



**AEMETIS**

# Commercializing Below Zero Carbon Advanced Biofuels Production

Eric A. McAfee  
Chairman/CEO – Aemetis, Inc.  
January 28, 2019

# Disclaimer

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Certain of the statements contained herein may be statements of future expectations and other forward-looking statements that are based on management's current views and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in such statements. In addition to statements which are forward-looking by reason of context, the words "may, will, should, expects, plans, intends, anticipates, believes, estimates, predicts, potential, or continue" and similar expressions identify forward-looking statements.

Actual results, performance or events may differ materially from those projected in such statements due to, without limitation: (i) general economic conditions, (ii) ethanol and gasoline prices, (iii) commodity prices, (iv) distillers grain markets, (v) supply and demand factors, (vi) transportation rates for rail/trucks, (vii) interest rate levels, (viii) ethanol imports, (ix) changing levels of competition, (x) changes in laws and regulations, including govt. support/incentives for biofuels, (xi) changes in process technologies, (xii) the impact of acquisitions, including related integration issues, (xiii) reorganization measures and (xiv) general competitive factors on a local, regional, national and/or global basis, (xv) natural gas prices, and (xvi) chemicals and enzyme prices.

The matters discussed herein may also involve risks and uncertainties described from time to time in the company's annual reports and/or auditors' financial statements. The company assumes no obligation to update any forward-looking information contained herein, and assumes no liability for the accuracy of any of the information presented herein as of a future date.

## **Non-GAAP Financial Information**

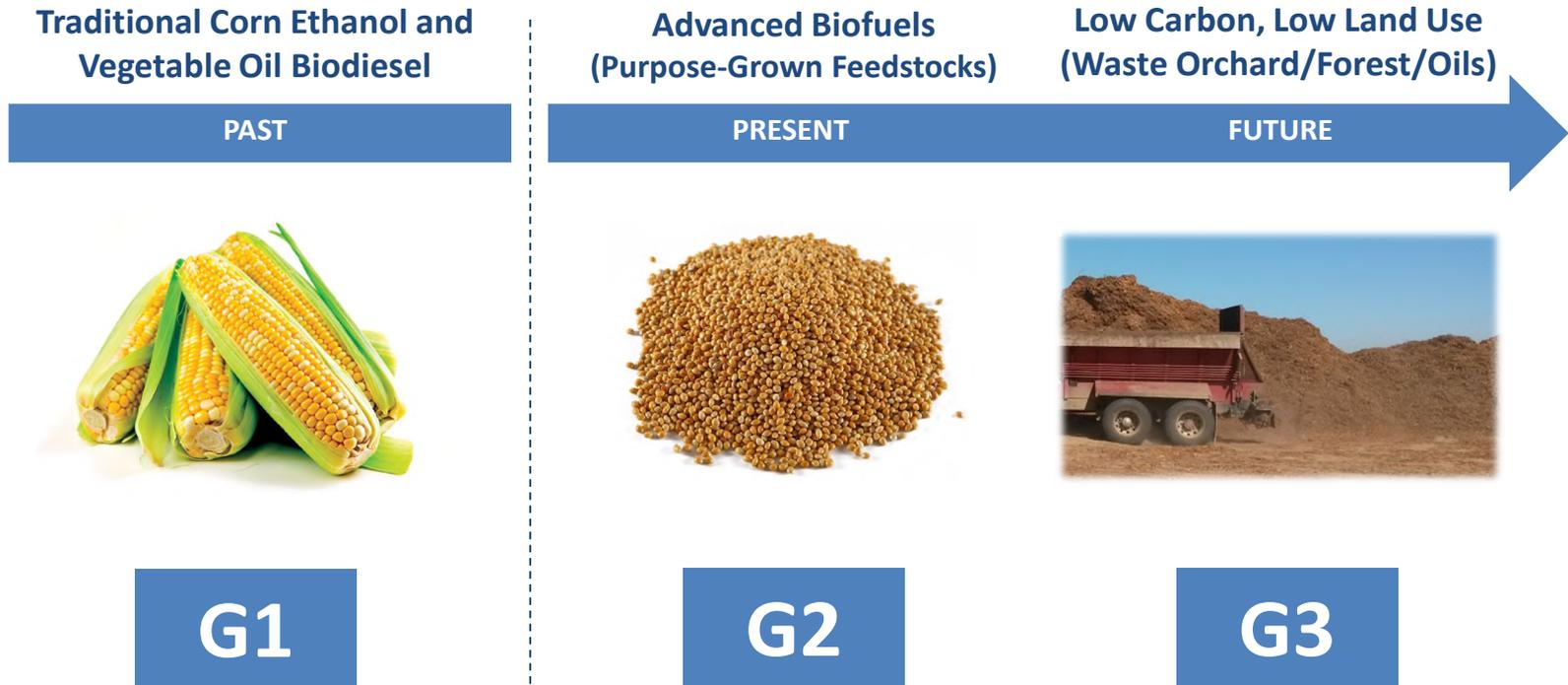
We have provided non-GAAP measures as a supplement to financial results based on GAAP. A reconciliation of the non-GAAP measures to the most directly comparable GAAP measures is included in the accompanying supplemental data. Adjusted EBITDA is defined as net income/(loss) plus (to the extent deducted in calculating such net income) interest expense, loss on extinguishment, income tax expense, intangible and other amortization expense, depreciation expense, and share-based compensation expense.

Adjusted EBITDA is not calculated in accordance with GAAP and should not be considered as an alternative to net income/(loss), operating income or any other performance measures derived in accordance with GAAP or to cash flows from operating, investing or financing activities as an indicator of cash flows or as a measure of liquidity. Adjusted EBITDA is presented solely as a supplemental disclosure because management believes that it is a useful performance measure that is widely used within the industry in which we operate. In addition, management uses Adjusted EBITDA for reviewing financial results and for budgeting and planning purposes. EBITDA measures are not calculated in the same manner by all companies and, accordingly, may not be an appropriate measure for comparison.



# Aemetis Mission

Aemetis is an international renewable fuels and biochemicals company using patented industrial biotechnology for the conversion of first-generation ethanol and biodiesel plants into advanced biorefineries.



