

**DOCKETED**

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<b>Project Title:</b>	Natural Gas Outlook and Assessments
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<b>Document Title:</b>	Presentation -Maas Energy Works
<b>Description:</b>	S1.3C Daryl Maas, Maas Energy
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<b>Organization:</b>	Maas Energy
<b>Submitter Role:</b>	Public Agency
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<b>Docketed Date:</b>	8/30/2021



**MAAS**  
**ENERGY WORKS**

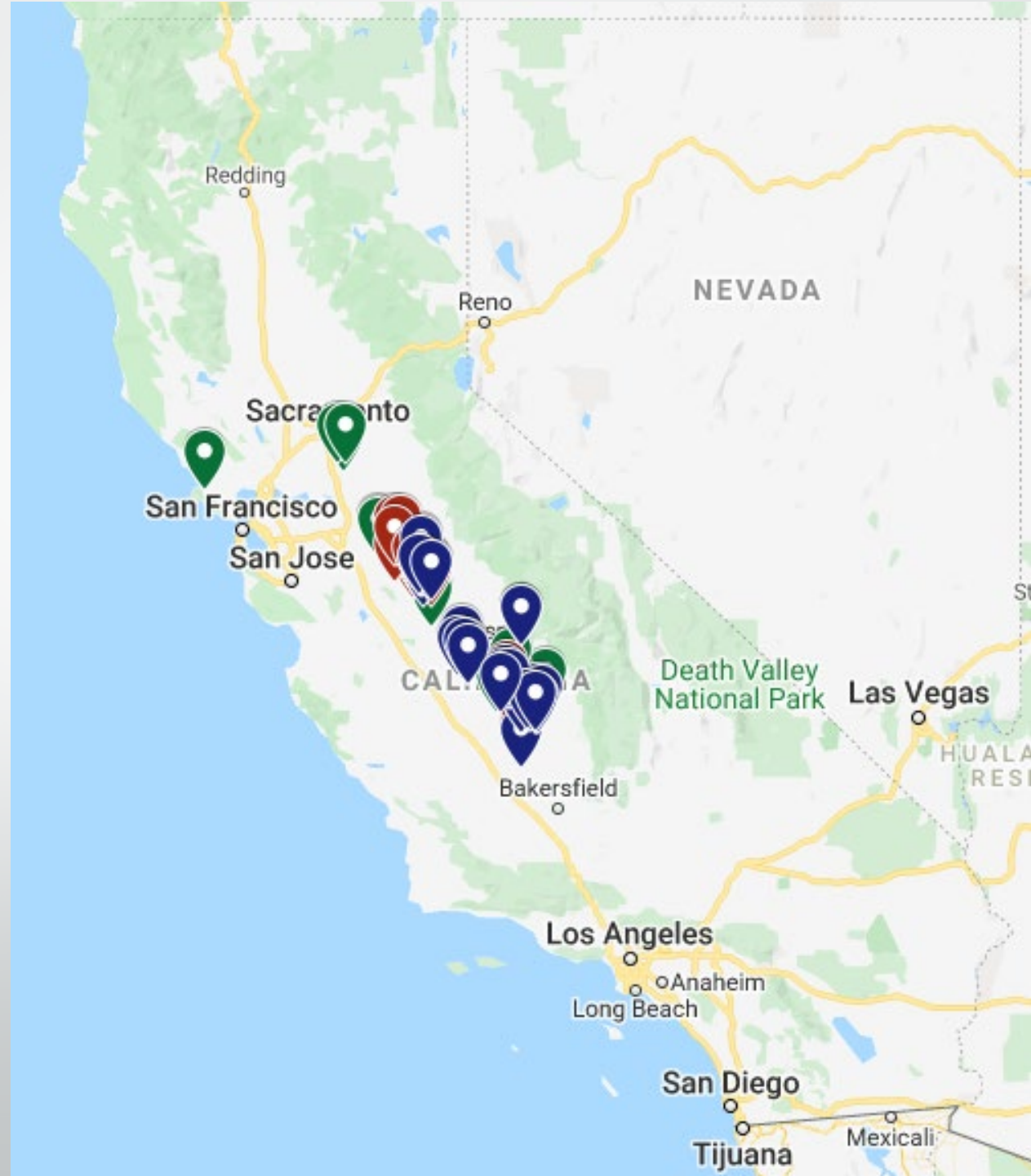
**CEC IPER Renewable Natural  
Gas Workshop**



