

Date of Hearing: April 24, 2024

ASSEMBLY COMMITTEE ON UTILITIES AND ENERGY

Cottie Petrie-Norris, Chair

AB 2083 (Berman) – As Amended April 1, 2024

SUBJECT: Industrial facilities' heat application equipment and process emissions

SUMMARY: Requires the California Energy Commission (CEC) in consultation with the California Public Utilities Commission (CPUC), the California State Air Resources Board (CARB), the Governor's Office of Business and Economic Development (GO-Biz), and the California Independent System Operator (CAISO), to assess the potential for the state to reduce greenhouse gas (GHG) emissions from the state's industrial facilities' heat application equipment and processes by at least 85% below 1990 levels by January 1, 2045. Requires the CEC to include a report on GHG emissions associated with the supply of energy to industrial facilities by fuel type in the 2027 edition of the integrated energy policy report (IEPR).

Specifically, this bill requires the assessment to include:

- a) An evaluation of the cost per metric ton of carbon dioxide equivalent (CO₂e) and of the potential reduction from each subsector of industrial emissions sources relative to other statewide GHG emissions reduction strategies;
- b) How to maximize criteria pollutant emissions reductions in disadvantaged communities and meet applicable federal Clean Air Act deadlines in nonattainment areas;
- c) Strategies to reduce GHG emissions from industrial heating in both new and existing industrial facilities, assessing which subsectors within the industrial sector have the greatest readiness for transition to zero-emission technologies;
- d) Strategies to reduce GHG emissions from industrial heating processes and applications that also reduce or eliminate criteria air pollutants;
- e) The opportunities and challenges associated with reducing GHG emissions through electrification of industrial heat processes, and the commensurate health benefits;
- f) An evaluation of interim zero-emission technology deployment targets, including industrial heat pumps and thermal energy storage devices, necessary to achieve the GHG emissions and criteria air pollutant reductions required in the industrial sector;
- g) The opportunities and challenges associated with reducing GHG emissions from high-heat processes;
- h) An assessment of how demand response, distributed energy resources, energy efficiency, thermal energy storage, and other complementary resources and strategies may optimize industrial energy use to strengthen grid reliability and reduce GHG emissions;
- i) The potential impacts of emissions reduction strategies on ratepayers, construction costs, and grid reliability;

- j) The workforce necessary to install, maintain, and operate new zero-emission equipment; and,
- k) An analysis of the potential for, and opportunities associated with, facilitating and expanding businesses in California that manufacture zero-emission industrial technologies.

EXISTING LAW:

- 1) Requires CARB to adopt a statewide GHG emissions limit equivalent to 1990 levels by 2020 and adopt regulations to achieve maximum technologically feasible and cost-effective GHG emission reductions. Authorizes CARB to permit the use of market-based compliance mechanisms to comply with GHG reduction regulations once specified conditions are met. Requires CARB to approve a statewide GHG emissions limit equivalent to 85% below the 1990 level by 2045. (Health and Safety Code § 38500-38599.11)
- 2) Requires CARB to ensure that statewide greenhouse gas emissions are reduced to 40% below the 1990 level by 2030. (Health & Safety Code § 38566)
- 3) Requires CARB to prepare, adopt, and update an inventory of GHG emissions from different sectors, including estimates for carbon dioxide, methane, nitrous oxide, and fluorinated gases with high global warming potential. (Public Resources Code § 39607.4)
- 4) Establishes that the policy goal of the state is that eligible renewable energy resources and zero-carbon resources supply 100% of all retail sales of electricity to California end-use customers and 100% of electricity procured to serve all state agencies by December 31, 2045. (Public Utilities Code § 454.53)
- 5) Requires the CEC to adopt the Integrated Energy Policy Report (IEPR) every two years, which must contain an overview of major energy trends and issues facing the state, including, but not limited to, supply, demand, pricing, reliability, efficiency, and impacts on public health and safety, the economy, resources, and the environment. (Public Resources Code § 25302)
- 6) Requires the CEC to establish various clean energy programs such as the industrial grid support and decarbonization program to provide financial incentives for the implementation of projects at industrial facilities to provide significant benefits to the electrical grid, reduce emissions of greenhouse gases, and achieve the state's clean energy goals. (Committee on Budget, AB 209, Chapter 251, Statutes of 2021, Public Resources Code § 25662-25665.1)
- 7) Defines under-resourced communities as disadvantaged communities pursuant to HSC § 39711, low-income communities pursuant to HSC § 39713, or disadvantaged communities pursuant to Public Resources Code § 75005. (Public Resources Code § 71130)
- 8) Recognizes seven GHGs as: Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Sulfur hexafluoride (SF₆), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Nitrogen Trifluoride (NF₃). (Health and Safety Code § 38505)

