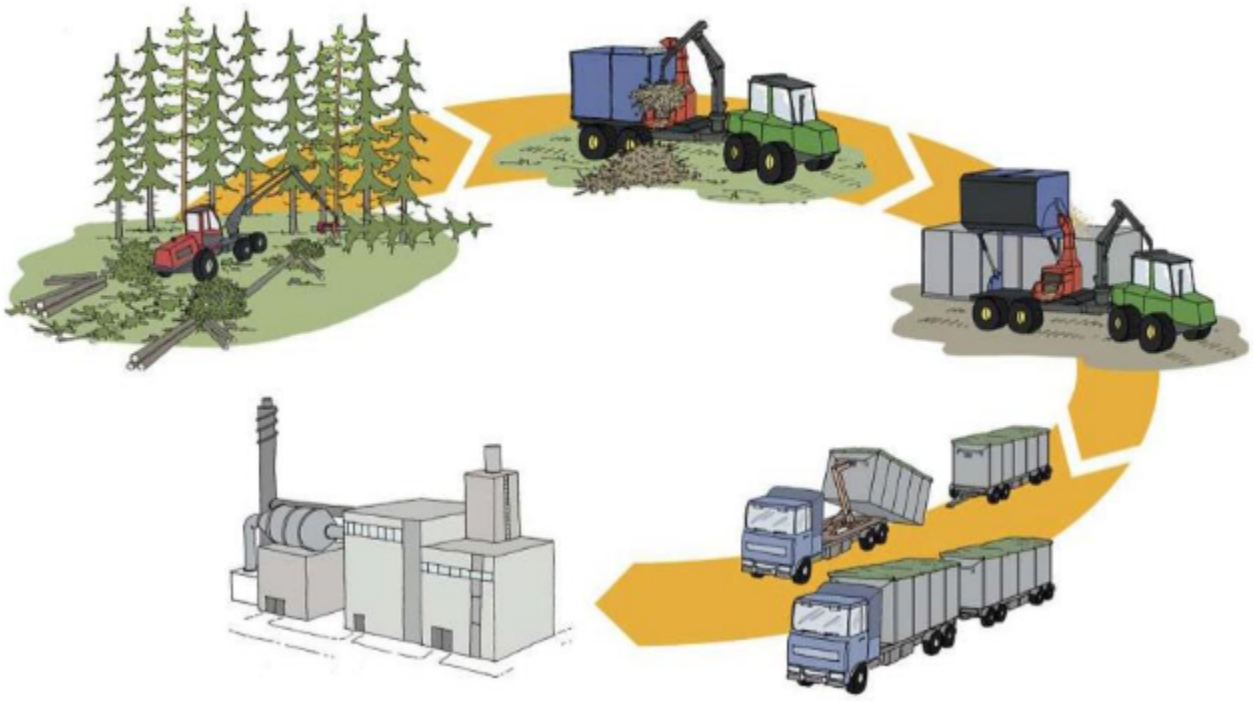

Figure 1 Wood chipping process (LUT 2013)

Market

The quality of chips is affected by many properties. Net caloric value, energy density, foliage content, ash content and particle size matter for the use. However, the most important single quality factor is the moisture content of chips, because it is a direct cost factor and it is taken into account in the pricing of the fuel. If the moisture content is high, it will decrease the price because drying and combusting take more energy than if the chips are already dryer. Moisture content also affects to the heating value, storage properties and transport costs of the fuel (VTT).

The use of forest chips has almost eight-folded since 2000 and in recent years the amount has remained practically unchanged (Figure ***2***). In 2017, 7,8 million cubic meters of forest chips were used to generate heat and power, and most of this volume (7,2 million m^3) was used in heating and power plants (Ministry of Agriculture and Forestry of Finland). In EU-area Finland and Sweden are the biggest users of forest chips, but the raw material base is different between them (LUKE 2015).

