

Direct pellet distribution of Johann Pabst Holzindustrie GmbH



General

Johann Pabst Holzindustrie GmbH operates a sawmill, a planing mill, a profiled timber production, two laminated-wood plants as well as a pellet production plant in two different locations in Styria. The construction of the first pellet plant as well as the beginning of the pellet production took place in 2001.

By now, the Pabst Company has a production capacity of around 60 000 t of pellets per year in Zeltweg. The current production amounts to about 53 000 t of quality class A1 according to ENplus. Over 80 % of the feedstock for the pellet production, which consist of sawdust (80 %) and wood shavings (20 %) from spruce and, to some extent larch, comes as byproduct from the own plants. About 25 000 t of the produced pellets are sold directly in loose form to end consumers within a radius of 100 km by Pabst GmbH, 10 000 t are distributed via pellet traders and 18 000 t are exported. The direct pellet distribution is carried out through the company's own truck fleet, which contains four pellet-silo-trucks. In addition, the direct distribution channel to the end consumer is also used by some in-between pellet traders.

On one hand, the transport distance and the corresponding costs and CO₂-emissions are reduced through the direct distribution from plant to end consumer, while on the other hand, intermediate storage and handling are avoided, which minimizes abrasion and breakage of pellets as well as handling costs. The transport in specialized silo-trucks with on-board weighing system allows determining the exact amount of pellets unloaded at the customer. Furthermore, the pneumatic injection of pellets into the storage room adds to a careful and gentle storage of pellets.

In the Process of direct pellet distribution, usually the following people involved: a sales manager, an office employee, one person from the production (pellet loading), a truck driver and the customer.

Loading of pellets

Before pellets are loaded, the empty truck is weighed on a calibrated weigh bridge. After screening, the pellets are directly loaded from the storage silo into the silo truck. Afterwards, the truck is weighed again to determine the exact amount of pellets loaded.



Loading of pellets into the truck with foregoing screening

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Transport and unloading at the customer

After loading, the pellets are transported to the customer and are pneumatically inserted into the storage room through a hose. This procedure is very gentle and reduces dust formation, abrasion and pellet breakage. To allow for a dust-free blow in of pellets and to avoid overpressure in the storage room, a suction and screening device is necessary. By using a so-called dust bag, it is guaranteed that only a minimal amount of fines is blown into the customer's storage room. If the storage room is full although the ordered quantity of pellets has not been blown in completely, excess pellets are discharged back into the truck. In contrast, the unloading stops automatically if the ordered amount of pellets is lower than the capacity of the storage room. The unloading process takes between 30 minutes and 1 hour, depending on the ordered quantity. The exact amount of the unloaded pellets, which is determined through the on-board weighing system, provides the basis for invoicing. A weigh note is printed out locally and a copy is handed to the customer. The original note is delivered to the office by the truck driver, where the invoice is created and sent to the customer (Pabst GmbH 2013; Obernberger and Thek 2009).



Unloading of pellets at the customer © Pabst GmbH

Technical data

Plant data	
Production capacity	60 000 t/year
Annual production	53 000 t
Number of pellet presses	3
Production output	12 t/h
Pellet quality	ENplus A1
Higher heating value of pellets	4,9 kWh/kg
Feedstock demand	371 000 bulk m ³ sawdust and wood shavings
Pellet storage capacity	7 000 t

Truck fleet data	
Number of silo trucks	4
Loading capacity	13 – 22 t
Number of axles	3 - 4
Equipment	On-board-weighing system, blow-in equipment
Delivery radius	100 km
Average transport distance	50 km
Investment costs	200 000 – 280 000 € per truck

Economic data

Depending on purchase quantity and transport distance, 1 t of pellets costs between 245 and 257 € delivered to customer including tax (July 2013). In addition, a delivery charge of 39 € is charged per shipment. The minimum purchase quantity is 3 t, the maximum quantity is 23 t (Pabst GmbH 2013). At an average energy content of 4,9 kWh per kg pellets, the energy price amounts to about 5,1 ct/kWh which leads to a certain price advantage in comparison to natural gas (8,58 ct/kWh) and heating oil (9,50 ct/kWh) (proPellets Austria, August 2013). The annual pellet demand for a single family home lies between 4 and 7 t. The total fuel cost including delivery amounts for about 1300 € for an average annual demand of 5 t.

Economic data	
Cost of pellets delivered	245 – 257 €/t
Delivery charge	39 €
Minimum purchase quantity	3 t
Maximum purchase per delivery	23 t
Annual demand for single family house	4 -7 t
Total fuel cost delivered (5 t annual demand)	1300 €

Environmental data

The energy demand for the production of 1 t of pellets amounts to 860 kWh on average in Austria, which equals around 17,5 % of the pellets' energy content. During the production of 1 t of pellets, around 15 kg of CO₂ are emitted, which is equivalent to 1 % of the CO₂ contained in the fuel. This low value leads back to the fact that most of the thermal energy for feedstock drying stems from biomass heating plants owned by the sawmills and pellet plants and are operated with residues from the production process (proPellets Austria 2012; Moser 2009). The energy demand for the transport of 1 t of pellets to the end consumer over a distance of 100 km sums up to 50 kWh on average, which equals about 1 % of the energy contained in 1 t of pellets. The corresponding CO₂-emissions amount to about 14 kg per t (Moser 2009). Since the average delivery distanced of Pabst GmbH is only about 50 km, it can be assumed that energy demand and CO₂-emissions of pellet transportation are significantly lower. Over the whole supply chain, almost 97 % less CO₂ is emitted, if wood pellets are used for heating purposes instead of heating oil.

Socio-economic data

In total, 15 people are employed in the production and distribution of wood pellets at the Pabst Company: 1 sales manager, 1 customer consultant, 2 office employees, 6 truck drivers as well as 5 persons working in the production process. Therefore, several jobs could be created in the region through the beginning of the pellet production and the development of an own distribution channel.

References

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