Dear Chair Randolph,

We are a team of Berkeley engineers who undertook a semester-long design project[1] to understand methane emissions from agriculture in CA and to propose solutions.

California is the fifth largest economy in the world and the largest dairy producer in the country. This abundance of resources has been continually and ruthlessly exploited by industrial agriculture to the detriment of public health and the ecosystem. The agricultural sector and landfilled organic waste associated with food systems together account for almost 70% of total methane emissions. The number of CAFOs in California has grown to over 1000 in the last few decades, with the number of cattle per farm increasing. Given the size of this industry in California and the expectation that the production and demand for meat and dairy products will continue to increase over time, forward-thinking measures need to be a key feature in the 2022 Scoping Plan. We also need widespread public education on local food systems and community partnerships bolstered by transparent data sharing.

Our recommendations for such an approach are the following:

1. **Adopt more aggressive measures for SB 1383.** Current projections suggest that by meeting the SB 1383 target of a 40% reduction of 2013 emissions by 2030, methane from the dairy industry will be contributing negative GWP within 5 years of consistent reduction.
   a. Publish semi-annual reports on compliance to SB 1383 targets, accounting for the delays that the program has already experienced.
   b. Prioritize publicizing upcoming regulations to minimize lag once these measures go into effect after January 2024.
   c. Monitor and identify super-emitter landfills to target emissions reductions. The landfills we found to be emitting large methane plumes were also underreporting emissions by almost 50%.
   d. Use captured landfill gas in renewable natural gas (RNG) systems in neighboring communities. We found that only 25% of captured landfill gas is utilized.

2. **Push for sustainable agriculture practices through rebates, tax benefits, and stipends.** Anaerobic digestion and feed additives can significantly reduce ruminant methane emissions.
   a. Mandate that all farms with at least 500 cattle adopt an anaerobic digester system. This has a net negative cost, as the biogas produced by digesters is very profitable in the long run.

   b. Expand government investment in research to reduce enteric fermentation with nutritional additives, genetic evaluation and dispersed digester systems.

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[1] As a part of an engineering design course called Design for Global Transformation, taught by Prof. Tina Chow in Spring 2022, see https://chow.ce.berkeley.edu/teaching/ce-105-spring-2022/

3. **Ensure data availability and transparency.** Data on the implementation of measures such as the Farm Bill and Environmental Quality Incentives Program has been subject to manipulation on the part of agricultural lobbies.
   a. Establish regulatory frameworks requiring the dissemination of annual emissions data from concentrated animal feeding operations (CAFOs) and mega-dairies for public scrutiny.
   b. Leverage the availability of Carbon Mapper satellite imagery starting from 2023 to identify large emitters and implement immediate rectification.

4. **Implement forward-thinking food and agriculture education in schools.** Better education and awareness of food systems can create enough momentum for greater government investment in more local food systems.
   a. Ensure that the impacts of short-lived climate pollutants like methane are made a part of mainstream science education at the K-12 level.
   b. Implement practices to decrease SLCP emissions such as increasing plant-based meals in school lunches.
   c. Introduce measures such as affordable kits for residents to grow their own food at home to motivate a more plant-based diet.
   d. Invest community resources into infrastructure for urban agriculture and promote smaller-scale farms.

California has historically been a pioneer in climate action, and methane emissions must be prioritized now. We believe that a target for carbon neutrality by 2035 and an associated massive scale down in agricultural methane emissions would set a critical global precedent.

Sincerely,
Samyukta Shrivatsa
UC Berkeley Environmental Engineering Science - Class of 2023
On behalf of our UC Berkeley student team - Kevin Gibson Weinberger, Juan Hernandez, Sarena Kuhn, and Charlotte Mourad, with Prof. Tina Chow in Civil and Environmental Engineering

The StoryMap summary of our work is here:
https://storymaps.arcgis.com/stories/90534e2a97f048cb9f79c5ea8c9c9ba4
Our final semester report is attached for further details.