FISCAL EFFECT: Unknown. This bill is keyed fiscal and will be referred to the Committee on Appropriations for its review.

BACKGROUND:

California's Climate Goals – AB 32 (Nunez, Chapter 488, Statutes of 2006), also known as the California Global Warming Solutions Act of 2006, required CARB to develop a Scoping Plan that describes the state's approach to reduce GHGs to achieve the goal of reducing emissions to 1990 levels by 2020. This Scoping Plan has since been updated a decade later by SB 32 (Pavley, Chapter 249, Statutes of 2016) which requires statewide GHG emissions to be reduced to 40% below the 1990 level by 2030. To track the state's progress towards these goals, CARB developed the GHG Inventory Program which provides estimates and monitors GHGs emissions from different sectors of the state.¹ One way GHG inventory has been categorized by CARB is by economic sector which aligns with how sectors are defined by the public and the North American Industries.²

California's Industrial Sector – According to CARB's 2020 GHG Emissions by Economic Sector, emissions from the industrial sector – which includes, cement, steel, and food manufacturing industries – comprised 23 percent of total GHG emissions in the state, second only to the transportation sector. Approximately, 80 percent of the industrial sector's emissions come from combustion-based processes, and 20 percent of its emissions come from fugitive emissions³ associated with chemical conversions intrinsic in some industrial processes. Combustion of fossil gas and fossil fuels provides energy to meet three broad industry needs: electricity, steam, and process heat. Industrial process heat is defined as heat energy (thermal energy) used for preparation or treatment of materials that produce manufactured goods. Process heat is reportedly the most significant source of GHG emissions in the industrial sector, accounting for about 30% of GHGs.⁴ In addition to GHG emissions, industrial sources also emit air pollution, including criteria air pollutants and toxic air contaminants.

The Integrated Energy Policy Report (IEPR) – The CEC adopts an IEPR every two years and provides an update every other year in between. To inform the IEPR, the CEC conducts forecasts and assessments of all aspects of energy industry supply, production, transportation, delivery, distribution, demand, and pricing.⁵ The CEC is then required to use these assessments to develop energy plans and policies.⁶ A lead commissioner generally provides policy direction related to collecting and analyzing data needed to complete the IEPR. The 2024 IEPR Update will provide updates on 15-year electricity demand forecast with the latest demographic and economic data. Furthermore, it will include statutory requirements under SB 605 (Padilla, Chapter 405, Statutes

¹ CARB; “Current California GHG Emission Inventory Data”; <https://ww2.arb.ca.gov/our-work/programs/greenhouse-gas-inventory>

² Pg.29, CARB; “California Greenhouse Gas Emissions for 2000 to 2020 Trends of Emissions and Other Indicators”; October 2022

³ Fugitive emissions refer to the unintentional release of gases or vapors into the atmosphere from industrial processes, equipment, or infrastructure. These emissions can occur during the extraction, production, processing, storage, transportation, and distribution of various substances, including fossil fuels like oil and natural gas. Fugitive emissions contribute to air pollution and can include greenhouse gases such as methane and volatile organic compounds.

⁴ Office of Energy Efficiency & Renewable Energy, DOE, “Process Heat Basics.” <https://www.energy.gov/eere/iedo/process-heat-basics>

⁵ CEC, “2023 Integrated Energy Policy Report”; <https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2023-integrated-energy-policy-report>

⁶ Ibid

of 2023) to evaluate wave and tidal energy.⁷ The CEC is currently holding workshops and soliciting comments to help inform the 2024 IEPR update.

