10Mw Straw-Fired District Heating Plant:

Complete Design and Installation in Rødby

In 2020/21, Runarsson A/S constructed a straw-fired district heating plant with a capacity of up to 10Mw for Rødby Fjernvarme. 8MW + 20% overcapacity, providing a total output of 10Mw at 110°C at 6 bar pressure.

Runarsson A/S designed the majority of the facility and was responsible for the manufacturing and installation of the core components. The delivery included a boiler with a shell-and-tube heat exchanger positioned above a pusher grate, a bag filter, a dry ash handling system, and a comprehensive flue gas, combustion air, and recirculation system. Furthermore, Runarsson A/S provided the complete feeding system, consisting of a receiving table, bale shredder, and fuel feeder.

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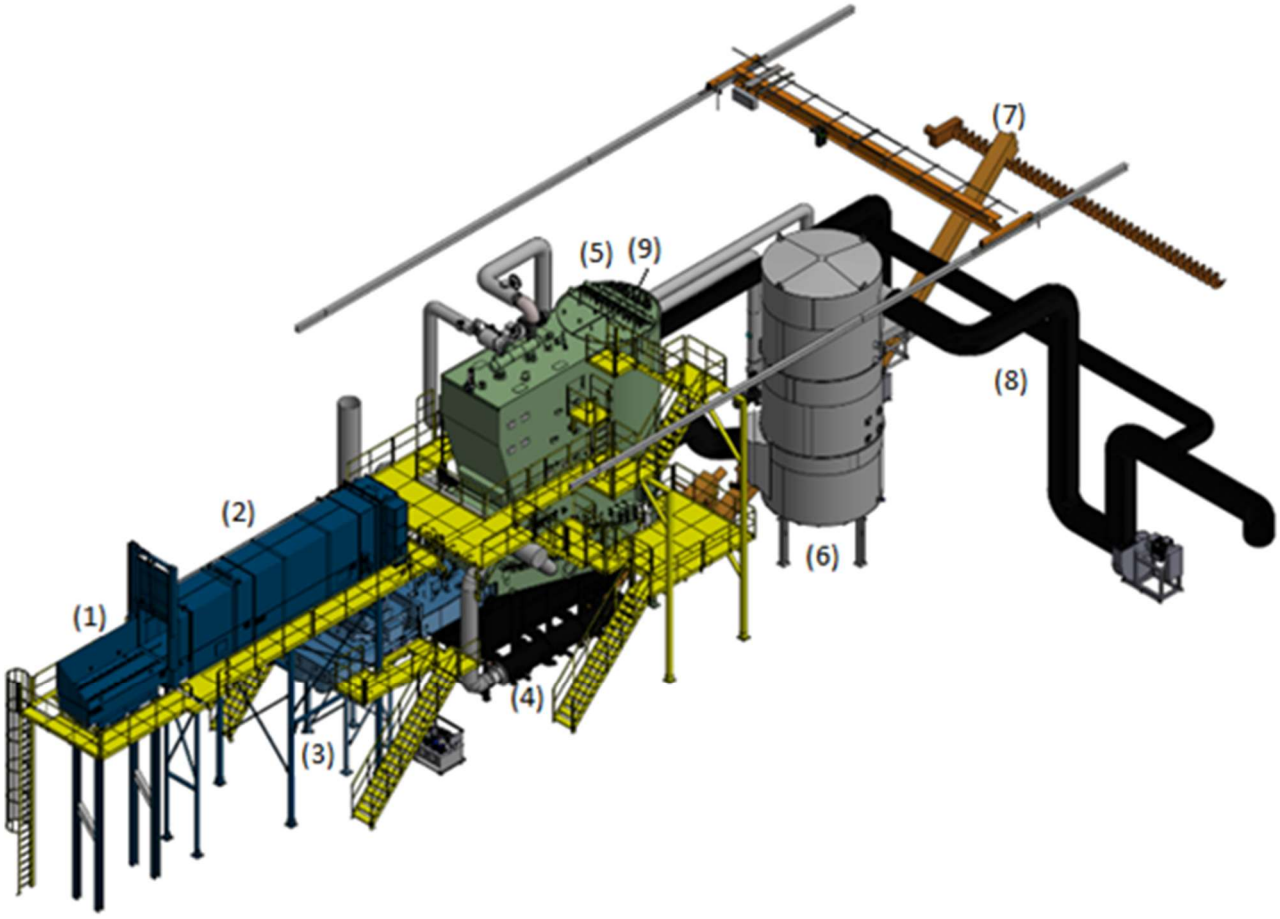
Here are the core components of the Runarsson Delivery:



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1. Receiving Table

Receives straw bales from a robotic crane and transports them from the straw storage through a fire damper into the shredder room.

