



CALIFORNIA DEPARTMENT OF
FOOD & AGRICULTURE



Implementing the Dairy Digester Research and Development Program

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(AMMP, DDRDP, SB 1383, CLIM³ATE-RP, AB 1981)

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Acknowledgments

Methane Emission Reduction Team:

- Harsimran (Rosie) Gill – DDRDP
- Alyssa Louie – AMMP
- Dana Yount – AB 1891
- Charles Brooke – SB 1383 and CLIM³ATE-RP

Deputy Secretary Virginia Jameson

Secretary of Agriculture Karen Ross

All Office of Environmental Farming and Innovation (OEFI) and collaborators



Dairy Industry Key Statistics

#1

Dairy State in the US

1.7M

milking cows

\$6.3B

Dairy and dairy products
sales generated

1,250

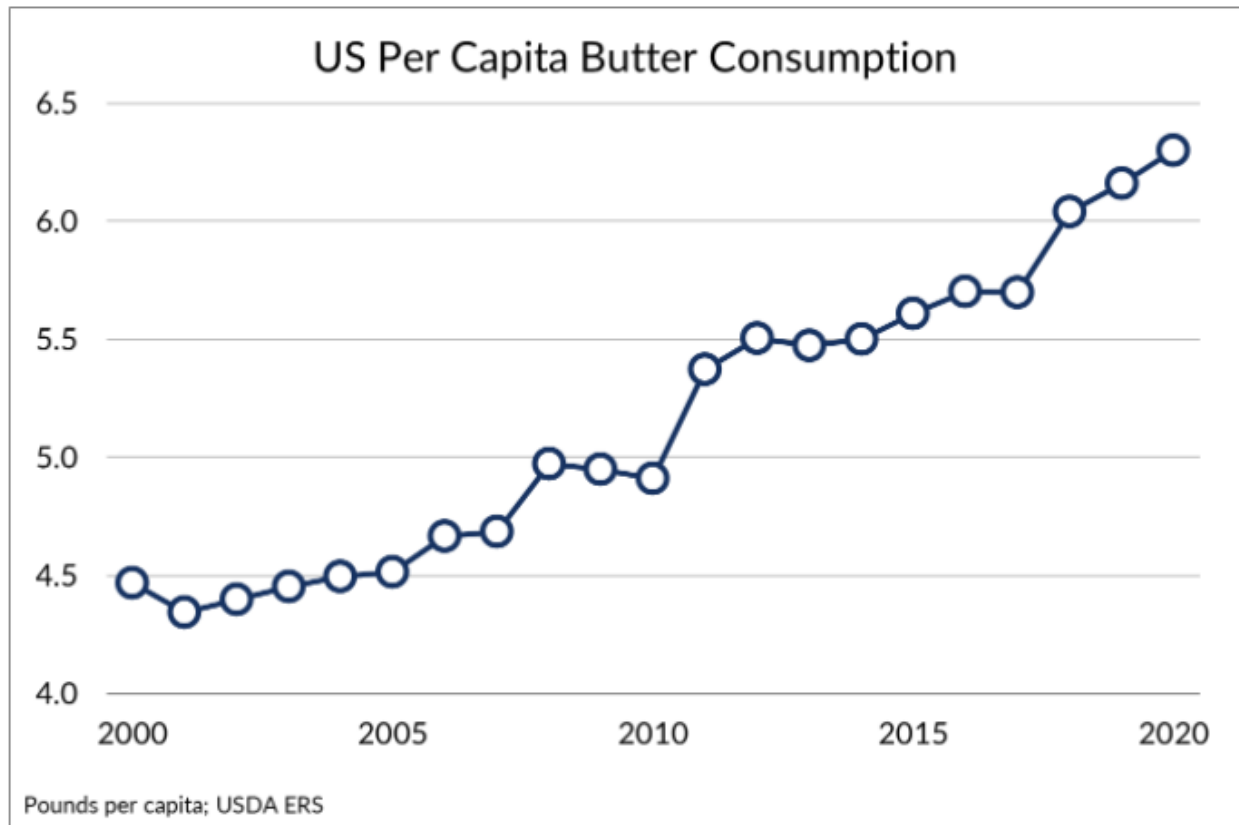
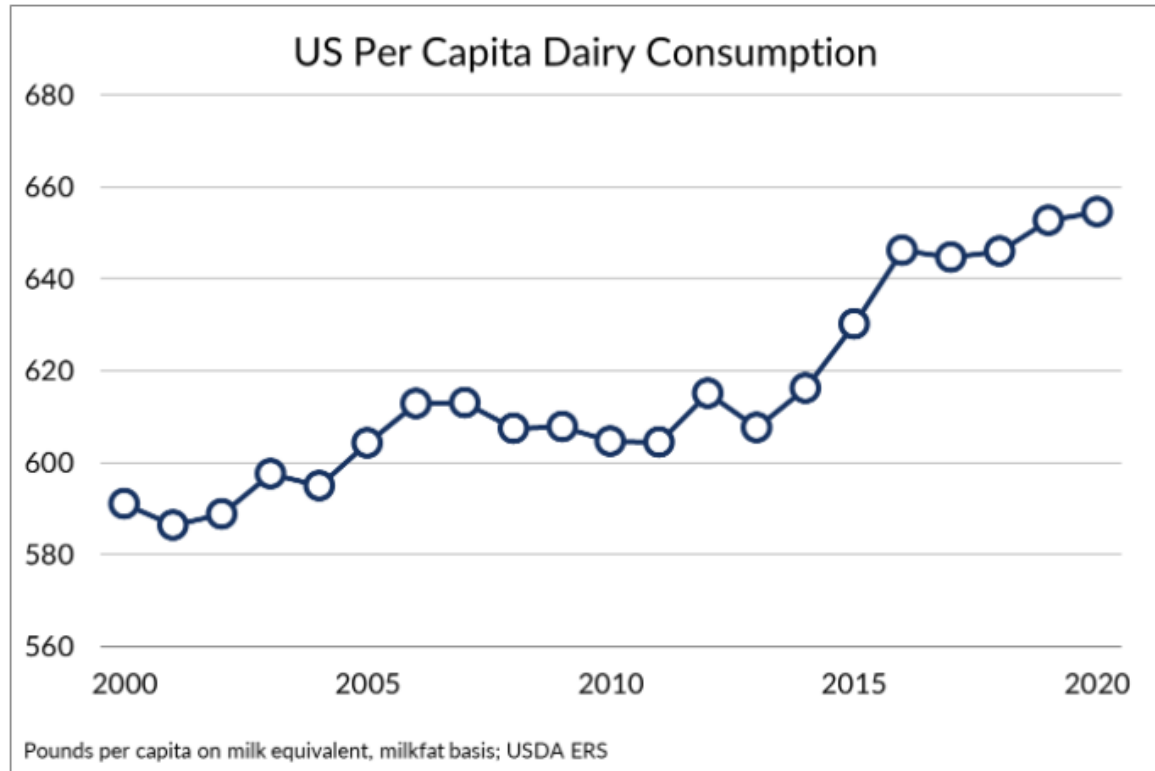
dairies across CA