California Building Decarbonization Assessment – AB 3232 (Friedman, Chapter 373, Statutes of 2018) directed the CEC to develop an assessment, in consultation with the CPUC and other state agencies, of the feasibility of reducing GHG emissions of California’s buildings 40 % below 1990 levels by 2030. The legislation only required a cost-effectiveness assessment addressing emissions from space and water heating, but not other applications, such as cooking. The assessment illustrated avenues for the state to take to decarbonize residential and commercial buildings; identified challenges and opportunities from decarbonizing; estimated the impact of decarbonization activities on the electrical grid; and illustrated topics and data gaps needing additional analysis in future assessments on building decarbonization. In particular, the CEC identified efficient electrification of space and water heating in California’s buildings combined with refrigerant leakage reduction as the most readily achievable pathway to California’s GHG emissions reduction goals but noted that challenges including consumer awareness and financing availability pose barriers to the adoption of any decarbonization strategy.

CEC Initiatives – In recent years, the CEC has worked on developing and administering statewide programs that support decarbonization efforts in the industrial sector, including:

- The Industrial Decarbonization and Improvement of Grid Operations (INDIGO)⁸ Program was created in 2022 under the CEC to provide incentives for projects that enhance electrical grid reliability, electrify processes that use fossil fuels, incorporate renewable resources, increase energy efficiency, or develop and deploy novel decarbonization technologies. The program currently has at least \$60 million in unspent funding and seeks to also leverage federal funding. While the Governor’s January budget proposed to reduce the program by \$22 million, the legislative analyst office reported the program plans to leverage \$90 million in Department of Energy funds, which would offset the program reduction.
- The Food Production Investment Program (FPIP)⁹ was created in 2018 and has provided up to \$117.8 million in grants to help food producers reduce GHG emissions through the adoption of advanced energy technologies. FPIP’s goals include helping food producers achieve a low-carbon future, demonstrating the reliability and effectiveness of advanced energy decarbonization technologies while enhancing the electric grid, especially during peak periods.

California’s Plan for Cement Decarbonization – The cement industry has one of the highest carbon dioxide (CO₂) emitting processes in the world and is often referred to as one of the most “hard to decarbonize” industrial sectors. Due to the high heat required during manufacturing, full electrification is often difficult. California is the second-largest cement producing state in the United States after Texas,¹⁰ with many of the plants in California concentrated in low-income communities. Similarly, California’s cement factories are the largest consumers of coal in the

⁷ CEC, “Notice of Request for Comments on the Draft Scoping Order for the 2024 Integrated Energy Policy Report Update.” March 22, 2024

⁸ Committee on Budget, AB 209, Chapter 251, Statutes of 2021

⁹ Committee on Budget, AB 109, Statutes of 2017

¹⁰ Pg. 2; Global Efficiency Intelligence, “CALIFORNIA’S CEMENT INDUSTRY”; February 2019

state.¹¹ Given these challenges, the state has been looking at abatement opportunities for the cement industry. Specifically, SB 596 (Becker, Chapter 246, Statutes of 2021) directed CARB to develop a comprehensive strategy that requires California’s cement sector achieve a GHG intensity 40% below baseline levels by 2035 and net-zero GHG emissions by 2045. Since October 2022, CARB has held three workshops and is yet to release the strategy.

Department of Energy (DOE) Industrial Decarbonization Roadmap. In September 2022, the DOE identified a roadmap of pathways towards decarbonization that focuses on the five major sources of industrial emissions nationally: 1) chemical manufacturing 2) petroleum refining 3) iron and steel manufacturing 4) food and beverage production and 5) cement production. The roadmap identifies four technological pillars that support the reduction of emissions for these five subsectors:

- 1) Energy efficiency: This includes Strategic energy management approaches and optimization of thermal heat from manufacturing process heating sources.
- 2) Industrial electrification: This includes electrification of high-temperature range processes such as those found in iron, steel, and cement making.
- 3) Substitute low-carbon fuels, feedstocks, and energy sources: Substituting reduces combustion associated emissions for industrial processes. Decarbonization efforts include use of biofuels and bio feedstocks.
- 4) Use of carbon Capture, Utilization, and Storage. This strategy refers to capturing generated CO₂ from a point source and utilizing the captured CO₂ to make value added products or storing it long-term to avoid release to the environment.

