Chicken Litter Power – A case for energy recovery from non-point source pollution in sensitive watersheds

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Abstract

Agriculture is essential to all people: farms provide us with food, fiber, natural areas, and possess aesthetic and environmental benefits. But agriculture is also the single largest source of non-point source nutrient and sediment pollution entering the sensitive watersheds in which these farms reside and while conventional tillage, fertilizers, such as chicken litter (manure), and pesticides can be beneficial to crops, their excessive use can pollute rivers and streams, pushing nutrients and sediment into waterways.

This study looks at several options that are either currently employed in the United States' Chesapeake Bay Watershed or that could be employed at farms within the watershed to recovery energy from chicken litter that would have otherwise been land applied as a form of fertilizer and add to the nutrient problems currently being experienced in the Bay.

The presentation includes a discussion of chicken litter as a fuel source for small boiler systems that are primarily used to generate hot water heat that is used to maintain optimal growing temperatures in the farm's chicken houses as well as larger systems Combined Heat and Power (CHP) systems that have the potential of generating sufficient electrical power for the farmer use in addition to generating hot water heat for the chicken houses. The discussion will also include a summary of the chemical analysis of chicken litter as a fuel source and provide data on the ash[1] which can be recycled as a valuable fertilizer for areas outside of the bay region that are deficient in the recovered nutrients typically found in high concentrations in the chicken litter ash.

In addition to eliminating or significantly reducing non-point source pollution associated with traditional chicken litter disposal methods, a properly sized CHP system, deployed in a farm setting, appears to have several tangible benefits including; the recycling of chicken manures into valuable fertilizer feedstock, the generation of consistent hot water heat for the chicken houses, and the potential to offset a portion or all of the farm's electrical energy demand from the grid.

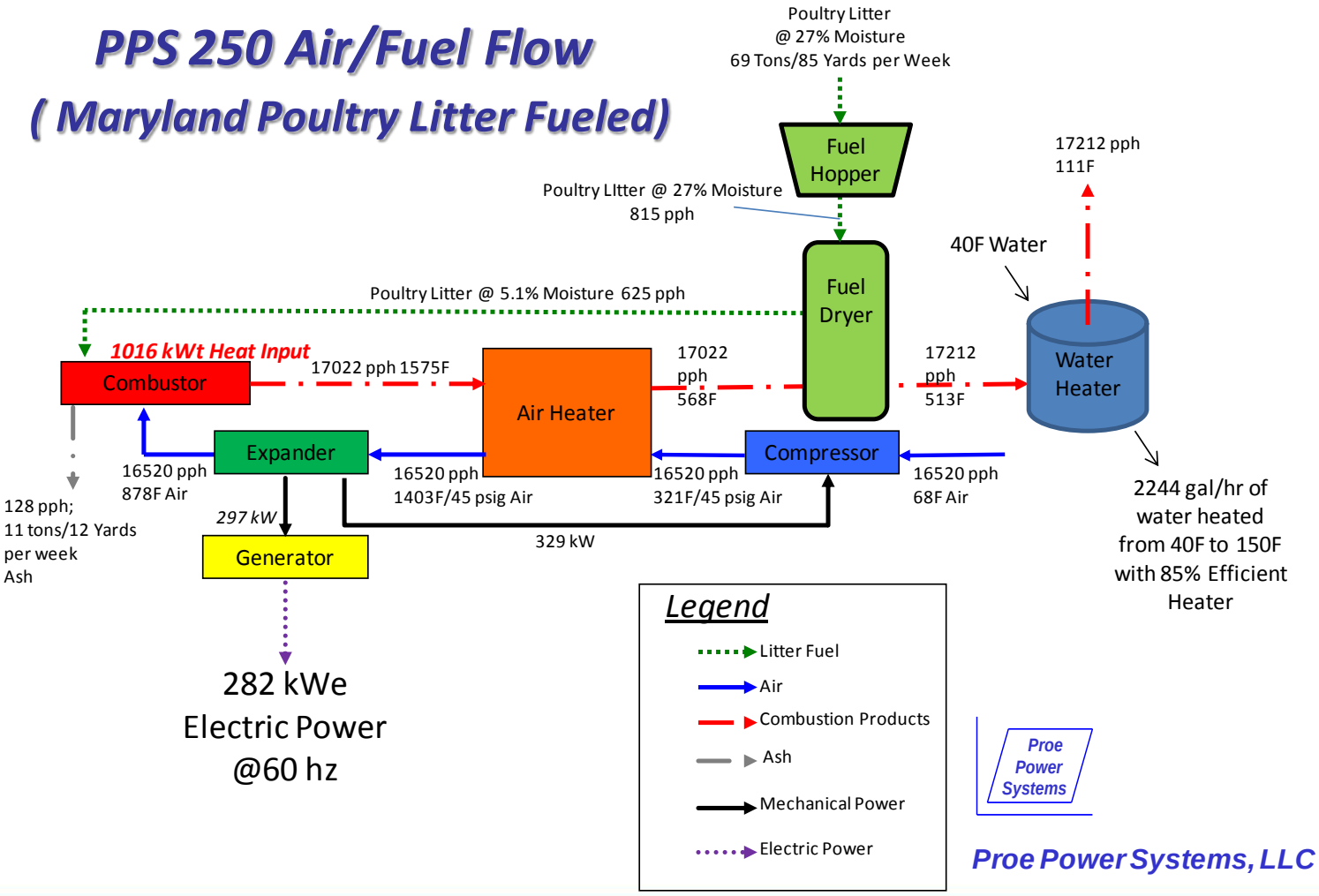
References

[1] Kim, W. K., and P. H. Patterson . 2006. Ammonium-nitrogen transformation and nitrogen retention in broiler manure supplemented with a soil amendment containing nitrifying bacteria. *J. Environ. Sci. Health, Part B.* 41:121-133.

Combined Heat and Power Systems

PPS 250 Air/Fuel Flow

(Maryland Poultry Litter Fueled)



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