

Methane and California's Livestock Operations



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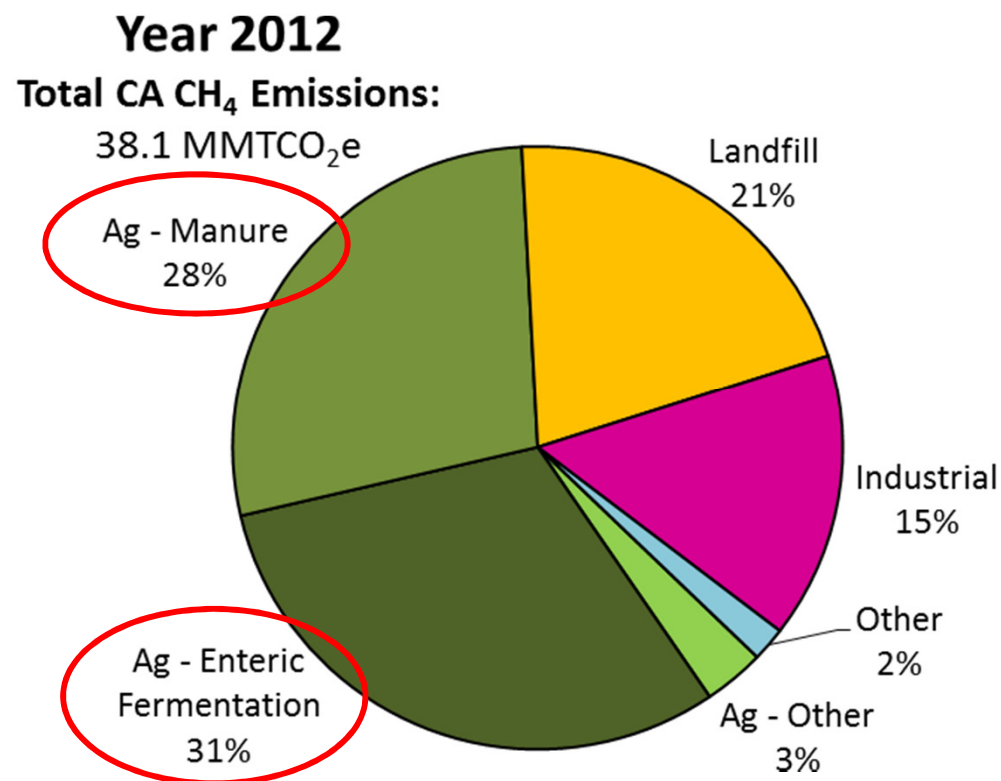
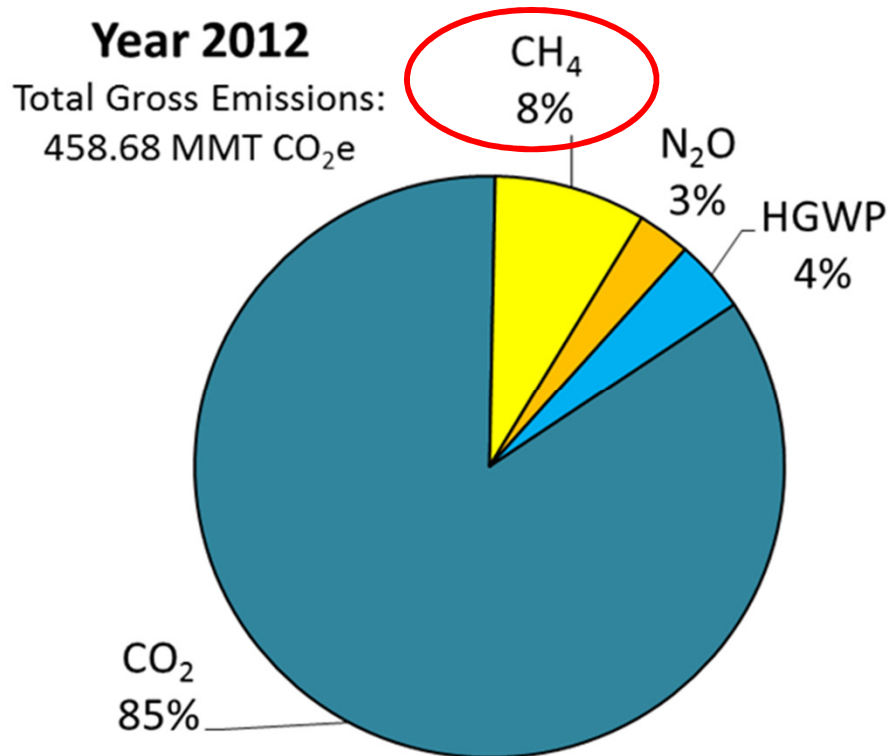
Climate Action Reserve

