Date of Hearing: June 23, 2021

ASSEMBLY COMMITTEE ON NATURAL RESOURCES
Luz Rivas, Chair
SB 596 (Becker) – As Amended June 16, 2021

SENATE VOTE: 31-9

SUBJECT: Greenhouse gases: cement and concrete production

SUMMARY: Requires the Air Resources Board (ARB) to develop a comprehensive strategy for the state's cement sector to achieve net-zero greenhouse gas (GHG) emissions associated with cement used within the state as soon as possible, but not later than December 31, 2045.

EXISTING LAW, pursuant to the California Global Warming Solutions Act of 2006:

1) Requires ARB to approve a statewide GHG emissions limit equivalent to the statewide GHG emissions level in 1990 to be achieved by 2020 and to ensure that statewide GHG emissions are reduced to at least 40% below the 1990 level by 2030.

2) Requires ARB to prepare and approve a Scoping Plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions and to update the Scoping Plan at least every five years.

3) Requires ARB when adopting regulations, to the extent feasible and in furtherance of achieving the statewide GHG emissions goal, to do the following:

    a) Ensure that activities undertaken to comply with the regulations do not disproportionately impact low-income communities.

    b) Ensure that activities pursuant to the regulations do not interfere with efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions.

    c) Consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.

    d) Consider cost-effectiveness of these regulations.

THIS BILL:

1) By December 21, 2022, requires ARB to develop a comprehensive strategy for the state's cement sector to achieve net-zero GHG emissions associated with cement used within the state as soon as possible, but not later than December 31, 2045. Requires the strategy to be part of, or in coordination with, the Scoping Plan.

2) Requires ARB to establish interim targets for reductions in the GHG intensity of cement used within the state relative to the average GHG intensity of cement used within the state during

2019. Establishes a goal to reduce the GHG intensity of cement used within the state to 40% below the 2019 average levels by December 31, 2035, as specified.

3) By July 1, 2028, requires ARB to evaluate the feasibility of achieving the interim targets and may propose to adjust the interim targets, as specified. If the ARB proposes to adjust the interim targets downward, requires it to submit a report to the Legislature recommending measures and actions necessary to achieve net-zero GHG emissions.

4) In developing the comprehensive strategy, requires ARB to:

   a) Define a metric for GHG intensity and evaluate the data submitted by cement manufacturing plants for the 2019 calendar year and other relevant data about GHG emissions for cement that was imported in to the state to establish a baseline.

   b) Assess the effectiveness of existing measures, identify any modifications to existing measures, and evaluate new measures to overcome the market, statutory, and regulatory barriers to achieving the goals of the bill.

   c) Prioritize actions that reduce adverse air quality impacts and support economic and workforce development in communities neighboring cement plants.

   d) Include provisions to minimize and mitigate potential leakage and account for embedded GHG emissions in imported cement in a similar manner to GHG emissions for cement produced in the state.

   e) Coordinate and consult with other state agencies, districts, and experts in academia, industry, and public health, and with local communities.

   f) Prioritize actions that leverage state and federal incentives, where applicable, to reduce costs of implementing GHG emissions reduction technologies and processes and to increase economic value for the state.

   g) Evaluate measures to support market demand and financial incentives to encourage the production and use of cement with low GHG intensity, including, but not limited to, consideration of the following:

      i) Measures to expedite the adoption for use in projects by state agencies;

      ii) Measures to provide financial support and incentives for research, development, and demonstration of technologies to mitigate GHG emissions from the production of cement with the objective of accelerating industry deployment of those technologies;

      iii) Measures to facilitate fuel switching; and,

      iv) Measures to create incentives and remove obstacles for energy efficiency improvements and waste heat recovery at cement manufacturing facilities.

5) States related legislative findings and declares the intent of the Legislature that attaining net-zero or net-negative GHG emissions from the cement and concrete sector in a manner that enhances California's competitiveness, supports high-paying jobs, improves public health,

and aligns with local community priorities becomes a pillar of the state's strategy for achieving carbon neutrality.

