

CALIFORNIA COW POWER: THE REGULATORY CHALLENGES FACING DAIRY MANURE BIOGAS PRODUCTION PROJECTS IN THE SAN JOAQUIN VALLEY

I. INTRODUCTION

California's new clean energy solution is a picturesque scene. Envision a lagoon of cow manure three stories deep and the length of "five football fields."¹ There are approximately two thousand dairies and 1.7 million production dairy cows in the State of California.² Approximately three quarters of those dairy cows are located in California's San Joaquin Valley.³ The immense population of cows in this region has resulted in an intense concentration of cow manure and its byproducts, greenhouse gases.⁴ The average dairy cow produces approximately 115 pounds of manure each day.⁵ Manure decomposition results in the release of various gases and particulate matter into the atmosphere.⁶ These gases include methane, ammonia, nitrous oxide, carbon dioxide,⁷ hydrogen sulfide, and volatile organic compounds.⁸ Methane, in particular, is one of

¹ Nichola Groom, *California Cows Start Passing Gas to the Grid*, ENVIRONMENTAL NEWS NETWORK, Mar. 5, 2008, 7:10 AM, <http://www.enn.com/energy/article/32239>.

² Cal. Air Res. Bd., *Fact Sheet: Dairy Manure Biogas Production Projects*, CAL. ENVTL. PROT. AGENCY AIR RES. BD. (May 19, 2009), available at <http://www.arb.ca.gov/ag/manuremgmt/digester-fact-sheet-look-here.pdf>.

³ San Joaquin Valley Dairy Manure Tech. Feasibility Assessment Panel, *An Assessment of Technologies California for Management and Treatment of Dairy Manure in California's San Joaquin Valley*, CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY AIR RESOURCES BOARD, (Dec. 2005), available at <http://www.arb.ca.gov/ag/caf/dairypnl/dmtfaprprt.pdf>.

⁴ *See id.*

⁵ Cal. Air Res. Bd., *supra* note 2.

⁶ Coal. on Agric. Greenhouse Gases, *Carbon and Agriculture: Getting Measurable Results Chapter 4*, COALITION ON AGRICULTURAL GREENHOUSE GASES, (Apr. 2010), available at http://www.c-agg.org/docs/CAGMR_ch_4.pdf.

⁷ *Id.*

⁸ San Joaquin Valley Dairy Manure Tech. Feasibility Assessment Panel, *supra* note 3.

the principal contributors to the class of greenhouse gases associated with global climate change.⁹

As a result, air pollution, believed to emanate from the high concentration of dairy cows in the San Joaquin Valley, has become a major concern.¹⁰ Two percent of the United States greenhouse gas emissions can be attributed to the dairy industry¹¹ and 1.4 percent of California's overall greenhouse gas emissions are a result of dairy cow manure.¹² Consequently, there is a strain on dairies to address air quality concerns caused by manure.¹³ Environmental regulations at the national, state and local levels require changes in dairy manure management.¹⁴ Identifying cost effective "manure management strategies and technologies" in compliance with environmental regulations is a challenge now facing dairies.¹⁵ Due to the decision in *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497 (2007) and federal preemption laws, greenhouse gases must be regulated at the local level and digesters should be permitted as a viable means of eliminating harmful greenhouse gases.

This Comment will discuss methane digesters as a clean energy solution that the dairy industry is pursuing and the regulatory challenges it faces. Section II discusses dairy manure biogas production projects and the benefits of this technology. Section III examines the regulatory challenges facing dairies and biogas production projects by exploring the policies affecting the dairy industry. Section IV discusses regulation of greenhouse gas emissions at a local level and permitting of dairy biogas production projects by focusing on the decision in *Massachusetts*, and argues for a regulatory response. Finally, development of uniform rules consistent with the existing law is recommended. A solution consistent

⁹ Natural Res. Conservation Serv., *Animal Manure Management*, UNITED STATES DEPARTMENT OF AGRICULTURE (Dec.1995), http://www.nrcs.usda.gov/wps/portal/nrcs/detail/?ss=16&navtype=SUBNAVIGATION&cid=nrcs143_014211&navid=120110120000000&pnavid=120110000000000&position=Not%20Yet%20Determined.Html&ttype=detail&pname=Animal%20Manure%20Management%20|%20NRCS.

¹⁰ San Joaquin Valley Dairy Manure Tech. Feasibility Assessment Panel, *supra* note 3.

¹¹ Cal. Milk Advisory Bd., *Sustainability Issue: Environment*, REAL CALIFORNIA MILK, (2011), <http://www.realcaliforniamilk.com/farm-life/sustainability/issue-climate-change/>.

¹² Cal. Air Res. Bd., *supra* note 2.

¹³ Nat'l Dairy Env'tl. Stewardship Council, *Cost Effective and Environmentally Beneficial Dairy Manure Management Practices*, SUSTAINABLE CONSERVATION, 5 (Kristen Hughes & Ann C. Wilkie eds., 2005), www.suscon.org/news/ndesc_report/Full_Document.pdf.

¹⁴ *Id.*

¹⁵ *Id.*

with the 2006 California Global Warming Solutions Act cap-and-trade provision is proposed.

II. FRAMING THE ISSUE

A. Dairy Manure Biogas Production Projects

Capturing and using dairy manure biogas as a fuel creates environmental benefits.¹⁶ Through the process of anaerobic digestion, manure decomposes in the absence of oxygen, which creates biogas.¹⁷ The principal component of biogas is methane.¹⁸ Methane is a greenhouse gas twenty times more destructive than carbon dioxide.¹⁹ However, biogas can be burned as a fuel to create energy on the dairy, or it can be conditioned and cleaned to be sold commercially.²⁰ Greenhouse gas emissions could be reduced by eighty-five percent through the use of biogas as an energy source.²¹ Additionally, burning or collecting dairy manure biogas prevents greenhouse gas emissions from entering the atmosphere.²² Effective implementation of dairy manure biogas production projects can lower dairy operating costs, provide revenue from energy sales, or result in a combination of income and expense avoidance.²³ The annual savings from avoided energy expenses amounts to approximately sixty-nine dollars per cow based on the commercial electricity rate average.²⁴

A dairy manure biogas production project provides the most advantageous conditions for anaerobic digestion and methane biogas produc-

¹⁶ Carolyn Betts Liebrand & K. Charles Ling, *Cooperative Approaches for Implementation of Dairy Manure Digesters*, RURAL DEVELOPMENT, (Apr. 2009), available at <http://www.rurdev.usda.gov/rbs/pub/RR217.pdf>.

