Creating Value to Overcome Barriers in Waste Feedstock Supply Chains

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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.

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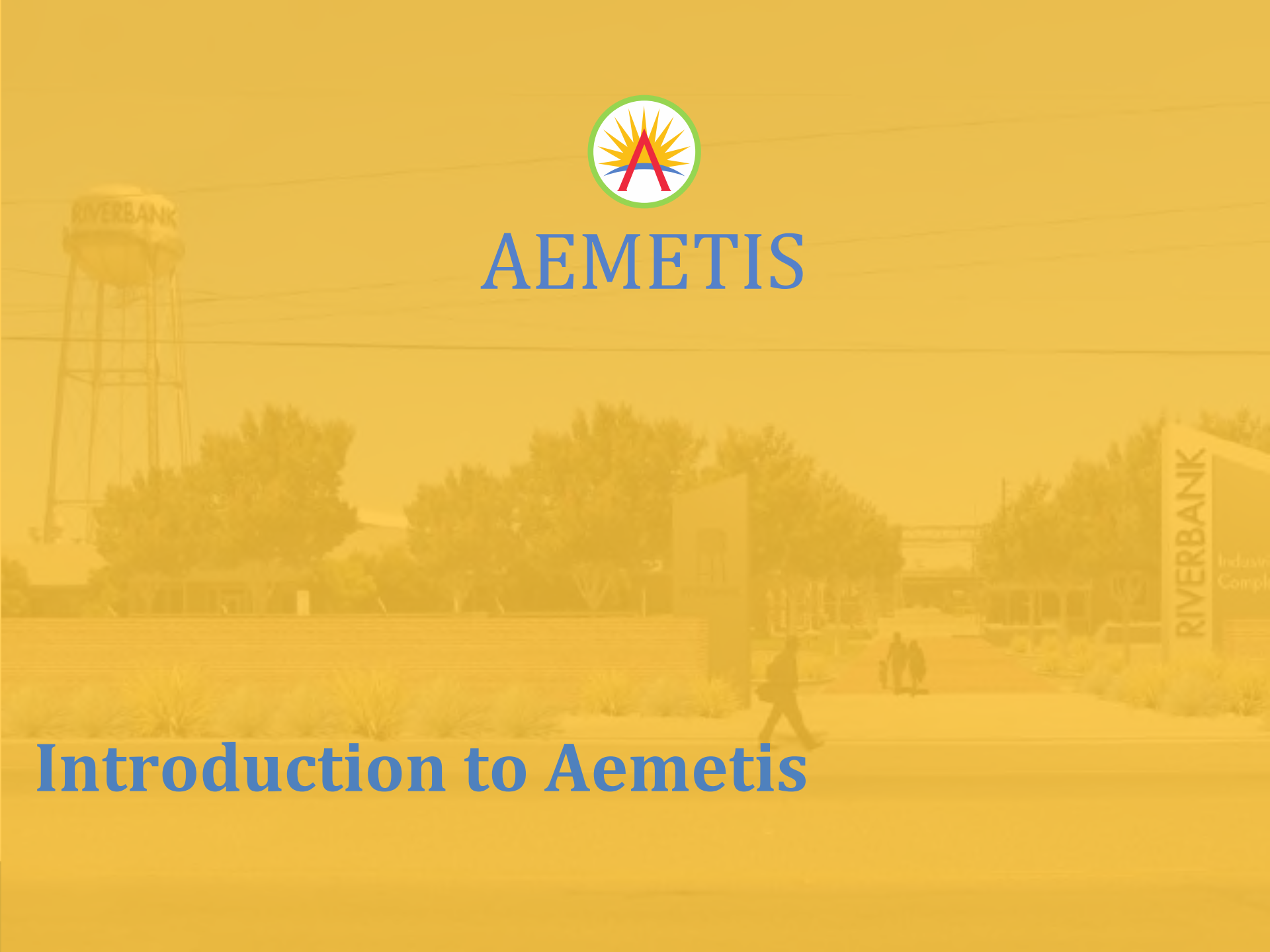
Non-GAAP Financial Information

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

Introduction to Aemetis

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.

Traditional Corn Ethanol and Vegetable Oil Biodiesel	Advanced Biofuels (Purpose-Grown Feedstocks)	Low Carbon, Low Land Use (Waste Orchard/Forest/Oils)
PAST	PRESENT	FUTURE
		
G1	G2	G3

Aemetis Overview

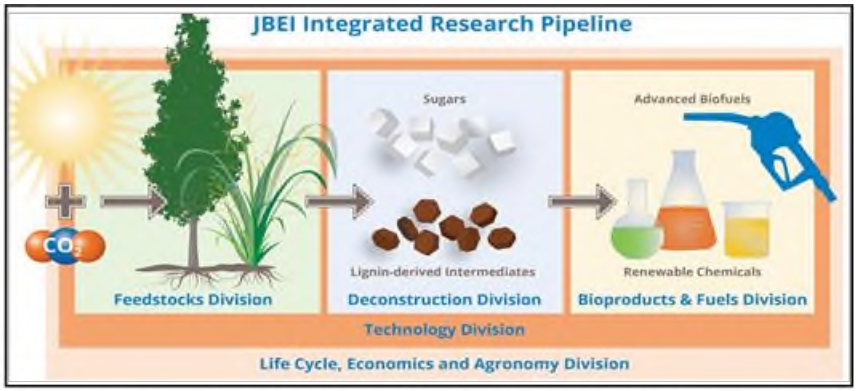
- **Founded in 2006 by biofuels veteran (co-founder of Pacific Ethanol; EPM)**
- **$170 million revenue in 2018; 110 million gallons per year biofuels capacity**
  - Own/operate 60+ million gallon ethanol plant in California
  - Own/operate 50 million gallon capacity Biodiesel and Glycerin refinery in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

