



California Bioenergy

ABE Bidart Old River and Stockdale:

PPA Review with the PUC

Energy Division

April 25, 2013



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2. California Dairies + Digest
3. Stockdale, Old River PPAs
4. Project Economics
5. Project Benefits

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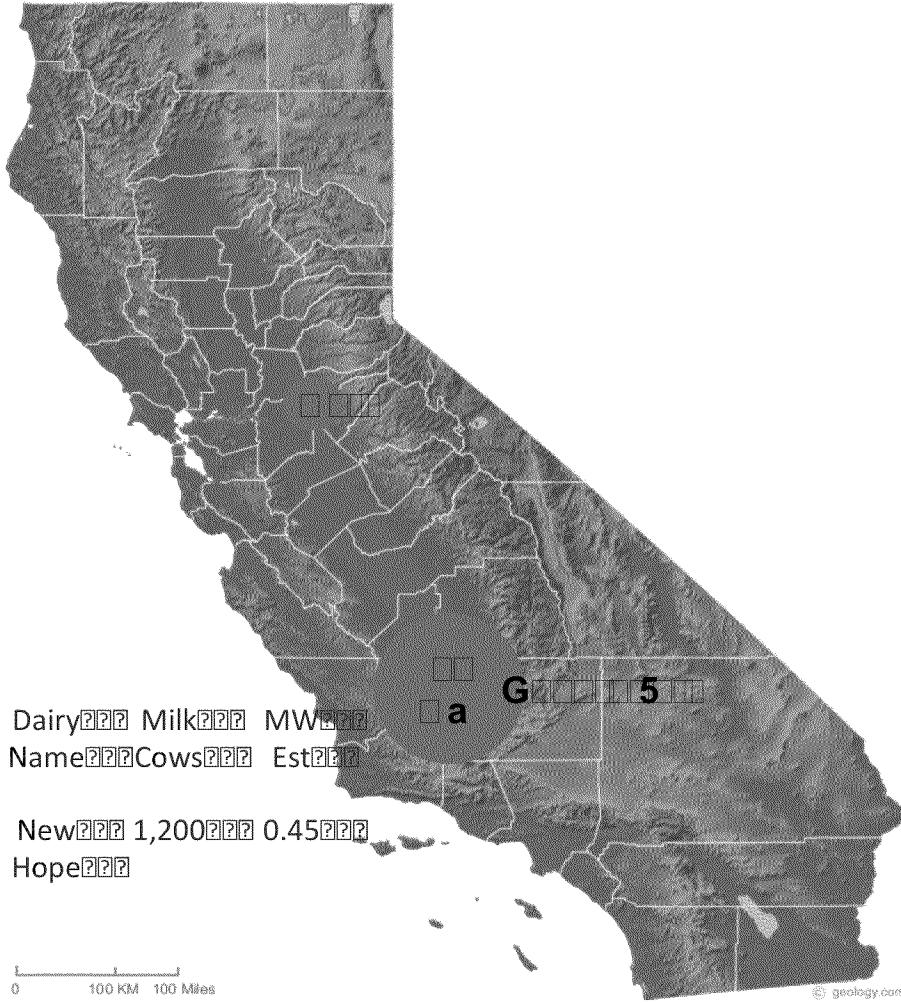
About California Bioenergy, LLC

- Founded 2006, management from dairy and business
 - Goal: build a dairy biogas company that generates energy cost competitively, destroys greenhouse gas, creates jobs, and adds value to the dairy and com
- Business model: build, own and operate digester
 - Expertise to dairy, CalBio's financial partners (co-op)
 - Aggregation of projects for the utility
- Achievements to date in this emerging industry
 - Assembled group of 16 dairies and secured 2 G&E
 - Built Stockdale; lined up Old River (CAT financing and Western Water Fed project team); assisted New Hope
 - Developed carbon expertise (ClimateSmart) biogas model "virtual peaker plant"



