



[Azeus Machinery Co.ltd](http://www.azemus.com)

Email: [info@biopelletmachine.com](mailto:info@biopelletmachine.com)

Website: [www.biopelletmachine.com](http://www.biopelletmachine.com)

Add: SOKEYUFA Building, NO.26 Jingliu Road,Zhengzhou,CHINA



## The Feasibility of Making Sawmill Residues into Fuel Pellets

keywords

*sawmill residues recycling,how to utilize sawmill residues,wood wastes products,make sawmill residues into fuel pellets,sawmill residues pelletizing machines,fuel pellets press machine,wood pellet plant,sawdust pellet mill*

Abstract

*Huge market demand of fuel pellets and availability of wood pellet making machines provide a wide range opportunities for utilizing these sawmill residues to make fuel pellets. Along with the huge market demand of fuel pellets, the development of bio-energy market and the availability of pelletizing equipment and technology, there is a wide range opportunities for utilizing these sawmill residues to make fuel pellets.*

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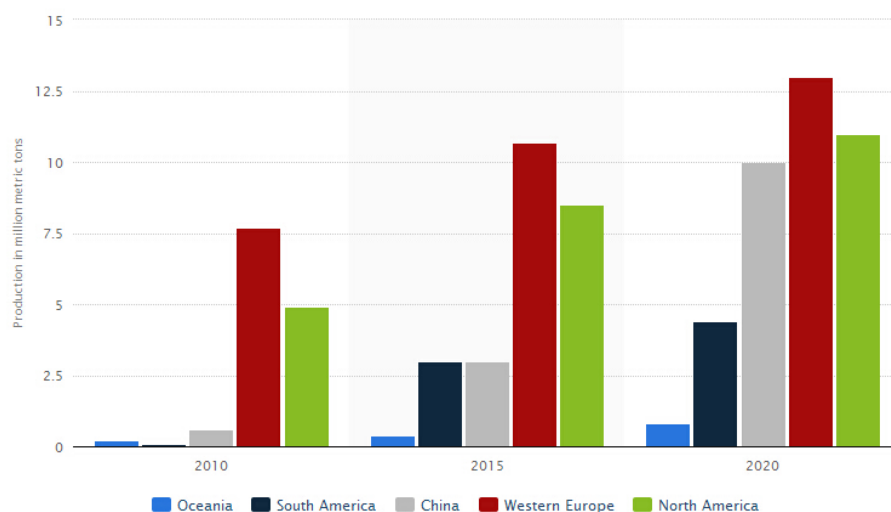
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## An Overview of Global Market of Fuel Pellets

### I. The Global Wood Pellets Production

In recent years, the wood pellet production has increased greatly, but it is still small and fraught with uncertainty as the international trade of wood pellets increases. And the global wood pellet production is far from meeting the global market demand. Here is the global wood pellet production from 2010 to 2020 by major region (in million metric tons).

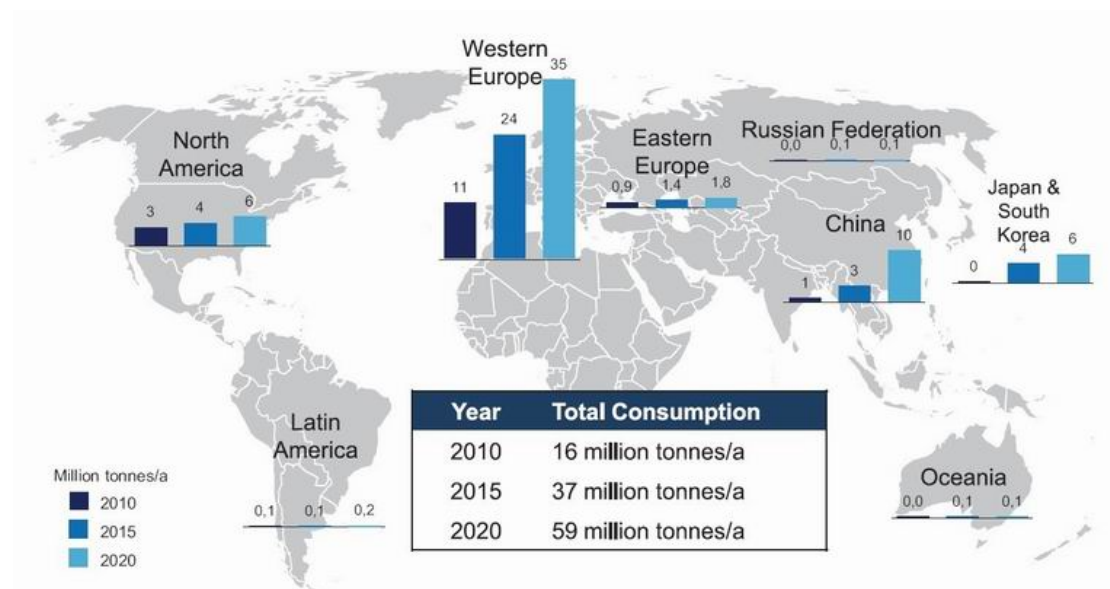


### II. The Global Market Demand of Fuel Pellets

In the wake of high energy prices, consumers, businesses and regulators look for fuel alternatives to fossil fuels; and policies that promote the generation of renewable energy are spurring the use of fuel pellets as a substitution for coal in power plants.

Therefore the global wood pellet demand is expanding rapidly. Here is the global wood pellet market demand in 2010 and 2012 with projections through 2020 by major region (in million metric tons). Western Europe will continue to be the largest pellet consumer in the future. North America will see growth mainly in the residential pellet sector. Asia countries have seen emerging use of pellets recently and this will continue.