¹⁷ See State Water Res. Control Bd., *Central Valley Dairy Digester and Co-digester PEIR Environmental Checklist*, CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY (March 2010), available at http://www.swrcb.ca.gov/centralvalley/press_room/announcements/ceqa_3mtgs_initial_study.pdf.

¹⁸ *EPA Administrator and Agriculture Secretary Team Up to Promote Farm Energy Generation Agreement will help cut greenhouse gas emissions*, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (May 5, 2010), <http://yosemite.epa.gov/opa/admpress.nsf/e77fdd4f5afd88a3852576b3005a604f/eddc8a628ce5e9b2852577180066c2d3!OpenDocument>.

¹⁹ *Id.*

²⁰ Liebrand, *supra* note 16.

²¹ Cal. Air Res. Bd., *supra* note 2.

²² U.S. Env'tl. Prot. Agency, *AgSTAR Accomplishments* (Dec. 2010), <http://www.epa.gov/agstar/about-us/accomplish.html>.

²³ Liebrand, *supra* note 16.

²⁴ *Id.*

tion.²⁵ Biogas is collected from a part of a manure management system called a digester.²⁶ The biogas production project is comprised of four components: the manure collection system, which collects and transports manure to the digester; the anaerobic digester, which stabilizes manure and optimizes methane production; the biogas handling system which gathers, treats, and transports biogas to an alternate device; and a gas use device, which generates energy in the form of heat or electricity.²⁷ Any remaining gas is ignited to reduce both odor and residual methane emissions.²⁸ Digesters reduce greenhouse gas emissions in two distinct ways.²⁹ The first is done directly by capturing and burning biogas that would otherwise be emitted into the atmosphere.³⁰ The second is accomplished by offsetting the harmful effects of fossil fuels, greenhouse gases, and other pollutants by creating energy alternatively.³¹

It is estimated that 8,000 farms in the United States are qualified candidates to utilize digesters to collect biogas.³² "If all 8,000 farms implemented digesters to capture biogas, methane emissions would be reduced by more than 34 million metric tons of carbon dioxide each year, which is roughly equal to the emissions from 6.5 million passenger vehicles annually."³³ In California, dairies currently produce about 450,000 tons of methane annually, which could provide enough energy to run 120,000 homes.³⁴ Unfortunately, only one percent of the dairies in California currently utilize digesters.³⁵

Regulatory challenges have slowed the implementation of dairy manure biogas production projects in California.³⁶ Dairies face an unpre-

²⁵ See *id.*

²⁶ U.S. Env'tl. Prot. Agency 1, *supra* note 18.

²⁷ Env'tl. Prot. Agency, *AD 101 Biogas Recovery Systems*, <http://www.epa.gov/agstar/anaerobic/ad101/index.html>, (last updated Sept. 24, 2010).

²⁸ Miller, Paul, *Methane Recovery from Manure: Control Odor and Produce Energy, Odor and Nutrient Management*, <http://www.extension.iastate.edu/pages/communications/epc/F99/methane.html>, (Fall 1999).

²⁹ U.S. Env'tl. Prot. Agency 2, *supra* note 22.

³⁰ *Id.*

³¹ *Id.*

³² U.S. Env'tl. Prot. Agency 1, *supra* note 18.

³³ *Id.*

³⁴ Celia Lamb, *Dairy Digester Dispute*, SACRAMENTO BUSINESS JOURNAL, Aug. 10, 2008, <http://www.bizjournals.com/sacramento/stories/2008/08/11/story9.html>.

³⁵ Valentino M. Tiangco, Ph.D. *The Dairy Digester Opportunities in SMUD's Service Territory*, SMUD, 11 (2010), http://epa.gov.agstar.documents/workshop10/smud_dairy_agstar_april_27_28_2010.pdf.

³⁶ Wes Sander, *Bureaucracy Stifles Dreams of Digesters*, CAPITAL PRESS, Sept. 11, 2010, <http://www.capitalpress.com/print/ws-digesters-081310>.

dictable permitting process, which is a considerable risk when investing millions of dollars into the biogas production projects.³⁷ Once a dairy manure biogas production project enters the energy generation stage, it will inevitably generate pollution, which has sparked the permitting controversy.³⁸

B. Senate Bill 700

Until recently, agricultural sources of air pollution in California had maintained an exemption from air quality permit requirements.³⁹ The enactment of Senate Bill 700 removed that exemption.⁴⁰ The California Air Resources Board developed a definition to determine which large confined animal facilities are required to meet emission regulations under Senate Bill 700.⁴¹ The definition, as applied to dairies, is a facility with one thousand or more milking cows.⁴² Through Senate Bill 700, local air districts are given the authority to develop regulations to control livestock emissions on large confined animal facilities, like the dairies implementing dairy manure biogas production projects.⁴³ Agricultural operations using equipment that may cause emission of air pollutants, like dairy manure biogas production projects, are required to obtain a permit from the local air district.⁴⁴

C. San Joaquin Valley Air Pollution Control District Rule 4570

The EPA rates the San Joaquin Valley's air quality as one of the worst in the nation.⁴⁵ This designation necessitates the application of strict rules⁴⁶ to respond to the federally mandated standard.⁴⁷ In response, the

³⁷ *Id.*

³⁸ See P.J. Huffstutter, *A Stink in Central California Over Converting Cow Manure to Electricity*, LOS ANGELES TIMES (Mar. 1, 2010), <http://articles.latimes.com/2010/mar/01/business/la-fi-cow-power1-2010mar01>.