# Aemetis Overview

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- **Founded in 2006 by biofuels veteran (co-founder of Pacific Ethanol; EPM)**
- **\$170 million revenue in 2018; 110 million gallons per year biofuels capacity**
  - Own/operate 60+ million gallon ethanol plant in California
  - Own/operate 50 million gallon capacity Biodiesel and Glycerin refinery in India
  - Building \$30 million Dairy Biogas digesters, pipeline and cleanup system
  - Building \$175 million Cellulosic Ethanol plant (waste orchard wood feedstock)



# Management and Board of Directors

## Board of Directors



**John Block** - Former Secretary of Agriculture from 1981-86 under President Reagan

**Fran Barton** - Former CFO of five high tech companies with revenues above \$1 billion

**Dr. Steven Hutcheson** - Molecular genetics founder of Zymetis, acquired in 2011 by Aemetis

**Lydia Beebe** – Former 20-year Chevron corporate officer (38 years at Chevron)



## **Eric McAfee - Chairman and CEO**

- Founder of *Aemetis* (NASDAQ: AMTX) and co-founder of *Pacific Ethanol* (NASDAQ: PEIX)
- Founding shareholder of oil production company *Evolution Petroleum* (NYSE: EPM)
- Founded seven public companies and funded twenty-five private companies as principal investor



## **Todd Waltz - EVP and CFO**

- Joined Aemetis in 2007
- Served in senior financial management roles with Apple, Inc. for 12 years
- Ernst & Young CPA



## **Andy Foster - EVP and President, Aemetis Advanced Fuels**

- Joined Aemetis in 2006
- Senior executive at three Silicon Valley tech companies
- Served in the George H.W. Bush White House (1989-1992) as Associate Director - Office of Political Affairs and as Deputy Chief of Staff for Illinois Governor Edgar for five years

## **Sanjeev Gupta - EVP and President, Aemetis International**

- Joined Aemetis in 2007
- Manages India biodiesel and glycerin business
- Previously head of petrochemical trading company with about \$250 million revenues and offices on several continents



# Unique Attribute of Biofuels: “Below Zero” Carbon Emissions

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**Solar, Wind, Hydro and Nuclear electricity** reduce emissions of new greenhouse gases compared to coal and petroleum, but **do not consume CO<sub>2</sub>** from the atmosphere.

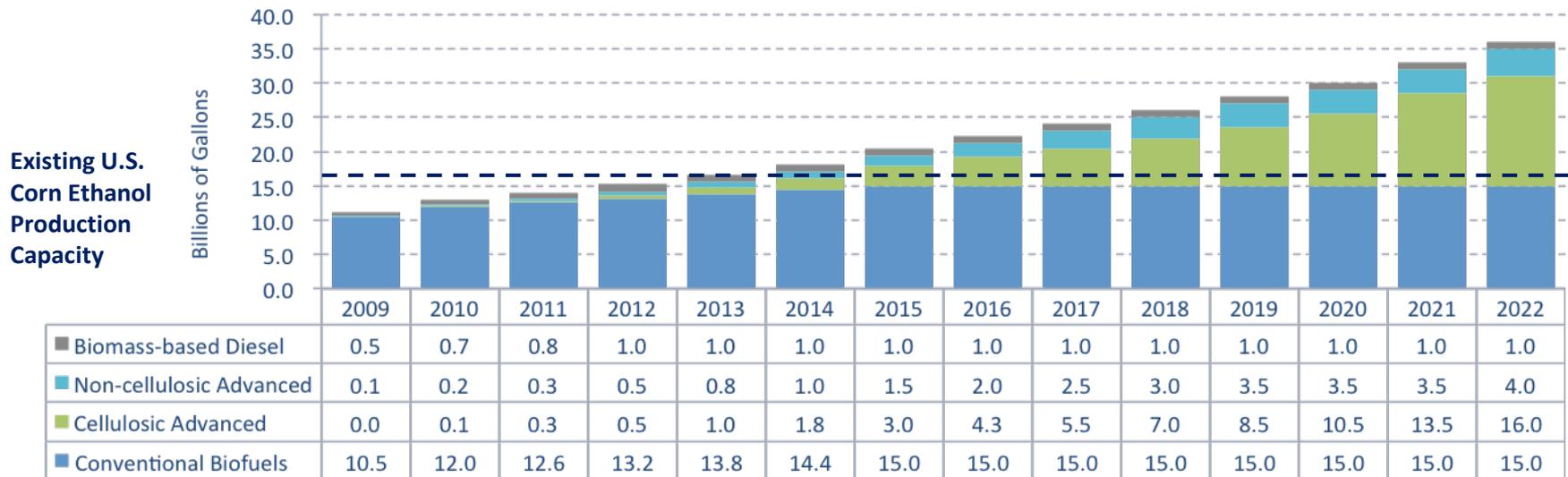
**Renewable fuels and biogas** from plant materials **consume CO<sub>2</sub>** and **can help reverse Climate Change** by the use of waste wood and renewable oil feedstocks to produce biofuels.



# Expanding US Federal Renewable Fuel Standard Mandate

*In order to meet the federal Renewable Fuel Standard, obligated parties are required to blend biofuels in increasing quantities each year*

- “Conventional Biofuels” reduce greenhouse gas emissions by 20% relative to gasoline/diesel
- “Advanced Biofuels” reduce greenhouse gas emissions by 50% relative to gasoline/diesel
- Higher ethanol blends (E15 and E85), recent ASTM approval of 100 octane gasoline and expanding export markets expected to drive favorable supply/demand for biofuels

