17th Technical Training Series

CalRecycle

April 3-6, 2017 · Long Beach Hyatt

200 South Pine Avenue · Long Beach, California, 90802

LACSD Food Waste Recycling Project Update

CalRecycle 17th Technical Training Series

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Los Angeles County Sanitation Districts

April 3, 2017

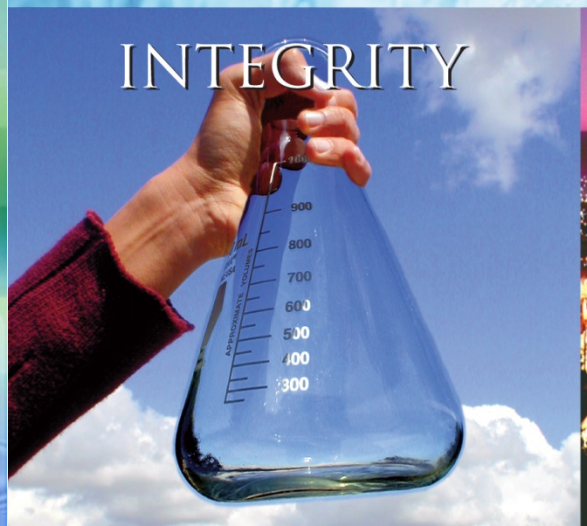
Our Mission Statement

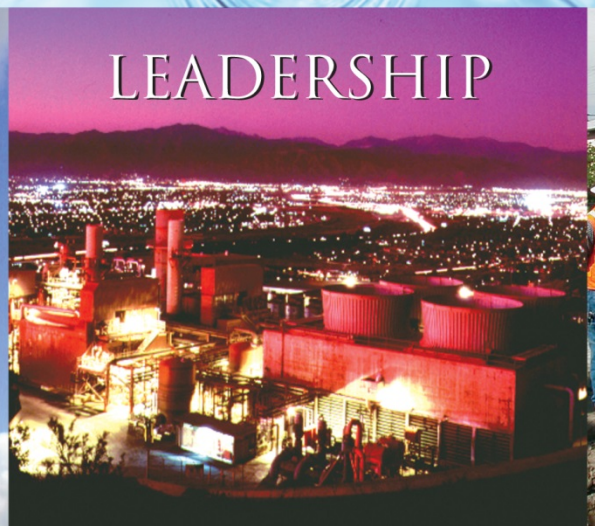
MISSION

SANITATION DISTRICTS OF LOS ANGELES COUNTY

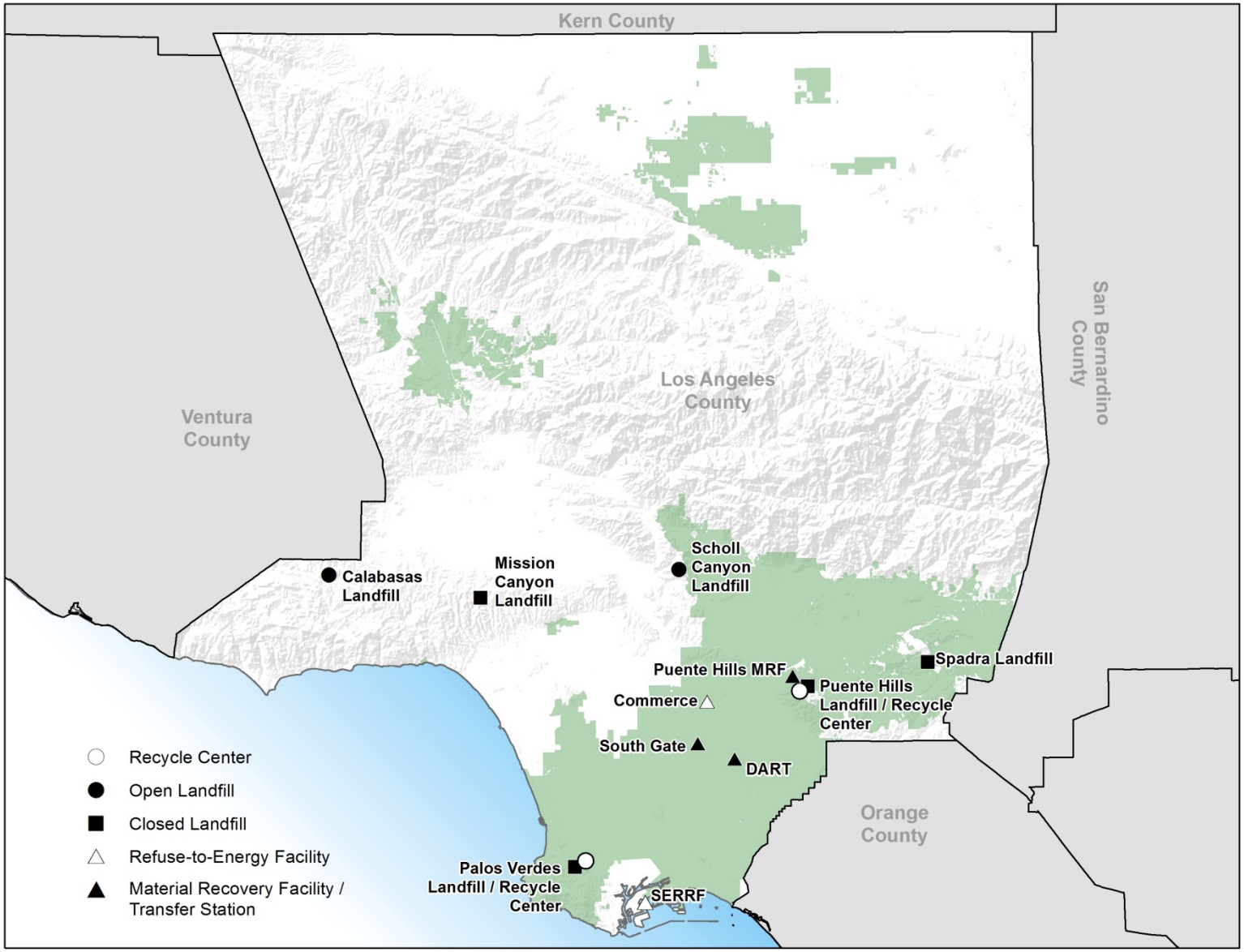
To protect public health and the environment through innovative and cost-effective wastewater and solid waste management and, in doing so, convert waste into resources such as recycled water, energy, and recycled materials.