19%

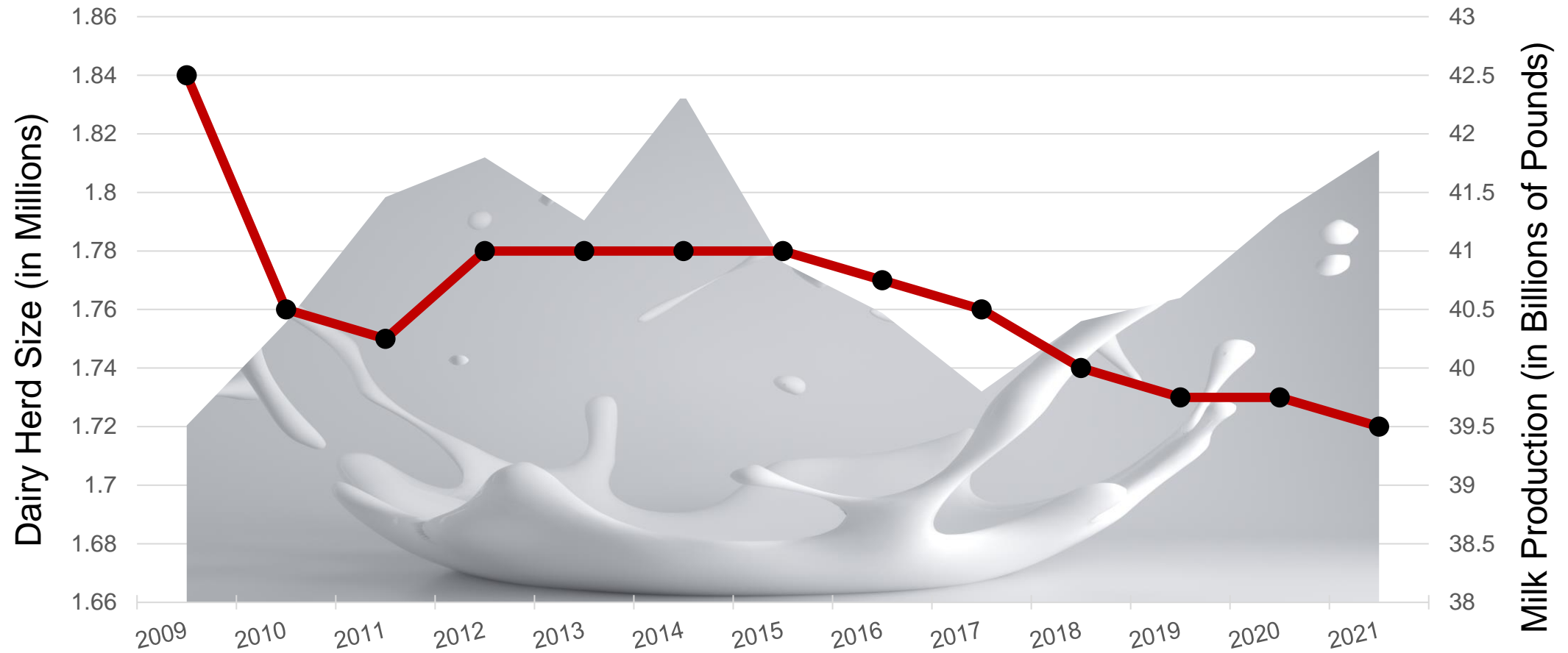
of US milk

The California dairy sector provides milk and milk products like cheese that are highly nutritious, safe, and affordable food sources for children and adults. The dairy sector plays an important role in local, national, and international food security

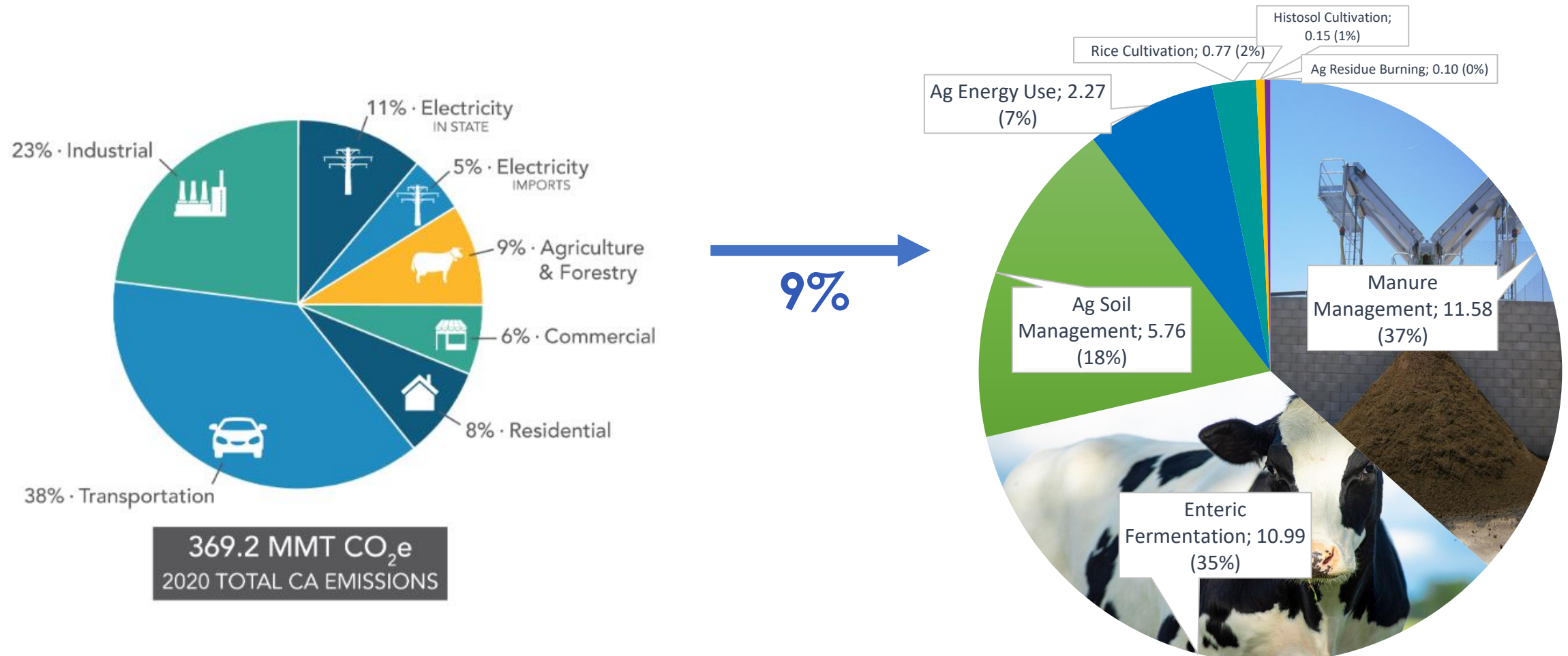
Consumption of dairy and products continues to rise across the country



