Project on Bioenergy linked to Wastewater Treatment Selected for Funding by USTAR | Sustainable Waste-to-Bioproducts Engineering Center

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The Utah Science Technology and Research initiative has awarded the team consisting of Utah State University, WesTech-Inc., and the Central Valley Water Reclamation Facility a project titled “Bioenergy and Waste Reduction from Municipal Reclaimed Water” under the Industry-University Partnership Program (IPP).

Project Description. Phosphorus and total inorganic nitrogen (TIN) will be removed from the wastewater and captured using a technology developed at Utah State University in collaboration with WesTech-Inc. that utilizes the wastewater nutrients to cultivate microalgae cells in a rotating algae biofilm reactor (RABR). The RABR technology combines both algae cultivation and harvesting into one process thereby improving efficiency and reducing costs.

The nutrients are removed from the wastewater and the algae cells containing the nutrients can then be sent to an existing anaerobic digestion process and used to enhance the production of biomethane that is already being generated on-site to offset ~70 percent of the facility’s energy needs. In addition, the microalgae can be mixed in with the facility’s compost to create a higher-value product fertilizer. Therefore, the University-Industry team of USU, Wes-Tech, and Central Valley will test the use of algae in a variety of different product streams, including bioenergy as methane gas for heat and power for the plant, compost fertilizer, and algae production from CO2 in the digester biogas.

A pilot-scale RABR will be implemented at the site of the CVWRF to develop scale-up information. The commercial potential will be identified for manufacturing and selling the technology through the environmental firm of WesTech-Inc. with headquarters in Salt Lake City.

Potential Economic Impact to the State of Utah. This project could reduce large capital and operating expenses for CVWRF, while also creating valuable product streams for CVWRF. Long-term monitoring and maintenance of the RABR would create jobs within the facility and within other facilities as the technology is introduced to other water reclamation plants in Utah. The CVWRF, as the largest municipal wastewater treatment plant in the State of Utah, is viewed by other wastewater reclamation plants in Utah as well as in the Western U.S. as a leader and model for meeting future state and national treatment requirements and developing “waste-to-value” opportunities.

WesTech-Inc. is interested in adding a competitive product, the RABR, to its worldwide market and could sell RABRs to other wastewater reclamation facilities in the nation and internationally, thereby increasing its revenue base and the tax base for the State of Utah.

Engineering graduates who are trained in this new technology will provide new skills to current and new businesses in Utah for workforce development and for providing new technologies specifically related to energy and clean technology that are more efficient and also more cost-effective. These professionals, with new and unique technical skills, will add to the economic development and create new professional jobs.