SANITATION DISTRICTS OF LOS ANGELES COUNTY

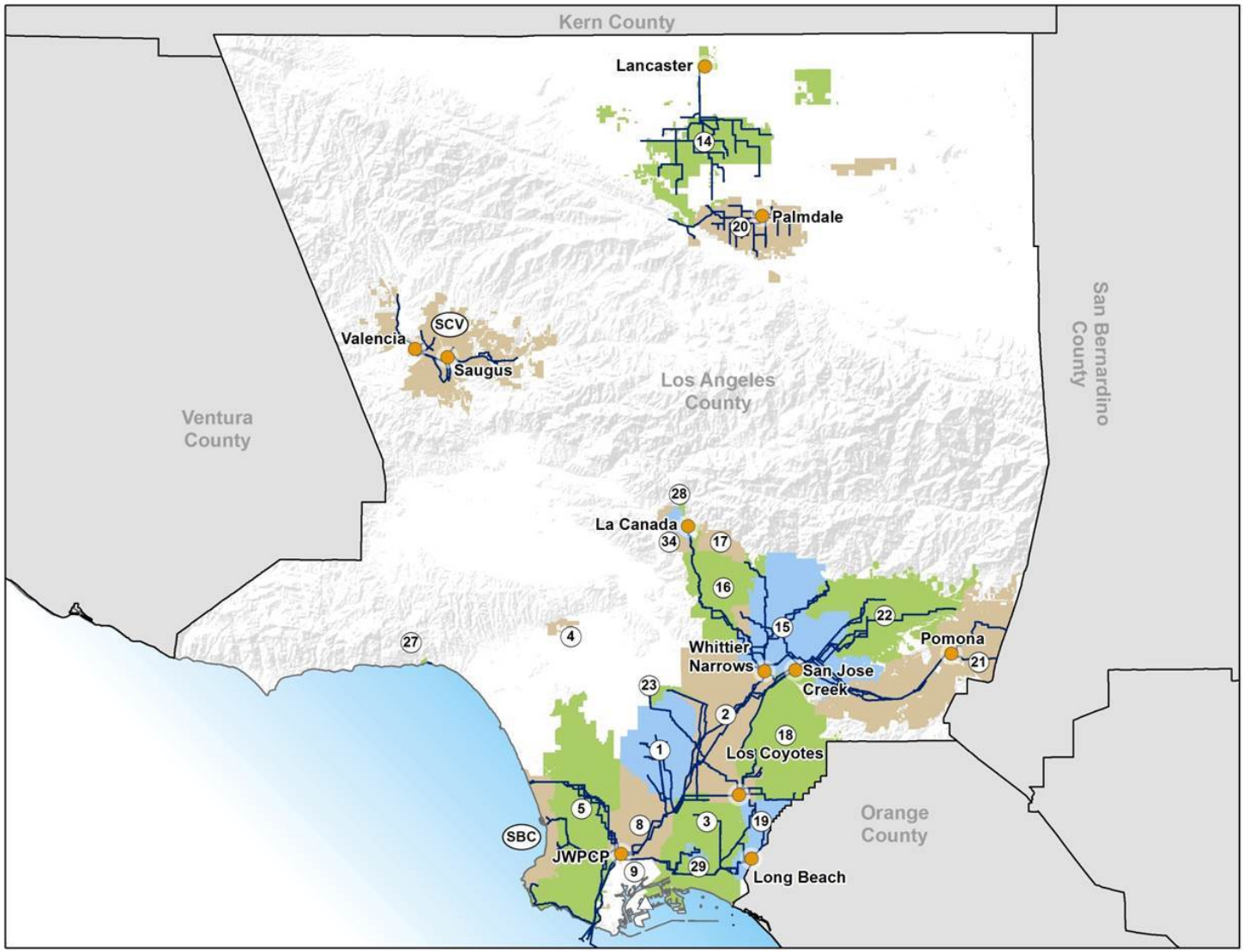




Districts' Solid Waste Facilities



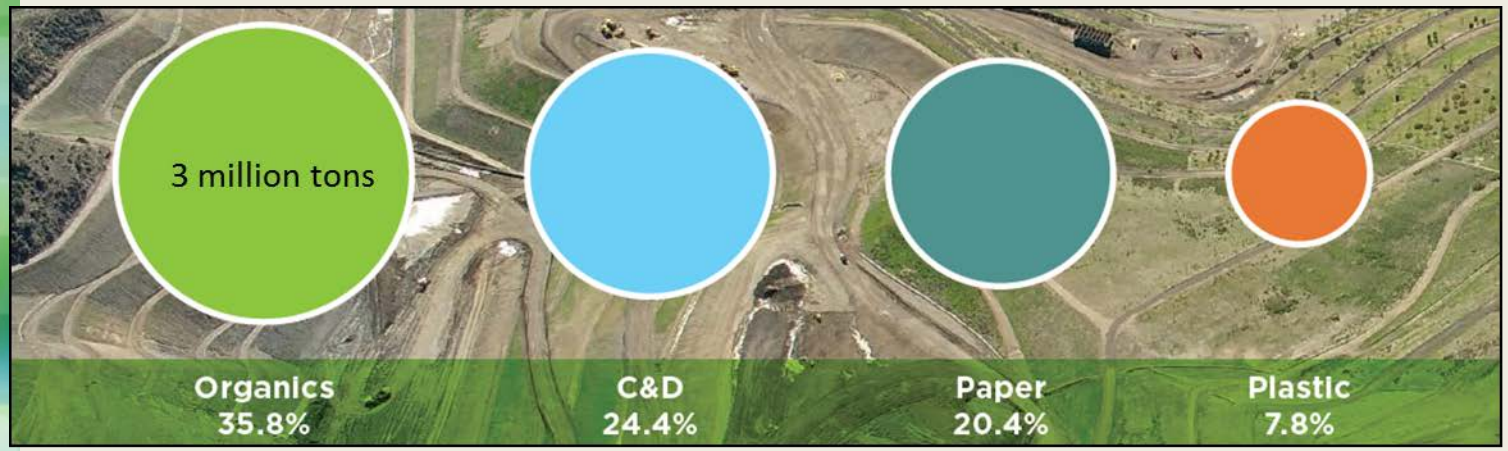
Districts' Wastewater Facilities



LOS ANGELES COUNTY

2012 Summary

Solid Waste	Million Tons
Generated	21.5
Disposed	8.8
Diversion Rate	60%



Source: Roadmap to a Sustainable Waste Management Future by Los Angeles County Department of Public Works, October 2014

