

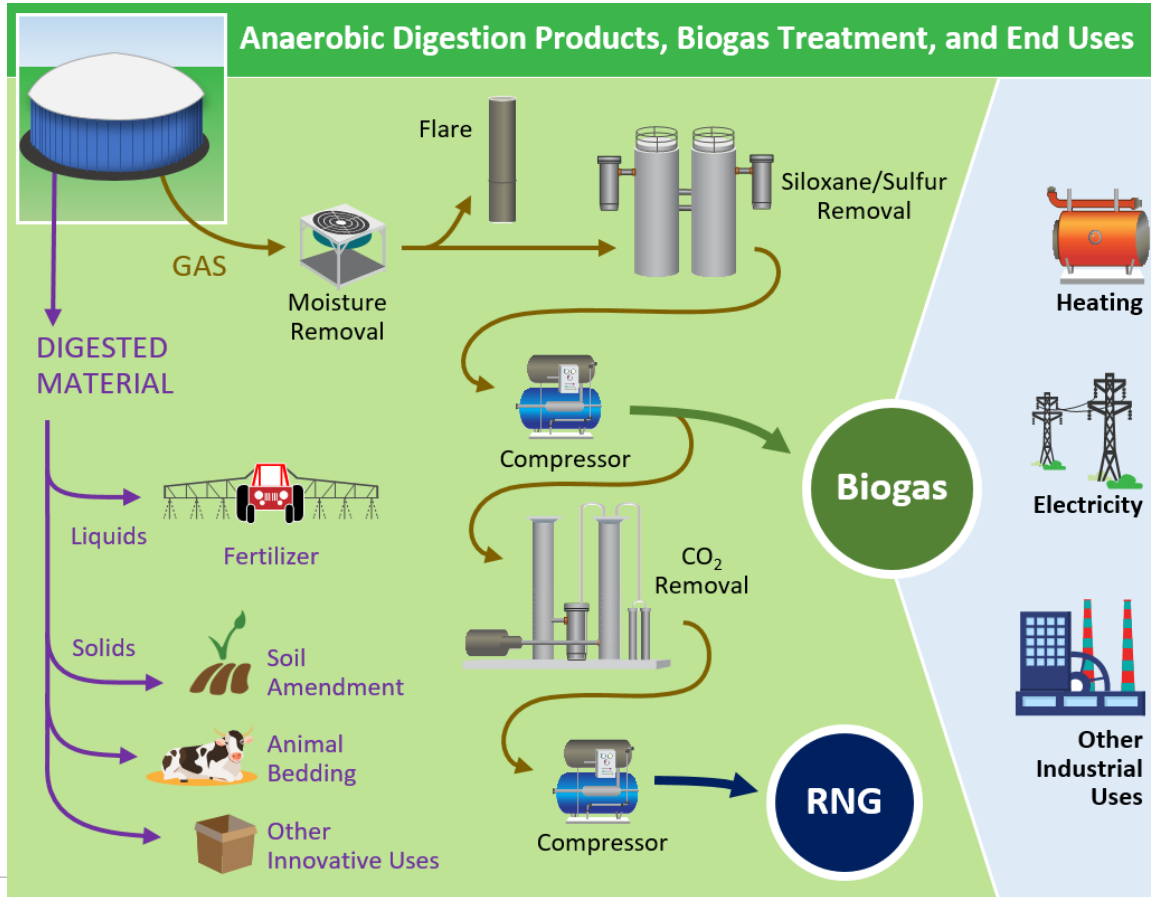
**DOCKETED**

<b>Docket Number:</b>	21-IEPR-05
<b>Project Title:</b>	Natural Gas Outlook and Assessments
<b>TN #:</b>	239523
<b>Document Title:</b>	Presentation - RNG Market
<b>Description:</b>	S2.4 Stephan Barsun, Verdant Associates
<b>Filer:</b>	Raquel Kravitz
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<b>Docketed Date:</b>	8/30/2021

# RNG (and Biogas) Incentives

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# RNG AND BIOGAS FROM ANAEROBIC DIGESTERS



- » Biogas – used onsite
- » RNG – Biogas that has further been refined and (usually) injected into the NG distribution network

