May 31, 2019

Clean Air Action Plan Team for Draft 2018 Feasibility Assessment for Cargo-Handling Equipment
Submitted Via Email to caap@cleanairactionplan.org

Subject: Comments on Draft 2018 Feasibility Assessment for Cargo-Handling Equipment

Dear Clean Air Action Plan Team:

The Port of Oakland ("Port") appreciates the opportunity to comment on the Draft 2018 Feasibility Assessment for Cargo-Handling Equipment (CHE) posted April 26, 2019 ("Draft Feasibility Assessment for CHE"). Port staff appreciate the level of effort and diligence that went into the Draft 2018 Feasibility Assessment for Cargo-Handling Equipment, including the survey of vendors; discussion of operational modes; electrical rates by demand and time of day; discussion of costs and incentives; and workforce training needs. Port staff appreciate your research into technologies which may be feasible “evaluated within the context of widespread deployment” in a marine terminal environment using the West Coast operating model. We at the Port of Oakland are also interested in zero- and near-zero emissions (ZE and NZE) technologies that can be used across all port activities as functionally equivalent replacements for current Tier 4 diesel CHE.

Port staff offer the following specific comments on the Draft Feasibility Assessment for CHE.

1. Port staff appreciate the inclusion of the NZE Hybrid-Electric category for both horizontal transport and lift equipment. Port staff see hybrid-electric equipment as a valuable bridge to fully ZE equipment.

2. Section 5.2.3 of the Draft Feasibility Assessment for CHE summarizes Original Equipment Manufacturer (OEM) involvement in ZE and NZE Rubber-Tired Gantry (RTG) crane development. Port staff would like to share the Port of Oakland’s experiences with hybrid RTG cranes. Port tenant SSA Terminals is in the process of upgrading its entire fleet of 13 RTGs at the Oakland International Container Terminal to be hybrid electric. The retrofit project, funded in part through the Carl Moyer Program, will reduce NOx emissions by 99% and emissions of Diesel Particulate Matter (DPM) by 95%. The hybrid RTGs at OICT are capable of operating in zero-emissions mode, using their battery packs. The vendor SSA Terminals selected, Mi-Jack, should be included in
Section 5.2.3 as an OEM in the hybrid RTG market and Mi-Jack is the dealer for Künz, which sells E-RTGs.

3. In Section 7.3.4 there is some question about availability of parts and service for Orange EV yard trucks. For your information, there are a few Orange EV yard trucks operating in off-dock service in and around the Port of Oakland, and Port staff are unaware that there is an issue with the local Orange EV service team supporting these deployments. Port staff look forward to the results of demonstrations at the Port of Los Angeles and the Port of Long Beach testing battery-electric yard trucks in marine terminals. Port tenant SSA Terminals will also be demonstrating battery-electric yard trucks and one top pick in a marine terminal as part of the ZANZEFF START project with the Port of Long Beach.

4. In Section 8.5.1, the Draft Feasibility Assessment for CHE notes that a below-grade cable reel system has the least operational impact on MTOs using E-RTGs. As discussed in Appendix B, the Port of Long Beach demonstration project for grid-electric E-RTG cranes will provide valuable information regarding how E-RTGs will work on the West Coast. Port staff understand there are differences in Northern and Southern California work practices around container stacks. In Northern California, drayage trucks and top picks work both sides of a stack, making rubber protective belts (that would be needed to protect below-grade electrical lines) especially vulnerable to vehicle traffic to the point where this configuration may be operationally infeasible.

5. Port staff appreciate the discussion of incentive funding in Section 9.5. Port staff reach the same conclusions regarding the use of currently available funding: “there is funding available today for equipment purchase, but the industry may need years to develop the fueling or charging infrastructure to support this equipment, effectively limiting the amount of incentives that can be accessed in the near term.” The funding will be most effective for technologies at Technology Readiness Level 9, which is limited at the current time. This is not to diminish the value of incentive funding, which is absolutely necessary to accomplish this transition, but to highlight the struggles in aligning our goals with real-world commercial technology.

6. In the discussions of cost effectiveness for GHG reductions in Section 9.7, Port staff would encourage inclusion of the costs of GHG offsets in the cap and trade market and in voluntary carbon offset markets, which can be on the order of $10/MT CO2e. Regarding the cost effectiveness for criteria air pollutant emissions, the cost effectiveness numbers shown in Figures 18 and 20 show that, with the exception of NZE Hybrid-Electric RTGs, the proposed NZE and ZE equipment would not warrant state or local grant funding as emissions reductions projects under the Carl Moyer Program, which supports commercial products. This underscores the value of the California Air Resources Board Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) and the upcoming Clean Off-Road Equipment (CORE) voucher incentive project.
Closing

The Draft Feasibility Assessment for CHE provides a comprehensive and clear picture of the state of current CHE technologies, costs, and operational needs. Port staff thank the Port of Los Angeles and the Port of Long Beach for their efforts in preparing a feasibility study which is relevant to all ports. Port staff also recognize the San Pedro Bay Ports for leading demonstration projects and appreciate that you have the magnitude of resources to conduct 17 laborious and important demonstration projects.

Please contact Catherine Mukai, P.E., Port Associate Environmental Planner/Scientist at cmukai@portoakland.com with any follow-up questions.

Sincerely,

[Signature]

Richard Sinkoff
Director of Environmental Programs and Planning
RISE Robotics  
28 Dane Street  
Somerville, MA 02143  

May 31st, 2019  

Dear Clean Air Action Plan team,  

I wanted to write a comment about the draft 2018 Feasibility Assessment for Cargo-Handling Equipment.  

In regards to the core fuel-technology platforms that were evaluated for Top Handlers and Large-Capacity Forklifts, the assessment determines that "None meet the basic criteria and considerations to be deemed commercially available in late 2018, nor do they appear (at this time) to be on that path by 2021." A technology agnostic solution to this problem is to replace hydraulic cylinder systems with a more efficient component. Specifically, this will extend operating endurance and lower costs, regardless of the fuel-technology platform used.  

Hydraulic cylinder systems are a significant source of energy usage for container handling equipment, however they are less than 40% efficient. So, doubling the efficiency of hydraulic cylinder systems would result in double the operating endurance of the machine or half the required energy capacity, or a mix of both.  

Also, hydraulic cylinder systems have little to no regenerative ability that would further extend endurance and lower costs.  

In the case of battery electric forklifts and battery electric top handlers, batteries are one of the significant costs. However, reducing battery cost is a treatment for an underlying problem: the significant energy usage of hydraulic cylinder systems.  

I wanted to thank you for publishing this draft assessment, and for welcoming comments on it.  

Sincerely,  

Arron Acosta  
CEO, RISE Robotics
May 31, 2019

Heather Tomley
Acting Managing Director of Planning and Environmental Affairs Port of Long Beach
4801 Airport Plaza Dr.
Long Beach, CA 90815

Chris Cannon
Director of Environmental Management Port of Los Angeles
425 South Palos Verdes St.
San Pedro, CA 90731

RE: Comments – 2018 FEASIBILITY ASSESSMENT FOR CARGO-HANDLING EQUIPMENT

Dear Ms. Tomley and Mr. Cannon,

Please allow this letter to serve as formal comments submitted on behalf of BYD Motors, LLC (“BYD”) with respect to the recently released “2018 Feasibility Assessment for Cargo-Handling Equipment” (Assessment) by the Ports of Los Angeles and Long Beach (“Ports”).

BYD is pleased to see thorough, comprehensive surveys of both zero-emission OEMs and San Pedro Marine Terminal Operators, a show of support by industry stakeholders for the desired implementation of the CAAP. BYD is committed to the deployment of zero emission (“ZE”) technologies and the survey findings corroborates the industry’s likewise commitment and progress. However, BYD believes the Assessment inadequately evaluates the equipment’s status in 2021 and existing manufacturing scale, while also failing to reference the different fuel technologies’ effect on achieving CAAP goals.

With current demonstration projects validating the technology and multiple OEMs committed to manufacturing electric yard tractors by or before 2021, the all-electric ZE platform should achieve TRL 8 status by 2021. We appreciate the recognition of BYD’s yard tractors as capable of meeting the extended 2-shift endurance requirements; MTOs will gain crucial experience deploying zero-emission yard hostlers into different operational patterns during the coming demonstrations, consolidating the equipment in TRL 8 by 2021.

Globally, BYD is the leading heavy-duty electric vehicle manufacturer by volume, and is perfectly capable of meeting expanded demand for trucks in the U.S. Additionally, BYD has already acquired more than 150 acres of land in California and can expand our production capacity rapidly to meet any substantial increase in demand. Thus, BYD believes the Assessment should reevaluate the references (included in Addendum) to the industry’s inability to provide manufacturing scale.

Lastly, while recognizing the Assessment focuses on technical and operational issues (as well as economic) we are concerned the public will believe that both platforms are environmental and health equals. The side-by-side economic analysis of ZE and near-zero emission (“NZE”) trucks fueled by natural gas does not assess the fuel technologies’ impact to the San Pedro community. A more localized comparison, specifically with respect to environmental health impacts and CAAP goal compatibility, is necessary.
We appreciate your consideration of these comments. As a complement to the foregoing, we have provided an Addendum with specific comments regarding data and conclusions presented in the report. Please advise if you have any questions or would like to discuss any of these matters further.

Sincerely,

Vincent Pellecchia
Strategic Account Manager
BYD Motors, LLC
ADDENDUM:

Report Page 23:
- BYD has significant experience mass-producing electric, heavy-duty vehicles and could meet production needs for replacing existing yard tractors with ZE yard tractors.

Report Page 27:
- Page 27 allocates ¾ of a circle for “sufficient means and timeline for production” for ZE battery electric yard tractors.
- With the criterion defined as the “demonstrated capability to manufacture sufficient numbers of CHE (suitable for SPBP MTOs) within timeline to meet existing or expected demand,” BYD believes “sufficient means and timeline for production” warrants a full circle.

Report Page 33:
- Table 11 categorizes ZE battery electric yard tractors as TRL 7 in 2018 and TRL 7/8 in 2021.
- BYD believes ZE BE Yard Tractors will be TRL 8, if not TRL 8/9 by 2021.

