



GAIL FARBER, Director

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
<http://dpw.lacounty.gov>

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

March 9, 2016

IN REPLY PLEASE

REFER TO FILE: **EP-4**
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TO: Each Supervisor

FROM: Gail Farber *Gail Farber*
Director of Public Works

BOARD MOTION OF JANUARY 27, 2015, ITEM NO. 21-A
CONVERSION TECHNOLOGY PROJECTS
SEMI-ANNUAL STATUS REPORT: AUGUST 2015 THROUGH JANUARY 2016

On January 27, 2015, the Board adopted a motion by Supervisor Mark Ridley-Thomas instructing the Director of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable conversion technology projects, in conjunction with the Boards' approval of a technical services contract with Alternative Resources Incorporated to assist the County of Los Angeles and potential project developers in developing conversion technology projects in the County.

Attached is the second report in response to this motion for the period of August 2015 through January 2016. If you have any questions regarding this report, please contact me or your staff may contact Daniel J. Lafferty at (626) 458-3500 or dlaff@dpw.lacounty.gov.

CS:jl

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Attach.

cc: Chief Executive Office (Rochelle Goff)
County Counsel
Executive Office
Department of Public Health
Department of Regional Planning
Los Angeles County Integrated Waste Management Task Force
Regional Planning Commission
Sanitation Districts of Los Angeles County

CONVERSION TECHNOLOGY PROGRAM

SEMI-ANNUAL STATUS REPORT

August 2015 – January 2016





Prepared by the County of Los Angeles Department of Public Works

Cover Photos

Top Left: Pitchess Detention Center in Castaic, CA

Top Right: County Sanitation Districts Food Waste Digestion Project in Carson, CA

Bottom: CR&R Anaerobic Digestion Facility in Perris, CA



1.0 Executive Summary

This is the second report, which responds to the January 27, 2015, motion by Supervisor Mark Ridley-Thomas to report on progress regarding conversion technologies. The report details four conversion technology projects that have achieved significant progress in the last 6 months, as well as benchmarking and milestones, and next steps.

The projects are:

1. Joint Water Pollution Control Plant – This is a joint effort between Waste Management (WM) Company and the County Sanitation Districts (Districts). WM continues to supply 25 tons per day (tpd) of food waste to the Districts' Plant in the City of Carson. The Department of Public Works and the Districts are conducting a pilot food waste collection program in selected unincorporated County of Los Angeles areas, which brings additional organic waste to the facility for processing.
2. Perris Materials Recovery Facility, CR&R Incorporated – This privately developed, \$25 million conversion technology (CT) facility in Riverside County completed construction of the Phase I digester and will begin operation in spring 2016. Construction of Phase II recently began. Each phase of the facility will process up to 230 tpd of organic waste using anaerobic digestion.
3. Lancaster Landfill, LARGO – This project by WM has initiated the permitting process to build an anaerobic digestion and composting facility at the Lancaster Landfill. The project will be able to process up to 2,000 tpd of organic waste.
4. Pitchess Detention Center, Los Angeles County Sheriff's Department – This potential project would digest food and green waste from the Pitchess Detention Center in addition to organic waste from nearby County facilities. Public Works is providing technical assistance to the Sheriff's Department for this potential project.

Benchmarking and Milestones – The initial Semi-Annual Report established numerical milestones to measure progress in implementing the CT Program starting with the current in-County CT capacity of 84 tpd and continuously increasing the capacity to reach 3,000 tpd of conversion capacity by 2035. In addition to the potential projects in Lancaster and Pitchess Detention Center, the Districts' facility in Carson is likely to develop additional capacity to process organic solid waste. Thus, the County is on track to achieve the next milestone of 200 tpd in-County waste conversion capacity by 2020.

Conclusion – CTs have the ability to play a critical role in reducing our reliance on landfills and recovering energy, fuels, and other products from waste. CT projects are making significant progress in the County. Public Works will continue to facilitate the



development of these projects by providing technical assistance, educating stakeholders, and working to remove regulatory barriers.