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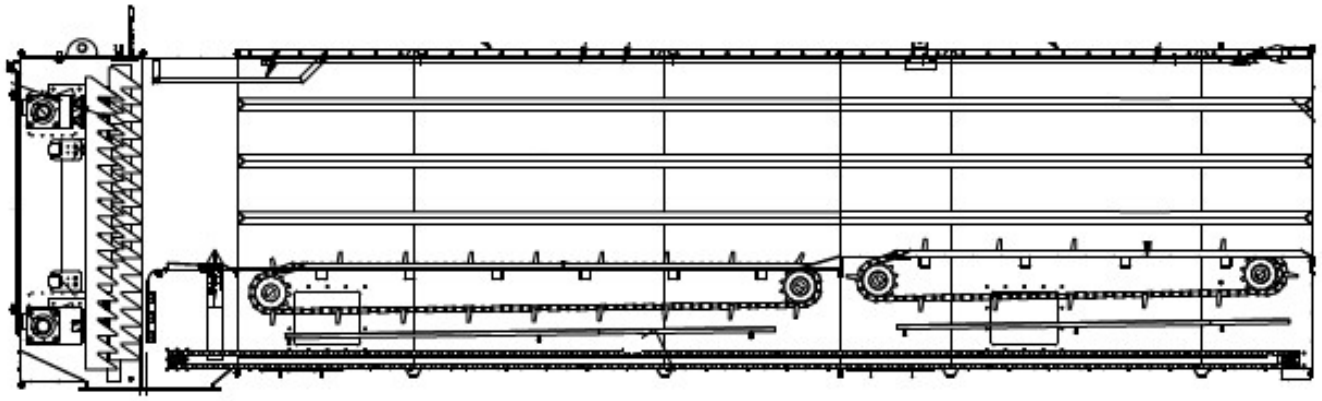
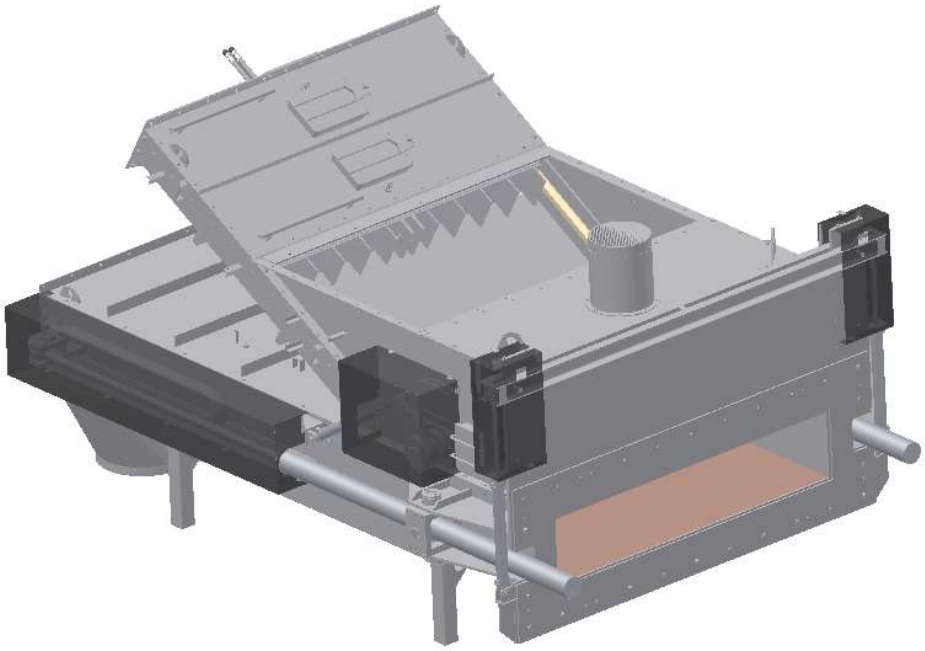
2. Bale Shredder

This unit features two chain-driven conveyors that press the bales against shredder teeth. The shredding force is transferred from a gear motor via a heavy-duty crankshaft, while an integrated string cutter removes the bale strings from below.