Report Page 41:
- The baseline criteria for this assessment is categorized as, “The fundamental question for any emerging fuel technology platform is: will it be able to move containers (or other cargo) as well as – and preferably better than – the baseline diesel technology that it is intended to replace?”
- It is unclear why the emerging fuel technology should be expected to operate better than the baseline technology.

Report Page 46-47:
- Table 21 and Figure 11 indicate a significant percentage of the yard tractors deployed at the San Pedro Bay Ports run for 2000 hours or less per year.
- Considering this, it would be helpful for the feasibility analysis to break down the possibility of replacing yard tractors with new technology in segments, rather than primarily focusing on the extreme case of extended 20-hour shifts.

Report Page 55:
- Table 25 allocates a ¼ circle for the “Speed and Frequency of Refueling / Recharging” criterion.
- Although this criterion is applicable to all ZE battery electric yard trucks, Table 23 of the feasibility assessment identifies that BYD’s yard tractor can meet the requirements of the basic specifications, standard 2-shift endurance and extended 2-shift endurance, which implies BYD’s yard tractor merits more than ¼ circle here.

Report Page 58:
- The feasibility assessment should consider a phased approach to the replacement of vehicles, which would provide a better understanding of how many vehicles can currently be replaced without requiring additional units.

Report Page 62-63:
- The discussion in this section regarding infrastructure footprint would benefit from diagrams that illustrate the various space requirements.
- With respect to BYD chargers specifically, BYD’s AC chargers require significantly less space than generally available DC chargers.

Report Page 67:
- The allocations for the criteria in Table 28 do not appear to take into consideration the significant global roll out of heavy-duty EVs or the concerns surrounding lack of demonstration around LNG wet hose fueling discussed in Section 8.

Report Page 73:
- These cost calculations are based on a 20-hour operating profile; it would be helpful for better understanding if and how the different operating profiles could be factored into analysis of infrastructure cost.

Report Page 76:
- Table 35 includes the Carbon Intensity (CI) for diesel, NZ NGV and BEV taken from the CARB LCFS Final Regulation Order. However, this table and section does not include any discussion of the related Energy Economy Ratio (EER).
- According to the CARB LCFS Final Regulation Order Table 7.1, the EER must be applied to the CI for each fuel as the EER-adjusted CI is the value to be used when comparing fuel types. Doing so in this instance for electricity should provide a much lower EER-adjusted CI.

Page 82
- Table 37 should consider the lower cost of ownership with incentives from HVIP, CORE, SCE and other programs that are expected to be available between now and 2021.
May 31, 2019

Heather Tomley, Port of Long Beach
Chris Cannon, Port of Los Angeles
Submitted to: caap@cleanairactionplan.org

Re. Comments on Draft Feasibility Assessment of Cargo Handling Equipment

Dear Heather and Chris:

Thank you for the opportunity to comment on the Draft 2018 Feasibility Assessment for Cargo Handling Equipment. Feasibility assessments are integral to advancing technologies in port applications to ensure that technologies are not deployed prior to commercialization to ensure operational success. To that end, the following comments are submitted on the Draft Feasibility Assessment.

Cost-effectiveness is critical to port competitiveness and jobs.

While the aspirational goal has been made to achieve zero emissions, such goals cannot exist in a vacuum and mask the fact that there are no zero emissions technologies when beyond the tailpipe is considered. The driving force should be cost-effectiveness in achieving emissions reductions that approach zero emissions of criteria pollutants and climate pollutants. Technologies may function, but these technologies must be affordable in a competitive world. The total end-to-end costs and cost-effectiveness of each technology including charging and fueling infrastructure needs to be transparent, including costs that are allocated to other parties such as utility ratepayers.

Hours of operation should not be the primary metric for assessing operational feasibility.

In its operational feasibility assessment, Draft Feasibility Assessment uses hours as its primary metric. While this is an important metric, it does not adequately assess operational feasibility. Yard tractors at container terminals generally have three “jobs”: taking containers from vessels to storage rows, sorting containers within rows, and taking containers from rows to on-dock rail. Of these, the rail operation is by far the most rigorous in terms of its continuous operation and energy needed. In contrast, offloading containers from ships contains more overall time idling in lines, thus using less energy. In addition to hours, energy used in operations should be considered when assessing operational feasibility.
Technologies should be evaluated using the most demanding operational scenario.

In its operational feasibility assessment, Draft Feasibility Assessment looks at the average hours used, daily and annually. While the average is a good reference point, it is critical to assess the “worst case” scenario for hours and energy used. As stated above, the rail service is the most energy intense job for yard tractors. This service should be the standard to which operational feasibility is assessed. If the average is used to assess operational feasibility, the technologies will not be able to do all of the work needed at a terminal. Terminals generally manage one fleet of yard tractors that can flow freely between services based on need. If technologies cannot complete all services, terminals will be forced to manage separate fleets for each service.

LNG yard tractors should be TRL 8 based on already proven history.

LNG yard tractors have a history of use in goods movement. According to the Port of Los Angeles Emission Inventories, seventeen LNG yard tractors have been in operation since 2015, BNSF Railway has used LNG yard tractors in its normal revenue operations at its Los Angeles facilities, and both ports have previously completed separate successful LNG yard tractor demonstration projects. The Port of Long Beach LNG Yard Tractor Demonstration Project found that:

a. 97% felt LNG yard hostlers performed same or better than traditional diesel yard tractors;
b. 67% of drivers rated LNG yard hostlers superior in general; and
c. 100% of mechanics rated LNG yard hostlers “acceptable”.[1]

It is important to note the distinction that the current demonstration projects for LNG yard Tractors are not to test if the technology is viable, as that has been proven. The current tests are to test the latest iteration of the engine. Therefore, the Technology readiness Level for Near Zero Technologies in yard tractors should be TRL 8.

There is not enough test data for zero emission yard tractors to earn a TRL 7-8 rating.

Zero emission technologies are given a TRL rating of 7-8, which is the same as the TRL for Near Zero technologies. This was surprising given the history of testing and use of LNG yard tractors as noted above. For comparison, of the planned zero emission yard tractor demonstrations at the two ports, there are currently three zero emission yard tractors operating. Two of those are being used at a break bulk terminal meaning only one zero emission yard tractor is being used at a traditional container termina, Long Beach Container Terminal. There is clearly not enough usage or data to decide that the technology is at a TRL 7-8. TRL should be based on what a technology has accomplished rather than planned pilots and demonstrations.

Terminal operators have decommissioned electric rubber-tired gantry cranes.

The Draft Feasibility Assessment states that electric rubber-tired gantry cranes (eRTGs) are TRL 9. However, the document goes on to explain that three terminals began using eRTGs but decommissioned them due to “to various technical and operational limitations,” “inconsistent performance,” and “operational limitations.” Due to these issues, eRTGs should not be given a TRL 9.
**Resiliency should be a metric in the study.**

The transportation sector, including goods movement facilities, are considered critical infrastructure by the United States Department of Homeland Security and its resilience is of the utmost importance to national security. The study should include an evaluation of energy security and resiliency as part of feasibility to better understand risks to goods movement in transitioning to new technologies. A technology may function, but if the Ports are exposed to risks of energy interruptions or shortages, this risk needs to be known and mitigated.

Thank you for considering our comments. We are committed to supporting the Ports of Long Beach and Los Angeles in developing a fact-based assessment of technology readiness and capabilities. We welcome a meeting to discuss our comments.

Sincerely,

Thomas Lawson  
California Natural Gas Vehicle Coalition

Greg Roche  
Clean Energy

Kevin Maggay  
Southern California Gas Company
May 30, 2019

Submitted via email
ciaap@cleanairactionplan.org

Dear Port Administrators:

Thank you for the opportunity to comment on the Draft 2018 Feasibility Assessment for Cargo Handling Equipment (CHE), developed as required by the San Pedro Bay Ports Clean Air Action Plan 2017. The Coalition for Clean Air’s mission is to protect public health, improve air quality, and prevent climate change.

Your analysis into CHE included a feasibility evaluation of Yard Hostlers, Top Handlers, Rubber Tire Gantry (RTG) Cranes and Large Capacity Forklifts. These categories were measured against several criteria to determine overall feasibility of use at the San Pedro Bay Ports: Commercial Availability; Technical Viability; Operational Feasibility; Infrastructure Availability and Economic Workability. Based upon your overall analysis, the only category of zero or near zero-emission CHE that fully passed all the criteria were Near Zero Emission Diesel Hybrid Electric RTG Cranes. The other categories of equipment that came close to meeting all criteria were Zero Emission Grid Electric RTG cranes; Zero Emission Battery Electric Yard Tractors; and Near Zero Emission Yard Tractors.¹

The Coalition for Clean Air thanks the staff of both ports for their hard work on this Feasibility Assessment. We recognize that a number of pilot and demonstration projects are going forward at both ports testing a wide variety of CHE equipment that simply are not yet meeting all the criteria utilized by this Feasibility Assessment. At the same time, we strongly urge the ports to move forward with those tests so that more and better CHE technologies will be found to be feasible for commercial use at the time of the next Feasibility Assessment in three years.

Specifically, we respectfully request the following relating to CHE at the San Pedro Bay Ports:

1. The ports must continue to aggressively pursue projects to pilot and demonstrate new, zero and near zero-emission CHE technologies that meet all feasibility criteria, especially in the Yard Hostler and Large Capacity Forklift categories that are farthest away from being ready for commercial use.

2. The ports must continue their admirable work in pursuing incentive funds and joint state and federal agency funding to pursue zero and near zero-emission CHE technologies for pilot, demonstration and other operational testing on-site at the port complex.

3. The ports must study now and begin to implement infrastructure support to meet the energy requirements for fueling or charging CHE on-dock at the port operations. This will require close coordination with terminal operators, workers and port staff, which is why such study and implementation should begin as the first zero and near zero-emission CHE is starts regular operations at both ports.