2.0 Background

On January 27, 2015, the County of Los Angeles Board of Supervisors adopted a motion by Supervisor Mark Ridley-Thomas instructing the Director of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable CT projects, including the amount of waste to be diverted, financial viability, project status, and significant impediments that will allow the Board to meaningfully assess the efficacy of conversion technologies in meeting the County's goal of a sustainable waste management future. This is the second report in response to that motion for the period of August 2015 to January 2016.

In October 2014, the Board adopted the Roadmap to a Sustainable Waste Management Future, which established waste diversion targets of 80 percent by 2025, 90 percent by 2035, and 95 percent or more by 2045. The successful development of CTs is key to achieving these targets since it is not economically feasible to reduce, reuse, or recycle the entire waste stream.

3.0 Project Development Highlights

The following CT projects have achieved progress in the last 6 months.

3.1 Joint Water Pollution Control Plant, County Sanitation Districts of Los Angeles County and Waste Management Company (WM)

In 2013, the Districts partnered with WM to establish a demonstration project at the District's Joint Water Pollution Control Plant (JWPCP) in the City of Carson, California. As part of this project, WM collects food waste, cleans and processes it into a slurry, and delivers it to the JWPCP where it is co-digested with sewage sludge to create biogas which is converted into electricity. The project has been operating roughly two years, recycling approximately 25 tpd of food waste with virtually no issues. The Districts determined that it can be technically viable to expand the co-digestion project at JWPCP into a commercial-scale anaerobic digestion facility. The agreement with WM allows for up to 84 tpd to be processed, and the Districts have determined that additional organics can be processed if a consistent clean supply can be secured in a financially viable manner.

Public Works and the Districts are working with waste haulers to develop pilot programs for collecting food waste from the Firestone and Belvedere Garbage Disposal Districts (GDDs) and commercial franchise areas in the San Gabriel area of the County. Food waste collection began in the Firestone GDD on October 20, 2015, and in the Belvedere



GDD on January 5, 2016. The pilot commercial food waste collection program is expected to begin in spring 2016.

The food waste material is taken to the Districts' Puente Hills Materials Recovery Facility where after it is processed further, it is delivered to JWPCP to be digested and converted into energy. The Districts have partnered with Anaergia, a renewable energy and waste-to-resources company, to pilot a small-scale "press" at Puente Hills Materials Recovery Facility. Public Works has arranged to send loads from County unincorporated areas for pilot testing. The press is an advanced material separation technology that recovers organics from the waste stream by separating the dry inorganic fraction of the waste from the wet organic fraction. The press will also help with determining organics recovery rates and contamination levels of different types of commercial and residential loads. This program will provide insight on the challenges and costs associated with separate organic waste collection, which can be reviewed before being implemented throughout the unincorporated County areas.

The Districts also signed a contract with Kore Infrastructure, LLC to convert a portion of the biosolids from JWPCP to biofuel using pyrolysis and Fischer-Tropsch Technology at a facility in Rialto, California. Pyrolysis is a type of gasification, which is a non-combustion thermal conversion technology. The Fischer-Tropsch Technology uses chemical processes to convert gases into liquid fuels.

3.2 Perris Materials Recovery Facility, CR&R Incorporated

CR&R Waste and Recycling Services, a local solid waste management company, has completed construction of a 230 tpd anaerobic digestion project at the Perris Materials Recovery Facility and Transfer Station in Riverside County. The project is designed to convert organic waste into renewable fuels for use by their waste collection vehicles. As approved by the Board in 2010, Public Works assisted CR&R by providing technical assistance as well as assisting them in successfully pursuing grant funding for the facility. Thanks in part to support and assistance from the County, this project was successful in receiving a total of nearly \$9 million in grant funding to date - \$4.5 million from the California Energy Commission, \$1.4 million from the South Coast Air Quality Management District/Mobile Source Air Pollution Reduction Review Committee, and \$3 million from the California Department of Resources Recycling and Recovery. The grants received to date have helped to accelerate the development of the project.

This facility has plans to scale-up in four equal phases and ultimately digest up to 1,075 tpd, which could allow the facility to process organic waste generated in unincorporated Los Angeles County. The facility is also expected to process waste from the City of Los Angeles starting in 2017. Phase I was completed and is expected to begin operation in April 2016. Phase II is currently under construction and is expected to be complete in summer 2016. The facility will serve as a reference for viable



CT projects that can separate the organic fraction of the waste stream, and we are benefiting from the lessons learned in successfully developing this project.

