



# REVIEW OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT WAREHOUSE INDIRECT SOURCE RULE (ISR)

STUDY CONDUCTED BY:

**RAMBOLL**

---

## CONTACT

Sarah Wiltfong, Chief Public Policy and Advocacy Officer  
[sarah@supplychainfederation.com](mailto:sarah@supplychainfederation.com)

## EXECUTIVE SUMMARY

Warehouses are facing increased scrutiny due to localized air quality and environmental justice concerns linked to heavy-duty truck traffic. With long-standing state and federal mobile-source regulations potential weakening, several U.S. states and air districts are considering Warehouse ISRs modeled on South Coast Air Quality Management District (SCAQMD) Rule 2305 - Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program. Rule 2305 applies to 100,000 square feet or larger facilities and ties annual compliance obligations to truck trip activity.

To determine if ISRs can deliver real, incremental emission reductions, Supply Chain Federation (SCF) commissioned Ramboll to evaluate the WAIRE Program's effectiveness and its costs and market implications. SCF released the Ramboll study on June 23, 2025. Key findings include:

- The WAIRE Program has not resulted in the emission reductions that it claims; most reported decreases in NO<sub>x</sub> (oxides of nitrogen) and DPM (diesel particulate matter) are attributable to existing mobile-source regulations rather than the ISR.
- Actual compliance costs are three to nine times higher than SCAQMD's initial estimates.
- Because warehouse operators have limited control over visiting trucks and their facilities, the WAIRE Program primarily acts as a tax, imposing a significant financial burden on the industry and raising the risk of economic and emissions leakage.

SCAQMD released the 3rd Annual Report for the WAIRE Program in January 2026, covering implementation from May 7, 2021 through August 31, 2025. Ramboll reviewed the new data and updated its analysis; the core conclusions remain unchanged. Overall, the evidence suggests that Warehouse ISRs, when implemented in isolation or as partial substitutes for robust mobile-source standards, are unlikely to deliver meaningful air quality improvements and may impose significant economic and administrative burdens on both industry and regulators.

## REVIEW OF THE SOUTH COAST AQMD WAREHOUSE INDIRECT SOURCE RULE (ISR)

### 1. Emission Benefits of Near Zero Emission and Zero Emission Truck Visits in the South Coast Air Basin are a result of Existing and Previous Statewide Vehicle and Fuel Regulations rather than the WAIRE Program

While the WAIRE Program awards WAIRE points for near zero emission (NZE) and zero emission (ZE) truck visits as a means to encourage the use of cleaner trucks and reduce regional and localized emissions, the presence of these cleaner trucks in the local fleets is predominantly a result of existing and previous Statewide vehicle and fuel regulations in California such as the California Air Resources Board's (CARB's) Truck and Bus Regulation,<sup>1</sup> the Low Carbon Fuel Standards (LCFS) Program,<sup>2</sup> the Advanced Clean Truck Regulation,<sup>3</sup> and the Advanced Clean Fleets Regulation.<sup>4</sup> Consequently, emission reductions from these NZE and ZE truck trips claimed by the WAIRE Program are actually attributable to these Statewide vehicle and fuel regulations rather than the WAIRE Program as claimed by SCAQMD staff. This is corroborated by United States Environmental Protection Agency's regulatory conclusion<sup>5</sup> that they "did not find a sufficient basis to credit Rule 2305 with achieving a specific amount of emissions reductions". Hence, it is more effective to adopt vehicle and fuel standards to reduce transportation emissions rather than ISRs. Additional details on emission benefit claims for NZE and ZE visits under the WAIRE Program are provided below.

#### a. Near Zero Emission Truck Visits

The early adoption of low nitrogen oxides (NOX) natural-gas (NG) trucks in California has been largely driven by the state's in-use vehicle and fuel regulations such as CARB's Truck and Bus Regulation and the LCFS Program, which mandate replacement of high-emission heavy-duty vehicles and incentivizes use of low carbon fuels, respectively. As shown in Figure 1 below, the Truck and Bus Regulation has reduced over 84% of heavy-duty truck-related Statewide NOX emissions over the last two decades. Meanwhile, the LCFS Program has significantly lowered the cost of renewable natural-gas as a transportation fuel through credit incentives, accelerating the deployment of low NOX NG trucks in California long before the WAIRE Program went into effect. This is corroborated by the truck population and vehicle miles traveled (VMT) in Figure 2, which shows a gradual increase in NG trucks since the 2010s.

<sup>1</sup> CARB. Truck and Bus Regulation. Available at: <https://ww2.arb.ca.gov/our-work/programs/truck-and-bus-regulation>. Accessed: April 2026.

<sup>2</sup> CARB. Low Carbon Fuel Standard. Available at: <https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard>. Accessed: April 2026.