We underscore the sense of urgency in pursuing all avenues available to the ports to reduce emissions from port sources of air pollution. Air pollution emissions from the ports are responsible for a large portion of the particulate matter emissions that arise from the state’s freight industry and cause heart and lung diseases as well as premature death. The ports are also responsible for significant emissions of NOx in the South Coast Air Basin, a criteria air pollutant that serves as a precursor to fine particulate matter and ground-level ozone (also known as smog). In addition, the South Coast Air Quality Management District needs a considerable reduction in NOx emissions to reach attainment of federal Clean Air Act health-based air quality standards by 2023. Anything the ports can do to reduce air pollution from the CHE category of vehicles operating at their facilities is absolutely and urgently necessary, and we appreciate the work that has been accomplished to date under the ports Clean Air Action plans.

Finally, the San Pedro Bay Port complex is located adjacent to disadvantaged communities and many of those communities are comprised of people of color who suffer disproportionately from the adverse health impacts of freight-related pollution. Improved air quality for these communities is a vital goal of the Ports’ Clean Air Action Plan and should add increased urgency to the applicability of new technologies in the CHE sector.

Thank you again for your hard work and the opportunity to comment on your draft CHE Feasibility Assessment. Please feel free to contact us if you have any questions.

Sincerely,

/s/
Jerilyn López Mendoza
Senior Policy Advocate
Dear Messrs. Cannon and Arms,

Thank you for the opportunity to provide comments on the draft 2018 Feasibility Assessment for Cargo-Handling Equipment (Feasibility Assessment). The Feasibility Assessment is an important step in understanding the opportunities and hurdles for deploying advanced cargo-handling equipment (CHE) in San Pedro Bay. PMSA, representing marine terminal operators and ocean carriers, provides the following comments to ensure that analysis provides the most realistic examination of current technology available.

One of the primary themes that are repeated throughout the comments below is the speculative nature of the analysis. In instance after instance, the Feasibility Assessment makes speculative conclusions about advanced technology. It appears that this is done in order to make meaningful comparisons between the state of various technologies. However, the fact that the conclusions are speculative means that the comparisons are also not substantive or objective. The entire Feasibility Assessment should be revised to clearly state those areas of knowledge are simply unknown because the data has not been generated through onsite demonstrations. To do otherwise gives industry, the public, and decisionmakers a false sense of the current state of technology.

**Executive Summary Mischaracterizes CHE Contribution to Port Emissions Inventory**

The Executive Summary describes CHE and their heavy-duty engines as emitting “disproportionately high levels of key pollutants”. This is a mischaracterization. CHE, along with on-road heavy-duty trucks, are the most tightly controlled sources in the port complex. In fact, based on the ports’ most recent 2017 emissions inventory CHE emissions make up only 4% of total port-related diesel particulate matter emissions and 6% of nitrogen oxide emissions. At less than 52 pounds per day, total CHE diesel particulate emissions for the entire port complex are less than the South Coast Air Quality Management District’s CEQA Threshold of Significance of 55 pounds per day. While designed to evaluate individual projects and not something like the entire port complex, the comparison shows the *de minimis* nature of CHE emissions. The Executive Summary should be revised to reflect the trivial amount of emissions that CHE actually contribute to total port-related emissions.
Application of Future On-Road Standards to Off-Road Equipment is Inappropriate
The Feasibility Assessment states that “If CARB does adopt a formal NZE standard of on-road heavy-duty engines, and/or an equivalent standards for non-road engines, the Ports will rely on these certifications as the determination of whether or not particular engines used in CHE are considered to emit at near-zero emission levels.” The implication that the ports may apply on-road engine standards to off-road engines is inappropriate. Distinct on-road and off-road engines exist because the characteristics and duty-cycles are different. There is no reason to expect that future NZE standards for on-road and off-road equipment will be the same. In fact, current standards for on-road and off-road standards are different. As a result, the ports should not expect off-road engines to meet on-road engines standards and should rely on an NZE standard if one is promulgated for off-road engines. Such statements should be revised to delete any reference to on-road NZE standards.

A “Snapshot” Assessment Should Not Speculate on Future Developments
The Feasibility Assessment continually makes speculative assertions about the future. In doing so, the Feasibility Assessment is pre-judging the outcome of numerous demonstrations being conducted throughout San Pedro Bay. Advanced technology like battery electric CHE have been undergoing demonstration projects in San Pedro Bay for over a decade. All of those demonstrations have advanced the state of technology, but none can be described as successful in the sense that none of the demonstrations have achieved the basic operational characteristics required. No one could have guessed the outcome of those numerous previous demonstrations and this Feasibility Assessment should not attempt to guess the outcome of ongoing or planned demonstrations. The Feasibility Assessment’s tendency even colors its application of Technology Readiness Levels, as described below. The Feasibility Assessment should limit itself to demonstrable facts. To do otherwise, would be to give industry, the public, and decision makers flawed speculative information on which to base their judgement and decision.

When originally proposed in the update to the Clean Air Action Plan, technology assessments were proposed to be conducted every five years. As an acknowledgement that technology can rapidly progress and avoid speculative assessments, the assessment cycle was shortened to three years. Every three years is frequently enough to judge progress without the need to resort to speculation. As a result, the document should be revised to remove all speculative forecasting, including the state of technology in 2021, the future availability of technology, or future technical viability of technology.

Cost-Effectiveness Should be Discussed in Executive Summary
While cost-effectiveness is analyzed, it should be discussed in the Executive Summary. Some of the key conclusions are lost within the assessment. First, that some near-zero emission (NZE) technology is available now, that the cost-effectiveness for some equipment is so good that it actually provides a positive return on investment, and that cost-effectiveness for battery electric technology is so poor that it is several orders of magnitude worse than NZE technology.

Speculative Statements on Future Equipment Availability is Inappropriate
The Feasibility Assessment states that “it is likely that significant numbers of ZE and/or NZE units could be manufactured and available for deployment by 2021.” However, in the case of yard tractors, not a
single unit has been successfully demonstrated, as discussed above. Until a unit is successfully demonstrated, it is inappropriate to speculate about future availability. The hurdles to successful demonstration are significant. The basic technology has been repeatedly tested in port applications for a decade without successful demonstration. While the current generation of technology may overcome these obstacles, it is speculative on the part of the authors of the Feasibility Study to assume that will occur and significant numbers will be manufactured and available for deployment shortly. The document should be revised to state that future availability is unknown at this time and will remain unknown until the equipment is successfully demonstrated.

**The Application of Technology Readiness Levels Are Consistently Misapplied**

Technology Readiness Levels (TRLs) are supposed to indicate the level of progress a given technology has achieved, not the next level they are striving to succeed. Yet, the Feasibility Assessment repeatedly assigns a TRL level to technology based on what it prospectively hopes to achieve.

Battery Electric (BE) Yard Tractors are described in the document as TRL 7. However, TRL 7 is defined as “Full-scale, similar prototype system demonstrated in relevant environments” (emphasis added). In fact the report acknowledges that BE yard tractors have not been demonstrated in a port setting, pointing out that “[a]n especially important issue for battery-electric yard tractors in port operation is whether or not they can achieve diesel-equivalent shift operating time between battery charging events.” In fact, BE yard tractors are TRL 6. The technology is in engineering/pilot scale demonstration and has used in “system validation in relevant environment”, namely warehouse use.

Similarly, BE top handlers are not TRL 6. At the time of the Assessment and this comment letter, BE top handlers have never operated a single day in any relevant environment. They have achieved TRL 5, laboratory scale validation. A single unit is about to be deployed to determine whether it can achieve TRL 6.

The use of other terms is also misapplied. The Feasibility Assessment describes “early commercial” and later defines that the term applies to equipment that “has been demonstrated, are certified by CARB, come with a warranty, and are purchased or leased by the end user.” As the Feasibility Assessment repeatedly points out, there is a lack of data for the current generation of BE yard tractors and other CHE because they have not yet been successfully demonstrated in marine container terminal applications. In both the case of TRLs and “early commercial” and “pre-commercial” the described equipment does not meet the basic, plain language definition set forward.

It is inappropriate for the Feasibility Assessment to judge the outcome of pilot scale or full-scale demonstrations and assign readiness levels on the assumption that they will successfully achieve that level of readiness. The entire point of the numerous demonstrations that the port is engaged in is to make that determination. By jumping the gun, the Feasibility Assessment is misinforming industry, the public, and decision makers about the state of the technology.

**eRTGs Are Not Fully Demonstrated**

The Feasibility Assessment overestimates the suitability and readiness of eRTGs. The document describes the commercial availability of the technology and points to that as demonstration of the
technology’s readiness. Normally, that would likely be sufficient, but the assessment notes that there have been several deployments of this commercial technology in San Pedro Bay and all have been removed for a multitude of reasons, often technical limitations. The document goes on to describe other deployments of the technology in Long Beach and Savannah as demonstrations. Generally, equipment operators do not remove operationally successful equipment. The failure of past deployments and the demonstration nature of current deployments indicate the technology is close but clearly not at a TRL 9 level. The Feasibility Assessment should be revised to give weight to these equipment failures and the demonstration nature of current deployments.

**Feasibility Assessment Makes Speculative Statements About Endurance**
The Feasibility Assessment provides estimated endurance for BE CHE. One of the primary purposes of the current demonstrations is to determine their range in a marine container terminal environment. Previous range forecast from manufacturers have been based on work performed in less rigorous environments like warehouses. By offering an estimated range for undemonstrated equipment, the Feasibility Assessment is drawing a conclusion about the feasibility of technologies for industry, the public, and decision makers that has not been proven. The Feasibility Assessment should refrain from identifying “facts” about advanced equipment that are not independently demonstrable. As an example, the Feasibility Assessment states that “BYD and Kalmar yard tractors meet the ten-hour shift endurance requirement” and later that “the Kalmar unit’s ability to meet a 20-hour endurance with an inter shift charging event is marginal.” These statements are speculative. To PMSA’s knowledge, none of the equipment has run through even a single shift on a San Pedro Bay marine container terminal. The Feasibility Assessment also repeatedly points out the lack of data and does not document any in-use testing. Again, the Feasibility Assessment should refrain from making speculative statements for any equipment not based on completed port demonstrations. The Feasibility Assessment should be revised to show that any range estimates for equipment like BE yard tractors or top handlers are “Unknown, Subject to Demonstration”.