3. Fuel Feeder

Receives the loosened straw from the shredder and uses a hydraulic cylinder system to push the fuel through the feeding channel into the boiler.



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4. Step Grate

Featuring a 3.75 x 2.35 m grate surface, this system moves the straw from the inlet down toward the ash discharge.

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5. Boiler System

The system is divided into a radiation section and a shell-and-tube heat exchanger, each capable of yielding 5MW. The two-part radiation section is partially lined with acid-resistant refractory mortar. It features a narrowed gas throat where temperatures exceed 900°C to ensure optimal performance of the De-Nox ammonia nozzles. The heat exchanger is a vertical, traditonal water-to-water design.

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6. Bag Filter

Equipped with 466 bags, this filter ensures emissions remain below 10 mg/Nm^3. A large filter area ensures low load and maximum bag longevity, withstanding operating temperatures of 180°C (190°C peak).

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7. Dry Ash Handling System

Ash is extracted from the grate via screw conveyors and transported to the ash storage, where a distribution screw levels the material within the room.

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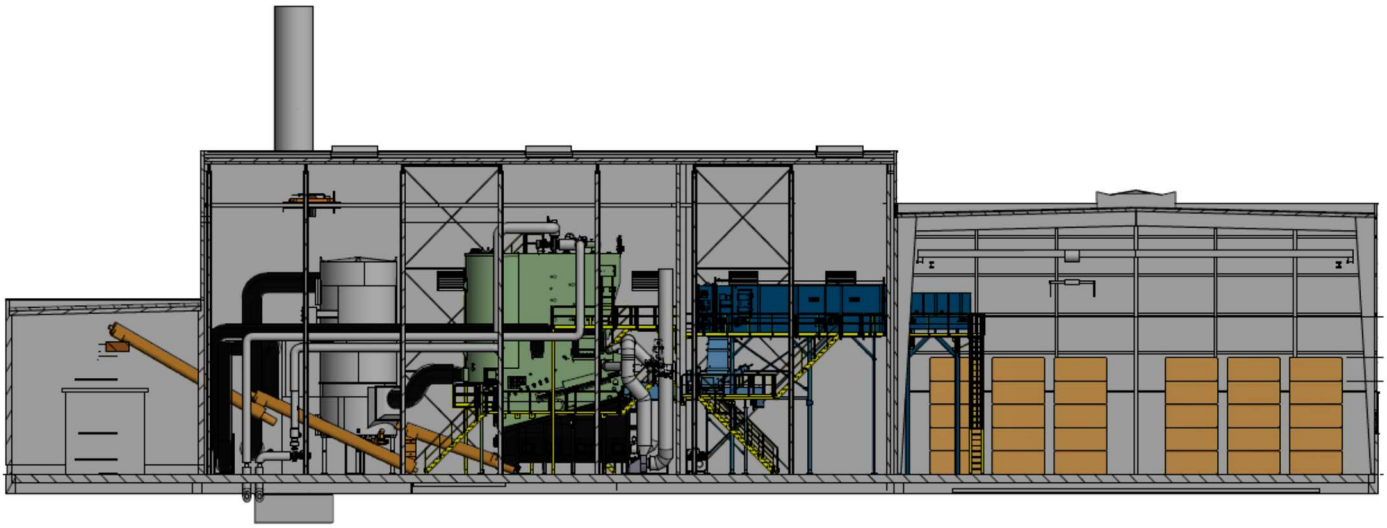
8. Flue Gas, Combustion Air, and Recirculation System

Constructed using high-quality materials including Corten steel, AISI 316/EN 1.4404, and carbon steel.

9. Compressed Air Cleaning System with shot cleaning

To prevent dust buildup and maintain efficiency, critical parts of the boiler and bag filter are automatically cleaned using a high-pressure air system.



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