3.3 Lancaster Landfill, Waste Management

On July 10, 2013, WM issued an Invitation-Only Request for Proposals for a green waste and food waste processing facility on designated land within the boundaries of WM's Lancaster Landfill, located in the unincorporated region of the County near the City of Lancaster. WM secured an agreement with Zero Waste, LLC, that has successfully developed similar projects in California to move forward with a full-scale organics digestion and composting operation (referred to as the Lancaster Advanced Recycling for Green waste and Organics project, aka LARGO), which will eventually be able to process up to 2,000 tpd of organic waste. The anaerobic digester is estimated to process approximately 250 tpd of the organic waste and the rest to be composted.

Public Works' CT Program provided technical assistance to WM with permitting, environmental review, and pursuing grants for the project. WM is currently preparing the materials necessary to move forward with permitting the new facility with the Department of Regional Planning.

3.4 Pitchess Detention Center, Los Angeles County Sheriff's Department

In April 2013, the Los Angeles County Sheriff's Department (LASD) requested assistance from Public Works in implementing a small scale in-vessel composting system to manage organic waste and provide soil amendments for farm operations at Pitchess Detention Center (PDC), a cluster of jail facilities in Castaic, California. Subsequently, LASD and Public Works received a proposal from an organics processor to consider expanding the scope of the composting system to include an anaerobic digester, which would process source-separated food and green waste to create biogas for energy generation and heat as well as compost for farming operations. Such a facility could receive and process food and green waste from other County departments, as well as potentially the surrounding areas and provide compost and renewable energy or biofuels to other County departments.

The proposed project has numerous potential benefits. It would help conserve natural resources and reduce landfill disposal, thereby assisting County Departments and potentially businesses in complying with State mandates, including Assembly Bill (AB) 1826, AB 341, and AB 32. This project aligns with the strategies outlined in the Roadmap to a Sustainable Waste Management Future and County Strategic Plan. By diverting food waste into the composting and anaerobic digestion system, the project would reduce traffic and pollution from trash hauling. The anaerobic digestion facility would be mutually beneficial to all parties involved and create useful products including a rich soil amendment for PDC farmland and biogas that could be used for low carbon electricity and heat generation, and vehicle fuel. The facility would also reduce costs associated with trash disposal, water usage and sewer fees, kitchen clarifier cleanout



fees, and compost expenses. Additionally, the project could potentially provide job training opportunities for inmates or job opportunities for former inmates.

Public Works and LASD have finalized an economic analysis for the three potential phases of this project. The initial phase includes recycling 1,000 tons per year of food waste and green waste from PDC, and the remaining two phases would add feedstock from other County facilities or other regional sources. It has been calculated that a facility capacity of 40,000 tons per year would provide economic feasibility. However, additional consideration would need to be given to the availability and commitment of organic waste feedstock within the region. Working with a consultant, Public Works, and LASD are determining the details for issuing a Request for Qualifications and Proposals for the design, permitting, construction, commissioning, and operation of the anaerobic digestion project.

4.0 Public Outreach

A Comparative Greenhouse Gas (GHG) Emissions Analysis was commissioned by Public Works to compare the net GHG emissions of two scenarios. The baseline scenario is a transport and disposal of residuals from a mixed waste Materials Recovery Facility (MRF) in a modern sanitary landfill. The alternative scenario is processing the residuals at an Integrated MRF with CT. The Comparative Analysis shows the net environmental benefits of managing residual solid waste using anaerobic digestion and gasification at an integrated CT facility, as opposed to transporting it to a landfill for disposal. This analysis will provide tremendous assistance in educating stakeholders of the necessity for CT facilities to improve air quality and combat climate change. Public Works plans to release the Comparative Analysis in the next few weeks.

The Los Angeles County Integrated Waste Management Task Force and its Alternative Technology Advisory Subcommittee, in conjunction with the County of Los Angeles, the BioEnergy Producers Association and UCLA's Extension Recycling/Municipal Solid Waste Management Program will be co-sponsoring a conference in spring 2016 that will present the findings of the Comparative Analysis and address how to best motivate State government to include CTs in their AB 341 implementation planning and future policy-making. The County's CT consultant is currently assisting with conference logistics, preparing the conference agenda, and reaching out to potential speakers and attendees.

