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Report on Biomass Drying Technology

Wade A. Amos
National Renewable Energy Laboratory

National Renewable Energy Laboratory
1617 Cole Boulevard
Golden, Colorado 80401-3393
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EXECUTIVE SUMMARY

Using dry fuel provides significant benefits to combustion boilers, mainly increased boiler efficiency, lower air emissions, and improved boiler operation. The three main choices for drying biomass are rotary dryers, flash dryers, and superheated steam dryers. Rotary dryers are least sensitive to material size and are the most common, but also have the greatest fire hazard. Flash dryers are more compact and easier to control, but require a small particle size. Superheated steam dryers are less common, but provide significant energy savings.

Environmental controls and safety are important considerations in the dryer design. Superheated steam dryers have zero air emissions, but a medium-strength wastewater may need to be processed. The fire risk is much lower with superheated steam dryers because all drying occurs in an inert steam atmosphere.

Which dryer is chosen for a particular application depends very much on the material characteristics of the biomass, the opportunities for integrating the process and dryer, and the environmental controls needed or already available. Heat recovery can improve the efficiency of some drying options, but at an added capital cost.

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