



Appendix to 2023 Report to the Joint Legislative Budget Committee

Report of Funded Projects (2015 – 2023) Past Projects Information



I. Individual Project Information

Information on individual projects funded through the CDFA DDRDP from 2015-2022.

Verwey-Hanford Dairy Digester
Funded: 2015
Completion: September 2016
Status: Operational

The Verwey-Hanford Dairy Digester project is a new covered lagoon digester at Philip Verwey Farms #2 dairy. The biogas from the digester is used to produce approximately 7.6 million kWh of renewable electricity per year.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$3 million
- Matching funds - \$3,011,595
- Total Project costs - \$ 6,011,595
- Estimated 10-year GHG reductions - 535,770 MTCO_{2e}
- GHG reductions per CDFA grant dollar - 0.18 MTCO_{2e}
- GHG reductions per total project dollars - 0.09 MTCO_{2e}
- Total cost per MTCO_{2e} - \$11.22



Image 1. View of the covered lagoon digester at Verwey-Hanford Dairy.

Open Sky Ranch Dairy Digester

Funded: 2015

Completion: August 2016

Status: Operational

The Open Sky Ranch Dairy Digester project recommissioned a defunct covered lagoon digester at Open Sky Ranch. The biogas from the digester is used to produce approximately 6.4 million kWh of renewable electricity per year.

- Location – Riverdale, California (Fresno County)
- CDFA DDRDP Funding - \$973,430
- Matching funds - \$990,486
- Total Projects costs - \$1,963,916
- Estimated 10-year GHG reductions - 258,911 MTCO_{2e}
- GHG reductions per CDFA grant dollars – 0.27 MTCO_{2e}
- GHG reductions per total projects dollars 0.13 MTCO_{2e}
- Total cost per MTCO_{2e} - \$7.59



Image 2. A view of the Open Sky Ranch Dairy digester.

Verwey-Madera Dairy Digester

Funded: 2015

Completion: May 2017

Status: Operational

The Verwey-Madera Dairy Digester project is a new covered lagoon digester to be installed at Philip Verwey Farms #1. The biogas from the digester is used to produce approximately 4.8 million kWh of renewable electricity per year.

- Location – Madera, California (Madera County)
- CDFA DDRDP Funding - \$2,281,091
- Matching funds - \$2,331,935
- Total Project costs - \$4,613,026
- Estimated 10-year GHG reductions - 240,000 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.11 MTCO₂e
- GHG reductions per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$19.22



Image 3. Covered lagoon digester at Verwey-Madera Dairy.



Image 4. Installed electrical genset at Verwey-Madera Dairy.

West-Star North Dairy Digester
Funded: 2015
Completion: February 2018
Status: Operational

The West-Star North Dairy digester is a covered lagoon digester project. This project will capture biogas from two covered lagoons at the dairy. Biogas from the digester produces 7.6 million kWh of renewable electricity per year.

- Location – Buttonwillow, California (Kern County)
- CDFA DDRDP Funding - \$1,837,005
- Matching funds - \$6,381,069
- Total Project costs - \$8,218,114
- Estimated 10-year GHG reductions - 158,370 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.09 MTCO₂e
- GHG reductions per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$51.78



Image 5. Biogas conditioning and electric generation equipment (foreground) with covered lagoon digester (background) at the West-Star North Dairy.

Lakeview Dairy Biogas Digester

Funded: 2015

Completion: February 2018

Status: Operational

Lakeview Dairy Biogas Digester is a covered lagoon digester system. The biogas generated by this project generates 6.7 million kWh of electricity per day.

- Location – Bakersfield, California (Kern County)
- CDFA DDRDP Funding - \$2 million
- Matching funds - \$5,128,324
- Total Project costs - \$7,128,324
- Estimated 10-year GHG reductions - 144,090 MTCO_{2e}
- GHG reductions per grant dollar - 0.07 MTCO_{2e}
- GHG reductions per total project dollars - 0.02 MTCO_{2e}
- Total cost per MTCO_{2e} - \$49.47



Image 6. Covered lagoon digester at Lakeview Dairy.

Carlos Echeverria & Sons Dairy Biogas Project

Funded: 2015

Completion: February 2018

Status: Operational

ABEC #4 LLC dba Carlos Echeverria & Sons Dairy Biogas is a new covered lagoon dairy digester system and a biogas-fueled combined heat and power (CHP). An estimated 7.6 million kWh of renewable electricity per year.

- Location – Bakersfield, California (Kern County)
- CDFA DDRDP Funding - \$1 million
- Matching funds - \$5,560,375
- Total Project costs - \$6,560,375
- Estimated 10-year GHG reductions - 201,200 MTCO₂e
- GHG reductions per CDFA grant dollars - 0.2 MTCO₂e
- GHG reductions per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$32.61



Image 7. Electric generation equipment at the Carlos Echeverria & Sons Dairy Biogas Project.

Circle A Dairy Digester Fuel Pipeline Project

Funded: 2017

Completion: September 2018

Status: Operational

The Circle A Dairy Digester Fuel Pipeline Project is a covered lagoon anaerobic digester. The project is part of the Calgren Dairy Fuels Cluster. Transported via private pipeline, the biogas from the digester supplies fuel to two 5MW gas turbines that power the Calgren ethanol refinery. The cluster will install an RCNG station and later connect to the utility pipeline to supply more RCNG stations.

- Location – Pixley, California (Tulare County)
- CDFA DDRDP Funding - \$1.05 million
- Matching funds - \$1,429,744
- Total Project costs - \$2,479,744
- Estimated 10-year GHG reductions - 138,745 MTCO_{2e}
- GHG reductions per CDFA grant dollar - 0.13 MTCO_{2e}
- GHG reductions per total project dollars - 0.06 MTCO_{2e}
- Total cost per MTCO_{2e} - \$17.87



Image 8. View of biogas handling building (foreground) and covered lagoon digester (background) at Circle A Dairy.

R Vander Eyk Dairy Digester Fuel Pipeline Project

Funded: 2017

Completion: December 2018

Status: Operational

The Robert Vander Eyk Dairy Digester Fuel Pipeline Project is a covered lagoon anaerobic digester. The project is part of the Calgren Dairy Fuels Cluster. Transported via private pipeline, the biogas from the digester supplies fuel to two 5MW gas turbines that power the Calgren ethanol refinery. The cluster will install an RCNG station and later connect to the utility pipeline to supply more RCNG stations.

- Location – Pixley, California (Tulare County)
- CDFA DDRDP Funding - \$1 million
- Matching funds - \$1,604,440
- Total Projects costs - \$2,604,440
- Estimated 10-year GHG reductions - 132,586 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.13 MTCO₂e
- GHG reductions per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$19.64



Image 9. Covered lagoon digester at R Vander Eyk Dairy

Legacy Dairy Digester Fuel Pipeline Project
Funded: 2017
Completion: January 2019
Status: Operational

The Legacy Dairy Digester Fuel Pipeline Project is a covered lagoon anaerobic digester. The project is part of the Calgren Dairy Fuels Cluster. Transported via private pipeline, the biogas from the digester supplies fuel to two 5MW gas turbines that power the Calgren ethanol refinery. The cluster will install an RCNG station and later connect to the utility pipeline to supply more RCNG stations.

- Location – Pixley, California (Tulare County)
- CDFA DDRDP Funding - \$1.55 million
- Matching funds - \$1,887,320
- Total Project costs - \$3,437,320
- Estimated 10-year GHG reductions - 207,209 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.13 MTCO₂e
- GHG reductions per total project dollars - 0.06 MTCO₂e
- Total cost per MTCO₂e - \$16.59



Image 10. Covered lagoon digester (foreground) and solid separator (background) at Legacy Dairy.

Cornerstone Dairy Digester Pipeline Project
Funded: 2018
Completion: April 2019
Status: Operational

Cornerstone Dairy Digester Pipeline Project is a new covered lagoon digester. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub near the Calgren ethanol refinery. Once at the hub, it will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Pixley, California (Tulare County)
- CDFA DDRDP Funding - \$1,266,053
- Matching funds - \$1,275,663
- Total Projects costs - \$2,541,716
- Estimated 10-year GHG reductions – 185,238 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.15 MTCO₂e
- GHG reduction per total project dollars - 0.07 MTCO₂e
- Total cost per MTCO₂e - \$13.72



Image 11. Biogas conditioning equipment (foreground) and covered lagoon digester (background) at Cornerstone Dairy.

Sousa & Sousa Dairy Digester Pipeline Project

Funded: 2018

Completion: July 2019

Status: Operational

Sousa & Sousa Dairy Digester Pipeline Project is a new covered lagoon digester processing dairy manure. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub at the Calgren ethanol refinery. Once at the hub, it will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Tipton, California (Tulare County)
- CDFA DDRDP Funding - \$886,934
- Matching funds - \$1,779,865
- Total Projects costs - \$2,666,799
- Estimated 10-year GHG reductions – 68,700 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$38.82



Image 12. Covered lagoon dairy digester at Sousa & Sousa Dairy.

Vander Poel Dairy Digester Pipeline Project
Funded: 2018
Completion: August 2019
Status: Operational

Vander Poel Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. Biomethane from the digester will be transported via a private, low-pressure pipeline to the cluster's central hub at the Calgren ethanol refinery. Once at the hub, it will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Pixley, California (Tulare County)
- CDFA DDRDP Funding - \$1,972,485
- Matching funds - \$2,222,073
- Total Projects costs - \$4,194,558
- Estimated 10-year GHG reductions – 290,060 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.15 MTCO₂e
- GHG reduction per total project dollars - 0.07 MTCO₂e
- Total cost per MTCO₂e - \$14.46



Image 13. Covered lagoon digester filled with biogas at the Vander Poel Dairy.

K&M Visser Dairy Digester Fuel Pipeline Project

Funded: 2017

Completion: September 2019

Status: Operational

The K&M Visser Dairy Digester Fuel Pipeline Project is a covered lagoon anaerobic digester. The project is part of the Calgren Dairy Fuels Cluster. Transported via private pipeline, the biogas from the digester supplies fuel to two 5MW gas turbines that power the Calgren ethanol refinery. The cluster will install an RCNG station and later connect to the utility pipeline to supply more RCNG stations.

- Location – Pixley, California (Tulare County)
- CDFA DDRDP Funding - \$1.5 million
- Matching funds - \$1,902,047
- Total Project costs - \$3,402,047
- Estimated 10-year GHG reductions - 203,416 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.14 MTCO₂e
- GHG reductions per total dollars - 0.06 MTCO₂e
- Total cost per MTCO₂e - \$16.72



Image 14. Details of the digester lagoon cover at K&M Visser Dairy showing welded liners to prevent biogas leakage.

Riverview Dairy Digester Pipeline Project

Funded: 2018

Completion: November 2019

Status: Operational

Riverview Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub at the Calgren ethanol refinery. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Pixley, California (Tulare County)
- CDFA DDRDP Funding - \$1,332,070
- Matching funds - \$1,386,350
- Total Projects costs - \$2,718,420
- Estimated 10-year GHG reductions – 90,093 MTCO_{2e}
- GHG reductions per CDFA grant dollar - 0.07 MTCO_{2e}
- GHG reduction per total project dollars - 0.03 MTCO_{2e}
- Total cost per MTCO_{2e} - \$30.17



Image 15. Biogas conditioning equipment (foreground) and covered lagoon digester (background) at Riverview Dairy.

