CALIFORNIA
AIR RESOURCES BOARD

March 17, 2022

2022 Amendments to the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate

Transport refrigeration units (TRU) emit multiple air pollutants, including diesel particulate matter (diesel PM), fine particulate matter (PM2.5), oxides of nitrogen (NOx), and greenhouse gases (GHG). TRUs typically operate at refrigerated warehouses or distribution centers (WHDC), grocery stores, seaport facilities, intermodal railyards, and other locations that are often near sensitive receptors. Toxic and harmful TRU emissions impact surrounding communities, many of which are environmental justice and Assembly Bill 617 communities. These communities bear a disproportionate health burden due to their close proximity to emissions generated from TRU activity.

The California Air Resources Board (CARB) adopted the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate (TRU ATCM) in 2004 (and amended it in 2010 and 2011) to reduce diesel PM emissions and resulting health risk from diesel-powered TRUs. Despite the progress made, additional TRU emission reductions are needed to further protect communities from near-source pollution impacts, help meet the current health-based ambient air quality standards across California, and support the State's climate goals. On February 24, 2022, CARB adopted amendments to the TRU ATCM (2022 Amendments) to achieve additional emission and health risk reductions from diesel-powered TRUs and increase the use of zero-emission (ZE) technology in the off-road sector. The 2022 Amendments will help meet the State's multiple risk reduction, air quality, and climate goals, as well as the directive of Executive Order (EO) N-79-20, which set a goal for 100 percent ZE off-road vehicles and equipment in the State by 2035.

Purpose of the 2022 Amendments

- Expand public health and environmental benefits by increasing the use of ZE technology.
- Provide PM2.5 and NOx emission reductions to help attain regional and federal air quality standards.
- Provide GHG emission reductions to help meet the State's GHG targets and climate goals.
- Address growth in emissions from trailer TRUs, domestic shipping container (DSC) TRUs, railcar TRUs, and TRU generator sets with less than 25 horsepower engines.

Key Elements of the 2022 Amendments

- **Lower global warming potential refrigerant –** Beginning December 31, 2022, newly-manufactured truck TRUs, trailer TRUs, and DSC TRUs shall use refrigerant with a global warming potential (GWP) less than or equal to 2,200, or no refrigerant at all.
- **More stringent PM emission standard –** Beginning December 31, 2022, model year (MY) 2023 and newer trailer TRU, DSC TRU, railcar TRU, and TRU generator set engines shall meet a PM emission standard of 0.02 grams per brake horsepower-hour or lower (aligns with the United States Environmental Protection Agency Tier 4 final off-road PM emission standard for 25-50 horsepower engines).

- **Applicable facility requirements –** Beginning December 31, 2023, owners of refrigerated WHDCs with a building size of 20,000 square feet or greater, grocery stores with a building size of 15,000 square feet or greater, seaport facilities, and intermodal railyards (applicable facilities) shall register the facility with CARB, pay fees every three years, and report all TRUs that operate at their facility to CARB quarterly, or alternatively attest that only compliant TRUs operate at their facility.
- **Expanded TRU reporting –** Beginning December 31, 2023, TRU owners shall report all TRUs (including out-of-state based) that operate in California to CARB.
- **TRU operating fees and compliance labels –** Beginning December 31, 2023, TRU owners shall pay TRU operating fees and affix CARB compliance labels to their TRU every three years, for each TRU operated in California. Collected fees will be used to cover CARB's reasonable costs associated with the certification, audit, and compliance of TRUs.
- **Zero-emission truck TRU requirement –** Beginning December 31, 2023, TRU owners shall turnover at least 15 percent of their truck TRU fleet (defined as truck TRUs operating in California) to ZE technology each year (for seven years). All truck TRUs operating in California shall be ZE by December 31, 2029.
- **Zero-emission truck TRU assurances –** Manufacturers of zero-emission truck TRUs shall be required to provide a comprehensive warranty for zero-emission truck TRUs and have an authorized service-and-repair facility located in California to perform warranty repairs.
- **Compliance extensions due to private financing, equipment manufacture delays, or installer delays** – Compliance extensions due to private financing, equipment manufacture delays, or installer delays may be granted for a maximum of six months (previously four months).
- **Requirements for lessors and lessees –** TRU owners (lessors) may delegate compliance responsibility to the TRU operator (lessee) if the rental or lease agreement is for a period of one year or longer.