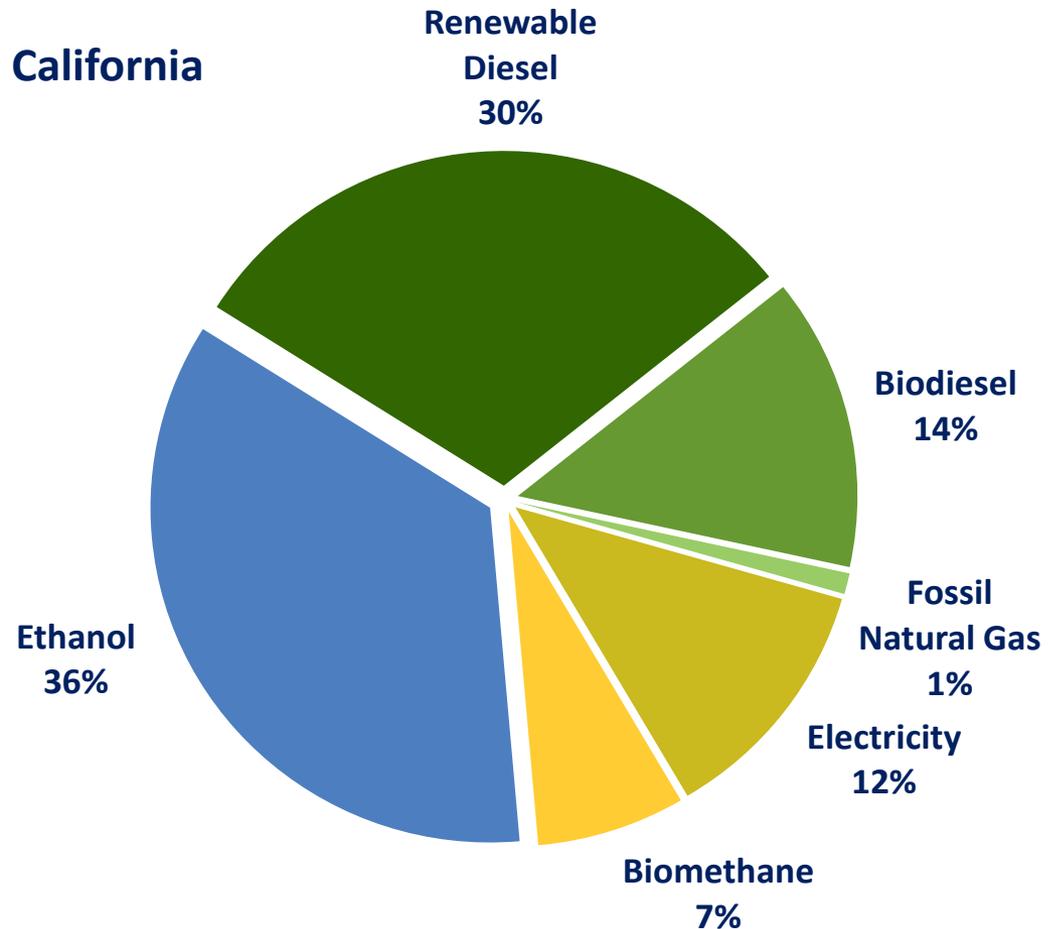


# California LCFS Carbon Reduction

## Biofuels Lead Carbon Reduction in California

California LCFS Carbon Credit Generation by Fuel Type - 2017

- Ethanol
- Renewable Diesel
- Biodiesel
- Fossil Natural Gas
- Electricity
- Biomethane



California Air Resources Board: "Low Carbon Fuel Standard Re-Adoption: Fuel Availability" - April 25, 2018



# California LCFS: Favorable and **Enforced** Regulatory Environment

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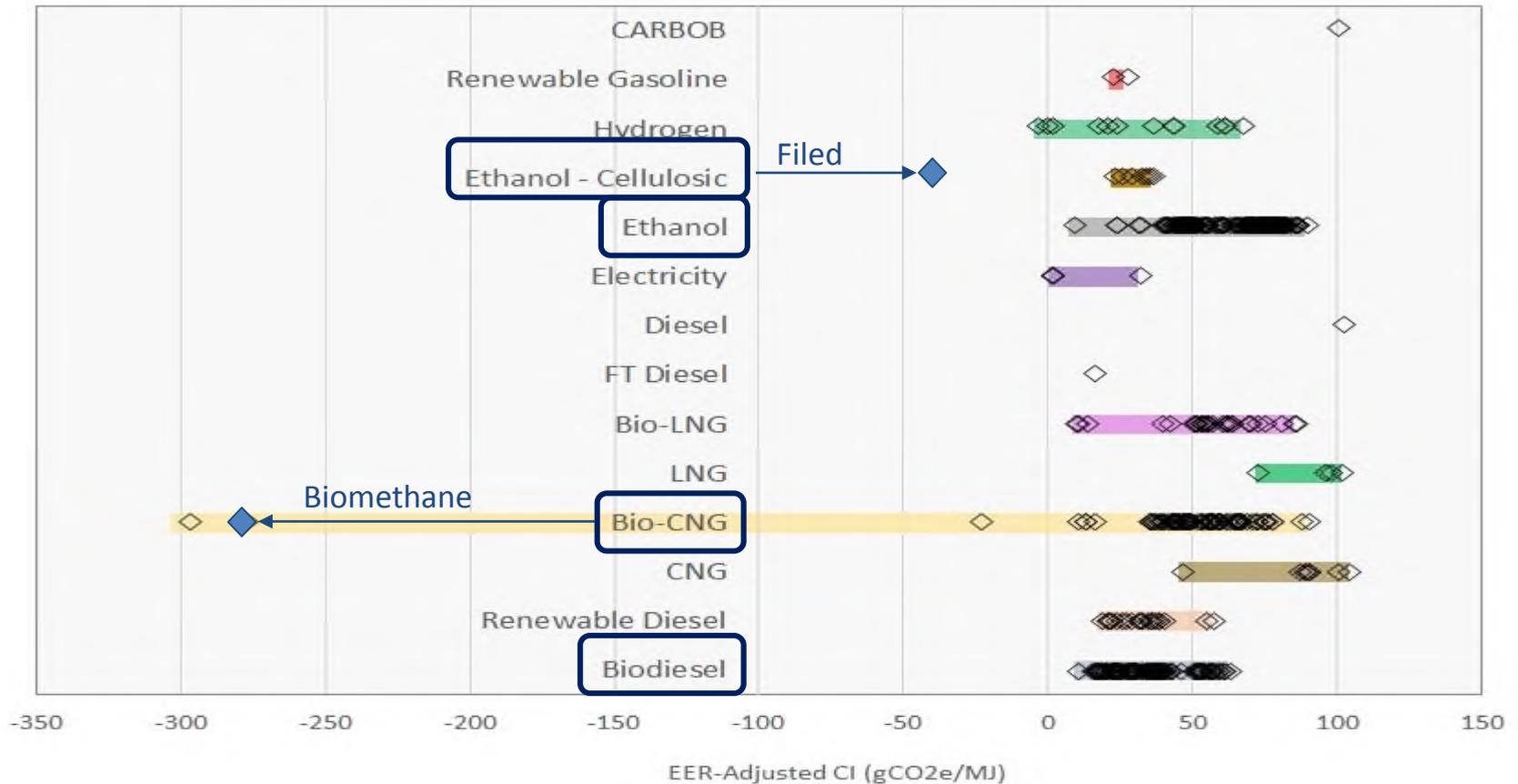
## California Low Carbon Fuel Standard (LCFS)