Federal Investments. The Inflation Reduction Act and the Infrastructure Investment and Jobs Act has set aside over \$10 billion in manufacturing tax credits for industrial facilities that, among other eligible actions, use equipment or refurbish their systems with low-or zero-carbon process heat systems that reduce GHG emissions by at least 20%.¹² Additionally, DOE is providing about \$6 billion through the Advanced Industrial Facilities Deployment Program to assist states with industrial projects that implement advanced technology for reducing emissions.¹³

COMMENTS:

- 1) *Author’s Statement.* According to the author, “Industrial emissions make up 23 percent of greenhouse gas emissions in California, which is the second largest source behind transportation. Unfortunately, emissions reported from industrial sources have remained flat or even risen in recent years. Moreover, these sources emit large quantities of criteria air pollutants that create heavy air pollution burdening primarily under-resourced communities. AB 2083 is a key first step for California to push the transition of our industrial sectors to zero-emission. This bill achieves this by tasking the California Energy Commission to assess the potential for the state’s industrial facilities to reduce

¹¹ Ibid

¹² Section 13501 of the IRA, Department of the Treasury and Department of Energy. “Advanced Energy Project Credit”.

¹³ DOE, “Clean Energy Infrastructure Programs at Department of Energy.”

<https://www.energy.gov/infrastructure/clean-energy-infrastructure-programs-department-energy>

greenhouse gas emissions in order to contribute towards California’s existing climate target of reducing greenhouse gas emissions by at least 85 percent below 1990 levels by 2045.”

- 2) *Purpose of the Bill.* The author contends that GHG emissions from industrial sources have remained flat or even risen in recent years. Furthermore, industrial sources also emit criteria air pollutants and toxic air contaminants that place additional air pollution burdens to low-income communities. As such, developing a strategy for the reduction of GHG emissions in the state’s industrial facilities’ heat application equipment and processes by at least 85% below 1990 levels by 2045 provides an opportunity to proactively plan for air quality improvements in communities that may need it the most. While the overall concept of the bill may be valid, this bill does not seem to adequately account for existing efforts at the CARB and CEC – and the DOE – to reduce GHG emissions for California’s industrial sector. In that regard, this legislation could benefit from further in-depth discussion with relevant agency staff and stakeholders from the industrial sector on what could be supplemental to the current work being undertaken by these agencies.
- 3) *Opposition.* The California Manufacturers & Technology Association (CMTA) and other organizations maintain that according to the CARB, the industrial GHG emissions have declined from 2000 to 2021.¹⁴ CARB also notes that the assumption of increase or decrease of industrial GHG emissions depends on the industrial subsector.¹⁵ The opposition also argues that industrial decarbonization is complex due to the diversity of the industrial sector and the unique processes used. For this reason, among others, the statewide assessment as provided by this bill will likely not capture those differences.
- 4) *California Workforce Development Board.* This bill requires the CEC in consultation with the CPUC, the CARB, the GO-Biz, and the CAISO to evaluate the workforce necessary to install, maintain, and operate new zero-emission equipment. The California Workforce Development Board helps to shape workforce development policy for the state. *As such, the committee recommends including the California Workforce Development Board as part of the inter-agency evaluation.*
- 5) *Double Referral.* This bill was previously heard in the Assembly Committee on Natural Resources on April 8th, 2024, where it passed 9-0-2.
- 6) *Related Legislation*

SB 941 (Skinner, 2024) requires the CARB, in its next update to the scoping plan, to include certain information and recommendations relating to industrial sources of emissions of GHGs. This bill is *pending hearing* at Senate Committee on Environmental Quality.

SB 1073 (Skinner, 2024) speeds up California’s transition to green cement and concrete by allowing state agencies to enter into contracts to buy low-carbon cement or concrete

¹⁴ CARB; “2000-2021 GHG Emissions Trends Report Data”; https://ww2.arb.ca.gov/sites/default/files/2023-12/2000-2021_ghg_inventory_trends_figures.xlsx

¹⁵ Pg. 11; CARB; “Overview of Emissions Trends by Sector.” December 14, 2023

products up to 10 years in advance. This bill is *pending hearing* at Senate Committee on Environmental Quality.