- Non-profit created by state legislation in 2001
 - Promote the reduction of greenhouse gas emissions by pioneering credible market-based policies and solutions
- Serve compliance and voluntary carbon offset markets
- Consult to governments on climate policy development and offset program design
- Have developed six GHG offset protocols that address methane emissions: landfills, rice cultivation, composting, organic waste digestion, coal mines and livestock operations

California GHG Emissions¹



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Methane from Manure Management

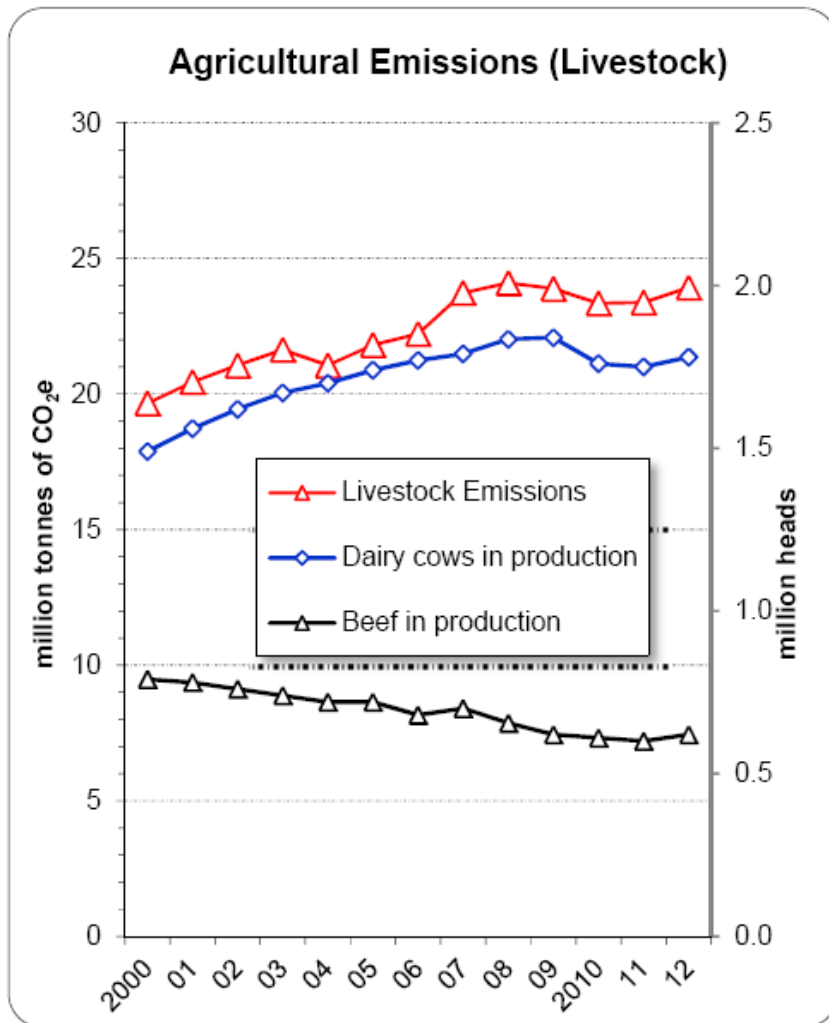
- Manure treated and stored in anaerobic conditions (lagoons) = methane
- Solution: install biogas control systems, also called “digesters”



Methane emissions from California dairies are not regulated and increasing ^{2,4}...



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State	2012 Milk Sales (\$ billions)	2012 Milk Cows (million)	2012 Farms w/ 500 or more cows
California	\$6.9	1.8	51%
Wisconsin	\$5.0	1.3	5%
New York	\$2.4	.61	3%



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What's Being Done? Regulations and Incentives

- Requirement on utilities to procure 250 MW of electricity from small scale bioenergy facilities (SB 1122)
- Low Carbon Fuel Standard (AB 32): incentive to produce low carbon fuels
- Cap-and-trade offsets program (AB 32): market-based incentive to invest in methane reduction projects at livestock facilities
- Biogas conditioning and upgrading tariffs (from utilities)
- State and federal grant and loan programs





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Reserve Livestock Offset Project Stats

- *Offset:* A permit to emit greenhouse gases issued when an emission reduction is achieved and retired from an unregulated and/or uncapped source
 - Offsets can be used for up to 8% of an entity's compliance obligation
- 35 livestock projects issued credits by Reserve
- 70 additional livestock projects in process
- Over 2 million credits issued
- 4 livestock projects in California issued ~100,000 credits (6 more in process)

