Date of Hearing: April 21, 2025

ASSEMBLY COMMITTEE ON TRANSPORTATION
Lori D. Wilson, Chair
AB 605 (Muratsuchi) – As Amended April 10, 2025

SUBJECT: Lower Emissions Cargo Handling Equipment Pilot program

SUMMARY: Creates the Lower Emissions Cargo Handling Equipment (CHE) Pilot program to allow for emissions certified CHE deployment under the program, and requires the California Air Resources Board (CARB) to not prohibit its use prior to the end of its useful life. Specifically, **this bill**:

1) Qualifies as a piece of CHE for participation in the Lower Emissions Cargo Handling Equipment Pilot when all of the following have occurred between the time of purchase and delivery:

    a) The manufacturer has certified that the equipment meets the emission specifications of less than 1g CO2/km or less than 1g CO2/kWh, the purchase requirements of this bill, and the date of delivery of the piece of equipment;
    b) The manufacturer has procured an opinion of an independent third party to validate that the certification rendered meets the emissions rate of less than 1g CO2/km or less than 1g CO2/kWh;
    c) The manufacturer physically affixes a label to the CHE, or otherwise makes a note, in a prominent and readily viewable location on the CHE, that contains both of the following:

        i. A description that reads, "Purchased pursuant to the Lower Emissions Cargo Handling Equipment Pilot"; and,
        ii. The dates of purchase and expected delivery.

    d) The manufacturer produces written copies confirming and containing the manufacturer certification, third-party validation of certification, and proof of equipment labeling or marking pursuant to this section.

2) Requires that at all times post-delivery a piece of CHE shall maintain its labeling or notation as a piece of pilot technology equipment.

3) Requires that a piece of CHE subject to this bill shall include, at the time of delivery, a description, warrant, or both, of the useful life of the piece of CHE from the manufacturer. If a piece of cargo handling equipment subject to this bill does not have a description, warrant, or both, of the useful life of the CHE shall not be protected by the terms of this bill.

4) Prohibits the useful life of a piece of CHE subject to this bill from exceeding the average useful life in years for port or rail operations provided for any specific equipment type as designated in the Emission Estimation Methodology for Cargo Handling Equipment Operating at Ports and Intermodal Rail Yards in California, Table II-6, as prepared by CARB in support of adoption of Section 2479 of Title 13 of the California Code of Regulations.

5) Prohibits CARB from adopting future regulations that prohibit or disallow a piece of CHE subject to this bill from utilizing the entire useful life from the date of delivery that is purchased pursuant to this bill prior to December 31, 2027.

6) Defines "cargo handling equipment" as any off-road, self-propelled vehicle, or equipment used at a port or intermodal railyard to lift or move container cargo that meets the carbon dioxide (CO_2) emission performance standard of less than 1g CO_2/km or less than 1g CO_2/kWh.

7) Specifies that CHE includes, but is not limited to, top handlers, side handlers, straddle carriers, reach stackers, forklifts, loaders, and aerial lifts. CHE does not include any equipment that is licensed as an on -road vehicle. CHE does not include any excavators or dozers.

8) States that CHE does not mean any fully automated cargo handling equipment, including equipment that is remotely operated and remotely monitored with or without the exercise of human intervention or control.

9) States that this bill is not intended to prescribe or otherwise preclude the application of any future emission standards by CARB, except as specified.

10) States that this bill is self-executing and does not require any implementing or interpretive rulemaking by CARB or any other agency to become operative.

EXISTING LAW:

1) Establishes CARB as the air pollution control agency in California and requires CARB, among other things, to control emissions from a wide array of mobile sources and coordinate with local air districts to control emission from stationary sources in order to implement the Federal Clean Air Act. (Health and Safety Code (HSC) 39602; HSC 39602.5)

2) Requires CARB, pursuant to California Global Warming Solutions Act of 2006 (AB 32 (Núñez) Chapter 488, Statutes of 2006) to adopt a statewide Greenhouse Gas (GHG) emissions limit equivalent to 1990 levels by 2020 and to develop a scoping plan for achieving the maximum technologically feasible and cost effective reductions in GHGs. (HSC 38500)

3) Requires, pursuant to SB 32 (Pavley) Chapter 249, Statutes of 2016 that CARB ensure that statewide GHG emissions are reduced to at least 40% below 1990 levels by 2030. (HSC 38566)

4) Provides, pursuant to the California Climate Crisis Act (AB 1279 (Muratsuchi) Chapter 337, Statutes of 2022) that it is the policy of the state to do both of the following:

   a) Achieve net zero GHG emissions as soon as possible but no later than 2045; and,
   b) Ensure that by 2045, GHG emissions are reduced to at least 85% below 1990 levels.