- The Low Carbon Fuel Standard (LCFS) is administered by the **California Air Resources Board**
- The LCFS “**Cap and Trade**” system was established in 2007 and **extended in 2017 to year 2030** to offset emissions from petroleum fuels
- Petroleum importers, refiners and wholesalers can either develop their own low carbon fuel products or **buy LCFS credits** from other companies that develop and sell low carbon alternative fuels, such as biofuels plants
- LCFS credits traded \$62 in July 2017, but **LCFS credits are now \$190**



# California LCFS Carbon Intensity Values: Aemetis Products

Carbon Intensity Values of Current Certified Pathways (2018)



Source: California Air Resources Board - October 2018





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# Aemetis Cellulosic Ethanol Overview

# Ethanol Molecule: High Octane, High Oxygen, Replace BTEX

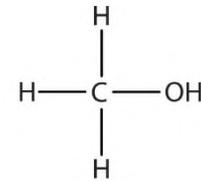
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## *Unique Properties of Ethanol Molecule*

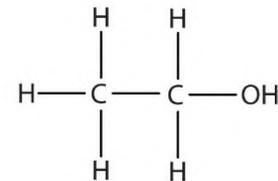
- Ethanol is 114 octane = prevents pre-ignition of fuel and lost power under high compression
  - Higher octane = higher compression engines = better fuel efficiency
  - Replace benzene and other harmful BTEX additives in gasoline
- Ethanol is 34% oxygen by weight
  - Cleaner burning gasoline
  - Reduce air pollution



methanol



ethanol



# Problem: California Orchard Waste Wood Burning

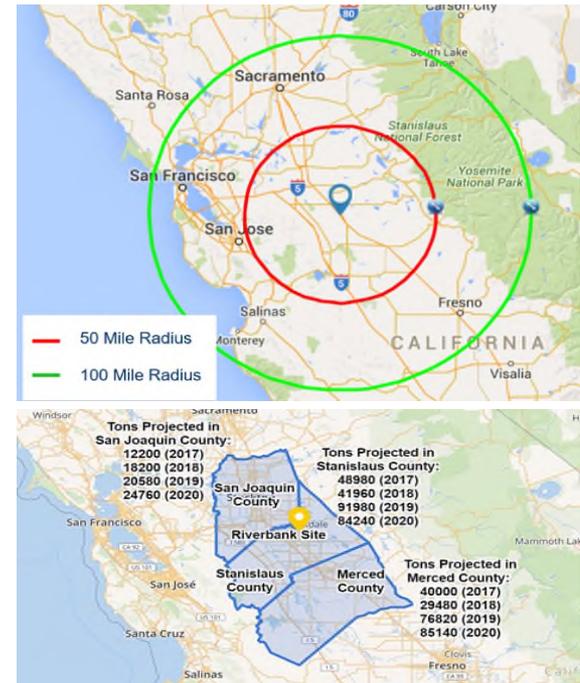
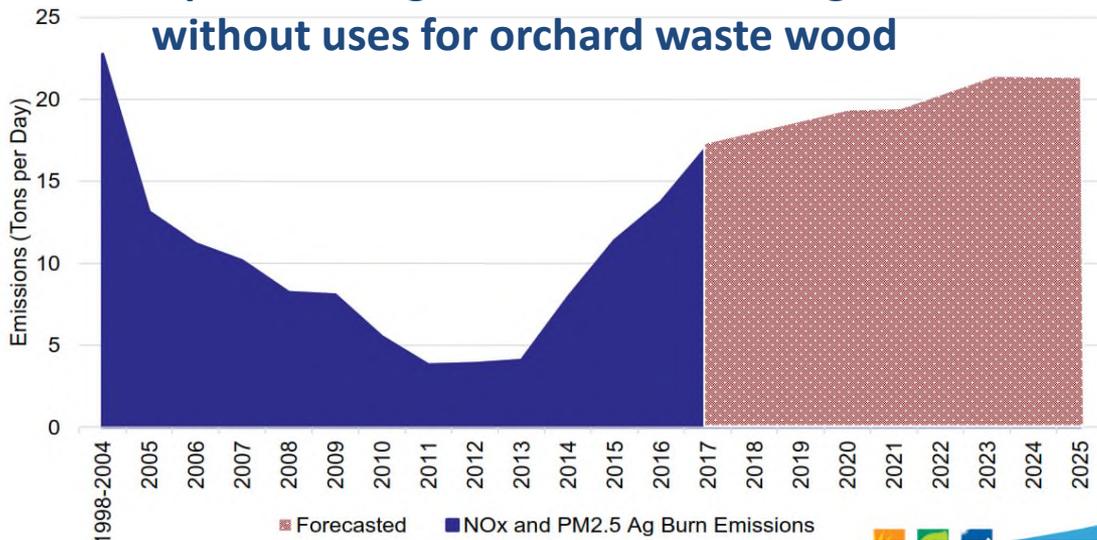
## Biomass-to-Energy Plants Closing in California

- More than 40% of biomass-to-electricity plants have shut down in California
- Lack of ability to compete with low-cost solar, wind and natural gas electricity