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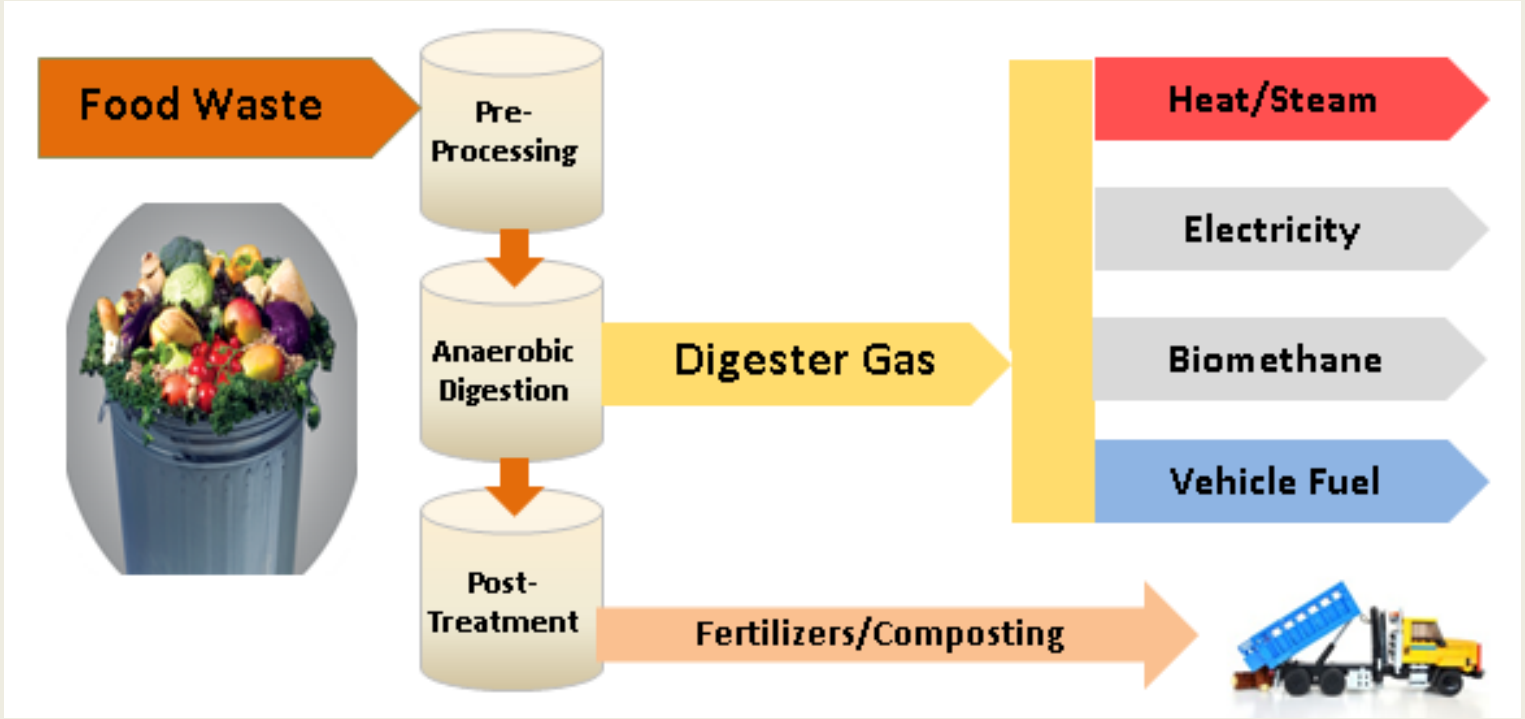
