The forest industry and energy

Energy

Finnish Forest Industries
Energy is a core question

ENERGY is, alongside wood raw material, one of the most important production factors for the forest industry. Energy and wood are the fundamental prerequisites for a developing forest industry, and taking care of their steady availability encourages manufacturing companies to invest in Finland.

NEW ELECTRICITY production capacity is needed to decrease our dependence on imports, replace outgoing capacity and respond to growing consumption. The forest industry can invest in Finland if environment-friendly electricity is available at a competitive cost.

BUILDING MORE NUCLEAR POWER IS IN THE BEST OVERALL INTEREST OF SOCIETY
Long-term energy policy is of decisive importance to the future of the forest industry in Finland. The export revenue the industry earns is needed to retain our present standard of living and the funding of basic services. The forest industry plays a strategic role in Finland’s effort to attain national climate and energy objectives – 70% of all renewable energy is produced in conjunction with the industry’s production.

A THRIVING FOREST INDUSTRY requires competitively priced electricity and the industry’s electricity needs are growing. For example, electricity is the second most substantial cost component in the production of biodiesel after wood raw material.

NATIONAL ENERGY AND CLIMATE OBJECTIVES are a major challenge for Finland and the forest industry offers solutions that can help achieve them. The forest industry has invested and will continue to invest in diverse carbon-dioxide-free electricity production that is suitable for the industry’s needs. Wood will in future become an increasingly diverse source of value added.

SOCIETY develops and energy requirements evolve. Electricity generation must therefore be modernised and increased. Certainty of the price and steady availability of electricity increases the competitiveness of the Finnish industry and encourages investments in Finland.
The forest industry manufactures paper goods for 100 million and wood products for 50 million consumers. These products are shipped around the world, primarily to EU countries.

The processing of wood requires energy

The forest industry accounts for over a quarter of overall electricity consumption in Finland. Before wood becomes paper, it must be processed into fibre. Mechanical fibre pulp is made by grinding or honing, while chemical pulp is made by cooking wood into cellulose.

The manufacture of mechanical pulp consumes a lot of electricity, but the same amount of wood can be used to make twice the amount of products that could be made out of cellulose. Pulp manufacture in turn creates large amounts of bioenergy as a by-product. Both processes are needed to make paper grades with different kinds of properties.

Wood products have a small ecological footprint

The manufacture of wood products consumes the least energy of all forest industry products.

Wood product manufacture likewise consumes a remarkably small amount of natural resources. Building with wood eventually yields more energy than was consumed in its manufacture.

Around 90 terawatt-hours of electricity are consumed annually in Finland. More than half of this is used by the industrial sector. Housing, services and agriculture account for the greater part of electricity consumption in many other countries. The industrial sector accounts for such a substantial share of overall consumption because Finland is home to a large amount of energy-intensive export industries.
The forest industry needs energy

**ENERGY 24/7**

Paper and pulp mills require a steady supply of electricity all year round because they operate around the clock, seven days a week. Many production facilities have their own power plants, which supply about 40% of overall electricity consumption – and the majority of this is bioenergy.

Forest industry corporations also acquire electricity from external power plants and from the electricity market. In addition to biomass, important low-emission energy sources to the forest industry are nuclear power and hydropower, because they ensure the steady availability of electricity at all times, also on the coldest days of the year.

**ENERGY-EFFICIENCY CUTS COSTS AND REDUCES EMISSIONS**

The improvement of energy-efficiency is a routine everyday activity at production facilities. This effort has been successful, as energy consumption has grown at a slower pace than production. The forest industry has invested over one billion euros in energy-efficiency and bioenergy in the 2000s. Carbon dioxide emissions have been cut by over 40% per tonne of manufactured goods in the wake of these investments.
The forest industry produces energy

THE FOREST INDUSTRY IS THE BIGGEST PRODUCER OF BIOENERGY IN FINLAND
About 75% of the heat and electricity that factory power plants produce are generated from wood-based biofuels. This is why forest industry factories have fairly low carbon dioxide emissions even though their production volumes are so high. Bioenergy is generated from the by-products of manufacturing, such as wood bark and biosludge, which is created during pulp making.

HEATING UP FACTORY NEIGHBOURHOODS
If power plants produce both electricity and heat, emissions are cut and natural resources are conserved. Combined production of heat and power (CHP) is very efficient and the method is considered an ecologically effective way to produce energy.

