Addressing Greenhouse Gases in California’s Dairy Sector

Casey Walsh Cady, CDFA

C-AGG – March 8, 2017
## Key Statistics

**CA #1 dairy state in US**
- 1,748,00 milking cows
- 1,438 dairies
- 1,215 avg. herd size

**Operating Digester Systems**
- Currently at 17
- 4 more under construction

**CA/Federal Dairy Digester Working Group**
- Developed recommendations to address key barriers, including permitting, finances etc.
CDFA’s Dairy Methane Efforts

**Dairy Digester Research & Development Program**

$29 - $36 million proposed

**Alt. Manure Mgmnt. Practices**

$9 - $16 million proposed
CDFA Program
Development Process

Initial Program Framework Draft

Finalize Grant Solicitation

Review of Submitted Applications

Awards Announced

Project Verification and Monitoring of Greenhouse Gas Reductions

Feedback from:
- State and federal agencies
- Policy documents and research literature
- Public comments
- Stakeholder and partner input: EJ, industry, researchers, etc.
## CDFA Dairy Digester Research & Development Program (2015)

<table>
<thead>
<tr>
<th>Project</th>
<th>Funding</th>
<th>Biogas end-use</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verwey-Hanford Dairy Digester</td>
<td>$3,000,000</td>
<td>Electricity</td>
<td>Completed</td>
</tr>
<tr>
<td>Open Sky Ranch</td>
<td>$973,430</td>
<td>Electricity</td>
<td>Completed</td>
</tr>
<tr>
<td>Verwey-Madera Dairy Digester</td>
<td>$2,281,091</td>
<td>Electricity</td>
<td>In progress</td>
</tr>
<tr>
<td>West-Star North Dairy Biogas Project</td>
<td>$1,837,005</td>
<td>Electricity, RCNG in future</td>
<td>In progress</td>
</tr>
<tr>
<td>Lakeview Dairy Biogas Project*</td>
<td>$2,000,000</td>
<td>Electricity, RCNG in future</td>
<td>In progress</td>
</tr>
<tr>
<td>Carlos Echeverria &amp; Sons Dairy Biogas Project*</td>
<td>$1,000,000</td>
<td>Electricity, RCNG in future</td>
<td>In progress</td>
</tr>
</tbody>
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* Kern cluster
Verwey-Hanford Project: Covered Lagoon Digester
CDFA DDRDP

Upcoming Solicitation

- To be released mid-March 2017.
- Applications Due – May 11, 2017.
- $29 - $36 million available from GGRF.
- $3 million max. per project – with 50% match required.
- Draft Solicitation released for public comment.
- Technical, Administrative and Financial Review.
- New GHG emission reduction tool.
- Awards to be announced August 2017.
Section 16428.86 (SB 859) added to the Government Code

Applicants are to:
- Conduct outreach in potentially impacted areas,
- Determine potential adverse impacts of the project,
- Commit to measures to mitigate impacts.

CDFA to prioritize projects based on criteria pollutant emission benefits.
Projects report the total GHG emission reductions, the total project GHG emission reductions per unit of energy-corrected milk production, and the total project GHG emission reductions per dollar of GGRF funds requested.

https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/quantification.htm
Alternative Manure Management Practices Program

To be determined – e.g. switch to scrape or solid manure management & composting; solid separation; pasture-based dairying.

$9 - $16 million proposed.
### Tentative Timeline for the 2016-2018 Alternative Management Practice Program

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PROPOSED DATES*</th>
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<tbody>
<tr>
<td>Public/Stakeholder Meetings</td>
<td>March - Apr 2017</td>
</tr>
<tr>
<td>Notice of Funding availability released</td>
<td>July 2017</td>
</tr>
<tr>
<td>Grant Application Workshops</td>
<td>July - Aug 2017</td>
</tr>
<tr>
<td>Applications proposals due</td>
<td>August 2017</td>
</tr>
<tr>
<td>Proposal evaluation period</td>
<td>Aug – Sept 2017</td>
</tr>
<tr>
<td>Announce grant awardees</td>
<td>October 2017</td>
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<tr>
<td>Project Implementation begins</td>
<td>November 2017</td>
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</tbody>
</table>

*Subject to change

[https://www.cdfa.ca.gov/oefi/AMMP/](https://www.cdfa.ca.gov/oefi/AMMP/)
CDFA Supported Research

- Converting Manure to Reduce GHG Emissions, Minimize Environmental Impacts, and Enhance the Economic Feasibility of Dairy Operations
  - Dr. William Horwath, University of California, Davis

- Evaluate the use of a hydrodynamic cavitation capable of converting large amounts of manure into a more stable sterile soil amendment with a predictable nitrogen mineralization response that reduces greenhouse gas (GHG) emissions.
Support near-term actions to reduce manure methane through:
- Financial incentives
- Collaborations to overcome barriers
- Development of policies to encourage RNG production
- ARB in partnership with CDFA and other relevant agencies, and stakeholders, to form dairy workgroup(s) in 2017
SB 1383 (Lara) Short Lived Climate Pollutants - ARB to develop comprehensive strategy no later than Jan. 1, 2018:

- Will regulate methane emissions from livestock and dairy manure management.
- Target: to reduce dairy manure methane emissions to 40% below 2013 levels by 2030
Kern County Dairy Biogas Cluster

Hub & Spoke Model

Hub
Gas Cleaning & Conditioning

Dairy 1
Low pressure PVC gathering line

Dairy 2

Dairy 3

Dairy 4

Dairy 5

Dairy 6

Dairy 7

Dairy 8

Dairy 9

Dairy 10

Biogas Cleaning

Fuel Station

Natural Gas Provider

Electrical Generation