Cost Impacts of the 2022 Amendments

- Fewer statewide adverse health outcomes from 2022 to 2034 are valued at an estimated $1.75 billion.
- Total net cost of the 2022 Amendments from 2022 to 2034 is estimated to be $850.2 million.
- If the total net cost of the 2022 Amendments is fully passed through to consumers, the total cost per California household from 2022 to 2034 is estimated to be $64.06 with a yearly average of $4.93.

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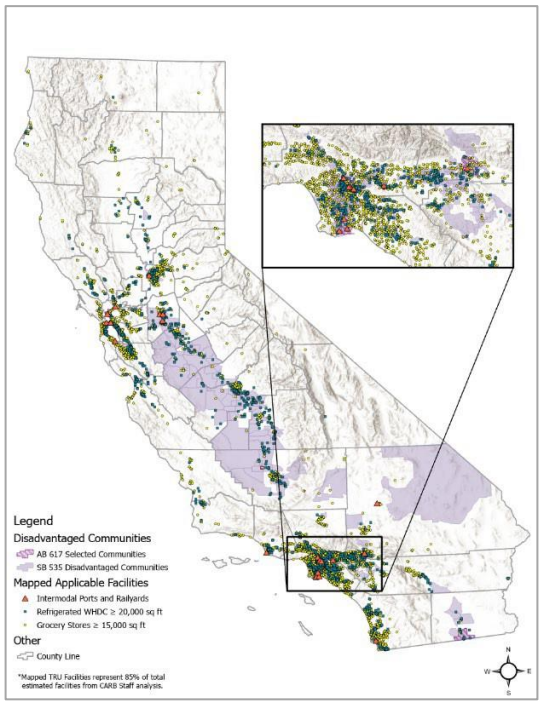
TRU Activities Impact Disadvantaged Communities

Many of the communities near facilities where TRUs operate bear a disproportionate health burden due to their close proximity to emissions from the diesel engines that power TRUs. There are several occurrences across the State where communities contain "groups" or "clusters" of facilities where TRUs operate. In many cases, these facilities are located in or near communities that are classified as disadvantaged by the California Environmental Protection Agency (CalEPA). CalEPA uses CalEnviroScreen to score California communities based on environmental pollution burden and socio-economic indicators. Based on staff's analysis, approximately 40 percent of the applicable facilities identified are located in disadvantaged communities as designated by CalEnviroScreen 3.0.

Statewide Distribution of Applicable Facilities, Including Those in Disadvantaged Communities (as of January 2021)