Aemetis Projects: Optimizing California's Waste Supply Chains

Agricultural Waste to Sugars

JBEI Collaboration and $3 million DOE/CEC Funding

- Ionic Liquids have the capability to breakdown cellulose and hemicellulose into C5 and C6 sugars
- Sugars can be utilized in existing ethanol facilities utilizing forest and agricultural waste for wide range of usages



JBEI's Integrated Approach to Bioenergy

JBEI AT A GLANCE

Six National Laboratories
Argonne, Brookhaven, Pacific Northwest, Lawrence Berkeley, Lawrence Livermore and Sandia

Eight Academic Institutions
UC Berkeley, Clemson, UC Davis, Iowa State, UMass - Amherst, Northwestern, UC San Diego, UC Santa Barbara

Five Divisions
Lifecycle, Economics, and Agronomy Division
Feedstocks Division
Deconstruction Division
Bioproducts & Fuels Division
Technology Division

Centralized at One Facility

CO2 to Compressed CO2: Displacing Petroleum

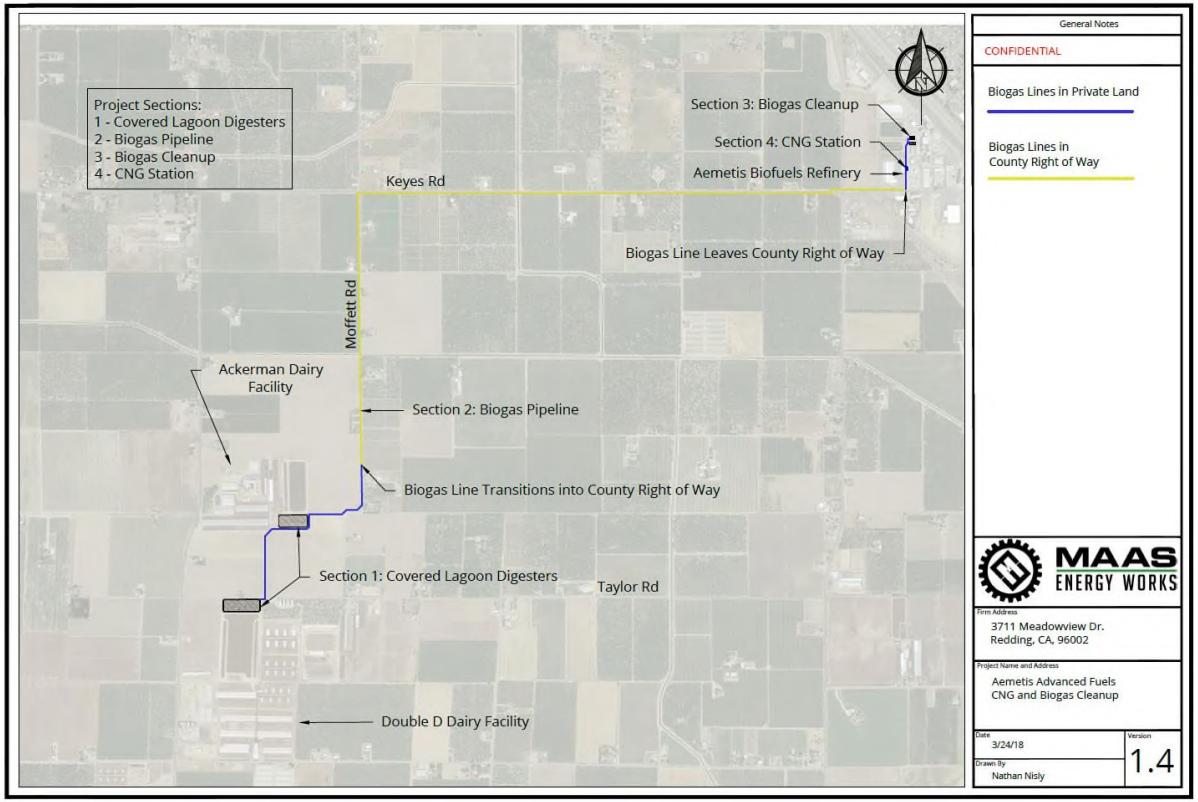
Liquid CO2 Plant

- Executed off-take agreement with Large Gas Company
- Shared OPEX for additional equipment
- Market barriers of long contracts and multiple supply sources support CO2 plant ventures with existing gas companies
- CO2 must be compressed and processed next to emission point

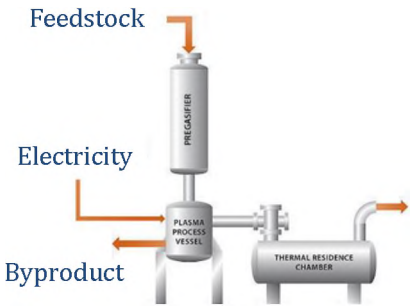
Dairy Waste to Biogas

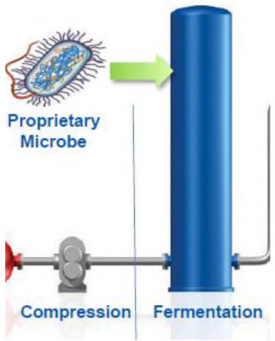
Aemetis Biogas to Ethanol Plant Project:

- $30 million in funding secured from existing lender 2018
- $3.1 million in CDFA funds awarded for the project in July 2018
- Engineering/ Permitting Underway
- First operations Q4 2019



Agricultural Waste to Cellulosic Ethanol





1

Feedstock

Biomass

- Orchard/Vineyard Wood Waste
- Orchard Byproducts
- Forest Wastes

2

Thermal Transformation

3

LanzaTech Fermentation

4

Ethanol Plant Integration

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

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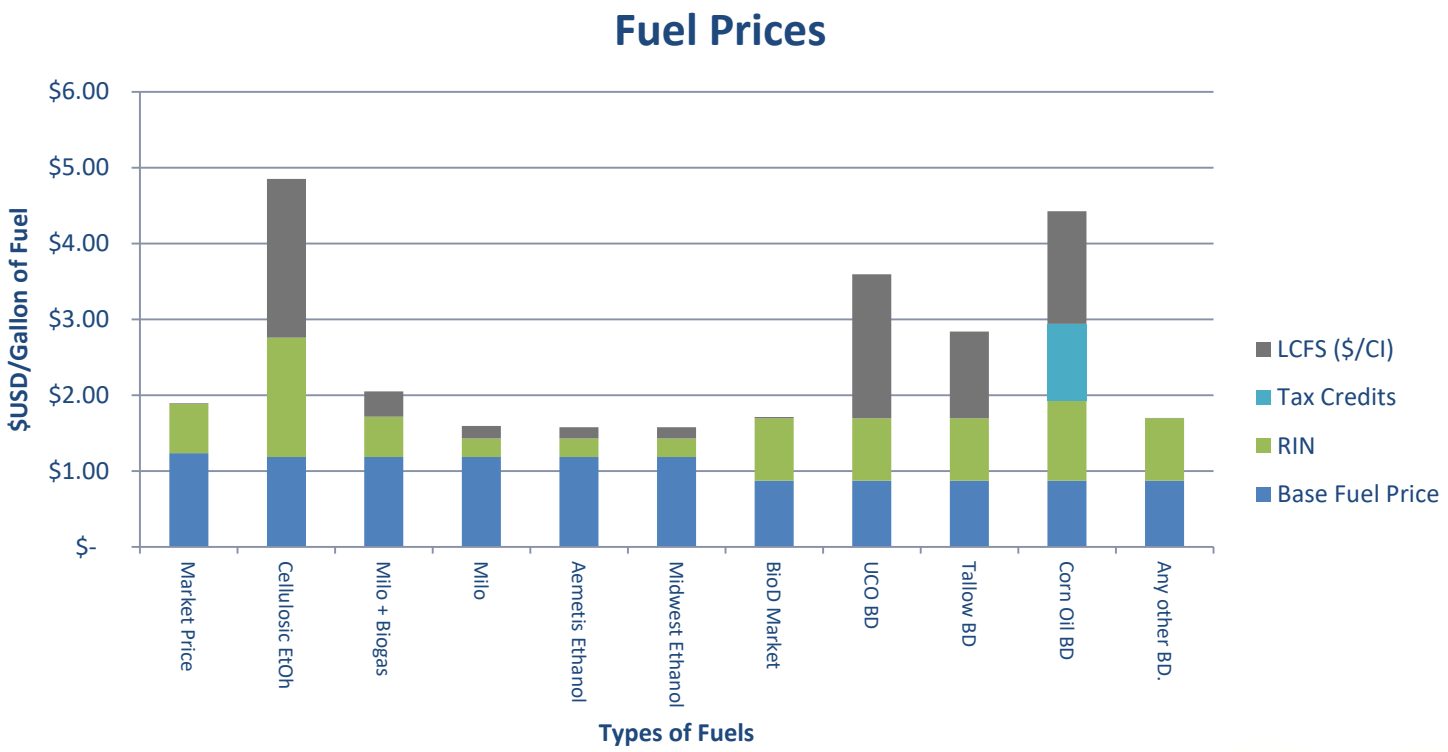
Value Creation Through Incentives and Valued Products