In the wake of high energy prices, consumers, business and regulators look for fuel alternatives to fossil fuel; and policies



## Wood Pellets

Compared to other fuels in use today, wood pellets can be considered as a new type of fuel. Wood pellets are usually made from dry, untreated, industrial wood wastes like sawdust, shavings, or chip fines. The material is compressed into small cylindrical pellets under high pressure by the wood pellet making machine. Wood pellets are manufactured at wood pellet mills or wood pellet plants.

### I. Advantages of Wood Pellets

1. The main feedstock is wood wastes.
2. Featured with high energy density and consistency, fuel pellets make the international trade feasible.
3. Neutral in terms of greenhouse gas emissions, which has made fuel pellets as an alternative to fossil fuel more and more popular in boilers and power plants for electricity generation.

### II. Energy Potential of Wood Wastes

Across the EU, it is estimated that wood wastes contributes about 60 TWh from Europe's total biomass energy supply. Forestry by-products including sawdust, barks,

etc. contribute about 380TWh to the total energy supply.

### III. Sources of Wood Wastes

Wood wastes sources are mainly organized in three major categories: forest biomass, wood processing residual by-products and urban wood waste. And these wood residues can be divided into two types: logging residues and industrial wastes.

Types of residues	Share(%)
<b>1. Logging residues</b>	<b>57</b>
<b>2. Wood wastes</b>	
- Sawmills	40
- Plywood plants	2
- Other processing plants	1
	<b>43</b>
<b>Total</b>	<b>100</b>

As the main wood wastes sources, sawmill residues has large potential for making fuel pellets.

### Potential of Making Fuel Pellets from Sawmill Residues

#### I. Stable Supply of Raw Material

The above table of sources of wood wastes shows that 40% wood wastes come from sawmills, which means the sufficient supply of raw materials for making fuel pellets.

Sawmills produce wood residues in the form of sawdust, chip fines, dry shaving, barks and trimmings etc. Generally speaking, a log in a sawmill produces 60 to 70 percent of useful timber as boards, 20-30 percent as wood chips, and 10 percent as sawdust.



*Sawdust* can be generated in large quantities through the log saw-milling process.

*Chip fines* are created in sawmills where off-cuts and the round sides of logs are diverted to a chipper.



*Shavings* are created when saw timber is molded to specific section size. Shavings tend to be quite dry as timber is often seasoned before molding.

Sawdust, chip fines and shavings have a desirable calorific value, moisture content for making fuel pellets.

## **II. The Development of Bio-energy Markets Provide Opportunity for Making Fuel Pellets from Sawmill Residues**

Due to mounting social and political pressure to reduce greenhouse gas emission, bio-energy products are of increasing interest to developers and regulators. The combustion of biomass for energy is recognized as being neutral in terms of greenhouse gas emission. So the use of wood for bio-energy generation reduces energy carbon footprint. This will be opportunities for sawmills and other wood processing businesses to access renewable energy markets for the wood by-products they produce.

The development of bio-energy markets provide opportunity for making fuel pellets from sawmill residues.

## **III. The Availability of Wood Pellet Machines and Wood Pellet Technology for Pelletizing Sawmill Residues**

Besides large capacity wood pellet mill for commercial wood pellet plants, there are

small scale fuel pellet making machine and portable wood pellet mill available to be used alongside sawmills to make fuel pellets at site.

The manufacturing process is determined by the raw material, but generally includes the following steps: grinding, drying, pelletizing, cooling, sifting and packaging.

### **Grinding and Drying of Sawmill Residues**

Before sawdust, shavings or chips can be pelletized, it is vital that the size and the moisture content of the material are suitable. The proper size is less than 6mm and the suitable moisture content is about 12%-20%. So if the material size is larger, the hammer mill is necessary equipment; if the moisture content is higher than 20%, use sawdust dryer (you can use the moisture meter to measure the water percentage in raw materials), but remember that raw materials should not be too dry, the minimal level is 12%.

### **Pelletizing**

Fuel pelletizing machine, also known as wood pellet mill or extruder, are available in different capacities. There are two types of fuel pellet machine, namely, flat die wood pellet mill and ring die wood pellet mill. Flat die wood pellet mill can be driven by electric motor or diesel engine, and the flat die pellet mill, featured with small size, easy to move, easy operation and maintenance, is the preferred pellet making machine for sawmills to pelletizing their own sawmill residues.



### **Cooling of Finished Fuel Pellets**

As the pellets leave the wood pellet mill, they are hot and soft. Thus they need to be cooled in the wood pellet cooler. The cooling process is important for the strength and durability of the pellets.

### **Screening of Pellets**

The cooled pellets should be passed over a vibrating screen to remove fines among the pellets. These fine material can be sent back to the pelletizing process. Once screened, pellets are ready to be packaged for the desired end use.

### **IV. Benefits of Making Fuel Pellets from Sawmill Residues**

Generally the sawmill residues are piled or burned or sold in local markets for fuel. This way increases the storage cost of sawmills and brings environmental pollution by burning directly. If turn these sawmill residues into fuel pellets, it can not only offer energy for sawmills themselves and save energy cost and storage cost of sawmills but also benefits the environment.

### **Conclusion**

It is hard for even the most modern sawmills to turn half the volume of a log into lumber, so sawmills create large quantities of wood residues. Along with the huge market demand of fuel pellets, the development of bio-energy market and the availability of pelletizing equipment and technology, there is a wide range opportunities for utilizing these sawmill residues to make fuel pellets.