FISCAL EFFECT: Unknown

COMMENTS: Mobile source emissions refers to air pollution generated by vehicles, engines, and equipment that can be moved from one location to another. The fossil fuels that power mobile sources are the largest contributors to the formation of ozone, GHG emissions, fine particulate matter ($PM_{2.5}$), and toxic diesel particulate matter. In California, they are responsible for approximately 80% of smog-forming nitrogen oxide (NO_x) emissions. They also represent about 50% of GHGs when including emissions from fuel production, and more than 95% of toxic diesel particulate matter emissions. Statewide, more than 21 million out of over 39 million Californians live in areas that exceed the federal ozone standards; within these areas, there are many low-income and disadvantaged communities that are exposed to not only ozone, but also particulate and toxic, pollutant levels significantly higher than the federal standards which have immediate and detrimental health effects.

The National Ambient Air Quality Standards (NAAQS). The Clean Air Act of 1970 instructs the U.S. Environmental Protection Agency (USEPA) to set primary NAAQS to protect public health, and secondary NAAQS to protect plants, forests, crops and materials from damage due to exposure to six air pollutants. These pollutants include: particulate matter, ozone, nitrogen oxides, sulfur oxides, carbon monoxide, and lead.

Federal law (42 United States Code 7409 and 7410) requires that all states attain the NAAQS and develop State Implementation Plans (SIP) for nonattainment areas to attain the NAAQS, and attainment areas to maintain attainment. Failure of a state to reach attainment of the NAAQS by the target date can trigger penalties, including withholding of federal highway funds.

Under State law (Health and Safety Code (HSC) 39602), CARB is responsible for developing the SIP emission reduction strategies for cars, trucks, and other mobile sources to meet the requirements in the Clean Air Act. The California Department of Pesticide Regulation (DPR) is the State agency responsible for controlling pesticide emissions. Local air districts are primarily responsible for controlling emissions from stationary sources such as factories and power plants. CARB coordinates closely with the local air districts in the development of attainment plans which are then incorporated into the SIP.

Shipping and CHE. A shipping container is a large standardized container designed to be used across different modes of transport—from ship to rail to truck—without unloading or reloading the cargo. Container ports are facilities where cargo or shipping containers are transferred between different vehicles and machinery to move goods, both containerized and bulk. CHE such as yard trucks (hostlers), container handlers, and forklifts are central to port operations.

Most port equipment is powered by diesel or gasoline. Emissions from ports contribute to poor air quality that affects not only port workers, but also those who live and work in neighboring communities. Often these are low-income or disadvantaged communities. Diesel- and gasoline powered port equipment also produces GHGs, contributing to climate change. In recent years, several ports have set goals to become zero-emission, or "green" ports, including the Port of Hueneme, and the larger Ports of Long Beach and Los Angeles.

CARB adopted the Mobile Cargo Handling Equipment Regulation on December 8, 2005 and amended it in 2011, to reduce toxic and criteria emissions to protect public health and it was fully implemented by the end of 2017. The regulation requires CHE to use the Best Available Control Technology and has achieved a 91% reduction in diesel particulate matter and a 74% reduction in oxides of nitrogen (NO_x). CARB staff are currently assessing the availability and

performance of zero-emission technology as an alternative to all combustion-powered cargo equipment and evaluating additional solutions that may include efficiency improvements.

CARB plans to amend its regulation to transition CHE to zero-emission. According to a proposal from CARB in 2018: "Staff would assess the availability and performance of zero-emission technology as an alternative to all combustion-powered cargo equipment and evaluate additional solutions that may include efficiency improvements. The regulatory amendments would propose an implementation schedule for new equipment and facility infrastructure requirements, with effective dates beginning in 2026. CARB staff would also consider opportunities to prioritize the earliest implementation in or adjacent to the communities most impacted by air pollution." In CARB's potential action, all mobile equipment at ports and rail yards would be subject to new requirements for zero-emission. Although CARB previously suggested effective dates beginning in 2026, CARB has not yet initiated the rulemaking process.

Powering CHE. Increasingly, CHE may be powered by cleaner, alternative fuels, such as electricity, hydrogen, compressed natural gas (CNG), liquefied natural gas (LNG), and liquefied petroleum gas (LPG). The table below shows the types of fuel that various types of power CHE can use today. Cleaner alternative power sources are developing and more will be available in the future.