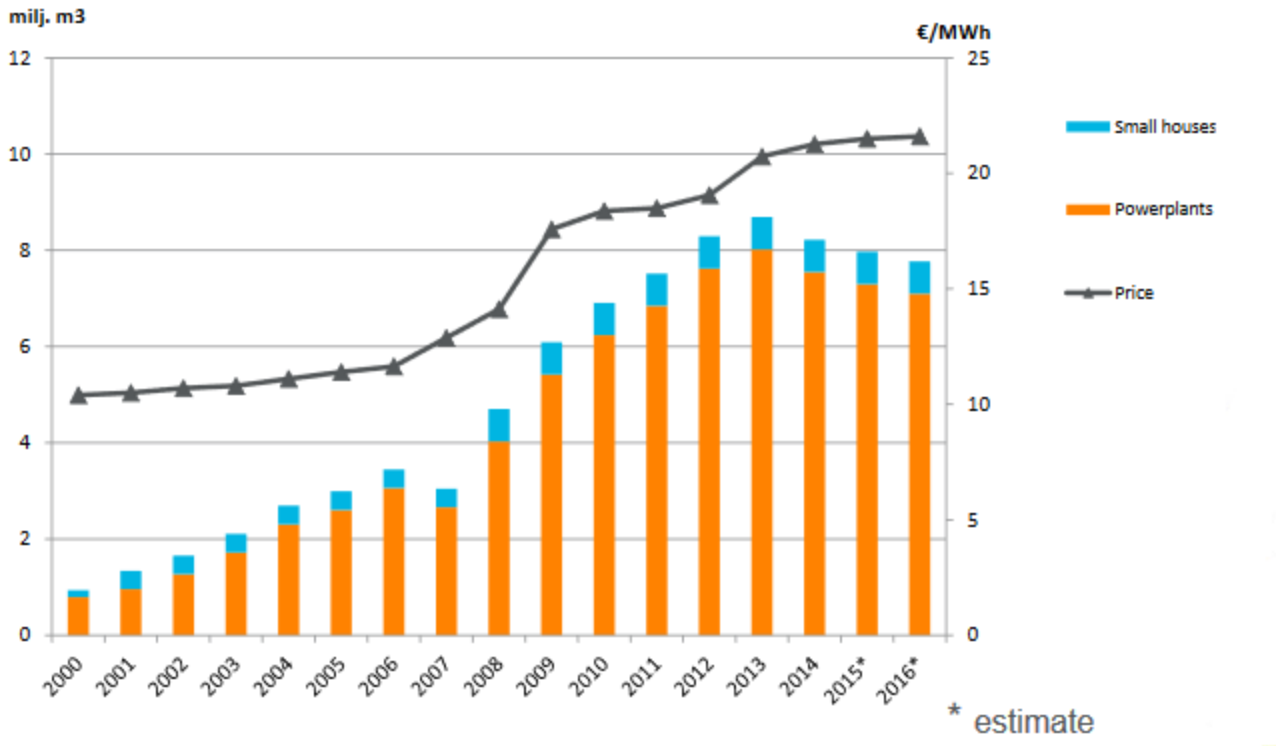

Figure 2 Use of forest chips in Finland (LUKE 2015)

Wood fuels represented the most important energy source in Finland, covering 27% of the total energy consumption (LUKE 2018). More wood fuels were consumed in Finland in 2017 than ever before and the consumption of wood fuels 2017 is represented below (Figure 3).

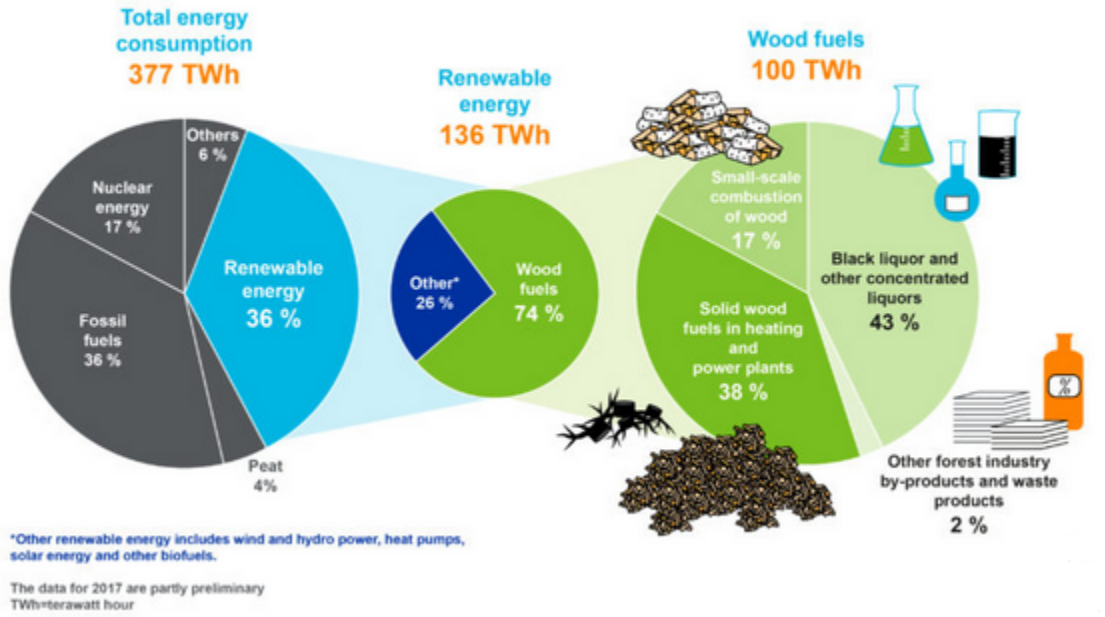

Figure 3 Consumption of wood fuels 2017 (LUKE 2018)

The price competitiveness of forest chips will be the determining issue of utilization level. Energy prices in Finland are shown in Figure ***2*** and Figure 4. The price of coal is the cheapest but nowadays it is quite similar than the price of milled peat. The price of forest chips has been very

stable last years and it is more expensive than coal and milled peat but cheaper than natural gas.