5.0 Benchmarking and Milestones

The goal for the CT Program is to reduce the dependence on landfills and ensure there is sufficient, sustainable capacity available to the County to meet future needs. Public Works set benchmarks for the program based on current waste disposal quantities and the disposal reduction targets established in the County's Roadmap as well as State laws, such as AB 1826 for organic waste. Although a significant portion of



organic waste will be diverted using composting and land application, additional conversion technology facilities will be needed to meet this goal.

The following milestones have been identified to measure our progress:

Timeframe	Milestone	Capacity (tons per day)	Status
Today	County Sanitation Districts anaerobic digestion co-digestion at Carson facility	84 (can be expanded in the future)	Completed
12/31/2015	Construction of Perris anaerobic digestion facility	230	Completed
12/31/2020	In-County conversion technology capacity (projection)	200	To be completed
12/31/2025	In-County conversion technology capacity (projection)	500	To be completed
12/31/2035	In-County conversion technology capacity (projection)	3,000	To be completed

After a small number of facilities become operational and demonstrate their viability, the market for CT in the County will quickly expand. Achieving 2025 and 2035 milestones will require investment by the private sector. The 2020 milestone could be achieved by the development of additional capacity at the Districts' Carson facility. In addition, the potential anaerobic digestion projects at Lancaster Landfill and PDC could be built by 2020 with streamlined permitting.

Although the County does not have direct control over the timing of the private projects, State mandates are driving business development, which will lead to projects being developed in the next few years. To accelerate this investment, Public Works can take a number of steps, as described below.

6.0 Next Steps

- Work with the Districts in continuing to implement the organic waste collection program, with the goal of increasing the anaerobic digestion of food waste in the County.
- Provide technical assistance to facilitate WM's LARGO project, including permitting assistance, environmental review, and support for grant applications.
- Present the comprehensive, peer reviewed Comparative GHG Emissions Analysis that shows the benefit of CTs at a conference to be held at Public Works in spring 2016.



- In collaboration with Regional Planning, prepare a draft Recycling and Waste Facilities Ordinance, which will ensure these types of facilities have appropriate zoning as well as permitting process.
- Continue to serve as a resource and catalyst for CT project development in the County for other CT projects in various stages of development, such as potential projects at PDC and Lancaster Landfill.

As described in Appendix A (attached), legislative barriers have historically been a major impediment to the development of CTs in California. Senate Bill 498 (SB 498, authored by Senator Ricardo Lara in 2014 and sponsored by the County), cleared a significant hurdle for the siting of biomass conversion facilities in the County by providing waste diversion and renewable energy credit to such facilities. The County will be sponsoring another CT bill that would build on the success of SB 498, by expanding the definition of biomass conversion to other types of feedstock, such as biosolids or digestate. The County prepared a recommended legislative proposal, which was approved by the Board of Supervisors adding “non-recyclable byproduct or residue from composting” to the definition of biomass in SB 498 as a way to encourage CT projects to use this feedstock.

Public Works will continue to facilitate the development of CTs in the County by working with stakeholders to identify barriers and creating solutions to those barriers as described in this report.

Public Works’ next status report will be submitted in August 2016 for the period February 2016 through July 2016.



Appendix A – Legislation

Recently Adopted Legislation

Senate Bill 350

The California Clean Energy and Pollution Reduction Act of 2015 include two key proposals, doubling the energy efficiency of buildings and increasing the use of renewable electricity to 50 percent by 2030. Conversion Technology (CT) has the ability to generate renewable electricity from waste, thereby assisting the State in meeting these environmental goals. Senate Bill 350 was signed by Governor Jerry Brown on October 7, 2015.