Dairy Herd Size vs. Milk Production in CA



GHG Emissions From Agriculture In California



Source: California Greenhouse Gas Inventory – 2022 Edition
<https://ww2.arb.ca.gov/ghg-inventory-data>

All values in MMT CO₂e and includes all GHG

California's Approach To Methane Reduction

Legislative and Regulatory Measures

- AB 32 and SB 32
- California's Short-Lived Climate Pollutant Strategy (SB 605, Lara, 2014).
- SB 1383 (Lara, 2016)
 - Reduction in emission of manure management methane from dairy and livestock sector to 40% below 2013 levels by 2030.
 - Regulation for methane reduction on or after 2024.

Voluntary Measures

- Incentive Programs at CDFA
 - Anaerobic digesters for renewable energy (DDRDP)
 - Non-digester based approaches (AMMP)



Alternative Manure
Management Program



Dairy Digester Research
& Development Program

- Enteric Fermentation
 - Research to determine cost-effective and feasible approaches



What is the DDRDP?



- Competitive grant solicitation process administered by the California Department of Food and Agriculture (CDFA).
- Purpose is to award funds to California dairy operations and digester developers for the implementation of dairy digesters that result in manure methane emission reductions on California dairies and minimize or mitigate adverse environmental impacts.

Funding and Duration

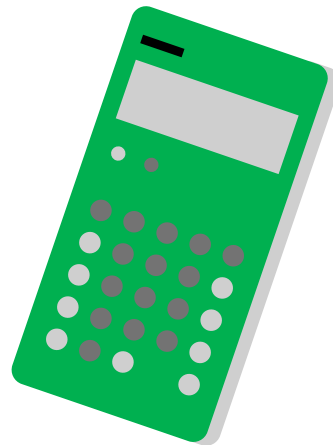
- **\$48 million funding available for 2023 DDRDP and AMMP, with priority to AMMP**



- Project Grant Amounts: **Up to \$1.6 million** (50% match required)
- Maximum Project Duration (2 years): (e.g., January 1, 2023 – December 31, 2024)