**Endurance Degradation and Fueling Speed/Frequency Relies on Speculative Statements**
The Feasibility Assessment again relies on speculation about endurance degradation for equipment that has not successfully completed a single shift on a marine container terminal in San Pedro Bay. It is not possible to know at this time what battery degradation will look like. It is entirely possible that more intensive rapid charging will be necessary to meet marine container terminals endurance requirements, resulting in more rapid battery degradation. Or it may not. In either case, until the equipment has been subject to full scale demonstration, it is impossible to know.

Similarly, the Feasibility Assessment acknowledges that assumptions are being made regarding the fueling speed of BE yard tractors. The Feasibility Assessment is not factually assessing the state of current technology if it is relying on assumptions rather than demonstrable facts to assess equipment. The Feasibility Assessment should be revised to indicate that much of what it is seeking to assess is unknown at this time, is among the goals of the proposed demonstrations, and will be further evaluated in the future.
Use of Orange EV Warehouse Yard Tractor as Data Point is Inappropriate

Orange EV equipment has developed a solid reputation for developing BE equipment. However, the use of their equipment as a data point in the Feasibility Assessment is inappropriate. Orange EV has publicly stated (most recently at the ACT Expo) that their company does not make equipment for marine container terminals, their existing equipment is not capable of performing the duty-cycle on marine container terminals due to the heavier loads and rigorous duty-cycle, and that company has no near-term plans on producing yard tractors for marine container terminals. While the company can be pointed to for their work in producing equipment for the warehouse sector, their equipment should not be used as part of this Feasibility Assessment.

Battery Electric CHE Cost Is Underestimated

BE yard tractor cost is underestimated. The Feasibility Assessment indicates that the cost is based on the average of BYD, Kalmar, and Orange EV yard tractors. As indicated above, Orange EV’s yard tractor is not suitable for marine container terminal duty cycle. As a result, it should not be included in the average cost. Figure 16 of the Feasibility Assessment shows a BE yard tractor capital cost of approximately $250,000. Cal-Lift, Kalmar’s local dealer, has indicated that their 5-cell BE port yard tractor will cost approximately $370,000. Given that data point, it seems impossible to arrive at an average cost of approximately $250,000. The ports should obtain actual quotes from local dealers and prepare a new average cost based on equipment designed for a port duty-cycle.

The total cost of ownership analysis also does not include the cost of charging infrastructure. BE CHE is fundamentally different from traditional CHE. Given the limited charging opportunities documented in the Feasibility Assessment every piece of BE CHE will likely need its own charging infrastructure. As a result, charging infrastructure is part of the capital cost of equipment purchase. Additionally, it is unlikely that charging infrastructure can be discounted for use with subsequent generations of equipment as the charging technology is likely to change over the 7-10 year useful life of a yard tractor and even longer useful life for other CHE. The Feasibility Assessment should be revised to include charging infrastructure in the capital cost of CHE.

In addition, the Feasibility Assessment describes the effect of incentives on BE yard tractors making “the total cost of battery-electric yard tractors substantially less than baseline diesel yard tractors.” Ignoring that the cost of BE yard tractors has been underestimated, an LADWP-based BE yard tractor with incentives is 7% less net present value cost than a diesel unit. That 7% difference is likely within the margin of error of the analysis, given the stated assumptions on charging, fueling, and other factors that support the analysis; in any case, it is not substantial. That margin may disappear entirely based on a more reasonably calculated capital cost for the units. Such cheerleading diminishes the credibility of the Feasibility Assessment.

Demand and Added Facility Charges Not Properly Analyzed

The analysis of fueling costs inappropriately eliminates demand charges for Southern California Edison (SCE) customers. As the Feasibility Assessment notes, the program has a five-year duration. At the conclusion of the program, demand charges will return. Since it is likely that only demonstration

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1 A separate email has been sent to Gladstein, Neandross & Associates as documentation.
equipment will be introduced over the next five years, it is inappropriate to eliminate the demand charges. Demand charges can be expected to be a significant part of future electricity costs. Recently, Port of Long Beach staff presented the figure below to their Board. The figure shows the impact of CHE charging on power demand at a large container terminal. The figure illustrates the potential impact of demand charges on marine terminal electricity bills. The Feasibility Assessment essentially treats the five-year demand charge incentive as a permanent rate structure change, which is known not to be the case. The Feasibility Assessment should be revised to reflect the demand charge holiday as a time-limited 5-year incentive that some CHE may be able to take advantage, while later deployments will not. The assessment should ultimately show how BE CHE charging will impact total electrical cost for terminal operators.

The Feasibility Assessment also does not discuss Added Facilities Charges. Will the deployment of BE CHE result in added electrical infrastructure that will result in an Added Facilities Charge? The Feasibility Assessment should assess the need for additional infrastructure and its impact on total monthly electrical costs. Failure to do so will result in an underestimation of the total cost of ownership and a false comparison to the existing cost structure.

Rising Electricity Rates Not Evaluated
The Feasibility Assessment is silent on future California electricity. Given that California has some of the fastest accelerating electricity rates in the nation and the number of other areas that the Feasibility Assessment has chosen to speculate on, that is surprising. For the period 2011-2017 California industrial electricity rates increased nearly 30% (see chart below). Since then, the California Legislature has imposed additional requirements for California’s renewable portfolio and other regulations that will likely ensure an increase in costs. If the final Feasibility Assessment continues to speculate in other areas, California’s increasing electricity costs should be added to the mix.
Potential for Future Improvements
The Feasibility Assessment rightly notes that “LNG yard tractors are being built and purchased in very limited volumes, and the entire U.S. market for yard tractors is relatively small. In summary, the near-term prospect for significantly reducing costs to manufacture LNG yard tractors – and therefore improving their cost effectiveness to reduce criteria pollutant emissions – is uncertain. However, the Feasibility Assessment fails to note that same circumstances are equally true for BE yard tractors. In fact, there is no demand outside of California. While passenger vehicle may reduce battery cost, it may also hamper improvements due to the lack of investment in battery cell design specifically for port applications. The Feasibility Assessment should also acknowledge these uncertainties for BE technology.

Conclusions
PMSA would like to thank port staff for allowing us the opportunity to provide comments regarding the draft Feasibility Assessment. PMSA hopes that it will be able to continue to work collaboratively on the implementation of the Clean Air Action Plan. We look forward to continuing our discussion.

Sincerely,

Thomas Jelenić
Vice President
Greetings,

On behalf of Nuvera Fuel Cells, LLC, I appreciate the opportunity to comment on the draft 2018 Feasibility Assessment for Cargo-Handling Equipment.

Nuvera is a manufacturer of fuel cell motive power systems for commercial and industrial applications. The company was established in 2000 and is headquartered in Billerica, Massachusetts. Our parent company is Hyster-Yale Group (HYG), a global OEM headquartered in Cleveland, Ohio that develops, manufactures, and produces industrial trucks under the Hyster(r) and Yale(r) brand names. HYG’s product line includes small forklift trucks such as pallet jacks, reach trucks, and counterbalance trucks used in manufacturing and distribution, up to bigger trucks used for container handling at seaports.

Nuvera provides fuel cell systems to power HYG products as well as to power vehicles and equipment manufactured by other companies. As was noted in the draft Feasibility Assessment, Nuvera and Hyster are developing a fuel cell top-loading container handler that will be demonstrated at Fenix Marine Services at the Port of Los Angeles in 2020. Hyster is also developing a reach stacker that will be demonstrated at the Port of Valencia in Spain. Both of these equipment types have strong commercial prospects, and others are under consideration for development.

In our view, the draft assessment is a comprehensive and balanced analysis of zero- and near-zero emission options available today or likely to be available in the near future, and we believe it will be an extremely useful resource for policy makers, port administrators, and terminal operators. The methodology used to conduct the assessment seems well-crafted and robust. I am not aware of any significant omissions in the findings, but would like to point out that while the Nuvera-Hyster project mentioned above at the Port of LA is cited (section 12.5), it would also be appropriate to mention Hyster-Yale among the OEMs developing ZE platforms in Section 12.3.

As the authors note, there may be justification for more frequent assessment of certain technology and equipment categories than every three years. We believe that fuel cell equipment certainly fits this category, and it is important that prospective end-users are aware of what is likely to be commercially available in the near future.

I would be happy to answer any questions you may have about our activities or the responses above. Please feel free to contact me if I can be of further assistance.

Best regards,
Gus Block

GUS BLOCK

NUVERA FUEL CELLS, LLC

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Making Hydrogen Make Sense.
May 31, 2019

Subject: San Pedro Bay Ports Clean Air Action Plan - 2018 FEASIBILITY ASSESSMENT for CHE


This letter comments on the April 2019 draft of the Feasibility Assessment for CHE, focusing on Orange EV and yard trucks, not the entire body of work. While the comments herein are critical in nature, we want to affirm our respect for the overarching intent of the Clean Air Action Plan, complexity of the problem and how to measure progress, while recognizing the effort and achievement of the communities that have worked so hard to improve air quality in the San Pedro ports.

The comments below address factual errors, erroneous conclusions and broader assumptions in how the problem itself is being approached. At bottom we list the specific sections in question. To summarize the comments:

1. **Factual errors.** Items could have been better researched and concluded, for example Orange EV is headquartered outside Kansas City, Missouri. We are not based in Montana.

   *Request: Please review and correct these verifiable facts.*

2. **Erroneous conclusions.** Conclusions warrant re-evaluation, for example, the conclusion that due to a headquarters location and assumed limited deployments in Southern California, that Orange EV would have difficulty supporting large scale deployments. There are other examples.

