Stockton students construct over 100 air purifiers to be distributed at Earth Day event

By Gabriel Porras
ABC10.com, Saturday, April 23, 2022

STOCKTON, Calif. — An Earth Day partnership between Edison High School in south Stockton and UC Berkeley is hoping to make the city cleaner one air purifier at a time.

Over the course of two hours on April 16, students at Stockton's Edison High School crafted 108 air purifiers with help from UC Berkeley engineering students.

"We got together with them, they had the units delivered here. About 25 Berkeley students teamed up with about 25 Edison students," said Edison High School chemistry teacher Doug Stelzer. "The students were able to take (the air purifiers) home as they wanted if they needed them or knew somebody that could benefit from them. And the rest of them will be distributed on Earth Day at Victory Park through the environmental justice project."

Supplies for the one-day event, which included fans, cardboard, rubber bands and MERV 13 filter were funded by Assembly Bill 617, a law passed in 2017 meant to lessen the inequality of air pollution in cities across the state.

In 2019, a 16-mile stretch of southwest Stockton was awarded funding for AB617 projects after research showed the area was among the top 5% of most disadvantaged communities in California. According to the San Joaquin Valley Air Pollution Control District, the area of south Stockton ranked as having the highest particulate matter pollution compared to all other disadvantaged communities in the north portion of the district's coverage area.

"We're hit with a lot of things," said Jonathan Pruitt, coordinator of the Environmental Justice Program at Catholic Charities. "We have outside sources from those that are coming from traffic. We have the Bay Area, and then we also have the Port of Stockton, the Crosstown freeways and the warehouses."

AB 617 funding awarded to Stockton goes towards events like the one at Edison, which coordinators hope will become more frequent.

"AB 617 is more than $30 million, that's going to south Stockton," said Stockton City Councilwoman and Edison High School teacher Christina Fugazi. "There are other measures, clean buses, zero-emission buses, things of that nature, that all of south Stockton will benefit from."

While some students opted to take their air purifiers home, others are donating their work in hopes of helping Stockton residents.

"It's very useful for people who have very strong asthma, people that can't breathe regularly," Raphael Alvarez, an Edison High School chemistry student, said. "There's people that are trying to sell these, but they're overpricing and making them quite expensive for no reason, when we could just give it out for free."

Students and teachers plan to attend Stockton's Earth Day Festival Sunday where they hope to distribute the purifiers. The Earth Day Festival is being held from 10 a.m. to 4 p.m. Sunday at Victory Park in Stockton

For some Edison High School students, the project has driven home an important lesson about air pollution and about innovation.

"It's so it's amazing, because there's a lot of people that have those difficulties, and they don't know what to do about it," Alvarez said. "It's just a very useful thing to use."

Dairy industry looks to feed supplements for faster action on greenhouse gases

By John Cox
The Bakersfield Californian, Saturday, April 23, 2022

After hundreds of millions of taxpayer and private dollars spent on reducing dairy emissions from manure, more attention is turning lately to greenhouse gases coming from the other end of cows.

Enteric emissions — cow burps, the source of close to half of all dairy methane — have become a central focus for California dairies working to help meet the state's ambitious greenhouse gas reduction goals.

Unlike so-called dairy digesters that require large investments to capture methane from manure and then turn it into marketable fuel, cutting enteric emissions generally involves far less expensive processes: adding a dietary supplement to cow feed or genetically selecting livestock that burp less methane — or both.

Several products exist that have shown positive results in cutting enteric methane emissions. The near-term challenge for the manufacturers of these food additives is clearing regulatory hurdles, then after that, figuring out how to pay for them to achieve widespread adoption on dairies.

State government hopes to move fast in light of 2016's Senate Bill 32, which requires California to cut greenhouse gas emissions to 40 percent below 1990 levels by 2030. Another bill passed that year, Senate Bill 1383, calls for cutting short-lived climate pollutants like methane, a particularly potent greenhouse gas, by 40 percent from 2013 levels.

Policymakers have prodded dairies to move quickly because, according to the California Air Resources Board, dairy enteric emissions account for a fifth of the state's methane emissions.