4K Dairy Digester Pipeline Project
Funded: 2018
Completion: January 2020
Status: Operational

4K Dairy Digester Pipeline Project built a new covered lagoon digester. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub near the Calgren ethanol refinery. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Pixley, California (Tulare County)
- CDFA DDRDP Funding - \$1,780,588
- Matching funds - \$1,875,566
- Total Projects costs - \$3,656,154
- Estimated 10-year GHG reductions – 192.143 MTCO_{2e}
- GHG reductions per CDFA grant dollar - 0.11 MTCO_{2e}
- GHG reduction per total project dollars - 0.05 MTCO_{2e}
- Total cost per MTCO_{2e} - \$190.3



Image 16. Aerial view of the covered lagoon digester at 4K Dairy.

Little Rock Centralized Dairy Digester Pipeline Project

Funded: 2018

Completion: February 2020

Status: Operational

Little Rock Centralized Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure from two smaller dairies. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub at the Calgren ethanol refinery. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Tipton, California (Tulare County)
- CDFA DDRDP Funding - \$2,096,578
- Matching funds - \$2,268,895
- Total Projects costs - \$4,365,473
- Estimated 10-year GHG reductions – 146,839 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$29.73



Image 17. Biogas conditioning equipment at Little Rock Dairy.

Maple Dairy Biogas
Funded: 2017
Completion: August 2020
Status: Operational

Maple Dairy built a covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project added a pre-digester sand lane and screens for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and is used for vehicle fuel use.

- Location – Bakersfield, California (Kern County)
- CDFA DDRDP Funding - \$3 million
- Matching funds – \$6,568,257
- Total Project costs - \$9,568,257
- Estimated 10-year GHG reductions – 342,587 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.11 MTCO₂e
- GHG reductions per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$27.93



Image 18. Weir box and a weir box meter (foreground) and covered lagoon digester and biogas conditioning equipment (background) at Maple Dairy.

Trilogy Dairy Biogas
Funded: 2017
Completion: August 2020
Status: Operational

Trilogy Dairy built a covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and is used for vehicle fuel use.

- Location – Bakersfield, California (Kern County)
- CDFA DDRDP Funding - \$2.25 million
- Matching funds - \$6,528,090
- Total Project costs - \$8,778,090
- Estimated 10-year GHG reductions - 254,577 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.11 MTCO₂e
- GHG reductions per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$34.48



Image 19. An oxygen generator skid for biological control of hydrogen sulfide (H₂S) at Trilogy Dairy.

T&W Dairy Biogas
Funded: 2017
Completion: August 2020
Status: Operational

T & W Farms built a covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project added a sand lane and screens for pre-digester solid separation. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and is used for vehicle fuel use.

- Location – Bakersfield, California (Kern County)
- CDFA DDRDP Funding – \$2.6 million
- Matching funds - \$6,147,941
- Total Project costs - \$8,747,941
- Estimated 10-year GHG reductions - 294,892 MTCO_{2e}
- GHG reductions per CDFA grant dollar - 0.11 MTCO_{2e}
- GHG reductions per total project dollars - 0.03 MTCO_{2e}
- Total cost per MTCO_{2e} - \$29.66



Image 20. Gathering line array (foreground) and covered lagoon digester (background) at T&W Dairy.

Ackerman Dairy Digester Pipeline Project

Funded: 2018

Completion: August 2020

Status: Operational

Ackerman Dairy Digester Pipeline Project built a new covered lagoon digester. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub at the Aemetis ethanol refinery. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is used on-site to fuel boilers at the Aemetis ethanol refinery to make very low carbon vehicle fuel.

- Location – Ceres, California (Stanislaus County)
- CDFA DDRDP Funding - \$1,331,291
- Matching funds - \$1,581,769
- Total Projects costs - \$2,913,060
- Estimated 10-year GHG reductions – 89,574 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$32.52



Image 21. Sand lane and covered lagoon digester at Ackerman Dairy.

BV Dairy Biogas
Funded: 2018
Completion: September 2020
Status: Operational

BV Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and is used for vehicle fuel use.

- Location – Bakersfield, California (Kern County)
- CDFA DDRDP Funding - \$1,749,596
- Matching funds - \$5,130,445
- Total Projects costs - \$6,880,041
- Estimated 10-year GHG reductions – 205,835 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$33.43



Image 22. Gas compressor equipment at BV Dairy.

Double D Dairy Digester Pipeline Project
Funded: 2018
Completion: September 2020
Status: Operational

Double D Dairy Digester Pipeline Project built a new covered lagoon digester. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub at the Aemetis ethanol refinery. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is used on-site to fuel boilers at the Aemetis ethanol refinery to make very low carbon vehicle fuel.

- Location – Ceres, California (Stanislaus County)
- CDFA DDRDP Funding - \$1,822,668
- Matching funds - \$2,225,662
- Total Projects costs - \$4,048,330
- Estimated 10-year GHG reductions – 189,850 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$21.32



Image 23. Aerial view of the covered lagoon digester and the biogas conditioning equipment at Double D Dairy.

S&S Dairy Biogas
Funded: 2017
Completion: September 2020
Status: Operational

S&S Dairy built a covered lagoon with enhanced gas storage, gas pre-treatment, and effluent distribution. The project added a sand lane and screens for pre-digester solid separation. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding – \$1.6 million
- Matching funds - \$4,916,846
- Total Project costs - \$6,516,846
- Estimated 10-year GHG reductions - 167,417 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.10 MTCO₂e
- GHG reductions per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$38.93



Image 24. Upgrader equipment at the CalBioGas West Visalia Cluster, which receives biogas from S&S Dairy.

Moonlight Dairy
Biogas Funded: 2017
Completion: September 2020
Status: Operational

Moonlight Dairy built a covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project added a sand lane and screens for pre-digester solid separation. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$1.5 million
- Matching funds - \$6,440,123
- Total Projects costs - \$7,940,123
- Estimated 10-year GHG reductions - 154,834 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.10 MTCO₂e
- GHG reductions per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$51.28



Image 25. Sand lane at Moonlight Dairy.

Hamstra Dairy Biogas
Funded: 2017
Completion: September 2020
Status: Operational

Hamstra Dairy built a covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project added a sand lane and screens for pre-digester solid separation. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding – \$2 million
- Matching funds - \$6,630,543
- Total Project costs - \$8,630,543
- Estimated 10-year GHG reductions 205,115 MTCO_{2e}
- GHG reductions per CDFA grant dollar - 0.10 MTCO_{2e}
- GHG reductions per total project dollars - 0.02 MTCO_{2e}
- Total cost per MTCO_{2e} - \$42.08



Image 26. Covered lagoon digester at Hamstra Dairy.

Western Sky Dairy Biogas
Funded: 2018
Completion: January 2021
Status: Operational

Western Sky Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is now conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Bakersfield, California (Kern County)
- CDFA DDRDP Funding - \$2,820,762
- Matching funds - \$5,315,518
- Total Projects costs - \$8,136,280
- Estimated 10-year GHG reductions – 352,595 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$23.08



Image 27. Biogas compressor skid at Western Sky Dairy.

FM Jerseys Dairy Digester Virtual Pipeline Project
Funded: 2018
Completion: March 2021
Status: Operational

FM Jerseys Dairy Digester Virtual Pipeline Project built a new covered lagoon digester processing dairy manure. Biomethane from the digester is hauled using clean-burning renewable CNG-fueled trucks and compressed natural gas tube trailers to create a virtual pipeline to the cluster's central hub at the Calgren ethanol refinery. At the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Tipton, California (Tulare County)
- CDFA DDRDP Funding - \$2,010,747
- Matching funds - \$2,017,330
- Total Projects costs - \$4,028,077
- Estimated 10-year GHG reductions – 161,960 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$24.87



Image 28. Biogas conditioning system at FM Jerseys Dairy

River Ranch Dairy Digester Pipeline Project
Funded: 2018
Completion: March 2021
Status: Operational

River Ranch Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub at the center of the dairy. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$1,994,860
- Matching funds - \$2,115,158
- Total Projects costs - \$4,110,018
- Estimated 10-year GHG reductions – 187,884 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.09 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$21.88



Image 29. Emergency vent stack at River Ranch Dairy Digester Pipeline Project.

Dixie Creek Dairy Digester Pipeline Project
Funded: 2019
Completion: March 2021
Status: Operational

Dixie Creek Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. The methane-rich biogas from the digester is transported via a private, low-pressure pipeline to the cluster's central hub near River Ranch dairy. There, the biogas is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the SoCalGas utility pipeline for delivery to contracted CNG fueling stations around the state.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$2,436,030
- Matching funds - \$2,473,632
- Total Projects costs - \$4,909,662
- Estimated 10-year GHG reductions – 271,176 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.11 MTCO₂e
- GHG reduction per total project dollars - 0.06 MTCO₂e
- Total cost per MTCO₂e - \$18.11



Image 30. New covered dairy digester at Dixie Creek Dairy.

Lone Oak #1 Dairy Digester Pipeline Project
Funded: 2018
Completion: March 2021
Status: Operational

Lone Oak #1 Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub near River Ranch. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$1,869,269
- Matching funds - \$2,395,596
- Total Projects costs - \$4,264,865
- Estimated 10-year GHG reductions – 247,703 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.13 MTCO₂e
- GHG reduction per total project dollars - 0.06 MTCO₂e
- Total cost per MTCO₂e - \$17.22



Image 31. Installation of a mixer in the covered lagoon digester at Lone Oak#1 Dairy.

Double J Dairy Biogas
Funded: 2018
Completion: April 2021
Status: Operational

Double J Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$2,426,716
- Matching funds - \$5,051,199
- Total Projects costs - \$7,477,915
- Estimated 10-year GHG reductions – 285,496 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$26.19



Image 32. Activated Carbon Vessel at Double J Dairy.

Rob Van Grouw Dairy Biogas
Funded: 2018
Completion: April 2021
Status: Operational

Rob Van Grouw Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$1,193,757
- Matching funds - \$3,366,012
- Total Projects costs - \$4,559,769
- Estimated 10-year GHG reductions – 140,442 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$32.47



Image 33. Weir box and new covered lagoon digester at Rob Van Grouw Dairy.

Aukeman Dairy Biogas
Funded: 2018
Completion: April 2021
Status: Operational

Aukeman Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$1,765,457
- Matching funds - \$3,072,438
- Total Projects costs - \$4,837,895
- Estimated 10-year GHG reductions – 207,701 MTCO_{2e}
- GHG reductions per CDFA grant dollar - 0.12 MTCO_{2e}
- GHG reduction per total project dollars - 0.04 MTCO_{2e}
- Total cost per MTCO_{2e} - \$23.29



Image 34. Chillers in the biogas conditioning skid at Aukeman Dairy.

Dykstra Dairy Biogas
Funded: 2018
Completion: April 2021
Status: Operational

Dykstra Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$2,260,454
- Matching funds - \$3,276,239
- Total Projects costs - \$5,536,693
- Estimated 10-year GHG reductions – 265,936 MTCO_{2e}
- GHG reductions per CDFA grant dollar - 0.12 MTCO_{2e}
- GHG reduction per total project dollars - 0.05 MTCO_{2e}
- Total cost per MTCO_{2e} - \$20.82



Image 35. Dehydration skid at Dykstra Dairy.

