Handling of solid biomass to a biomass fired power plant is a complex task and many critical aspects have to be respected to obtain the function well and to have high availability.

**Baled fuel**

BWSC has since the late 1980's designed straw fired power plants. For the straw line BWSC designs straw handling equipment as in-house design. Baled fuel is complicated due to high variations in humidity, straw quality, strings and bale geometry.

Today BWSC supplies the following straw line equipment for straw bale fired powerplants:

- Barn reception conveyor and buffer conveyor (receives bales from crane)
- Flipper conveyor if needed (Turns bale 90° on horizontal axis)
- Distribution table (delivers bales to line calling for a bale)
- Weighing table (weight, length and humidity is measured)
- Seal gates (where bales enter the for closed conveyors)
- Buffer and adapter conveyor (between seal gate and dosing)
- String cutter
- Dosing conveyor (load control)
- Bale opener (disintegrates bale)
- Straw chutes (connection to double stoker screw)
- Straw chutes fired damper
- Double stoker screw (presses straw into the stoker duct)
- Water cooled damper
- Water cooled stoker duct (here the straw is a forward moving plug)
- Water Cooled Vibration Grate (combustion grate)
- Vibration drive for Grate (intermittent operation)

**Typical data pr. line**

- Fuel Capacity: 2.5 kg/s eq. 35 MWt
- Fuel humidity, max: 2 %
- Power consumption pr. line: 40 kW (typical)
Wood chips
For many years BWSC has supplied in-house designed spreader stokers for BWSC wood chips fired boilers. The Spreader Stoker is a classic design with a proven function. Based on experience from numerous plants BWSC has succeeded in design improvement with some very important features:

Wear and tear on the spreader table has been reduced based on design changes. Replacement of the spreader table, which is a wear part, has been made much easier and faster=inexpensive.

The design includes the spouts which are the interface to the upstream dosing silos and the design includes well defined interface to the boiler front wall – the opening in the pressure part and related casing.

The spreader is equipped with a spreader air system which normally is connected to the combustion air system. A rotating flap ensures a pulsating air flow shifting between the installed spreaders. A by-pass system can be adjusted to make the pulsation more or less significant. The pulsation leads to a mix of short and longer throws. At the same time the spreader angel is adjustable to ensure a landing area as close to the back wall as possible without hitting any pressure parts.

The spreader system and partly the upstream equipment requires that fuel Particle Size Distribution, PSD, is within a well defined range. Typical as the largest particles being smaller than 120 mm. Specific PSD can be according to EN 14961 or replacement EN 17225 – size group P45 with limitations on max length. Or PSD can be based on rougher material where largest particles are screened and downsized to typical less than 120 mm.

Typical data:
- Distance between spreaders: 1.600-2.200 mm
- Inside width of spout: 420 mm
- Capacity: 2.5 kg/s (approx. 25 MWt)
- Max furnace length: 8.500 mm
- Distance above grate: 2.000-2.500 mm
- Air consumption: 0.5 kg/s pr. Spreader
- Furnace near parts material: Avesta 253 MA

BWSC will supply comprehensive O&M Manual which in details instruct and guide for best possible availability and well controlled sequences for inspection, service and wear part replacement.