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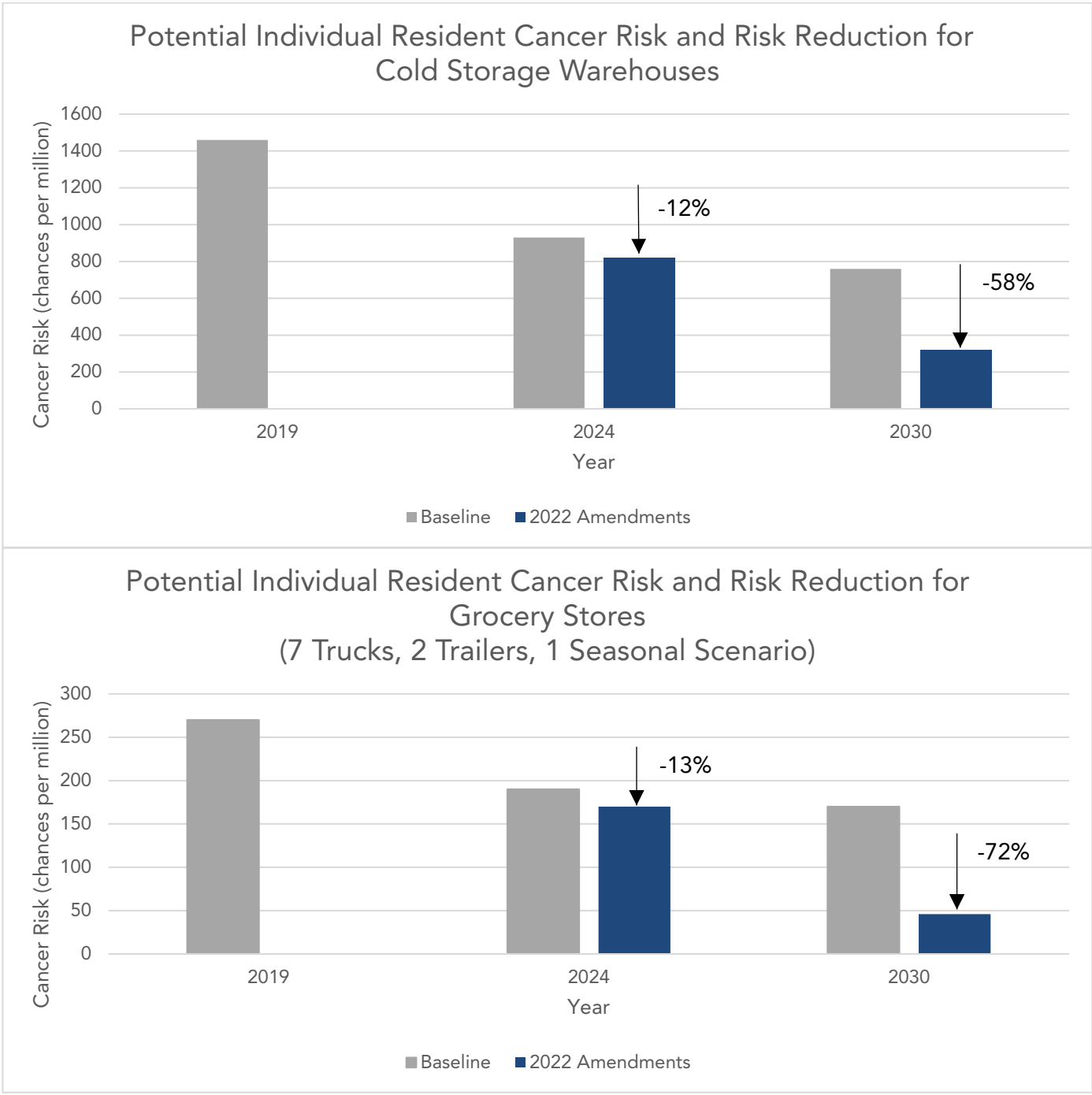
Health Analysis Shows Reduction in Potential Cancer Risk



Note: Individual resident cancer risk estimates are based on a 30-year exposure duration using the Risk Management Policy method (95th percentile/80th percentile daily breathing rates. Fraction of time at home equals 1 for age bins <16 years and 0.73 for age bin 16-70 years.