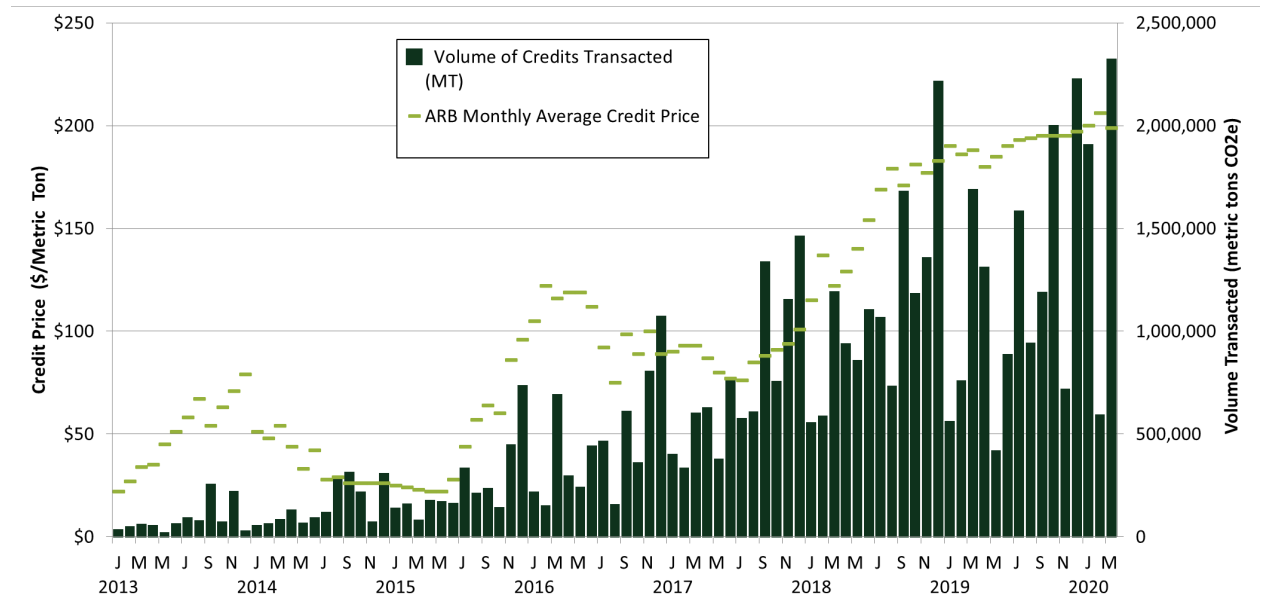
# INCENTIVES

Supply RNG	LCFS	LCFS based on Carbon Intensity of biogas
	RFS	Credits based on energy
	Interconnection Assistance	Up to half of interconnection costs for dairies
Both	CDFA DDRDP	Grants for up to half of the cost of AD installation
Generation from Biogas	SGIP	Capacity Based, Half up-front, half over five years
	REAP	Rural Energy For America Program – 25%
	BioMAT	Feed-in-tariff: sell electricity directly to utility
	RECs	RECs are sold as a commodity into the marketplace. 1 REC = 1 MWh
	NEM	Compensation for renewable electricity exported back to the utility
	Federal Tax Incentives	26 percent tax credit based on the FMV (fuel cells and microturbines)