Horizon Jersey Dairy Biogas
Funded: 2018
Completion: April 2021
Status: Operational

Horizon Jersey Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Tipton, California (Tulare County)
- CDFA DDRDP Funding - \$2,850,886
- Matching funds - \$3,788,728
- Total Projects costs - \$6,639,614
- Estimated 10-year GHG reductions – 335,398 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$19.80



Image 36. Biogas build up in the new covered lagoon digester at Horizon Jerseys Dairy.

Udder Dairy Biogas
Funded: 2018
Completion: May 2021
Status: Operational

Udder Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$1,153,459
- Matching funds - \$2,126,156
- Total Projects costs - \$3,279,615
- Estimated 10-year GHG reductions – 135,701 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$24.17



Image 37. Mixer and oxygen port in the covered lagoon

Mineral King Dairy Biogas
Funded: 2018
Completion: May 2021
Status: Operational

Mineral King Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$1,655,384
- Matching funds - \$3,078,995
- Total Projects costs - \$4,734,379
- Estimated 10-year GHG reductions – 194,751 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$24.31



Image 38. Metering equipment at Mineral King Dairy.

Mellema Dairy Biogas
Funded: 2018
Completion: May 2021
Status: Operational

Mellema Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$1,292,485
- Matching funds - \$3,342,228
- Total Projects costs - \$4,634,713
- Estimated 10-year GHG reductions – 152,057 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$30.48



Image 39. Solid separator at Mellema Dairy.

Cloverdale Dairy Biogas
Funded: 2017
Completion: May 2021
Status: Operational

Cloverdale Dairy built a covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project added a sand lane and screens for pre-digester solid separation. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$3 million
- Matching funds - \$5,955,939
- Total Project costs - \$8,955,939
- Estimated 10-year GHG reductions - 360,851 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reductions per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$24.82



Image 40. Gas compressor equipment at Cloverdale Dairy.

Hollandia Farms Dairy Biogas
Funded: 2017
Completion: May 2021
Status: Operational

Hollandia Farms built a covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project added a sand lane and screens for pre-digester solid separation. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$1.5 million
- Matching funds - \$6,264,272
- Total Project costs - \$7,764,272
- Estimated 10-year GHG reductions - 178,426 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reductions per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$43.52



Image 41. Oxygen rotameter in a covered dairy digester at Hollandia Dairy.

Wreden Ranch Dairy Biogas
Funded: 2017
Completion: May 2021
Status: Operational

Wreden Ranch built a covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project added a sand lane and screens for pre-digester solid separation. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$3 million
- Matching funds – \$5,215,483
- Total Project costs - \$8,215,483
- Estimated 10-year GHG reductions - 393,915 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.13 MTCO₂e
- GHG reductions per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$20.86



Image 42. H₂S scrubber at Wreden Ranch Dairy.

Valadao Dairy Biogas
Funded: 2018
Completion: May 2021
Status: Operational

Valadao Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project included a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$1,028,545
- Matching funds - \$2,061,008
- Total Projects costs - \$3,089,553
- Estimated 10-year GHG reductions – 121,005 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$25.53



Image 43. Oxygen and air compressor at Valadao Dairy.

Jacobus De Groot #2 Dairy Biogas
Funded: 2018
Completion: May 2021
Status: Operational

Jacobus De Groot #2 Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$523,736
- Matching funds - \$2,624,086
- Total Projects costs - \$3,147,822
- Estimated 10-year GHG reductions – 61,616 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$51.09



Image 44. Power Distribution Center room at Jacobus De Groot #2 Dairy.

Rancho Sierra Vista Dairy Biogas

Funded: 2018

Completion: May 2021

Status: Operational

Rancho Sierra Vista Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$1,470,143
- Matching funds - \$3,045,546
- Total Projects costs - \$4,515,689
- Estimated 10-year GHG reductions – 172,958 MTCO_{2e}
- GHG reductions per CDFA grant dollar - 0.12 MTCO_{2e}
- GHG reduction per total project dollars - 0.04 MTCO_{2e}
- Total cost per MTCO_{2e} - \$26.11



Image 45. Close up of the new covered lagoon digester at Rancho Sierra Dairy.

Rancho Teresita Dairy Biogas

Funded: 2017

Completion: May 2021

Status: Operational

Rancho Teresita Dairy built a covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project added a sand lane and screens for pre-digester solid separation. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$2.1 million
- Matching funds - \$5,500,336
- Total Projects costs - \$7,600,336
- Estimated 10-year GHG reductions - 236,251 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.11 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$32.17



Image 46. Biogas flowmeter at Rancho Teresita Dairy.

Riverbend Dairy Biogas
Funded: 2018
Completion: May 2021
Status: Operational

Riverbend Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$2,090,404
- Matching funds - \$2,664,638
- Total Projects costs - \$4,755,042
- Estimated 10-year GHG reductions – 245,930 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$19.33



Image 47. Activated carbon vessel at Riverbend Dairy.

Bos Farms Dairy Biogas
Funded: 2017
Completion: May 2021
Status: Operational

Bos Farms is a covered lagoon digester project with enhanced gas storage, gas pre-treatment, and effluent distribution. The project added a sand lane and screens for pre-digester solid separation. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$1.5 million
- Matching funds - \$5,199,492
- Total Project costs - \$6,699,492
- Estimated 10-year GHG reductions - 168,398 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.11 MTCO₂e
- GHG reductions per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$39.78



Image 48. Digester wastewater flowmeter at Bos Farms Dairy.

El Monte Dairy Biogas
Funded: 2018
Completion: June 2021
Status: Operational

El Monte Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Tipton, California (Tulare County)
- CDFA DDRDP Funding - \$1,010,674
- Matching funds - \$3,026,715
- Total Projects costs - \$4,037,389
- Estimated 10-year GHG reductions – 118,903 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$33.96



Image 49. New sand lane at El Monte Dairy.

Scheenstra Dairy Biogas
Funded: 2018
Completion: June 2021
Status: Operational

Scheenstra Dairy Biogas built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$1,873,064
- Matching funds - \$3,393,707
- Total Projects costs - \$5,266,771
- Estimated 10-year GHG reductions – 220,360 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$23.90



Image 50. New solid separators at Scheenstra Dairy.

Decade Centralized Dairy Digester Pipeline Project

Funded: 2018

Completion: July 2021

Status: Operational

Decade Centralized Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure from two dairies. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub near River Ranch. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$1,773,587
- Matching funds - \$2,176,364
- Total Projects costs - \$3,949,951
- Estimated 10-year GHG reductions – 192,558 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.11 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$20.51



Image 51. New covered lagoon digester at Decade Dairy.

McMoo Farms Dairy Biogas
Funded: 2019
Completion: July 2021
Status: Operational

McMoo Farms Dairy Biogas installed a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane is delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, is injected into the co-located point of receipt.

- Location – Bakersfield, California (Kern County)
- CDFA DDRDP Funding - \$1,598,893
- Matching funds - \$3,013,668
- Total Projects costs - \$4,612,561
- Estimated 10-year GHG reductions – 164,384 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$28.06

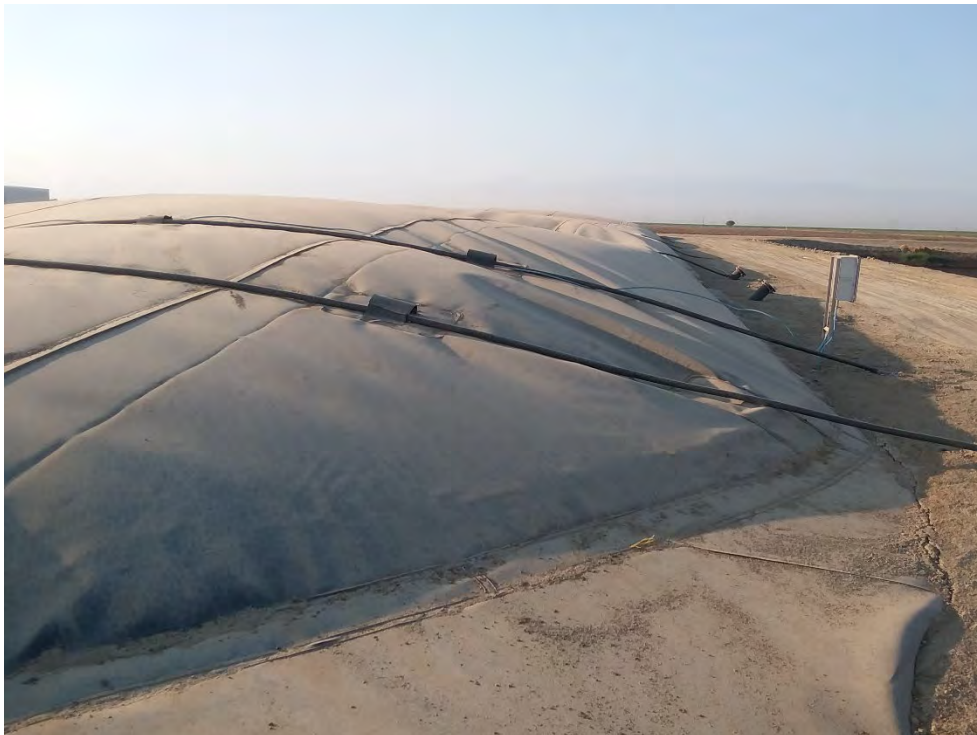


Image 52. New covered lagoon digester at McMoo Farms Dairy.

Newhouse Dairy Biogas

Funded: 2019

Completion: July 2021

Status: Operational

Newhouse Dairy Biogas installed a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane is delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, is injected into the co-located point of receipt.

- Location – Bakersfield, California (Kern County)
- CDFA DDRDP Funding - \$1,665,037
- Matching funds - \$3,982,045
- Total Projects costs - \$5,647,082
- Estimated 10-year GHG reductions – 171,098 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$33.00



Image 53. Biogas conditioning equipment at Newhouse Dairy.

Northstar Dairy Digester Pipeline Project

Funded: 2019

Completion: August 2021

Status: Operational

Northstar Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. The biogas from this new digester is transported via a private, low-pressure pipeline to the cluster's hub near the Calgren ethanol refinery. Once there, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the SoCalGas pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – Tipton, California (Tulare County)
- CDFA DDRDP Funding - \$1,576,438
- Matching funds - \$1,638,113
- Total Projects costs - \$3,214,551
- Estimated 10-year GHG reductions – 170,658 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.11 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$18.84



Image 54. New covered lagoon digester at Northstar Dairy.

Belonave Dairy Biogas LLC
Funded: 2018
Completion: September 2021
Status: Operational

Belonave Dairy Biogas LLC built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution. The project includes a sand lane, screens, and mechanical separator with a screw press for solid separation pre-digester. Biogas is conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Bakersfield, California (Kern County)
- CDFA DDRDP Funding - \$1,918,099
- Matching funds - \$3,561,605
- Total Projects costs - \$5,479,704
- Estimated 10-year GHG reductions – 225,659 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$24.28



Image 55. Heat exchanger equipment at Belonave Dairy.