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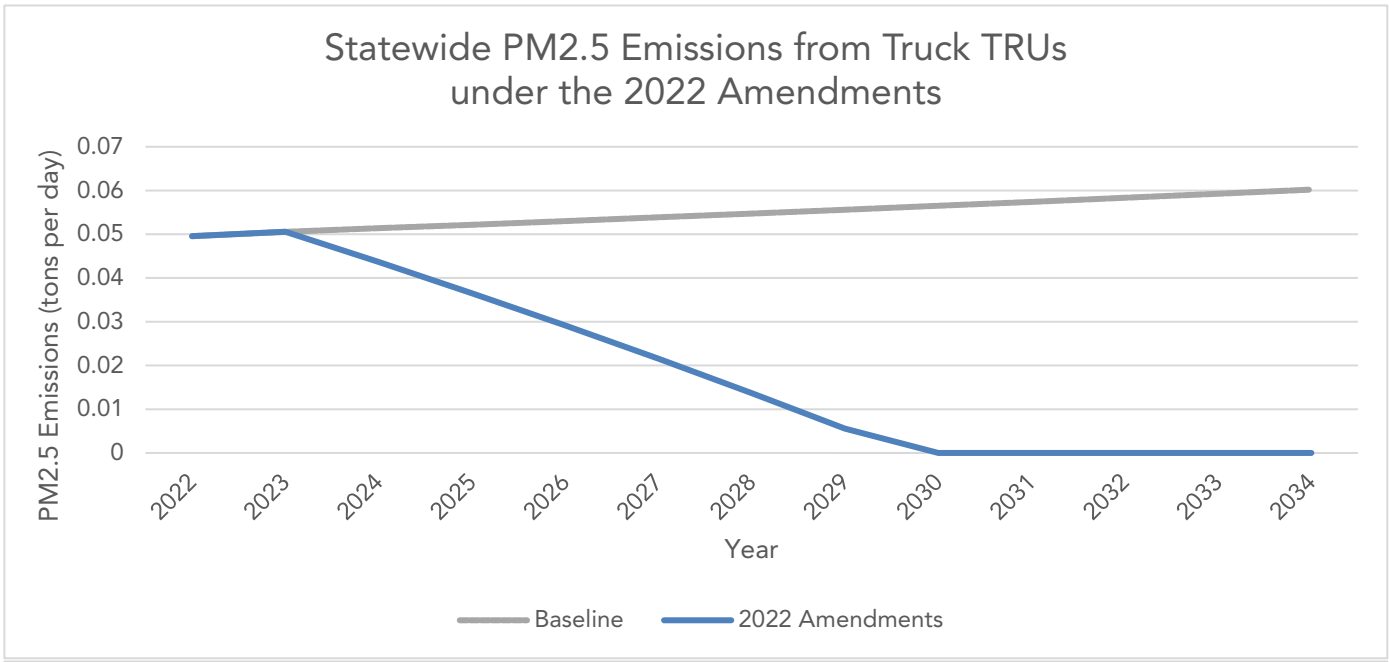
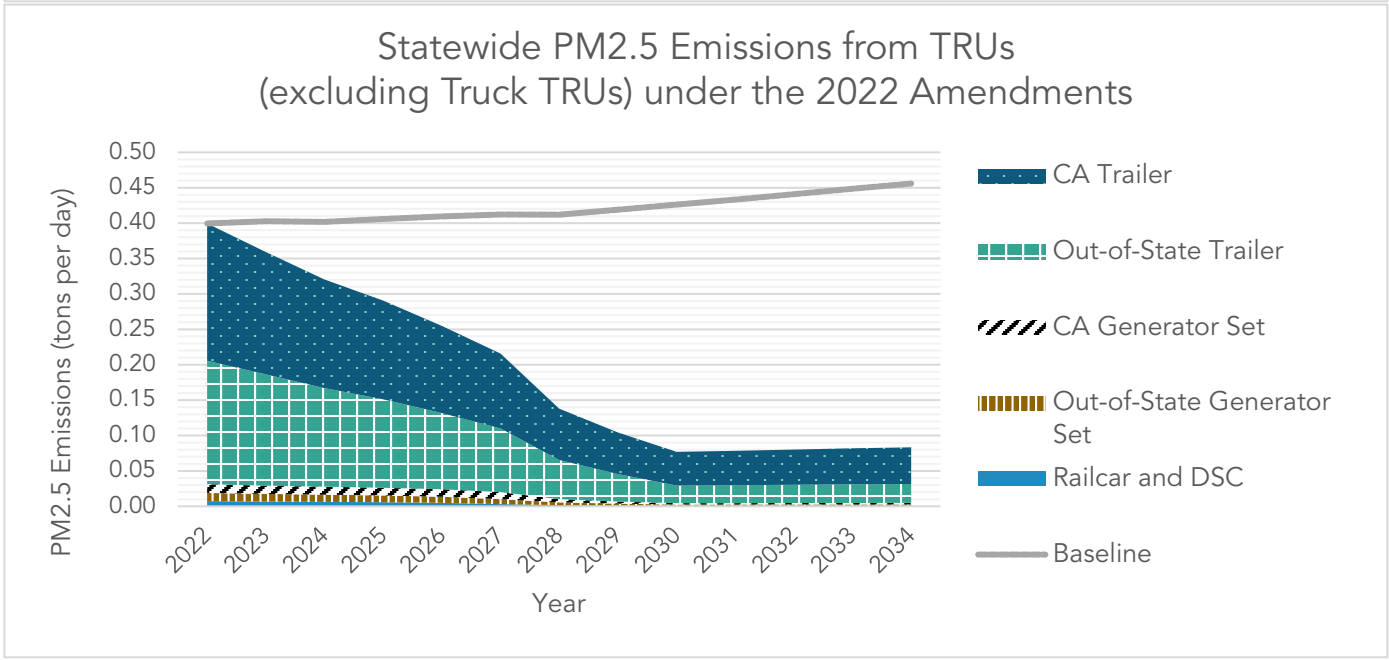
Reducing Emissions from TRUs