# RNG Incentives

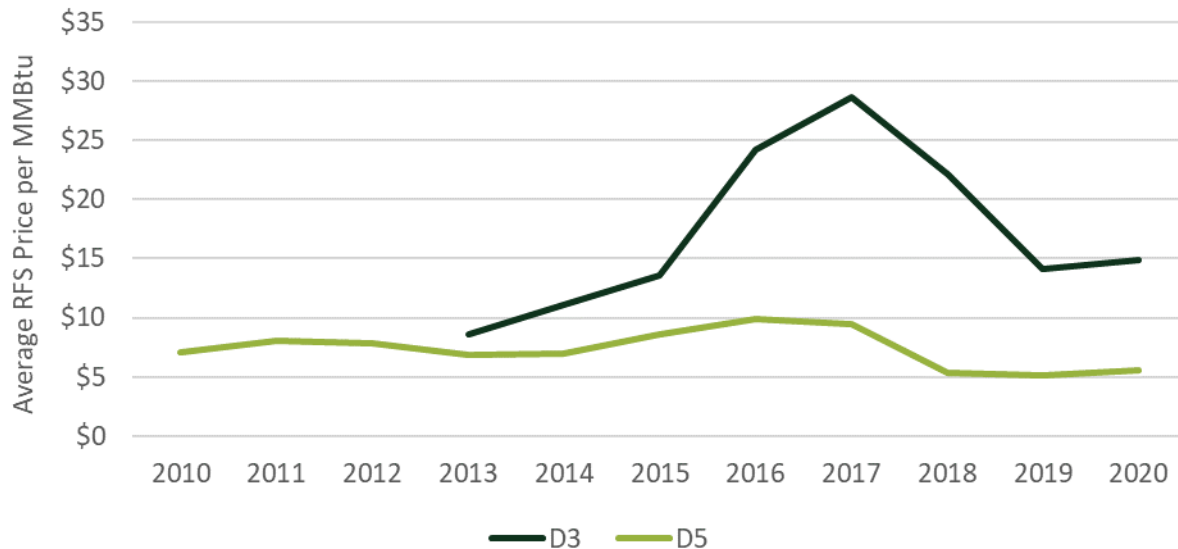
# LOW CARBON FUEL STANDARD (LCFS) CREDITS

- » Market based, administered by CARB
- » Based on 'cradle to grave' pathway reducing one Metric Ton of CO<sub>2</sub>e
- » Emitters by offsets to lower overall carbon content
- » Sources can be outside of California



# FEDERAL RENEWABLE FUEL STANDARD (RFS)

- » EPA program to replace fossil transportation fuel
- » Priced per gallon of gas equivalent (energy)
- » RIN value changes over time and varies by category
- » Majority of RNG is 'D3'