## About 1.5 million acres of almond and walnut orchards in Central California

- 2+ million tons/year of Ag Waste

### Open Burning Emissions Increasing without uses for orchard waste wood



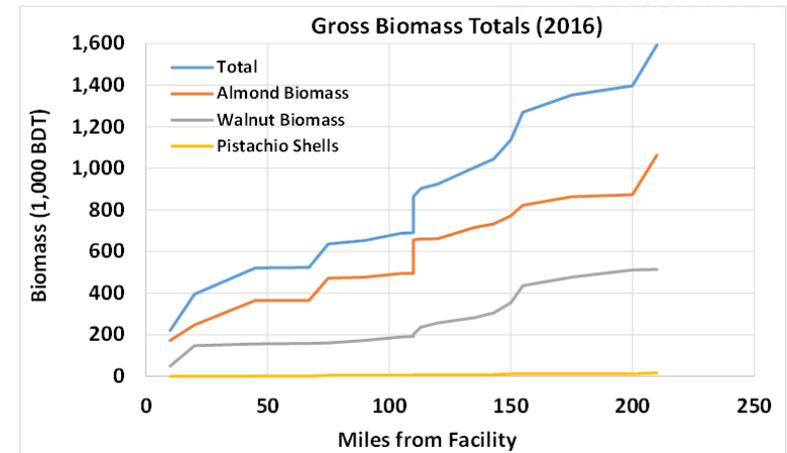
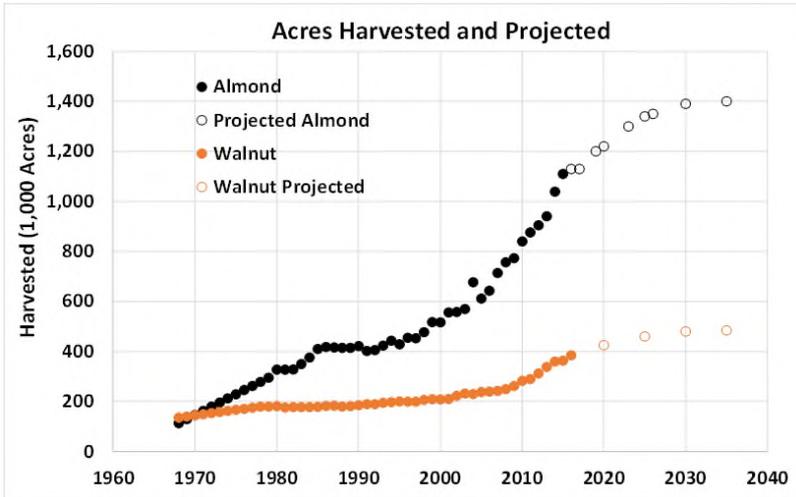
Source: San Joaquin Valley Air Control District Emergency Meeting on Open Burning November 2017



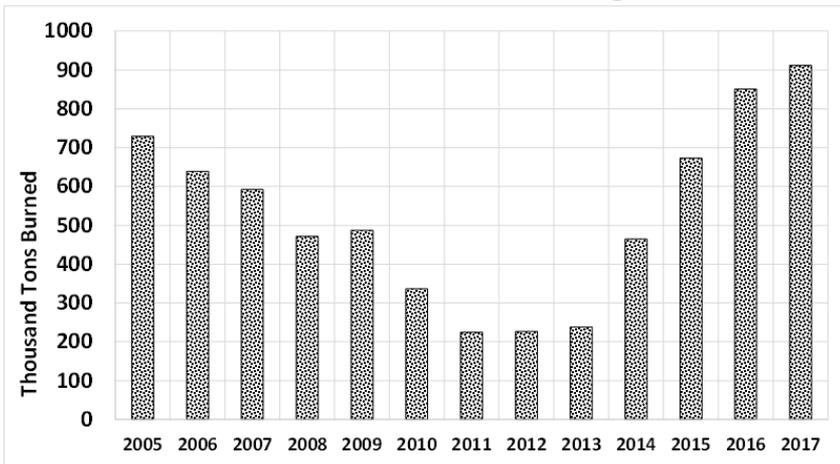
# UC Davis Feedstock Study Results



## Increase in Waste Wood



## Increase in Burning



## UC Davis Study Conclusions:

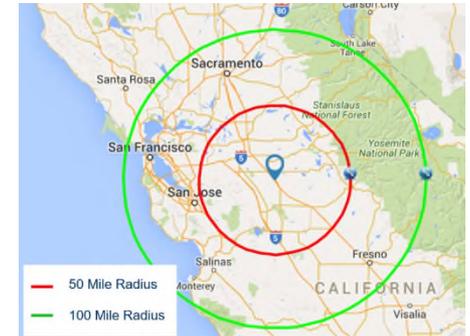
- Confirmed air emissions assumptions for carbon intensity score under LCFS
- Confirmed biomass growth and availability tonnage
- Confirms feedstock pricing and feedstock projected cost for 20 years
- Expanding supply due to lifecycle of trees



# Solution: Convert Orchard Wood Waste to Low Carbon Ethanol

## About 1.5 million acres of almond and walnut orchards in CA

- 20 year almond tree life = remove about 40,000 acres per year
  - Up to 40 tons per acre for each orchard removed
  - Orchard/vineyard wood waste = 2+ million tons per year
- Pistachio shells and hulls have limited uses



## *California orchard waste can produce 160+ million cellulosic ethanol gallons per year*

- At 80 gallons per ton of waste feedstock, requires 1.6 million tons of wood biomass per year
  - Also available Forest, Construction & Demolition wood waste
- Creates 30,000 direct/indirect jobs in Central Valley
- Attracts \$1.6 billion of new capital investment to California
- Eliminates air pollution from orchard, vineyard and forest wood burning