³⁹ See Summary: Sen. Bill NO.700, Ch 479, §6, (2003), <http://www.arb.ca.gov/ag/sb700/sb700.htm>.

⁴⁰ *See id.*

⁴¹ Cal. Air Res. Bd., *Confined Animal Facilities*, CAL. ENVTL. PROTECTION AGENCY (July 18, 2011), <http://www.arb.ca.gov/ag/caf/caf.htm>.

⁴² See SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DIST., FINAL DRAFT STAFF REPORT: AMENDED REVISED PROPOSED AMENDMENTS TO RULE 4570 (CONFINED ANIMAL FACILITIES 16 (Oct. 21, 2010), *available at* http://www.valleyair.org/workshops/postings/2010/10-21-10_r4570/R4570 Revised Staff Report OCT.pdf.

⁴³ *See* Cal. Air Res. Bd., *supra* note 41.

⁴⁴ *See* Summary: Sen. Bill NO.700, *supra* note 39.

⁴⁵ Sander, *supra* note 36.

⁴⁶ *Id.*

San Joaquin Valley Air Pollution Control District has set strict limits to control the pollution.⁴⁸ It adopted Rule 4570 in June of 2006, enacting the most strict air pollutant emissions regulations for large confined animal facilities in the United States.⁴⁹ Rule 4570 aims to reduce air pollutant emissions at large confined animal facilities by employing “expeditiously practicable, technologically feasible, and economically reasonable methods,” to comply with the goals of the federal air standards.⁵⁰ “The purpose of the rule is to limit the emission of volatile organic compounds (“VOCs”).”⁵¹ VOCs are gases emitted from a variety of chemicals, which may pose long-term and short-term adverse health impacts, and whose pollutant levels can remain in the air for long periods of time.⁵² Rule 4570, however, does not presently consider greenhouse gases, like methane, air pollutants.⁵³

Consequently, Rule 4570 places climate change goals at odds with air quality through preference of air quality over greenhouse gas emission reduction when permitting dairy manure biogas production projects.⁵⁴ The primary goal of Rule 4570 remains to protect public health by setting air quality standards, consistent with California’s designation of having deteriorated air quality.⁵⁵ Although the objectives of Rule 4570 are beneficial, it leaves dairy farmers who are trying to implement dairy manure biogas production projects without the ability to secure the necessary permits because of the pollution caused by the digester generator engine.⁵⁶ It is clear that the implementation of Rule 4570 creates tension between competing regulations, where reduction of methane is defeated by the regulation of air pollution caused by the very machines that are attempting to reduce the methane emissions.

⁴⁷ See Huffstutter, *supra* note 38 (explaining NOx levels in the San Joaquin Valley are federally set where the levels are add to the existing smog problem).

⁴⁸ John Holland, *Fiscalini Plan to Turn Methane into Energy Runs into Air Problems*, THE MODESTO BEE, July 12, 2008, <http://www.modbee.com/2008/07/12/357872/fiscalini-plan-to-turn-methane.html>.

⁴⁹ SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DIST., *supra* note 42, at 1.

⁵⁰ SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DIST., *supra* note 42, at 2.

⁵¹ SJVUDPCD, *Rule 4570* §1 (Jun. 16, 2009), <http://www.valleyair.org/rules/currentrules/r4570.pdf>.

⁵² *An Introduction to Indoor Air Quality*, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (Mar. 22, 2011), <http://www.epa.gov/iaq/voc.html>.

⁵³ See generally SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DIST., *supra* note 42 at 7.

⁵⁴ See *id.*

⁵⁵ See *id.*

⁵⁶ See Jeff Young, *California Air Officials Nix Polluting Dairy Energy*, LIVING ON EARTH (Sept. 11, 2009) <http://www.loe.org/shows/segments.html?programID=09-P13-00037&segmentID=3>.

Similar to “the internal combustion engine in a car,” air pollutants are generated when methane is converted into electricity.⁵⁷ This requires pollution control rules to be placed on digester engines.⁵⁸ The problem is that none of the digester engines can meet the pollution control standards of the San Joaquin Valley.⁵⁹ The combination of “a catalytic converter on a caterpillar engine powered by biogas with emissions this low,” has never been done before.⁶⁰ “Air regulators say they understand why dairy farmers are frustrated.”⁶¹ Dairy farmers would not have a problem with the tough rules if the digester engines were “capable of complying” with these more stringent air pollution rules.⁶² The generator engines are simply not technologically capable of meeting the standards at the current time.⁶³

It is believed that one possibility for the lack of the ability to comply is that slight contamination in the methane gases being burned are hindering the emission control technology.⁶⁴ Any variability in the system means noncompliance with permitting requirements.⁶⁵ Other alternative controls like pipeline injection and fuel cells are acceptable under the regulations, but are more costly than catalytic converters and are infrequently operated in the dairy industry.⁶⁶ However, it does not seem that denial of permitting for dairy manure biogas production projects based solely on air pollutant emissions is a sound decision. Arguably, a better standard would consider an integrated solution bearing in mind both air pollutants and greenhouse gases, in order to effectively implement biogas production projects. Therefore, a solution to the regulatory challenges must be achieved.

III. REGULATORY CHALLENGES: APPLICABLE FEDERAL, STATE AND LOCAL ENVIRONMENTAL POLICIES

When combustion from energy generation in dairy biogas production projects occurs, nitrogen oxide gas (“NOx”) is created, which is a “pre-

⁵⁷ Huffstutter, *supra* note 38.

⁵⁸ Sander, *supra* note 36.

⁵⁹ Holland, *supra* note 48.

⁶⁰ Amy Coombs, *The Methane Question*, GOOD TIMES, Feb. 23, 2010, <http://www.goodtimesantacruz.com/santa-cruz-news/santa-cruz-local-news/729-the-methane-question.html>.

⁶¹ Huffstutter, *supra* note 38.

⁶² Holland, *supra* note 48.

⁶³ *See id.*

⁶⁴ *Id.*

⁶⁵ Coombs, *supra* note 60.

