The Clean Air Action Plan Will Allow Truck NOx Emissions to Increase

The draft Clean Air Action Plan (CAAP) is based upon faulty assumptions and thus flawed analysis. Once corrected, it is clear that NOx emissions from the drayage truck fleet will be allowed to significantly increase in the critical next five-year period.

The proposed Draft CAAP will allow NOx emissions to increase over the next five years (through 12/31/2022) and may provide little to no air quality benefits in the 2023 to 2035 timeframe. Critical deadlines for demonstrating federal air quality attainment are in 2023 and 2031; it is therefore untenable to put for a "clean air action plan" that will allow NOx emissions to increase in the period when they are most required. The structure of the Clean Truck Program elements combined with the increased level of activity (i.e. port volume) and continued deterioration of in-use diesel emissions (as defined by EMFAC) is the primary cause of this emissions increase. Without further definition of potential dirty truck fees, or any kind of commitment to provide incentives for zero and near zero emission trucks, the market will not respond in a manner consistent with the assumptions being made by the Ports in the Draft CAAP. The assumptions about market transition and thus emission benefits – as laid out in the Draft CAAP and accompanying documents – are unrealistic, inconsistent with industry practice and unsupported.

The proposed Clean Trucks Program update is as follows:

- **Beginning in early 2018, new trucks entering the Port’s Drayage Truck Registry must have a 2014 engine model year (MY) or newer.**
- **Beginning in 2023, or when the State’s near-zero-emission heavy-duty engine standard takes effect, new trucks entering the Ports Drayage Truck Registry must meet this near zero standard or better.**
- **Starting in 2023, or when the State’s near-zero-emission heavy-duty engine standard takes effect, all heavy-duty trucks will be charged a rate to enter the ports’ terminals, with exemptions for trucks that meet this near-zero standard or better.**
- **Beginning in 2035, only trucks that meet zero-emissions or the equivalent will be exempt from the rate.**

There are many challenges with each of the above elements.

**DRAFT CAAP CLEAN TRUCK PROGRAM ELEMENT:** Beginning in early 2018, new trucks entering the Port’s Drayage Truck Registry must have a 2014 engine model year (MY) or newer.

- **WHY THIS WILL NOT PROVIDE AIR QUALITY BENEFITS:**
  1. The practice in the port drayage industry is to acquire used diesel trucks and operate these trucks for as long as possible. Port drayage does not have a regular truck replacement cycle that exists in other trucking applications, such as is suggested on page 31 of the Draft CAAP. Prior to the implementation of the first Clean Truck Program, the average asset life of a port
The ACT Now Plan by the California Natural Gas Vehicle Coalition replaces all diesel port trucks with cost-effective ultra-clean trucks over the next 5 years. To learn more, please visit ACTNowLA.org.

drayage truck was approximately 11 years\(^1\). This confirms that the port drayage market seeks to maximize the life of trucks and only replace trucks when the truck can no longer be repaired. New registrations in the PDTR are infrequent and the Ports have offered no data to the contrary. There is overcapacity in the current drayage fleet, therefore attrition will not necessarily result in a new truck registration in the PDTR, and the current fleet is capable of handling the growth the Ports have recently experienced. Thus, very few trucks with 2014 MY diesel engines will be entered into the PDTR in the coming years. Further, the most recently available data on container moves at the ports show that 2007-2013 MY trucks perform approximately the same number of moves per truck as 2014+ MY trucks.\(^2\) There is no indication that these older trucks are reaching the end of their operational life. The adoption of the CAAP document, as currently drafted, will help to ensure that few, if any, trucks will be entered into the PDTR beginning in 2018.

2. Diesel powered 2014 MY engines do not necessarily have low emissions, particularly when used to power a drayage truck. Recent testing completed by the University of California CE-CERT of multiple 2014 MY diesel engines in a variety of duty cycles demonstrated NOx emissions are multiple times higher (generally 3x to 5x) than their EPA certification level when operating in a mode “comprised of short, low-speed accelerations between period of idle that coverage short distances (0.124 miles). Such stop-and-go type of driving tends to create high emissions when evaluated on a per mile or per unit of work done basis.”\(^3\) Diesel powered 2014 MY engines are not much cleaner than the current trucks in the PDTR, including 2007-2009 MY engines which use in-cylinder emission control strategies rather than the exhaust-based SCR systems (found on 2010 MY and newer trucks) that have proven very ineffective in slow speed port drayage applications. While on-board diagnostic (OBD) equipment on 2014 MY trucks may help to reduce the overall level of in-use NOx emissions from diesel trucks operating in low speed applications, the emissions are still many times higher than implied by the U.S. EPA 2010 on highway standard.