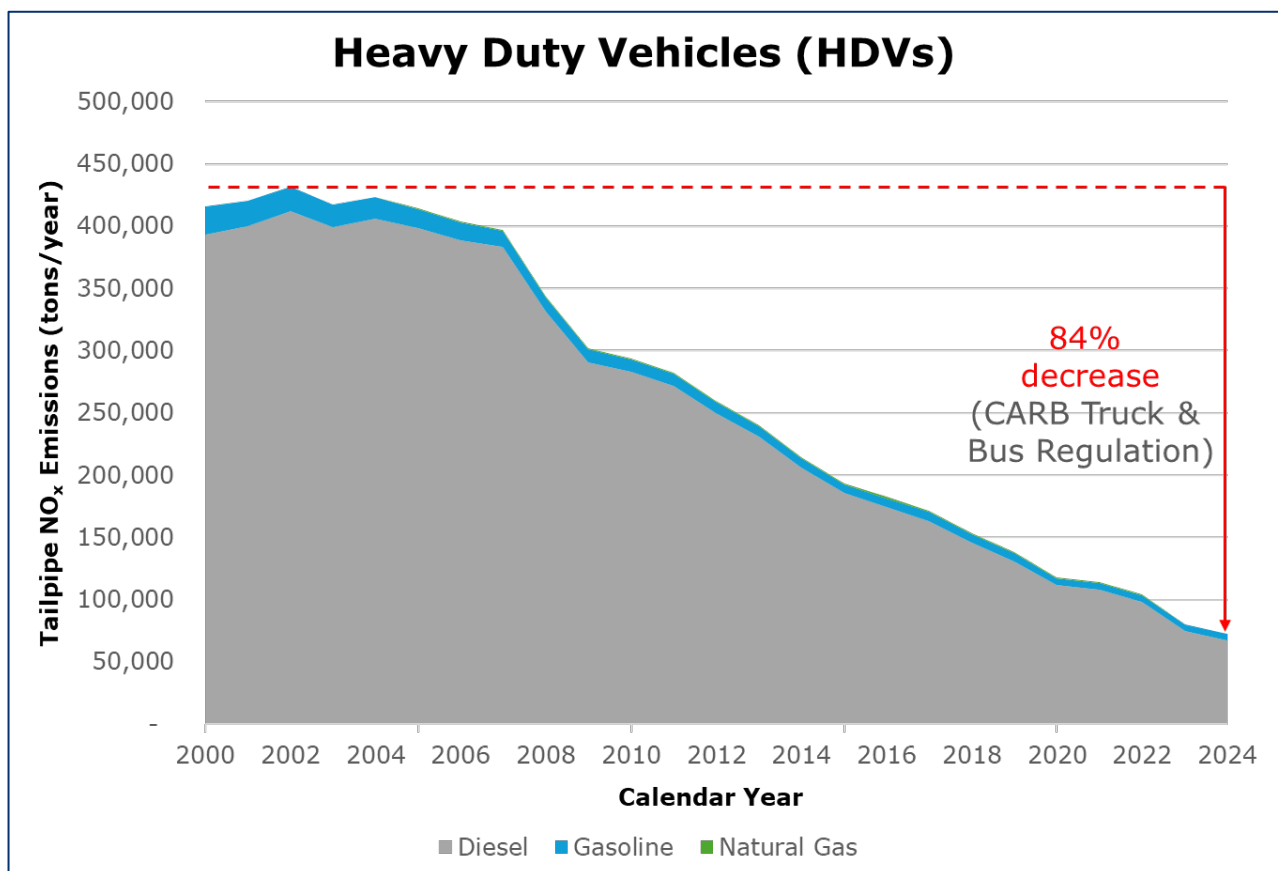
<sup>3</sup> CARB. Advanced Clean Trucks Regulation. In 2025, the United States Congress revoked the U.S. Environmental Protection Agency waiver that allowed California to implement the rule. The resolution was signed into law in June 2025, creating regulatory uncertainty and prompting ongoing legal challenges regarding California's authority to enforce the program. Available at: <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks>. Accessed: April 2026.

<sup>4</sup> CARB. Advanced Clean Fleets Regulation. CARB adopted a September 25, 2025 Board resolution that repealed the regulation's drayage, high-priority, and federal fleet requirements. As a result, the rule currently applies primarily to state and local government fleets, while broader fleet transition mandates for private operators are no longer in effect. Available at: <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets>. Accessed: April 2026.

<sup>5</sup> Federal Register Air Plan Approval; California; South Coast Air Quality Management District is available here: <https://www.federalregister.gov/documents/2024/09/11/2024-20349/air-plan-approval-california-south-coast-air-quality-management-district>. Accessed: April 2026.