⁶⁶ *Id.*

cursor to ozone pollution.”⁶⁷ In the San Joaquin Valley where the air is some of the worst in the nation,⁶⁸ NOx gas emissions must be reduced to meet federal air standards.⁶⁹ Although dairy manure biogas production projects reduce one form of pollution, they are simultaneously adding to another, which air boards are attempting to thwart.⁷⁰ As a result, when situations arise where air quality standards and greenhouse gas emission reductions collide, the Air Pollution Control Districts give primary preference to reducing pollutant emissions to maintain air quality standards.⁷¹

A. Clean Air Act

In 1963, the federal government enacted the Clean Air Act, which established funding for studies and cleanup efforts of air pollution nationwide.⁷² With the more comprehensive Clean Air Act of 1970, Congress created the United States Environmental Protection Agency (“EPA”) and gave it the responsibility of carrying out clean air programs to reduce air pollution.⁷³ In 1990, Congress again revised the Clean Air Act, giving the EPA broader authority to enforce regulations to reduce air pollutants.⁷⁴

“Under the Clean Air Act,” the EPA sets air pollution standards that are enforceable nationwide.⁷⁵ These stringent standards must be met by the states through development of State Implementation Plans (“SIPs”), which must be approved by the EPA prior to implementation.⁷⁶ State and local governments review and approve permit applications for industries, like the dairy industry, in compliance with the federal EPA standards carried out through SIPs.⁷⁷

“The California Air Resources Board is responsible for monitoring the regulatory activity of California’s thirty-five local air districts,”⁷⁸ which “regulate stationary sources of air pollutants,” such as commercial and

⁶⁷ See Young, *supra* note 56.

⁶⁸ Sander, *supra* note 36.

⁶⁹ See Young, *supra* note 56.

⁷⁰ Lauren Sommer, *Stinky Renewable Energy Source Creates Smog*, 90.9WBUR (Oct. 25, 2010 12:01 AM), <http://www.wbur.org/npr/130754782>.

⁷¹ SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DIST., *supra* note 42.

⁷² U.S. Env’tl. Prot. Agency, *Understanding the Clean Air Act* (2011), <http://www.epa.gov/air/caa/peg/understand.html>.

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ *Id.*

⁷⁶ *Id.*

⁷⁷ See *id.*

⁷⁸ Cal. Air Res. Bd., *Federal and State Statutes*, CALIFORNIA ENVTL. PROT. AGENCY (February 28, 2011), <http://www.arb.ca.gov/html/lawsregs.htm>.

industrial facilities, at the local levels.⁷⁹ Both federal and state law require local air pollution control districts, like the San Joaquin Valley Air Pollution Control District, to regulate emissions in areas where air pollution exceeds national standards.⁸⁰ Local air districts share the goal “to work cooperatively in establishing comprehensive air quality control programs to benefit all California residents.”⁸¹

The Clean Air Act generally preempts states from enacting their own air pollution standards.⁸² However, California is allowed the unique opportunity to apply for and receive a preemption waiver to develop its own air pollution standards due to its uniquely deteriorated air quality.⁸³ California is the only state allowed to adopt more stringent standards under the preemption waiver because California was the only state to regulate air pollutants prior to the creation of the Clean Air Act.⁸⁴ To receive a preemption waiver, the standards developed by California must be more stringent than the federal standards.⁸⁵ The Clean Air Act allows any state with approved SIPs the authority to adopt either the federal standards or standards identical to those enacted by California, if California is granted a waiver.⁸⁶

B. Statutory Law Demands Greenhouse Gas Regulation

The major regulatory concern centers on how the EPA defines farms, including dairies with manure biogas production projects, and how it aggregates their respective emissions.⁸⁷ Under section 101(a)(2) of the Clean Air Act, Congress has found that the growth of “industrial development” has resulted in increasing dangers including injury to agricul-

⁷⁹ CAL. AIR RES. BD., LETS CLEAR THE AIR: A PUBLIC PARTICIPATION GUIDE TO AIR QUALITY DECISION MAKING IN CALIFORNIA 2 (July 2005), available at <http://www.arb.ca.gov/ch/ppgEnglish2005.pdf>.

⁸⁰ San Joaquin Valley Unified Air Pollution Control Dist., *About the Dist.* (2011), http://www.valleyair.org/General_info/aboutdist.htm#The%20Jurisdiction%20Puzzle

⁸¹ *Id.*

⁸² See JAMES E. MCCARTHY, CONG RESEARCH SERV., RL 34099, CALIFORNIA’S WAIVER REQUEST UNDER THE CLEAN AIR ACT TO CONTROL GREENHOUSE GASES FROM MOTOR VEHICLES (2009), available at <http://www.cnre.org/NLE/CRSreports/09Mar/RL34099.pdf>.

⁸³ *California Greenhouse Gas Waiver Request*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/otaq/climate/ca-waiver.htm>.

⁸⁴ McCarthy, *supra* note 82.

⁸⁵ CAL. AIR RES. BD., *supra* note 79.

⁸⁶ See McCarthy, *supra* note 82.

⁸⁷ See MAJOR EXISTING EPA LAWS AND PROGRAMS THAT COULD AFFECT AGRICULTURAL PRODUCERS, ENVIRONMENTAL PROTECTION AGENCY, U.S. ENVTL. PROT. AGENCY (June 2007), <http://www.epa.gov/agriculture/agmatrix.pdf>.

tural crops and livestock and damage and deterioration of property.⁸⁸ In response, Congress calls for a reduction in air pollution.⁸⁹ Therefore, dairies can reasonably be considered to come within the scope of section 101(a)(2) of the Clean Air Act under “industrial development,” which means the air pollutants they emit, including greenhouse gases, would have to be regulated.⁹⁰ The movement toward regulation is inevitable as agriculture is employing industrialized techniques at large highly specialized farms, which are run like factories.⁹¹

Additionally, section 111(a)(3) of the Clean Air Act may also apply specifically to dairy manure biogas production projects as stationary sources.⁹² Section 111(a)(3) defines a stationary source as “any building, structure, facility, or installation, which emit or emits air pollutant.”⁹³ If dairies, as a whole, come within the scope of section 111(a)(3) of the Clean Air Act, then their associated harmful air pollution, including greenhouse gases, would have to be regulated under this section as well.⁹⁴ Surely, regulation of dairy air pollutants is intended.