Program Requirements

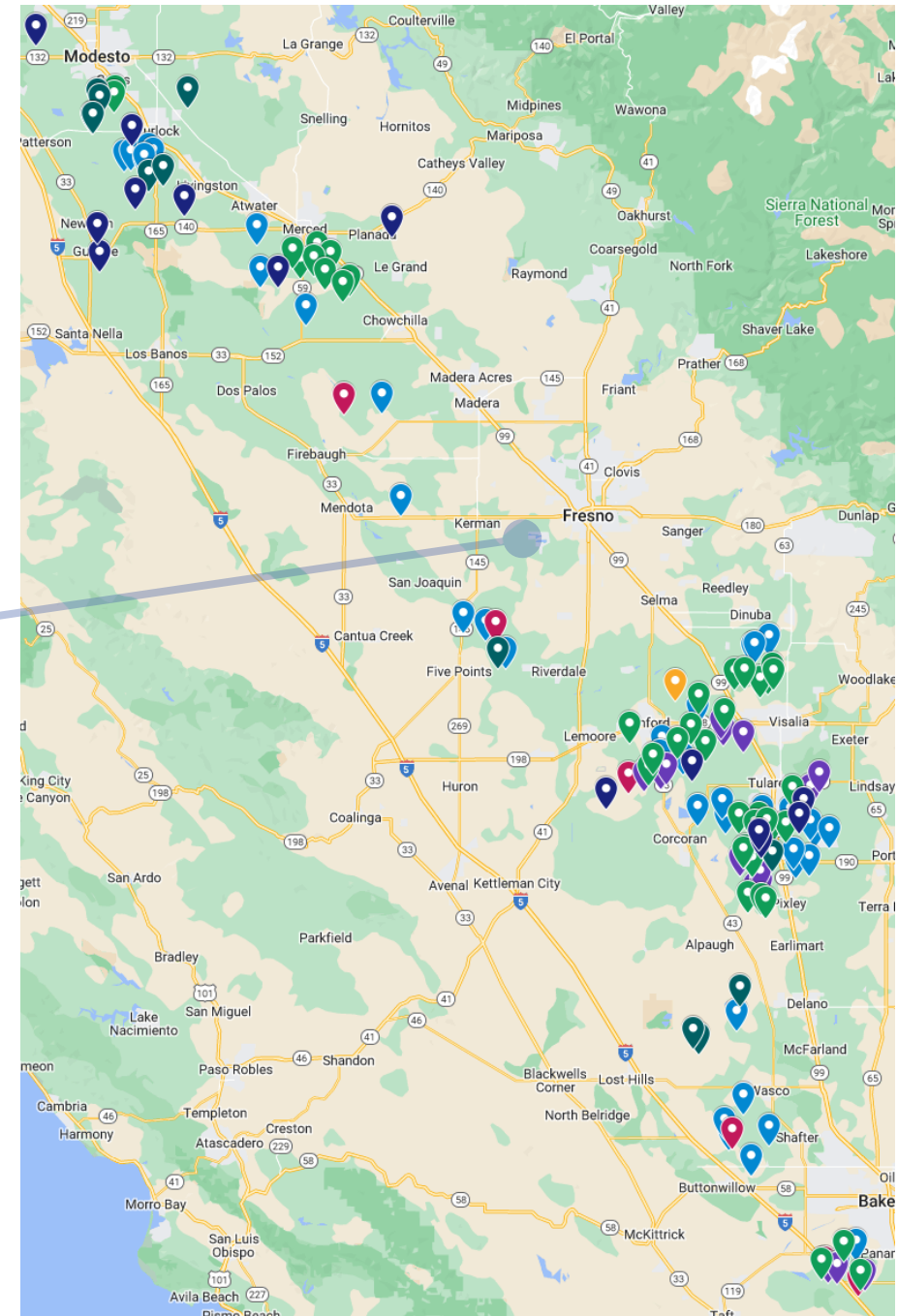
- Methane must be used for energy production or transportation fuel (i.e., flaring as sole biogas end-use is not eligible for funding).
- 80% or more dry weight of the feedstock for anaerobic digestion must be manure from dairy livestock.
- Total NOx emissions must be no greater than 0.50 lb/MW hr for electricity projects.
- Must comply with all applicable state and federal regulations.
- Recipients must not change the herd size beyond their existing permits during the project term.
- Must use the latest DDRDP/CARB Quantification Methodology and Benefits Calculator Tool to estimate GHG emissions reductions and co-benefits