   Orange EV has deployed electric yard trucks across the United States and is the only OEM to do so. Further, Orange EV has conducted usage studies with its truck at the seaport in the MTO role in 2015; this was not however under an R&D grant but rather supported by Orange EV itself to understand the unique duty cycle of the seaport bomb cart role and broader environment in which “bomb cart” trucks operate. Consequently, there is no public data on Orange EV energy usage rates in the seaport MTO role. Orange EV trucks are however commercially deployed and operating on seaport property and supporting seaport container traffic. In this too Orange EV is unique.

   *Request: Please re-examine the relevant facts and the conclusions made based upon them. Where lacking data, indicate this and omit mention, thus avoiding speculation and flawed conclusions.*

3. **Approach.** This assessment and the broader conversation regarding the seaport air quality problem seem bound by current workflow, process control and management practices. It seeks technology answers where changes to process and policy would enable deployment of proven solutions that are available today and could help realize CAAP objectives more quickly and at lower cost. The relationship between labor and terminal operators seems the crux of this issue and solvable, but only with cooperation and coordination. If this relationship doesn’t change, we foresee higher-than-necessary costs in time and money spent solving the wrong problems. We also foresee a seaport in which container handling functions are much more fully automated and jobs eliminated.

   *Suggestion: Broaden the conversation and this assessment to evaluate all options that would help realize CAAP objectives.*
Orange EV acknowledges that the assessment was based on targeted questions regarding the state of alt fuel technology to meet assumed current-state, worst-case duty cycles. As presented, however, the assessment invites misunderstanding and perpetuation of the notion that new technology is required to realize CAAP objectives where instead changes to process and policy could unleash existing technologies. This broader range of options could be more clearly part of the conversation.

The list below identifies some of the specific sections of the assessment on which comments were based.

P 18. Table 4 – Orange EV electric terminal trucks are 2019 CARB certified (and have been since 2015)

P 19. Figure 3, photos of trucks. We’ve provided a photo suitable for publication (enclosed).

P 23. Duty cycle assumptions. Strongly suggest evaluating viability of existing technologies assuming a) operators have control over the use and charging of vehicles, including b) the requirement to pull single containers vs. two on a fully loaded bomb cart. Pulling single containers and using “opportunity charging”, Orange EV’s trucks could today easily replace the seaport’s diesel yard trucks. Orange EV trucks have been doing this for years across the country. Benefits of doing so include:

- Minimizing the significant electrical infrastructure investment required at the ports, and
- Reducing related utility demand charges, since charging could occur around the clock instead of all at once during limited windows, and
- Enabling labor to benefit today from zero emission trucks proven to do the job

See the attached press release package sharing a few examples of fleets using Orange EV trucks and what they think. These include seaport-related operations.

P 27, Table 6. Orange EV yard trucks are proven both operationally and economically, having been commercially deployed across the country in every type of environment including seaports, except for the seaport bomb cart role. By “commercially deployed” we mean with paying customers, daily use, repeat orders, testimonials, years of real-world operating data affirming claims, and more. None of Orange EV’s deployments are driven by research & development (R&D) grants. Consequently, Orange EV has with intent sold and deployed trucks only where the duty cycle requirements were better known and elements in place to assure success (e.g. infrastructure, process control, executive sponsorship, etc.).

P 32, Table 10 / Table 11. Orange EV yard trucks are TRL 9, except in the seaport bomb cart role where we’ve pursued neither demonstrations nor commercial deployments. This isn’t because Orange EV couldn’t build that bomb cart truck, but rather because it’s unclear if such trucks would ultimately be deployed in the seaports given the current lack of process control and quickly emerging automation technologies.

P 34, Table 21. In Orange EV’s experience, 1,600 annual engine hours is light and 3,500 moderate. This suggests opportunity to improve the assumed duty cycle and/or asset management practices. We don’t suggest the figures are factually incorrect. Rather we think the figures affirms that there is opportunity to reduce the challenge operationally and economically through rationalization and alternate management of the required vehicle assets.

P 48, Table 22 to 24. Authors might assume, for Orange EV at least, that the DGE figures are not correct, simply noting the lack of data in the MTO (seaport bomb cart) role. Orange EV trucks have been in commercial use (rather than in R&D demonstrations) in since 2015 supporting 24x7 duty cycles and operating up to 24+ hours on a single charge. Orange EV’s power train is of a fundamentally different design (e.g. with no transmission), more energy efficient and for years has been delivering a higher endurance than suggested in the assessment. For this and other reasons we’d caution against extrapolating DGE across vehicle platforms. As noted on page 52, “Demonstrations of early commercial battery-electric yard tractors are just commencing at both Ports.”
P. 53-54. This statement is factually incorrect and verifiable: “Orange EV offers on-site warranty service for its equipment. However, Orange EV is headquartered in Montana and has limited deployments of yard tractors in California. Thus, it could be difficult for Orange EV to support large scale deployments of yard tractors in Southern California, without further growth of its service network.”

- Orange EV is headquartered in the Kansas City, Missouri area, not Montana.
- Orange EV has already established service areas supporting commercial deployments across the United States, including up and down California that support fleets in the major California air quality districts.
- A broad range of fleet customers have provided public testimony on the strength of Orange EV’s service model.

We’ve tried to be specific while concise and realize fuller conversation might be helpful. Please feel free to contact us to discuss these comments.

Respectfully,

Mike Saxton
Orange EV, Chief Commercial Officer
MikeS@OrangeEV.com
816-210-9669
World’s First Successful Class 8 Electric Truck
Commercially deployed and reordered since 2015

Orange EV was the first and is still the only manufacturer offering 100% electric Class 8 vehicles that have been deployed and reordered since 2015. Orange EV trucks meet the most rigorous duty cycles and 24x7 shift schedules while being safer, more reliable, and preferred by drivers and management alike. Orange EV trucks eliminate about 1.4 tons NOx, 1.3 tons CO, 67.9 kg PM, and 139 tons CO2 compared to Tier 3 diesels operated 5,000 hrs at 2.5 gal/hr. Older trucks are several times this. Orange EV trucks are saving > $50,000 annually per truck in fuel, maintenance and emission control. Add to this savings in work comp/liability, PR, safety, health, process efficiency, and more.

Fleets trust Orange EV
Orange EV is the long-standing industry leader with trucks commercially deployed (i.e., working in the same mission-critical roles, purchased with funds budgeted for diesels) across container-handling operations nationwide. Every Orange EV truck remains in operation with its original owner and on the original battery pack. Fleets value Orange EV’s solution-based approach: spec’ing and building trucks to site-specific requirements; explaining the spec’d solution, rationale, and what to expect; training operators, maintainers, and other team members; providing responsive, superior post-delivery support, remote and onsite. Orange EV trucks meet expectations both operationally and financially. A long time industry insider (years ago) provided this test drive and assessment.

Orange EV trucks deliver
- **Emissions reductions**: Orange EV trucks eliminate about 1.4 tons NOx, 1.3 tons CO, 67.9 kg PM, and 139 tons CO2 compared to Tier 3 diesels operated 5,000 hrs at 2.5 gal/hr. Older trucks are several times this.
- **Savings**: In the same duty cycle described above, Orange EV trucks are saving > $50,000 annually per truck in fuel, maintenance and emission control. Add to this savings in work comp/liability, PR, safety, health, process efficiency, and more.

DHL Supply Chain was recognized for deploying Orange EV’s electric terminal trucks and have several all-electric sites with no diesel backups; Orange EV electric trucks are more reliable than the diesels they replaced. At their first site in 2015, DHL reduced fuels costs by 85-90% and completely eliminated tailpipe emissions. Municipal entities like the City of Orlando and Chautauqua County as well as commercial fleets like Groot Industries, a subsidiary of Waste Connections, use Orange EV in waste transfer operations. Anderson DuBose, McDonald’s distributor, supplying restaurants daily, issued this case study. For years Orange EV electrics have been the lead trucks at YRC Freight’s largest break bulk site. Oakland Maritime Support Services, TriModal, Impact Transportation, and R&A use Orange EV trucks in and around California seaports. In its first re-order, Rail Management Service (RMS), the largest intermodal ramp operator, deployed nine (9) trucks to sites in harsh northern climates. Brand-leading, regional, and government fleets alike choose Orange EV electric terminal trucks.

Proven & preferred, working 24x7 daily across the U.S.
Kansas City based Orange EV is the leading OEM providing industrial fleets with heavy duty electric vehicle solutions that are proven to save money while being safer, more reliable, and preferred by drivers and management alike. Orange EV trucks meet the most rigorous duty cycles and 24x7 shift schedules while eliminating diesel fuel and emissions. Building both new and re-powered terminal trucks with patent-pending technology, Orange EV was the first and is still the only manufacturer offering 100% electric Class 8 vehicles that have been commercially deployed and re-ordered into container handling operations.

Visit OrangeEV.com to learn more, see the T-Series in action, and request a quote.
Setting sights on zero emissions

DHL Supply Chain employing a range of equipment measures

As part of a global initiative to use more fuel-efficient vehicles, DHL Supply Chain in the U.S. has a local target in its sights—to contribute to improving air quality in urban areas, it aims to deliver 70% of its first and last mile services with clean pickup and delivery solutions. GoGreen, the corporate program of this contract logistics services provider, includes numerous initiatives that focus on making its operations more sustainable. Its goal is to achieve zero emissions by 2050.

DHL Supply Chain is employing a wide range of measures to improve the carbon and fuel efficiency of its fleet operations. Solutions focus on aerodynamics as well as lightweight vehicle designs and telematics. In addition to making technical modifications to conventional fuel vehicles, the company is also relying on alternative drive technologies and fuels to reduce greenhouse gas emissions.

That includes electric- and natural gas-powered vehicles for short distances as well as sustainably produced biofuels for long haul transport operations. Out of approximately 92,000 road vehicles around the world, DHL has modified roughly 20,500 vehicles.

“If we’re not talking about sustainability with our suppliers, we are affecting our bottom line and not meeting our corporate responsibility to reduce our carbon footprint and set a good example every day for our associates,” said Jennifer Miller, DHL Supply Chain’s senior director of automotive operations, North America. “We approach our sustainability goals from the beginning of our procurement process and on a daily basis throughout our operation.