IV. LOCAL LEVEL GREENHOUSE GAS REGULATION

The overall response to regulating air pollutants for dairies and dairy manure biogas production projects therefore lies with integrating the current local air pollution control board policies and the decision in *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497 (2007) to include regulation of greenhouse gases as well.

A. *Massachusetts v. Environmental Protection Agency* (“EPA”)

A Supreme Court decision provides a solution to the regulatory challenge. In *Massachusetts v. EPA*, a group of petitioners, including the State of Massachusetts, challenged the EPA’s refusal to regulate the emissions of greenhouse gases from any class of new motor vehicle under the Clean Air Act.⁹⁵ The petitioners alleged that motor vehicle

⁸⁸ See 42 U.S.C. § 7401 (2010).

⁸⁹ *Id.*

⁹⁰ See *id.*

⁹¹ See Union of Concerned Scientists, *Hidden Costs of Industrial Agriculture*, CITIZENS AND SCIENTISTS FOR ENVIRONMENTAL SOLUTIONS (August 24, 2008), http://www.ucsusa.org/food_and_agriculture/science_and_impacts/impacts_industrial_agriculture/costs-and-benefits-of.html.

⁹² See 42 U.S.C. §7411 (2010).

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ *Massachusetts v. Env'tl. Prot. Agency*, 549 U.S. 497, 505 (2007).

greenhouse gas emissions contribute to “air pollution reasonably anticipated to endanger public health or welfare,” and therefore fall within the standards of an air pollutant as defined by the Clean Air Act.⁹⁶ Petitioners argued that carbon dioxide, hydrofluorocarbons, nitrous oxide, and methane are heat-trapping greenhouse gases which significantly accelerate climate change causing serious health and environmental effects.⁹⁷ Finally, petitioners claimed that air temperature and subsurface ocean temperatures due to climate change are causing the ocean to rise creating a serious loss of coastal territory.⁹⁸

Respondent EPA contended that petitioners lacked standing to sue; that the Clean Air Act provided the EPA authority to regulate air pollutants, not greenhouse gases; and that the Clean Air Act granted the EPA broad deference in deciding whether or not to issue a regulation, including the consideration of the policy under President George W. Bush’s administration to deemphasize the regulation of air pollutants.⁹⁹ This was the current presidential administration’s policy at the time of the decision.¹⁰⁰

1. *Standing to Sue*

The Court began by analyzing whether the petitioners had standing to sue.¹⁰¹ The Court reasoned that the rise in sea levels consuming Massachusetts coastal territory, as proven by a scientific consensus amongst qualified experts and supported by petitioner’s uncontested affidavits, substantiated petitioner’s claims of “existence of a causal connection between manmade greenhouse gas emissions and global warming.”¹⁰² The EPA argued that they were not required to regulate greenhouse gas emissions because greenhouse gas emissions did not fall within the scope of “air pollutants” for which they were authorized to regulate.¹⁰³ The Court applied the traditional standing analysis whether the litigant, “suffered a concrete and particularized actual or imminent injury that is fairly traceable to the defendant and that a favorable decision will likely redress the injury,” and determined that Massachusetts had met this standard.¹⁰⁴ The Court held that the EPA’s refusal to regulate contributed to

⁹⁶ *Id.* at 506.

⁹⁷ *Id.* at 510.

⁹⁸ *Id.* at 515.

⁹⁹ *Id.* at 517, 526.

¹⁰⁰ *See id.* at 526.

¹⁰¹ *Id.* at 516.

¹⁰² *See id.* at 523.

¹⁰³ *Id.* at 528.

¹⁰⁴ *Id.* at 517.

Massachusetts' injuries.¹⁰⁵ The EPA did not contest the relative relationship between greenhouse gas emissions and climate change.¹⁰⁶ The Court determined that while reducing greenhouse gas emissions may not reverse global warming in its entirety, any reduction is hardly inappropriate.¹⁰⁷

Standing in the case at hand can be easily proven. Impacts of climate change to California's agriculture have been known and studied for years.¹⁰⁸ Several elements directly connect climate change to agricultural productivity: increasing temperature, rainfall pattern and quantity changes, rising atmospheric concentrations, pollution levels, and extreme climatic variability.¹⁰⁹ A changing climate would affect water resources impacting agricultural crop yields,¹¹⁰ traumatizing California's agricultural livestock, including dairy cows, and strain water resources vital to production.¹¹¹ Amplified heat, disease, and severe weather changes due to climate change reduce livestock productivity.¹¹² Temperatures are expected to rise about 1.2 degrees Celsius on average by 2040 dropping crop yields, creating longer growing seasons which will use more water, increasing the development and range of weed growth, and causing outbreaks in insect and crop disease.¹¹³ Temperature increases will lead to scarcity and increased costs of water, creating a strain on the water supply.¹¹⁴ Ultimately, climate change will affect some of the Valley's most

¹⁰⁵ *Id.* at 523.

¹⁰⁶ *Id.*

¹⁰⁷ *Id.* at 525.

¹⁰⁸ *Climate Change Effects in California*, SCIENCE DAILY (Apr. 12, 2009), <http://www.sciencedaily.com/releases/2009/04/090401182835.htm>.

¹⁰⁹ *Agriculture and Food Supply*, U. S. ENVTL. PROT. AGENCY (April 14, 2011), <http://epa.gov/climatechange/effects/agriculture.html>.

¹¹⁰ ELECTRIC POWER RESEARCH INSTITUTE, GLOBAL CLIMATE CHANGE: CALIFORNIA IMPACTS 1 (2003), <http://www.energy.ca.gov/pier/portfolio/Content/Completed97to06/Completed-prior05plusEISG05/Global%20Climate%20Change%20California.htm>.