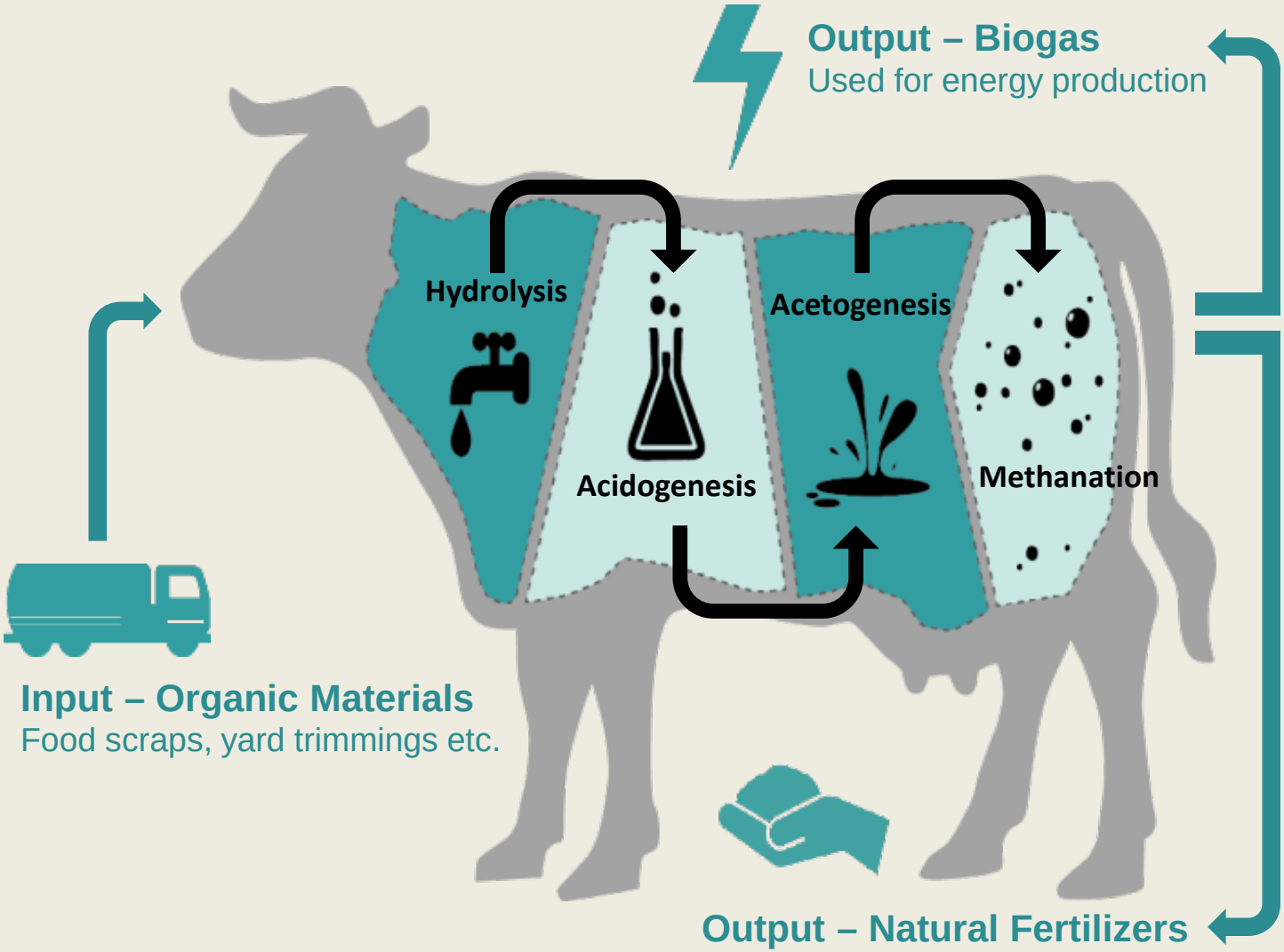
Food Waste Recycling Steps