California Dairy Partners

- 16 dairies, approximately 25 MW



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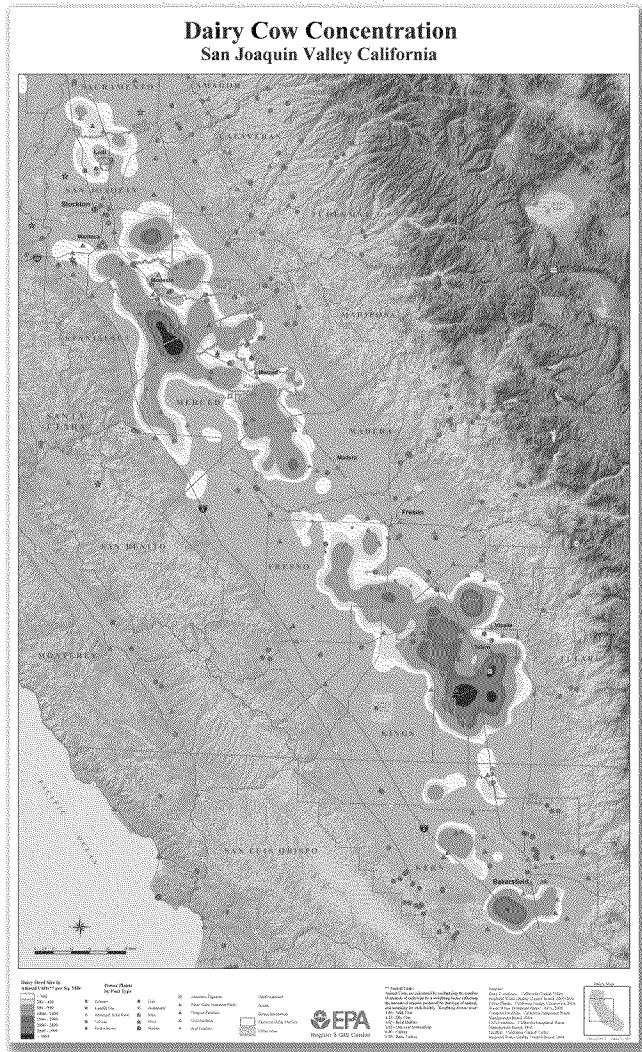
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California is the Leading Dairy State



- The largest dairy producing state, generating 20% of the nation's milk
- The largest sector of California's farm economy
- Most dairies concentrated in the Central Valley
- 1.8 million milking cows on 1,700 dairy farms
- Mix of old and new dairies, many larger than an average U.S. dairy



CA Dairy Farms Generate Methane

- Most California dairies flush manure into lagoons
 - The nutrient-rich water is used to fertilize and irrigate adjacent croplands; the crops feed the cows
- The lagoon is an anaerobic environment, where bacteria breakdown the organic matter and produce biogas (60% to 70% methane)
- Open lagoons release biogas to the atmosphere
 - Methane is a potent greenhouse gas; 22x potency
 - California dairies release 341,000 tons of methane, 10 million tons of CO₂e per year (U.S. EPA)
- Digester projects capture the biogas and harness methane



California Dairy Biogas at Early Stage

- Dairy digester industry is in its infancy
 - 1,700 dairies, only 12 digesters (Stockdale first since)
 - A number have shut down with two high profile
- Developers face complex issues and higher costs
 - Regulatory issues: Air District (NOx) and Water Board
 - Interconnection ticket
 - Financing barriers and high costs
- Few professional management firms
 - Professional firms needed to develop industry, bringing energy and management expertise to the host dairies aggregating projects on behalf of utility partners