¹¹¹ See U.S. Global Change Research Program, *Key Findings*, UNITED STATES GLOBAL CHANGE RESEARCH PROGRAM (2011), available at <http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/key-findings>.

¹¹² U.S. Global Change Research Program, *Agriculture Sector*, UNITED STATES GLOBAL CHANGE RESEARCH PROGRAM (2011), <http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/full-report/climate-change-impacts-by-sector/agriculture>.

¹¹³ See Kent Garber, *How Global Warming Will Hurt Crops*, U.S. NEWS, May 28, 2008, <http://www.usnews.com/news/articles/2008/05/28/how-global-warming-will-hurt-crops>.

¹¹⁴ See FRANK ACKERMAN & ELIZABETH A. STANTON, *THE COST OF CLIMATE CHANGE: WHAT WE'LL PAY IF GLOBAL WARMING CONTINUES UNCHECKED* 16 (2008), available at <http://www.nrdc.org/globalwarming/cost/cost.pdf>.

important crops by affecting the yield and productivity.¹¹⁵ Research has determined that air pollution causes the San Joaquin Valley to lose roughly one billion dollars per year.¹¹⁶ This type of actual harm felt by dairy farmers and California's dairy industry is analogous to the actual harm felt in *Massachusetts* where the Court found that greenhouse gas emissions and global warming created a rise in sea levels consuming coastal territory.¹¹⁷ Similar to *Massachusetts*, California's dairy industry here will have standing to sue based on the actual harm felt by the dairy farmers and the California dairy industry.¹¹⁸

2. *Merits of the Case*

The *Massachusetts* Court then moved into the merits of the Clean Air Act issue.¹¹⁹ It ruled that the EPA had authority to regulate greenhouse gases because the term "air pollutant" must be broadly interpreted to correspond with the legislative intent that granted the EPA power to regulate such emissions.¹²⁰ Therefore, the EPA must regulate greenhouse gases as air pollutants.¹²¹ The Court also addressed the EPA's alternative argument for refusal to regulate based on administrative judgment, "that even if it has statutory authority to regulate greenhouse gases, it would be unwise to do so at this time."¹²² Under the statutory text of the Clean Air Act section 7601(a)(1), the EPA action is conditioned on the formation of an administrative judgment focusing on whether an air pollutant "causes or contributes to, air pollution which may reasonably be anticipated to endanger public health or welfare," or by providing an explanation as to why a determination cannot be made.¹²³ The Court found that rather than determining whether sufficient information existed to make an endangerment finding, the EPA rejected rulemaking on impermissible grounds, by simply providing a list of reasons not to regulate greenhouse

¹¹⁵ See News Release, Jerry Martin, San Joaquin Valley Air Quality Study Final Report Released, Cal. Air Res. Bd. (Jan. 17, 2007) (on file with author), available at <http://www.arb.ca.gov/newsrel/nr211797.htm>.

¹¹⁶ *Id.*

¹¹⁷ *Cf.* *Massachusetts v. Env'tl. Prot. Agency*, 549 U.S. 497,542 (2007) (discussing the actual harm felt by the state analogizing with the actual harm felt by plaintiff farmers).

¹¹⁸ *See id.* at 535.

¹¹⁹ *Id.* at 528.

¹²⁰ *See id.* at 530.

¹²¹ *Id.* at 529.

¹²² *Id.* at 532.

¹²³ *Id.* at 532, 533.

gas emissions.¹²⁴ It was the EPA's complete refusal to regulate that was "arbitrary, capricious, or otherwise not in accordance with law."¹²⁵

Dairy farmers and the California Dairy industry have a strong argument that the refusal of local air pollution control districts to issue permits for digesters is an exhibition of their complete refusal to regulate greenhouse gases causing harm reasonably anticipated to endanger public health and welfare. "Any delay in fighting global warming would be detrimental to our economic stability—costing us billions of dollars and dampening the state's most important economic sectors."¹²⁶ There is a strong correlation between greenhouse gas emissions and the interrelated harm to agriculture, one of California's most economically vital industries.¹²⁷ Without a reduction in greenhouse gas emissions, it is estimated that nearly "half the world's population" could encounter a "climate-induced famine by 2100."¹²⁸

It is appropriate, then, to hold the local air pollution control boards liable for the harm caused by greenhouse gas emissions and require them to recognize and regulate greenhouse gas emissions as an air pollutant due to the harm to dairy farmers' property, livestock, and production. This is similar to the circumstances in *Massachusetts* where the EPA was held liable for the rise in sea levels harming Massachusetts's property, and was required to recognize and regulate greenhouse gas emissions as air pollutants.¹²⁹ If local air boards continue to refuse to regulate greenhouse gas emissions as an air pollutant and continue to deny permits to dairy manure biogas production projects, they could be held liable for the associated harm.¹³⁰ Additionally, to apply the principles of *Massachusetts* most simply, it seems digesters should be allowed due to the offset of methane as a greenhouse gas air pollutant in the aggregate.¹³¹ Regardless, to be consistent with the Supreme Court decision in *Massachusetts*, the EPA must regulate greenhouse gases as air pollutants under the Clean Air Act.¹³² Therefore, local agencies must regulate greenhouse gases as air pollutants in accordance with federal law and dairy biogas production projects should be permitted.

¹²⁴ *Id.* at 533.

¹²⁵ *Id.* at 534.

¹²⁶ University of California, San Diego, *supra* note 108.

¹²⁷ See *Agriculture Industry*, CALIFORNIA ENERGY COMM'N (2011), <http://www.energy.ca.gov/research/iaw/industry/agri.html>.

¹²⁸ Bryan Walsh, *Global Warming Portends a Food Crisis*, TIME SCIENCE, Jan. 13, 2009, <http://www.time.com/time/health/article/0,8599,1870766,00.html>.

¹²⁹ See *Massachusetts v. Env'tl. Prot. Agency*, 549 U.S. at 529 (2007).

¹³⁰ See *id.* at 523.

¹³¹ See *id.* at 524.

¹³² See *id.* at 532.

