

November 27, 2023

California Air Resources Board  
1001 I Street  
Sacramento, CA 95814

*Submitted via e-mail to: [hydrogen@arb.ca.gov](mailto:hydrogen@arb.ca.gov)*

**RE: Comments on Senate Bill 1075 Report – Hydrogen Use for Ammonia/Fertilizer**

On behalf of Industrious Labs, we appreciate the opportunity to provide comments on the Senate Bill (SB) 1075 joint agency process led by the Air Resources Board (ARB). In our comments, we focus on the potential for green hydrogen to be utilized in the ammonia/fertilizer market.

**Background**

California's agricultural sector produces over one-third of the country's food supply. To ensure crop yields season after season, farmers rely on anhydrous ammonia fertilizers (ammonia) that use fossil fuels as a feedstock. Nearly all synthetic fertilizers utilize anhydrous ammonia as a precursor in their production, thereby closely linking our food supply to a single chemical made with fossil fuels. California's anhydrous ammonia fertilizer was previously imported from countries like Russia prior to their invasion of Ukraine. Currently, California receives the majority of its ammonia supply from the United Arab Emirates, Norway, and others through the Port of Stockton – where it is then distributed to agricultural centers. It is estimated that California imports more than 1.18 million tons of ammonia annually. In the midst of a cascading set of global crises, exporting liquified natural gas (LNG) from the US to Europe, only to return it in the form of nitrogenous fertilizer to California is poor economic, environmental, and foreign policy.

While the state imports close to 1.2 million tons of ammonia on an annual basis, more than half is devoted to synthetic fertilizer uses. In 2021, California [utilized nearly](#) 800,000 tons of synthetic fertilizer and slightly decreased to 700,000 tons in 2022. Meanwhile, fertilizer prices have doubled and even tripled due to compounding impacts from supply chain issues, the COVID-19 pandemic, the [only fertilizer manufacturer in California closing](#), and rising gas prices resulting in increased prices for consumer goods. Between 2020 and 2023, farmers experienced an almost 150% increase in the price of ammonia, rising from \$450 per ton to [\\$1,116 per ton](#) in Spring 2023.

While our state pursues decarbonization efforts across various industries, the agricultural sector will be left behind with escalating costs due to their heavy reliance on fossil fuel based fertilizer.

To protect its farmers, communities, and consumers, California needs to invest in domestic, zero-carbon production of ammonia.

### **Potential for Green Hydrogen for Ammonia/Fertilizer**

Last month, the Alliance for Renewable Clean Energy Hydrogen Systems' (ARCHES) hydrogen hub application was signaled to move forward for a potential \$1.2 billion to advance California's green hydrogen network and infrastructure. Green ammonia fertilizer replaces the dirty hydrogen produced through steam-methane reforming (SMR) with green hydrogen generated using renewable-powered electrolyzers. The production of in-state green hydrogen for ammonia aligns seamlessly with ammonia's existing role as a key end-use for hydrogen, and California's standing as the nation's leading fertilizer consumer. Moreover, unlike transportation applications or electricity generation, ammonia production already has the required infrastructure to handle, transport, and safely store fertilizer.

In Minnesota, Governor Walz issued an Executive Order last year directing agencies to coordinate and collaborate on green hydrogen end uses, prioritizing fertilizer production and supporting agricultural cooperatives. The Order follows research led by the University of Minnesota highlighting the cost savings possible through small-scale green hydrogen production powered by in-state wind and solar. The momentum for green hydrogen in the agricultural sector has continued to grow, with the State Legislature allocating approximately \$7 million in this year's budget to pilot a green fertilizer production incentive. This priority is memorialized in Minnesota's hydrogen hub application in partnership with two other states – the Heartland Hydrogen Hub – which was also signaled to move forward last month.

Along with reducing climate and air quality impacts by displacing fossil fuel-based hydrogen, green ammonia production in California can provide additional benefits. These benefits could include decreasing supply costs, enhancing supply and economic resilience and independence, and fostering the development of in-state and local clean energy resources.

### **Prioritizing a Responsible and Equitable Transition for Communities**

Shifting away from fossil fuel-based fertilizer towards zero-carbon solutions requires a focus on environmental justice, public health, climate resilience, and economic equity.

California's reliance on centralized fertilizer factories has forced a dependency on an unjust, import-heavy market. Developing a green hydrogen network in California will present a unique opportunity to establish small-scale ammonia production facilities that can be owned and operated by local farming communities and agricultural cooperatives and be produced in close proximity to where it is utilized. By decentralizing green fertilizer production and empowering communities, California can tackle economic and social inequities associated with the fertilizer industry, while generating and retaining wealth within rural communities.

Beyond addressing fertilizer supply issues, this transition must also avoid perpetuating injustices and disproportionate impacts on rural and environmental justice communities. These communities are already burdened with air pollution and contaminated drinking water due to excessive fertilizer application. This means we must also focus on reducing the demand for fertilizer through regenerative agricultural practices and application efficiency.

A two-pronged approach to clean up the fertilizer supply chain and reduce our dependence on synthetic fertilizers is critical to tackle existing harms, and concurrently protect and uplift rural and environmental justice communities. California has demonstrated leadership in this space over the years through programs such as the Healthy Soils Program (HSP) under the California Department of Food and Agriculture (CDFA). Therefore, as we scale decentralized green ammonia facilities, they must be paired with expanded targets and policies to reduce overall fertilizer consumption.

We fully support increasing fertilizer-use efficiency practices and the expansion of regenerative agriculture practices at scale. A new, fossil free synthetic fertilizer industry cannot be used to justify expanded dependence on synthetic fertilizer. Rather, it must be viewed as an essential but not singular strategy for ending our use of fossil-fuel based synthetic fertilizer. As California's farming demand grows, it is important to make progress on reducing and eliminating the negative impacts from our current fertilizer production processes on both the supply and demand side.

### **Conclusion**

We urge ARB to prioritize green hydrogen for the agricultural sector, considering its existing end use in comparison to other sectors and its potential given California's outsized role in feeding both the country and the world.

As this process continues, we look forward to working with ARB and others to ensure that the deployment of and transition to green hydrogen for this sector is responsible, equitable, and holistic in order to reduce harm, eliminate inequities, and protect and uplift rural and environmental justice communities.

Thank you again for the opportunity to provide comments.

Sincerely,

A handwritten signature in black ink, appearing to read "E.C. Gillespie". The signature is fluid and cursive, with a long horizontal stroke at the end.

Evan Gillespie  
Partner, Industrious Labs

cc: Governor's Office of Business and Economic Development  
Alliance for Renewable Clean Energy Hydrogen Systems  
California Energy Commission  
Office of the Governor