"Those overall (state climate) goals cannot be met without enteric solutions," said Denise Mullinax, executive director of the California Dairy Research Foundation. "Feed additives will play a central role in achieving these reductions."

Ideas for moving forward surfaced at the California Dairy Sustainability Summit April 12-14, which brought state and federal regulators together with industry leaders. Speakers were encouraged by recent progress but divided at times over what needs to be done to make a dent in the problem.

Some of the event's best news on cutting enteric dairy emissions came from CEO Joan Salwen of Hawaii-based Blue Ocean Barns, cultivator of red seaweed, an all-natural feed additive grown in seawater-fed tanks in San Diego and Hawaii.

Salwen reported that earlier this month the company presented the U.S. Food and Drug Administration with study results suggesting dairy cows that ate the supplement put out 52 percent less enteric methane emissions — 92 percent less in one particular cow.

"It was a significant success. It really proved that a carbon-positive dairy economy is within reach," Salwen said. She added that the seaweed doesn't lead to weight loss in herds or hurt cows or humans or change the flavor of milk or meat from livestock.

What's more, there were indications the supplement increases feed efficiency by 10 percent.

"Cows are apparently making better use of their feed and requiring less of it to produce the same amount of milk," she said. "That represents real money to California's farmers."

Other products are being marketed elsewhere around the world, having already been approved for use in different countries. Manufacturers of these additives point to a variety of benefits not limited to reductions of enteric emissions.

Vice President Mark van Nieuwland at Swiss-based DSM Nutritional Products said during the sustainability summit that the company's feed additive boosts cows' meat production while cutting enteric methane reductions by 30 percent. The product has been approved by the governments of Brazil, Chile and the European Union, but not in the United States.

There was discussion during the summit about how to increase the California dairy industry's adoption of feed additives for cutting enteric emissions. Some speakers suggested using financial incentives, while

others called for doling out marketable carbon credits to dairies that successfully lower their methane reductions, as already happens with dairy digesters.

Thomas Hafner, founder and CEO of Swiss-based feed supplement-maker Mootral, noted that dairy producers using his garlic- and citrus-based additive have worked with retailers to promote their milk as more environmentally sustainable. They're able to charge more money for it.

"That almost covers the cost of the product by itself," Hafner said. He said the product increases milk production by as much as 5 percent while cutting reductions between 20 percent and 38 percent.

Apart from the idea of charging a premium for climate-friendlier milk, Hafner said some governments are working toward mandating the use of feed additives at dairies.

Peter Williams, a partner at Cincinnati-based Feedworks USA Ltd., favored the use of carbon credits over government mandates, at least for speeding adoption of feed additives.

Williams said his company's product, made from essential oil extracts and herbs, costs just 4 to 5 cents per cow per day and cuts enteric methane emissions by about 10 percent while also improving feed efficiency and reducing ammonia and nitrous oxide releases.

He said incentives, or lack of them, stand as the biggest barrier to greater use of such products, especially in California.

"Dairy farmers are very concerned," he said, "that they'll be left carrying the cost of reducing enteric methane emissions on their farms."

Modesto schools will have 30 electric buses next year. Where will they charge up?

By John Holland
Modesto Bee, Thurs., April 21, 2022

Modesto City Schools celebrated the dawn of its electric bus future with a Tuesday morning gathering.

Two of the eventual 30 buses sat in front of the audience at the Woodland Avenue maintenance yard. The rest will be delivered between the August start of the next school year and early 2023, Superintendent Sara Noguchi said.

The MCS board in January accepted $6.3 million from the state to cover part of the $13.8 million cost. The rest is general fund dollars freed up by coronavirus relief money.

This purchase from Blue Bell Bus Corp., based in Macon, Ga., will convert about half the MCS fleet from diesel engines. District officials are considering another application to the voucher program at the California Air Resources Board.

The purchase is part of a nationwide effort to shift transportation away from the carbon-based fuels behind climate change. Gov. Gavin Newsom seeks to end sales of new gasoline cars by 2035. Trucking, passenger rail and maybe even aviation could go electric, too.