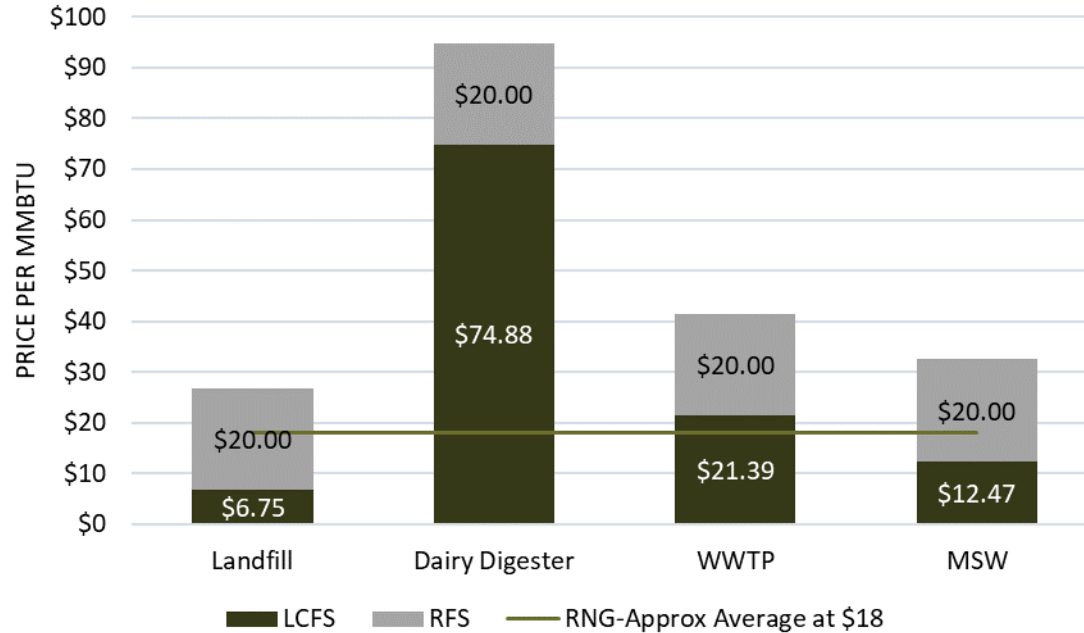
# TRANSPORTATION CREDITS AND RNG SUPPLY

## » LCFS

- California
- Market Based by **Carbon Reduction**

## » Renewable Fuel Standard (RFS)

- Federal
- Based on gasoline equivalent **energy**





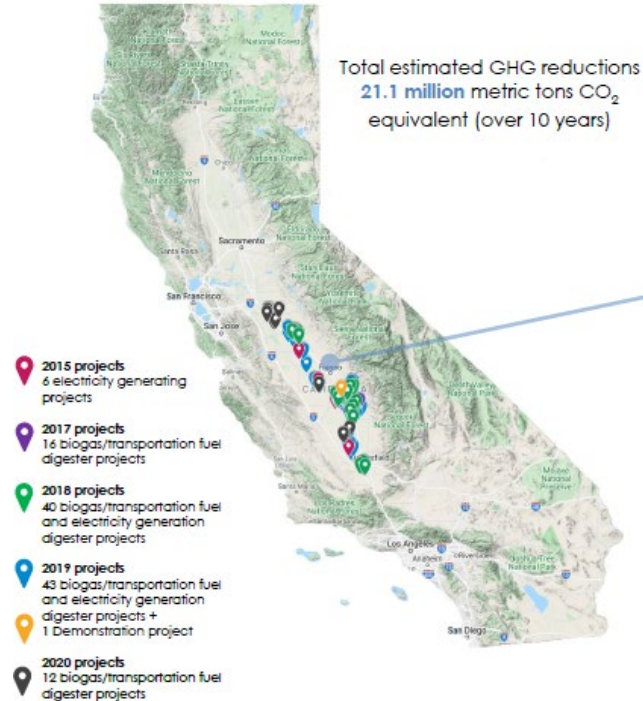
# INTERCONNECTION ASSISTANCE

- » Aids RNG producers to connect to the gas system
  
- » Assembly Bill (AB) 1900
  - Incentive Program Authorized
  
- » Assembly Bill (AB) 2313
  - Reimbursements can be up to 50 percent of the interconnection costs
  - Capped at \$3 million per project
  - Capped at \$5 million for dairy clusters

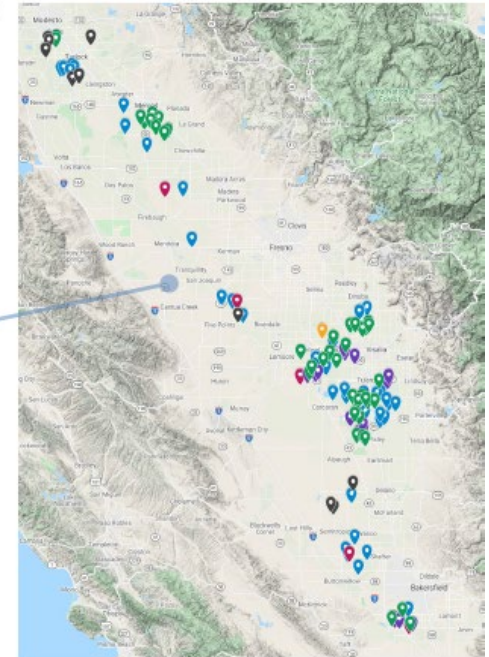
# CALIFORNIA DEPARTMENT OF AGRICULTURE (CDFA)

## DAIRY DIGESTER RESEARCH AND DEVELOPMENT PROGRAM (DDRDP)

- » CDFA has funded a total of \$195.5 million to 118 dairy digester since 2014
- » Dairy Digesters
- » Competitive Program
- » Biggest dairies closest to pipelines all done?
  