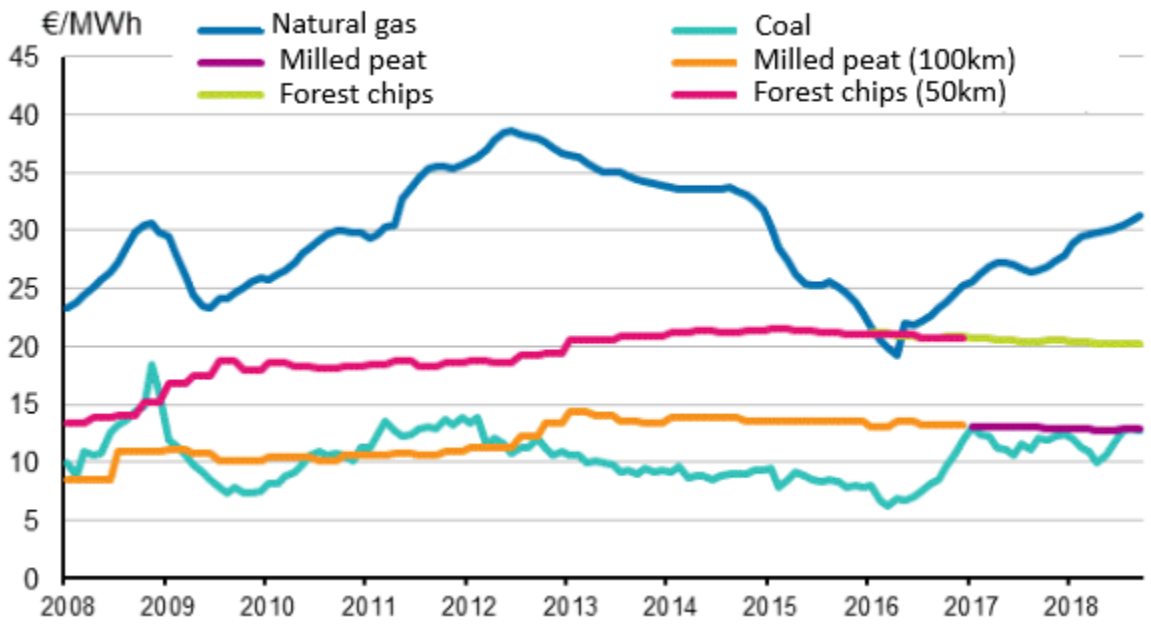

Figure 4 Prices of producing electricity in power plant fuels (Statistics Finland 2018)

Policy

Both the European Union and Finland want to increase the share of renewables in energy production. The goal of the European Union is that by 2020 one fifth of the energy used in the member states would come from renewable resources. The target set for Finland is 38 percent (Finnish Forest Association 2016).

Financing, subsidies and taxation have a big role in bioenergy market and policy. The competitiveness of renewable energy sources needs investments for technology research and development. The Finnish Funding Agency for Technology and Innovation (Tekes) is the main public financer of technology R&D (LUT 2009). Taxation is one of the main instruments to influence climate change and the environmental policy. In Finland, energy taxation is high. Fossil fuels have a tax which is based on the carbon content of the fuel and the level of energy taxation is much higher than the minimum level in the European Union countries. In Finland, renewable energy production has been subsidized mainly with production subsidies for forest chips and wind power as well as heat production in plants. (Finnish Energy)

Evaluation

Wood chips are a very basic source of energy and they have quite good energy values. When forest companies are harvesting timber, the logging residues do not have any value, if they are left in the forest decomposing. Logging residues can be chipped into forest chips, which can be used to produce energy in houses or power plants.

Wood chips are easy to transport from the forest to the power plants. The difficulty is the moisture content, because it decreases the value of the material. Also, in winter high moisture content causes freezing of the wood chips. Then it is hard to get all of them out of the trucks.

In my opinion, taxation of renewable fuels should be reasonable and much smaller than in fossil fuels. Also, subsidizing new processes and technologies is very important in developing the use of renewable resources. Same goals and for example taxation should be used in other countries also, so the biggest goal of finishing the use of fossil fuels could be easier to achieve.

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