Bar 20 Dairy Biogas
Funded: 2019
Completion: October 2021
Status: Operational

Bar 20 Dairy Biogas installed a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. An on-dairy biogas conditioning station removes hydrogen sulfide and meter and moves the clean biogas directly into a co-located, ultra-clean, high-efficiency 2.0 MW Bloom Energy fuel cell interconnected to PG&E. CalBio will generate LCFS credits by directly matching generation and supplying the renewable energy credits to in-state electric vehicle re-charging load.

- Location – Kerman, California (Fresno County)
- CDFA DDRDP Funding - \$3 million
- Matching funds - \$6,345,131
- Total Projects costs - \$9,345,131
- Estimated 10-year GHG reductions – 374,390 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$24.96



Image 56. Fuel cells at Bar 20 Dairy.

Hettinga Centralized Dairy Digester Pipeline Project
Funded: 2019
Completion: October 2021
Status: Operational

Hettinga Centralized Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. The biogas from this new digester is transported via a private, low-pressure pipeline to the cluster's hub near the Calgren ethanol refinery. Once there, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the SoCalGas pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – Pixley, California (Tulare County)
- CDFA DDRDP Funding - \$2,352,909
- Matching funds - \$2,576,784
- Total Projects costs - \$4,929,693
- Estimated 10-year GHG reductions – 167,339 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$29.46



Image 57. New covered lagoon digester at Hettinga Centralized Dairy.

Schott Dairy Digester Pipeline Project
Funded: 2019
Completion: October 2021
Status: Operational

Schott Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. The biogas from this new digester is transported via a private, low-pressure pipeline to the cluster's hub near the Calgren ethanol refinery. Once there, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the SoCalGas pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – Tipton, California (Tulare County)
- CDFA DDRDP Funding - \$1,444,592
- Matching funds - \$1,444,592
- Total Projects costs - \$2,889,184
- Estimated 10-year GHG reductions – 129,082 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.09 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$22.38



Image 58. New covered lagoon digester at Schott Dairy.

Lakeside Dairy Digester Pipeline Project
Funded: 2019
Completion: October 2021
Status: Operational

Lakeside Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. The methane-rich biogas from the digester is transported via a private, low-pressure pipeline to the cluster's central hub near River Ranch dairy. There, the biogas is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the SoCalGas utility pipeline for delivery to contracted CNG fueling stations around the state.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$2,213,063
- Matching funds - \$2,21,063
- Total Projects costs - \$4,426,126
- Estimated 10-year GHG reductions – 218,679 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$20.24



Image 59. New covered lagoon digester at Lakeside Dairy.

Pixley Dairy Digester Fuel Pipeline Project
Funded: 2017
Completion: November 2021
Status: Operational

The Pixley Dairy Digester Fuel Pipeline Project is a covered lagoon anaerobic digester. The project is part of the Calgren Dairy Fuels Cluster. The biogas from the digester supplies biogas via a private pipeline to the Calgren ethanol refinery. The cluster has an RNG station, and it is connected to the utility pipeline to supply more RNG.

- Location – Pixley, California (Tulare County)
- CDFA DDRDP Funding - \$1.6 million
- Matching funds - \$1,675,681
- Total Project costs - \$3,275,681
- Estimated 10-year GHG reductions – 215,251 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.13 MTCO₂e
- GHG reductions per total project dollars - 0.07 MTCO₂e
- Total cost per MTCO₂e - \$15.21



Image 60. New covered lagoon digester at Pixley Dairy.

Ribeiro Dairy Biogas
Funded: 2019
Completion: November 2021
Status: Operational

Ribeiro Dairy Biogas installed a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane is delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, is injected into the co-located point of receipt.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$1,124,962
- Matching funds - \$1,613,882
- Total Projects costs - \$2,738,844
- Estimated 10-year GHG reductions – 132,348 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$20.69



Image 61. Biogas conditioning equipment at Ribeiro Dairy.

Vander Woude Dairy Digester Pipeline Project

Funded: 2018

Completion: December 2021

Status: Operational

Vander Woude Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub at the center of the dairy group. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent PG&E utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Merced, California (Merced County)
- CDFA DDRDP Funding - \$1,863,562
- Matching funds - \$1,863,864
- Total Projects costs - \$3,727,426
- Estimated 10-year GHG reductions – 188,575 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$19.77



Image 62. New covered lagoon digester at Vander Woude Dairy.

Five H Dairy Digester Pipeline Project

Funded: 2018

Completion: December 2021

Status: Operational

Five H Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub at the center of the dairy group. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent PG&E utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Merced, California (Merced County)
- CDFA DDRDP Funding - \$1,851,297
- Matching funds - \$1,859,722
- Total Projects costs - \$3,711,019
- Estimated 10-year GHG reductions – 122,183 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$30.37



Image 63. New sand lane at Five H Dairy.

Red Rock Dairy Digester Pipeline Project
Funded: 2018
Completion: December 2021
Status: Operational

Red Rock Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. Biomethane from the digester will be transported via a private, low-pressure pipeline to the cluster's central hub at the center of the dairy group. Once at the hub, it will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the adjacent PG&E utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Merced, California (Merced County)
- CDFA DDRDP Funding - \$2,031,126
- Matching funds - \$2,039,438
- Total Projects costs - \$4,070,564
- Estimated 10-year GHG reductions – 156,242 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$26.05



Image 64. Biogas conditioning equipment at Red Rock Dairy.

Albert Goyenette Dairy Biogas
Funded: 2019
Completion: January 2022
Status: Operational

Albert Goyenette Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the co-located point of receipt.

- Location – Buttonwillow, California (Kern County)
- CDFA DDRDP Funding - \$1,609,316
- Matching funds - \$3,588,642
- Total Projects costs - \$5,197,958
- Estimated 10-year GHG reductions – 199,706 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$26.03



Image 65. Biogas compressor skid equipment at Albert Goyenette Dairy.

Skyview Dairy Biogas
Funded: 2019
Completion: January 2022
Status: Operational

Skyview Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the co-located point of receipt.

- Location – Shafter, California (Kern County)
- CDFA DDRDP Funding - \$686,620
- Matching funds - \$3,799,476
- Total Projects costs - \$4,486,096
- Estimated 10-year GHG reductions – 85,174 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$52.67



Image 66. Weir box and wastewater flowmeter at Skyview Dairy.

Whiteside Dairy Biogas
Funded: 2019
Completion: January 2022
Status: Operational

Whiteside Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the co-located point of receipt.

- Location – Wasco, California (Kern County)
- CDFA DDRDP Funding - \$960,043
- Matching funds - \$3,773,726
- Total Projects costs - \$4,733,769
- Estimated 10-year GHG reductions – 119,137 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$39.73



Image 67. Metering skid at Whiteside Dairy.

Rib-Arrow Dairy Biogas
Funded: 2019
Completion: January 2022
Status: Operational

Rib-Arrow Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the co-located point of receipt.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$657,231
- Matching funds - \$3,069,649
- Total Projects costs - \$3,726,880
- Estimated 10-year GHG reductions – 76,343 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$48.82



Image 68. Mechanical solid separators at Rib-Arrow Dairy.

Van Der Kooi Dairy Digester Pipeline Project

Funded: 2019

Completion: January 2022

Status: Operational

Van Der Kooi Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. The methane-rich biogas from the digester will be transported via a private, low-pressure pipeline to the cluster's central hub near the operational Open Sky Ranch digester. Once at the hub, the biogas will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the adjacent PG&E utility pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – Riverdale, California (Fresno County)
- CDFA DDRDP Funding - \$1,897,438
- Matching funds - \$2,052,493
- Total Projects costs - \$3,949,931
- Estimated 10-year GHG reductions – 170,089 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.09 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$23.22



Image 69. New covered lagoon at Van Der Kooi Dairy.

Vanderham Dairy Digester Pipeline Project
Funded: 2019
Completion: January 2022
Status: Operational

Vanderham Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. The methane-rich biogas from the digester will be transported via a private, low-pressure pipeline to the cluster's central hub near the operational Open Sky Ranch digester. Once at the hub, the biogas will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the adjacent PG&E utility pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – Riverdale, California (Fresno County)
- CDFA DDRDP Funding - \$1,984,951
- Matching funds - \$2,090,233
- Total Projects costs - \$4,075,184
- Estimated 10-year GHG reductions – 186,037 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.09 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$21.91



Image 70. New covered lagoon digester at Vanderham Dairy.

*Elk Creek Dairy Biogas
Funded: 2019
Completion: February 2022
Status: Operational*

Elk Creek Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the nearby point of receipt.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$512,706
- Matching funds - \$2,247,274
- Total Projects costs - \$2,759,980
- Estimated 10-year GHG reductions – 59.555 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$46.34



Image 71. Oxygen rotameter and oxygen injection port at Elk Creek Dairy.

Maya Dairy Biogas
Funded: 2019
Completion: February 2022
Status: Operational

Maya Dairy Biogas installed a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane is delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, is injected into the co-located point of receipt.

- Location – Buttonwillow, California (Kern County)
- CDFA DDRDP Funding - \$2,015,393
- Matching funds - \$2,938,894
- Total Projects costs - \$4,954,287
- Estimated 10-year GHG reductions – 250,090 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$19.81



Image 72. Oxygen and air compressor skid at Maya Dairy.

Southern Cross Dairy Biogas

Funded: 2019

Completion: March 2022

Status: Operational

Southern Cross Dairy Biogas installed a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane is delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, is injected into the co-located point of receipt.

- Location – Buttonwillow, California (Kern County)
- CDFA DDRDP Funding - \$1,019,121
- Matching funds - \$4,601,953
- Total Projects costs - \$5,621,074
- Estimated 10-year GHG reductions – 125,872 MTCO_{2e}
- GHG reductions per CDFA grant dollar – 0.12 MTCO_{2e}
- GHG reduction per total project dollars - 0.02 MTCO_{2e}
- Total cost per MTCO_{2e} - \$44.66



Image 73. Irrigation vault and meter at Southern Cross Dairy.

Vista Verde Dairy Digester Pipeline Project
Funded: 2018
Completion: March 2022
Status: Operational

Vista Verde Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub at the center of the dairy group. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent PG&E utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Chowchilla, California (Madera County)
- CDFA DDRDP Funding - \$1,594,109
- Matching funds - \$1,643,656
- Total Projects costs - \$3,237,765
- Estimated 10-year GHG reductions – 140,653 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.09 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$23.02



Image 74. New covered lagoon digester at Vista Verde Dairy.

Rockshar Dairy Digester Pipeline Project
Funded: 2018
Completion: April 2022
Status: Operational

Rockshar Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub at the center of the dairy group. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent PG&E utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Merced, California (Merced County)
- CDFA DDRDP Funding - \$1,679,093
- Matching funds - \$1,679,620
- Total Projects costs - \$3,358,713
- Estimated 10-year GHG reductions – 124,664 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$26.94



Image 75. New covered lagoon digester at Rockshar Dairy.