CHP facilities are common in the forest industry and they often produce district heat that benefits surrounding society. In Rauma, for example, a power plant co-owned by a paper mill and the municipality uses mostly biofuels to produce process steam and electricity for the mill as well as electricity and heat for Rauma. The municipality and the mill also purify wastewater in cooperation. The mill’s biological purification plant processes the wastewater produced by the 35,000 residents of Rauma.

WOOD IS UTILISED CAREFULLY

Commercial forests provide a renewable natural material

Taking advantage of the diverse properties of wood, creating products for a variety of needs

Recycling and energy use give biomass a long life
The forest industry produces energy

WHAT IS ENERGY WOOD?
Harvesting residue such as branches and treetops, trees thinned from young forests as well as tree stumps are collected as energy wood, which is sometimes also referred to as forest chips. Finland is a pioneer in the development of the harvesting of energy wood.

It is possible to produce environment-friendly bioenergy and bio-products in Finland and elsewhere in the EU by improving the availability of wood and harvesting more harvesting residues.

Biorefineries that integrate with pulp and paper mills enable the effective utilisation of renewable domestic wood-based biomass, strengthening the forest industry’s operating prerequisites in Finland.

OPPORTUNITIES WITH BIO-REFINERIES
New innovative products are emerging alongside the forest industry’s traditional range, which comprises wood products as well as pulp, paper and paperboard and the products processed from them. The forest industry is focusing strong efforts in the development of bio-refineries, for example.

Biorefineries separate chemical compounds from wood and process them into new products such as biodiesel, bioethanol, biological heating oil and various green chemicals.
The forest industry
THE ROLE OF FORESTS
Reducing the amount of atmospheric carbon and slowing down climate change are central challenges of the future. Our planet’s forests have a unique ability to bind and store atmospheric carbon dioxide.

Climate change can be slowed by focusing on the utilisation of wood and by shifting the focal point of consumption towards products that are made from renewable raw materials. Favoured wood in building can reduce the negative environmental impacts of construction. Paperboard is an ecological alternative for the packaging of food, for example.

WOOD IS A SUPERIOR RAW MATERIAL
The use of wood and products that are made from it does not result in an increase in the amount of atmospheric carbon dioxide. Products, which are made by processing wood, store carbon for the entire duration of their lifecycle. Paper and wood products can both be recycled many times and then burned to create energy at the end of their lifecycle. In this way, these products eventually serve as sources of bioenergy. In addition to wood-based products, managed and growing forests also serve as effective carbon sinks.

Fossil fuels are the most significant source of atmospheric carbon dioxide emissions. The forest industry is Finland’s most significant producer of renewable energy.

DEVELOPMENT OF FOREST INDUSTRY PRODUCTION IS THE BEST WAY TO PROMOTE RENEWABLE ENERGY
The forest industry produces a lot of energy and very little carbon dioxide emissions.

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<tr>
<th>Renewable wood raw material</th>
<th>CO₂-free electricity</th>
<th>Share of Finland’s renewable energy</th>
<th>Share of Finland’s CO₂ emissions</th>
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<td>100%</td>
<td>80%</td>
<td>70%</td>
<td>7%</td>
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A forerunner in the bioeconomy

Wood is a superior natural material. Renewable, recyclable and biodegradable.

Products that are made out of wood store carbon for the entire duration of their lifecycle.

Processing wood produces more added value and employment than just burning it to generate energy.

The growth of Finnish forests exceeds their utilisation. There are plenty of forests for recreational use, forestry and conservation.

The forest industry is a leading producer of and investor in renewable energy.

Over 90% of the production of Finland’s pulp and paper industry is exported overseas.

Every tenth Finn earns his or her living from the forest industry or the industries that serve it.
The forest industry is by far the biggest producer of renewable energy in Finland

Almost 70% of Finland’s renewable energy is generated in conjunction with the production operations of the forest industry. About 40% of the wood that arrives at mills winds up being used to generate bioenergy after various processing stages.

THE EU SET A TARGET FOR FINLAND to increase the share of renewables in all energy consumption to 38% by 2020. Attainment of this target requires development of all low-emission and renewable energy forms.

THE PRODUCTS OF THE FOREST INDUSTRY are an important part of developing society. Renewable and recyclable products make it possible to reduce consumption of non-renewable raw materials and fossil fuels. Finland has the natural resources the forest industry requires – forests and water – as well as plenty of world-class expertise in the forest industry. This makes it globally sustainable to produce paper and wood products in Finland.

READ MORE ABOUT THE FOREST INDUSTRY AND ENERGY AT www.forestindustries.fi