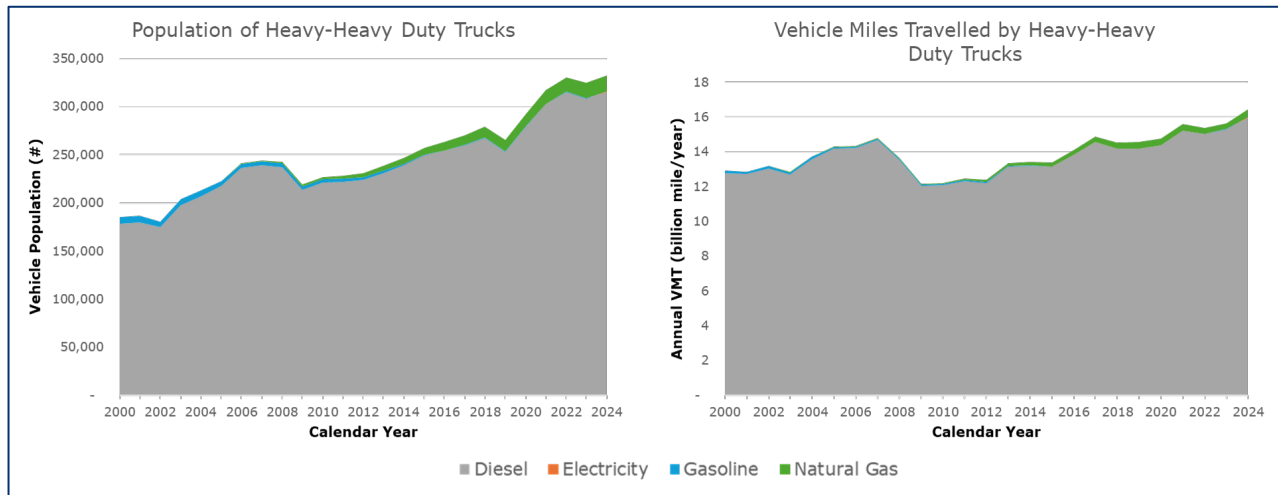
With respect to NZE trucks recognized by the WAIRE Program, Rule 2305 specifies that qualifying NZE trucks must be equipped with engines certified to meet the lowest optional NO<sub>x</sub> standard applicable at the time of manufacture as defined in the California Code of Regulations Title 13, Section 1956.8. Beginning in 2022 when the WAIRE Program went into effect, the lowest optional NO<sub>x</sub> standard dropped to 0.01 grams per horsepower hour (g/hp-hr). However, to date, no engines have been certified to meet this 0.01 g/hp-hr standard. As a result, warehouse operators are unable to purchase new NZE trucks (with Model Year (MY) 2022 or newer engines) even if they are incentivized to do so under the WAIRE Program. All NZE trucks that are currently in operation are equipped with Model Year 2021 or older engines certified to the 0.02 g/hp-hr optional low NO<sub>x</sub> standard. Given that these engines predate the WAIRE Program's initial implementation date, NO<sub>x</sub> emission reductions from NZE truck trips cannot be attributed to the WAIRE Program. For 2022, 2023, and 2024, AQMD estimated NO<sub>x</sub> reductions from NZE truck visits at 0.41 tons per day (tpd), 0.52 tpd, and 0.74 tpd respectively.<sup>6</sup> Excluding these emission benefits would reduce the WAIRE Program's estimated regional NO<sub>x</sub> reductions to 0.24 tpd, 0.42 tpd and 0.73 tpd, respectively.

**Figure 1. Temporal trend of tailpipe NO<sub>x</sub> emissions from heavy-duty trucks**



<sup>6</sup> SCAQMD. 2026. 3<sup>rd</sup> Annual Report for the WAIRE Program. January. Available at: <https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/3rd-annual-report-for-the-waire-program.pdf>. Accessed: April 2026.

**Figure 2. Temporal trend of heavy-duty truck population and VMT by technology type.**



**b. Zero Emission Trucks**

Similarly, the growth of ZE trucks in California today is largely driven by state policies and incentive programs and not by the WAIRE Program. Key catalysts include:

- The Advanced Clean Trucks (ACT) regulation, whose manufacturer sales mandate began phasing in during 2024 and whose credit-banking and trading provisions encouraged early zero emission vehicle (ZEV) sales even before the first compliance year;
- Financial support from the Hybrid and Zero Emission Truck and Bus Voucher Incentive Project (HVIP) and credits available under the LCFS Program;
- The Advanced Clean Fleets (ACF) regulation, which required ZE fleet transition; and
- Improving cost-effectiveness of ZE technologies for certain vehicle classes.

Together, these measures have spurred ZE truck adoption over the past five years, meaning that the NO<sub>x</sub> reductions associated with ZE truck trips in the South Coast Air Basin cannot be attributed to the WAIRE Program. With CARB’s repeal of the ACF’s High-Priority and Drayage Truck Fleet Requirements<sup>7</sup> and Congress’s joint resolution rejecting the Clean Air Act waiver for ACT,<sup>8</sup> two of the key drivers for ZE truck adoption in California have been removed. Future growth in the ZE truck market is therefore likely to depend mainly on remaining incentives and continued improvements in technology cost-effectiveness, rather than the requirements imposed by the ISR.

<sup>7</sup> CARB adopted a September 25, 2025 Board resolution that repealed the regulation’s drayage, high-priority, and federal fleet requirements. As a result, the rule currently applies primarily to state and local government fleets, while broader fleet transition mandates for private operators are no longer in effect. Details are available at: <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets>. Accessed: April 2026.

<sup>8</sup> United States Code. 2025. Public Law 119-15 - Joint resolution providing congressional disapproval under chapter 8 of title 5, United States Code, of the rule submitted by the Environmental Protection Agency relating to "California State Motor Vehicle and Engine Pollution Control Standards; Heavy-Duty Vehicle and Engine Emission Warranty and Maintenance Provisions; Advanced Clean Trucks; Zero Emission Airport Shuttle; Zero-Emission Power Train Certification; Waiver of Preemption; Notice of Decision". Available at: <https://www.govinfo.gov/app/details/PLAW-119publ15>. Accessed: April 2026.

## 2. Emission Benefits of Zero Emission Yard Hostlers Claimed by SCAQMD's WAIRE Program are Overstated

In SCAQMD's Final Staff Report for the Warehouse ISR (also known as the "WAIRE Program"), the baseline NO<sub>x</sub> emissions from all yard hostlers associated with warehouses that would be subject to the WAIRE Program, was estimated to be 0.09 tpd for 2023 and 0.08 tpd for 2031 (see Table 13 in the SCAQMD Final Staff Report).<sup>9</sup> The 3<sup>rd</sup> Annual Report for the WAIRE Program<sup>10</sup> claimed that the WAIRE Program had reduced emissions from yard hostlers by 0.22 tpd in 2022, 0.31 tpd in 2023, and by 0.52 tpd in 2024, which is approximately three to seven times higher than the baseline emissions reported for these equipment.

