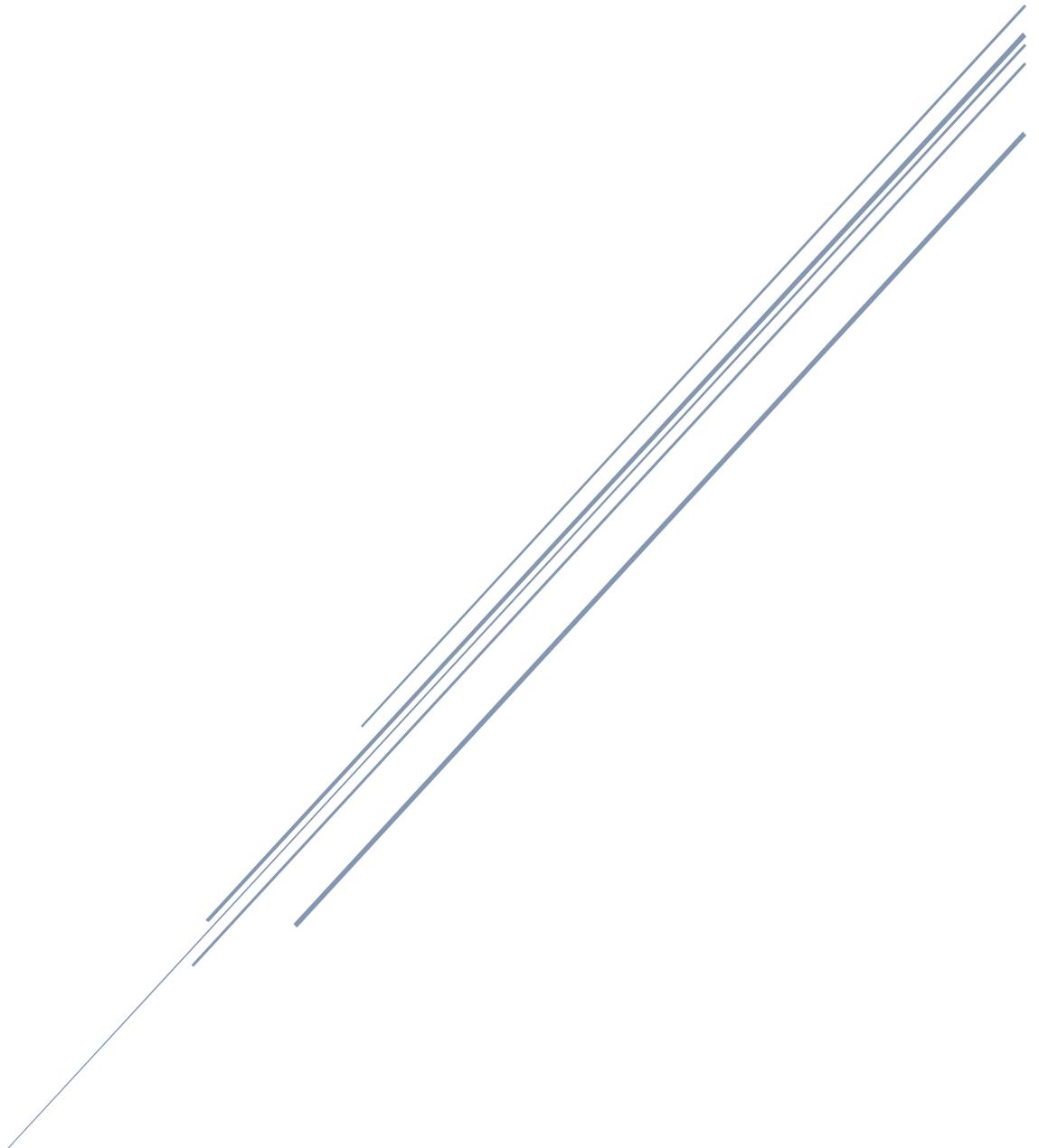


CARBON FOOTPRINT IN INDUSTRIAL DRYING

White Paper



Swedish Exergy AB

- Experience & Know-How for Optimal Drying Solutions -



Industrial drying

Industrial drying is a thermal process requiring heat and electricity to remove water from feed-stock. In traditional industrial drying processes, heat energy is transferred directly from drying media to feed-stock. Drying media usually is air or flue gases which are heated by the combustion of fuels. Heated drying media is mixed with wet feed-stock which in turn heats feed-stock allowing 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 the process is between 950 to 1100 kwh/ton evaporated water. High energy consumption equals high CO₂ emission from drying processes as well as VOC's and particulate emissions are common problems needing post-treatment of drying gases.