“We work with our OEMs to fundamentally understand how best to set our sustainability targets based on their product designs,” Miller continued. “We focus on speed, mpg, fuel, and idling, to name a few. We also ensure our drivers understand that these goals are in place to help meet corporate sustainability targets, and we reward them for their performance.”

One of the equipment-related sustainability initiatives at DHL Supply Chain that is reducing fuel use involves deploying all-electric terminal trucks. “We are currently operating four electric yard tractors built by Orange EV at two sites,” related Emily Davis, sustainability program manager and GoGreen Lead, North America. “They make the most sense where we use incentives to help cover the incremental cost of the trucks.

“As costs come down and fuel prices go up, the electric trucks will demonstrate price parity to standard diesels,” Davis added, “but we also save on fuel and maintenance costs. And there are benefits to our drivers having less exposure to air pollution, vibration and noise.”

The Orange EV 100% electric Class 8 T-Series terminal trucks can be rated for on- or off-highway use and built as new vehicles, or remanufactured using existing diesel chassis with new powertrain, auxiliary, and environmental systems. The manufacturer says the trucks eliminate all of the NOx, CO, PM, and carbon dioxide produced by a typical diesel operating 6,000 hours annually at 2.5 gallons per hour.

Operationally, Davis said all-electric models are a good fit for warehouse shuttling operations at DHL Supply Chain, which involves two or three shifts daily and high levels of low speed utilization at the facilities. For the yard tractors, the company has installed an equipment-specific charging infrastructure at warehouses. The trucks are capable of operating up to 20 hours per day on a single charge.

“It makes the most sense to have our own charging infrastructure in locations where we control and operate the warehouse as well,” Davis said. “While the infrastructure needed depends on the type, range, and application of electric vehicles, installing charging systems at the point of domicile enables us to get a longer overnight charge when necessary.”

Every aspect of the sustainability programs for equipment at DHL Supply Chain is evaluated regularly and monitored closely.

“We measure driver and vehicle performance every day to ensure we leave the smallest possible carbon footprint,” Miller stated.
Kraft Heinz Deploys All Electric Trucks in Ohio, Eliminating Diesel Emissions with Firefly Transportation Services and Orange EV

Global food and beverage leader replaces Class 8 diesel terminal trucks with pure electric at its Ohio distribution center
Kraft Heinz Deploys All Electric Trucks in Ohio, Eliminating Diesel Emissions with Firefly Transportation Services and Orange EV

Global food and beverage leader replaces Class 8 diesel terminal trucks with pure electric at its Ohio distribution center

KANSAS CITY, MO and GROVEPORT, OH, May 8, 2019 - Orange EV, Firefly Transportation Services, and The Kraft Heinz Company today announced the deployment of three (3) Orange EV T-Series pure electric terminal trucks to the Kraft Heinz distribution center in Groveport, Ohio.

“As part of our commitment to Growing a Better World and improving our operational sustainability, we’ve partnered with Firefly Transportation Services to replace several of the diesel trucks in our Groveport, Ohio operation with electric ones,” said Erin Mitchell, Head of North American Warehouse and Logistics for The Kraft Heinz Company. “Orange EV’s battery-electric terminal trucks deliver 100 percent emission-free transportation services – a key driver of our progress toward a more sustainable and resilient supply chain.”

Firefly will operate three (3) Orange EV pure electric terminal trucks to do the work formerly accomplished by five (5) diesels. For fuel diversity alone, one diesel will remain onsite and is expected to go unused in routine operations. With this deployment, Kraft Heinz plans to virtually eliminate diesel terminal truck emissions at their Groveport distribution center.

The electric truck solution was partially funded by the American Lung Association through a grant provided by the U.S. Environmental Protection Agency’s Diesel Emissions Reductions Act (DERA) Program, secured and administered by the Clean Air Team at the American Lung Association (ALA)’s Springfield, Illinois office. The ALA has been a longtime leader in the fight for healthy air.

“Firefly Transportation Services is committed to delivering zero-emission yard management services to our customers while also dramatically increasing site productivity and cost savings”, affirmed Mike Bohnstengel, one of the Firefly principal partners. “Utilizing data from our EV telematics systems, we provide advanced analytics and implement operational improvements that would not be achieved via traditional diesel units.”

Mike Saxton, Orange EV’s Chief Commercial Officer, confirmed, “This decision by Kraft Heinz demonstrates thoughtful mitigation of the extremely high operational, economic, and environmental costs of using diesel trucks. With this deployment, Kraft Heinz becomes the first site in Ohio to fully commit to pure electric in their heavy duty, Class 8 terminal truck fleet.”
About The Kraft Heinz Company

For 150 years, The Kraft Heinz Company (NASDAQ:KHC) has produced some of the world’s most beloved products. Our Vision is To Be the Best Food Company, Growing a Better World. We are one of the largest global food and beverage companies, with 2018 net sales of approximately $26 billion. Our portfolio is a diverse mix of iconic and emerging brands. As the guardians of these brands and the creators of innovative new products, we are dedicated to the sustainable health of our people and our planet. To learn more, visit http://www.kraftheinzcompany.com/ or follow us on LinkedIn and Twitter.

About Firefly Transportation Services

Through state-of-the-art technology, Firefly Transportation Services is revolutionizing the spotting services industry. Firefly provides 100% electric trucks for yard management operations to create a safer and healthier work environment, support fleet sustainability goals, and reduce operating costs. For all spotting and shuttling services, Firefly delivers advanced analytics, KPI reporting, and in-depth business reviews. With nearly 75 years of combined experience in transportation, logistics, and supply chain management, the Firefly leadership team has deep industry expertise and is committed to improving clients’ bottom line productivity.

About Orange EV

Kansas City based Orange EV is the leading OEM providing industrial fleets with heavy duty electric vehicle solutions that are proven to save money while being safer, more reliable, and preferred by drivers and management alike. Orange EV trucks meet the most rigorous duty cycles and 24x7 shift schedules while eliminating diesel fuel and emissions. Building both new and re-powered terminal trucks with patent-pending technology, Orange EV was the first and remains the only manufacturer offering 100% electric Class 8 vehicles that have been commercially deployed and re-ordered into container handling operations.
For Immediate Release

For information concerning this release, contact:

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Rail Management Services (RMS) Re-Orders Orange EV T-Series after Successful Chicago Deployment

Leading rail intermodal firm expands use of electric yard trucks
Rail Management Services (RMS) Re-Orders Orange EV T-Series after Successful Chicago Deployment

Leading rail intermodal firm expands use of electric yard trucks

KANSAS CITY, Mo., March 1, 2017 - Orange EV today announced that Rail Management Services (RMS) has placed a follow-on order for nine (9) additional T-Series pure electric terminal trucks. RMS, one of the largest rail intermodal yard operators in the United States, purchased their first Orange EV truck in July 2016 for use at a Class 1 railyard in Chicago. Ed Morgenthaler, Vice President of Maintenance, Safety, Legal and Operations for RMS, estimates that the Chicago yard ranks as one of the top five toughest sites of their 40+ facilities across the U.S.

"We put the Orange EV truck in Chicago at one of our toughest ramps. It's one of the larger facilities in the country and has been active for decades making the terrain harsh on hostlers," said Morgenthaler. "The Chicago winters also play an important role in it being a difficult location. Frankly, I was surprised. I didn't expect the truck to be as reliable as it is."

Orange EV offers a range of configurations built to meet site-specific requirements while managing cost. The RMS reorder is comprised of nine Extended Duty (160 kWh) trucks, each with galvanized frames but built to three different configurations: new, on-road (DOT compliant), with standard onboard charging; re-manufactured (aka re-powered), off-road, with offboard fast charging; and re-manufactured, off-road, with standard onboard charging. The trucks are being worked into onsite fleets to supplement and replace RMS's diesel trucks. Five of the trucks will be deployed at the same Chicago railyard while four will be utilized at rail sites in New York.

"Although we had hiccups at first, the Orange EV guys got right on it and quickly rectified the situation," Morgenthaler continued. "The New York sites are also difficult environments with lots of snow, ice, and rough ramps but after the Chicago pilot, I feel confident that the trucks will be very reliable."

“RMS has done an incredibly thorough job of evaluating and understanding our technology - why and how to use it - while making us better in the process” said Mike Saxton, Orange EV chief commercial officer. "Our goal with RMS and all customers is to ensure that Orange EV trucks deliver the promised value in a complete electric truck solution that does the job while making economic sense. It’s gratifying that 75% of our fleets have reordered within six months of receiving their first Orange EV truck."

Railyards and other container handling operations are often located in designated non-attainment areas. Switching from diesel yard trucks to electric provides immediate emissions reductions and health benefits for workers and surrounding communities. While figures vary by site, Orange EV estimates the per truck emissions eliminated in rail intermodal hub operations annually can be up to 160 tons CO2, 1.7 tons NOx, 1.6 tons CO, and 80 kg PM.

Total cost of ownership is reduced as well due to savings in fuel, maintenance and other expenses, enabling fleets to use existing capital and expense budgets planned for diesels. Additional savings of up to 85% of total purchase price are available via incentive programs offered at city, state and federal levels.
About Rail Management Services

Rail Management Services (RMS) is an intermodal lift-on/lift-off contractor with a hostling fleet of 700+ trucks. A leading supplier of intermodal ramp services, RMS is currently contracted at 40+ facilities across the United States on four Class 1 railroads and handles over 7.4 million lifts per year. RMS is a subsidiary of Carrix, one of the world’s largest privately held marine terminal and rail yard operators. Contact Rail Management Services at contact@rmsintermodal.com and 206-382-4460, or visit the RMS website at rmsintermodal.com.