Digesting the Waste

How a Digester Works

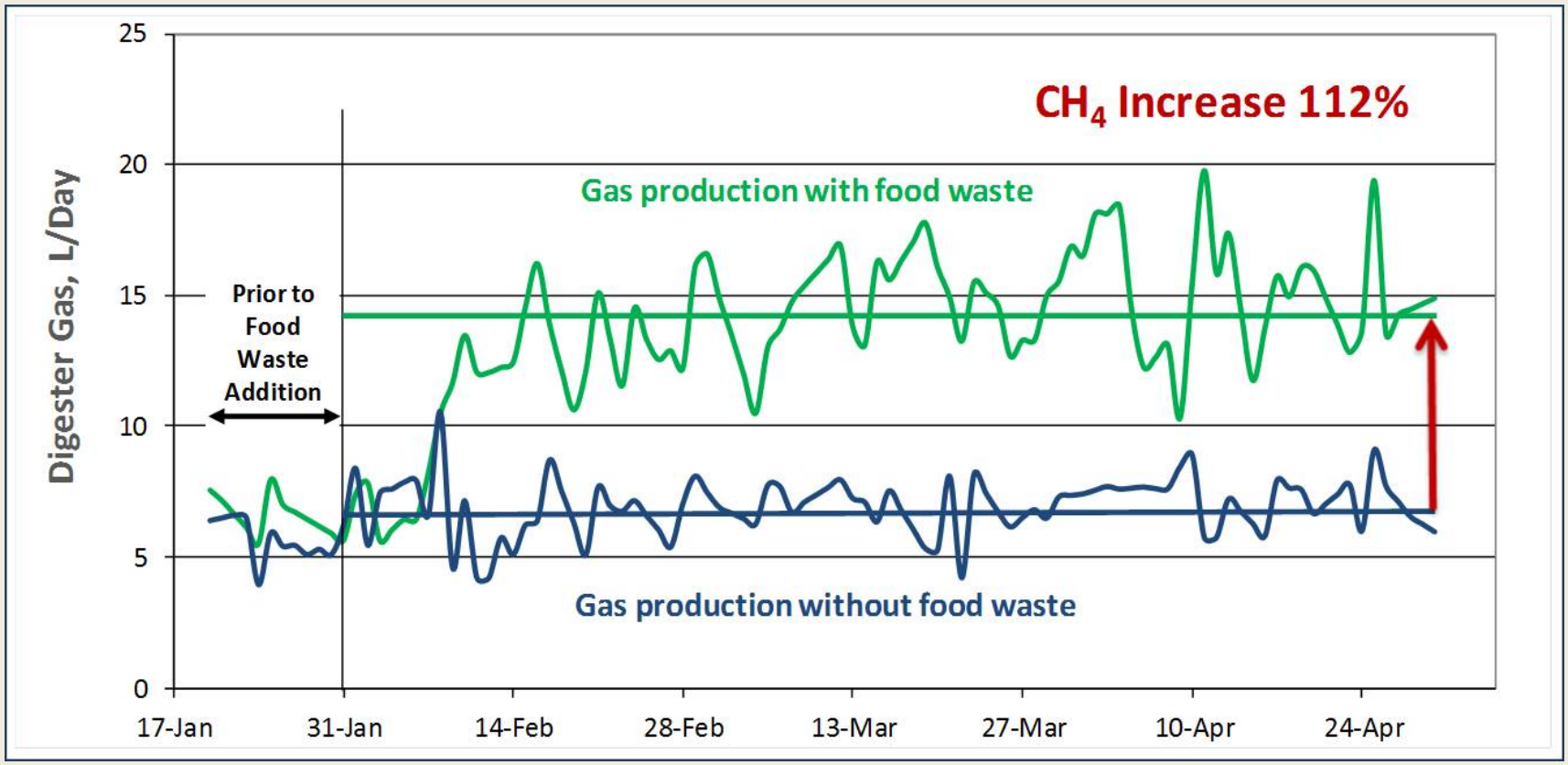


Digesting Organic Waste Streams at Wastewater Treatment Plants (WWTPs)

- Advantages:
  - Digester already exists
  - Energy recovery equipment already exist

  - California WWTPs have capacity for up to 75% of California's food waste stream
- Concerns and challenges:
  - Can accept only relatively clean feedstock
  - Impact of additional residuals on biosolids
  - WWTPs have an important public health mission