V. GOVERNMENTAL PROJECT SUPPORT

A. Federal Funding

The United States government has a longstanding history of supporting agricultural small businesses, like dairies, and their push for renewable energy and energy efficiency.¹³³ Building on the 2002 Farm Bill, the Food, Conservation, and Energy Act of 2008 created the Rural Energy for America Program (“REAP”), which provides grants and loans to farmers specifically to promote rural energy solutions.¹³⁴ REAP is one source of funding for anaerobic digesters and provides opportunities for support of biogas production projects in the future.¹³⁵

Another source of federal financial support for dairy manure biogas production projects comes from AgSTAR.¹³⁶ This program is a coalition of the U.S. Environmental Protection Agency, the U.S. Department of Agriculture (“USDA”) and the U.S. Department of Energy.¹³⁷ AgSTAR promotes the development of biogas production projects with the primary objective of reducing methane gas emissions from livestock manure.¹³⁸ In continuing with this trend, the USDA High Energy Cost Grant Program provides financial assistance for rural energy “generation, transmission, and distribution facilities” in rural communities with high energy costs.¹³⁹ The Sustainable Agriculture Research and Education program frequently provides grants to biogas projects that promote environmentally sound agricultural systems.¹⁴⁰ Amongst the many other federal financial assistance programs supporting dairy manure biogas projects, the USDA Natural Resources Conservation Service Environmental Quality Incentives Program assists farmers with funds to help comply with environmental regulations on the federal, state, tribal, and local lev-

¹³³ See U.S. ENVTL. PROT. AGENCY, ONLINE AGSTAR DIGEST: SUMMER 2008 (May 26, 2011), available at <http://www.epa.gov/agstar/news-events/digest/2008summer.html>.

¹³⁴ *Id.*

¹³⁵ *Id.*

¹³⁶ U.S. Env'tl. Prot. Agency, *AgSTAR About Us*, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (June 2, 2011), <http://www.epa.gov/agstar/about-us/index.html>.

¹³⁷ *Id.*

¹³⁸ *Id.*

¹³⁹ U.S. Dep't of Agric., *High Energy Cost Grant Program Overview*, RURAL DEVELOPMENT, http://www.rurdev.usda.gov/UEP_Our_Grant_Programs.html (last modified Dec. 27, 2011).

¹⁴⁰ Western SARE, *About SARE Grants*, SUSTAINABLE AGRICULTURE RESEARCH AND EDUCATION, <http://www.westernsare.org/layout/set/print/Grants/About-SARE-Grants> (last visited July 5, 2011).

els.¹⁴¹ Compliance with environmental regulations is a direct concern for dairy manure biogas production projects, and a significant contributor to their high cost.¹⁴²

B. State Funding

The State of California is also a major financial contributor to dairy manure biogas production projects within its borders.¹⁴³ The California Energy Commission Dairy Power Production Program's purpose is to advance the development of anaerobic digestion and biogas electricity generation with the expectation of reducing air pollutants associated with manure storage.¹⁴⁴ The California Public Utilities Commission Self Generation Incentive Program for Renewable Fuels also provides funding to dairy manure biogas production projects that are constructed with the ability to supply public utilities companies with surplus electricity from biogas energy production.¹⁴⁵ For additional funding, farmers with dairy manure biogas production projects may also seek development loans from the California State Assistance Fund for Enterprise Business and Industrial Development Corporation ("SAFE-BIDCO") to help fund their projects.¹⁴⁶ SAFE-BIDCO was developed by the California legislature particularly to assist with funding for small businesses like dairies.¹⁴⁷

The total capital cost for dairy manure biogas recovery projects is estimated between 2.5 and 4.3 million dollars for a 1,000 cow dairy.¹⁴⁸ Due to the high capital cost of building dairy manure biogas production projects, many dairy farmers seek government subsidies and financial assis-

¹⁴¹ Natural Res. Conservation Serv., *NRCS Environmental Quality Incentives Program*, U. S. DEP'T OF AGRIC. (August 4, 2011), <http://www.nrcs.usda.gov/programs/eqip/>.

¹⁴² *See id.*

¹⁴³ *See generally* DANIEL A. SUMNER & JOHN THOMAS ROSEN-MOLINA, *IMPACTS OF AB 32 ON AGRICULTURE 16* (Giannini Found. of Agric. Econ. ed., Vol.14 no.1 2010) (explaining greenhouse gas energy generation accounts for a small portion supported by the California economy).

¹⁴⁴ *See California Dairy Power Production Program*, W. UNITED RES. DEV. INC. (April 2009), http://wurdco.com/index.php?option=com_content&view=article&id=47&Itemid=56.

¹⁴⁵ *See* Database of State Incentives for Renewables and Efficiency, *Self Generation Incentive Program*, UNITED STATES DEPARTMENT OF ENERGY (July 8, 2011), http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=CA23F&re=1&ee=1.

¹⁴⁶ *Loan Programs*, SAFE-BIDCO (2007), <http://www.safe-bidco.com/content.asp?contenttype=Loan Programs&sortby=RelatedURL>.

¹⁴⁷ *See id.* (showing SAFE-BIDCO provides financing for the Small Business Administration and Northern California Native American owned small businesses, in addition to various other groups).

¹⁴⁸ Cal. Air Res. Bd., *supra* note 2.

tance.¹⁴⁹ Governmental support for biogas production projects encourages the development of biogas recovery technology on a larger scale and helps promote dairy biogas as a clean energy resource, which contributes to a reduction in greenhouse gas emissions from methane.¹⁵⁰ Therefore, the availability of the various financial assistance programs offered to dairy manure biogas production projects makes implementation and utilization of the projects economically feasible.¹⁵¹

It is clear through the amount of funding available to help finance dairy manure biogas production projects that the federal and state governments recognize that these projects are beneficial. It is also clear that both the federal and state governments intend to support dairy manure biogas production projects. Therefore, it would not only be a waste of available resources not to allow permitting of the biogas projects, but denial of permitting also denies financial assistance to the dairy industry in general. It is obvious, demonstrated through the many outlets of federal and state funding, that greenhouse gases are a serious concern and are in need of regulation and attention.