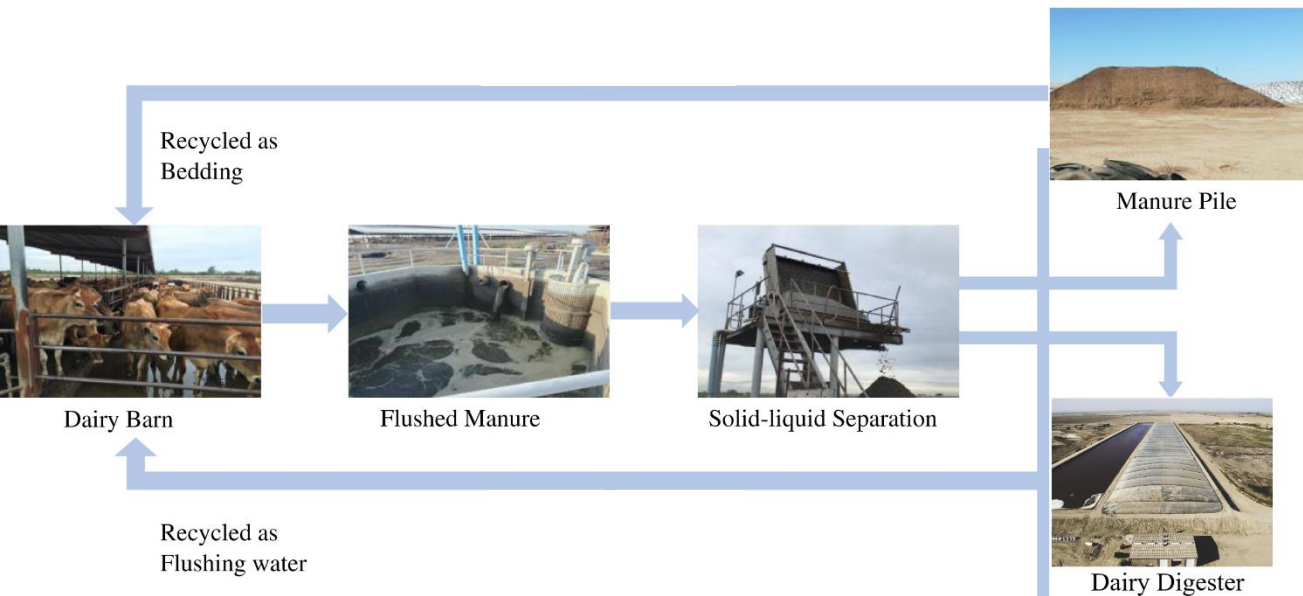
Total estimated GHG reductions
~23 million metric tons CO₂
equivalent (over 10 years)

From 2015 to 2022:
\$214 million awarded for 130
incentive and 1 demonstration
projects