# Biomass to Cellulosic Ethanol

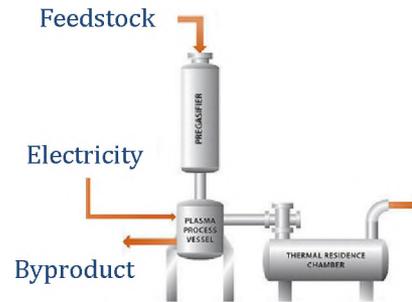


1

Feedstock

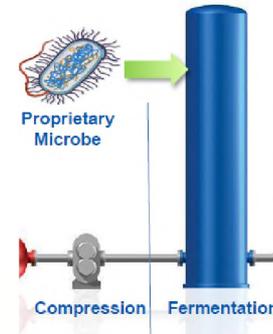
Biomass

- Orchard Wood Waste
- Ag Byproducts
- Forest Wastes



2

Thermal Transformation



3

LanzaTech Fermentation



4

Ethanol Plant Integration



Aemetis is implementing the first **biomass-to-biofuels** plant using the LanzaTech process



# LanzaTech Facilities

16 million gallon nameplate plant operating in China on steel mill gas

Demo Plants: 100,000 combined operating hours

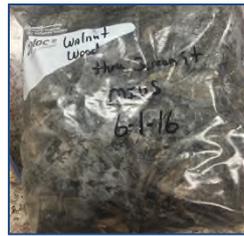
Multiple operating runs exceeding 2,000 hours



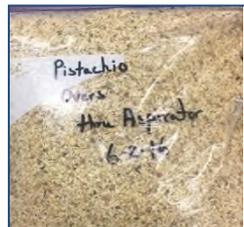
*Multiple plants at various scales demonstrated key aspects of process*



# Aemetis Integrated Demonstration Unit Completed



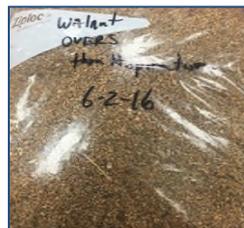
Walnut Wood



Pistachio Shell



Almond Wood



Walnut Shell



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Gasification



Gas Cleaning



Fermentation





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# Riverbank Project Development

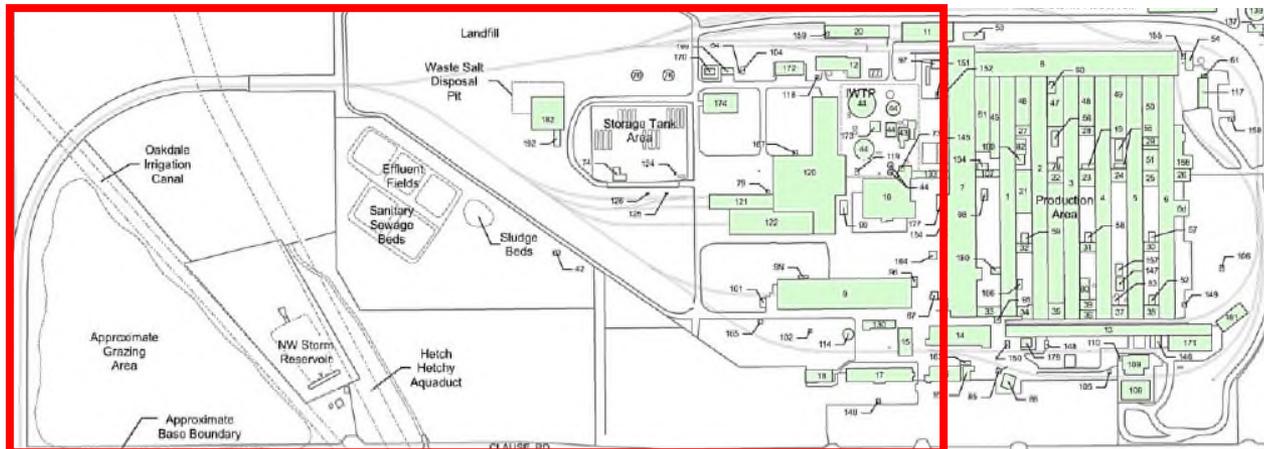
# Riverbank Site: Aemetis 55 Year Lease Signed

- Former US Army Ammunition Production Plant near Modesto, CA
- Additional space for expansion
- Existing Power and Building Infrastructure
- 100% Hydroelectric Power
- Rail spur in place
- Feedstock storage areas adjacent to plant



## Site Status:

- Site Layout Complete
- Site Permitting Complete



# 20-Year Feedstock Contract Signed

- Signed 130,000 ton for \$15 BDT fixed price
- Price escalator increases price by \$1-2/BDT per year
- 20 year agreement, 10 year initial term with renewal for an additional 10 years
- No obligation to purchase feedstock
- Specific feedstock composition and logistics negotiated



## Aemetis Feedstock Purchase Agreement

This Feedstock Purchase Agreement (the "**Agreement**") is made and entered into as of July 27, 2017 ("**Effective Date**"), by and between

("Seller"), to sell and deliver, and Aemetis Advanced Products Keyes, Inc., a Delaware corporation having a place of business at 20400 Stevens Creek Boulevard, Suite 700, Cupertino, California 95014 ("**Buyer**") to purchase and receive Feedstock under the following terms and conditions. The Seller and the Buyer are the parties to this Agreement (the "**Parties**").

The Parties hereby agree as follows:

1. **Feedstock:** "Feedstock" has the meaning set forth in Exhibit A and as more fully described in Exhibit C hereto. The Seller hereby agrees to deliver to Buyer ten thousand Bone Dry Tons (10,000 BDT) monthly during the duration of this Agreement (the "Feedstock Tons"). Buyer shall provide thirty (30) days prior written notice to Seller before the first delivery of Feedstock by Seller to Buyer. Buyer shall thereafter have the right to increase or decrease the daily deliveries of Feedstock at any time upon five (5) days prior written notice, not to exceed the Feedstock Tons per month and not to be less than 2,000 Bone Dry Tons per month. At the election of Buyer, Feedstock deliveries shall be to facilities in or near five (5) miles from Modesto, California.
2. **Price:** The base price ("Base Price") for Feedstock shall be fifteen dollars per Bone Dry Ton (\$15.00/BDT) delivered FOB Buyer's plant. Buyer shall pay for the delivered Feedstock by the 25th day of the month after the month of delivery.
3. **Delivery:** Seller shall deliver to Buyer the Feedstock as defined in Exhibit A attached to this Agreement. Buyer shall receive Feedstock deliveries Monday through Saturday between 6:00 AM and 6:00 PM, but reserves the right to modify delivery hours as it deems necessary. Feedstock shall be delivered to Aemetis Advanced Products Keyes, Inc. at 5300 Claus Road, Riverbank, California 95357 or another facility within five (5) miles of Modesto, California, as directed by the Buyer.
4. **Term:** The Term of this Agreement ("Term") is for twenty (20) years from the date of first delivery of Feedstock, as described in and subject to the attached Exhibit B - Terms & Conditions which are hereby made a part of this Agreement as if fully set forth herein.
5. **Title and Warranty:** Seller warrants and represents that it shall have legal title to all Feedstock sold to Buyer hereunder, and that the Feedstock shall be produced and transported in accordance with all applicable laws and regulations. Buyer reserves the right to reject any Feedstock delivery which does not meet the Feedstock specifications in Exhibit A of this Agreement or is deemed unsafe for unloading ("Unacceptable Feedstock").
  - a. **Insurance:** Seller shall maintain workers' compensation, property damage, and liability insurance, and shall cause its transportation contractor(s) to maintain truck insurance, as required by law.
  - b. **Title:** Title and risk of loss of Feedstock shall pass to Buyer upon delivery F.O.B. Buyers facilities.

*PL*



# USDA 9003 Loan Guarantee Approved for \$125 million Loan

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## Loan Overview

- USDA 9003 Biorefinery Assistance Program
- \$125 million, 20 year bank syndicated loan with 80% USDA Loan Guarantee
- Aemetis has invested \$10+ million in project to date

## Milestones Achieved

- Environmental Assessment Completed
- 20 year Feedstock Contracts Completed
- Ethanol Off-Take Contracts Completed
- Integrated Demonstration Unit operated for 120 days
- Bank Approved Financial Model Complete
- Technical Report Completed
- Preliminary Engineering



# EB-5 Approved Exemplar by USCIS for \$50 million



- USDA “National Interest” EB-5 project support letter received
- Aemetis advanced biofuels project converts former Army ammunition plant
- Creates 2,000 new direct, indirect and induced jobs
- Aemetis completed \$35 million EB-5 raise for Keyes ethanol plant
- 3% interest rate, subordinated funding, no conversion into stock
- No equity dilution to Aemetis

## Job Creation

	2019	2020	2021	2022	2023
Revenues	\$63,381,000	\$92,125,000	\$94,718,000	\$95,135,000	\$95,353,000
Total Jobs	836	1,127	1,424	1,720	2,014



# Permits: Finding of No Significant Impact (FONSI) Completed

- USDA Office of General Counsel Review Complete
- NEPA and FONSI newspaper postings complete
- Public comment period and responses accepted by OGC complete



United States Department of Agriculture  
Rural Development

## FINDING OF NO SIGNIFICANT IMPACT

Multi-Feedstock Ethanol Production Facility  
Aemetis Advanced Products Keyes, Inc.  
Riverbank, California

Rural Business-Cooperative Service  
U.S. Department of Agriculture

Prepared by:  
Peggy Wade  
Program Support Staff  
Rural Housing Service

September 2017

1400 Independence Ave, S.W. Washington, DC 20250-0700  
Web: <http://www.rurdev.usda.gov>

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To file a complaint of discrimination write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, DC 20250-9410 or call (800)795-3272 (voice) or (202) 720-6382 (TDD).



### AFFIDAVIT OF PUBLICATION

Account #	Ad Number	Identification	PO	Cols	Lines
614522	0003289893	FONSI PUBLIC NOTICE JEFF WELCH	FONSI NOTICE JEFF WELCH	1	50

#### Attention:

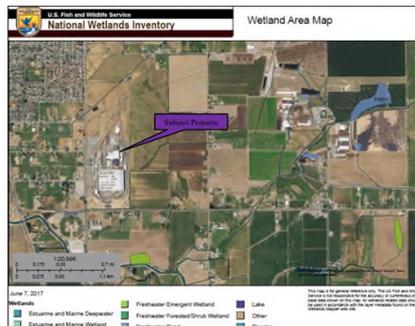
AEMETIS INC.  
20400 STEVENS CREEK BLVD  
SANTA CLARA, CA 95051