This unrealistic emission benefit estimate for yard hostlers is a result of SCAQMD's flawed assumption that all zero emission (ZE) hostler usage reported under the WAIRE Program represent replacements of equivalent diesel-fueled yard hostlers. However, there is no requirement in the WAIRE Program to retire diesel yard hostlers with ZE yard hostlers added to facilities. Instead, the WAIRE Program allows users of ZE yard hostlers to earn WAIRE points that can be used to meet their compliance requirements without assuring such retirements or replacements.

## 3. Emission Benefits of Zero Emission Truck Visits Claimed by SCAQMD's WAIRE Program are Overstated

The average one-way truck trip lengths used to estimate the baseline inventory for the WAIRE Program are 39.9 miles/trip and 14.2 miles/trip for heavy-heavy (Class 8) and medium-heavy (Class 4-7) duty trucks, respectively.<sup>11</sup> While the baseline inventory does include a discounting factor of 22.2% for the trips made by Class 8 trucks (reduces one-way trip length to 31.0 miles/trip) to account for trips made between warehouses, there is no such discounting for the Class 4-7 trucks.<sup>12</sup>

It appears that these average one-way trip lengths used to develop the baseline inventory for the WAIRE Program were also used by SCAQMD staff to estimate the emission benefits of ZE truck trips that are reported in the 3<sup>rd</sup> Annual Report for the WAIRE Program.<sup>13</sup> The use of these average one-way trip lengths likely overestimates the emissions benefits in many instances as ZE trucks have a smaller range than conventional diesel trucks and are therefore typically deployed on shorter routes.

<sup>9</sup> SCAQMD. 2021. Final Staff Report for Proposed Rule 2305 – Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program and Proposed Rule 316 – Fees for Rule 2305. May. Available at: <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10>. Accessed: April 2026.

<sup>10</sup> SCAQMD. 2026. 3<sup>rd</sup> Annual Report for the WAIRE Program. January. Available at: <https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/3rd-annual-report-for-the-waire-program.pdf>. Accessed: April 2026.

<sup>11</sup> SCAQMD. 2021. Final Staff Report for Proposed Rule 2305 – Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program and Proposed Rule 316 – Fees for Rule 2305. May. Available at: <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10>. Accessed: April 2026.

<sup>12</sup> *Ibid.*

<sup>13</sup> SCAQMD. 2026. 3<sup>rd</sup> Annual Report for the WAIRE Program. January. Available at: <https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/3rd-annual-report-for-the-waire-program.pdf>. Accessed: April 2026.

Additionally, some warehouse operators have multiple warehouse buildings that are located within a one-mile radius, with one building acting as an overflow for the other. In such instances, the trips made between these two warehouse buildings are counted twice under the WAIRE Program, once at each warehouse building as both warehouse buildings are subject to the program.

Another common example of a situation where use of these average one-way trip lengths would result in an overestimation of emission benefits is for transport of goods from a manufacturing facility<sup>14</sup> to a nearby warehouse facility (such as an overflow warehouse for finished goods storage), both of which are subject to the WAIRE Program.

Finally, yard hostlers registered with the Department of Motor Vehicles can operate on-road. Some warehouse operators that transport goods over short distances use their ZE yard hostlers to make these trips. In such instances, the emission benefits associated with the truck trips made by these ZE yard hostlers are double counted and reported under the "ZE Truck Trip" and the "ZE Yard Hostler Usage" emission benefit categories.

#### 4. Solar Panels do not Provide Localized Emission Reductions

The stated purpose of Rule 2305 is to "reduce regional and local emissions of NO<sub>x</sub> and DPM" and "improve public health, especially in communities that are located near warehouses."<sup>15</sup> As noted in the 3<sup>rd</sup> Annual Report for the WAIRE Program,<sup>16</sup> solar panel usage is among the four primary actions completed by warehouse operators that generated emission reductions in 2023 and 2024. While solar panels are installed on-site at individual warehouses in the South Coast Air Basin, emissions reductions from solar panel usage are not generated locally for the benefit of communities located in and around these warehouses. SCAQMD staff acknowledge this but go a step further to state that solar panels "...reduce emissions associated with a warehouse by reducing power produced from local NG fueled power plants."<sup>17</sup> This statement is incorrect as most of the electric power supplied to the South Coast Air Basin is not produced by local NG fueled power plants. Hence, use of these solar panels to generate electricity at warehouses in the region would not generate the amount of NO<sub>x</sub> emission benefits that SCAQMD staff claim.

Furthermore, as noted in the Final Staff Report for the Warehouse ISR, "some warehouses already operate solar panels that generate electricity" and the usage of solar panels can result in a cost savings, based on the price of electricity, over the life of the panel.<sup>18</sup> Similarly, staff identified 214 applicable warehouses with solar panel systems installed prior to the adoption of the WAIRE Program and noted that "solar panel system installations also offer additional flexibility for

---

<sup>14</sup> A manufacturing facility with a building square footage over 100,000 square feet that utilizes over 50,000 square feet of the total building area for warehousing activities would be subject to the WAIRE Program.