All of that has prompted electrical utilities to plan for a future of much greater demand on their grids. They include the Modesto and Turlock irrigation districts and Pacific Gas & Electric Co. All three lent their expertise to a recent report on charging station needs for the Stanislaus Council of Governments.

The utilities also face mandates to generate much of the power from solar, wind and other climate-friendly sources. MCS will help with this by installing solar panels to charge its new buses. It plans to sell the excess to MID during times of low demand.

Drivers did not start up and move the electric buses on display Tuesday. But speakers did note that they will be much quieter than diesel, and easier on the lungs of Modesto residents.

“I want to celebrate with you this momentous day of Modesto City Schools’ big leap into the zero-emissions future in California,” state air board member Tania Pacheco-Werner told the gathering.

She is co-director at the Central Valley Health Policy Institute at Fresno State University. She also serves on the board of the San Joaquin Valley Air Pollution Control District.

Electric buses can cost two to three times as much as diesel, but MCS expects to have lower maintenance costs along with the fuel savings. It also is shifting to electric lawn mowers, hedge trimmers and other equipment.

Noguchi said the effort also could provide “job-shadowing” for students interested in engine repair, solar panels, batteries and other green technology.

Local air quality, still lagging badly, improves in some respects

By John Cox
Bakersfield Californian, Thursday, April 21, 2022

Bakersfield and Kern continued to have some of the nation's worst air quality between 2018 and 2020, according to a new report that nevertheless highlighted significant local improvement, particularly with regard to reductions in ozone pollution.

The American Lung Association's 23rd annual State of the Air update, released late Wednesday, concluded Bakersfield had the worst particulate pollution in the country for the third consecutive year, by one measure, and the second-worst after Fresno by a different measure.

The city's ozone pollution ranked second-worst in the United States behind the Los Angeles-Long Beach area, while Kern was listed runner-up in the category of the most polluted places to live in the country, behind Mono County.

Even so, Bakersfield was one of three cities, along with Fresno and San Diego, singled out as having posted better ozone numbers than a year earlier. Researchers also pointed out Bakersfield has made big strides during the past decade.

Will Barrett, the lung association's national senior director of clean air advocacy, noted Bakersfield has seen what he characterized as a steady and healthy drop to 95.2 days when local ozone surpassed the national standard, down from 97.2 in last year's report and 103.2 the year before that.

"That's very good news," Barrett said. "We're below 100 days of unhealthy ozone pollution" for only the third time in the report's history.

The report focuses on the health risks of poor air quality at a time when changing weather patterns — warmer temperatures and bigger, more frequent wildfires — are worsening the situation. It calls for phasing out internal combustion engines and making cities more walkable, in part to protect communities of color that overall are 61 percent more likely to live in unacceptably dirty air.

Air pollution increases the risk of asthma, heart attack, stroke, reproductive harm, lung cancer and premature death, according to the association.

Topography and meteorology are a big part of the reason why air quality is so bad in the southern Central Valley. Surrounding mountains trap pollution that's created locally or which flows in from more highly populated areas. Also, hot valley summers contribute to the formation of smog.

Representatives of the San Joaquin Valley Air Pollution Control District said the improvement in recent years, not just in ozone pollution but also in particulates relative to a decade ago, reflects many years of work on regulations placed on stationary sources of pollution, as well as taxpayer incentives that fund replacement of equipment like lawn mowers and diesel engines.

Jon Klassen, the district's director of air quality science, pointed out what the lung association noted as well: Airborne pollution across the West suffered in 2020 because of historically bad wildfires.

Speakers at a morning phone conference hosted by the lung association said wildfires are one aspect of climate changes that are worsening air quality. More needs to be done, and quickly, to phase out greenhouse gases and particulate matter, they said, proposing measures like faster deployment of zero-emissions vehicles and urban design that reduces the need for cars. They also supported prescribed burns, and public education to help prevent the spread of large wildfires.

One of the speakers, Executive Officer Richard Corey of the California Air Resources Board, said about half of California's greenhouse gas emissions originate in the transportation sector, which he said was also responsible for 80 percent of nitrogen oxides leading to ozone, and 95 percent of particular matter from diesel fuel.