Adding Food Waste to Digesters Increases Biogas Production

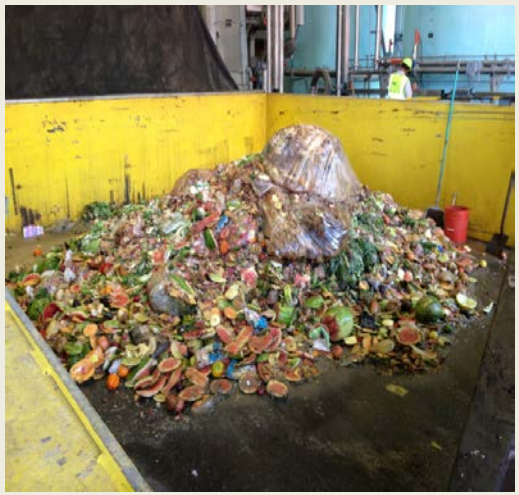


Adding 10-12% (v/v) food waste slurry to sludge could <u>double</u> biogas production

Food Waste Slurry characteristics: Total Solids ~ 14% by wt., Volatile Solids ~ 92% by wt., COD ~ 222,400 mg/L

Getting the Food Waste: Waste Management's CORe® Solution

- WM collects food waste from sources such as restaurants, food processing plants, cafeterias and grocery stores. Tipped material is inspected prior to processing.
- Food waste is processed to remove physical contamination (e.g., utensils, cans, packaging, and heavies) using WM's patented CORe® process.
- The processed food waste is blended and tested to manufacture a high quality, consistent EBS™ product.
- Manufactured EBS™ is loaded into tanker trucks for delivery to JWPCP.



Districts Objectives for Demonstration Project

- Assist Districts member cities and haulers in diversion efforts
- Determine the impacts of full-scale food waste co-digestion on WWTP operations

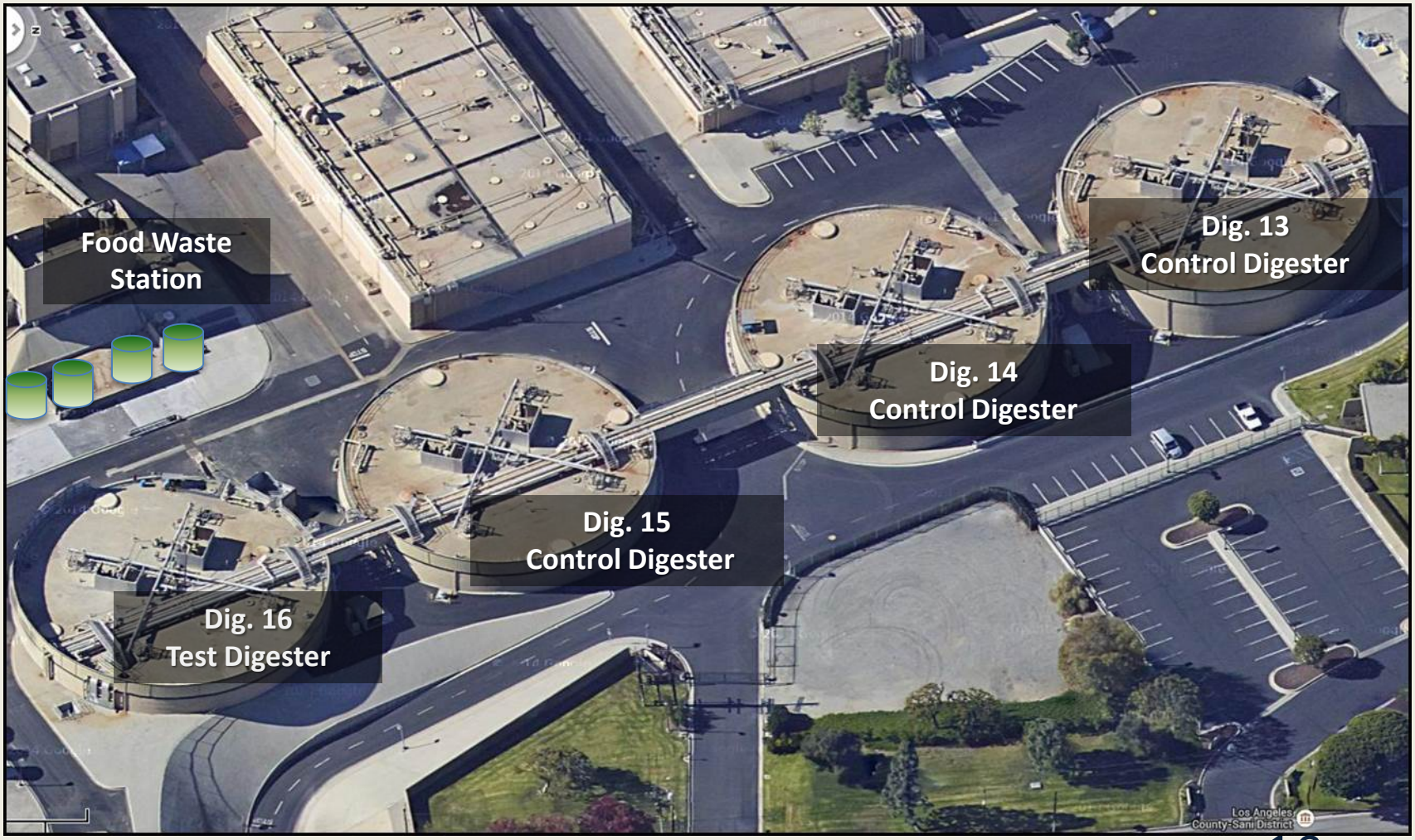
- Evaluate the performance and cost-effectiveness of food waste co-digestion at a WWTP
- Use project results to determine feasibility of a larger food waste digestion program at Districts wastewater treatment facilities