*"Renewable Energy that Works"*

# Maas Energy Works

- Maas Energy Works, Inc
  - Founded in 2010
  - 27 digesters constructed or refurbished in CA
  - 18 sites in pre/full development
  - 29 sites in construction
  - Largest West Coast developer of dairy digesters (~\$100M install base)





# MAAS

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## ENERGY WORKS

2010 – present (Aug 2021)

Accomplishments across California, Texas, Idaho, Nebraska, Wisconsin, and Michigan

### *Digesters*

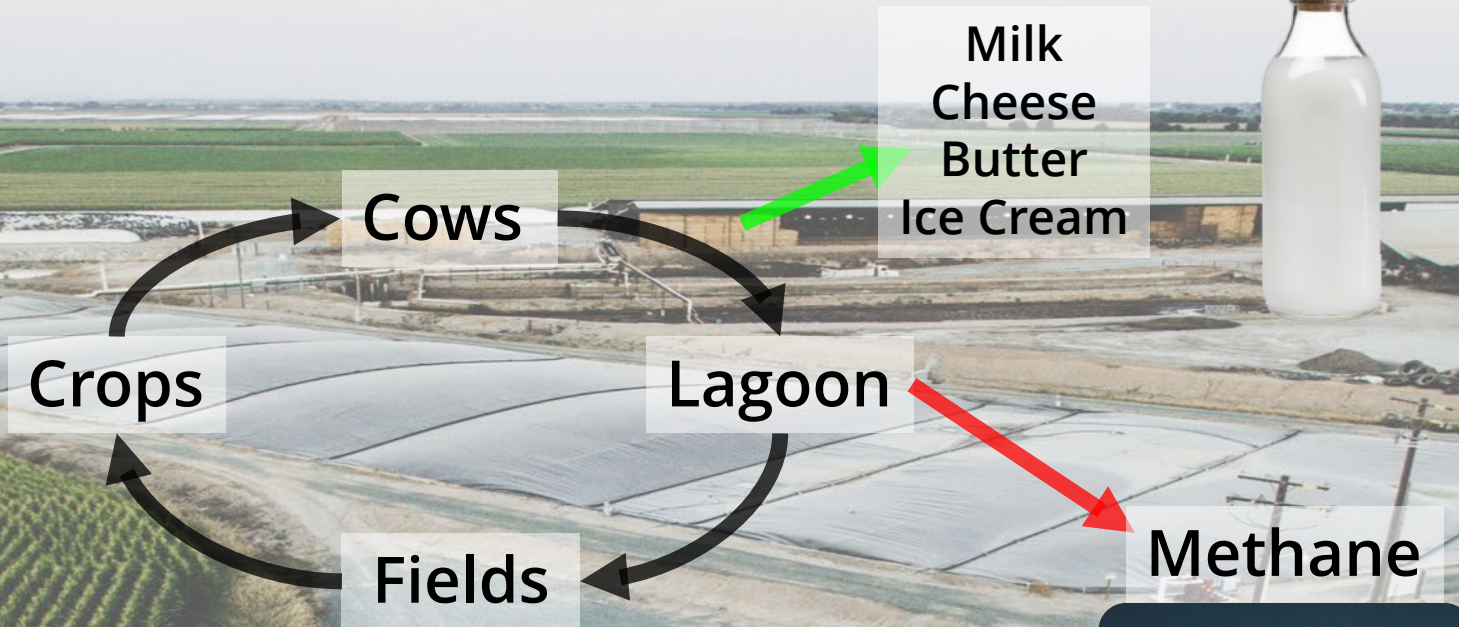
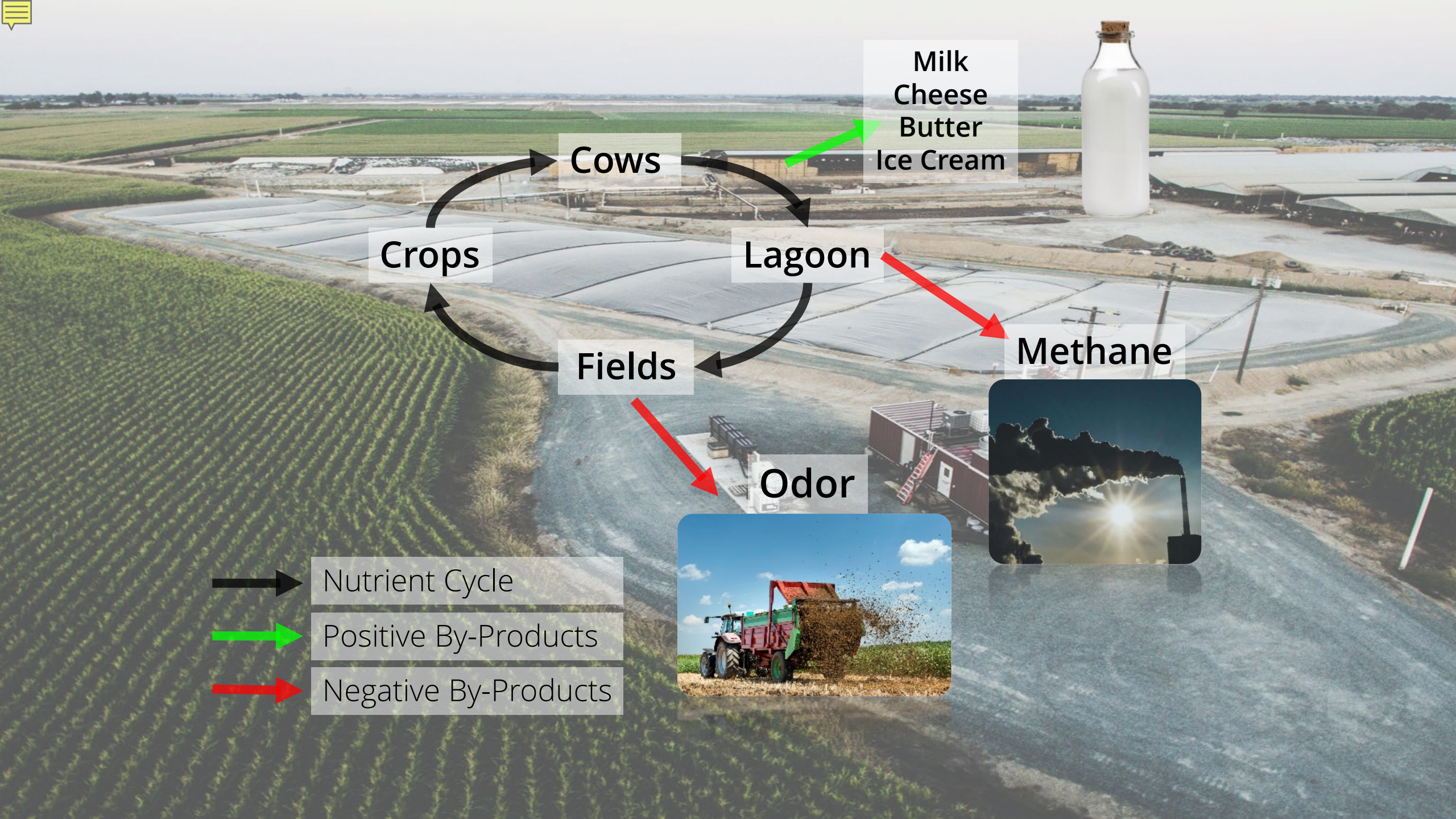
- 31 digesters in steady operations.
- 28 digesters in development or construction.
- 5 retrofitted existing sites.
- 2 refurbished digesters.

### *Bio Methane Injection Facilities*

- 5 operational bio methane injection facilities.
- 9 in development.