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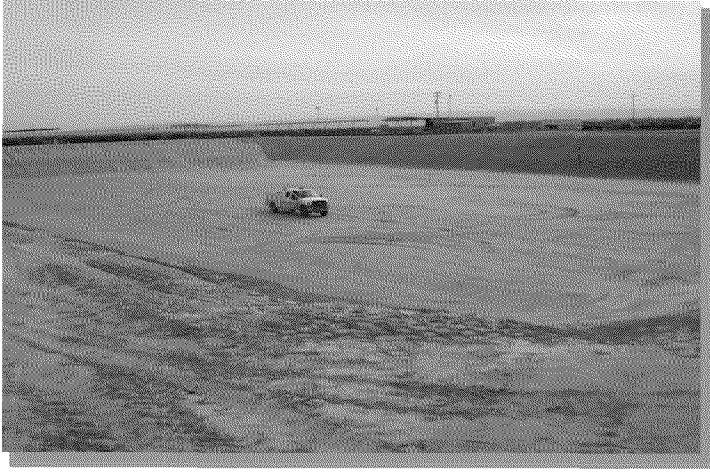
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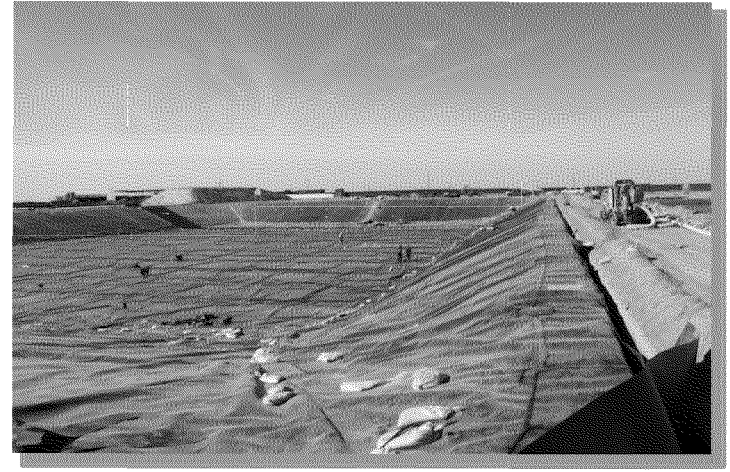
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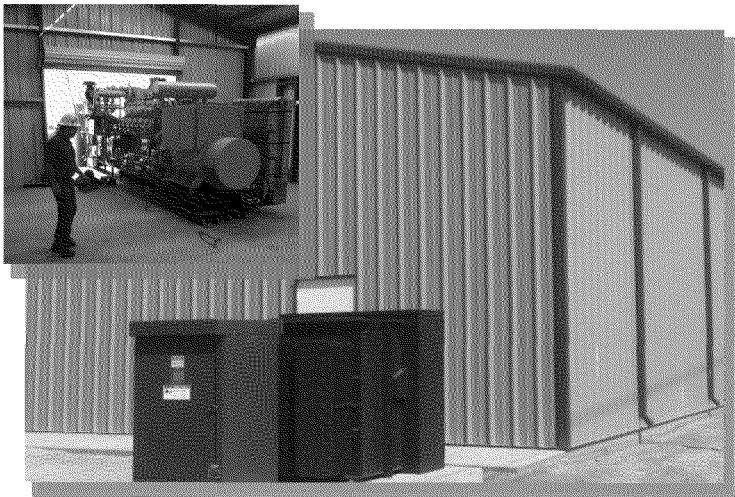
Stockdale Project, Bakersfield, CA



Final Subgrade Preparation



Digester Liner Installation



Generation Facility and Final Assembly



Operating Digester, Generation Facility and Background



PG&E PAs: Stockdale and Old River

- Bi-lateral negotiations
 - Discussions 2007-2010 (full cluster)
 - Negotiations 2011-2012 (Stockdale and Old River)
- Contract Price
 - Stockdale: \$130/Wh
 - Old River: \$135/Wh
 - Both projects have partial, capped inflation adjustment
- Adapted PAs to size, technology, early industry
 - As Available with scheduling (payer first year)
 - GEP: 140% bandwidth (payer first year)
- Conversations with Commissioners and advisors

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Stockdale and Old River Overview

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Old River Milestone Schedule