About Orange EV

Kansas City based Orange EV is the leading OEM providing industrial fleets with heavy duty electric solutions that do the same work while eliminating diesel fuel and emissions. Orange EV’s terminal truck was the first heavy duty electric vehicle approved for sale in California. Building both new and re-powered vehicles, Orange EV was the first to commercially deploy 100% electric Class 8 vehicles into container handling operations. Contact Orange EV at Sales@OrangeEV.com and 866-688-5223, or visit the company’s website at www.OrangeEV.com. Media: Contact Mike Saxton at 866-688-5223 ext. 702 or MikeS@OrangeEV.com.
Dot Transportation, Inc. Deploys Orange EV Electric Yard Truck at California Distribution Center

Full-electric reduces cost while increasing driver safety and comfort
Dot Transportation, Inc. Deploys Orange EV Electric Yard Truck at California Distribution Center

Full-electric reduces cost while increasing driver safety and comfort

KANSAS CITY, MO and MT. STERLING, IL, April 23, 2019 - Orange EV and Dot Transportation, Inc., a subsidiary of Dot Foods, Inc., the largest food industry redistributor in North America, today announced the deployment of an Orange EV T-Series pure electric terminal truck at Dot’s operation in Modesto, CA. The Modesto facility is one of eleven distribution centers operated by Dot Foods in the U.S.

“Making the move to pure-electric aligns with Dot’s mission to implement innovative, efficient solutions that contribute to the success of its food industry partners and their sustainability objectives,” said Kevin Buss, Dot Transportation’s Director of Fleet Maintenance.

Orange EV’s patent-pending technology represents an innovation over existing electric-powered Class 8 vehicle systems, delivering increased safety as well as a vehicle that increases energy efficiency by more than 400% over traditional diesel systems.

Dot Foods is committed to sustainable initiatives at all its facilities, such as motion-activated LED lighting in warehouses, specialized insulation on freezers and refrigerators to reduce energy consumption, opportunity charging for equipment, solar panels on refrigerated units, idle-reducing measures, and use of aerodynamic fairings.

Deployment of Orange EV’s T-Series pure electric terminal truck marks the first zero-emission vehicle deployed into Dot Transportation’s operations. The Modesto site has seamlessly integrated the new electric truck, charging during existing breaks and keeping the battery in a state of high charge while averaging about 12 hours of key-on time daily in around-the-clock operations.

“We’re really excited to pilot this technology for Dot,” said David Bigelow, Dot Foods California General Manager. “We will learn a lot from this electric yard truck in terms of lifespan and maintenance, and then we can use that learning moving forward. We are always excited about the challenge to try something new and help figure it out, and anytime that we can do that while also supporting Dot’s cost-savings and green initiatives, all the better.”
Truck data is reported using Orange EV’s web-based telematics system (standard equipment on all Orange EV trucks) that provides instant feedback, real-time performance statistics, and hard data that helps fleets understand system status, fuel efficiency, cost savings and more.

“Orange EV is thrilled to be working with an innovative industry leader like Dot Foods,” commented Mike Saxton, Orange EV Chief Commercial Officer. “Orange EV trucks are built to fit site duty cycles and meet cost savings objectives. With trucks commercially deployed since 2015, Orange EV has amassed a wealth of real-world operating data that helps ensure everyone knows what they’re getting into operationally and economically. Typical distribution center operations report savings up to $40,000+ per truck annually in fuel, maintenance and emission control. Facilities also enjoy all the other things that get better when diesel fuel is eliminated including a safer, healthier environment for site personnel and the surrounding community.”

Increased safety was a key component in the decision to purchase all-electric. The Orange EV truck provides a cooler, quieter, vibration-free alternative to its diesel counterpart with regenerative braking that allows for smooth, no-shift deceleration, finer control, and reduces stopping distance and stopping time.

“There’s so much new technology in the industry today, and this yard truck is going to help us in a lot of ways,” Buss explained. “We looked at a lot of options before we decided to move forward with this one. It will help us better understand electric trucks, how they perform, and how they operate. The Orange EV truck is very similar to the yard trucks we are already using, but it will allow us to lower maintenance costs and should have a longer life in the yard.”

Dot Foods California introduced the all-electric truck at the end of 2018, and the vehicle has been well-received by drivers.

“We want to stay on the leading edge of technology in our industry so we’re in a position to give our employees the best tools, and ultimately, to provide the best service possible to our customers,” Bigelow continued. “Our driving careers are not like all the others out there. I encourage anyone who wants to learn more to visit DriveforDot.com.”

Dot Foods utilized funding from the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) to purchase their Orange EV truck for use at the California distribution center. Fleets using
Orange EV trucks can now also monetize site-generated carbon credits worth thousands of dollars per truck annually.

**About Dot Foods and Dot Transportation**

Dot Foods, Inc., carries 131,000 products from 1,040 food industry manufacturers making it the largest food industry redistributor in North America. Through Dot Transportation Inc., an affiliate of Dot Foods, the company distributes foodservice, convenience, retail and vending products to distributors in all 50 states and 39 countries. Dot Foods operates 11 U.S. distribution centers, which are located in Modesto, California; Vidalia, Georgia; Burley, Idaho; Mt. Sterling, Illinois; Cambridge City, Indiana; Williamsport, Maryland; Liverpool, New York; Ardmore, Oklahoma; Dyersburg, Tennessee; University Park, Illinois; and Bullhead City, Arizona. A twelfth facility is currently under construction in Bear, Delaware. Dot Foods' Canadian operations are located in Toronto, Ontario and Calgary, Alberta. For information, visit DotFoods.com.

Dot Foods and Dot Transportation continue to experience exceptional growth. Both companies are looking to fill several positions for full and part-time drivers and warehouse personnel at all U.S. locations. To learn more about careers at Dot Foods visit DotFoods.com/Careers and follow @DotFoodsCareers. For more on opportunities available with Dot Transportation, visit DriveForDot.com.

**About Orange EV**

Kansas City based Orange EV is the leading OEM providing industrial fleets with heavy duty electric vehicle solutions that are proven to save money while being safer, more reliable, and preferred by drivers and management alike. Orange EV trucks meet the most rigorous duty cycles and 24x7 shift schedules while eliminating diesel fuel and emissions. Building both new and re-powered terminal trucks with patent-pending technology, Orange EV was the first and is still the only manufacturer offering 100% electric Class 8 vehicles that have been commercially deployed and re-ordered into container handling operations. For information contact: Mike Saxton at 866-688-5223 x702, MikeS@OrangeEV.com or via OrangeEV.com.
For Immediate Release

Impact Transportation Deploys Orange EV Electric Yard Truck to Port of Oakland Operations

Zero-emission Class 8 is better for site personnel, strong as a diesel, and supports Port emissions goals
Impact Transportation Deploys Orange EV Electric Yard Truck to Port of Oakland Operations

Zero-emission Class 8 is better for site personnel, strong as a diesel, and supports Port emissions goals

KANSAS CITY, MO and OAKLAND, CA, March 19, 2019 - Orange EV and Impact Transportation today announced the deployment of an Orange EV T-Series pure electric terminal truck to Impact’s 250,000 square foot warehouse and special project site supporting Port of Oakland operations.

“Impact Transportation is a dedicated champion of clean transportation. Their efforts and leadership are helping pave the way to zero emissions at the Port of Oakland,” commented Mike Saxton, Chief Commercial Officer for Orange EV.

“At Impact Transportation, we take pride in what we do and how we do it. Our team members spend five to six days a week moving customer cargo through our facilities, so comfortable, dependable, and environmentally friendly equipment is a must,” said Ron Cancilla, President of Impact Transportation. “Over the last two years we have replaced all of our cargo handling equipment with the cleanest technology available. Deploying an Orange EV electric was just one more step in our efforts to provide our team with the best equipment out there.”

Impact’s Orange EV truck is DOT compliant and built with an 80 kWh battery pack and standard charging. The pure-electric yard truck is used to pull containers, 53-foot vans, flatbeds, and large, heavy, out-of-gauge cargo. "We've had no issues,” said Ron. “The Orange EV electric is as strong as any of our diesel equipment and has surprising torque under any load, heavy or light."

According to onboard telematics data, Impact can operate their Orange EV truck for about eleven (11) hours on a single charge if needed, although the site is routinely opportunity charging, plugging in to charge during breaks, shift changes, and other downtime. Battery endurance varies as with a tank of diesel, where energy consumption can be higher or lower based on how hard the truck is working. Orange EV offers a range of equipment configurations to meet site-specific needs including larger battery pack (e.g., 160 kWh) and fast charging. With a 160 kWh battery pack, Impact could operate about 22 hours on a single charge.

Terminal trucks are Class 8 vehicles and known by many names, most commonly yard trucks or yard tractors, but also hostlers, spotters, goats, shunts, jockeys, shuttles and more. Impact has a unique nickname for their truck. “We love our new Hot Wheel and its custom paint scheme,” shared Ron. “The quiet, smooth operation makes it fun to drive.”

Impact Transportation utilized funding from the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) to purchase their Orange EV truck. HVIP is currently open, enabling discounts of up to $165,000 per Orange EV terminal truck. Fleets using Orange EV trucks can now also monetize site-generated carbon credits worth thousands of dollars per truck annually. Contact Orange EV to learn more.
About Impact Transportation

Impact Transportation is one of the most diversified logistics operations in the Bay Area. Based at the Port of Oakland, Impact provides drayage, flatbed, van, warehouse, cross docking, and special projects services in and around Northern California. For more information on the company and its services please visit www.ImpactTransportation.com and “Get with IT!”

About Orange EV

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The Anderson DuBose Company Deploys the First Orange EV Electric Yard Truck in McDonald’s Distribution Network

*Eliminating Emissions Advances Leadership in Sustainability, Employee Health, and Safety*
The Anderson DuBose Company Deploys the First Orange EV Electric Yard Truck in McDonald’s Distribution Network

Eliminating Emissions Advances Leadership in Sustainability, Employee Health, and Safety

KANSAS CITY, MO and ROCHESTER, NY, August 30, 2017 - Orange EV and The Anderson DuBose Company today announced the deployment of the first 100% electric, class 8 truck in the McDonald's distribution network.

The Orange EV T-Series electric yard truck replaced its diesel predecessor at The Anderson DuBose Company’s Rochester, New York distribution center where it manages and moves dispatch trailers in a seven-day-a-week operation. Replacing a heavy-emitting diesel yard truck with pure-electric completely eliminates that vehicle's emissions and diesel fuel consumption, an important step in the sustainability efforts of both Anderson DuBose and McDonald’s.

