

COALITION FOR SUSTAINABLE CEMENT MANUFACTURING & ENVIRONMENT
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Ms. Mary Nichols
Chair, California Air Resources Board
1001 "I" Street
Post Office Box 2815
Sacramento, California 95812

Subject: CSCME Comments on Minimizing Emissions Leakage

Dear Ms. Nichols,

The Coalition of Sustainable Cement Manufacturing and Environment ("CSCME"), a coalition of six cement manufacturers operating the 11 cement plants in California,¹ would like to take the opportunity to comment on the issue of emissions leakage, which was the focus of a recent California Air Resources Board ("CARB") workshop.

Simply put, emissions leakage represents a fundamental threat to both the viability of the California cement industry and the environmental effectiveness of the state's climate change policy. This notion was accurately and concisely expressed in the Draft Scoping Plan,

With California's continuing growth comes an increase in demand for cement. Reducing GHG emissions from this sector needs to be done in a manner that minimizes the potential for both emissions and economic leakage and maintains a strong, competitive cement industry in California.

The important interrelationship between achieving GHG emissions reductions and preserving (and growing) the California cement industry is underpinned by several factors:

- A ton of cement produced in California generally has a lower GHG footprint than a ton of cement produced outside California, especially when transportation-related emissions are considered.
- When evaluated on a lifecycle basis, the industry's durable eco-efficient concrete end products generate significant GHG savings over alternative construction materials.
- The cement industry is uniquely positioned to utilize alternative fuels, waste otherwise destined for landfills, and cementitious waste streams to produce a less carbon-intensive product and simultaneously provide the co-benefits of reducing many problematic wastes.

Consequently, CARB is faced with a unique and beneficial set of circumstances for regulatory development – policies that contribute to a strong, competitive California cement industry are also policies that contribute to meeting the state's climate change objectives.

¹ The Coalition includes CalPortland Company, Cemex, Inc., Lehigh Southwest Cement Company, Mitsubishi Cement Corporation, National Cement Company of California Inc., and Texas Industries, Inc.

To take advantage of this unique and beneficial set of circumstances, however, it is imperative that CARB design regulations that effectively minimize the risk of emissions leakage. The foundation of any approach to minimize leakage is a system of equal rights and obligations for all competing products consumed in the California market. Without a level playing field, costs imposed solely on a subset of competing firms will lead to a shift in market share and investment to firms located in jurisdictions with few or no environmental regulations.

CSCME commends CARB's current efforts to develop methodologies that systematically and rigorously identify and quantify the risk of leakage. We believe that CARB's effort to review what others have proposed is a sensible first step, and that basic indicators, such as trade exposure and emissions intensity, offer a useful framework for conducting an initial assessment. We also believe, however, that every industry consists of a unique set of characteristics that dictate the nature of, and potential for, emissions leakage. Some of these characteristics can be accurately captured by simple frameworks and existing data, but others cannot. Consequently, CARB's efforts to minimize leakage must eventually move beyond basic indicators and focus on the unique circumstances of individual California industries and the challenges they face in adapting to a carbon-constrained world.

With this goal in mind, CSCME would like to offer the following comments on the challenges of defining, identifying, and quantifying the risk of emissions leakage, as well as potential policies for minimizing that risk within the California cement industry. CSCME looks forward to working closely with state officials on this issue in the coming months.

I. CARB Should Continue to Utilize the Definition of Leakage Provided by AB 32

As noted in CARB's presentation, AB 32 defines leakage as:

A reduction in emissions of greenhouse gases within the state that is offset by an increase in emissions of greenhouse gases outside the state.

In slide six of the presentation, however, leakage is described as:

When production is transferred to jurisdictions without a GHG emissions cap, leading to no (or a smaller) net decrease in global GHG emissions.

It is unclear if CARB provided this definition as a possible alternative to the AB 32 language, or simply for the purposes of exposition. Regardless, it is important to note that there are several important inaccuracies associated with CARB's description of leakage.

First, CARB's description specifies that leakage occurs when production is transferred to jurisdictions without a GHG emissions cap. Although this addition is presumably intended to distinguish between shifts in production that occur as a result of the policy and those that occur for unrelated reasons, CSCME believes that this characterization is, at best, imprecise. For example, emissions leakage could occur when production relocates to jurisdictions with less stringent GHG caps and therefore lower compliance costs, all else being equal. Alternatively, emission leakage could occur when production relocates to jurisdictions with equally stringent GHG caps but with lower overall compliance costs because of programmatic choices or policy design features, such as fewer limitations on the use of offsets. Simply put, the potential for

emissions leakage is ultimately determined by the overall compliance cost differential between jurisdictions, not simply the presence or absence of a GHG emissions cap.

Second, CARB's description specifies that leakage results in no (or a smaller) net decrease in global emissions. It is important to note, however, that leakage can potentially result in a net increase in global emissions. For instance, evidence suggests that, all else being equal, cement imports from China result in 25% more emissions than cement produced and consumed in California. Thus, severe emissions leakage that results in a significant loss of market share to imports of cement from China, for example, may in fact result in a net increase in global GHG emissions.