Solving Barriers and Logistical Concerns for CA Feedstocks

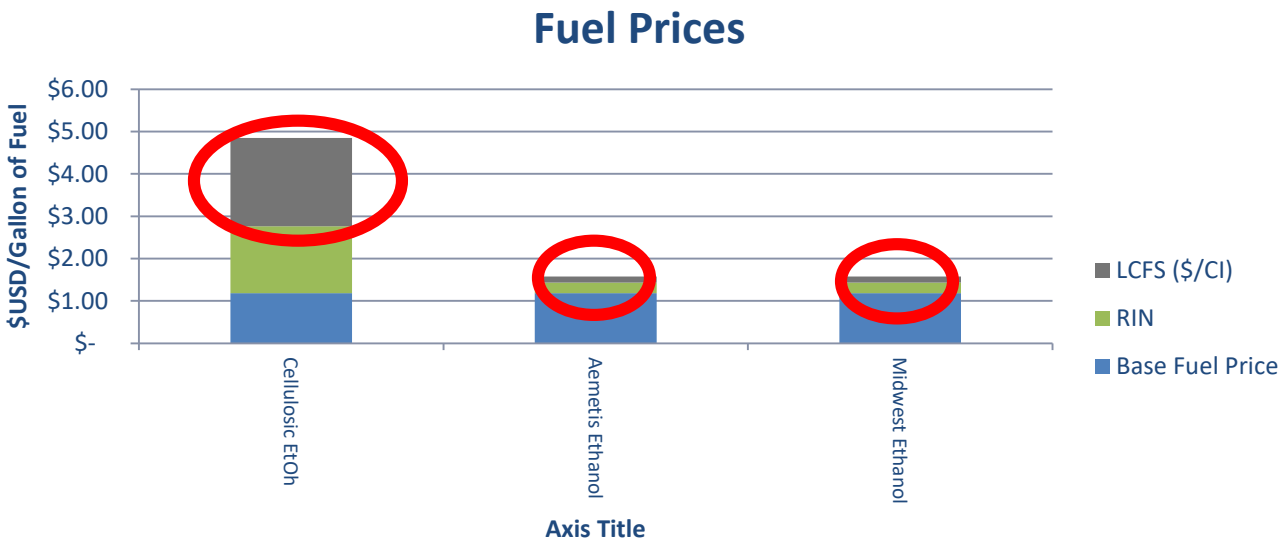
Create Value Through.....

1) LCFS 2) RFS 3) Product and Process Considerations



LCFS Value Creation

LCFS Value Creation



- Perform Studies with credible local universities, national labs and established environmental engineers to exhibit the benefits of waste feedstock
- Work with CARB to create standardized pathway
- Change logistic and value chain to improve carbon intensity score
- Find ways to utilize the GREET model to accurately calculate appropriate CI
    - Example: Temporal model for ag. waste burning

Aemetis Example: University Study and Expert Reports

Biomass-to-Energy Plants Closing in California

- Biomass to energy plant operations decreased
- Lack of ability to compete with low-cost solar, wind and natural gas

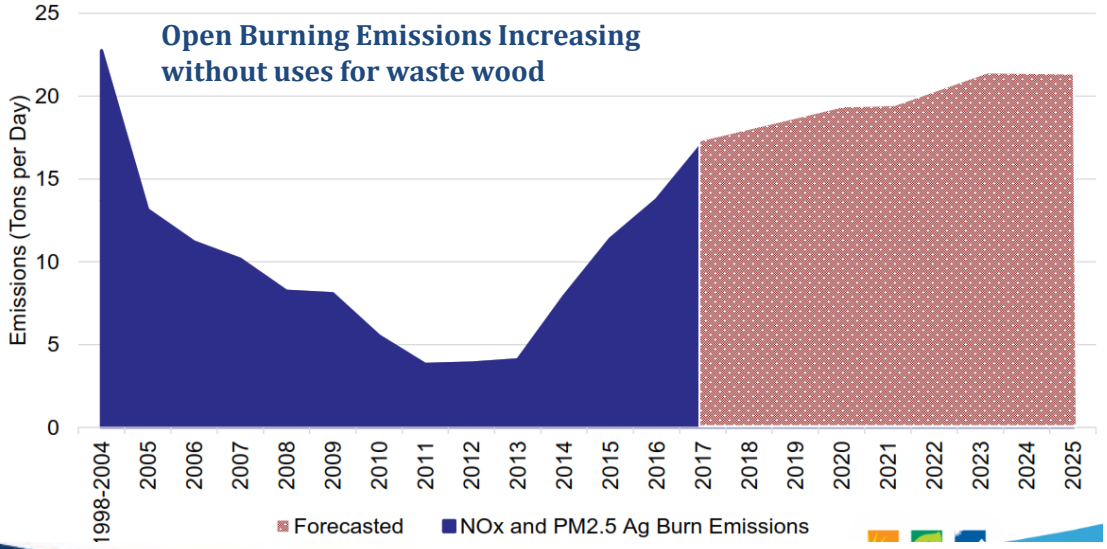
California advanced ethanol plants could produce 160+ million cellulosic ethanol gallons per year from orchard waste

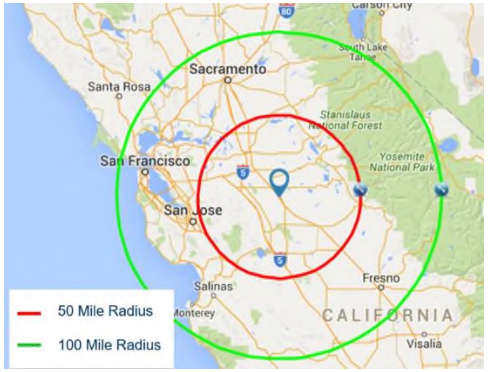
- 4 ethanol plants each could produce about 40 million cellulosic gallons / year
- At 80 gallons per ton of waste feedstock, requires 1.6 million tons of biomass
  - Almond / pistachio / walnut wood waste

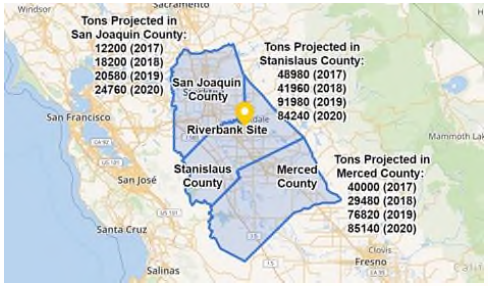
About 1.5 million acres of Almonds and walnuts in California

