



UNIVERSITY OF CALIFORNIA, DAVIS
OFFICE OF RESEARCH
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December 12, 2014

California Department of Water Resources
IRWM Financial Assistance Branch
Water-Energy Grant Program
P.O. Box 942836
Sacramento, CA 94236

Proposal entitled:

“Conducting water energy nexus assessments of the Stockton wastewater control facility at the Campbell Soup tomato processing facility in Stockton California to achieve water conservation, enhance municipal biogas yield and improve industrial wastewater”

UC Davis Principal Investigator – Dr. Christopher Simmons

UC Davis Requested Funds: \$1,093,047

Period requested: 05/01/2015 – 04/30/2018

To Whom It May Concern,

It is our pleasure to forward institutional support and approval of the above-referenced proposal being submitted to California Department of Water Resources under the Water-Energy Grant Program.

In response to the requirements as an eligible applicant: The Regents of the University of California are the regularly constituted state university of the State of California originally created by a state legislature act of 1868. The University of California is an authorized 501.C3 Nonprofit Organization. The Regents of the University of California is deemed a State institution codified in the State of California's Constitution Article 9, Section 9 and, as such, are legally authorized to enter into an agreement with the State of California. The University has successfully entered into many contractual arrangements with the State of California, under various departments, reflective of our respective policies and regulations and those of the State of California, as part of the outlined research project.

Please call on Dr. Simmons, UCD Principal Investigator, for scientific information. Administrative questions may be directed to Shanna Nation Jose at the address or phone below or at snation@ucdavis.edu. We request correspondence pertaining to this proposal and any ensuing award be sent to the Office of Research and to the Principal Investigator.

Send Award Notice to:

Office of Research
Sponsored Programs
1850 Research Park Drive
University of California
Davis, California 95618
(530)754-7700/ Fax: (530)752-0333
awards@ucdavis.edu

Send Checks (Payable to The Regents of the University of California) to:

Cashier's Office
University of California Davis
PO BOX 989062
West Sacramento, California 95798-9062

Sincerely,

Handwritten signature of Robert Pattison in blue ink.

Robert Pattison
Contracts and Grants Officer
rpattison@ucdavis.edu

Enclosure: Eligible Applicant Documentation

Department of Water Resources
Scope of Work, Budget and Budget Justification

Due date: December 12, 2014

Granting Agency: California Department of Water Resources

Duration: May 1, 2015 to April 1, 2018

Principal Investigator:

Dr. Christopher Simmons, Assistant Professor in the Department of Food Science and Technology (FST)
University of California Davis
Phone: (530) 752-2109
Email: cwsimmons@ucdavis.edu

Project Title:

Conducting Water Energy Nexus Assessments at the Stockton Regional Wastewater Control Facility and at the Campbell Soup Tomato Processing Facility in Stockton, California: To Achieve Water Conservation, Enhance Municipal Biogas Yield and Improve Industrial Water and Wastewater Energy Management

Scope of Work

The University of California, Davis (UCD) Food Science and Technology Department (Dr. Christopher Simmons, FST) invite the Stockton Regional Wastewater Control Facility (RWCF) and the Campbell Soup Company to demonstrate the economic and environmental benefits derived from conducting Water Energy Nexus (WEN) Assessments. Establishing a public-private collaborative to address the water-energy nexus at a regional institutional facility and an industrial customer located within the RWCF water boundary. With the potential to achieve energy efficiency, water conservation, and bioenergy generation, resulting in greenhouse gas (GHG) emission reductions.

UCD Researchers will develop a tailored RWCF WEN Assessment Tool, to: 1) Account for the energy intensity (WEi) of processing municipal wastewater, and 2) Model the technical potential to enhance biomethane yield. The WEN Tool will be used by UCD researchers and consultants to conduct WEN Assessments at the regional wastewater facility, with support from RWCF staff. The WEN Tool provides guidelines, standards, templates and calculators to establish the WEi metric and estimate biogas yield potential.