Given these concerns, CSCME strongly recommends that CARB develop regulations that are consistent with the carefully crafted definition of leakage in AB 32, which we believe is a sufficiently general, complete, and accurate description of this critical policy consideration.

II. CARB Should Use A Broad Set of Factors When Evaluating the Potential for Emissions Leakage

As noted by CARB, leakage arises when industries that compete in global markets are not able to pass through the costs of the GHG emissions reduction program to consumers. The ability to pass through costs is the result of a variety of factors. CSCME believes that CARB should consider at least seven factors when identifying industries at risk of leakage:

2.1 The Nature of the Product

Homogeneous products, such as cement, compete almost exclusively on the basis of price. In markets for homogeneous products, imposing a regulatory cost (e.g., the cost of carbon emissions) on some products (e.g., domestically produced cement) but not on others (e.g., imported cement) distorts competitive conditions in the market. This regulatory asymmetry will shift market share away from the more regulated product in the short term and shift investment away from the more regulated product in the long term – resulting in both economic and emissions leakage. Thus, the degree of product homogeneity should be a primary factor for consideration.

2.2 The Capital Intensity of the Industry

A capital-intensive industry requires large upfront investments in long-lived capital equipment and requires the operation of this equipment at high levels of capacity utilization to achieve commercially sustainable returns. To finance the purchase of an expensive and long-lived productive asset, an investor must be confident that he or she will receive a fair return over the life of the asset (*i.e.*, several decades). In the absence of stable policies and predictable compliance costs, investment in long-lived capital equipment will suffer – resulting in both economic and emissions leakage. Therefore, the nature of the regulatory instrument and the extent of long-term compliance cost uncertainty can have a profound influence on the extent of leakage in capital-intensive industries.

2.3 The Geographic Scope of the Market & The Extent of International Competition

California's location on the Pacific Ocean makes it easily accessible to imports of all products and widens the geographic scope of markets, including the markets for products that are typically expensive to transport by land, such as cement. As recognized by CARB, the ability of imports to economically access the California market will limit an industry's capacity to pass through compliance costs to consumers – resulting in a loss of market share in the short run and a relocation of productive capital in the long run (*i.e.*, emission leakage). As demonstrated by a history of high import penetration, the California cement industry is a textbook example of an industry subject to intense international competition and, therefore, unable to pass through the costs associated with a California climate change policy.

2.4 Opportunities for Cost-Effective GHG Reductions: Process Emissions

As noted by CARB in its concept paper, a key consideration for identifying leakage-prone industries is the potential cost increase due to the GHG reduction policy, which is (partially) a function of an industry's capacity to achieve cost-effective GHG reductions. Common to all cement production is the chemical reaction that occurs when the calcium carbonate (CaCO_3) in limestone is heated and breaks down into lime (CaO) and carbon dioxide (CO_2) – a process that accounts for 57% of emissions in the California cement industry.² Thus, the majority of CO_2 emissions in the cement industry are a direct and unalterable consequence of the chemical reaction that is fundamental to the manufacturing process. These immutable "process emissions" distinguish the cement industry from other carbon-intensive sectors, such as electric power or transportation, and significantly reduce the opportunities for cost-effective reductions.

2.5 Energy intensity and Opportunities for Cost-Effective GHG Reductions: Technology

Another important determinant of an industry's vulnerability to leakage is not only its energy intensity but its capacity to achieve cost-effective GHG reductions which depends to a large extent on the state of its production technology. Cement is a technologically mature industry. The last great technological advancement in cement production occurred decades ago as new manufacturing facilities shifted from the less efficient wet process to the more efficient dry process, and no major technological advancements in large-scale production technology are on the horizon. In addition, California's history of environmental leadership combined with strong competition from importers has resulted in a California cement industry that is more energy efficient than those in the vast majority of nations. Thus, as an energy-intensive but highly efficient industry that utilizes relatively mature technology, cement manufacturing is likely to suffer from the worst of all worlds: prohibitively high compliance costs coupled with limited opportunities to defray those costs through technological improvements.

2.6 Capacity to Achieve the Regulatory Objective

Even if opportunities to achieve cost-effective GHG emissions reductions exist, they are unlikely to materialize if the industry lacks the capacity to achieve the regulatory objective. Virtually

² California Climate Action Team, Cement Subgroup (2008).

every aspect of the cement industry is tightly controlled by rules and regulations, from the structure of the market to the operations of plants to the nature of the end product. The manufacturing process, especially in California, is subject to stringent environmental regulations and a thorough permitting process. Even the properties of cement products are tightly controlled through technical specifications and building codes intended to ensure product performance and safety under a variety of conditions. Failure to harmonize all regulations related to the provision of cement in a eco-friendly manner will create conflicts that limit the ability to realize any opportunities for cost-effective GHG emissions reductions that may exist in the industry.