Equipment	Gas	Diesel	CNG	LNG	LPG	Hybrid	Electric	Fuel Cell
Automated Guided Vehicle							✓	
Chassis Rotator		✓						
Container Crane		✓					✓	
Forklift	✓	✓	✓		✓		✓	✓
Log Stacker		✓						
Material Handler		✓				✓	✓	
Mobile Crane		✓					✓	
Pallet Jack							✓	
Reach Stacker		✓					✓	
Rubber-Tired Gantry Crane		✓				✓	✓	
Side Handler		✓			✓		✓	
Straddle Carrier		✓				✓	✓	
Terminal Tractor	✓	✓	✓	✓			✓	
Top Handler		✓					✓	

Source: Argonne National Laboratory, Cargo Handling Equipment at Ports, March 2022

Hydrogen for CHE. In October 2023, the U.S. Department of Energy (DOE) awarded $1.2 billion to California's Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES) through the Regional Clean Hydrogen Hubs Program created under the Bipartisan Infrastructure Law. ARCHES is a statewide public-private partnership to produce and create a market for renewable hydrogen. The ARCHES program is expected to focus on hydrogen infrastructure projects in support of three hard-to-decarbonize sectors: heavy-duty vehicles, power plants, and ports.

Federal funding for ARCHES is currently facing uncertainty. On March 26, 2025, Politico reported that a list circulating internally at the DOE suggested cutting funding to ARCHES, along with the three other hydrogen hubs located in democratic leaning states. Politico adds "The funding cuts are under consideration amid President Donald Trump's directive to cut government waste and eliminate climate-focused spending enacted during the Biden administration. Previous submissions for spending cuts from DOE offices included potentially eliminating federal funding for all seven of the hydrogen hub projects."

Although most hydrogen strategies have focused on zero-emission hydrogen fuel cell (H_2FC) technology, there has been renewed interest in hydrogen-powered internal combustion engines (H_2 ICEs). Over the last few years both the public and private sector have explored H_2 ICEs for heavy-duty trucking and CHE applications. The DOE recently awarded $10.5 million total, with individual awards of $3.5 million each, to PACCAR Inc., Cummins Inc. and MAHLE Powertrain LLC to develop hydrogen combustion engines for medium- and heavy-duty applications. A number of heavy-duty engine manufacturers and light-duty car makers have also announced H_2 ICE prototypes in the works, as government regulations require them to decarbonize.

H_2 ICEs are an old pre-commercial technology. Due to similarities with traditional gasoline and diesel internal combustion engines, H_2 ICEs are much cheaper than H_2 FC technology in terms of manufacturing cost. H_2 ICEs can operate flexibly as bi-fuel systems, using either diesel or hydrogen, and can run on much less purified hydrogen as compared to H_2 FC systems, which require high purity hydrogen.

Unlike H_2 FC technology, however, H_2 ICEs would not be considered zero-emission under existing state regulations, since the high operating temperatures of H_2 ICEs generate NO_x and trace carbon dioxide (CO_2) emissions (from engine oil). However, H_2 ICEs produce significantly lower levels of other pollutant species compared to diesel-powered engines, and using optimized combustion processes and catalytic conversion after-treatment systems, tailpipe NO_x emissions from H_2 ICEs can be reduced to near zero.

Some studies have shown that the CO_2 emissions profile of hydrogen internal combustion engine technology may not be substantially less than diesel if emissions from hydrogen generation are included. Currently, hydrogen is largely produced from methane, with limited production of "green hydrogen" using cleaner solar or wind energy. The CO_2 emissions from hydrogen generation similarly apply to H_2 FC technology.

The state has prioritized advancement of zero-emission technologies as part of its climate goals. Among the fuel types listed above, only electric and fuel cell are considered to be zero-emission technologies. However, in Europe, H_2 ICE-equipped heavy duty vehicles are sanctioned as a "zero-emission" technology as long as they satisfy CO_2 emissions limits of less than 1 g CO_2/kWh or less than 1g CO_2/km. Hydrogen-powered internal combustion engines are the only known internal combustion engine that meet these EU regulations.

Committee comments: The transition of CHE at seaports and intermodal railyards to zero-emission is challenged by a lack of zero-emission CHE combined with the difficulty of providing enough transmission infrastructure or hydrogen supply chains to support this equipment. This bill proposes to address that challenge by providing a useful life reassurance on new hydrogen–powered CHE, and more specifically, H_2 ICE-powered CHE, that would cumulatively decrease

emissions over the regulatory baseline, while also providing a transitional technology to convert port operations to hydrogen fuel cells.

Though there is no prohibition on the use of H_2 ICE-powered CHE today, H_2 ICE-powered CHE are currently in development and may not be available to use for several years. The useful life of traditional CHE can be up to 24 years, so this bill will likely result in front loading the purchases of 'not quite zero' emission cargo equipment that would then be in service for up to 24 years, assuming a comparable useful life of hydrogen-powered CHE to diesel CHE. To address concerns related to the non-zero emissions from H_2 ICE technology, the author may wish to add provisions to this bill, such as requiring covered equipment to use renewable hydrogen (or hydrogen not derived from fossil fuels) or grant CARB discretion to require purchase of GHG offsets for any future emissions by hydrogen-powered CHE in excess of regulatory requirements for zero emission.