- 2+ million tons/year of Ag Waste
- Need for valuable uses for waste ag wood

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







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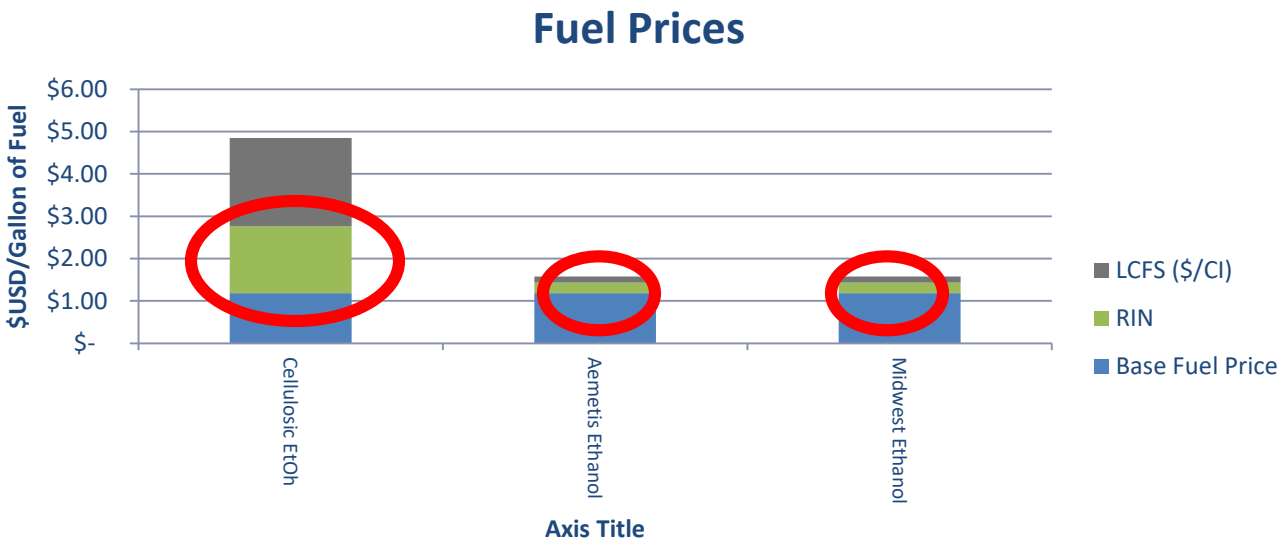
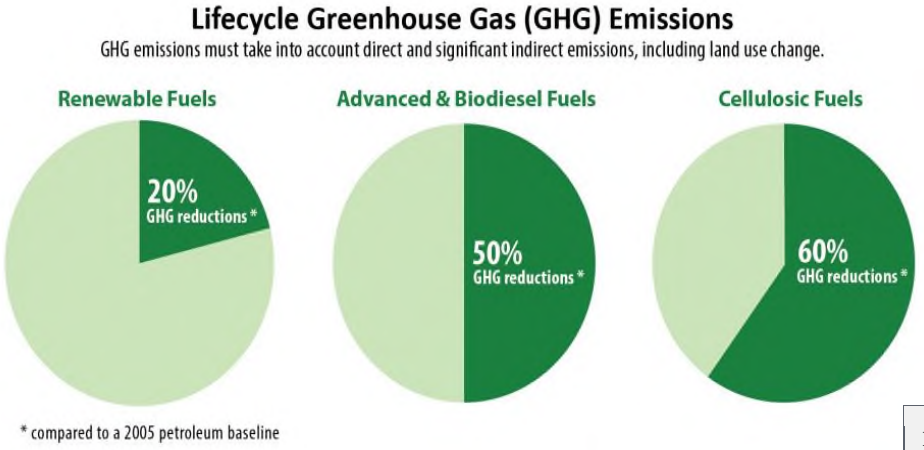
Renewable Fuels Standard Value Creation

Renewable Fuel Standard (RFS) Value Creation



- To receive value through the EPA's RFS you must have a "Pathway"
- Products fall under an existing pathway or a pathway must be created
- Depending on the type of Renewable Identification Number, drastically different values result

How to Create RFS Value?



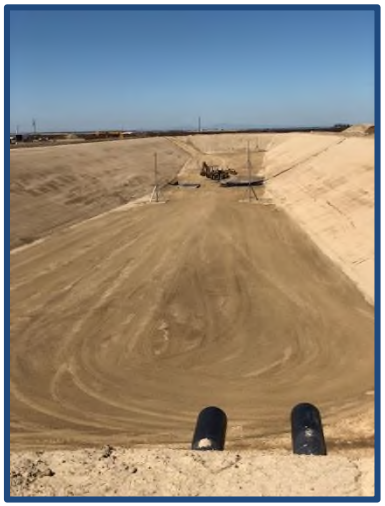
1) Meet GHG reduction thresholds

2) Meet or Create Pathway Definition

D-Code	Cellulosic Biofuel	Biomass-Based Diesel	Advanced Biofuel	Total Renewable Fuel
3	X		X	X
4		X	X	X
5			X	X
6				X
7	X		X	X

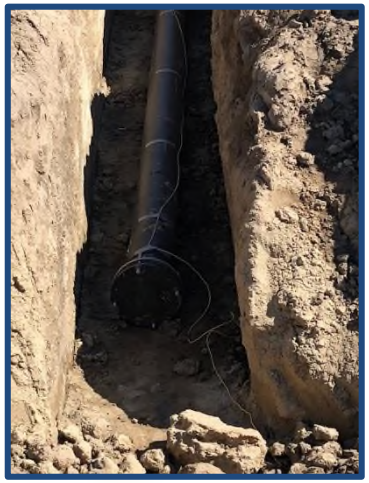
Aemetis Biogas Project Supported by LCFS/RFS Value Creation

