

Alternative Technology Advisory Subcommittee  
Los Angeles County Solid Waste Management Committee/  
Integrated Waste Management Task Force

**Minutes for February 18, 2021**

**WEB CONFERENCE**

Los Angeles County Public Works  
900 South Fremont Avenue  
Alhambra, CA 91803

SUBCOMMITTEE MEMBERS PRESENT:

Steve Cassulo, rep by Brenda Eells, Waste Connections  
Chris Coyle, rep by Dennis Montano, Republic Services, Inc. – Sunshine Canyon Landfill  
Michelle Dewey, rep by Paulina Kolic, California Department of Resources Recycling and Recovery (CalRecycle)  
Wayde Hunter, North Valley Coalition of Concerned Citizens, Inc.  
Ron Kent, rep by Paul Ghougassian, Southern California Gas Company  
Ben Lucha, City of Palmdale  
Kevin Mattson, Waste Management  
Mark McDannel, County Sanitation Districts of Los Angeles County  
Mike Mohajer, Los Angeles County Integrated Waste Management Task Force  
Christopher Sheppard, Los Angeles County Public Works  
Eugene Tseng, UCLA Solid Waste Program  
Carolyn Watson, rep by Dorcas Dee Daniel-Lugo, Los Angeles County Department of Public Health

SUBCOMMITTEE MEMBERS NOT PRESENT:

Alex Helou, City of Los Angeles  
Kay Martin, Bioenergy Producers Association  
Rob Williams, UC Davis Policy Institute for Energy, Environment and the Economy

OTHERS PRESENT:

Christine Arbogast, Tetra Tech  
Will Chen, County Sanitation Districts of Los Angeles County  
Nam Doan, Los Angeles County Public Works  
Kawsar Vazifdar, Los Angeles County Public Works  
Dr. Andrea Festuccia, enVerde, LLC.  
Dave Goebel, enVerde, LLC.  
Dr. Russ Hoge, enVerde, LLC.  
Carol Oyola, Los Angeles County Public Works  
Jeffrey Zhu, Los Angeles County Public Works

## **I. CALL TO ORDER**

Mr. Christopher Sheppard called the meeting to order at 10:01 a.m.

## **II. APPROVAL OF JANUARY 21, 2020 SUBCOMMITTEE MINUTES**

A motion to approve the minutes from the January 21, 2021 meeting was made by Mr. Mike Mohajer and seconded by Mr. Ben Lucha. The motion passed with one abstention.

Mr. Mohajer raised concern that the City of Los Angeles representative has not consistently attended meetings and suggested they be contacted. Mr. Sheppard responded staff had reached out to the City of Los Angeles and would follow up again.

## **III. PRESENTATION – ENVERDE, LLC**

Mr. Dave Goebel, CEO and Founder of enVerde, gave a presentation on the company's development of a conversion technology that can convert various waste streams, including biomass, plastics, oils, chemicals, paper, and agricultural residues, into syngas that can be used to create fuels, power, heat, and chemicals as well as biochar.

The technology differs from the typical gasification process because the system is portable and can be moved to where waste is generated. The syngas can be used on site immediately or can be stored. The syngas can be used to create hydrogen in three different ways: as a direct source, as an electrolysis fuel, or as a precursor to hydrogen carriers. The technology is scalable to accommodate different size feedstocks. A one-megawatt system requires approximately 50 feet in length, height, and width including the feedstock handling and preparation equipment, the catalytic reactor, and storage.

EnVerde's current goal is to commercialize their technology and set up a demonstration project. They also hope to eventually license the technology and allow others to operate the system while providing background support. They are currently looking for funding for their first commercial facility potentially in California.

Mr. Wayde Hunter commented that a material recovery facility may be a suitable site for a system. Mr. Hunter also asked if the process generates emissions. Mr. Goebel responded that it is a closed system and the only emissions generated would be from downstream applications to create syngas.

Mr. Mohajer asked about the difference between the thermochemical process and incineration. Mr. Goebel responded that the thermochemical process uses heat to break apart the chemical bonds of long chain molecules in the waste to produce syngas, unlike incineration where waste is directly burned as a fuel source.

Mr. Eugene Tseng asked about the throughput for a commercial scale facility. Mr. Goebel responded that a one-megawatt system would take 40 tons per day of waste.

