



# Dairy Methane Initiatives

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GREENHOUSE GAS REDUCTION WORKING GROUP  
MEETING




## METHANE REDUCTION EFFORTS AT CDFA



### Dairy Digester Research and Development Program (DDRDP)

Since 2014: \$47.1 million awarded for development of digester projects on CA dairies.



### Alternative Manure Management Program (AMMP)

Since 2017: awards to be announced in 2018.



### Research Projects

**\$99 million**

appropriated from Greenhouse Gas Reduction Fund for FY 2017-18.

# Dairy Digester Research & Development Program

## Grant size

- A maximum of 50% of the total cost of project, up to \$3 million.
- 2-year project term

## Eligibility:

- Existing milk producers, dairy digester developers.
- Cluster projects.
- Eligible bio-methane uses: On-site use or into electrical grid/pipeline (electricity generation or transportation fuel/RCNG), utilization of thermal energy on site or at neighboring facility

## Environmental Quality Requirements:

- Water Quality Protection:  
Double-lined ponds consistent with the Tier 1 specification of the Dairy General Order Central Valley Regional Water Quality Control Board, or, above-ground tank, or, below-ground concrete lined tank.
- Air Quality Protection:  
Total NOx emissions no greater than 0.50 lb/ MW-hr.



# 2017 Update

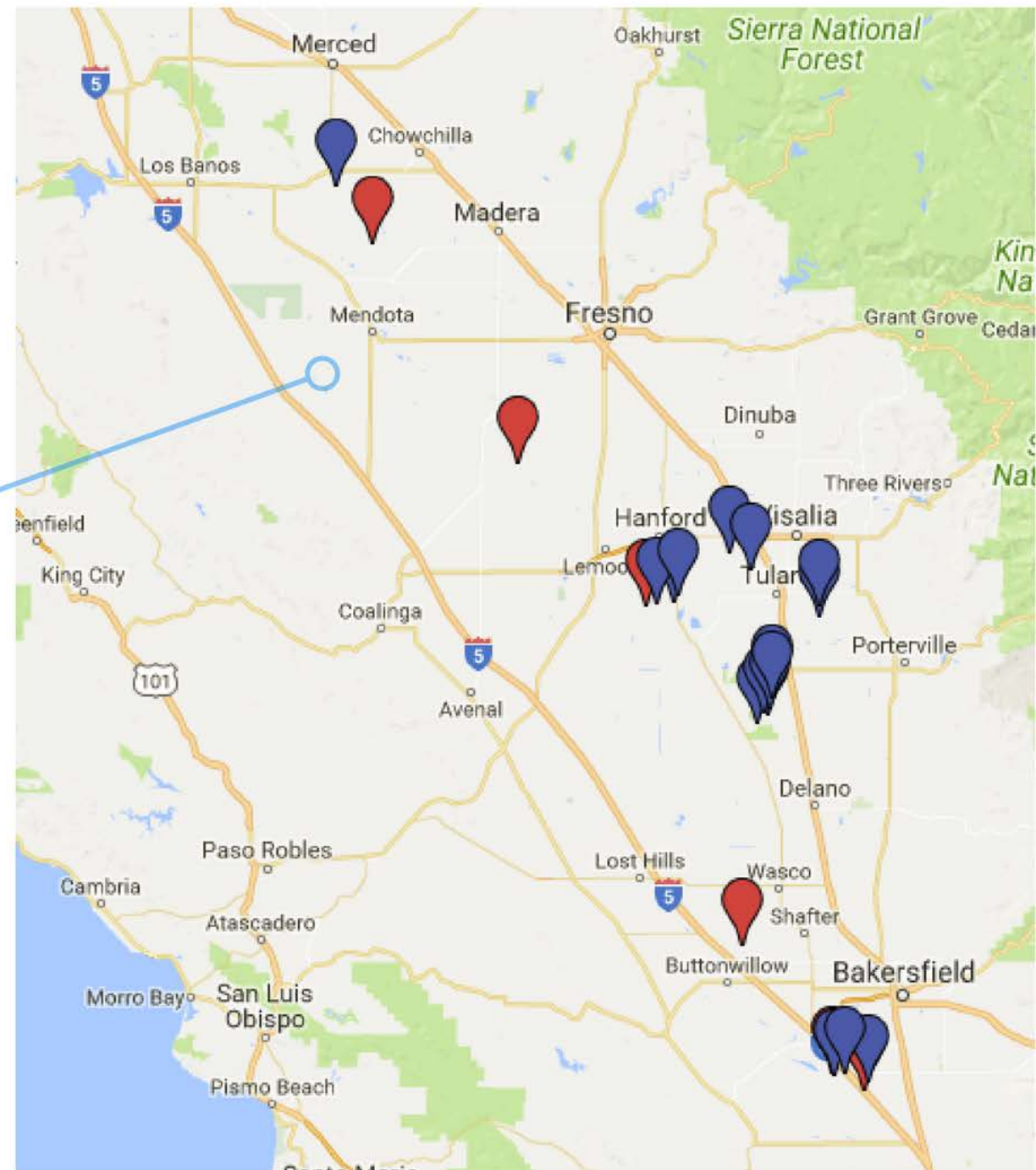
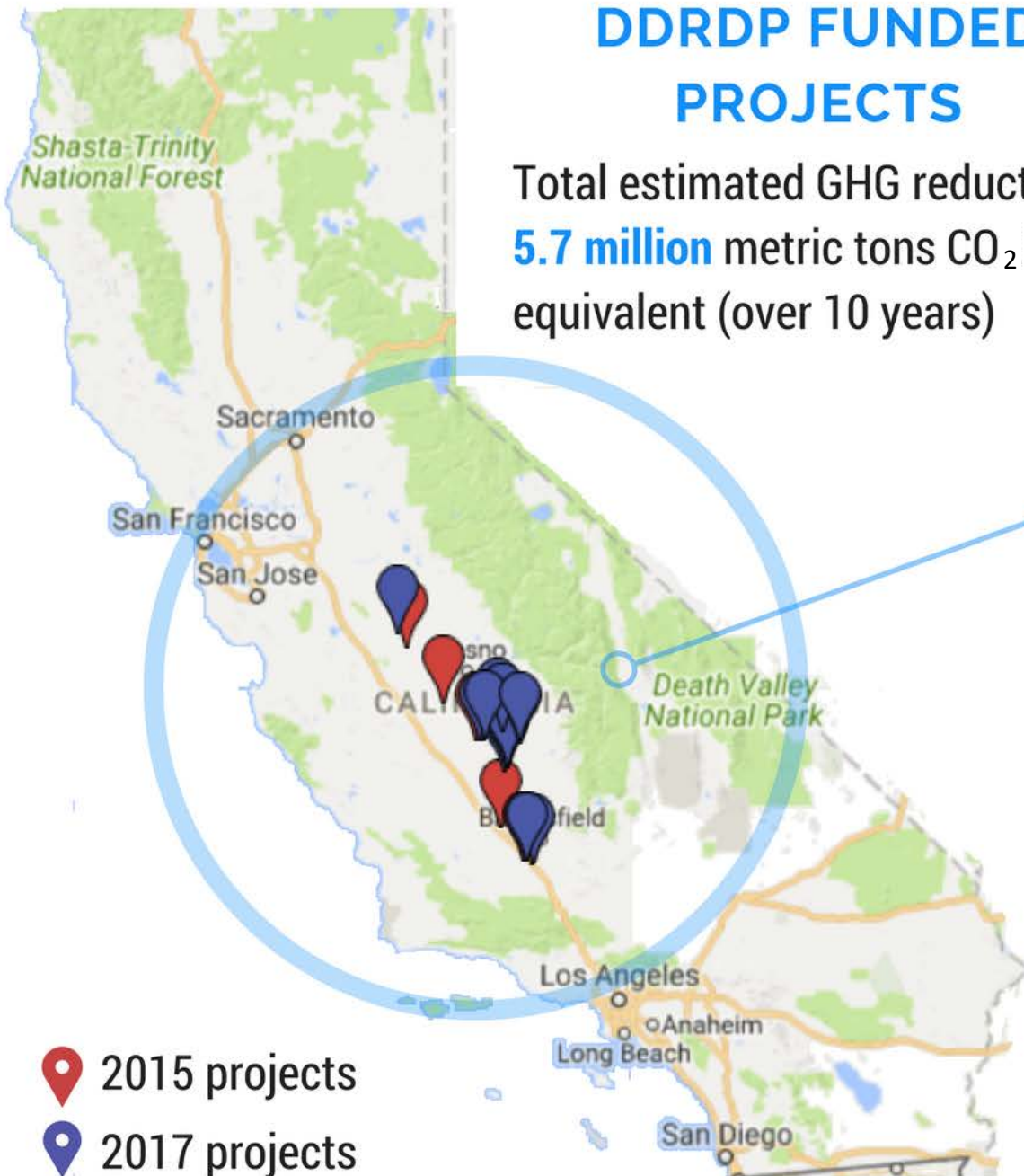
IN OCTOBER 2017 CDFA ANNOUNCED NEW AWARDS

- **18** new projects
- **\$35.3 million** CCI funding
- **\$79.6 million** in matching funds
- Estimated GHG reduction of **4.1 million metric tonnes** of CO<sub>2</sub> equivalents over 10 years