FISCAL EFFECT: Unknown

COMMENTS:

1) **Author's statement**:

> SB 596 is about reducing [GHG] emissions from the cement and concrete sector in California. Concrete and its main ingredient, cement, are vital to our economy for building roads, bridges, buildings, and even the infrastructure used to make renewable energy. In fact, concrete is the most widely used building material in the world. Unfortunately, cement is also a major source of GHGs, accounting for about 7% of global CO_2 emissions, and it is the second largest industrial source of GHG emissions in the state, behind only oil refineries. Since we are unlikely to stop using concrete and cement, it is very important that we figure out how to transition to making it with far less impact on our climate.
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> The good news is that technologies and processes exist for achieving large reductions in emissions from concrete and cement. These technologies have not been deployed at scale, though, because we don't have the right policies in place to encourage emissions reductions and create demand for low carbon building products. The cement industry is a willing partner in achieving these goals, as long as the state can create a supportive policy environment and address barriers that exist today. The California Nevada Cement Association published a paper in March of this year affirming the industry's commitment to achieving carbon neutrality by 2045 and identifying pathways for achieving it, but also pointing out areas where legislative and regulatory changes are needed to unlock those pathways.
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> This bill aims to create the right supportive policy environment to achieve that goal of carbon neutrality by 2045, with interim targets to spur near term action and a goal of a 40% reduction from 2019 levels by 2035. It directs the Air Resources Board to develop a strategy for achieving these targets and to adopt the necessary regulatory measures to drive demand for low-carbon materials and to create incentives for reducing emissions while protecting producers who do so from unfair competition from out-of-state producers who are not subject to the same rules. This is an opportunity to put one of our "hard-to-decarbonize" industries on a path toward a carbon neutral future.

2) **Concrete and Cement**. Concrete is a mixture of cement (a binder usually made from lime or calcium silicate), aggregates (sand, rock, etc.), water, and air. Cement is made by grinding clinker, an intermediary nodular material produced from heating limestone and clay in a rotary kiln to around 2700 °F. Most of the energy used in cement manufacturing is in clinker production. The remaining emissions come from quarrying, transporting, and preparing the other raw materials. In a typical mix, cement represents 10-15% of the material by volume but 80-90% of the life cycle CO_2 emissions for the concrete.

California is the second largest cement producing state, accounting for 10-15% of the cement production and industry employment in the US in 2009. As of 2019, there were eight cement plants in California and more than 300 concrete manufacturing plants. Most of the cement used in California is produced in state. Cement and clinker production is expected to increase significantly in California as the population and economy grow.

3) **Cement GHG Emissions**. Cement accounts for 1.8% of the California's GHG emissions and 7% of CO_2 emissions worldwide. It is often referred to as one of the most "hard to abate" industrial sectors. Cement plants are the largest consumer of coal in the state. In 2015, 51% of fuel combustion and energy for California's cement industry came from coal while 12% came from electricity. Due to the high heat required, full electrification is difficult. GHG emissions decreased 20% between 2000 and 2015, mainly due to a decrease in production; however, they have slowly been rising again. According to an Energy Innovation Report, California won't meet 2030 GHG emission reduction goals unless heavy industry like cement producers reduce their emissions. The report notes that this would require plant retrofits, major changes to infrastructure, and would likely lean heavily on technologies that haven't yet been deployed at scale in California, like carbon capture and storage. According to a 2019 report, *California's Cement Industry: Failing the Climate Challenge,* published by Global Efficiency intelligence, an environmental consulting firm, California cement industry had the second highest CO_2 emissions intensity among the countries studied, and 57% higher than that of the cement industry in China, due in part to a higher clinker-to-cement ratio.