Mr. Paul Ghougassian asked if enVerde has funding from the Department of Energy or other sources. Mr. Goebel responded that they sponsored the development of the technology and do not have any government funds but are looking for funding opportunities.

Mr. Sheppard asked how much funding is needed for a one-megawatt system. Mr. Goebel responded that it depends on the feedstock, but the cost ranges from \$3.5 million to \$5 million, with a higher cost for a system that can process multiple feedstocks. However, a 10-megawatt system would not cost 10 times more, because of economies of scale.

Mr. Tseng asked what level of preprocessing is needed. Mr. Goebel responded they prefer segregated streams over mixed streams of waste to optimize the operating conditions. The size of the feedstock may need to be reduced before entering the reactor, but the system can tolerate a high percentage of water in the waste.

Mr. Sheppard asked about the ideal feedstock for the system. Mr. Goebel responded that the ideal feedstocks are woody biomass, which was the first material tested in the system, and plastics which have fewer contaminants and can be fully converted into syngas with little residual material.

Mr. Ghougassian asked if the one-megawatt system can produce renewable natural gas (RNG) directly or if the syngas must go through a supplemental process. Mr. Goebel responded they would use a supplemental process to create RNG from syngas.

#### **IV. DISCUSSION REGARDING ANAEROBIC DIGESTION (AD) FACT SHEET**

The AD fact sheet was prepared for and distributed to the Task Force. The fact sheet illustrates the history of AD in the European Union (EU) versus the United States (US) and discusses different policies regarding landfill tip fees and energy costs. The fact sheet was prepared in response to questions the Task Force had last year regarding an ATAS presentation from True North Renewable Energy.

Mr. Mohajer stated he had several questions he sent to staff. Mr. Sheppard responded that staff would draft a response to his questions that will be sent to all ATAS Members. Mr. Sheppard stated that the fact sheet was initially prepared as an informational document for the Task Force, but staff is preparing a more detailed fact sheet to provide suggestions for policies changes to support the development of additional infrastructure in California.

Mr. Lucha commented that the fact sheet should expand on California's renewable portfolio standard. Mr. Sheppard responded that staff would address his concerns.

Mr. Sheppard listed Mr. Mohajer's main questions and added that the full list would be sent to all Subcommittee members:

- How the EU define organics versus the US;
- Factors that can impact development and operation of AD facilities besides landfill tip fees;
- The role of different feedstock types and collection systems in the ability for AD facilities to be built;
- The impact, if any, of waste-to-energy on landfills and AD facilities in the EU versus the US;
- Additional information on tip fees on the west coast and other states;
- Information not only on electricity pricing, but also on incentives for RNG fuels like low carbon fuel standards and renewable portfolio standards;
- The impacts, if any, of composting facilities on AD facility development; and
- The cost impacts of existing laws and regulations on AD facilities.

#### **V. UPDATE ON CONVERSION TECHNOLOGY POLICY AND LEGISLATION**

Due to time constraints, there was no update. The update will be provided at next month's Subcommittee meeting.

#### **V. UPDATE ON CONVERSION TECHNOLOGY EVENTS/MEETINGS/OUTREACH ACTIVITIES**

Mr. Doan mentioned the following conferences that are also listed in the Conversion Technology (CT) Newsletter and will be held virtually:

- CRRRA SB 1383 Conference: February 23 – 25, 2021
- Anaergia Webinar on Achieving SB 1383 Compliance Through High Diversion Organics Waste Processing Facilities: February 24, 2021
- Verde Xchange 2021: March 2 and 16, 2021
- SoCal SWANA Chapter Workshop Edible Food Recovery: March 11, 2021
- International Conference on Solid Waste Technology and Management: March 14 – 16, 2021
- International Biomass Conference & Expo: March 15 – 17, 2021
- SoCal Waste Management Forum Spring Conference: March 24, 2021
- SoCal SWANA Chapter Workshop Legislative Updates: April 8, 2021
- SoCal SWANA Chapter Workshop Safety Summit: May 13, 2021

#### **VI. UPDATE ON CONVERSION TECHNOLOGY PROJECT DEVELOPMENT**

Due to time constraints, there was no update. The update will be provided at next month's Subcommittee meeting.

**VII. PUBLIC COMMENTS**

No comments.

**VIII. ADJOURNMENT**

The meeting adjourned at 11:02 a.m. The next ATAS meeting is tentatively scheduled remotely for Thursday, March 18, 2021, at 10 a.m.