<sup>15</sup> SCAQMD. 2021. Final Staff Report for Proposed Rule 2305 – Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program and Proposed Rule 316 – Fees for Rule 2305. May. Available at: <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10>. Accessed: April 2026.

<sup>16</sup> SCAQMD. 2026. 3<sup>rd</sup> Annual Report for the WAIRE Program. January. Available at: <https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/3rd-annual-report-for-the-waire-program.pdf>. Accessed: April 2026.

<sup>17</sup> SCAQMD. 2021. Final Staff Report for Proposed Rule 2305 – Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program and Proposed Rule 316 – Fees for Rule 2305. May. Available at: <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10>. Accessed: April 2026.

<sup>18</sup> Ibid.

warehouse operators, and this technology is also a common consideration for warehouse operators to meet their corporate sustainability goals.” Thus, many warehouses have existing solar panels or install panels for economic reasons that have nothing to do with the WAIRE Program compliance. Nonetheless, SCAQMD staff claim that the usage of solar panels to comply with the WAIRE Program has resulted in local reductions of NO<sub>x</sub> emissions.<sup>19</sup>

## 5. Unintended Consequences

The additional electric vehicle (EV) charging infrastructure installed by warehouses to generate WAIRE points places significant electricity demand on the grid. The majority of EV charging is likely to occur during night-time hours when solar panels cannot supply the required electricity. This additional demand is likely to result in the operation of peaker power plants that may not otherwise operate, increasing emissions elsewhere.

## 6. SCAQMD Underestimated the Cost Burden of Rule Compliance and the Negative Financial Impacts on the Industry. Ramboll estimates that the Compliance Costs for the SCAQMD Warehouse ISR are likely three to nine times higher than the SCAQMD Estimate. Additional Cost-Benefit Analysis is Warranted Before This Type of Rule is Adopted in Other Regions.

SCAQMD’s Socioeconomic Impact Assessment for Rule 2305<sup>20</sup> estimated that “the maximum cost warehouse operators would be expected to incur is about \$0.83/sq. ft./yr. from a mitigation fee-only scenario,” and that these costs could be reduced to as low as \$0.14/sq. ft./yr. if warehouse operators meet their compliance obligation using third-party Class 8 ZE truck visits to their facilities.

SCAQMD’s lower end cost estimate of \$0.14/sq. ft./yr. was based on staff’s assumption that there would be an increased number of Class 8 ZE trucks operating in Southern California. This assumption is less likely due to CARB’s repeal of the ACF’s High-Priority and Drayage Truck Fleet Requirements<sup>21</sup> and the Congress’s joint resolution rejecting the Clean Air Act waiver for ACT.<sup>22</sup> As a result, warehouse operators will not be able meet their compliance requirements by using third-party ZE truck visits.

- 
- <sup>19</sup> SCAQMD. 2026. 3<sup>rd</sup> Annual Report for the WAIRE Program. January. Available at: <https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/3rd-annual-report-for-the-waire-program.pdf>. Accessed: April 2026.
- <sup>20</sup> SCAQMD. 2021. Final Socioeconomic Impact Assessment for Proposed Rule 2305 – Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program and Proposed Rule 316 – Fees for Rule 2305. May. Available as Attachment K at: <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10>. Accessed: April 2026.
- <sup>21</sup> CARB adopted a September 25, 2025 Board resolution that repealed the regulation’s drayage, high-priority, and federal fleet requirements. As a result, the rule currently applies primarily to state and local government fleets, while broader fleet transition mandates for private operators are no longer in effect. Details are available at: <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets>. Accessed: April 2026.
- <sup>22</sup> United States Code. 2025. Public Law 119-15 - Joint resolution providing congressional disapproval under chapter 8 of title 5, United States Code, of the rule submitted by the Environmental Protection Agency relating to "California State Motor Vehicle and Engine Pollution Control Standards; Heavy-Duty Vehicle and Engine Emission Warranty and Maintenance Provisions; Advanced Clean Trucks; Zero Emission Airport Shuttle; Zero-Emission Power Train Certification; Waiver of Preemption; Notice of Decision". Available at: <https://www.govinfo.gov/app/details/PLAW-119publ15>. Accessed: April 2026.

Ramboll conducted a technical analysis supported by market research to assess the actual compliance costs for the following realistic compliance scenarios:<sup>23</sup>

- Scenario 1: The warehouse operator pays mitigation fees to meet its compliance obligation.
- Scenario 2: The warehouse operator meets its compliance obligation by leasing one or more Class 8 ZE trucks, purchasing EV chargers to fuel these trucks, and using these Class 8 ZE trucks to move goods to and from the warehouse (maximum one truck visit per ZE truck per day).
- Scenario 3: The warehouse operator meets its compliance obligation by purchasing one or more Class 8 ZE trucks and EV chargers to fuel these trucks and using these Class 8 ZE trucks to move goods to and from the warehouse (maximum one truck visit per ZE truck per day).
- Scenario 4: The warehouse operator meets its compliance obligation by purchasing a Class 8 ZE yard truck and an EV charger to fuel this yard truck and operates this yard truck for approximately 1,000 hours per year.