Pending Legislation (as of January 28, 2016):

Senate Bill 32

The California Global Warming Solutions Act of 2006, also known as Assembly Bill 32, establishes a goal to reduce Statewide Comparative Greenhouse Gas (GHG) emissions equivalent to the Statewide emissions level in 1990 by 2020. Senate Bill 32, introduced by Senator Fran Pavley, requires the California Air Resources Board (CARB) to approve a Statewide GHG emission limit that is equivalent to 80 percent below the 1990 levels to be achieved by 2050. The bill would also require the State board to approve an interim GHG emissions limit equivalent to 40 percent below 1990 levels by 2030. Without CTs and the GHG emission reductions associated with these technologies it would be difficult for the State to meet these goals. Therefore, this bill could bolster the advancement of CTs. The County is evaluating this bill to determine whether to recommend taking a formal position.

Senate Bill 687

This Bill would require CARB, on or before June 30, 2017, in consultation with the State Energy Resources Conservation and Development Commission and the Public Utilities Commission to adopt a carbon-based renewable gas standard that would require all gas sellers to provide minimum percentages of renewable gas to retail customers in California. Modeled similar to the State's Renewable Portfolio Standard, which has doubled renewable electricity in the State since 2002, the required percentage of renewable gas would gradually increase from 1 to 10 percent over a 10-year period beginning in 2019 and is intended to spur the in-State biomethane market. The bill would also require the CARB to issue an analysis of the lifecycle emissions of GHGs and reductions for different biogas types and end uses by January 1, 2017. The bill is a 2-year bill, which means it will be voted on in 2016. The County is on record in support of this bill.

Assembly Bill 577

Authorized pursuant to AB 32, monies collected by the CARB from the auction or sale of GHG emission allowances, otherwise known as "cap and trade," is deposited into the GHG Reduction Fund. Assembly Bill 577 would require the State Energy Resources



Conservation and Development Commission to use an unspecified amount of money from the State's GHG Emission Reduction Fund to develop and implement a grant program to award grants for projects that produce biomethane, that build or develop collection and purification technology or infrastructure, or that upgrade or expand existing biomethane facilities. The bill is intended to provide certainty in the biogas market which may attract further private development in this sector. The County is on record in support of this bill.

AGN. NO.

MOTION BY SUPERVISOR MARK RIDLEY-THOMAS

January 27, 2015

Providing Justification for Conversion Technology Investment
Relates to Agenda Item 16

Since 2010, the Los Angeles County (County) Department of Public Works has pursued various strategies to increase the utilization of non-combustion conversion technologies, which are aimed at reducing the amount of waste being sent to landfills, and are considered sustainable waste management solutions.

These facilities have proven to be very difficult to develop locally. Various legislative and regulatory frameworks have made these facilities complicated to permit and operate in California. The County has promoted alternative methods of waste disposal, and provided technical assistance to project developers to further this effort. However, there are no commercial-scale facilities yet operational within the County.

Progress was made in 2014 with the passage of County-sponsored Senate Bill 498, which helps clear the pathway to allow cleaner and more efficient technologies to be used to make low-carbon fuels as well as renewable energy from certain types of organic waste. However, significant work still needs to be done to ensure these technologies can be scalable to meet the County's goals. The Board of Supervisors (Board) recently approved a roadmap for a sustainable waste management future, which entails diverting 80 percent of solid waste from landfills by 2025.

- MORE -

MOTION

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MOTION BY SUPERVISOR MARK RIDLEY-THOMAS
JANUARY 27, 2015
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In 2014, Governor Brown also signed into law AB 1826, which requires businesses and government entities which generate organic waste to recycle. This bill also requires local jurisdictions to develop an organics management plan by December 31, 2015. This will require the waste industry to develop a number of conversion technology facilities to process organic material and the County to facilitate the permitting and development of these facilities.

Deployment of conversion technologies may help to divert a substantial amount of this waste stream. In order to realize this goal, the County must identify the specific barriers to rapidly and cost-effectively developing commercial-scale projects within the County. The Board should review data on the cost-effectiveness of this strategy and have a realistic sense of the timeframe and viability of scaling up this investment to meet the County's waste management needs.

I THEREFORE MOVE THAT THE BOARD OF SUPERVISORS:

Direct the Director of the Department of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable conversion technology projects (including amount of waste to be diverted, financial viability, project status, and significant impediments) that will allow the Board of Supervisors to meaningfully assess the efficacy of conversion technologies in meeting the County of Los Angeles' goal of a sustainable waste management future.

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