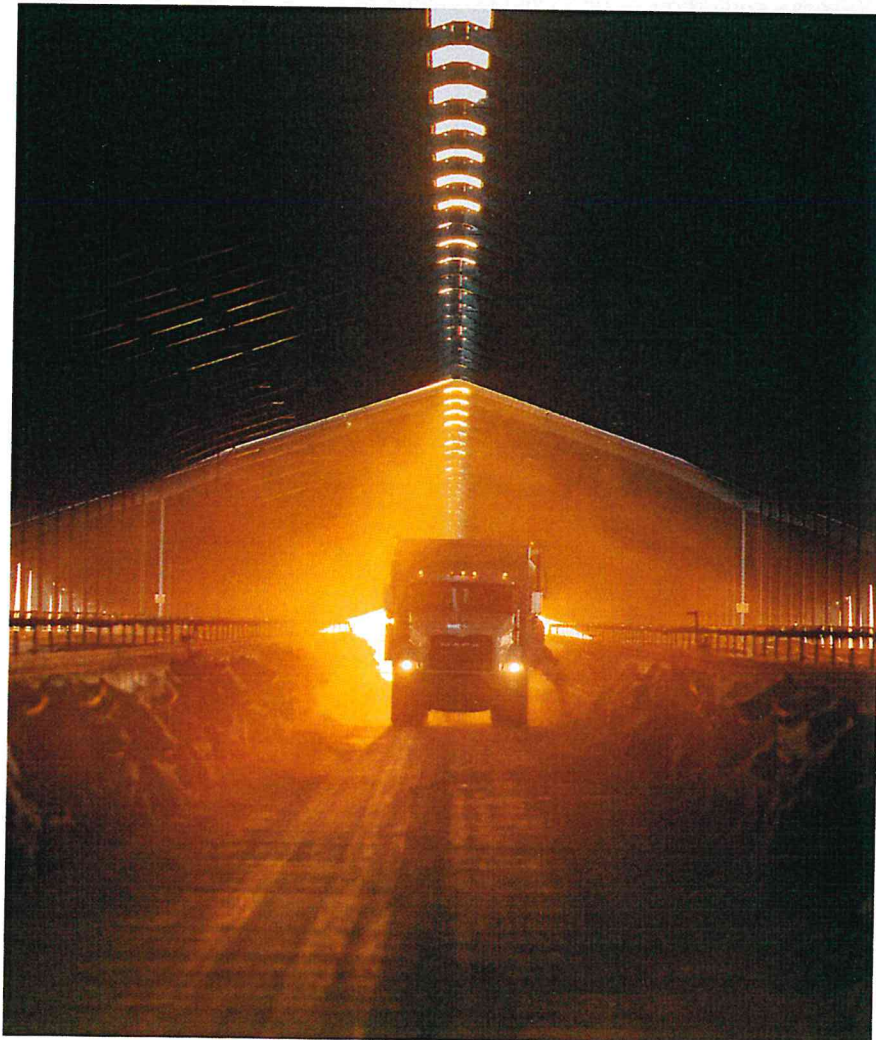


FROM POOP TO POWER

How dairy farmers are helping save the planet and powering BMW electric vehicles throughout California.

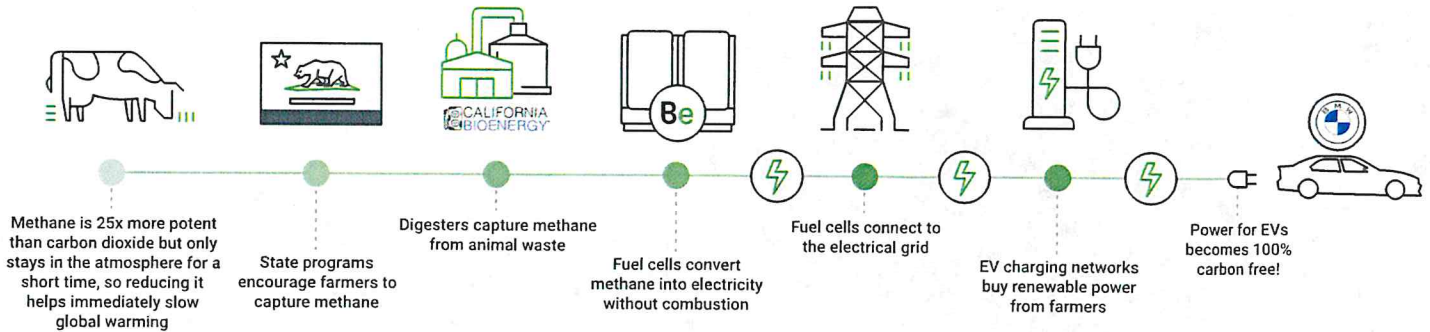


Located on the Bar 20 Dairy, California Bioenergy's dairy digester and Bloom Energy's fuel cell technology are capturing methane and generating renewable electricity without combustion. This first-of-its-kind solution will power BMW electric vehicles throughout California.