3. This measure will therefore have little impact on emissions given the low number of new trucks expected to be registered in the PDTR and the documented ineffectiveness of 2014 MY diesel engines in providing lower emissions for such trucks. Therefore, little to no air quality benefits should be assumed in the 2018 to 2023 timeframe, which is a critical period for


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Southern California to achieve massive NOx emission reductions to meet federal air quality standards for ozone.

- **FAULTY ASSUMPTIONS IN CAAP EMISSION MODELING:** The assumption that the current drayage fleet inventory of pre- and post-2010 MY trucks will shift to 31% pre-2010 and 69% 2010+ MY engines by 2020⁴ is unreasonable. There are no measures in the Draft CAAP that would logically result in such a transition. Thus the 36% NOx reductions from the baseline assumed by the Draft CAAP cannot reasonably be expected to be achieved.

- **ACT NOW – AN OPPORTUNITY FOR SIGNIFICANT EMISSION REDUCTIONS:** Via the immediate implementation of a dirty truck fee and availability of grants and incentive monies – as proposed in the ACT Now Plan – an estimated 14,000 new zero and near-zero emission trucks can be deployed between 2018 and 2023, thus resulting in 20,000 tons of actual NOx reductions in this period. These reductions are critical to achieve near term attainment deadlines and to protect public health. Further, these significant near-term NOx emission reductions will never be achieved by the plan laid out in the Draft CAAP, even with full implementation of the zero emission truck goals in 2035.

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**DRAFT CAAP CLEAN TRUCK PROGRAM ELEMENT:** *Beginning in 2023, or when the State’s near-zero-emission heavy-duty engine standard takes effect, new trucks entering the Ports Drayage Truck Registry must meet this near zero standard or better.*

- **WHY THIS WILL NOT PROVIDE AIR QUALITY BENEFITS:**
  1. While this is an admirable goal, it is heavily predicated upon a number of factors completely outside of the Ports’ influence. This measure cedes local control of clean air initiatives to the State and federal government.

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⁴ Draft Final, Clean Air Action Plan Updates, page 34.
a. It will require that CARB successfully develop a new Low NOx Emission Standard for heavy-duty trucks/engines. While CARB has signaled their intent, there are no guarantees that this will happen, particularly given the strong pushback that can be expected from the heavy-duty truck and engine manufacturers.

b. If CARB does successfully adopt a new Low NOx Emission Standard for heavy-duty trucks/engines, the new regulation must be approved by the U.S. EPA Administrator. Given the priorities of the current federal administration and existing political tensions with the state of California, it is far from certain that California’s new emissions standard would be approved. Again, resistance from heavy duty truck and engine OEMs could significantly delay or undermine the approval of California’s new emission standard.

2. If, however, CARB does secure EPA’s approval for a new Low NOx Emission Standard for heavy-duty trucks/engines, there remain a number of significant hurdles to immediate commercial deployment and thus, clean air for communities impacted by port drayage trucks.

a. There is no guarantee that low emission engine product will become immediately available from OEMs in 2023. A new heavy-duty engine program typically will require at least five years of development. Currently, no heavy-duty truck/engine OEM is working on a low NOx engine development program and all major heavy-duty diesel engine manufacturers have strongly stated the difficulty and challenges of developing a heavy-duty diesel engine that can perform and be warranted at the 0.02 g/bhp-hr NOx level. It will take at least a year or two (if not more) for CARB to successfully adopt a new heavy-duty Low NOx Emission Standard and get approval from the U.S. EPA. Thus, development work will not likely commence until at least 2019, with commercial product being available in 2024 at the absolute earliest. Given the number of potential hurdles such an effort will likely face, not to mention anticipated push-back from the OEMs during the CARB rulemaking process, it is not unreasonable to think that this timeline could be extended by several years.

b. Timeline issues aside, there is no guarantee that the new heavy-duty Low NOx Emission Standard will be set at 0.02 g/bhp-hr, a level considered to be equivalent to a zero-emission truck, and a level already being achieved by today’s certified natural gas engines. There is significant speculation that the CARB Low NOx Standard will likely be 0.05 g/bhp-hr, or maybe even 0.10 g/bhp-hr based on the technical challenges that diesel engines would face in meeting a 0.02g/bhp-hr standard.