"The fact is, we can't get to clean, healthy air for all Californians, or achieve our greenhouse gas reduction targets, without transitioning away from petroleum," Corey said. He later added that heavy-duty vehicles such as marine vessels and airplanes can't easily be electrified, and so liquid fuels will probably be around for years to come.

The two primary measures by which Bakersfield failed to register year-over-year air quality improvement are related to particulates.

Short-term particulate days, in which Bakersfield ranked just below No. 1 Fresno, reflects a weighted average of the number of days when the amount of tiny particles in local air exceeds national standards. According to the report, Bakersfield had 41 such days between 2018 and 2020, which was 28 percent more than it had between 2017 and 2019. There were 58.8 of those days between 2006 and 2008.

The city's annual particulate levels, used to describe particle pollution over the course of a year, increased by 4 percent to reach a reading of 17.6, which was slightly better than Bakersfield's reading for the three years that ended in 2018. Between 2006 and 2008, it came in at 21.5.

The association's report was based on an analysis of data from the U.S. Environmental Protection Agency's Air Quality System. It is available online at Stateoftheair.org.

Cleaner Earth: Healing ozone hole, less smog, more eagles

By The Sacramento Bee
The Sacramento Bee, Friday, April 22, 2022

With climate change, plastic pollution and a potential sixth mass extinction, humanity has made some incredible messes in the world.

But when people, political factions and nations have pulled together, they have also cleaned up some of those human-caused environmental problems, including healing the ozone hole, clearing perpetually smoggy air and saving many species from the brink of extinction.

“We can be good at cleaning up our messes, it’s whether or not we choose to be and what we prioritize,” said Michigan State University environmental sustainability researcher Sheril Kirshenbaum.

For Earth Day, The Associated Press asked more than 25 environmental scientists and policy experts, including two former U.S. Environmental Protection Agency chiefs and the current director of the United Nations Environment Programme, to share their top stories about environmental problems that the world fixed.

“There are some amazing success stories,” said Stanford University environmental scientist Rob Jackson. “It’s easy for us to get tunnel vision with everything going wrong, and there is a lot that needs to change quickly. But it’s wonderful to remind ourselves that other people in the past have succeeded and that society has succeeded too, both nationally here in the U.S. and also internationally.”

Here are the four successes mentioned most often and a key aspect that so many ecological wins have in common.

HEALING THE OZONE HOLE

Fixing ozone depletion was by far the top choice of scientists, officials and environmental policy experts.

“It was a moment where countries that usually compete with each other grasped the collective threat and decided to implement a solution,” former EPA chief Carol Browner said in an email.

Scientists in the 1970s had discovered that a certain class of chemicals, often used in aerosol sprays and refrigeration, was eating away the protective ozone layer in Earth's atmosphere that shields the planet from harmful ultraviolet radiation linked to skin cancer.

The ozone layer was thinning everywhere, creating a hole over Antarctica, which not only threatened increased skin cancer cases, but cataracts and widespread changes to ecosystems around the globe, said University of North Carolina atmospheric scientist Jason West.

"It's the first time we created a planet-killing problem and then we turned around and solved it," Stanford's Jackson said.

In 1987, the countries of the world signed the Montreal Protocol, a first of its kind treaty that banned the ozone-munching chemicals. At this point every nation in the world has adopted the treaty, 99% of the ozone-depleting chemicals have been phased out, "saving 2 million people every year from skin cancer," United Nations Environment Programme Director Inger Andersen said in an email.

The ozone hole over Antarctica worsened for a couple decades, but over the last several years it has slowly started to heal in fits and spurts. The United Nations Environment Programme projects that the ozone " will heal completely by the 2030s."

While activists point to the Montreal Protocol as a hope and example for the fight against climate change, it's not quite the same. In the case of the banned ozone-sapping chemicals the corporations that manufactured them also made their replacements. But with climate change "it's more of an existential threat to the oil and gas companies," Jackson said.