### *In House*

- 80+ employees across Redding, Pennsylvania, Central Valley and Los Angeles



Milk  
Cheese  
Butter  
Ice Cream



Crops

Cows

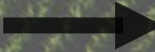
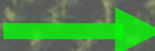

Lagoon

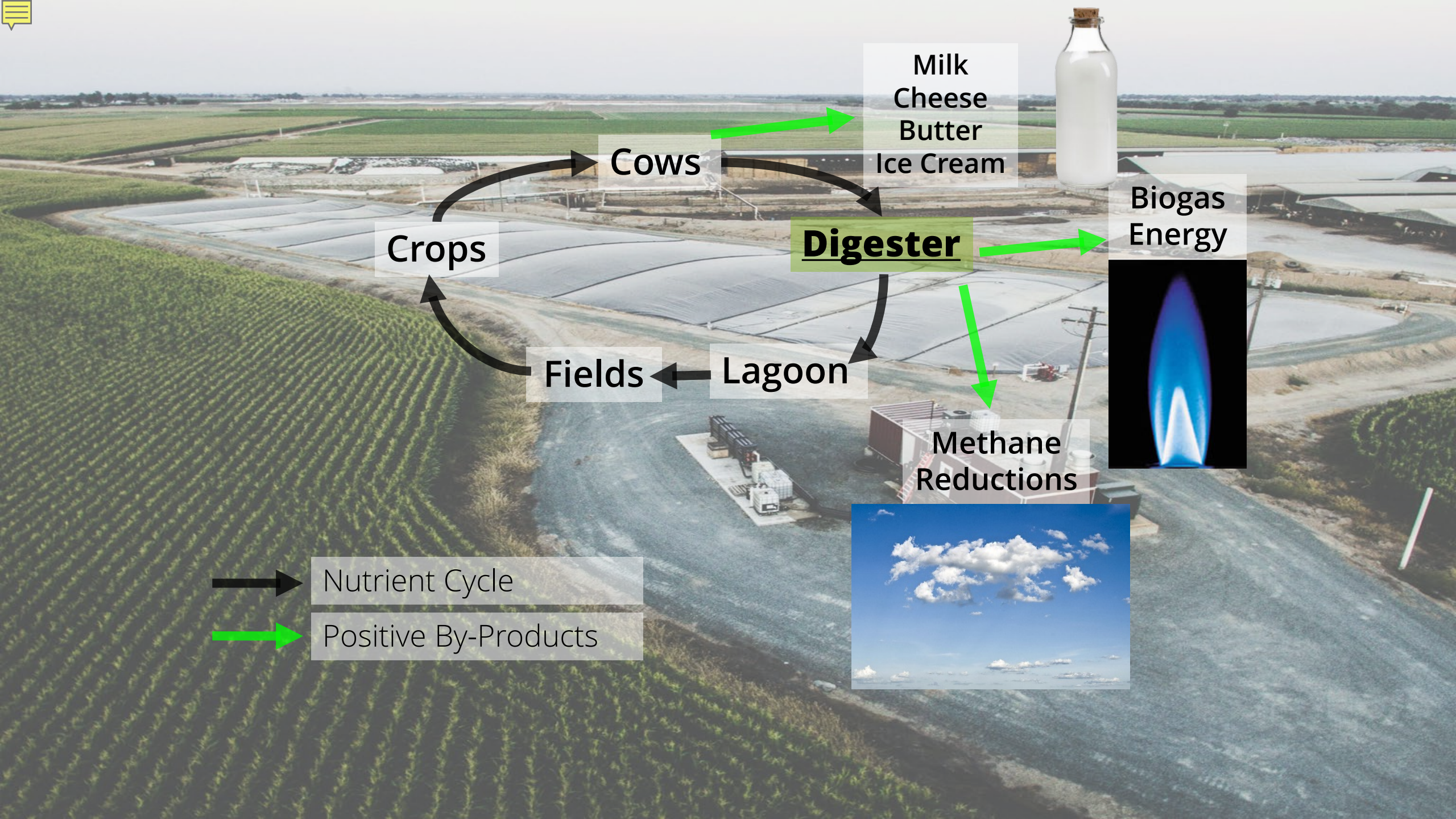
Fields

Methane

Odor



-  Nutrient Cycle
-  Positive By-Products
-  Negative By-Products



Crops

Cows

**Digester**

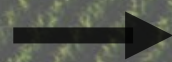
Biogas  
Energy

Fields

Lagoon

Methane  
Reductions

Milk  
Cheese  
Butter  
Ice Cream



Nutrient Cycle



Positive By-Products



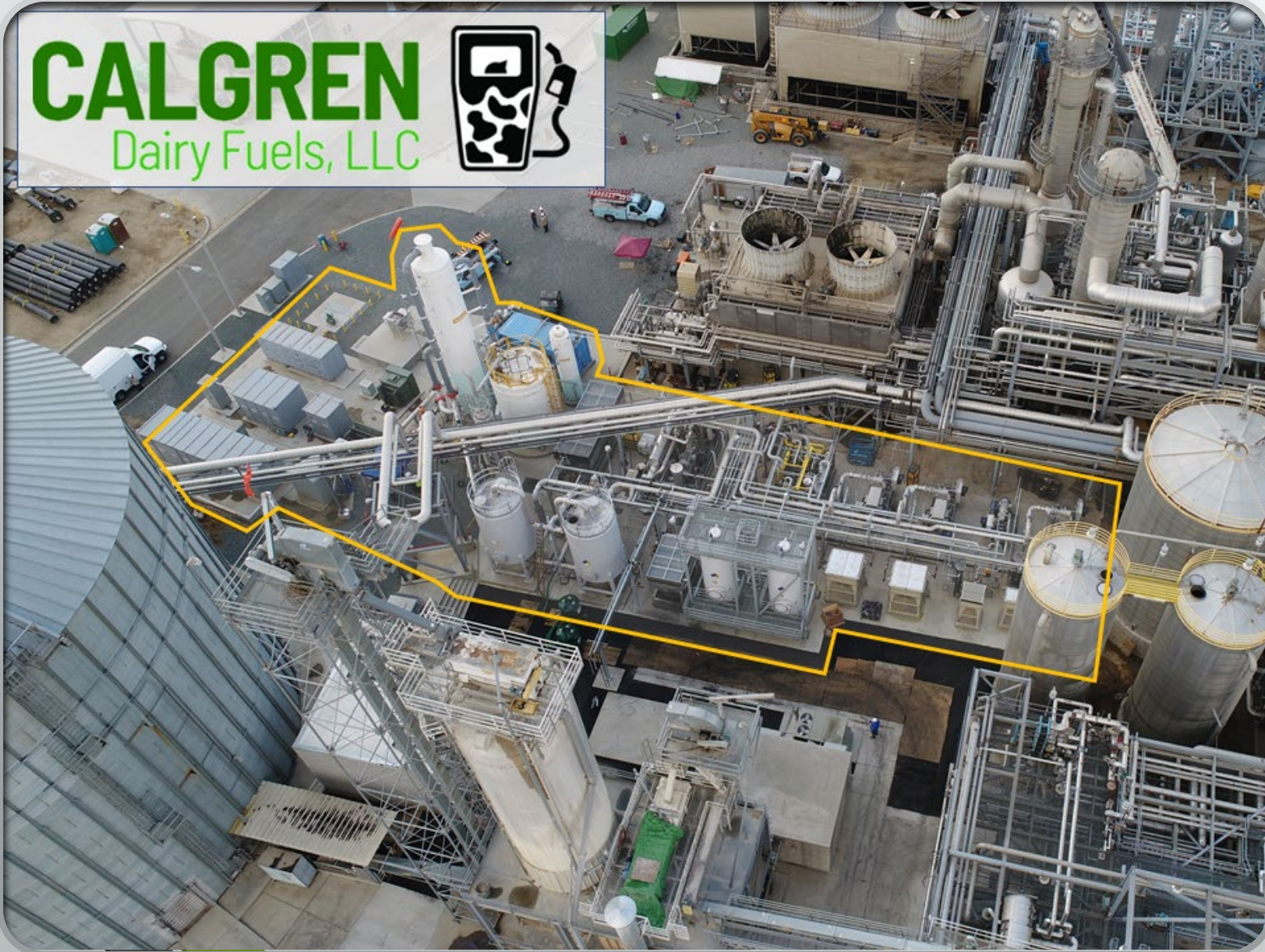
An aerial photograph of a large farm complex. In the foreground, there is a large, rectangular lagoon covered with a dark, flexible material, divided into several sections. To the right of the lagoon is a long, multi-sectioned freestall barn with a dark roof. The barn has several large open bays. In the background, there are green fields and a road. A red arrow points from the 'Freestall Barns' label to the barn structure. Another red arrow points from the 'Covered Lagoon Type Manure Digester' label to the lagoon. A small red building with a white roof is visible in the bottom right corner, near a paved area with some equipment.