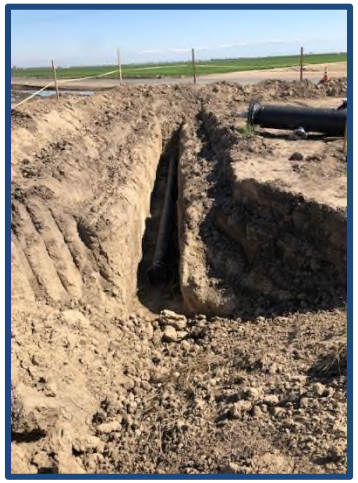
Dairy



Pipeline

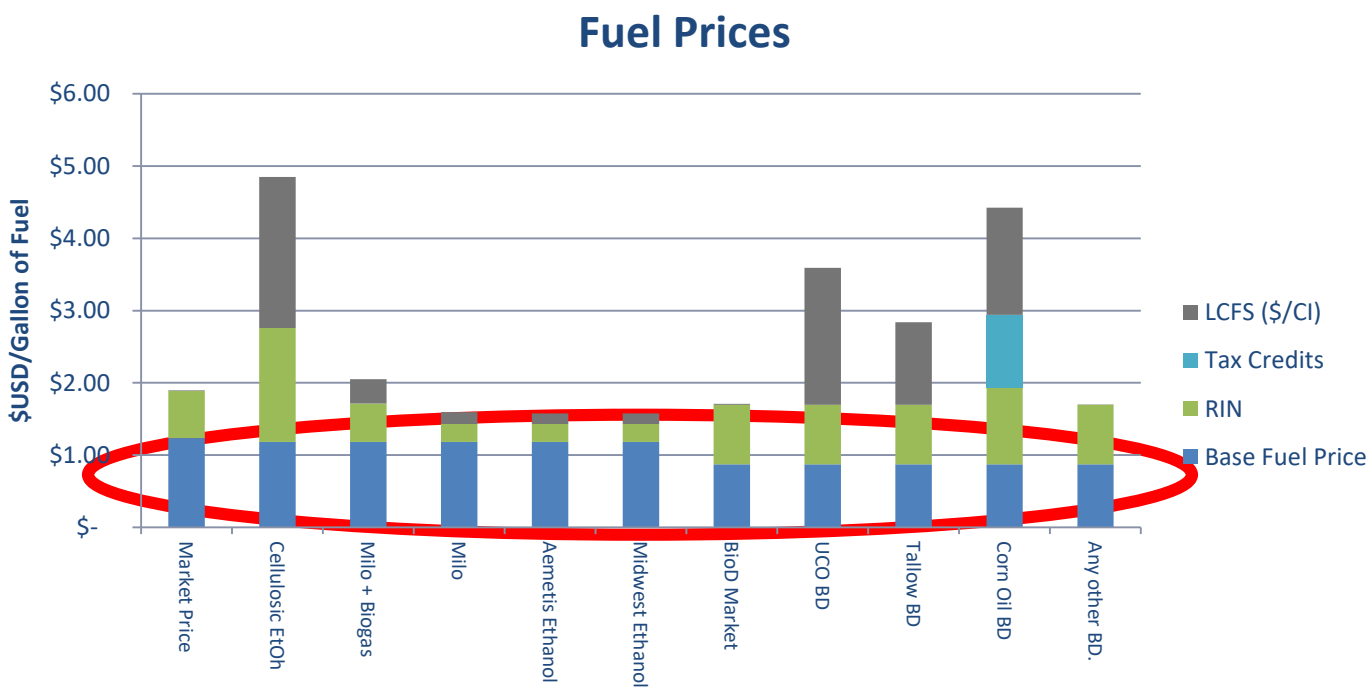
Local Customer





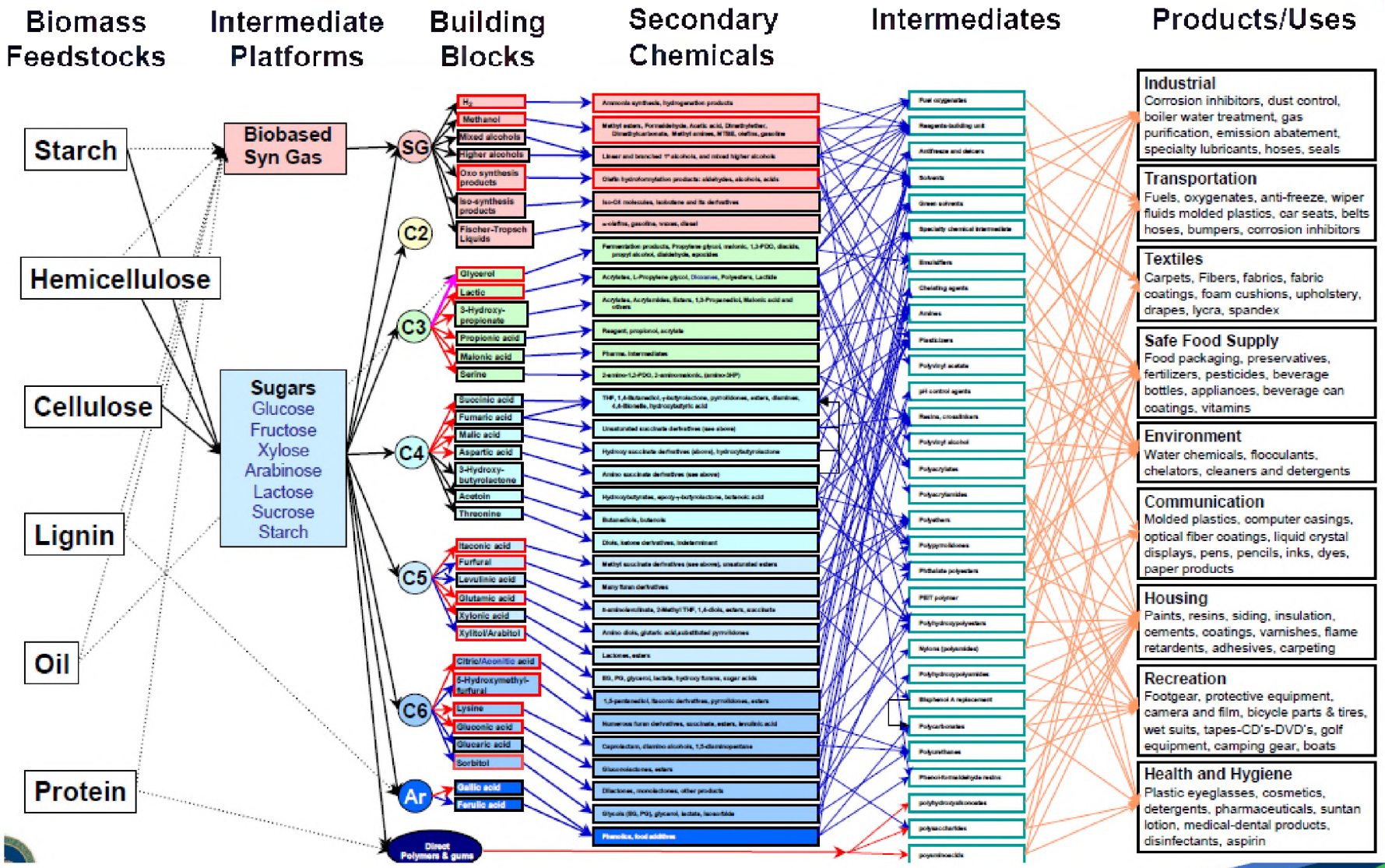
Specification and Product Creation with Technology Considerations

Product Value Creation: Renewable Fuels



- Determine highest value creation from specific waste feedstocks
- Explore technologies capable of utilizing specific waste material and create a roadmap