AB 2109 (Carrillo, 2024) defines industrial process heat recovery to mean a process that reuses waste heat and exempts energy efficiencies achieved at an industrial facility using this form of heat recovery from nonbypassable or departing load charges. Specifically, exempts any reduction in industrial customer electricity consumption from nonbypassable or departing load charges imposed by an electrical corporation if that reduction is achieved due to an industrial process heat recovery technology, as defined. Status: This bill *has been referred to* Assembly Committee on Appropriations.

7) *Prior Legislation*

AB 841 (Berman, 2023) would have required CEC to create a roadmap for electrifying industrial processes, including processes requiring heat. Status: This bill was held in the Senate Appropriations Committee.

SB 596 (Becker) Required the CARB to establish interim targets for reductions in the greenhouse gas intensity of cement used within the state relative to the average greenhouse gas intensity of cement used within the state during the 2019 calendar year, with the goal of reducing the greenhouse gas intensity of cement used within the state to 40% below the 2019 average levels by December 31, 2035. Status: Chapter 246, Statutes of 2021.

SB 68 (Becker) directed the CEC to gather and develop guidance and best practices to overcome barriers to the electrification of buildings and installation of electric vehicle charging equipment. This project implements the requirements of that bill to help commercial and residential building owners, the construction industry, and local governments. Status: Chapter 720, Statutes of 2021.

AB 3232 (Friedman) requires the CEC, by January 1, 2021, to assess the potential for the state to reduce GHG emissions from the state's residential and commercial building stock by 40% below 1990 levels by January 1, 2030. Status: Chapter 373, Statutes of 2018.

SB 1477 (Stern) requires the CEC to develop a statewide market transformation initiative to transform the state's market for low-emission space and water heating equipment for new and existing residential and nonresidential buildings, and to develop an incentive program to fund near-zero emission technology for new residential and commercial buildings. Status: Chapter 378, Statutes of 2018.

SB 32 (Pavley) requires the CARB to ensure that statewide GHG emissions are reduced to 40% below the 1990 levels by 2030. Status: Chapter 249, Statutes of 2016.

REGISTERED SUPPORT / OPPOSITION:

Support

350 Bay Area Action
Asian Pacific Environmental Network
Breathe California Sacramento Region

California Environmental Voters
Center for Biological Diversity
Center for Community Action & Environmental Justice
Central California Asthma Collaborative
Central Coast Alliance United for A Sustainable Economy
Clean Coaliton
Cleaneearth4kids.org
Climate Action California
Climate Center; the
Climate Reality Project - Silicon Valley Chapter
Climate Reality Project, California Coalition
Climate Reality Project, Los Angeles Chapter
Climate Reality Project, Orange County
Coalition for Clean Air
Community Environmental Council
Earthjustice
Elders Climate Action (ECA) Northern California (NORCAL) and Southerncalifornia (SOCAL)
Chapters
Elders Climate Action Norcal Chapter
Elders Climate Action Northern California Chapter
Elders Climate Action Southern California Chapter
Environment California
Industrious Labs
Natural Resources Defense Council
Natural Resources Defense Council (NRDC)
Nextgen California
Physicians for Social Responsibility - San Francisco Bay Area Chapter
Rondo Energy
Santa Cruz Climate Action Network
Sierra Club California
Social 350 Climate Action
Stand.earth
Sunflower Alliance
The Climate Center
Vote Solar
Watts Clean Air and Energy Committee

Opposition

Aerospace and Defense Alliance of California
Agricultural Council of California
Agricultural Energy Consumer Association
Agricultural Energy Consumers Association
Almond Alliance
American Chemistry Council
California Cotton Ginners & Growers Association
California Grain & Feed Association
California Grain and Feed Association
California Large Energy Consumers Association

California League of Food Producers
California Manufacturers and Technology Association
California Metals Coalition
California Poultry Federation
California Tomato Growers Association
California Warehouse Association
Chemical Industry Council of California
Dairy Institute of California
Industrial Environmental Association
Pacific Coast Renderers Association
Pacific Egg & Poultry Association
Plastics Industry Association
Western Agricultural Processors Association
Western Growers Association
Western States Petroleum Association

Analysis Prepared by: Lina V. Malova / U. & E. / (916) 319-2083