Freestall Barns

Covered Lagoon Type Manure Digester

# Pipeline

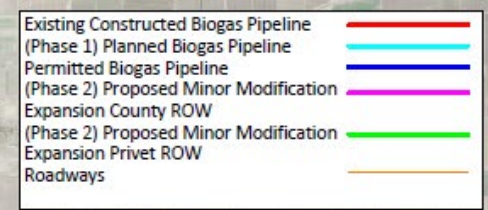
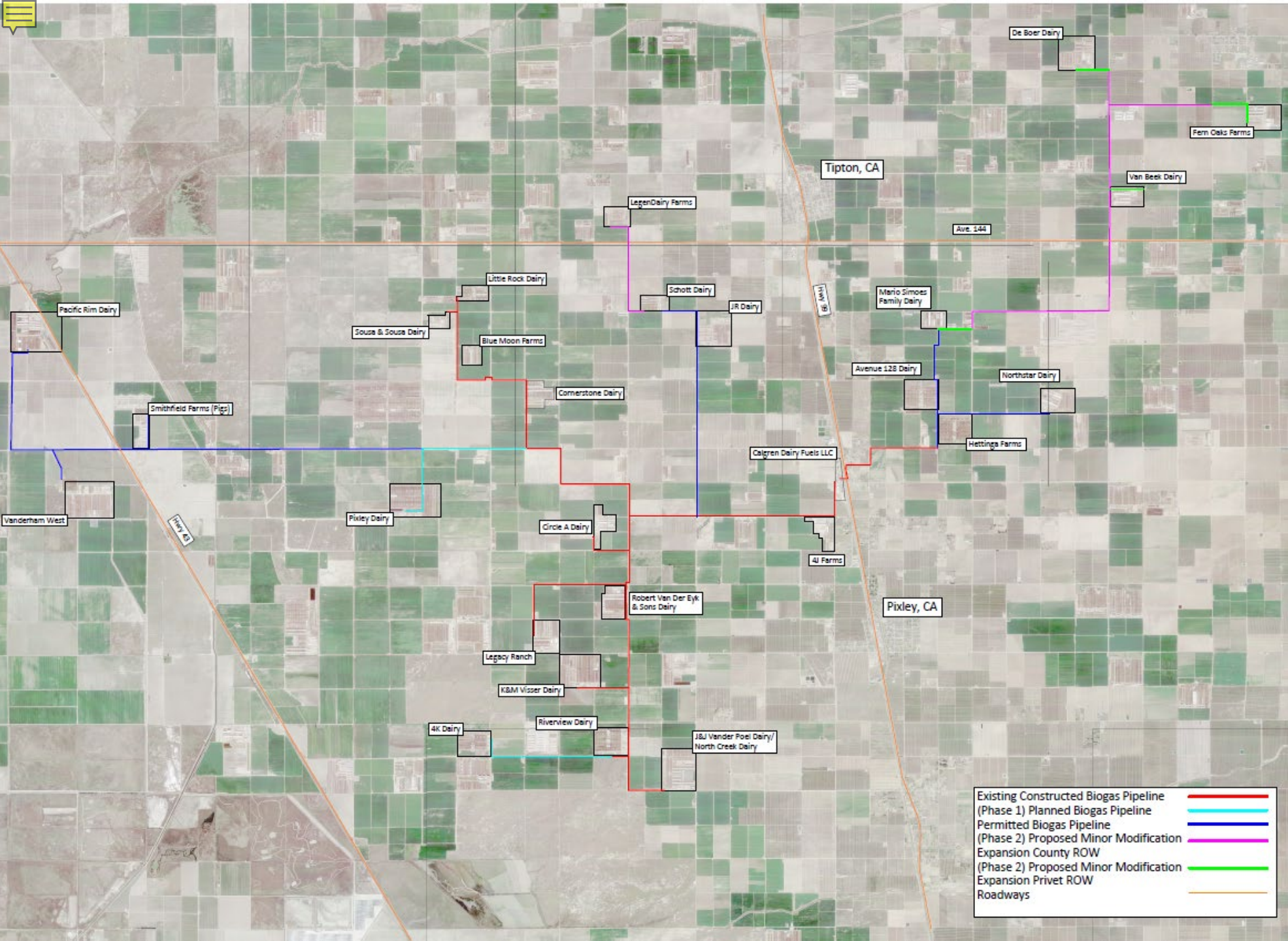
**CALGREN**  
Dairy Fuels, LLC