#### Declaration of Publication C.C.P. S2015.5

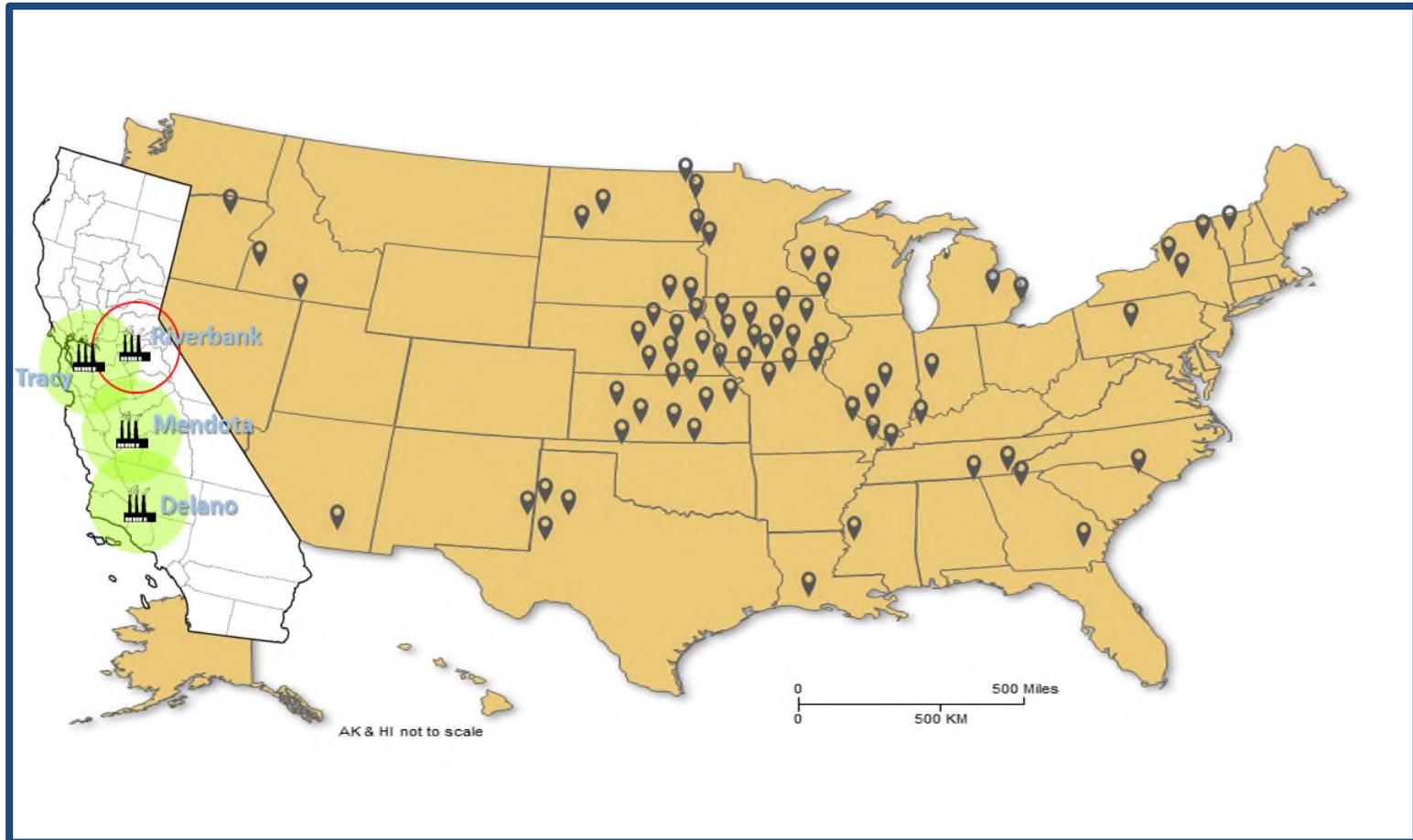
STATE OF CALIFORNIA )  
 ) ss.

#### 4.6.4 No-Action Alternative

Under the no-action alternative, there appears to be no significant difference from the preferred alternative of implementing the proposed project.



# Future Expansion in California: 160 million gallons at 4 plants



# Policies for Expansion of Biofuels Project Funding

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- **CEC grants: “Time is Money”**

- CEC grants are key support for low carbon fuels projects
  - currently up to 6 months for CEC grant NOPA
  - then 3 months to 12 months to sign final agreement before reimbursable project work can begin
    - project developer may receive a CEC grant, but then must decide to **delay the project for up to a year in order to use the funding**

- **New California Loan Guarantee Program (similar to USDA 9003): “Help Pensions and Banks Fund Projects”**

- Currently no biofuels loan guarantee program in CA
- CalPERS Direct, banks and others could fund projects with guarantee provided by cap-and-trade funding
  - Reduce risk for lenders while providing higher yields to fix underfunded pension plans in California



# Policies for Expansion of Biofuels Markets

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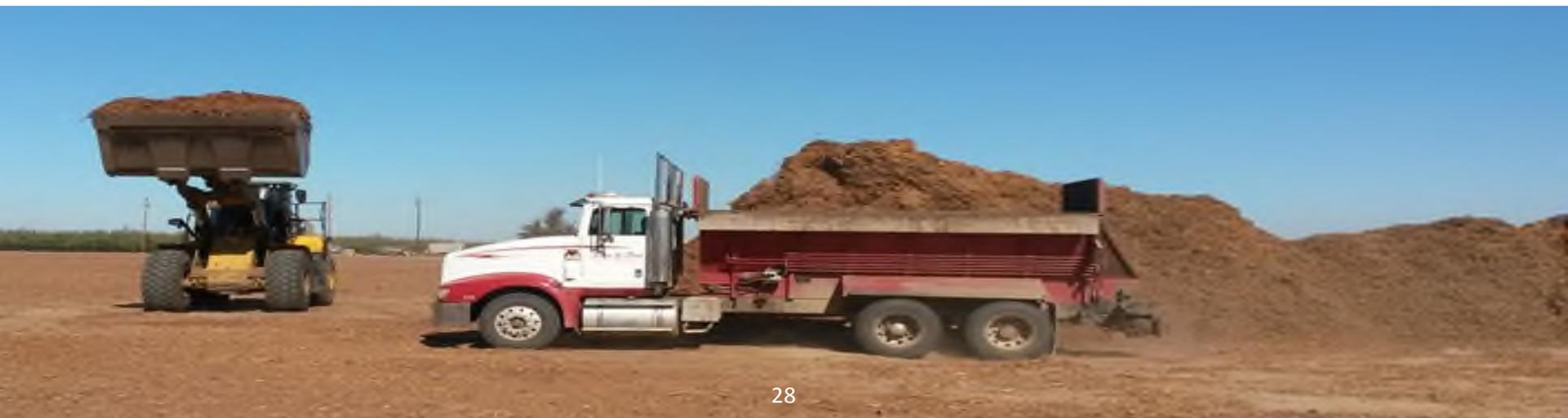
- **California should avoid federal EPA mistakes related to Renewable Fuel Standard:**
  - Issuance of “hardship waivers” to 42 highly profitable refineries that cancelled blending of 2.25 billion ethanol gallons in 2016 and 2017
  - “Biofuels” is not “renewable electricity”, so Renewable Fuel Standard RIN’s should not be issued to biomass electricity plants
- **Expand the market for biofuels by changing the “90% Petroleum Mandate” to “Consumer Choice at the Pump”:**
  - E15 (15% ethanol) approval year-round (EPA approval in 2019)
  - Mandate “Blender Pumps” for E10, E15, E30, E85 and E100 blends

**“Blender Pumps Provide Consumers a Choice at the Pump to Lower Fuel Costs, Reduce Carbon Emissions, Improve Air Quality, Support National Energy Security and Create California Jobs”**





**RNG from Dairy Biogas and Advanced Biofuels from Orchard Waste  
Producing “Below Zero Carbon” Renewable Fuel**





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