Testimony by Rebecca Dell, PhD to the
California Joint Legislative Committee on Climate Change Policies
10:30 AM – Thursday, March 10, 2022

Dear Members of the Joint Legislative Committee on Climate Change Policies:

Thank you for the work of this committee on behalf of the people of California and for the opportunity to appear before you today to discuss these extremely important issues.

The issue before us – whether to accelerate California's climate targets – could not be more important.

In brief, I would like to emphasize the critical role of California's industrial sector in this decision with the following three points:

(1) California cannot meet its climate goals without dramatically decreasing its industrial greenhouse gas emissions.
(2) California's manufacturing sector is essential to its economy and to all of our well-being, so all policy actions on industrial greenhouse gas emissions should be designed to support and increase the success of manufacturing in our state.
(3) The cement industry presents a unique opportunity to address multiple goals, including reducing our state's damage to the climate, increasing our global climate leadership, maintaining our manufacturing base, and improving public health and environmental justice.

To dive a little deeper on each of these, starting with the importance of California's industrial greenhouse gas emissions:

First, almost a quarter of California's greenhouse gases come from industry:[i]

This is simply too much to leave only to our cap-and-trade program.

These emissions are roughly evenly split between manufacturing and the production, transportation, and processing of oil and gas. Most of the trajectory of the oil and gas sector's emissions will be determined by what happens in transportation, not at the industrial sites themselves, so I will focus the rest of this testimony on manufacturing.

The most direct and simplest route to eliminate these industrial greenhouse gas emissions is also the worst: close down our manufacturing facilities. However, though this would get those emissions off California's books, it wouldn't necessarily reduce greenhouse gas emissions. The same products would be produced elsewhere, perhaps even with greater climate damage.

California's manufacturing sector is something we can be justly proud of. It has nearly $350 billion of output per year.[ii] This is the largest of any state in the United States. It also means that manufacturing is a larger portion of our state economy than the U.S. average. It provides high-quality employment, with the average employee in California's manufacturing sector earning $112,000 per year in total compensation.[iii]

To support reduce industrial greenhouse gas emissions while supporting California's manufacturing sector, we need to combine policies that require emissions reductions at facilities with policies that create business opportunities for the cleanest firms and policies that support innovation in technology, markets, and business models.

To illustrate how this might work, consider the cement industry. Cement is the largest source of manufacturing emissions in the state. With 2-3% of total state emissions, it is essential to tackle in its own right. However, globally, about 7% of greenhouse gas emissions come from cement, so if California can demonstrate technical, policy, and business feasibility of near-zero-greenhouse gas cement, that can have much greater impact around the world. No one has figured this out yet, so California's leadership is badly needed.

Cement is also critical because addressing climate change across our economy will require that we build an enormous amount of new transportation and energy infrastructure. If we continue to use conventional cement, our efforts to climate damage could themselves become a driver of climate damage.

Finally, addressing the climate damage from cement will also help us to address its public health impacts. California's cement kilns are the only facilities remaining in the state that still rely on direct coal burning for their energy. They have some of the highest rates of SOx emissions, a critical local air pollutant. The impact of this pollution falls disproportionately on low-income communities and communities of color.

For all these reasons, the cement industry is the obvious first target in the manufacturing sector.

To decarbonize cement production, we need a **comprehensive policy approach**. We can build on the foundation of **cap-and-trade**, by increasing and better targeting the financial incentive to reduce greenhouse gas emissions.[iv]

We should also **support innovation**. Unlike many industries, less than half of cement's greenhouse gas emissions come from energy, while most come from the raw materials—CO_2 coming directly out of rocks. This means innovation is especially important. Cement is the only sector in which carbon capture and storage (CCS) will almost certainly be needed. We should support technology directly and facilitate early deployments through things like infrastructure planning and permitting and regulatory support of geologic CO_2 storage. California's cement companies realize the need to decarbonize and are looking for policy support. Much of the cost of this effort can be

shared with the federal government because of existing tax credits like 45q and recent funding from the Infrastructure Investment and Jobs Act.

Finally, we should **create markets** for near-zero-CO_2 cement through mechanisms like:

- *Buy Clean*: preferentially purchase low GHG cements for state-funded construction[v]
- *Clean Product Standards*: mandate or incentivize GHG reductions in a particular product class, for example, as in the Low Carbon Fuel Standard[vi]
- *Building Codes*: require reductions in the GHG emissions associated with making building materials in addition to in the operations of buildings[vii]

In conclusion, California needs to address the climate damage that comes from its industrial sector while supporting its manufacturing economy. To do this, we should pursue a **comprehensive policy approach** that combines regulation, innovation, and market creation. If we move quickly and aggressively, we can dramatically reduce and perhaps eliminate greenhouse gas emissions from manufacturing activity by 2035.

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[i] https://ww2.arb.ca.gov/ghg-inventory-data

[ii] https://www.nam.org/state-manufacturing-data/2021-california-manufacturing-facts/; https://www.nam.org/state-manufacturing-data/2021-united-states-manufacturing-facts/

[iii] https://www.nam.org/state-manufacturing-data/2021-california-manufacturing-facts/

[iv] In addition to the relatively low allowance prices and large number of banked allowances, cap-and-trade's incentive to reduce cement emissions is reduced by the structure of the allowance allocation. Allowances are allocated based on output of clinker, not cement, which eliminates any incentive to make the low-cost transition to lower clinker, lower GHG cements.

[v] SB 778, sponsored by Senator Becker, if passed will add cement and concrete to California's existing Buy Clean program with additional incentives for the use of breakthrough technologies. This approach would be implemented by DGS in cooperation with CARB.

[vi] This approach would be implemented by CARB.

[vii] More than half of the total life-cycle GHG emissions from new California buildings come from manufacturing the building materials, but this is currently entirely unregulated. This approach would be implemented by CEC.