Rotary drum dryers, flash dryers, belt dryers are some of the traditional drying technologies available in the market.

Drying is one of the most energy-intensive processes in any industry however this doesn't have to be the case.

Novel Industrial drying technology using steam as drying media

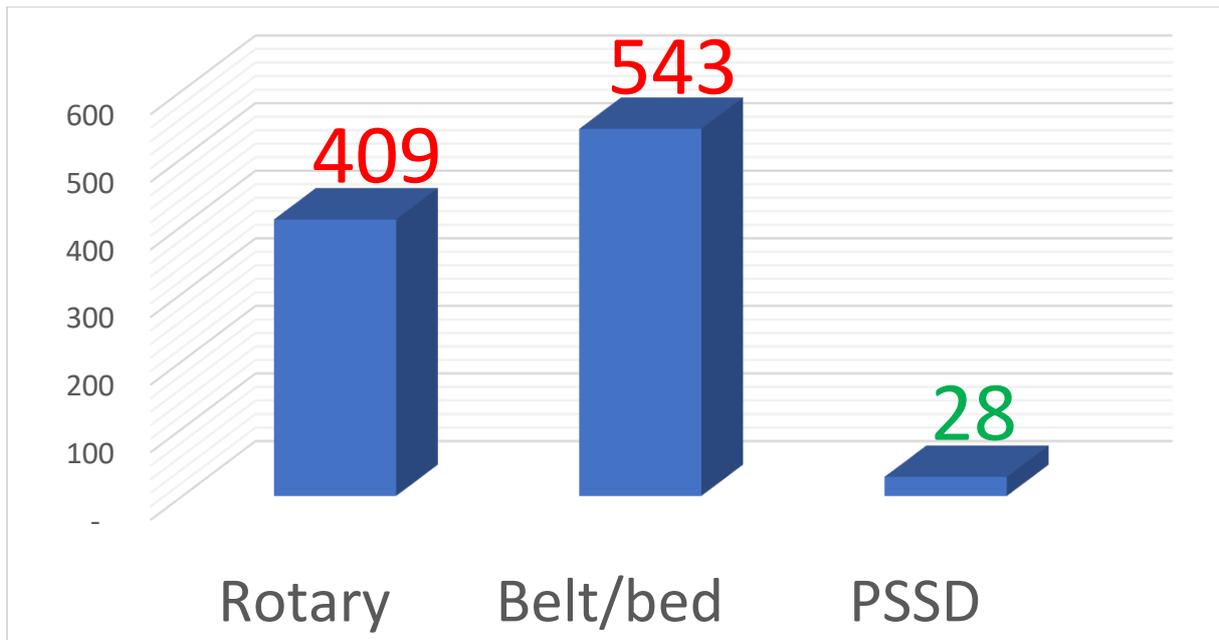
Swedish Exergy's technology (EXERGYPSSD) uses steam as drying media in a 100% closed-loop system which results in the lowest thermal energy consumption compared to traditional drying technologies which result in the lowest CO₂ emission from the drying process.

This white paper presents facts and data on the industrial drying process focusing on the lowest CO₂ emission.



CO₂ Emission - kg CO₂ / ton dry material

Drying Technology			
	Rotary	Belt/bed	EXERGY PSSD
Bark/chip amount	223	296	15
FG volume	1 028	1 365	71
FG CO ₂ content	20,4%	20,4%	20,4%
FG CO ₂ volume	210	279	14
FG CO ₂ density	1,95	1,95	1,95
FG CO ₂ amount	409	543	28



EXERGY PSSD has the lowest CO₂ emission as compared to traditional drying technologies. If we are to include a CO₂ capture then the figure which is achieved using EXERGY PSSD will be negative.



EXERGYPSSD Case studies:

Tauron power plant, Stalowa Wola, Poland

Installed year: 2012

Feed rate to EXERGYPSSD: 50 ton/h milled biomass with 50% moisture content.

Energy used for drying: 13 barg steam

Output from EXERGYPSSD: 27 ton/h at 8% moisture content

Final application: combustion in boilers

Hmab, Sveg, Sweden

Installed year: 1988

Feed rate to EXERGYPSSD: 2600 ton/day milled biomass with 50% moisture content.

Energy used for drying: electricity 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:

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