Our findings indicate that the compliance cost for Scenario 1 (compliance using mitigation fee-only) is approximately \$0.81/sq. ft./yr. which is similar to SCAQMD’s assessment. However, the costs associated with the acquisition and use of Class 8 ZE trucks to meet the compliance obligation (Scenarios 2 and 3) range from \$0.46 to \$1.32/sq. ft./yr (see Attachment Table 1 for details), depending on the type of warehouse and methods of ZE truck acquisition.<sup>24</sup> These costs are 3.3 to 9.4 times the \$0.14/sqft/yr value that staff estimated for the only Class 8 ZE truck visit scenario that they analyzed in the Socioeconomic Impact Assessment for Rule 2305.<sup>25</sup> The primary reasons for this discrepancy are staff’s assumption that the Class 8 ZE truck fleet visiting the warehouse would be a third-party truck that is not owned by the warehouse operator and staff’s projected decrease in the purchase cost of Class 8 ZE trucks from \$292,544 in 2022 to \$201,351 in 2024 and \$170,748 in 2031.<sup>26</sup> Unfortunately, as noted in a more recent 2024 report from CARB, the purchase price of a Class 8 ZE trucks have actually increased from \$332,757 in 2021 to \$436,839 in 2024.<sup>27</sup> Overall, Ramboll’s findings indicate that the lease and use of Class 8 ZE trucks for rule compliance is more costly than paying mitigation fees (Comparison of Ramboll’s Scenario 2 with Scenario 1). While purchase and use of ZE Class 8 truck (Ramboll’s Scenario 3) could be more cost effective than the mitigation fee payment (Ramboll’s Scenario 1), this requires a sizeable upfront capital investment, posing additional financial risks on business operations.

<sup>23</sup> Note, Ramboll did not analyze any scenarios that consider the use of near-zero emission (NZE) trucks to meet a warehouse operator’s compliance obligation, as no new NZE vehicles are currently available in the market. Existing NZEs may still be in use, but new purchases are not presently an option. Refer to Comment 1a for further details.

<sup>24</sup> Note, these costs represent the incremental cost for acquiring and operating a Class 8 ZE truck as compared to a Class 8 diesel truck and include capital costs for vehicle/charger acquisition and annual fuel and electricity costs over a ten-year period. These costs are presented in 2018 \$ so they can be compared directly to the costs presented in the Staff’s Socioeconomic Impact Assessment for Rule 2305.

<sup>25</sup> SCAQMD. 2021. Final Socioeconomic Impact Assessment for Proposed Rule 2305 – Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program and Proposed Rule 316 – Fees for Rule 2305. May. Available as Attachment K at: <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10>. Accessed: April 2026.

<sup>26</sup> Ibid.

<sup>27</sup> CARB. 2024. Zero-Emission Class 8 Truck Pricing Comparisons – EU & US. Available at: [https://ww2.arb.ca.gov/sites/default/files/2024-12/Zero%20Emission%20Class%208%20Tractor%20Pricing%20Comparisons\\_ADA.pdf](https://ww2.arb.ca.gov/sites/default/files/2024-12/Zero%20Emission%20Class%208%20Tractor%20Pricing%20Comparisons_ADA.pdf). Accessed: April 2026.

Finally, Ramboll’s analysis indicates that cost associated with the purchase and use of ZE yard truck (Scenario 4) to meet the compliance obligation is negligible over a ten-year period. However, this scenario also requires a substantial upfront capital investment.

In summary, AQMD staff has significantly underestimated the cost burden of rule compliance and the negative financial impacts on the industry. Additional thorough cost-benefit analysis utilizing up-to-date, real-world data is essential before this ISR is considered for adoption in other regions.

**7. The SCAQMD Warehouse Indirect Source Rule Will Primarily Serves as a Tax and Poses a Significant Financial Burden on Industry.**

- 8.** The primary action/investment that is proposed to reduce these emissions in Warehouse ISRs, is electrification of truck fleets that service the applicable warehouses. Most warehouse operators, who are the primary target of these ISRs, do not control these trucks or the cargo, or own the warehouse buildings in which they operate. Hence, they are unable to electrify the trucks that visit their warehouses or install the charging infrastructure that would be needed to fuel electric trucks at their warehousing facilities and are forced to choose the mitigation fee option for compliance. Therefore, a Warehouse ISR would effectively serve as a tax.

While SCAQMD’s 3<sup>rd</sup> Annual Report for the WAIRE Program<sup>28</sup> indicates that mitigation fees account for only 5% of the total WAIRE points earned through submitted AWRs in the first three compliance periods (2022, 2023, and 2024), a large portion of these points were early action and/or banked points that were not used towards compliance. This annual report also shows that mitigation fees were used to meet approximately 15% of the total compliance obligation across all warehouses that submitted Annual WAIRE Reports in 2022, 2023, and 2024. However, this value is not a true indicator of how all warehouses in the region would comply with the Warehouse ISR for two reasons:

1. The 3<sup>rd</sup> Annual Report reported that NZE truck trips were the 2<sup>nd</sup> largest category of total WAIRE points earned, accounting for approximately 27% of the total WAIRE points earned. As noted previously, no new NZE vehicles are currently available in the market thus this compliance option will not be sustainable in the long run (refer to Comment 1a for further details).
2. Around 65% of the warehouses subject to SCAQMD’s Warehouse ISR did not submit their Annual WAIRE Reports.<sup>29</sup> Because these warehouses have likely earned no WAIRE points, they would meet their compliance obligations by paying the mitigation fee. If all non-reporting warehouses take this approach, about 70% of the WAIRE Program’s total compliance obligation would end up being satisfied through mitigation fee payments.