JR Dairy Digester Project
Funded: 2020
Completion: April 2022
Status: Operational

JR Dairy Digester Project is a new covered lagoon digester. The Calgren Dairy Fuels Cluster is operational, producing biogas from 10 connected digesters and injecting renewable natural gas into the SoCalGas pipeline. The biogas from this new digester is transported via the private, low-pressure pipeline to a gas upgrading hub at an adjacent dairy. Once there, it is upgraded to pipeline quality. Then the biogas is compressed and delivered to the Calgren Dairy Fuels injection site via a CNG-fueled truck. The fuel is used for onsite CNG fueling or injected into the SoCalGas pipeline.

- Location – Tipton, California (Tulare County)
- CDFA DDRDP Funding - \$1,300,000
- Matching funds - \$1,567,224
- Total Projects costs - \$2,867,224
- Estimated 10-year GHG reductions – 191,049 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.15 MTCO₂e
- GHG reduction per total project dollars - 0.07 MTCO₂e
- Total cost per MTCO₂e - \$15.01



Image 76. New covered lagoon digester and conditioning skid at JR Dairy.

Hoogendam Dairy Digester Pipeline Project

Funded: 2018

Completion: April 2022

Status: Operational

Hoogendam Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. Biomethane from the digester is transported via private, low-pressure pipeline to the cluster's central hub at the center of the dairy group. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent PG&E utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Merced, California (Merced County)
- CDFA DDRDP Funding - \$1,809,452
- Matching funds - \$1,820,121
- Total Projects costs - \$3,629,573
- Estimated 10-year GHG reductions – 142,354 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$25.50



Image 77. New covered lagoon digester and conditioning skid at Hoogendam Dairy.

Double Diamond Dairy Digester Pipeline Project

Funded: 2019

Completion: May 2022

Status: Operational

Double Diamond Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. The methane-rich biogas from the digester is transported via a private, low-pressure pipe to the cluster's hub near Vander Woude Dairy. Once there, the biogas is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is conditioned and injected into the PG&E utility pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – El Nido, California (Merced County)
- CDFA DDRDP Funding - \$2,037,766
- Matching funds - \$2,578,783
- Total Projects costs - \$4,616,549
- Estimated 10-year GHG reductions – 290,633 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.14 MTCO₂e
- GHG reduction per total project dollars - 0.06 MTCO₂e
- Total cost per MTCO₂e - \$15.88



Image 78. Biogas conditioning skid at Double Diamond Dairy.

Gerben Leyendekker Dairy Biogas

Funded: 2019

Completion: May 2022

Status: Operational

Gerben Leyendekker Dairy Biogas installed a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane is delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, is injected into the nearby point of receipt.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$845,589
- Matching funds - \$2,320,839
- Total Projects costs - \$3,166,428
- Estimated 10-year GHG reductions – 85,419 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$37.07



Image 79. Digester wastewater flowmeter at Gerben Leyendekker Dairy.

Double L Dairy Digester Pipeline Project

Funded: 2018

Completion: July 2022

Status: Operational

Double L Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub near River Ranch. Once at the hub, it is be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$1,762,347
- Matching funds - \$1,767,556
- Total Projects costs - \$3,529,903
- Estimated 10-year GHG reductions – 136,148 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$25.93

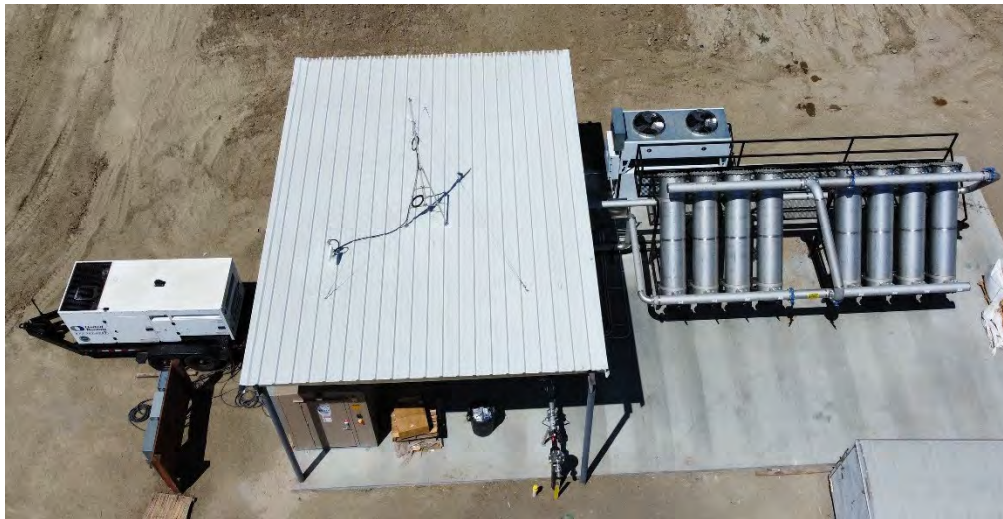


Image 80. Overview of biogas conditioning skid at Double L Dairy.

Simoes Centralized Digester Pipeline Project
Funded: 2019
Completion: August 2022
Status: Operational

Simoes Centralized Digester Pipeline Project built a new covered lagoon digester processing dairy manure. The biogas from this new digester is transported via a private, low-pressure pipeline to the cluster's hub near the Calgren ethanol refinery. Once there, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the SoCalGas pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – Tipton, California (Tulare County)
- CDFA DDRDP Funding - \$2,036,460
- Matching funds - \$2,043,922
- Total Projects costs - \$4,080,382
- Estimated 10-year GHG reductions – 161,275 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$25.30



Image 81. Mechanical solid separator at Simoes Centralized Digester Project.

Meirinho Dairy Digester Pipeline Project
Funded: 2018
Completion: September 2022
Status: Operational

Meirinho Dairy Digester Pipeline Project built a new covered lagoon digester processing dairy manure. Biomethane from the digester is transported via a private, low-pressure pipeline to the cluster's central hub at the center of the dairy group. Once at the hub, it is used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas is injected into the adjacent PG&E utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Merced, California (Merced County)
- CDFA DDRDP Funding - \$1,832,358
- Matching funds - \$1,975,914
- Total Projects costs - \$3,808,272
- Estimated 10-year GHG reductions – 147,352 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$25.84



Image 82. Mechanical solid separator at Meitinho Dairy.

Art Leyendekker Dairy Biogas
Funded: 2019
Completion: September 2022
Status: Operational

Art Leyendekker Dairy Biogas installed a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane is delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, is injected into the co-located point of receipt.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$769,784
- Matching funds - \$2,612,103
- Total Projects costs - \$3,381,887
- Estimated 10-year GHG reductions – 77,697 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$43.53



Image 83. Power Distribution Control at Art Leyendekker Dairy.

Wilson Dairy Digester Project
Funded: 2020
Completion: September 2022
Status: Operational

Wilson Dairy Digester Project is a new covered lagoon digester that is part of the Five Points Pipeline Cluster. This cluster is under development and will deliver biogas to the PG&E pipeline. The biogas from this new digester is transported via the cluster's private, low-pressure pipeline to the gas upgrading hub. Once there, it fuels partner and public trucks at an on-site CNG fueling station. The remainder of the biogas is injected into the PG&E pipeline for delivery to contracted CNG fueling stations in the Central Valley and the state.

- Location – Riverdale, California (Fresno County)
- CDFA DDRDP Funding - \$1,400,000
- Matching funds - \$2,060,714
- Total Projects costs - \$3,460,714
- Estimated 10-year GHG reductions – 206,745 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.15 MTCO₂e
- GHG reduction per total project dollars - 0.06 MTCO₂e
- Total cost per MTCO₂e - \$16.74



Image 84. Sand lane at Wilson Dairy.

De Groot South Dairy Biogas
Funded: 2018
Status: Verification in Process

De Groot South Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. An on-dairy biogas conditioning station will remove hydrogen sulfide, and meter and move the clean biogas directly into a co-located, ultra-clean, high-efficiency 2.0 MW Bloom Energy fuel cell.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$1,542,697
- Matching funds - \$1,581,310
- Total Projects costs - \$3,124,007
- Estimated 10-year GHG reductions – 199,477 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.13 MTCO₂e
- GHG reduction per total project dollars - 0.06 MTCO₂e
- Total cost per MTCO₂e - \$15.66

Rocking Horse Dairy Biogas
Funded: 2018
Status: Verification in Process

Rocking Horse Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project will include a sand lane, screens, and a mechanical separator with a screw press for solid separation pre-digester. Biogas will be conditioned to meet the SoCalGas standards for natural gas fuel and will be used for vehicle fuel use.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$1,016,091
- Matching funds - \$1,172,419
- Total Projects costs - \$2,188,510
- Estimated 10-year GHG reductions –119,540 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$18.31

DJ South Dairy Digester Pipeline Project
Funded: 2018
Status: Verification in Progress

DJ South Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. Biomethane from the digester will be transported via a private, low-pressure pipeline to the cluster's central hub at the center of the dairy group. Once at the hub, it will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the adjacent PG&E utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Chowchilla, California (Madera County)
- CDFA DDRDP Funding - \$1,810,526
- Matching funds - \$1,859,833
- Total Projects costs - \$3,670,359
- Estimated 10-year GHG reductions – 150,175 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$24.44

Dairyland Farms Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2023

Dairyland Farms Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as R-CNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the nearby point of receipt.

- Location – Tipton, California (Tulare County)
- CDFA DDRDP Funding - \$1,760,347
- Matching funds - \$3,140,466
- Total Projects costs - \$4,900,813

- Estimated 10-year GHG reductions – 177,475 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$27.61

Friesian Farms Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2023

Friesian Farms Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the nearby point of receipt.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$639,602
- Matching funds - \$3,175,183
- Total Projects costs - \$3,814,785
- Estimated 10-year GHG reductions – 63,145 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$60.41

Rio Blanco Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2023

Rio Blanco Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the co-located point of receipt.

- Location – Tulare, California (Tulare County)

- CDFA DDRDP Funding - \$1,002,797
- Matching funds - \$2,556,018
- Total Projects costs - \$3,558,815
- Estimated 10-year GHG reductions – 100,886 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$35.28

Avalon Dairy Digester Pipeline
Project Funded: 2019
Status: In Progress
Expected Completion Date: December 2023

Avalon Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. The project will deliver biogas to the Calgren Dairy Fuels cluster. This Cluster is operational, producing biogas from other digesters and injecting renewable natural gas into the SoCalGas pipeline. The methane-rich biogas from the digester will be compressed on-site and then hauled using clean-burning renewable CNG-fueled trucks and compressed natural gas tube trailers to create a virtual pipeline to the cluster's central hub. Once at the hub, it will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the adjacent SoCalGas utility pipeline for delivery to other CNG fueling stations around the Central Valley and the state.

