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Sustainable Alternatives for Whole Stillage Management: Changing the Paradigm for Co-Product Management

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Abstract: In the effort to reduce operating costs for distilleries, and potentially for ethanol producers, in a high energy cost and lower co-product value environment, Ecovation, Inc. has been working with several large whiskey distilleries and one bio-ethanol company to develop a sustainable alternative to the traditional “dry house” approach of producing DDGs and the other derivative forms of processed whole stillage. Typically these co-product economics are driven by corn prices and the local animal feed markets, regardless of the cost of production which has risen rapidly over the past few years, particularly energy. We have developed a process that employs non-traditional solids separation technologies to whole stillage followed by treating the largely solids free effluent stream through a unique fixed film high-rate anaerobic digestion technology to produce biogas. This process scheme eliminates the need for evaporation (an energy user) and replaces it with an energy producing process, while still recovering a distiller’s wet grain (DWG) that can be used traditionally as animal feed. Alternately, the solids can be partially dried and used as a solid fuel stock. Our research and development (bench and pilot testing) show that 15-30% of the distillery energy use can be reduced using this scheme. We have also determined that further processing and combusting of the high BTU content spent grains can make a distillery or fuel ethanol facility energy self sufficient.

This presentation will include data developed from the solids separation process, including solids feed characteristics as well as the anaerobic treatability trial results on thin stillage from bench-scale testing. These bench scale anaerobic trials were later backed-up with on-site field trials where similar results were produced and bench scale results confirmed. The individual technology components of this “sustainable alternative” are proven and not new, however the combination and operation together make this process a unique alternative and provide a potential competitive advantage for alcohol producers. A full-scale system for a whiskey distillery in Kentucky is currently being installed. This first commercial installation will be the next step in proving the promised benefits to the ethanol producer.