As noted in the previous comment (Comment 6), Ramboll’s analyses indicate that the average cost of compliance with SCAQMD’s Warehouse ISR using the mitigation fee payments is approximately \$0.81/sq. ft./yr which ranges from approximately \$113,000 per year for a small warehouse (100,000 sqft) to \$296,000 per year for a large fulfillment center (250,000 sqft).<sup>30</sup> Additionally,

---

<sup>28</sup> SCAQMD. 2026. 3<sup>rd</sup> Annual Report for the WAIRE Program. January. Available at: <https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/3rd-annual-report-for-the-waire-program.pdf>. Accessed: April 2026.

<sup>29</sup> Ibid.

<sup>30</sup> Note, the unit cost of \$0.83/sq. ft./yr is reported in 2018 dollars for easy comparison with SCAQMD’s Socioeconomic Analysis and reflects a ten-year operating period from 2026 to 2035, whereas the total annual costs of \$113,000 and \$296,000 are nominal values for any given year.

warehouse operators would have to expend considerable resources to gather and compile daily truck trip data to meet the recordkeeping and reporting requirements of the rule. This is no small task. While some warehouses have a yard management system that automates the collection of truck trips, other warehouse operators (particularly small businesses) have to do this manually and it places a significant burden on their human and financial resources. Note, even when truck trip data collection is done electronically, there may be multiple electronic systems in place (for example, separate systems to tracking shipping and receiving) and human resources have to be expended to compile the data and perform the necessary quality checks.

It is important to note that SCAQMD's Warehouse ISR affects not just the warehousing industry but also retail (office supplies, grocery stores, etc.), e-commerce, and manufacturing. This is because the rule is applicable to any business that uses 100,000 sq. ft. of indoor space in a single building for warehousing activities, i.e., storage, packaging, labeling, and distribution of goods. Hence, the financial burden imposed by the Warehouse ISR on the industry is considerably larger than initially envisioned.

#### **9. Indirect Source Rules can Result in Emissions Leakage thereby Resulting in Net Emissions Increases**

Emissions leakage can occur when an area implements stricter emission reduction measures, causing a relocation to areas with more relaxed regulations. Proposed Warehouse ISRs that model SCAQMD's WAIRE Program could provide warehouse operators with an option to pay a mitigation fee, effectively making the ISR a tax obligation for warehouse operators who are unable to force the electrification of fleets visiting their facilities. These increased costs to warehouse operators would eventually be passed down to consumers through increased cost of goods and could cause small warehouse operators who are unable to absorb these additional costs to go out of business. Alternatively, warehouses may choose to relocate outside of ISR's jurisdiction to avoid paying these fees. This relocation could result in increased trip lengths and result in a net increase in regional NO<sub>x</sub> emissions.

#### **10. Warehouse Indirect Source Rules will result in a Significant Administrative Burden for Implementing Agencies**

The SCAQMD has allocated 6.3 Full Time Equivalent staff for the implementation of the Warehouse ISR.<sup>31</sup> Despite this allocation, staff are unable to respond to warehouse operators' requests promptly. Staff members often work overtime in the weeks leading up to compliance deadlines to address numerous requests related to annual report preparation and submission. However, they have a large backlog of other requests such as questions regarding rule applicability and compliance/reporting requirements, issues with the use of their online reporting tool (WAIRE POP), and amendments to previously submitted reports. Staff response times vary from 1-2 weeks to several months, with some report amendment related requests remaining unresolved for over a year. Additional staff are necessary for an effective implementation of this rule and the administrative burden of the Warehouse ISR is higher than what is currently perceived.

In addition to creating a substantial implementation team for the rule, SCAQMD has allocated approximately half a million dollars to AgreeYa Solutions, Inc. for the development and maintenance

---

<sup>31</sup> SCAQMD. 2025. Governing Board Package. May 2. Available at: [https://www.aqmd.gov/docs/default-source/agendas/governing-board/2025/brdpkq-2025-may2.pdf?sfvrsn=189d9d61\\_10](https://www.aqmd.gov/docs/default-source/agendas/governing-board/2025/brdpkq-2025-may2.pdf?sfvrsn=189d9d61_10). Accessed: April 2026.

of WAIRE POP.<sup>32,33</sup> Although staff have proactively addressed some of the bugs with the tool's functionality, WAIRE POP still suffers from foundational data integrity issues. Warehouse operators frequently need to contact staff during the report amendment process, requiring backend approval, which significantly slows the process.

SCAQMD's 3rd Annual Report for the WAIRE Program<sup>34</sup> states that 65% of warehouse operators subject to Rule 2305 have not submitted their annual reports. Consequently, SCAQMD's enforcement division has been actively reaching out to these warehouses to bring them into compliance. As of January 16, 2026, a total of 724 Notices of Violations<sup>35</sup> have been issued of which only 200 have been fully resolved.<sup>36</sup>

Furthermore, SCAQMD staff are currently developing the WAIRE Mitigation Program, which will establish a way to provide incentive funding using the collected mitigation fees. This program will likely go live in late August. Additional staff will be required to develop and implement this program. Although the Rule includes a 6.25% surcharge on mitigation fee collection to address administrative costs, its sufficiency remains uncertain.

Overall, the Warehouse ISR imposes a substantial administrative burden not adequately covered by current reporting fees.