- » 118 projects Funded
  - 6 IC Engines for Electricity in 2015 (2 SGIP)
  - 2 Fuel Cells in 2019 for EV fueling (LCFS)
  - Rest for transport or pipeline RNG (LCFS and Federal RFS)



CDFA Dairy Digester Research and Development Program  
Funded Projects Report



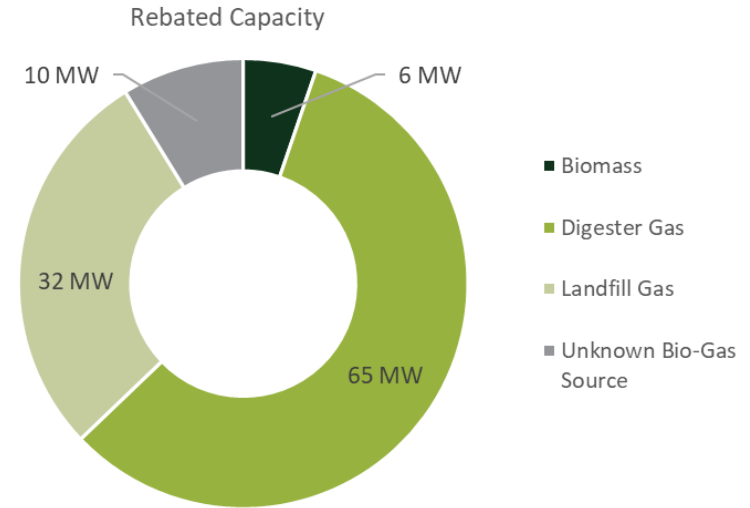
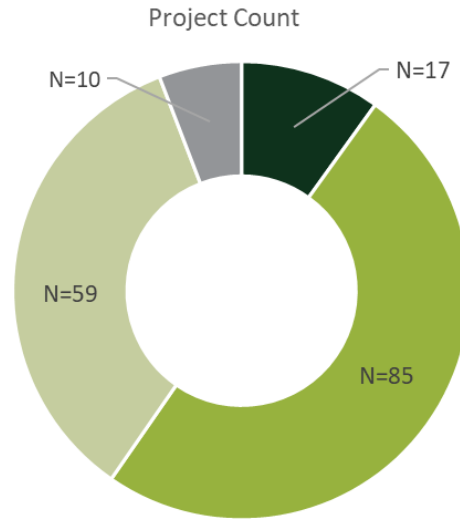
# COMBINING PIPELINE INCENTIVES & REVENUES

- » Up Front:
  - Interconnection Assistance
  - CDFA grants (if a dairy)
  
- » Over time
  - Variable over time:
    - LCFS
    - RFS
  - Contract with gas supplier

# Biogas Generation Incentives

# SGIP BIOGAS GENERATION PROJECTS (2001-2019)

- » Must now be renewably powered
- » Can be
  - Directed
  - On-Site
- » Incentives (recently raised):
  - \$2.5/ watt
  - +\$2/watt resiliency fire or PSPS areas
  - 50% up front
  - 50% 5-year Performance based



# NET ENERGY METERING

- » California Program
  - Available in many other states
  
- » Must be renewable or fuel cells (NEM-FC) that meet emissions requirements
  
- » NEM 2.0 provides credit at (nearly) retail rate for exported energy
  - Less non-bypassable charges
  - Must be Time of Use
  - Evaluation (led by Verdant): <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/net-energy-metering>
  
- » NEM 3.0 currently in development
  - <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/net-energy-metering>

# FEDERAL TAX BENEFITS – CHANGES COMING?

## +Modified Accelerated Cost Recovery System (MACRS)

### Investment Tax Credit (ITC):

- » Almost all renewable sources
- » Non-renewable Fuel cells, microturbines, CHP
- » Stepping down starting in 2023
  
- » Based on Fair Market Value:
  - 26% for solar, fuel cells, small wind
  - 10% for geothermal, microturbines and CHP
  - 30% for offshore wind

### Production Tax Credit (PTC):

- » Renewable generation
  
- » Systems Commencing construction prior to January 1, 2021
  
- » Based on Production:
  - Wind: \$0.015/kWh
  - Geothermal, Closed-loop Biomass (specifically grown crops): \$0.025/kWh
  - Other eligible technologies: \$0.013/kWh
  - Applies to first 10 years of operation