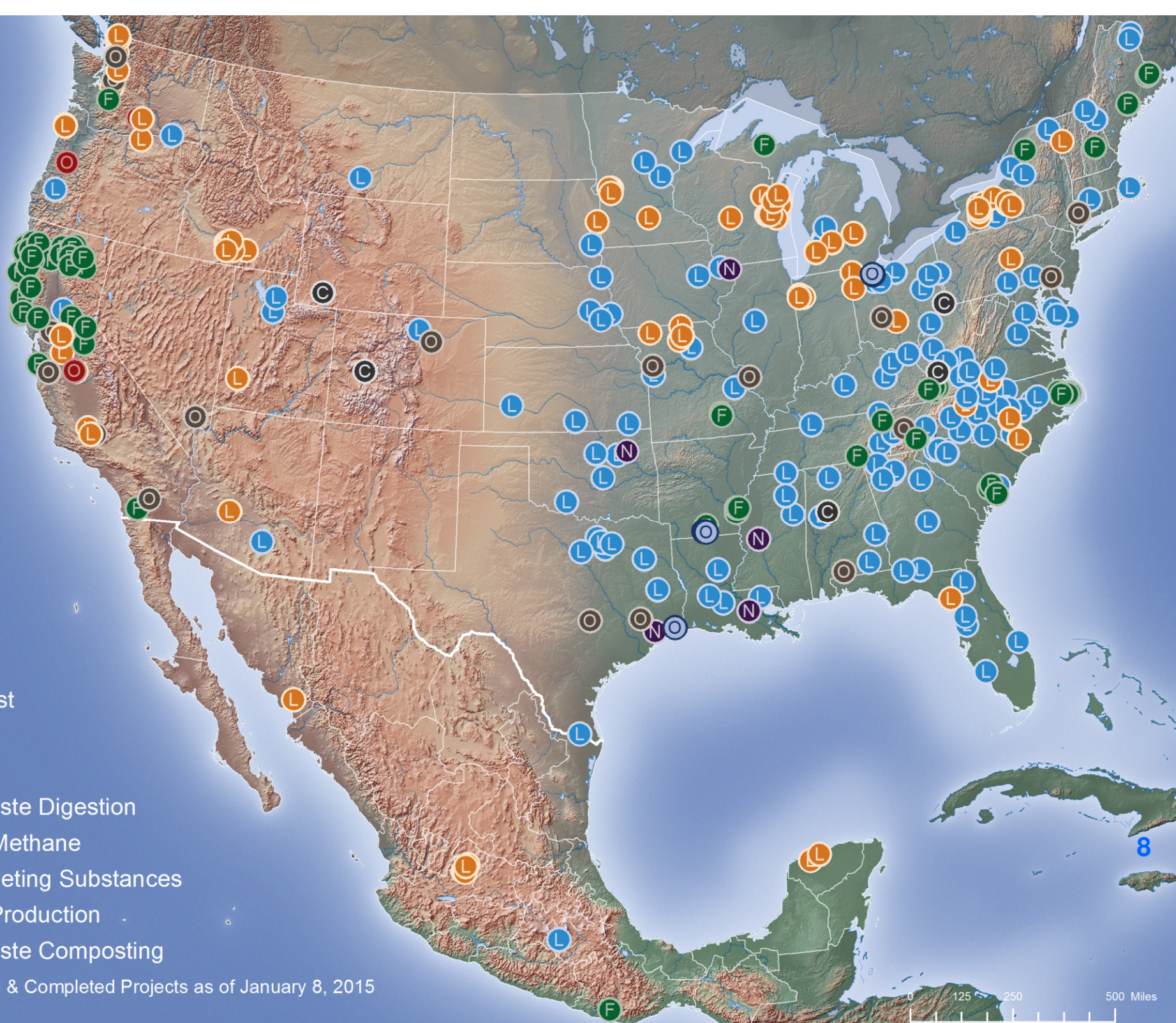




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- Forest
- Urban Forest
- Livestock
- Landfill
- Organic Waste Digestion
- Coal Mine Methane
- Ozone Depleting Substances
- Nitric Acid Production
- Organic Waste Composting

Listed, Registered & Completed Projects as of January 8, 2015



Challenges for Digester Installation and Use of Biogas



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- Combustion (electricity/heat generation or flare)
 - Air permits
 - Increased NOx emissions compared to combustion of natural gas
 - Contaminants hinder the use of emission controls
 - Water permitting issues
- Gas pipeline injection
 - Expense of required gas upgrade equipment
 - Must be physically proximate to pipeline
- Compressed methane as vehicle fuel
 - Only a few demonstration projects to date

What Else Can Be Done about Methane from Livestock Operations?³



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Cap & Trade Auction Proceeds

- 2015: \$11 million in competitive grant funding from CDFA for the installation of dairy digesters in California

Climate Change Scoping Plan Update

- Agriculture is one of nine focus areas
- Scoping Plan Update working papers states CDFA, U.S. EPA, and USDA are work with other relevant state and local agencies to address the technical, regulatory and economic barriers to dairy digesters in California
- The Dairy Digester Workgroup will develop recommendations for a methane capture standard by 2016



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Thank you



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References

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