Demonstration Program Summary

- The Districts and Waste Management entered into a demonstration program agreement
- WM is processing food waste slurry at off-site location and delivering to JWPCP, with a target food waste diversion rate of 62 tons per day
- AT JWPCP, the slurry is injected into one digester for co-digestion at 9% food waste slurry on a liquids basis and 30% food waste on a solids basis
- WM and JWPCP's Research team are monitoring the program to evaluate the impacts and performance of food waste when co-digested at a WWTP

Joint Water Pollution Control Plant (JWPCP)

JWPCP Test and Control Digesters



Food Waste Receiving

Food waste is pumped from WM tanker trucks into closed, sealed storage tanks, controlling odors.

Co-Digestion Testing

- Start up of the receiving/feed-in station began Feb 3, 2014
- Approximately 62 tpd of source separated is processed by WM in Carson to generate 82 tpd (20,000 gallons) of slurry that is hauled to JWPCP
- The slurry is fed to one digester so that biogas production can be measured and the digestion process can be monitored
- Ramp up to full feed rate completed October 2016

Key Results to Date

- Food waste handling and storage systems have worked as designed
- No major impacts on treatment plant operation seen to date
- Biogas production has increased as expected
- The demonstration has been deemed a success and plans are being made to convert to a full scale commercial program

Use of Digester Gas from Food Waste

- Current usage of digester gas
  - TEF is minimizing flaring and uses additional digester gas to generate extra electricity for on-site use and for outside sale
  - Digesting 61 diverted tpd of food waste could produce an additional 274,000 cfd of biogas or 700 kW of electricity.
- Future options…

Electricity

Vehicle Fuel

Biomethane

Biosolids Drying

Biomethane Production

- Digester gas can be purified to natural gas standards
- Inject into pipeline for sale-significant interconnection costs
- Use or sell locally as vehicle fuel-bypasses interconnection issue
- Potential financial benefits
  - Vehicle fuel worth 4x more than natural gas
  - Renewable incentives for vehicle fuel are higher than renewable power incentives
- No significant local air emissions or major permitting issues

What to Expect Moving Forward: Other Districts Activities

- Districts are starting to receive food waste at our own Material Recycling Facilities
- Continued evaluation of organics diversion technologies and strategies
- Enter into contracts with additional haulers to receive food waste at JWPCP
- JWPCP capacity estimated at 500 tpd diverted food waste
- Be ready to serve our member cities

Thank you. Questions?

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"So, this Humpty Dumpty guy falls off the wall and I think, Dang, ain't lettin' this go to the food waste bin."