The WEi metric provides a scientific value to measure and validate (M&V) the economic and environmental benefits from conserving electric energy and generating additional bioenergy at RWCF. The project will identify targeted WEN unit operations (WEN Points), collect archival data and conduct field measurements to obtain all the data that is required to calculate the WEi value, by WEN Point. The WEN Tool offers a roadmap approach to identify short, medium and long term resource efficiency measures (REMs). The WEN Tool models potential greenhouse gas (GHG) emission reductions from energy conservation projects and enhanced bioenergy generation.

UCD Researchers will develop a Campbell WEN Assessment Tool, to: 1) Establish the WE_i metric by WEN Points at the Campbell tomato processing facility located in the City of Stockton, 2) Evaluate the technical and economic potential to achieve water conservation, and 3) Model the potential to improve the wastewater system. The WEN Assessment identifies WEN Points, collects archival data and conducts field measurements to calculate the WE_i values. The WE_i metric will be used to M&V the economic and environmental benefits from conserving water, conserving electric and thermal energy efficiency and reduce wastewater's organic load before discharge to RWCF.

UCD Researchers are thankful to again have the support from the Campbell Soup Company to demonstrate the WEN Assessment Tool at the Stockton facility¹ and to participate in a regional public-private effort to improve resource management practices.

Project Budget:

UCD Salaries:

PI effort (5% time)

Analyst V

Graduate Students (2)

Undergraduate Students (2)

Consultant/Service Agreement Costs:

Steam, Pump, Fan, Bioenergy System Assessment Specialists

Campbell Soup Company

Supplies:

Data collection/Analysis Tools

Travel:

Not allowed by DWR, please see Appendix

Cost Sharing:

There is no cost share requirement in the DWR request for proposals.

Budget Justification

UCD Staff:

Dr. Christopher Simmons, Assistant Professor, Department of Food Science and Technology; Affiliated Faculty, Energy Efficiency Center, is the Principal Investigator (PI). Prof. Simmons provides leadership, organization, direction, technical assistance, and supervision to UCD staff to implement the work plan. Technical expertise includes BMP assessments, evaluation of wastewater treatment strategies, design of mathematical models to simulate the performance of bioenergy systems, and heat recovery modeling in industrial food processing.

Ricardo Amón, Analyst V. Provides the management expertise to plan, implement and execute the scope of work, with supervisory responsibilities to direct and evaluate the performance of

¹UCD Researchers conducted WEN Assessments at the Campbell Dixon tomato processing facility in 2012. The facility adopted REMs in 2013 and 2014, with continued plans for improvements.

consultants, UCD project staff, Service Agreements. The Analyst V is responsible to conduct field research including data collection and analysis, writing progress and final reports, prepare technical presentations for meetings and conferences, and write journal articles.

The Graduate and Undergraduate students will provide technical support with the collection and analysis of data, designing and testing mathematical models, writing software code, testing hardware and software tools, and writing progress reports.

A salary increase of 3% per year is budgeted.

Fringe Benefits:

The fringe benefits were calculated based on University of California Composite Benefit Rates.

Consultants and Collaborators:

Researchers will identify one or more steam, pump, fan and bioenergy system assessment consultants to conduct water energy nexus (WEN) assessments at the Stockton Regional Wastewater Control Facility and at the Campbell Stockton tomato processing facility.

The Campbell Soup Company is identified for a Service Agreement with UC Davis to receive \$150,000 over three years for the design and installation of the hot tomato water recovery project at the Campbell Stockton facility.

Materials, Equipment and Travel:

Materials expenses are budgeted to purchase data collection tools and instrumentation to conduct the WEN assessments. Additional budget items include cost of data analysis and modeling tools, laboratory testing equipment, and other hardware and software support needed to conduct the WEN Assessments.

Other miscellaneous materials are budgeted to purchase sampling equipment, printing reports, and preparing research posters. Travel costs are not budgeted because they are deemed not eligible for reimbursement by DWR. UCD will need to procure travel funds from a different account.

Tuition:

Graduate student fee remission is included. Budgeted increases of 5% are included.

Indirect Rate:

Indirect costs are calculated at 25% MTDC, per the existing exception with the State of California.