4) **Decarbonizing Cement**. Approximately 40% of the GHG emissions from making cement are from energy use (for heating and driving the processing) and 60% from the chemical reaction that occurs when limestone is heated at high temperatures to make cement, known as "process emissions."

   The California Nevada Cement Association has stated its commitment to achieving carbon neutrality by 2045. According to a report published by the Association, *Achieving Carbon Neutrality in the California Cement Industry: Key Barriers & Policy Solutions*, the industry's most significant challenge to reaching this goal is reducing process emissions. The report identifies four "levers" to reduce these emissions: a) Increasing the use of portland limestone cement; b) Carbon capture utilization and storage; c) Achieve a 70% clinker ration through the addition of alternative raw materials; and, d) Increase the use of alternative cements and clinkers. All of these changes pose regulatory and technological challenges, from acceptance of portland limestone cement by the California Department of Transportation and infrastructure constraints to developing new technologies to for alternative cements and clinkers. In addition to these four levers, the report also identifies the need to reduce combustion emissions by expanding the use of cleaner fuels like natural gas and waste- and biomass-derived fuels, and increasing distributed electricity generation.

5) **Community Impacts**. Cement kilns release numerous harmful pollutants, including nitrogen oxides, sulfur dioxide, and particulate matter. Research shows that local air pollution from cement kilns is both damaging to the environment and causes numerous adverse health effects, including heart and lung disease. Communities near cement kilns, especially low-income communities, which often include communities of color and children, bear the brunt

of these health issues. California is home to eight cement plants, many of which are concentrated in the Inland Empire and Eastern Kern County, which have poor air quality.

In 2019, the Lehigh Cement Company reached a settlement for alleged violations of the federal Clean Air Act. As part of the settlement, Lehigh has to invest $12 million in pollution control technology at 11 of their cement manufacturing plants, 3 of which are in California.

6) **Suggested amendment**. This bill requires ARB to evaluate the feasibility of interim targets, but requires ARB to "propose to adjust" the targets upward or downward and to report specified information to the Legislature if they propose to adjust a target downward. *The committee may wish to amend the bill* to allow ARB to adjust the interim targets based on the evaluation and to report the specified information to the Legislature if the adjustment is downward.

7) **Related/prior legislation**.

AB 1365 (Bonta) would require the Department of General Services to establish a maximum acceptable global warming potential for concrete, as specified, and require an awarding authority to require an environmental product declaration prior to the installation of any concrete products. This bill has been referred to this committee.

AB 966 (Bonta, 2019) would have required the state's cement plants to submit a facility-specific Environmental Product Declaration to ARB to disclose the environmental impacts of the plant. AB 966 was held in the Assembly Appropriations Committee.

AB 1452 (Skinner, 2009) would have required ARB to develop and adopt limitations on GHG emissions that result from the production of all cement sold in the state. AB 1452 was held in the Assembly Appropriations Committee.

REGISTERED SUPPORT / OPPOSITION:

Support

350 Bay Area Action
350 Humboldt: Grass Roots Climate Action
Acterra
Alameda County Democratic Party
Benisol, LLC
Blue Planet
California Democratic Party Environmental Caucus
California League of Conservation Voters
California Nevada Cement Association
Climate Youth Ambassador Program
Coalition for Clean Air
Coalition for Sustainable Cement Manufacturing and Environment
Environmental Entrepreneurs
Greentown Los Altos
Harker Green Team
Menlo Spark

Mothers Out Front Silicon Valley
Natural Resources Defense Council
Project Green Home
San Diego County Democrats for Environmental Action
Sierra Club California
Silicon Valley Democratic Club
Silicon Valley Youth Climate Action
Sunnyvale Cool
Sunnyvale Democratic Club
Sustainable Rossmoor
The American Institute of Steel Construction & the National Steel Bridge Alliance
The Climate Center
Union of Concerned Scientists
Unitarian Universalist Church of Palo Alto, Green Sanctuary Committee

Opposition

None on file

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