- Location – Wasco, California (Kern County)
- CDFA DDRDP Funding - \$1,917,757
- Matching funds - \$1,917,757
- Total Projects costs - \$3,835,514
- Estimated 10-year GHG reductions – 159,758 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$24.01

De Boer Dairy Digester Pipeline Project
Funded: 2019
Status: In Progress
Expected Completion Date: December 2023

De Boer Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. The biogas from this new digester will be transported via a private, low-pressure pipeline to the cluster's hub near the Calgren ethanol refinery. Once there, it will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the SoCalGas pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$1,825,261
- Matching funds - \$1,825,262
- Total Projects costs - \$3,650,523
- Estimated 10-year GHG reductions – 191,647MTCO₂e
- GHG reductions per CDFA grant dollar - 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$19.05

Fern Oaks Dairy Digester Pipeline Project
Funded: 2019
Status: In Progress
Expected Completion Date: December 2023

Fern Oaks Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. The biogas from this new digester will be transported via a private, low-pressure pipeline to the cluster's hub near the Calgren ethanol refinery. Once there, it will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the SoCalGas pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – Porterville, California (Tulare County)
- CDFA DDRDP Funding - \$1,688,894

- Matching funds - \$1,688,894
- Total Projects costs - \$3,377,788
- Estimated 10-year GHG reductions – 169,370 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$19.94

High Roller Dairy Digester Pipeline Project
Funded: 2019
Status: In Progress
Expected Completion Date: December 2023

High Roller Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. The methane-rich biogas from the digester will be transported via a private, low-pressure pipeline to the cluster's central hub near River Ranch dairy. There, the biogas will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the SoCalGas utility pipeline for delivery to contracted CNG fueling stations around the state.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$1,412,136
- Matching funds - \$1,412,136
- Total Projects costs - \$2,824,272
- Estimated 10-year GHG reductions – 105,257 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$26.83

Poplar Lane Dairy Digester Pipeline Project
Funded: 2019
Status: In Progress
Expected Completion Date: December 2023

Poplar Lane Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. The methane-rich biogas from the

digester will be transported via a private, low-pressure pipe to the cluster's central hub near River Ranch dairy. There, the biogas will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the SoCalGas utility pipeline for delivery to contracted CNG fueling stations around the state.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$1,756,966
- Matching funds - \$1,756,966
- Total Projects costs - \$3,513,932
- Estimated 10-year GHG reductions – 131,195 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$26.78

Van Der Hoek Dairy Digester Pipeline Project
Funded: 2019
Status: In Progress
Expected Completion Date: December 2023

Van Der Hoek Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. The methane-rich biogas from the digester will be transported via a private, low-pressure pipeline to the cluster's central hub near the operational Open Sky Ranch digester. Once at the hub, the biogas will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be injected into the adjacent PG&E utility pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – Helm, California (Fresno County)
- CDFA DDRDP Funding - \$2,061,968
- Matching funds - \$2,061,968
- Total Projects costs - \$4,123,936
- Estimated 10-year GHG reductions – 168,447 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$24.48

Ahlem Farms Dairy Digester Project
Funded: 2020
Status: In Progress
Expected Completion Date: March 2024

Ahlem Farms Dairy Digester Project is a new covered lagoon digester at Ahlem Farms Vista in Stanislaus County, California. The biogas from this new digester will be transported via the private, low-pressure pipeline to a new nearby gas upgrading satellite hub. Once there, it will be upgraded to pipeline quality. Then the biogas will be compressed and delivered to the Merced Pipeline injection site via a CNG-fueled truck. The fuel will be used for onsite CNG fueling or injected into the CEEC-PG&E pipeline.

- Location – Denair, California (Stanislaus County)
- CDFA DDRDP Funding - \$1.195 million
- Matching funds - \$3,130,536
- Total Projects costs - \$4,325,536
- Estimated 10-year GHG reductions – 167.761 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.14 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$25.78

Ahlem Farms Jerseys - AAFK Central Dairy Digester Cluster
Funded: 2020
Status: In Progress
Expected Completion Date: March 2024

Ahlem Farms Jerseys – AAFK Central Dairy Digester Cluster is a new covered lagoon digester that will produce biogas, which after being processed to remove hydrogen sulfide (H₂S), will be conveyed via private pipeline to the Aemetis Advanced Fuels Keyes facility. It will further be upgraded to negative-carbon-intensity renewable natural gas (RNG) suitable for use as transportation fuel. Aemetis will sell a portion of the RNG to local fleets via its onsite RNG fueling station and will direct the remainder to sale to larger fleets via the PG&E pipeline, or for use as energy at AAFK to produce renewable ethanol.

- Location – Crows Landing, California (Stanislaus County)

- CDFA DDRDP Funding - \$1,592,287
- Matching funds - \$1,672,003
- Total Projects costs - \$3,264,290
- Estimated 10-year GHG reductions – 113,979 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$28.64

Albert Mendes Dairy - AAFK Central Dairy Digester Cluster

Funded: 2020

Status: In Progress

Expected Completion Date: March 2024

Albert Mendes Dairy – AAFK Central Dairy Digester Cluster is a new covered lagoon digester that will produce biogas, which after being processed to remove hydrogen sulfide (H₂S), will be conveyed via private pipeline to the Aemetis Advanced Fuels Keyes facility. It will further be upgraded to negative-carbon-intensity renewable natural gas (RNG) suitable for use as transportation fuel. Aemetis will sell a portion of the RNG to local fleets via its onsite RNG fueling station and will direct the remainder to sale to larger fleets via the PG&E pipeline, or for use as energy at AAFK to produce renewable ethanol.

- Location – Crows Landing, California (Stanislaus County)
- CDFA DDRDP Funding - \$1,388,241
- Matching funds - \$1,735,754
- Total Projects costs - \$3,123,995
- Estimated 10-year GHG reductions – 99,372 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$28.64

Boschma Dairy Biogas

Funded: 2020

Status: In Progress

Expected Completion Date: March 2024

Boschma Dairy Biogas is committed to building a tier 1 double-lined, covered lagoon digester, a biogas conditioning system (iron sponge and activated carbon-based H₂S scrubber), a biogas to biomethane upgrader (skid mounted and located on-site), and a high-pressure tube trailer truck loading station. The system will be shared with the neighboring Poso Creek Dairy. The produced RNG will be tube-trailer down to the CalBioGas Buttonwillow interconnection location, or alternatively other nearby CalBio facilities, for off-loading and metering into the SoCalGas pipeline.

- Location – Wasco, California (Kern County)
- CDFA DDRDP Funding - \$1,723,302
- Matching funds - \$4,819,704
- Total Projects costs - \$6,543,006
- Estimated 10-year GHG reductions – 189,947 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.11 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$34.45

JDS Ranch Digester Project
Funded: 2020
Status: In Progress
Expected Completion Date: March 2024

JDS Ranch Digester Project is a new covered lagoon digester. The Calgren Dairy Fuels Cluster is operational, producing biogas from 10 connected digesters and injecting renewable natural gas into the SoCalGas pipeline. The biogas from this new digester will be transported via the private, low-pressure pipeline to a gas upgrading hub at an adjacent dairy. Once there, it will be upgraded to pipeline quality. Then the biogas will be compressed and delivered to the Calgren Dairy Fuels injection site via a CNG-fueled truck. The fuel will be used for onsite CNG fueling or injected into the SoCalGas pipeline.

- Location – Wasco, California (Kern County)
- CDFA DDRDP Funding - \$1.6 million
- Matching funds - \$3,044,536
- Total Projects costs - \$4,644,536
- Estimated 10-year GHG reductions – 159,082 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$29.20

Oliveira Dairy - AAFK Central Dairy Digester Cluster
Funded: 2020
Status: In Progress
Expected Completion Date: March 2024

Oliveira Dairy – AAFK Central Dairy Digester Cluster is a new covered lagoon digester that will produce biogas, which after being processed to remove hydrogen sulfide (H₂S), will be conveyed via private pipeline to the Aemetis Advanced Fuels Keyes facility. It will further be upgraded to negative-carbon-intensity renewable natural gas (RNG) suitable for use as transportation fuel. Aemetis will sell a portion of the RNG to local fleets via its onsite RNG fueling station and will direct the remainder to sale to larger fleets via the PG&E pipeline, or for use as energy at AAFK to produce renewable ethanol.

- Location – Hilmar, California (Merced County)
- CDFA DDRDP Funding - \$1,056,977
- Matching funds - \$2,103,160
- Total Projects costs - \$3,160,137
- Estimated 10-year GHG reductions – 80,857 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$39.08

Poso Creek Dairy Biogas
Funded: 2020
Status: In Progress
Expected Completion Date: March 2024

Poso Creek Dairy Biogas is committed to building a tier 1 double-lined, covered lagoon digester, a biogas conditioning system (iron sponge and activated carbon-based H₂S scrubber), a biogas to biomethane upgrader (skid mounted and located on-site), and a high-pressure tube trailer truck loading station. The system will be shared with the neighboring Boschma and Sons Dairy. The produced RNG will be tube-trailer down to the CalBioGas Buttonwillow interconnection location, or alternatively other nearby CalBio facilities, for off-loading and metering into the SoCalGas pipeline.

- Location – Wasco, California (Kern County)
- CDFA DDRDP Funding - \$1,464,930
- Matching funds - \$5,344,556
- Total Projects costs - \$6,809,486
- Estimated 10-year GHG reductions – 171,854 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.12 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$39.62

S&S Dairy - AAFK Central Dairy Digester Cluster

Funded: 2020

Status: In Progress

Expected Completion Date: March 2024

S&S Dairy – AAFK Central Dairy Digester Cluster is a new covered lagoon digester that will produce biogas, which after being processed to remove hydrogen sulfide (H₂S), will be conveyed via private pipeline to the Aemetis Advanced Fuels Keyes facility. It will further be upgraded to negative-carbon-intensity renewable natural gas (RNG) suitable for use as transportation fuel. Aemetis will sell a portion of the RNG to local fleets via its onsite RNG fueling station and will direct the remainder to sale to larger fleets via the PG&E pipeline, or for use as energy at AAFK to produce renewable ethanol.

- Location – Ceres, California (Stanislaus County)
- CDFA DDRDP Funding - \$1,271,396
- Matching funds - \$1,988,964
- Total Projects costs - \$3,260,360
- Estimated 10-year GHG reductions – 90,946 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$35.85

Trinkler Dairy - AAFK Central Dairy Digester Cluster

Funded: 2020

Status: In Progress

Expected Completion Date: March 2024

Trinkler Dairy – AAFK Central Dairy Digester Cluster is a new covered lagoon digester that will produce biogas, which after being processed to remove hydrogen sulfide (H₂S), will be conveyed via private pipeline to the Aemetis Advanced Fuels Keyes facility. It will further be upgraded to negative-carbon-intensity renewable natural gas (RNG) suitable for use as transportation fuel. Aemetis will sell a portion of the RNG to local fleets via its onsite RNG fueling station and will direct the remainder to sale to larger fleets via the PG&E pipeline, or for use as energy at AAFK to produce renewable ethanol.

- Location – Ceres, California (Stanislaus County)
- CDFA DDRDP Funding - \$1,194,840
- Matching funds - \$1,451,336
- Total Projects costs - \$2,646,176
- Estimated 10-year GHG reductions – 85,529 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$30.94

Wickstrom Jersey Farms - AAFK Central Dairy Digester Cluster

Funded: 2020

Status: In Progress

Expected Completion Date: March 2024

Wickstrom Jersey Farms – AAFK Central Dairy Digester Cluster is a new covered lagoon digester that will produce biogas, which after being processed to remove hydrogen sulfide (H₂S), will be conveyed via private pipeline to the Aemetis Advanced Fuels Keyes facility. It will further be upgraded to negative-carbon-intensity renewable natural gas (RNG) suitable for use as transportation fuel. Aemetis will sell a portion of the RNG to local fleets via its onsite RNG fueling station and will direct the remainder to sale to larger fleets via the PG&E pipeline, or for use as energy at AAFK to produce renewable ethanol.

