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◀PREV

Renewable Energy and Water System (REWS) at Musco Family Co. Olive Plant

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ABSTRACT

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This paper presents the results of a demonstration of a unique water distillation system at the Musco Family Olive Plant in Tracy, California. The Musco REWS (Renewable Energy/Water System) was developed by Combined Solar Technologies (CST) of Carmel Valley, California using its SteamBoy™ brine boiler technology. The system is powered using solar thermal and biomass energy. The notoriously hard to clean waste water from the olive canning process was a challenge for CST, a start-up company who had previously done successful technology demonstration projects for the California Department of Water Resources (agricultural drainage water) and Clint Eastwood's Tehama Golf course Water Treatment Plant (Reverse Osmosis Brine). The olive waste water at the Musco plant contained a high concentration of salts as well as organic materials. CST successfully treated water directly from the plants waste water stream (12,000 TDS) as well as the water from the plants Title 27 ponds (67,000 TDS). The CST processed water averaged 250 TDS. The CST REWS at the Musco olive facility uses one of the plants waste (olive pits) streams to provide the heat energy for the process. The olive pits are combusted in fluid bed burners that are specially designed for olive pit combustion. The Musco plants 200 tons per week of olive pits contain 8800 btu/lb (dry). The olive pits are fed into the CST burners where the heat energy is used to heat a heat transfer fluid (HTF) to 450F. The HTF is then directed to the SteamBoy™ brine boilers. The heat from the HTF evaporates the plants waste water under pressure. The resulting pressurized saturated steam is then used to power SteamBoy™ steam engine/generator sets. The engines are set up to leave large quantities of heat in the exhaust. That heat is used to take the remaining solids and sludge to a dry state in custom built drying pans that separate the minerals from the water, leaving a very high concentration of organics in the remaining water. That water is used in the burners for temperature control and as a way to eliminate the organics with combustion. The exhaust from the combustion of the olive pits goes first through an electrostatic particle separator and then to a selective catalytic reduction system. From there the exhaust is directed to bubbling algae tanks that reduce the CO2 by over 50%. The system has completed a successful demonstration phase and is now being upgraded to a full scale plant (50,000 GPD).

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