With the next CHE amendment on the horizon, this bill may pose a complicated endeavor for only a short-term window of opportunity. It is possible that by the time CARB establishes guidelines, there will be a zero-emission cargo handling regulation in development and soon to be implemented. As an alternative to the bill, CARB could consider incorporating useful life provisions into the future zero-emission cargo handling regulation.

In addition, this bill could have secondary impacts on ports' efforts to upgrade their infrastructure in preparation for cleaner technologies. Specifically, because hybrid and transitional technologies allow for equipment to partially continue to operate as it always has, these technologies may not necessitate ports to completely upgrade their infrastructure in preparation for fully zero-emission hydrogen equipment. Allowing for "transitional technologies" to operate at the ports could delay necessary infrastructure upgrades, delay ports' transition to fully zero-emission technologies, and delay expected cost decreases in zero-emission CHE that would result from increased adoption and manufacturing economies of scale.

The current landscape of federal funding uncertainty for ARCHES and other hydrogen hubs will likely delay the buildout of hydrogen infrastructure in California and possibly nationwide. The consequences will not only effect the pace at which hydrogen supply reaches the ports, it will also likely keep the cost of hydrogen at elevated prices, undercutting the cost effectiveness of equipment covered in this bill.

Additionally, while it is technologically feasible to ensure minimal NO_x emissions from H_2 ICE, this bill does not contain standards for NO_x emissions. The author may consider including a NO_x emission standard to align with California's definition of zero-emissions or add requirements for combustion optimization processes and the inclusion of catalytic conversion after-treatment systems on equipment deployed under the provisions in this bill.

According to the author. "California must reduce emissions from Cargo Handling Equipment (CHE) while ensuring ports remain competitive in global trade. However, operators hesitate to invest in lower-emission equipment due to concerns about future regulations that could phase it out before the end of its useful life. AB 605 addresses this by allowing transitional CHE that meets EU decarburization standards to be used for its full lifespan, ensuring near-term emissions reductions while paving the way for a full transition to zero-emission (ZE) technology. By providing regulatory certainty, the bill accelerates emissions reductions in disadvantaged communities near ports while supporting the state's long-term climate goals."

Arguments in support. The South Bay Association of Chambers of Commerce writes, "AB 605 establishes the Lower Emissions Equipment at Seaports and Intermodal Yards Program, incentivizing ports to adopt transitional low-emission cargo-handling equipment—like cranes and forklifts—while zero-emission technologies mature. Crucially, it prohibits the State Air Resources Board from restricting equipment purchased under this program before December 31, 2027, offering businesses regulatory certainty. By aligning with EU emission standards, the bill ensures California ports remain competitive globally, preventing cargo diversion to less-regulated regions."

Double referral. This bill is double referred to the Assembly Natural Resources Committee and will be heard by that Committee as it relates to issues under its jurisdiction.

Related legislation. AB 2760 (Muratsuchi) would have established the Lower Emissions at Seaports and Intermodal Yards Program, administered by CARB, to certify CHE that reduces cumulative emissions compared to current regulatory baseline as "covered equipment" under the program, and further prohibits CARB from requiring the mandatory retirement, replacement, retrofit, or repowering of covered equipment until the end of its useful life. *AB 2760 died in Assembly Appropriations Committee.*

AB 1743 (Bennett, Legislative Session 2023-2024) would have established the Lower Emissions Transition Program, requiring CARB to establish guidelines and methodologies for approving project applications for CHE having lower cumulative emissions as compared to regulatory baseline and prohibiting CARB from requiring CHE under an approved project to be replaced or retrofitted with zero-emission technology before the end of useful life of the CHE. *AB 1743 died in Assembly Appropriations Committee.*

SB 1 (Beall) Chapter 5, Statutes of 2017, in addition to increasing taxes and fees to raise $50 billion over ten years in new transportation revenues, provides owners of commercial motor vehicles certainty about the useful life of engines certified by CARB and other applicable agencies to meet required environmental standards for sale in the state.

AB 998 (Lowenthal), Chapter 821, Statutes of 2003 establishes the Non-Toxic Dry Cleaning Incentive Program (AB 998 Program), which provides incentives for dry cleaners in the state to transition from systems using perchloroethylene (Perc), a toxic air contaminant and potential human carcinogen to non-toxic, non-smog forming systems. AB 998 assesses a per gallon fee on Perc distributors, which then funds grants for dry cleaners to adopt dry cleaning systems using non-toxic and non-smog forming technologies.

REGISTERED SUPPORT / OPPOSITION:

Support

Cleanearth4kids.org
Long Beach Area Chamber of Commerce
Pacific Merchant Shipping Association
South Bay Association of Chambers of Commerce
The Climate Reality Project Orange County Chapter
The Climate Reality Project, California State Coalition
The Climate Reality Project, Los Angeles Chapter
The Climate Reality Project, San Diego Chapter

The Climate Reality Project, San Fernando Valley CA Chapter

Opposition

None on file

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