- Location – Hilmar, California (Merced County)
- CDFA DDRDP Funding - \$1,342,980
- Matching funds - \$1,383,737
- Total Projects costs - \$2,726,717
- Estimated 10-year GHG reductions – 121,350 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.09 MTCO₂e

- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$22.47

Ahlem Farms Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

Ahlem Farms Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting PG&E specifications, will be injected into the nearby point of receipt.

- Location – Hilmar, California (Merced County)
- CDFA DDRDP Funding - \$1,546,738
- Matching funds - \$4,557,504
- Total Projects costs - \$6,104,242
- Estimated 10-year GHG reductions – 153,151 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$39.86

Flint Dairy Biogas Project
Dairy Digester Research and Development Program –
Demonstration Projects
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

The Flint Dairy Biogas Project will build a two-stage anaerobic digester system to treat manure effluent. The digester system includes four up-flow anaerobic sludge blanket (UASB) reactors. The reactors allow for the conversion of approximately 80% of the organic material to biogas with methane concentrations of 80-85%. Biogas will be upgraded to renewable natural gas on-site and transported via virtual pipeline to an injection point. The system reduces the nitrogen levels in the effluent by approximately 30%, providing

new tools for compliance with the Dairy General Order and SGMA. The project features a scalable and modular future second phase consisting of Moving Bed Biofilm Reactor (MBBR) aerobic tanks paired with algae raceways that can cost-effectively reduce total nitrogen levels in the water by up to 90%.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Demo Funding - \$1.75 million
- Matching funds - \$3,374,782
- Total Projects costs - \$5,124,782
- Estimated 10-year GHG reductions – 126,988 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$40.36

Charles Ahlem Ranch Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

Charles Ahlem Ranch Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting PG&E specifications, will be injected into the nearby point of receipt.

- Location – Hilmar, California (Merced County)
- CDFA DDRDP Funding - \$1,373,697
- Matching funds - \$5,758,275
- Total Projects costs - \$7,131,972
- Estimated 10-year GHG reductions – 136,018 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$52.43

Clauss and Sunwest Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

Clauss and Sunwest Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the nearby point of receipt.

- Location – Hilmar, California (Merced County)
- CDFA DDRDP Funding - \$1,572,301
- Matching funds - \$4,780,296
- Total Projects costs - \$6,352,597
- Estimated 10-year GHG reductions – 155,682 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$40.80

Curtimade Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

Curtimade Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the nearby point of receipt.

- Location – Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$1,747,336
- Matching funds - \$3,025,858
- Total Projects costs - \$4,773,194
- Estimated 10-year GHG reductions – 174,734 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e

- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$27.32

Elkhorn Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

Elkhorn Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the nearby point of receipt.

- Location – Dinuba, California (Tulare County)
- CDFA DDRDP Funding - \$2,125,882
- Matching funds - \$4,520,035
- Total Projects costs - \$6,645,917
- Estimated 10-year GHG reductions – 211,940 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$31.36

Homen Dairy Digester Pipeline Project
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

Homen Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. The methane-rich biogas from the digester will be transported via a private, low-pressure pipe to the cluster's central hub near Vander Woude Dairy. Once there, the biogas will be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be conditioned and injected into the PG&E utility pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – Merced, California (Merced County)

- CDFA DDRDP Funding - \$1,640,419
- Matching funds - \$1,640,420
- Total Projects costs - \$3,280,839
- Estimated 10-year GHG reductions – 124,000 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.04 MTCO₂e
- Total cost per MTCO₂e - \$26.46

James Ahlem Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

James Ahlem Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting PG&E specifications, will be injected into the nearby point of receipt.

- Location – Hilmar, California (Merced County)
- CDFA DDRDP Funding - \$830,349
- Matching funds - \$4,861,351
- Total Projects costs - \$5,691,700
- Estimated 10-year GHG reductions – 82,216 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.01 MTCO₂e
- Total cost per MTCO₂e - \$69.23

Melo Dairy Digester Pipeline Project
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

Melo Dairy Digester Pipeline Project will build a new covered lagoon digester processing dairy manure. The methane-rich biogas from the digester will be transported via a private, low-pressure pipeline to the cluster's central hub near Vander Woude Dairy. Once there, the biogas will

be used to fuel partner and public trucks at an on-site compressed natural gas fueling station. The remainder of the gas will be conditioned and injected into the PG&E utility pipeline for delivery to contracted CNG fueling stations around the Central Valley and the state.

- Location – Merced, California (Merced County)
- CDFA DDRDP Funding - \$2,910,554
- Matching funds - \$2,910,555
- Total Projects costs - \$5,821,109
- Estimated 10-year GHG reductions – 272,690 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.09 MTCO₂e
- GHG reduction per total project dollars - 0.05 MTCO₂e
- Total cost per MTCO₂e - \$21.35

Nyman Brothers Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

Nyman Brothers Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting SoCalGas Rule 30, will be injected into the co-located point of receipt.

- Location – Hilmar, California (Merced County)
- CDFA DDRDP Funding - \$687,006
- Matching funds - \$4,654,902
- Total Projects costs - \$5,341,908
- Estimated 10-year GHG reductions – 68,026 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.01 MTCO₂e
- Total cost per MTCO₂e - \$78.53

Southpoint Ranch Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

Southpoint Ranch Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. An on-dairy biogas conditioning station will remove hydrogen sulfide and meter and move the clean biogas directly into a co-located, ultra-clean, high efficiency 2.0 MW Bloom Energy fuel cell interconnected to PG&E. CalBio will generate LCFS credits by directly matching generation and supplying the renewable energy credits to in-state electric vehicle re-charging load.

- Location – Madera, California (Madera County)
- CDFA DDRDP Funding - \$3 million
- Matching funds - \$13,642,393
- Total Projects costs - \$16,642,393
- Estimated 10-year GHG reductions – 484,999 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.16 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$34.31

Yosemite Jersey Dairy Biogas
Funded: 2019
Status: In Progress
Expected Completion Date: March 2024

Yosemite Jersey Dairy Biogas will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California. Biomethane, meeting PG&E specifications, will be injected into the nearby point of receipt.

- Location – Hilmar, California (Merced County)
- CDFA DDRDP Funding - \$960,644
- Matching funds - \$4,097,690
- Total Projects costs - \$5,044,334

- Estimated 10-year GHG reductions – 93,734 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$53.82

Bar Mac Dairy Biogas

Funded: 2022

Status: In Progress

Expected Completion Date: December 2024

The project is committed to building a tier 1 double-lined, covered lagoon digester, a biogas conditioning system, a biogas to biomethane upgrader, and a high-pressure tube trailer truck loading station. The produced RNG will be tube-trailer down to the CalBioGas South Tulare interconnection location, or alternatively other nearby CalBio facilities, for off-loading and metering into the SoCalGas pipeline.

- Location – Gustine, California (Merced County)
- CDFA DDRDP Funding - \$ 912,352
- Matching funds - \$6,844,732.06
- Total Projects costs – \$7,757,084.06
- Estimated 10-year GHG reductions - 91,235 MTCO₂e
- GHG reductions per CDFA grant dollar – 0.10 MTCO₂e
- GHG reduction per total project dollars – 0.12 MTCO₂e
- Total cost per MTCO₂e - \$85.02

CDF Howard Dairy Digester Project

Funded: 2022

Status: In Progress

Expected Completion Date: December 2024

CDF Howard Dairy Digester Project is a new covered lagoon digester at the CDF Howard Dairy. The biogas from this new digester will be upgraded to biomethane onsite at the dairy and then transported via truck to the Merced upgrading facility and utility interconnection. At the Merced facility, the biomethane will be offloaded and injected into the utility pipeline for delivery to contracted CNG fueling stations in the Central Valley and the state.

- Location - Livingston, California (Merced County)
- CDFA DDRDP Funding - \$ 1,600,000
- Matching funds - \$8,102,501
- Total Projects costs – \$9,702,501
- Estimated 10-year GHG reductions – 316,585 MTCO_{2e}
- GHG reductions per CDFA grant dollar – 0.20 MTCO_{2e}
- GHG reduction per total project dollars – 0.03 MTCO_{2e}
- Total cost per MTCO_{2e} - \$ 30.65

Couco Creek Dairy Digester Project
Funded: 2022
Status: In Progress
Expected Completion Date: December 2024

Couco Creek Dairy Digester Project is a new covered lagoon digester at the Couco Creek Dairy. The biogas from this new digester will be upgraded to biomethane onsite at the dairy and then transported via truck to the Merced upgrading facility and utility interconnection. At the Merced facility, the biomethane will be offloaded and injected into the utility pipeline for delivery to contracted CNG fueling stations in the Central Valley and the state.

- Location - Turlock, California (Stanislaus County)
- CDFA DDRDP Funding - \$ 1,600,000
- Matching funds - \$4,275,216
- Total Projects costs – \$5,875,216
- Estimated 10-year GHG reductions – 155,255 MTCO_{2e}
- GHG reductions per CDFA grant dollar – 0.10 MTCO_{2e}
- GHG reduction per total project dollars – 0.03 MTCO_{2e}
- Total cost per MTCO_{2e} - \$ 37.84

Grand View Dairy Digester Project
Funded: 2022
Status: In Progress
Expected Completion Date: December 2024

Grand View Dairy Digester Project is a new covered lagoon digester at the Grand View Dairy in Merced County, California. The biogas from this new

digester will be upgraded to biomethane onsite at the dairy and then transported via truck to the Merced upgrading facility and utility interconnection. At the Merced facility, the biomethane will be offloaded and injected into the utility pipeline for delivery to contracted CNG fueling stations in the Central Valley and the state.

- Location - Le Grand, California (Merced County)
- CDFA DDRDP Funding - \$1,600,000
- Matching funds - \$4,414,535
- Total Projects costs - \$6,014,535
- Estimated 10-year GHG reductions - 132,103 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.08 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$12.12

Lakeshore Dairy Digester Project
Funded: 2022
Status: In Progress
Expected Completion Date: December 2024

Lakeshore Dairy Digester Project is a new covered lagoon digester at the Lakeshore Dairy. The project is owned by Lakeshore Dairy and will be trucking biomethane to the Merced Pipeline Cluster. The biogas from this new digester will be upgraded to biomethane onsite at the dairy and then transported via truck to the Merced upgrading facility and utility interconnection. At the Merced facility, the biomethane will be offloaded and injected into the utility pipeline for delivery to contracted CNG fueling stations in the Central Valley and the state.

- Location - Hanford, California (Kings County)
- CDFA DDRDP Funding - 1,600,000
- Matching funds - \$3,972,072
- Total Projects costs - \$ 5,572,072
- Estimated 10-year GHG reductions - 159,224 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.099 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$34.99

LegenDairy Digester Project
Funded: 2022
Status: In Progress
Expected Completion Date: December 2024

LegenDairy Digester Project is a new covered lagoon digester at LegenDairy Farms in Tulare County. The project is owned by Calgren Dairy Fuels and will be a part of the Calgren Dairy Fuels Cluster. The biogas from this new digester will be transported via the cluster's private, low-pressure pipeline to the gas upgrading hub. At the upgrading facility, the biogas will be upgraded to biomethane and injected into the SoCalGas pipeline for delivery to contracted CNG fueling stations in the Central Valley and the state. The project is developed by Maas Energy Works.