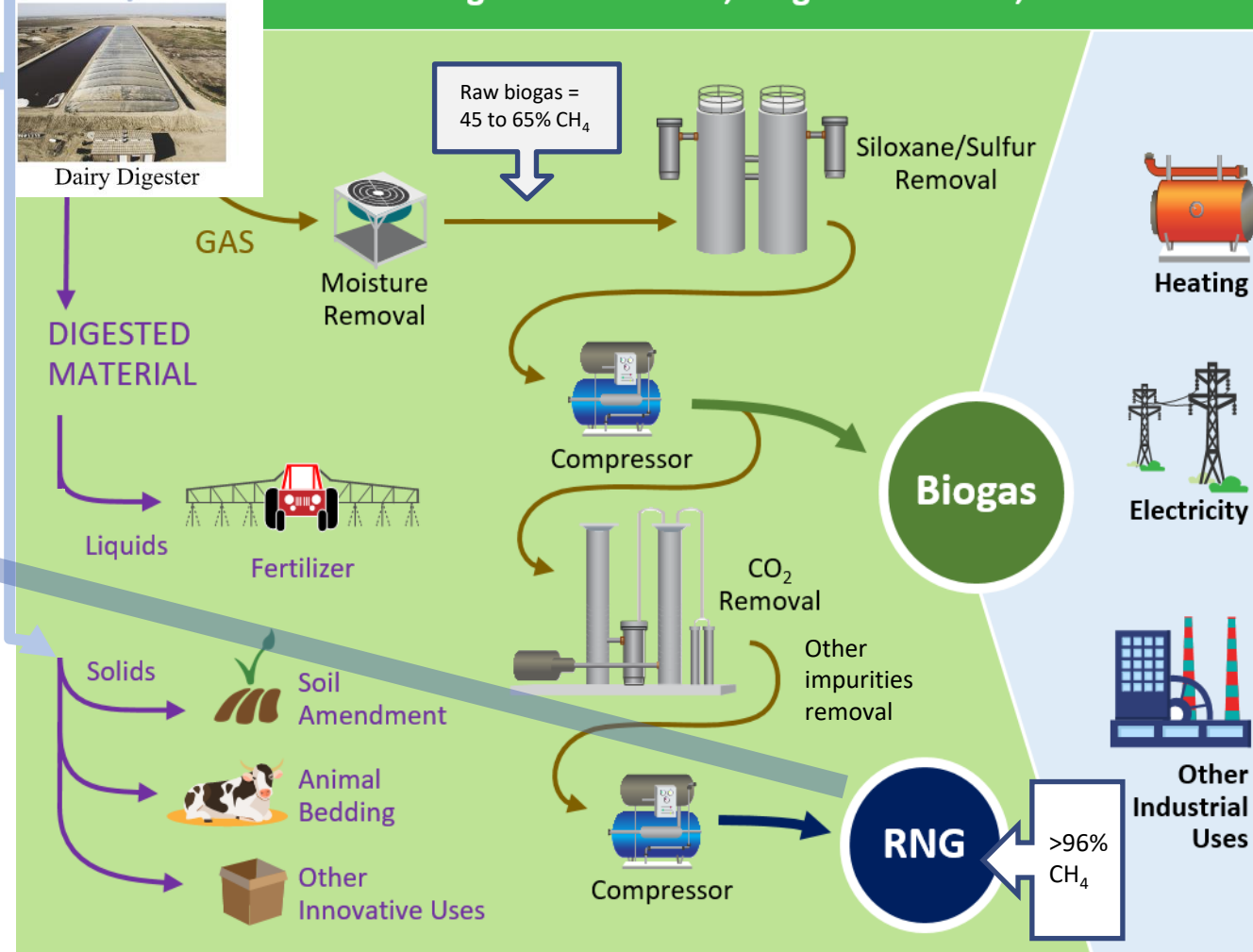
-  **2015 projects**
6 electricity generating projects
-  **2017 projects**
16 RNG fuel digester projects
-  **2018 projects**
40 RNG fuel and electricity
generating digester projects
-  **2019 projects**
42 RNG fuel and electricity
generating digester projects
+
1 Demonstration Project
-  **2020 projects**
12 RNG fuel digester projects
-  **2022 projects**
14 RNG fuel digester projects



Manure Management System on CA Dairies



Anaerobic Digestion Products, Biogas Treatment, and End Uses



Source credits (modified):

Pandey et al., 2018 - DOI: 10.7717/peerj.12408/fig-1; US EPA - <https://www.epa.gov/lmop/renewable-natural-gas>; CalBio and Maas Energy Works







DDRDP Co-Benefits (only since 2019!)

- » 1,562,570 gallons of fossil fuel reduced
 - » 102,932,745 gallons of renewable fuel produced or 19,114,110 MMBtu of RNG (\approx 22.7k vehicles/yr for 10 yrs)
 - » 567,405,897 KWh of electricity generated (\approx 5.3k vehicles/yr for 10 yrs)
 - » ROG reduction of 16,744,300 lbs
 - » NOx reduction of 1,929,630 lbs
 - » Local PM 2.5 reduction of 7,600 lbs
 - » Diesel PM reduction of 17,550 lbs
 - » Compost production of 32,440 tons (810 acres)
- » Additionally, these projects provided:
 - » 4379 full-time jobs (2267 direct, 644 indirect, 1468 induced)



Thank you!

Dairy Digester Research and Development Program

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Email Notifications:

<https://www.cdfa.ca.gov/subscriptions/MailChimp-signup.html>

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CDFA OFFICE OF ENVIRONMENTAL FARMING & INNOVATION