BAR 20 DAIRY'S COW POWER

Renewable Electricity Generated from Dairy Waste to Power EVs



Larry Shehadey started his dairy business in the late 1950's with just a few hundred cows on his original Bar 20 Dairy. In the 1970's a second dairy was opened and the herd grew to over 2,000 cows. In 2005 Larry's third and only remaining dairy was established. Today's Bar 20 Dairy in Kerman, California spans nearly 6,000 acres with a milking herd of 7,000 cows and produces up to 70,000 gallons of milk each day. Second and third generation family members oversee the Company's endeavors. John Shehadey and his son Steve manage the dairy and farming operations while Richard Shehadey and his sons Scott, Richie, and Kevin run the milk processing and distribution.

- 7,000 milk cows
- 190 million pounds of milk per year
- 25-million-gallon digester captures 112,000 MMBTU per year of biogas
- Digester captures gases and reduces dairy reactive organic gas ("ROG") emissions by 24 tons per year
- Bloom fuel cell produces clean, reliable 365 days per year x 24 hours per day renewable electricity
- Bloom fuel cell electricity is zero combustion with virtually no emissions, CARB certified clean
- 7.5 million kwh per year of continuous base load renewable generation regardless of grid situation
- Carbon emission reductions from Bar 20 are the equivalent of providing 100% renewable energy to 17,000 electric vehicles each year
- Electric fuel reduces smog producing vehicle NOx emissions and PM2.5 emissions
- Project employs 2 full time equivalents to operate and manage plant



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OUTSTANDING DAIRY FARM SUSTAINABILITY



BAR 20 DAIRY

Kerman, California

Unique Partnership Pioneers Cow-to-Car Climate Solution

On their Kerman, California dairy, the Shehadey family lives by a four-generation sustainability ethic that puts people, the planet and animals first.

"When I was young, my grandfather told me that we make milk for people's children," said Steve Shehadey. "That has always stuck with us on the farm. We can't offer anything but our best for children and the families who buy our milk."

Steve's grandfather, Larry Shehadey, started in the dairy business bottling milk with Producers Dairy in Fresno, California. To improve milk quality for his plant, Larry opened Bar 20 Dairy in the 1950s with a small herd of Holsteins. The dairy farm has grown to 7,000 cows today – still rooted in family values and a commitment to sustainability.

"We try to create a family atmosphere for our 125 employees," Steve said. "We want them to be with us for the long-term – 33 of our employees have been with us for more than 20 years. We're all working together to do more with less, to get a little better every day."

On-farm energy investments have added up for the environment and the dairy. LED bulbs now provide lighting in all the barns, reducing demand for electricity by 75%. A one megawatt solar array produces electricity for the dairy barn, while a second megawatt system offsets power usage of the farming operation.

In November 2021, the Shehadey family installed a first-of-its-kind, climate-smart dairy solution – fuel cells that convert methane, captured via a dairy digester, into renewable electricity. Through a partnership with BMW North America, the combustion-free, dairy-derived electricity is transmitted via the utility grid to power electric vehicles. The methane emission reductions at the farm, when combined with the renewable energy generation, result in carbon emission reductions equivalent to providing clean power to over 17,000 electric vehicles per year.

Electricity from the fuel cell also powers a new feed mixing system, replacing diesel and reducing emissions by 90%. With the fuel cells and solar array, the Shehadey family has built a clean energy, self-sustaining microgrid expected to produce more than 12 million kilowatt-hours of power annually – more energy than the dairy uses – making it a net-exporter of energy.

Other sustainability initiatives include a partnership with the Audubon Society and USDA's Natural Resources Conservation Service (NRCS) to set aside 50 acres to protect endangered tricolored blackbirds; water conservation practices to grow forage crops; and upcycling of agricultural byproducts, such as almond hulls and cotton seed, as cow feed.

- Bar 20 Dairy's anaerobic manure digester captures more than 25,000 tons of carbon dioxide equivalent greenhouse gas (GHG) emissions annually.
- The annual capture of GHG is equivalent to the carbon sequestered by more than 30,629 acres of U.S. forests in one year.
- The fuel cell system delivered an average of 23,000 kilowatt hours to the electrical grid every day in its first full month of operation.
- The electricity supplied by Bar 20 Dairy to BMW is expected to earn a carbon intensity score from CARB of -550. By comparison, average electricity in California scores +75.93.