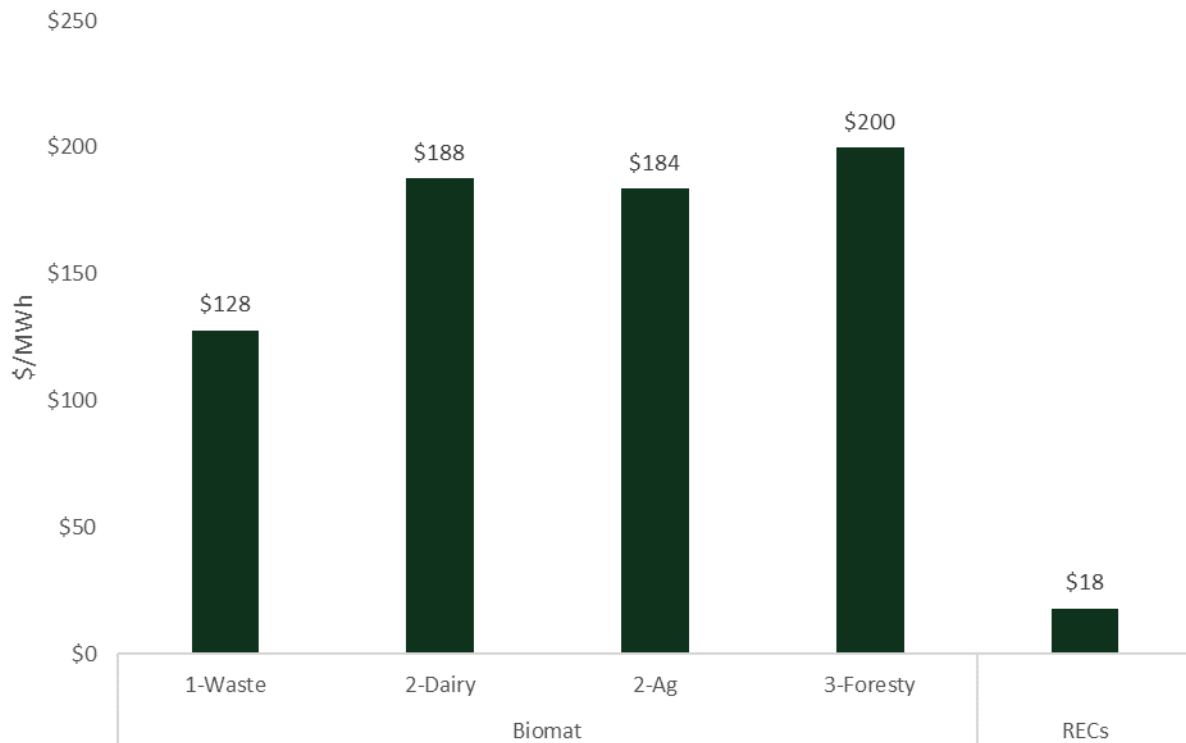
# BIOMAT & RECS

## » BioMAT

- California Program
- No double-dip with SGIP
- Incentivizes biogas fueled generation
- PPA 's w/ 10, 15, 20-year terms
- < 5 MW

## » Renewable Energy Credits (RECs)

- \$ Value based on Western Renewable Energy Generation Information System (WREGIS)





# RURAL ENERGY FOR AMERICA (REAP)

- » The grants can cover 25 percent of total eligible project costs up to a maximum of \$500,000.
- » These are restricted to rural small business or farms so these grants are unlikely to be used by landfills or wastewater treatment plants, which are usually owned by municipalities or corporations.

# STACKING INCENTIVES FOR GENERATION

- » Up Front
  - SGIP (half)
  - REAP
  - ITC
  
- » Over time
  - BioMAT (no SGIP or NEM)
  - SGIP PBI
  - NEM
  - MACRS
  - PTC (if no ITC)

# OTHER POLICIES

- » SB 1383 - Short-Lived Climate Pollutants (SLCP)
  - Reduce organic waste going to landfills:
    - 50% by 2020
    - 75% by 2025
    - May be diverted to wastewater digesters
  - Rescue at least 20% of edible food to those in need
- » SB 1440 – Biomethane Procurement
  - Karin covering next
  - IOUs buy RNG
  - Aid interconnection
- » RNG Tariffs
  - Others will expand in a bit

# QUESTIONS?

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**THANK YOU**

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