# Calgren Dairy Fuels Cluster

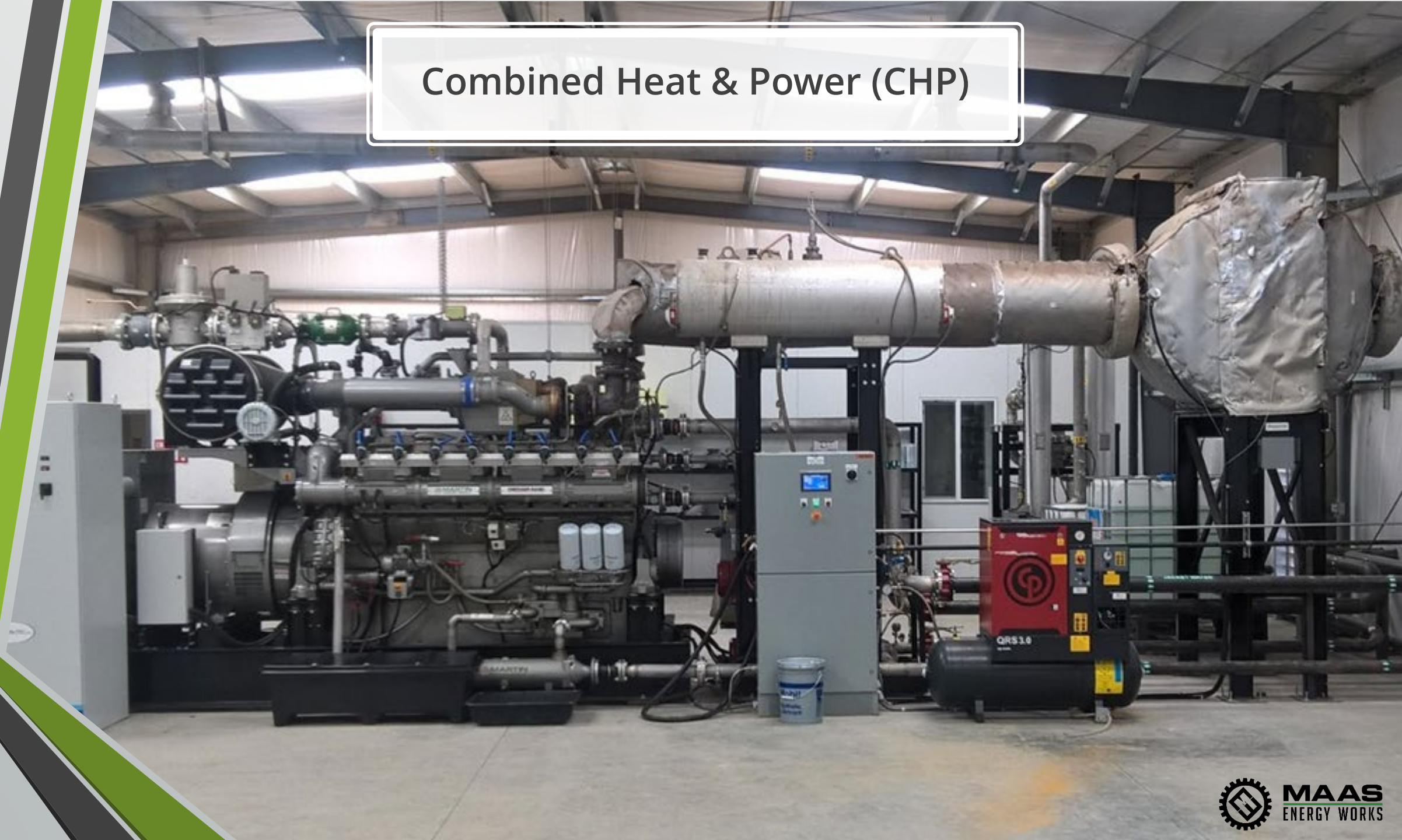
- Maas Energy Works - Lead Developer
- 13 Digesters online injecting RNG to SoCalGas Pipeline
- Expanding to 20+ total dairies
- ~4M GGE/year CNG