- Narrow down technologies and focus on lessons learned from other commercialization efforts
- Perform pilot testing to determine feasibility of process with feedstock

Product Creation Overall Roadmap

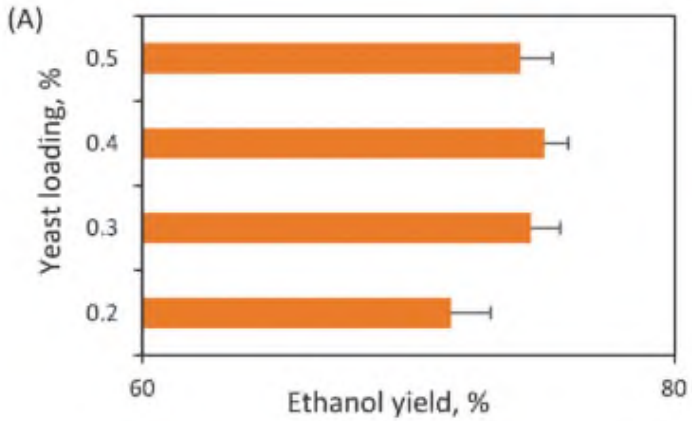


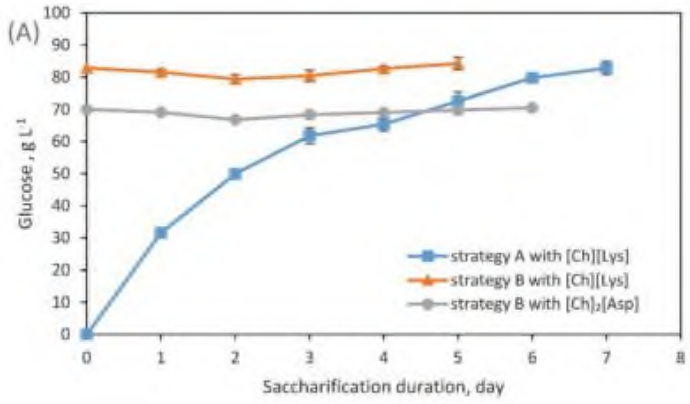
Considerations When Determining Process and Product