CLEANER AIR AND WATER

In the United States and much of the industrialized world, the air is much cleaner and clearer than it was 50 or 60 years ago when major cities like Los Angeles were choked with smog and even more dangerous microscopic particles in the air. And lakes and rivers were dumping grounds, especially around Ohio, Michigan and Canada.

"We would go to Lake Erie when I was young... and play on the beach and there would be dead fish everywhere. We would have dead fish fights," Stanford's Jackson said.

In the United States the Clean Air Act of 1970 and its follow up in 1990 with EPA regulations "effectively cleaned our air," UNC's West said. A similar law passed in the 1972 for water.

"This has led to fewer health conditions such as cancer and asthma, for example, and saved millions of lives and trillions of dollars in health care costs," Syracuse University environmental sciences professor Sam Tuttle said. "That means healthier people, more productive fisheries and a healthier and more attractive environment for all of us to enjoy."

Tight restrictions on tiny particles alone decreased annual U.S. air pollution deaths "from about 95,000 in 1990 to 48,000 in 2019," West said.

In Los Angeles in 1955, smog levels peaked at 680 parts per billion. In the last couple years they hit 185 parts per billion but are usually much smaller.

It's not just air outside. Former EPA chief William K. Reilly and University of Maryland environmental health scientist Sacoby Wilson said restricting indoor smoking had huge public health effects.

On the water, Brown University environmental scientist J. Timmons Roberts also grew up on Lake Erie and stopped going to the water because of the dead fish: "Regulations and cooperation between the U.S. and Canada really made the difference and now there's genuine eco-tourism there and thousands of walleye and other fishers come out every summer."

SOLAR AND WIND POWER

The steep fall in price of solar and wind power, which do not produce heat-trapping gases, has surprised experts and given them hope that the world can wean itself from coal, oil and natural gas that are causing global warming.

From 2010 to 2020, the price of residential solar power dropped 64% and the price of large-scale utility solar power generation dropped 82%, according to the National Renewable Energy Lab.

Solar “is becoming a dominant energy technology and it’s becoming cheaper,” Jackson said. “It is cheaper than almost all other forms of electricity generation.”

Few people thought solar and wind prices would drop so quickly just ten years ago, Jackson, Kirshenbaum and others said.

Experts credit renewable power subsidies to pull the world out of the 2008 Great Recession, especially in Germany and the United States.

ENDANGERED SPECIES

The bald eagle, American alligator, peregrine falcon, Canada geese and humpback whales are each environmental success stories.

All were once on the brink of extinction, put on the endangered species list for protection. Now they are all of the protected list and in some cases they are so abundant that people consider them a nuisance or they cause problems for other species.

“Conservation efforts are clawing some endangered species back from the brink,” Duke University ecologist Stuart Pimm said. “We are learning to do this thing called conservation.”

The U.S. Fish and Wildlife Service has taken 96 species off the endangered species list, 65 of them because they have recovered.

Experts credit regulations and laws across the world with restricting the killing and trading of endangered species and preventing destruction of crucial habitat for those critters and plants.

Another key change was the ban on the pesticide DDT, which reverberated through the food chain, causing thinning eggs for eagles, peregrine falcons and other birds of prey, Cornell University environmental biology professor Robert Howarth said.

COOPERATION

In the United States, many of these key successes were spurred by laws and actions taken by Republican administrations of Richard Nixon, Ronald Reagan and George H.W. Bush.

“All these major milestones, including the creation of the EPA, were bipartisan, but unfortunately today we can’t seem to get that stuff done,” said Christie Todd Whitman, who was an EPA chief during a Republican presidency. “Sadly, Republicans don’t seem to care about these issues anymore — everything is so hyper partisan now that (the) GOP seem to be Neanderthals on the environment.”

Often when a Republican is president, the rest of the country moves left and becomes more friendly to environmental action, whereas they move right and become more environmentally complacent during Democratic administrations, said Kirshenbaum, a former congressional staffer and director of Science Debate. What's important is cooperation and buy-in to big issues from all sides, experts said.

The treaty to heal the ozone hole is the example for what working together can accomplish, Syracuse's Tuttle said: “This agreement proved that the international community could come together to create an enforceable framework to tackle an environmental problem of global significance.”