The 2022 Amendments will further reduce statewide TRU emissions from 2022 to 2034 by approximately:

- 1,258 tons of PM2.5
- 3,515 tons of NOx
- 1.42 million metric tons of carbon dioxide equivalents (MMTCO2e)





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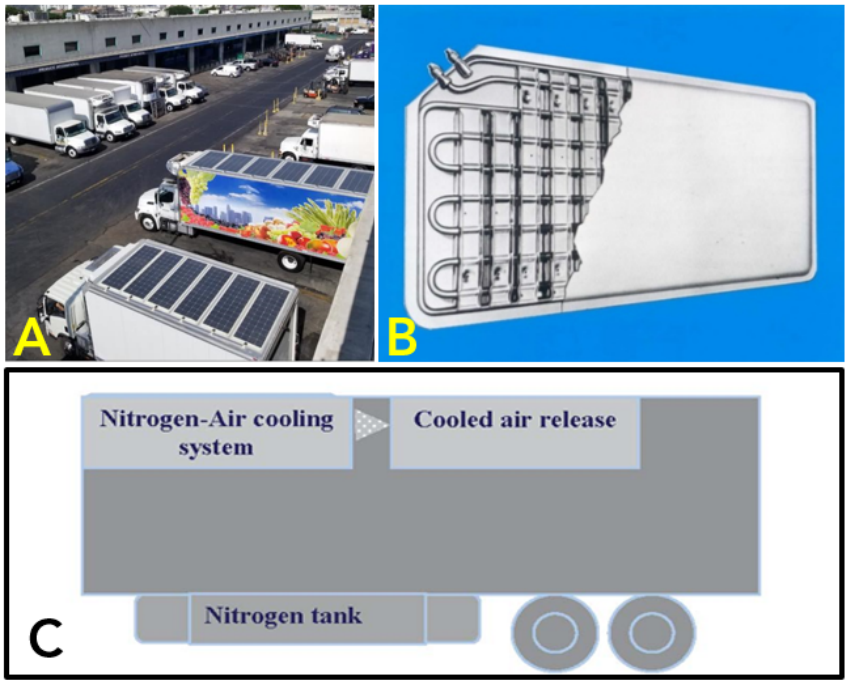
Currently Available ZE Truck TRU Technology



- **(A) Battery-electric truck TRU.** The diesel engine powering the compressor and fans is removed and replaced with electric motors powered by a battery pack. To recharge the battery pack after daily operations, truck TRU owners may rely on publicly accessible chargers or choose to install chargers at their home base facility.
- **(B) Cold plate truck TRU.** These systems consist of a sheet metal shell, with cooling coils built inside to hold the eutectic fluid. They are similar to the gel packs used in lunch boxes and ice chests, but larger. These units would require access to electrical plugs to refreeze cold plates after daily operations.
- **(C) Indirect cryogenic truck TRU.** A cryogenic fluid (liquid CO2 or liquid nitrogen) is the cooling agent, replacing the diesel engine-driven refrigeration system utilized in a conventional TRU. These units would require access to a liquid CO2 or liquid nitrogen fueling station.

Next Steps

- Staff will submit the final rulemaking package for the 2022 Amendments to the Office of Administrative Law.
- In response to EO N-79-20, staff are conducting a technology assessment to evaluate current and projected development of zero-emission technologies for non-truck TRUs (trailer TRUs, DSC TRUs, railcar TRUs, and TRU generator sets).
- Staff plan to start the development of a second rulemaking to transition non-truck TRUs to ZE technology in 2022. This second rulemaking is anticipated for Board consideration in 2025.

More Information: https://ww2.arb.ca.gov/new-transport-refrigeration-unit-regulation-development