

ZERO THERMAL ENERGY CONSUMPTION FOR INDUSTRIAL DRYING APPLICATIONS

White paper
October 2021



SWEDISH EXERGY

- Experience and know-how for optimal solutions -

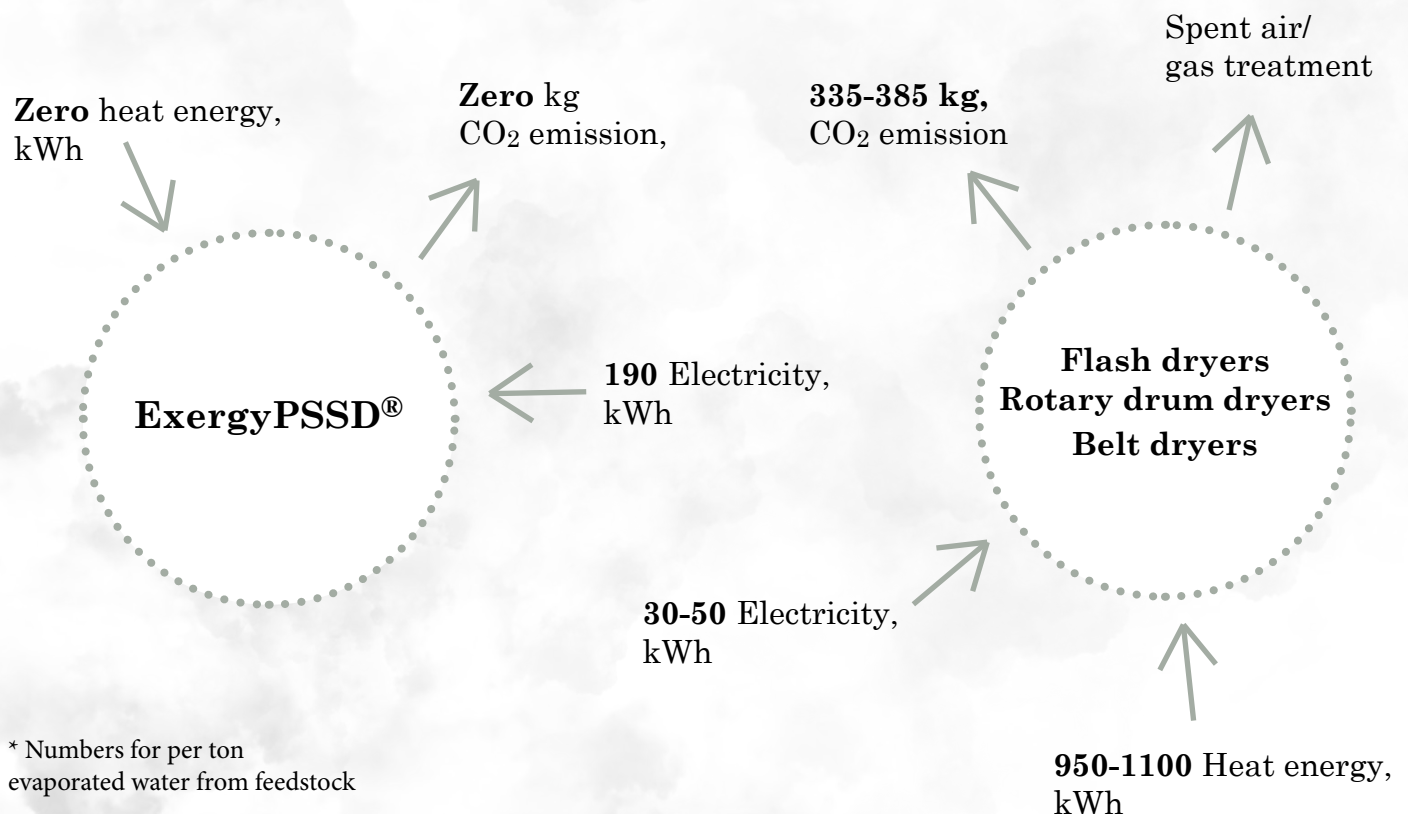
INDUSTRIAL DRYING

Industrial drying is a thermal process requiring heat and electricity to remove water from feed-stock. In the traditional industrial drying processes, the heat energy is transferred directly to feed-stock. The drying media in the traditional technologies is air or flue gases obtained by combustion of various types of fuels. The heating energy, whether if it is air or fluegas, is mixed with wet feed-stock, allowing the heat energy to transfer to the feed-stock causing the moisture to evaporate. Moist laden air/flue gas is discharged to the atmosphere at the end of the process. The typical thermal energy required in these dryers is 950 to 1100 kWh/ton evaporated water. High energy consumption means high CO₂ emission from drying processes.

In the traditional drying technologies, such as Rotary drum dryers, flash dryers and belt dryers, the VOC's and particulate emissions are common problems needing post-treatment of drying gases.

INDUSTRIAL DRYING TECHNOLOGY USING STEAM AS DRYING MEDIA

The Swedish Exergy technology (ExergyPSSD®) uses steam in a 100% closed-loop as drying media with no thermal energy consumption. Only 150 kWh electricity is needed to evaporate 1000 kg (2204 lbs) water. If renewable power is used for drying, CO₂ emission from the drying process is **zero**.



* Numbers for per ton evaporated water from feedstock

ExergyPSSD[®] CASE STUDIES



ROCKHAMMER BRUK, PAPER PULP DRYING, SWEDEN

- *Installed year:* 2016
- *Feed rate to ExergyPSSD[®]:* 36 ton/h wet pulp with 50% moisture content.
- *Energy used for drying:*
150 kWh electricity/ton evaporated water in steam compressors. No thermal energy needed.
- *Output from ExergyPSSD[®]:* 20 ton/h at 15% moisture content
- *Final application:* Market pulp for packaging production

HMAB, SVEG, SWEDEN

- *Installed year:* 1988
- *Feed rate to ExergyPSSD[®]:* 2600 ton/day milled biomass with 50% moisture content.
- *Energy used for drying:*
150 kWh electricity/ton evaporated water in steam compressors. No thermal energy needed.
- *Output from ExergyPSSD[®]:* 1444 ton/day at 10% moisture content
- *Final application:* Production of wood pellets



FOR MORE INFORMATION ON ExergyPSSD[®] PLEASE CONTACT:

Swedish Exergy AB

Phone: +46 (0) 31 51 39 90 Fax: +46 (0) 31 51 79 60

E-mail: info@swedishexergy.com

E-mail: sales@swedishexergy.com

Webpage: www.SwedishExergy.com