



## FACTSHEET OF SOLID BIOFUELS PRODUCTION

### Summary of the factsheet

Production of pellets/woodchips/briquettes are characterized by high homogeneity as well as stable physical and chemical properties. These solid biofuels production can take place with different technologies and in a wide range of installation capacity. Various options of production lines (automatic, half-automatic with manual operations, etc) create possibilities to adjust properly the installation to the fuel requirements, producer's expectations, investment needed and final price of the solid biofuel.

### KEYWORDS:

Installation capacity  
Uniform shape  
Stable quality  
Investment cost

### Why processing biomass?

- Production of good quality biomass fuel in the form of pellets, woodchips and briquettes is intended for achieving a homogenous biofuel with a stable quality. This fact will facilitate the following operations with high efficiency to produce heat in a controlled, maintenance-free, and environmentally friendly manner.
- Reference quality standards/certification:

- Pellet: [ENPLUS](#), [DINPlus](#), [ISO 17225-2/6](#)
- Woodchips: [ISO 17225-4](#), [Biomassud](#)
- Briquettes: [ISO 17225-3/7](#)

Parameter	Pellet	Woodchips	Briquettes
Moisture content, %, a.r.	8-12	15-35	10-20
Ash content, %, a.r.	<0.5	<3.0	<3.0
LHV, MJ/kg, a.r.	18-19	13-16	15-18
Bulk density, kg/m <sup>3</sup> , a.r.	600-750	150-350	350-550

a.r: as received; d.b: dry basis; LHV: Low Heating Value

### Pellet production

- The pellets production technological line consists of the following units: (i) shredding/milling system, (ii) drying/mixing section, (iii) pelletizing (granulator) unit, (iv) pellet's cooling system, and (v) packing line.
- The expenditures related to the pelletizing line (without buildings and feedstock cost) depend on its capacity and automation rate. The approximate production cost of pellets is from 60-120 €/t (in dependance on the labor costs, electricity price etc.)



\*Drying operations with herbaceous material is not always required



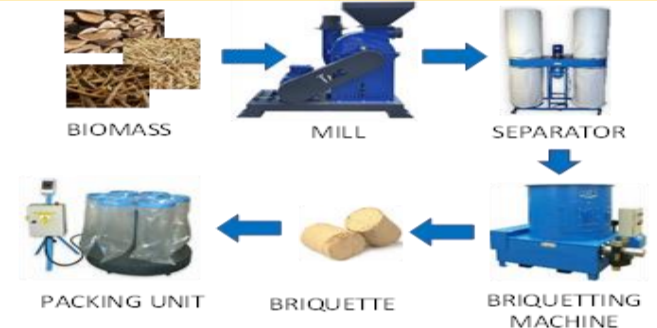
## Woodchip production

- The essential parameters of woodchips are proper particle size and moisture content. The wood chips production line is very simple, and its costs depends on the capacity and automation rate.
- The approximate production cost of wood chips is from 20 to 50 €/t (without feedstock cost).



## Briquettes production

- In the briquette production process, it is very important to select the appropriate mill for the processed type of biomass and its form (logs, branches, straw, boards, chips) and the briquetting device that will produce a product of a specific shape.
- The production costs are in the range 45-150 €/t (without feedstock cost).



## Investment costs

- The investment can highly change between EU countries, and the technology selected, but some ranges are:

Installation capacity, kg/h	Pellets Investment costs, k€	Woodchips Investment costs, k€	Briquettes Investment costs, k€
200	10-60	2-4	10-50
700	55-110	5-12	40-80
1000	110-600	10-15	55-120
2500	250-1,000	25-60	80-250

## Market audience of these solid biofuels

- Pellets are recommended for fully automatic domestic boiler with a small amount of storage spaces.
- Wood chips are rather suggested for medium-sized and industrial boilers (above 50 kW) due to the storage conditions and higher moisture content (the volume of wood chips store is 3-4 times larger than that of pellets).
- Briquettes can be utilised in boilers/fireplaces of all sizes, but their feeding to the combustion chamber in small heating units must be done manually.
- The market price of these solid biofuels for a final consumer depends on many factors (biomass type, fuel accessibility, alternative fuel prices etc.), and are, as follow: pellets (170-350 €/t), briquettes (150-400 €/t), and wood chips (50-100 €/t).

## THE PARTNERSHIP

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement no. 952930.

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