2.7 The Potential of Leakage to Other Non-Regulated Competing Products

Although the potential for emissions leakage is traditionally framed in the context of perfect substitutes (e.g., domestically produced cement versus imported cement), the potential for cross-sectoral leakage can also be significant in certain industries. For instance, depending on the nature of the market, cement may compete with other products in certain downstream uses, such as wood or steel in certain construction projects or asphalt for certain road projects. These competing materials generally have a greater lifecycle GHG emissions footprint.³ To the extent that AB 32 regulations increase the overall compliance burden on the California cement industry, even if such burden is equal to the burden on imported cement, any substantial increase in compliance costs for cement could result in significant cross-sectoral leakage that would undermine the climate change objectives of AB 32.

III. Any Framework Used to Evaluate the Potential for Emissions Leakage Should Rely on Data that Reflects Fluctuations in the Business Cycle

Recent proposals to address emissions leakage – including aspects of the EU ETS, the Australia CPRS, and the Waxman-Markey bill – typically use some measure of trade exposure as a primary indicator. For many energy-intensive, trade-exposed industries, however, such an indicator is highly sensitive to fluctuations in the business cycle and closely related economic phenomenon.

For example, the cement industry is highly depend on fluctuations in the construction cycle, and measures of import intensity can vary widely from the peak to the trough of the cycle. Although California cement imports exceeded 40% of the state's total cement consumption during the housing boom in 2006, the volume of imports has declined in the wake of a sharp housing market downturn and the current economic recession. Simply put, a methodology that relies heavily on data from 2006 is likely to result in substantially different results than a methodology that relies heavily and exclusively on more recent data.

Consequently, it is critical that any framework used to identify industries at risk of leakage or to quantify the potential extent of leakage rely on historical data that reflects these extreme fluctuations. Measures that utilize data from one particular year or a small set of years may dramatically understate the potential for emissions leakage. Rather, methodologies should employ data that reflects the industry's trade exposure throughout the entire industry cycle.

³ CSCME will shortly be submitting a comprehensive paper comparing the lifecycle GHG emissions for various building materials.

IV. CARB Should More Explicitly Consider the Potential for Cross-Sectoral Leakage

Efforts to address emissions leakage tend to focus on products that are perfect substitutes – for example, California cement versus imported cement. Even if this particular form of leakage is sufficiently minimized, however, other forms of leakage may persist. As previously noted, the risk of cross-sectoral leakage in the California cement industry is real and significant.

Specifically, increased compliance costs for California cement manufacturers may result in substitution away from cement toward competing materials such as wood, steel, or asphalt.⁴ To the extent that a California program fails to regulate the direct and indirect GHG emissions associated with the consumption of these competing materials, increased substitution of these products would result in emissions leakage.⁵ The potential for emissions leakage is compounded by the fact that cement is an eco-efficient, durable product that is environmentally superior to competing materials in many applications. Thus, cross-sectoral leakage has the potential to not only offset GHG reductions in the California cement industry, but increase GHG emissions globally.

The potential for cross-sectoral leakage has important policy design implications. Even if attempts to level the carbon playing field between California and non-California cement are successful, total compliance costs for the California cement industry must still be minimized to mitigate the risk of cross-sectoral leakage. Simply put, any program that aims to minimize the risk of leakage must level the carbon playing field between all major competing products, not simply between domestic and imported cement.

V. Conclusion

Although the risk of emissions leakage in the California cement industry is real and significant, it is not intractable or insurmountable. Although an ill-designed climate change policy will simultaneously threaten the viability of the state cement industry, damage the state economy, and diminish the efficacy of the state's environmental efforts, a well-designed climate change policy can overcome these challenges, enable the cement industry to contribute to meaningful reductions in global GHG emissions, and generate sustainable growth in California.

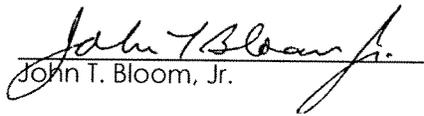
CSCME believes that effectively minimizing the risk of emissions leakage cannot be done through a "one-size-fits-all" approach. It will require sensible policies tailored to the unique characteristics and challenges of individual industries. As you know, CSCME recommends that California adopt a sector-specific approach of Tradable Performance Standards ("TPS") for the

⁴ For example, California does not have a significant steel manufacturing industry and the state does not appear to be considering regulations to account for the GHG emissions associated with the consumption of steel in California. In the absence of regulations that place concrete (and, by extension, cement) and steel on a level carbon playing field, California's climate change policy is likely to result in a shift in building materials consumption. To the extent that the lifecycle emissions associated with the consumption of steel is greater than that associated with the consumption of concrete, the result will be emissions leakage. A similar situation may arise with other materials that are unregulated or face a lower compliance burden, such as wood and asphalt.

⁵ It is important to note that cross-sectoral leakage may arise because of either the policy's limited scope (*i.e.*, imperfect participation), the policy's failure to properly account for the full lifecycle emissions associated with the consumption of various products (*i.e.*, incomplete measurement), or both.

cement industry. Leveraging and integrating a variety of instruments tailored to the unique nature of the California cement industry, the TPS framework provides an environmentally effective solution to leakage: a "command, control, and trade" approach to reducing the GHGs associated with California cement consumption in an environmentally effective, economically efficient, and equitable manner. We have made a lot of progress to date and look forward to further meetings to fully develop the TPS framework for the cement industry.

Sincerely yours,



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