- Location - Tipton, California (Tulare County)
- CDFA DDRDP Funding - \$ 1,200,000
- Matching funds - \$ 3,940,407
- Total Projects costs - \$ 5,140,407
- Estimated 10-year GHG reductions - 113,934 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.094 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$45.11

Lerda-Goni Farms Biogas
Funded: 2022
Status: In Progress
Expected Completion Date: December 2024

Lerda-Goni Farms is part of the established South Tulare dairy biogas to fuel cluster in Tulare County, CA. The dairy will install a Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. An on-dairy biogas conditioning and compressor will remove hydrogen sulfide and moisture and then meter and move the clean biogas into a gathering line connecting to centralized biogas upgrading and interconnection facility. The project's biomethane will be delivered as R-CNG to fleets and CNG fueling stations in California.

- Location- Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$502,448

- Matching funds - \$3,988,935
- Total Projects costs - \$ 4,491,382
- Estimated 10-year GHG reductions - 45,677 MTCO_{2e}
- GHG reductions per CDFA grant dollar - 0.091MTCO_{2e}
- GHG reduction per total project dollars - 0.01 MTCO_{2e}
- Total cost per MTCO_{2e}- \$98.33

3 Machados Dairy Digester Project
Funded: 2022
Status: In Progress
Expected Completion Date: December 2024

3 Machados Dairy Digester Project is a new covered lagoon digester at 3 Machados Dairy. The biogas from this new digester will be transported via the cluster's private, low-pressure pipeline to the gas upgrading facility. At the hub facility, the biogas will be upgraded into biomethane and injected into the utility pipeline for delivery to contracted CNG fueling stations in the Central Valley and the state.

- Location – Merced, California (Merced County)
- CDFA DDRDP Funding - \$1,200,000
- Matching funds - \$3,527,795
- Total Projects costs – \$4,727,795
- Estimated 10-year GHG reductions – 158,441 MTCO_{2e}
- GHG reductions per CDFA grant dollar – 0.13 MTCO_{2e}
- GHG reduction per total project dollars – 0.04 MTCO_{2e}
- Total cost per MTCO_{2e} - \$ 29.84

Martins View Jersey Dairy Biogas
Funded: 2022
Status: In Progress
Expected Completion Date: December 2024

The project is committed to building a tier 1 double-lined, covered lagoon digester, a biogas conditioning system (iron sponge and activated carbon based H₂S scrubber), a biogas to biomethane upgrader (skid mounted and located on-site) and a high-pressure tube trailer truck loading station. The

produced RNG will be tube-trailer down to the CalBioGas South Tulare interconnection location, or alternatively other nearby CalBio facilities, for off-loading and metering into the SoCalGas pipeline.

- Location - Gustine, California (Merced County)
- CDFA DDRDP Funding - \$ 818,216
- Matching funds - \$ 5,905,782
- Total Projects costs - \$ 6,723,997
- Estimated 10-year GHG reductions - 81,822 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.10 MTCO₂e
- GHG reduction per total project dollars -0.01 MTCO₂e
- Total cost per MTCO₂e - \$82.18

Mattos Bros Dairy Digester Project

Funded: 2022

Status: In Progress

Expected Completion Date: December 2024

Mattos Bros Dairy Digester Project is a new covered lagoon digester at the Mattos Bros Dairy. The project is owned by Mattos Bros Dairy L.P. and will be a part of the Lakeside Pipeline Cluster. The biogas from this new digester will be transported via the cluster's private, low-pressure pipeline to the gas upgrading facility. At the hub facility, the biogas will be upgraded into biomethane and injected into the SCG pipeline for delivery to contracted CNG fueling stations in the Central Valley and the state.

- Location- Hanford, California (Kings County)
- CDFA DDRDP Funding - \$ 1,600,000
- Matching funds - \$ 2,732,819
- Total Projects costs - \$ 4,332,819
- Estimated 10-year GHG reductions - 119,017 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$36.41

Meirinho West Dairy Digester Project
Funded: 2022
Status: In Progress
Expected Completion Date: December 2024

Meirinho West Dairy Digester Project is a new covered lagoon digester at the Meirinho West Dairy. The project is owned by Meirinho West Dairy Biogas LLC and will be trucking biomethane to the Merced Pipeline Cluster. The biogas from this new digester will be upgraded to biomethane onsite at the dairy and then transported via truck to the Merced upgrading facility and utility interconnection. At the Merced facility, the biomethane will be offloaded and injected into the utility pipeline for delivery to contracted CNG fueling stations in the Central Valley and the state.

- Location - Modesto, California (Stanislaus County)
- CDFA DDRDP Funding - \$ 1,600,000
- Matching funds - \$ 3,816,266
- Total Projects costs - \$ 5,416,266
- Estimated 10-year GHG reductions - 166,952 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.104 MTCO₂e
- GHG reduction per total project dollars - 0.031 MTCO₂e
- Total cost per MTCO₂e - \$32.44

P&M Dairy and VP Farms Biogas
Funded: 2022
Status: In Progress
Expected Completion Date: December 2024

P&M Dairy and VP Farms are two neighboring dairies within the established South Tulare dairy biogas to fuel cluster in Tulare County, CA. The dairies will install a shared Tier 1 designed manure-only covered lagoon digester with integrated gas storage and pre-treatment. The dairies will also share an on-dairy biogas conditioning and compressor which will remove hydrogen sulfide and moisture and then meter and move the clean biogas from both dairies into a gathering line connecting to centralized biogas upgrading and interconnection facility. The project's biomethane will be delivered as R-CNG to fleets and CNG fueling stations in California.

- Location - Tipton, California (Tulare County)

- CDFA DDRDP Funding - \$ 1,546,564
- Matching funds - \$ 4,626,524
- Total Projects costs - \$ 6,173,088
- Estimated 10-year GHG reductions - 154,656 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.10 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$39.91

River Rock Dairy Digester Project
Funded: 2022
Status: In Progress
Expected Completion Date: December 2024

River Rock Dairy Digester Project is a new covered lagoon digester at the River Rock Dairy. The project is owned by Second Street Energy LLC and will and will be trucking biomethane to the Merced Pipeline Cluster. The biogas from this new digester will be upgraded to biomethane onsite at the dairy and then transported via truck to the Merced upgrading facility and utility interconnection. At the Merced facility, the biomethane will be offloaded and injected into the utility pipeline for delivery to contracted CNG fueling stations in the Central Valley and the state.

- Location - Stevinson, California (Stanislaus County)
- CDFA DDRDP Funding - \$ 1,600,000
- Matching funds - \$ 4,115,962
- Total Projects costs - \$ 5,715,962
- Estimated 10-year GHG reductions - 104,835 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.07 MTCO₂e
- GHG reduction per total project dollars - 0.02 MTCO₂e
- Total cost per MTCO₂e - \$54.52

Top O' The Morn Farms Biogas
Funded: 2022
Status: In Progress
Expected Completion Date: December 2024

Top O' The Morn Farms is part of the established South Tulare dairy biogas to fuel cluster in Tulare County, CA. The dairy will install a Tier 1 designed

manure-only covered lagoon digester with integrated gas storage and pre-treatment. An on-dairy biogas conditioning and compressor will remove hydrogen sulfide and moisture and then meter and move the clean biogas into a gathering line connecting to centralized biogas upgrading and interconnection facility. The project's biomethane will be delivered as RCNG to fleets and CNG fueling stations in California.

- Location - Tulare, California (Tulare County)
- CDFA DDRDP Funding - \$ 1,332,251
- Matching funds - \$ 3,923,771
- Total Projects costs - \$ 5,256,023
- Estimated 10-year GHG reductions - 132,103 MTCO₂e
- GHG reductions per CDFA grant dollar - 0.099 MTCO₂e
- GHG reduction per total project dollars - 0.03 MTCO₂e
- Total cost per MTCO₂e - \$39.79

Aligned Digester Cooperative LLC
Funded: 2018
Status: Canceled

Aligned Digester Co., LLC (dba Aligned Digester Cooperative LLC) partnered with Red Top Jerseys Dairy to develop a covered lagoon digester that would have produced up to 63,000 MMBtu of RNG expanding the market for near-zero emission natural gas vehicles in the San Joaquin Valley.

- Location – Chowchilla, California (Madera County)
- CDFA DDRDP Funding – \$3 million
- Project canceled due to substantial changes in project scope.

Williams Family Dairy Digester Fuel Pipeline
Funded: 2018
Status: Canceled

The Williams Family Dairy Digester Fuel Pipeline Project is a covered lagoon anaerobic digester. The project was proposed as part of the Calgren Dairy Fuels Cluster to power the Calgren ethanol refinery.

- Location – Pixley, California (Tulare County)
- CDFA DDRDP Funding - \$1.5 million
- Project canceled due to substantial change in project objectives and scope.

De Groot North Dairy Biogas
Funded: 2018
Status: Canceled

De Groot North Dairy Biogas would have built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution.

- Location – Hanford, California (Kings County)
- CDFA DDRDP Funding - \$1,442,440
- Project canceled due to substantial change in project objectives and scope.

Milky Way Dairy Biogas
Funded: 2018
Status: Canceled

Milky Way Dairy Biogas would have built a new covered lagoon digester with enhanced gas storage, gas pre-treatment, and effluent distribution.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$2,953,427
- Project canceled due to substantial change in project objectives and scope.

GP Dairy Biogas
Funded: 2019
Status: Canceled

GP Dairy Biogas would have installed a new covered lagoon digester with integrated gas storage and pre-treatment.

- Location – Visalia, California (Tulare County)
- CDFA DDRDP Funding - \$502,554
- Project canceled due to substantial change in project objectives and scope.

*Research Project: Converting Manure to Reduce
Greenhouse Gas Emissions, Minimize Environmental
Impacts, and Enhance the Economic Feasibility of Dairy
Operations*

*Prof. William Horwath, University of California
Davis Funded: 2016 Status: Canceled*

The UC Davis Manure Conversion Research Project was funded with \$225,909 through the 2014-15 DDRDP. The project was designed to evaluate a new method capable of converting large amounts of manure and/or urine from dairy operations into a more stable, sterile soil amendment with a predictable nitrogen mineralization response that reduces greenhouse gas (GHG) emissions. This project targeted a 25 percent GHG reduction in overall CO₂e emission rates from manure and subsequently amended soils, which could have been scaled to intensive livestock operations throughout the state of California and beyond.

The objectives of the lab and field research were to measure the effects of 'converted' manure on N₂O, CH₄, and CO₂ emissions, as well as the effects of the converted manure on crop productivity, compared to conventionally handled manure and cropland fertility management. The 'conversion' process for manure involved the hydrodynamic cavitation of homogenized solid or liquid livestock waste slurry, which was pumped through attenuating tubules that suddenly opened. The over-arching goal of this research was to provide an alternative to business as usual waste management in dairy operations to reduce GHGs while maximizing economic and environmental benefits. The project was canceled due to substantial changes to the project timeline.