VI. RECOMMENDATION OF A COHERENT REGULATORY SCHEME AS A SOLUTION

In 2006, the California Global Warming Solutions Act (“Assembly Bill 32”) developed a legislative goal of reducing greenhouse gas emissions in California to 1990 levels by 2020.¹⁵² According to the predictions of the California Air Resources Board, this would result in a one to three percent reduction in greenhouse gas emissions by 2020.¹⁵³ California Air Resources Board recognizes that global warming due to greenhouse gas emissions is a threat and requires action by the state.¹⁵⁴ The California Air Resources Board predicts that climbing temperatures due to global warming could have an adverse impact on the dairy industry.¹⁵⁵ With that harm in mind, Assembly Bill 32 supports the installation of

¹⁴⁹ See Sander, *supra* note 36.

¹⁵⁰ See generally, MELISSA PAWLISCH ET AL., DESIGNING A CLEAN ENERGY FUTURE: A RESOURCE MANUAL CHAPTER 7 (THE MINN. PROJECT ED., July 2003) available at <http://www.cleanenergyresourceteams.org/files/CERTsManualCh7.pdf>

¹⁵¹ Cal. Air Res. Bd., *supra* note 2.

¹⁵² SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DIST., *supra* note 42, at 7.

¹⁵³ Sumner, *supra* note 143.

¹⁵⁴ Mark Looker & Paul Martin, *Commentary: Dairy Industry Takes on Global Warming Challenge*, CALIFORNIA FARM BUREAU FEDERATION, Feb. 28, 2007, <http://www.cfbf.com/agalert/AgAlertStory.cfm?ID=772&ck=E57C6B956A6521B28495F2886CA0977A>.

¹⁵⁵ *Id.*

methane digesters on dairies.¹⁵⁶ The greenhouse gas reduction goals of Assembly Bill 32 serve as the basis for building a coherent regulatory scheme.

Under Assembly Bill 32, a cap-and-trade program to reduce greenhouse gas emissions causing climate change is proposed.¹⁵⁷

Cap-and-trade is a market based policy tool for protecting human health and the environment. A cap-and-trade program first sets an aggressive cap or maximum limit on emissions. Sources covered by the program then receive authorizations to emit in the form of emissions allowances, with the total amount of allowances limited by the cap. Each source can design its own compliance strategy to meet the overall reduction requirement, including sale or purchase of allowances, installation of pollution controls, implementation of efficiency measures, among other options. Individual control requirements are not specified under a cap-and-trade program, but each emissions source must surrender allowances equal to its actual emissions in order to comply. Sources must also completely and accurately measure and report all emissions in a timely manner to guarantee that the overall cap is achieved.¹⁵⁸

It is projected that a cap-and-trade program would assist California in meeting its goal of reaching 1990 levels by 2020 by reducing emissions a projected eighty percent.¹⁵⁹ Dairy manure biogas production projects will benefit from the proposed cap-and-trade program by trading any methane emissions that fall under their allowance cap for a profit.¹⁶⁰ This technique would promote the continued expansion of dairy manure biogas production projects as a green energy renewable resource, further assist with the financial trials of building and operating these expensive projects, and conform to California's emission reduction target.¹⁶¹

A coherency of integrated regulations with considerations of both air quality standards as well as greenhouse gas emission goals should be implemented to best address the regulatory challenges facing dairy manure biogas production projects. Local air pollution control districts will need to adopt and recognize greenhouse gases as air pollutants pursuant to *Massachusetts*.¹⁶² Local air pollution control districts must then give adequate consideration to the integrated regulations, weighing the output of VOC's with the reduction of greenhouse gas emissions. The respon-

¹⁵⁶ See *id.*

¹⁵⁷ Cal. Air Res. Bd., *Cap and Trade*, CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY (July 28, 2011), <http://www.arb.ca.gov/cc/capandtrade.htm>.

¹⁵⁸ U.S. Env'tl. Prot. Agency, *Info About Cap and Trade*, CALIFORNIA CLIMATE CHANGE PORTAL (Apr. 9, 2009), <http://www.epa.gov/captrade/basic-info.html>.

¹⁵⁹ Cal. Air Res. Bd., *supra* note 157.

¹⁶⁰ See *id.*

¹⁶¹ See *id.*

¹⁶² See *Massachusetts v. Env'tl. Prot. Agency*, 549 U.S. 497, 532 (2007).

sibility of permitting will continue to lie with the local air quality control districts, as they are the agency charged with the regulatory authority under Senate Bill 700.¹⁶³

VII. CONCLUSION

Dairy manure biogas production projects are an environmentally beneficial clean energy solution being pursued by the dairy industry.¹⁶⁴ Dairies who have installed dairy manure biogas production projects feel that they are doing the right thing to reduce greenhouse gases and produce renewable energy but they are being penalized for it by not being able to meet the strict air pollution control standards imposed by the air districts.¹⁶⁵ To resolve this regulatory conflict, local air pollution control district regulations will be required to encompass an application of *Massachusetts v. EPA*, where greenhouse gases are held to fall within the definition of an air pollutant.¹⁶⁶ The appropriate response would be to adopt standards that require recognition of greenhouse gases as air pollutants.¹⁶⁷ Implementation of proposed cap-and-trade legislation under Assembly Bill 32 would help California meet its greenhouse gas emission reduction goals.¹⁶⁸ A coherency of integrated regulations involving both air quality concerns as well as greenhouse gas emission impacts should be developed with the regulatory authority given to the local air pollution control districts to resolve the dispute.¹⁶⁹

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¹⁶³ See Summary: Sen. Bill NO.700, *supra* note 39.

¹⁶⁴ See Liebrand, *supra* note 16.

¹⁶⁵ See Lamb, *supra* note 34.

¹⁶⁶ See *Massachusetts*, 549 U.S.at 532.

¹⁶⁷ See *id.*

¹⁶⁸ See Cal. Air Res. Bd., *supra* note 157.

¹⁶⁹ See Summary: Sen. Bill NO.700, *supra* note 39.