---

<sup>32</sup> SCAQMD. 2021. Governing Board Package. August 6. Available at: [https://www.aqmd.gov/docs/default-source/agendas/governing-board/2021/brdpgk-2021-aug6.pdf?sfvrsn=5681d661\\_15](https://www.aqmd.gov/docs/default-source/agendas/governing-board/2021/brdpgk-2021-aug6.pdf?sfvrsn=5681d661_15). Accessed: April 2026.

<sup>33</sup> SCAQMD. 2024. Governing Board Package Agenda NO 6. March 1. Available at: <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2024/2024-mar1-006.pdf?sfvrsn=2>. Accessed: April 2026.

<sup>34</sup> SCAQMD. 2026. 3<sup>rd</sup> Annual Report for the WAIRE Program. January. Available at: <https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/3rd-annual-report-for-the-waire-program.pdf>. Accessed: April 2026.

<sup>35</sup> SCAQMD. 2026. Facilities that have received NOVs under Rule 2305. January 16. Available at: <https://www.aqmd.gov/docs/default-source/compliance/rule-2305/violations-list.pdf>. Accessed: April 2026.

<sup>36</sup> SCAQMD. 2026. Meeting Agenda for the January 23, 2026 Hybrid Mobile Source Committee Meeting. Available at: [https://www.aqmd.gov/docs/default-source/agendas/mobile-source/msc-agenda-012326.pdf?sfvrsn=ac6e6a7e\\_9](https://www.aqmd.gov/docs/default-source/agendas/mobile-source/msc-agenda-012326.pdf?sfvrsn=ac6e6a7e_9). Accessed: April 2026.

**ATTACHMENT**

**Table 1- Cost Analysis Summary for Realistic WAIRE Compliance Scenarios**  
Supply Chain Federation

Scenario	Facility Type	Building Size (sqft)	Compliance Actions	Annual WPCO <sup>1</sup>	Number of Trucks Needed to Meet Annual WPCO	Incremental Cost of Compliance <sup>2</sup> (NPV, 2026\$)	Unit Compliance Cost (2026\$/sqft/yr)	Unit Compliance Cost (2018\$/sqft/yr)
Scenario 1	Warehouse	100,000	Pay Mitigation Fees (No WAIRE Actions/Investments)	106.1	--	\$1,023,297	\$1.02	\$0.79
	Fulfillment Center	250,000	Pay Mitigation Fees (No WAIRE Actions/Investments)	278.8	--	\$2,688,927	\$1.08	\$0.83
Scenario 2	Warehouse	100,000	Lease ZE Class 8 truck(s), ZE Class 8 Truck Visits, EVSE Acquisition(s) (51-149 kW), and EVSE Usage	106.1	2	\$1,720,961	\$1.72	\$1.32
	Fulfillment Center	250,000	Lease ZE Class 8 truck(s), ZE Class 8 Truck Visits, EVSE Acquisition(s) (51-149 kW), and EVSE Usage	278.8	4	\$3,441,922	\$1.38	\$1.06
Scenario 3	Warehouse	100,000	Purchase ZE Class 8 truck(s), ZE Class 8 Truck Visits, EVSE Acquisition(s) (51-149 kW), and EVSE Usage	106.1	2	\$741,403	\$0.74	\$0.57
	Fulfillment Center	250,000	Purchase ZE Class 8 truck(s), ZE Class 8 Truck Visits, EVSE Acquisition(s) (51-149 kW), and EVSE Usage	278.8	4	\$1,482,806	\$0.59	\$0.46
Scenario 4	Warehouse	100,000	Purchase ZE Yard Truck(s), ZE Yard Truck Usage, EVSE Acquisition(s) (19.2-50 kW), EVSE Usage	106.1	1	\$97,624	\$0.10	\$0.08
	Fulfillment Center	250,000	Purchase ZE Yard Truck(s), ZE Yard Truck Usage, EVSE Acquisition(s) (19.2-50 kW), EVSE Usage	278.8	1	\$97,624	\$0.04	\$0.03

**Notes:**

- \$ - dollar
- EVSE - electric vehicle supply equipment
- kW - kilowatt
- NPV - net present value
- sqft - square feet
- WAIRE - Warehouse Actions and Investments to Reduce Emissions
- WPCO - WAIRE points compliance obligation
- yr - year
- ZE - zero-emission

<sup>1</sup> The Annual WPCO is calculated based on truck trips rates obtained from SCAQMD PR 2305 Draft Baseline Emissions Inventory spreadsheet for each facility type. Available at: [https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/pr2305-draft-baseline-emission-inventory\\_v3.xlsx?sfvrsn=6](https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/pr2305-draft-baseline-emission-inventory_v3.xlsx?sfvrsn=6). Accessed: May 2025 and Table 5 of the High-Cube Warehouse Vehicle Trip Generation Analysis. Institute of Transportation Engineers. 2016. Available at: <http://newpromisefarms.com/files/2018/07/HighCube-Warehouse-Oct-2016-Study-ITE.pdf>. Accessed: May 2025.

<sup>2</sup> For Scenario 1, the incremental cost of compliance represents the mitigation fees owed. For Scenarios 2 through 4, the incremental cost of compliance is calculated as the incremental total cost of ownership of ZE compliance actions as compared to the conventional diesel alternatives over a 10-year period. The total cost of ownership estimates include the truck purchase/lease cost, EVSE purchase and installation cost (for ZE trucks), and annual fuel (electricity/diesel) cost.