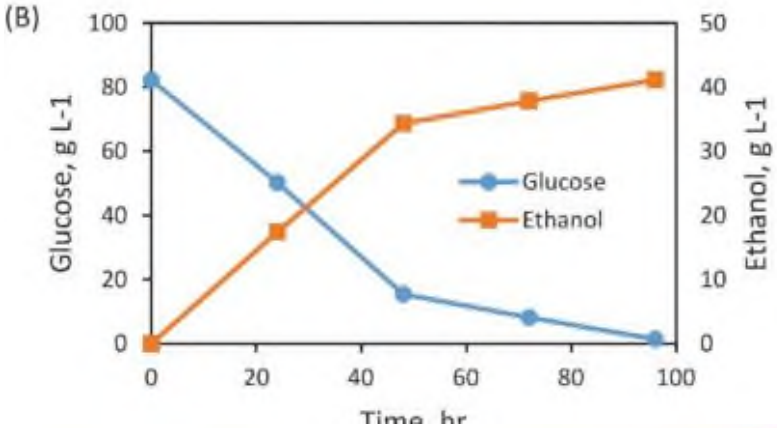
- **What is the ultimate and compositional analysis of the feedstock?**
  - Sugar content, cellulose content, hemicellulose content, lignin content
  - Carbon content, oxygen content, hydrogen content, ash content
- **What contaminants and barriers exist?**
  - Are there catalyst poisons?
  - Microbial poison?
  - Mechanical/ physical issues (rocks, ash, contaminants)
- **What is the waste product best positioned to produce?**
  - Biogas with digestion?
    - What kind of digestion
  - Ethanol and other products with microbes?
    - Syngas, sugar, protein or oil fermentations?
  - Renewable Diesel/ Biodiesel
    - What process, pressures, distillation, product specification considerations?
    - What type of catalyst?

Example: Ionic Liquids Overview (JBEI/Aemetis project funded by CEC)

- Ionic Liquids have the capability of breaking down any biomass source into their component sugar molecules
- With the production of sugars from cellulosic feedstocks, about 210 ethanol plants have the potential for upgrading
- Ionic liquids have the capability of changing the paradigm of biofuels







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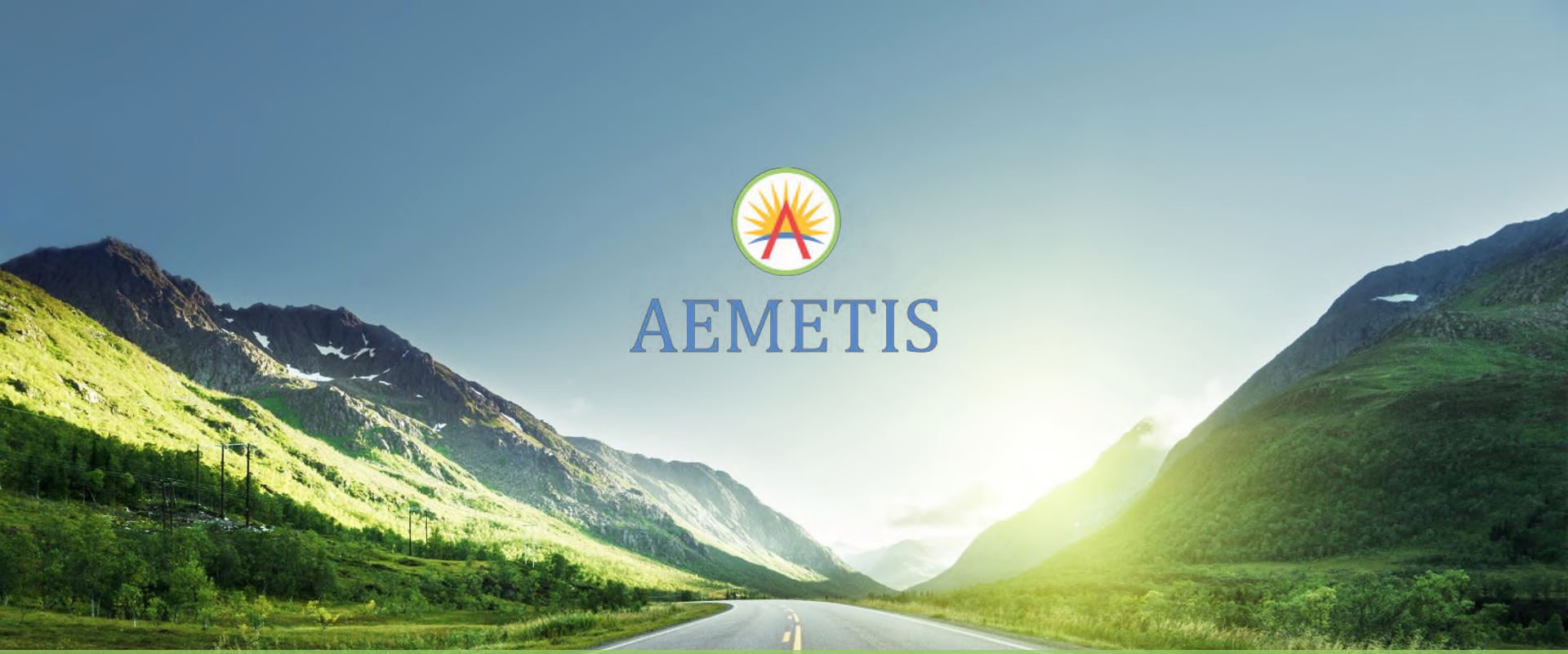
Recommendations for CARB

Recommendations to CARB

- California Air Resource Board staff are the GHG experts and currently lead worldwide renewable energy policy
- CARB should **continue to work with project developers to create accurate carbon intensity scores** in order to assist projects in receiving funds and ultimately begin operations
- **Time delays prevent projects from being built**
- **CARB's continued work to adjust the GREET model** to match and assist project developers in creating accurate CI scores either **allows the project to be built – or not.**
- The future of the global energy policy is directly impacted by CARB



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