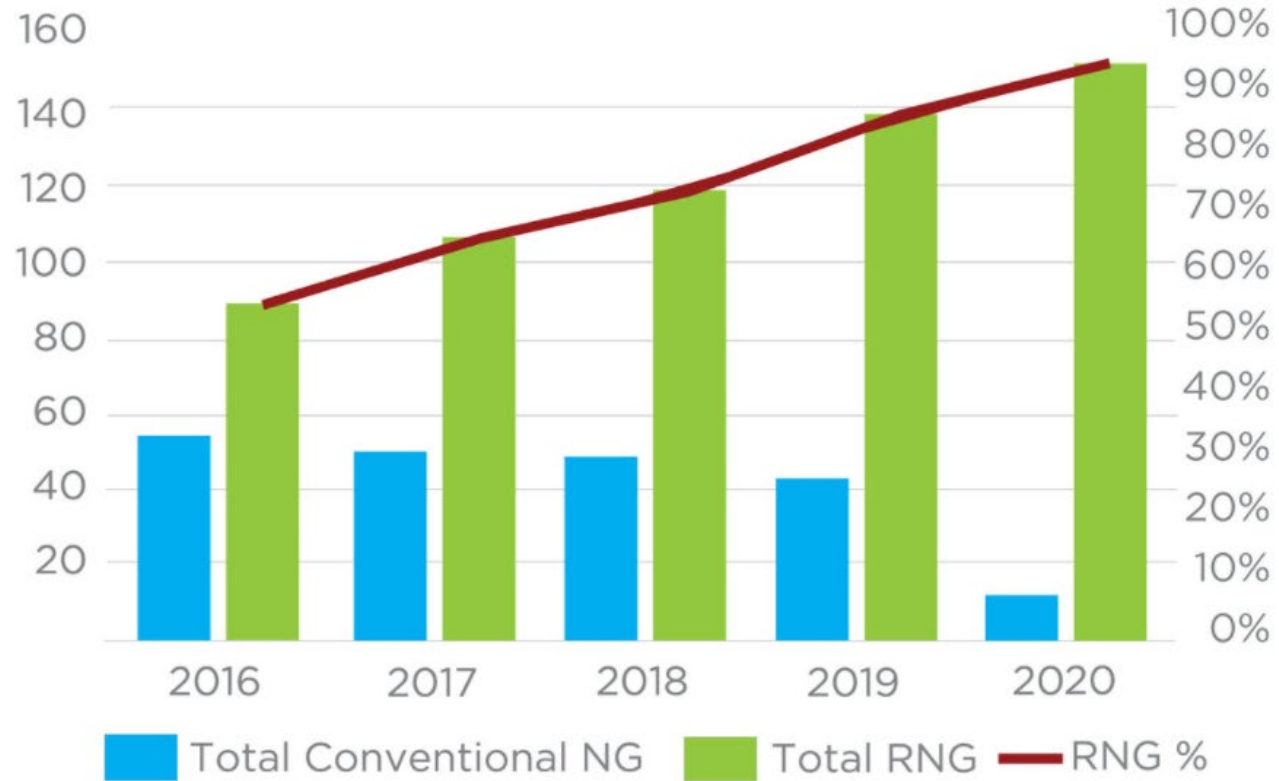
# Virtual Pipeline



# Combined Heat & Power (CHP)



# RNG Growth in California in Diesel Gallon Equivalents (DGEs)



Report produced June 2021 by:

**NGVAMERICA**  
Natural Gas Vehicles for America



Supporting Partners:



CALIFORNIA  
NATURAL GAS VEHICLE  
PARTNERSHIP



California Natural  
Gas Vehicle Coalition

# Thank You!

Daryl Maas

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**MAAS**  

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**ENERGY WORKS**