KOCHERGIN, VADIM[1], MARK SUHR[2] and CHRISTIAN LOHREY[1], [1]Audubon Sugar Institute, LSU AgCenter, 3845 Hwy 75, St. Gabriel, LA 70776 and [2]MS Processes Intl., LLC, 16491 Highway 7 East, Hutchinson, MN 55350. **Utilization of beet sugar factory resources for production of Algal Biodiesel.**

ABSTRACT

Increased economic pressure in recent decades force sugar producers to consider value-added technologies that can improve industry's sustainability. Carbon dioxide from boiler flue gas, water, and waste heat from sugar beet plants are resources that can be utilized for production of oil-containing algae. Algae production has been considered as a promising method of sequestration of carbon dioxide for conversion into jet and diesel fuels and chemicals. With oil content ranging between 30 and 50 % on dry mass, algae offer productivity10-20 times higher in comparison with oil producing land crops. Algal oil is easily converted into biodiesel via transesterification with ethanol, which can be obtained by fermentation of effluent streams from a sugar factory. Resulting biodiesel can be used to cover harvesting and transportation needs. Authors have previously analyzed the possibility of algal production in connection with raw cane mills. It was found that sugar cane mills can supply sufficient carbon dioxide from flue gas to support mass algae production, as well as provide sufficient electric power and steam required for conversion of algal biomass into biodiesel. In addition, cane mills generate significant amounts of clean water and have ponds available for algal production. Current presentation explores integration of algal technology into sugar beet processing facilities. Material and heat balances will be presented for operation scenarios where algae is produced adjacent to a 10,000 tpd sugar beet plant. Co-location of beet plants and algal production facilities will allow mitigation of greenhouse gases and offer benefits of utilization of existing agricultural infrastructure and resources while maintaining the same level of sugar production.