c. A new diesel engine certified to a potential CARB Low NOx Standard of 0.05 to 0.10 g/bhp-hr, when operating in a low speed drayage duty cycle, will almost certainly not have in-use emissions at these levels. Recent CE-CERT testing data indicates that in-use emissions could be three to five times higher in such an application, thereby negating the perceived gains of a Low NOx standard and instead demonstrating in-use emissions similar to today’s US EPA 2010 emission standard. Argonne National Laboratories also finds high in-use NOx emissions from 2010-compliant trucks in low-speed applications like drayage, indicating NOx emissions are four times higher than previously estimated.

d. Ultra-low NOx diesel engines will require a tremendous amount of additional after-treatment technology and other control strategies, thus making the truck/engine extraordinarily complex and expensive to develop, manufacture, support, and operate and maintain. They are also likely to be less fuel efficient and thus have a CO2 / GHG emissions penalty.

3. Ultimately, the Draft CAAP proposes to cede local control over one of the largest sources of NOx emissions in Southern California to the State and federal governments. The strategy will
require that many factors outside of the ports’ control align, which will result in new, expensive, and complicated diesel engines being available for commercial sale in at least five (5) years from today. These engines will likely not have emissions much lower than today’s diesel engine technology and far above that offered by natural gas engine technology already certified and commercially available today.

4. While leading global cities like Athens, Mexico City, Madrid, and Paris are drawing up plans to ban diesel by 2025, and countries such as Norway and Holland are planning to ban all gasoline and diesel powered vehicles by 2025 and the UK and France are planning the same by 2040; the Ports of LA and Long Beach are proposing plans to delay action on clean air strategies until at least 2023 so that diesel engine technologies can potentially catch up to the zero emissions offered by alternative fuel engines in the market today and in the forthcoming years. Zero and zero emission-equivalent technologies exist in the marketplace today and can immediately be deployed at scale; there is no reason to wait 5-10 years to perpetuate the use of diesel engine technology that will have higher emissions – potentially significant – than what is available today.

**FAULTY ASSUMPTIONS IN CAAP EMISSION MODELING:**

1. For the reasons noted above, it is extremely unlikely that any new low NOx engines will be ready for deployment by 2023. Thus, the assumptions that 59% to 85% of the trucks in the PDTR will be near-zero emissions by the end of 2023 (CY 2024) are almost certainly incorrect.

2. If, however, new low NOx engines will be ready for deployment by 2023, it is still an incredible assertion by the Ports that, “…by 2024, as a result of the 2023 requirement for new trucks and the fee in 2023, near-zero emission trucks will comprise up to 85% of the drayage truck fleet.” Given the nature of the drayage truck business, it is certain that drayage truck drivers and companies will not replace existing vehicles sooner than required (i.e. when the fee kicks in). Therefore, this expected result of 85% of the drayage truck fleet being comprised of near-zero emission technology by 2024 would require 10,400 new trucks (~ 12,200 frequent and semi-frequent trucks in the inventory x 85%) be purchased and deployed in one year. The port drayage truck market does not have the financial capacity to make such a switch (an estimated $2 billion expense), nor does California have such incentives available in a single year. Further, such an expectation to dramatically turnover the port drayage fleet will create significant risk to the continued reliable operation of the drayage truck system and the movement of cargo from the ports. For all of these reasons, the ACT Now Plan models a consistent turnover of the drayage fleet over a five-year period.

3. In 2023, the CARB Truck & Bus Rule will force all 2007 MY through 2009 MY diesel engines off the road in California, thus impacting approximately 7,900 such units in the San Pedro Bay. Given the structure of the Draft CAAP, and current uncertainties about any fee structure for dirty trucks in 2023, it can be assumed that the owners of the current inventory of 2007 MY through 2009 MY diesel (engine) trucks in the Ports will opt to replace their units in 2022 with ones powered by 2014 MY diesel engines (this will be analogous to the “pre buy” conditions seen in the heavy-duty truck market before a new emission standard takes effect), which will be able to run indefinitely in the Ports. Thus, in 2023, it can more reasonably be expected that the inventory of 2007 MY through 2009 MY diesel engines will be replaced by a similar number of 2014 MY diesel engines in advance of any new near-zero emission requirements. Given the relatively similarities in actual in-use emissions of (non-SCR equipped) 2007 MY

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5 Draft Final, Clean Air Action Plan Updates, page 33.

through 2009 MY diesel engines to 2010+ MY diesel engines equipped with SCR systems that tend not to work in port drayage applications, the relative impact on regional NOx emissions and thus ozone/smog will be negligible. NOx emissions would therefore be similar to a “No Action” scenario, which was not modeled by the Ports in the Draft CAAP.