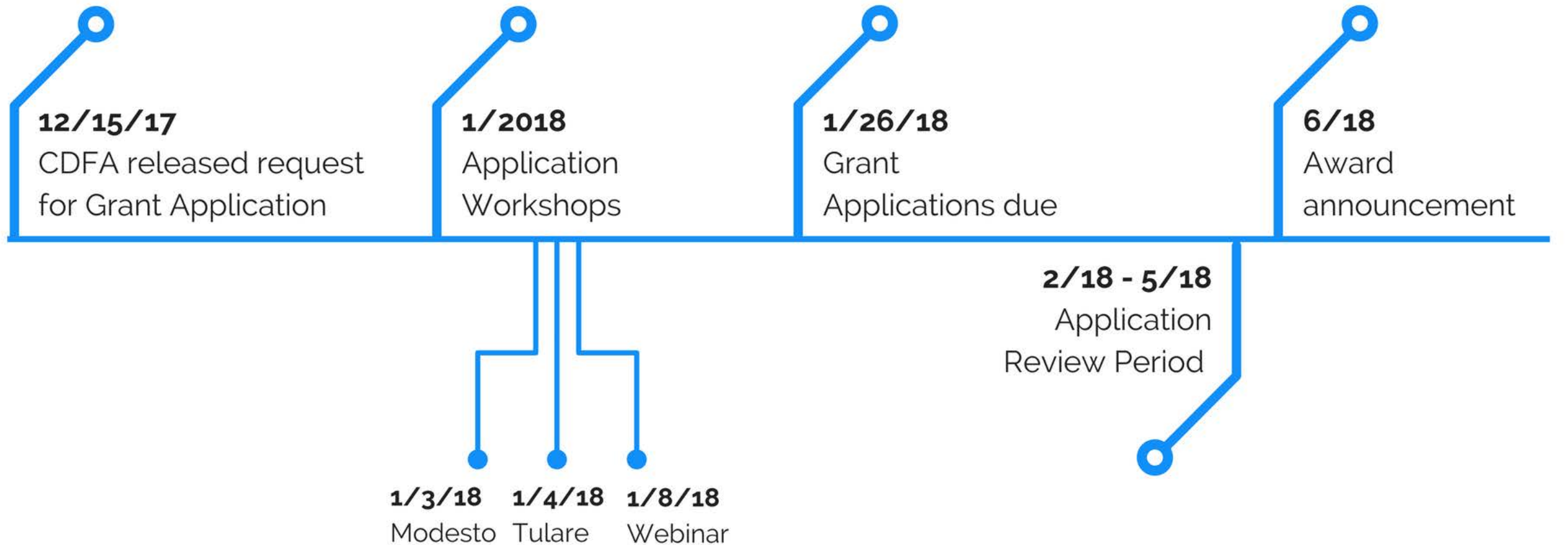
## DDRDP FUNDED PROJECTS

Total estimated GHG reductions  
**5.7 million** metric tons CO<sub>2</sub>  
equivalent (over 10 years)





# 2017/18 DDRDP Timeline



# Alternative Manure Management Program

**FINANCIAL ASSISTANCE FOR THE IMPLEMENTATION OF NON-DIGESTER MANURE MANAGEMENT PRACTICES, SUCH AS:**

- Pasture based management
- Solid separation, followed by drying, spreading or composting.
- Conversion from a flush to a scrape manure collection system, followed by drying, spreading or composting.

**APPROX. \$9.7 MILLION AVAILABLE FOR FUNDING PROJECTS (2016-17 ALLOCATION).**



# AMMP PROGRAM REQUIREMENTS



## GHG Reductions

Methane and equivalent Greenhouse Gas reductions from alternative (non-digester) manure management practices on California dairy and livestock operations must be **permanent, annual and measureable.**



## Matching Funds

Matching funds, although not required, are highly encouraged. CDFA will **fund up to 100%** of the total project costs with a maximum grant award **not to exceed \$750,000** per project.



## CEQA Compliance

Compliance with the California Environmental Quality Act (CEQA) and all applicable permitting within six months of the execution of the grant agreement.



## Technological Viability

Use commercially available technology with proven operating history.



## ARB Quantification Methodology

Must use Air Resources Board's Quantification Methodology for FY 2016-17 and Estimated GHG Reduction Calculator.

The calculator assists applicants in estimating avoided methane emissions from anaerobic manure decomposition.



# AMMP Timeline



# Manure Management Research Efforts

## ONGOING RESEARCH

1. Converting Manure to Reduce Greenhouse Gas Emissions, Minimize Environmental Impacts, and Enhance the Economic Feasibility of Dairy Operations: 2016-18: Dr. William R. Horwath and Dr. Xia Zhu-Barker, UC Davis
2. Producing Valuable Co-Products and Improving Nutrient Management for Dairy Manure Digester Systems: 2014-16: Dr. Ruihong Zhang, UC Davis
3. Effect of Solid Separation on Mitigation of Methane Emission in Dairy Manure Lagoons: 2016-17: Dr. Ruihong Zhang, UC Davis
4. Benchmarking of pre-Alternative Manure Management Program Dairy Emissions: 2017-2019: Dr. Frank Mitloehner, UC Davis

# THANK YOU!

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