# TERU Focus Report - CEC Awards for Waste & Biomass Conversion

**California Energy Commission Approves $83.7 Million in Grants for Transportation, Energy Storage, Biogas, and Efficiency Programs**
April 13, 2015 -- Michael Theroux

## Introduction

The California Energy Commission (CEC) at its April 8, 2015 Business Meeting dramatically improved the state's chances to divert mountains of trash from landfills, meet greenhouse gas reduction goals, and increase the fraction of our overall energy balance that we obtain from renewable and sustainable sources. In addition to approving a slew of grants, the CEC also OK'd the 2015-2016 Investment Plan Update for its Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP) at this same Business Meeting. The 2014 Electric Program Investment Charge (EPIC) Annual Report to the Legislature also won approval from the CEC; EPIC is a multiyear, research investment program focuses on creating electricity-related innovations and bringing clean energy ideas to the marketplace. Combined, the two programs ensure that financial help will continue for advanced technology development and demonstration, so crucial to kick-starting commercial roll-out.

Let's take a stroll through some of the CEC awards that address solid waste and biomass resource utilization:

## Viridis Fuels

Oakland-based Viridis Fuels LLC receives a $3,393,598 grant to construct and operate a biodiesel production facility in Oakland, California, co-located with the East Bay Municipal Utility District's (EBMUD) wastewater treatment plant. This facility will produce up to 20 million gallons of biodiesel annually from fats, oils, and grease (FOG), as well as purpose-grown crops. (ARFVTP; grant agreement)

## Interra Energy

San Diego company Interra Energy Inc. gets $2,000,000 to research, install, and demonstrate a pilot-scale advanced modular bioenergy technology, a microwave driven low temperature, high pressure pyrolytic retort for clean conversion of biomass to biochar. Following first phase testing and demonstration, the CEC may approve the second phase, which will include installation and pilot-scale demonstration of the technology. (PON-14-303; EPIC application)

## Taylor Energy

In a return to working in California after a long absence, New York based Taylor Biomass Energy has succeeded in securing a $1,499,481 grant to design, develop, and test a 3-pound per minute waste-to-energy process development unit, involving thermal-catalytic gasification integrated with reforming for conversion of refuse derived biomass into clean fuel gas, enabled by Pulse detonation technology. This project will evaluate the results and provide engineering data to design a 30 ton/day plant generating one megawatt of electric power. (PON-14-303; grant agreement)

## Southern California Gas Company

The Southern California Gas Company received CEC approval of Agreement EPC-14-047 for a $1,494,736 grant to demonstrate the integration of a combined concentrating solar power and a high temperature processing technology. The hybrid configuration will convert dairy manure into low-carbon, high-quality renewable natural gas suitable for electricity production. (PON-14-303; grant agreement)

## All Power Labs

And going from the mighty to the mighty determined, Berkeley open-engineering gasification shop All Power Labs as been awarded a $1,990,071 grant to design, deploy, and test a demonstration mobile biomass gasifier technology that can convert forest slash biomass into on-demand renewable energy. APL's "Power Pallet" wood chip gasifiers make usable heat and power and can be optimized to produce high-grade biochar. (PON-14-303; grant agreement)

## University of California, Irvine

For the first of six awards that "demonstrate bioenergy solutions that support California's industries, the environment and the grid", UC Regents accepted a grant of $1,499,386 on behalf of the Irvine Campus to demonstrate a gradual oxidizing technology for generation of electricity from low quality fuel gas produced from landfills. (EPIC PON-14-305; award elements and grant agreement)

## Watershed Research and Training Center

The North Fork Community Power Forest Bioenergy Facility Demonstration Project proposed by the Hayfork-based Watershed Research and Training Center (WRTC) will receive a $4,965,420 grant to install and demonstrate a commercial-scale gasification-to-electricity facility that converts wood waste from forest management activities to renewable electricity while providing reduced fire risk, watershed protection, improved air quality, other environmental benefits, as well as local jobs. WRTC is a community-based non-profit organization formed in 1993 whose mission has been to promote a healthy forest and a healthy community through research, training and education. (EPIC PON-14-305; grant agreement)

## Biogas & Electric LLC

La Jolla start-up Biogas & Electric LLC successfully proposed to demonstrate a low-cost wet scrubber technology with a biogas fired lean burn engine at a waste water treatment plant, receiving an award of $2,249,322. The grant allows the firm to build pilot results of their NOxRx® for biogas engines at Wastewater Treatment Plant (WWTPs) in South Coast Air Quality Management District (SCAQMD) where Rule 1110.22 is limiting biogas project development through emissions regulation. (EPIC PON-14-305; grant agreement)

## Lawrence Berkeley National Lab

The Department of Energy's Lawrence Berkeley National Laboratory (LBNL) secured a $4,300,000 grant to fund research to enable environmentally and economically sustainable deployment of technology that transforms organic municipal solid waste (MSW) into heat, electricity, and compost via dry anaerobic digestion. A dry anaerobic digestion and composting facility processing the organic fraction of MSW will be scaled up from 40,000 tons/year to 90,000 tons/year in Phase 1 and to 180,000 tons/year in Phase 2, resulting in an increased production of renewable electricity and heat. (EPIC PON-14-305; grant agreement)

## Kennedy Jenks Consultants

The purpose of the Kennedy Jenks Consultants $ 1,496,902 grant agreement with the CEC is to demonstrate a new technology to effectively pre-process food waste and to develop a new strategy to lower mass of dewatered cake to improve the economic viability of co-digestion and biogas energy production at Silicon Valley Clean Water. (EPIC PON-14-305; grant agreement)

## Organic Energy Solutions, Inc

Headquartered in San Bernardino, Organic Energy Solutions, Inc has been awarded a $5,000,000 grant to develop an innovative 100 ton per day anaerobic digester system that will convert organic waste and wastewater from a grocery store distribution center to clean renewable electricity integrated with peak load

strategies for the grid. This project will increase waste diversion for San Bernardino by up to 40,000 tons per year, providing a facility to recycle organic waste, as well as up to 8,760 megawatt hours of renewable electricity that will be sent to Southern California Edison's local grid and include demonstration of pre-commercial peak load shifting and energy storage strategies. (EPIC PON-14-305; agreement elements)

## Parting Shots

Fortunately for California, we have an Energy Commission that does not shy away from science and technology, and as part of their broad duties has been going to great lengths to encourage the clean conversion of waste and biomass to heat, power, fuels, and any other commodity. Unfortunately, that *other* state agency - the one charged to development of a feedstock driven, technology neutral approach to waste conversion - must not have gotten the Governor's memo.