- **ACT NOW – AN OPPORTUNITY FOR SIGNIFICANT EMISSION REDUCTIONS:** Instead of waiting until at least 2023 to develop new diesel engine technologies with likely higher emissions, the ACT Now Plan proposes a realistic and achievable plan to eliminate emissions from the port drayage truck fleet by July 1, 2023.

**DRAFT CAAP CLEAN TRUCK PROGRAM ELEMENT:** *Starting in 2023, or when the State’s near-zero-emission heavy-duty engine standard takes effect, all heavy-duty trucks will be charged a rate to enter the ports’ terminals, with exemptions for trucks that meet this near-zero standard or better*

- **WHY THIS WILL NOT PROVIDE AIR QUALITY BENEFITS:** It is impossible to determine potential air quality benefits at this time as the Ports have not given any information as to the structure and/or amount of the rate.

- **FAULTY ASSUMPTIONS IN CAAP EMISSION MODELING:** The analysis assumes that 61% to 87% of the port drayage truck fleet will be replaced in one year from 2023 to 2024 (or at least from 2021 through 2024 as the Ports’ modeling shows no penetration of near-zero emission trucks in CY 2020). This is an unrealistic assumption. For a host of reasons, this would present tremendous risk to the Ports and their customers. It would also cause a significant price spike in the drayage market in an extraordinarily short period of time.

- **ACT NOW – AN OPPORTUNITY FOR SIGNIFICANT EMISSION REDUCTIONS:** The ACT Now Plan lays out a reasonable, logical and legal approach to the coordinated implementation of dirty trucks fees and grants and incentives to allow for the structured transition of the drayage truck fleet to zero and zero emission equivalent technology by July 1, 2023. Clean air for our communities is the goal, and the concepts presented in the ACT Now Plan can reasonably and realistically achieve this important objective.

**DRAFT CAAP CLEAN TRUCK PROGRAM ELEMENT:** *Beginning in 2035, only trucks that meet zero-emissions or the equivalent will be exempt from the rate*

- **WHY THIS WILL NOT PROVIDE AIR QUALITY BENEFITS:** This requirement is in direct contradiction to the prior measure that will exempt near-zero emission trucks only when the State’s near-zero-emission heavy-duty engine standard takes effect. If the Ports’ approach to the prior element requires that the State have an emissions regulation tied to the fee or fee exemption, then the same should be required for zero-emission heavy-duty trucks in this measure. CARB is not expected to develop, nor has even talked about, a regulation that will require zero-emission heavy-duty trucks. Thus, without such a State-level requirement, the provisions of this measure can therefore only be considered to be void.

If, however, the Ports feel that they can apply a fee and provide exemptions for certain types of trucks without there being a corresponding CARB emissions regulation, then such a strategy should be implemented immediately in 2018 for zero and zero emission equivalent trucks that will be commercially available from a wide range of heavy-duty truck OEMs.
• **FAULTY ASSUMPTIONS IN CAAP EMISSION MODELING:** The Draft CAAP completely ignores the billions of dollars of investment (potentially $10 billion or more) that will be required to establish the charging / fueling infrastructure needed to support a fleet of 10,000 or more zero emission trucks⁷. Not only is there no recognition of such tremendous costs, but there is no consideration or discussion about how this infrastructure will be established, where it will be located, who will own and operate the required truck capable fueling stations, and related issues. Given the extremely significant implementation challenges and costs of such a plan – in addition to the billions of dollars of incremental investment required to purchase the zero emission trucks – it is unreasonable to think that this proposed measure can potentially become reality and thus achieve the emission reductions proposed.

• **ACT NOW – AN OPPORTUNITY FOR SIGNIFICANT EMISSION REDUCTIONS:** The ACT Now Plan offers a far more cost-effective approach to realistically achieve significant near-term emission reductions using commercially available and viable technology. The ACT Now Plan proposes to virtually eliminate emissions from the San Pedro Bay Ports drayage truck fleet by July 1, 2023.

⁷ The Draft CAAP attachment, “Preliminary Cost Estimates for Select Clean Air Action Plan Strategies,” notes on page 3, “This analysis does not include cost estimates for fueling or charging infrastructure for heavy-duty trucks, which is likely to exist outside the Harbor Districts and throughout the region.”