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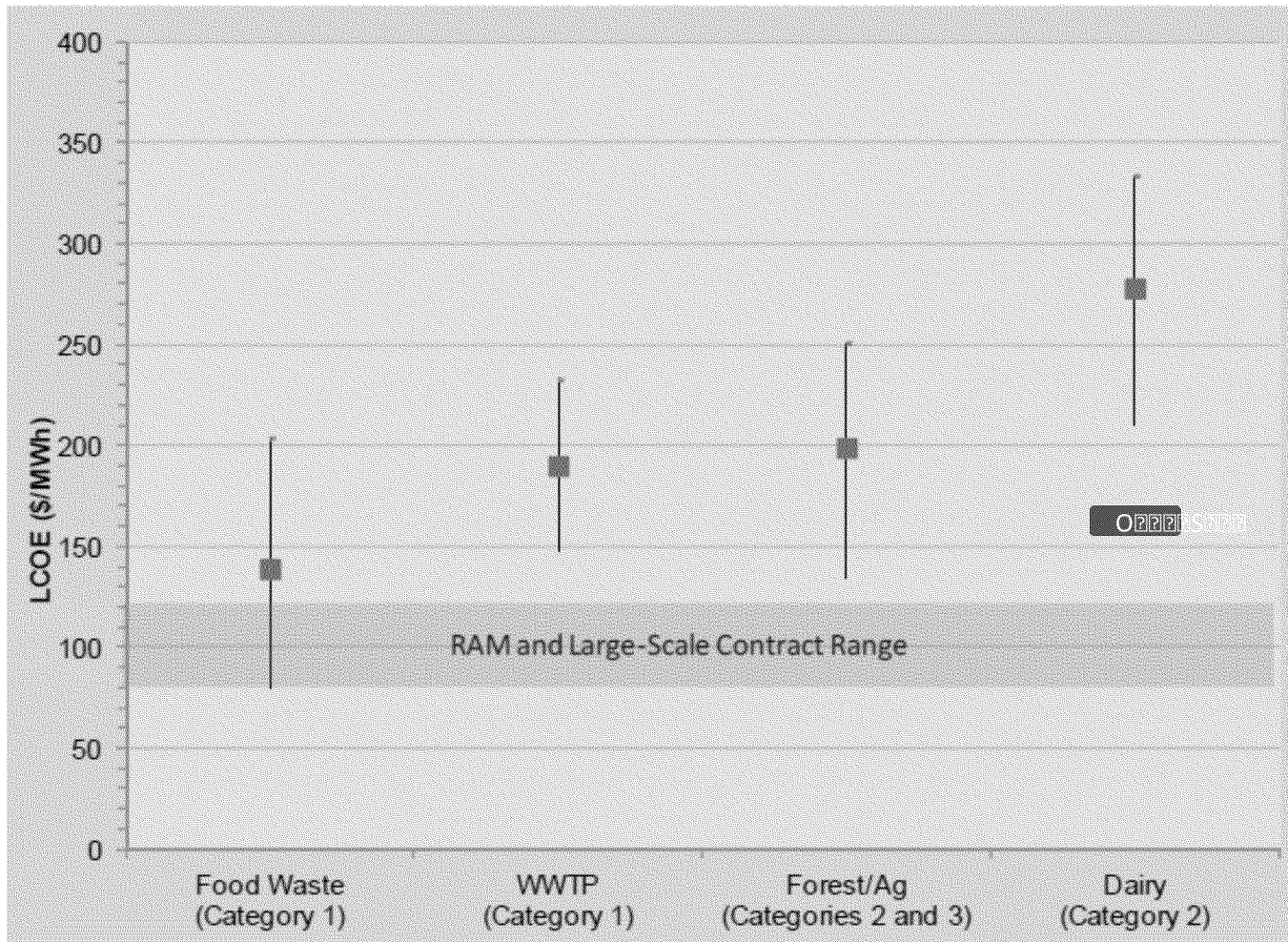


Figure 1-1 SB 1122 LCOE Range, No Incentives

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Summary Economics (and 1603 Role)

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Comparative Economics

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Time is of the essence (a) To contribute additional equity

(b) To close Caterpillar debt and remain on track for 1603



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Valuable Renewable Energy Resource

- Biogas is a baseload and it is storable
 - Lagoons built to store gas and engines are over sized
 - Thus, it is shapable: baseload, peaking, dispatchable potential
 - TOD provides incentives and structure (impacts COE)
- Biogas is complementary to intermittent solar and wind
 - Peak period is shifting to later in the day
 - Biogas is analogous to solar plus storage
- CalBio is developing scheduling expertise
 - Company goal to schedule across 50 MW of virtual
- CHP applications enable very high efficiencies
 - CHP heat uses include digester heating and milk cooling

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Significant Additional Benefits

- Climate change impacts and support of AB32
 - Dairy lagoons are the source of 7 million tons
 - Livestock one of only 4 approved AB32 protocols
 - Credits are needed for AB32 success [Shortage ant
 - Dairy projects create high quality, CA generated
- Enhanced protection of air quality
 - Digesters capture and destroy H₂S
 - Improve air quality and odor
 - Odor reduction a motivator for Kern County action
 - CalBio is a leader in NOx reduction technology
 - Stockdale: experimental engine recipient of EPA and SJVAPC
 - Old River: first PPC/Caterpillar backed implementation of SCR

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Significant Additional Benefits (Cont'd)

- Enhanced water protection
 - Stockdale and Old River install double lined lagoons
- Dairy Farm Benefits
 - Stockdale effluent data encouraging:
 - Organic nitrogen changed to ammonia. More absorbable
 - Potential to save costs and potential decrease in leakage
 - New revenues for dairy farmers in a difficult farm
- Job Creation in the Central Valley
 - More jobs per MW than solar or wind; local cons
 - versus foreign manufacturing; ongoing maintenance jobs
 - With the creation of a broader dairy biogas industry
 - \$2 billion investment, thousands of Central Valley o



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