Anderson DuBose has long been committed to minimizing the company’s environmental impact and utilizes an environmental management system that meets ISO 14001: 2004 Certification. Each year, Anderson DuBose sets aggressive sustainability targets to reduce electricity consumption, diesel fuel usage, and waste-to-landfill. Switching to a 100% electric yard truck significantly reduces the company's carbon footprint while also supporting their customer's vision to "realize a food supply where people, animals and the planet thrive."

Moving to electric also provides a better working environment for Anderson DuBose employees with a truck that is smoother, cooler, quieter, and cleaner. “I’ve heard nothing but great comments from the drivers,” said Tom Hank, General Manager of the Anderson DuBose Rochester facility. "Orange EV’s truck is more comfortable and our operators really like the quiet and smooth operation. Management is pleased that we can provide a safer and healthier working environment – the truck has no engine and no emissions." This change also positively impacts its neighbors and broader community.

“We appreciate the spirit of partnership and sense of shared-mission the entire Anderson DuBose team has brought to the relationship," noted Mike Saxton, Orange EV's chief commercial officer.

The Anderson DuBose Company works closely with the other members of the North American Logistics Council to identify and share best practices. "Being the first to identify the Orange EV truck and work through the steps to on-board the vehicle enables us to be a resource for the other distributors," commented Tom. "They can visit, observe truck operations, understand our design and business case, and hopefully deploy more trucks throughout the country."
About The Anderson DuBose Company

Headquartered in Lordstown, Ohio, The Anderson DuBose Company is dedicated to being a leader in the distribution industry by providing world-class service and brand protection to its valued business partners. Anderson DuBose is "Delivering with Pride - One Case at a Time" to more than 570 McDonald's and Chipotle restaurants in three states. The Rochester, New York distribution center services over 215 McDonald’s restaurants in New York and Pennsylvania. Contact Anderson DuBose at THank@Anderson-DuBose.com, 585-334-2400, or visit their website at anderson-dubose.com.

About Orange EV

Kansas City based Orange EV is the leading OEM providing industrial fleets with heavy duty electric solutions that do the same work while eliminating diesel fuel and emissions. Building both new and re-powered vehicles, Orange EV was the first to commercially deploy 100% electric Class 8 vehicles into container handling operations; Orange EV is the only manufacturer filling re-orders for continuing fleet deployments of 100% electric class 8 trucks. Contact Orange EV at 866-688-5223, sales@orangeev.com, or by visiting the company’s website at OrangeEV.com. Media: Contact Mike Saxton at 866-688-5223 ext. 702 or MikeS@OrangeEV.com.
Sonwil Expands Customer Commitment, Deploying Orange EV Electric Yard Truck to Buffalo, NY Distribution Center

Replacing diesel with electric increases competitive advantage

Innovative Transportation Services (ITS) with their new Orange EV T-Series pure-electric terminal truck.
From left: James Hotnich, Dispatch Manager; Owen Owens, Driver; and Dave Harper, President of ITS.
Sonwil Expands Customer Commitment, Deploying Orange EV Electric Yard Truck to Buffalo, NY Distribution Center

Replacing diesel with electric increases competitive advantage

KANSAS CITY, MO and BUFFALO, NY, February 7, 2018 - Orange EV and Sonwil Distribution Center, Inc., today announced the 2017 deployment of Orange EV’s T-Series pure-electric terminal truck to Sonwil’s 300,000 square foot warehouse and distribution center in Buffalo, New York. Replacing diesel with an Orange EV electric yard truck further delivers on Sonwil’s commitment to their customers to provide solutions that increase efficiency, reduce costs, and help achieve sustainability goals.

“Sonwil’s philosophy is simple,” said Dave Harper, President of Innovative Transportation Services (ITS), Sonwil’s transportation arm. “We put the customer first, continually working to add value, meet the customer’s evolving needs, and strengthen their competitive advantage.” For example, to increase efficiency and sustainability, ITS has worked with key industry partners to design custom trailers, both dry and refrigerated, to haul increased loads. The specialized dry trailers carry over 55% more per load resulting in fewer trips, significantly lower costs, and smaller carbon footprint.

“We like to operate on the leading-edge with clean technologies,” continued Harper. “Sonwil was one of the first thousand orders for Class 8 12-liter CNG tractors, and now we’re moving into Class 8 electric. The Orange EV truck is a good fit with our mission, eliminating emissions and solving problems. And compared to the steep learning curve with CNG, the electric yard horse was easy – just plug it in.”

Orange EV’s complete electric terminal truck solution includes everything needed to begin operations: trucks, charging capabilities, telematics, on-site training, manuals, customized operator settings, warranty, and more. Building both new and remanufactured vehicles, Orange EV designs and manufactures each truck to customer specifications. Sonwil is operating a new T-Series Extended Duty Terminal Truck with Standard Onboard Charging.

Diesel yard trucks are costly to operate due to fuel expense, maintenance, and emission control requirements; they also pose risks to employee health and safety. Fumes, heat, and dust are a few of Sonwil’s biggest challenges with diesel. Owen Owens, lead ITS driver, commented, “The Orange EV has been great. We still have a diesel yard horse here but I prefer the electric, and so do other drivers. It’s a lot quieter and you don’t have exhaust gas emissions. Summer will be great since we won’t be sitting on top of the engine cooking. Plus, we operate on a dirt lot and the diesel kicks up the dust and sucks it into the cab. With the electric, there’s no dust.” The Orange EV truck also performed well in the cold, working through a bitter January with back-to-back days of below-zero temperatures and wind chill of 30+ below.
Orange EV’s electric terminal trucks (aka yard trucks, horses, spotters, hostlers, etc.) operate in all segments of the container-handling market including ports, rail intermodal, manufacturing, distribution, parcel, waste transfer, LTL freight, third party logistics, and more. Understanding that each yard is physically and operationally unique, Orange EV delivers site-specific electric vehicle solutions backed by committed engineering and technical support.

In early operations with their electric terminal truck, Sonwil faced a unique challenge with the truck/trailer connection. Said Harper, “From the beginning, Orange EV treated the issue with urgency. They were in constant communication, and working together we found a solution.” He concluded, “The Orange EV electric has reduced maintenance, keeps drivers happy, and we expect to see reduced costs. To other fleets considering electric, I’d say don’t be afraid to dive in – you will be rewarded.”

About Sonwil

A family-owned and operated logistics solutions firm, Sonwil Distribution Center, Inc, has been serving regional, national, and international clients for more than 70 years. Sonwil is headquartered in Buffalo NY, with additional locations in Carlstadt NJ, Reno NV, and Arlington TX. Sonwil’s scalable logistics solutions help clients optimize revenue growth and reduce operating expenses related to inventory management and distribution. Innovative Transportation Services, Sonwil’s transportation arm, provides innovative ideas and equipment for customers requiring unique solutions. To learn more, call 716-684-0555 or visit www.sonwil.com.

About Orange EV

Kansas City based Orange EV is the leading OEM providing industrial fleets with heavy duty electric solutions that do the same work while eliminating diesel fuel and emissions. Building both new and re-powered vehicles, Orange EV was the first and is still the only manufacturer offering 100% electric Class 8 vehicles that have been commercially deployed and re-ordered into container handling operations. 75% of Orange EV customers have purchased additional trucks within six months of their first delivery. Contact Orange EV at 866-688-5223, Sales@OrangeEV.com, or by visiting the company’s website at OrangeEV.com. Media: Contact Mike Saxton at 866-688-5223 ext. 702 or MikeS@OrangeEV.com.
For Immediate Release

Delivering Zero-Emission Yard Management, Firefly Deploys First Class 8 Electric Truck in Michigan

Consumer Brand Leader Selects Firefly for Michigan and California Manufacturing and Distribution Sites
Delivering Zero-Emission Yard Management, Firefly Deploys First Class 8 Electric Truck in Michigan

Consumer Brand Leader Selects Firefly for Michigan and California Manufacturing and Distribution Sites

KANSAS CITY, MO and GLENVIEW, IL, August 14, 2018 - Orange EV and Firefly Transportation Services today announced the deployment of Orange EV T-Series pure electric terminal trucks into yard management operations for a leading manufacturer of consumer packaged goods. Providing emission-free yard management services at manufacturing and distribution facilities in Michigan and California, Firefly will reduce costs and add new KPI reporting and tracking capabilities while supporting customer sustainability goals.

Firefly offers leading-edge transportation services, providing customers with Orange EV’s 100% battery-electric yard trucks for spotting operations. For this consumer brand leader, Firefly has delivered the first commercially deployed, pure electric Class 8 truck in the state of Michigan. "To cut operating costs, improve operations, and reduce emissions all at the same time requires firms to do things differently," commented Mike Saxton, Orange EV’s Chief Commercial Officer. "Firefly’s team of respected logistics industry leaders has built a new model for transportation services free from the burdens of older diesel technologies.”

Orange EV’s industry-leading fleet of Class 8 battery-electric trucks, commercially deployed since 2015, recently surpassed 575,000 miles and 161,000 “key on” hours. Fleets using Orange EV trucks have repeatedly affirmed increased reliability and driver satisfaction as well as reduced maintenance and downtime. With operational cost savings of $20,000 to $60,000 annually, total cost of ownership of an Orange EV electric is often significantly less than that of a diesel.

“From a warehouse and logistics standpoint, we’ve done those jobs, been in those roles, and understand the challenges facing traditional diesel yard management where fleets are hard-pressed to find more savings or productivity. Legacy equipment and systems don’t meet the demands of today’s transportation environment,” said Mike Bohnstengel, Principal Partner at Firefly Transportation Services. “Firefly’s fresh approach delivers immediate cost savings with fuel costs reduced 80 percent or more. Through onboard telematics, key performance indicators, and real-time reporting and analysis, we help clients better understand and manage current yard operations, identify efficiencies, and improve bottom line productivity.”

Firefly employs industry best practices to deliver superior yard management services while improving safety for operators and site personnel. Orange EV trucks have lower noise and vibration and run on voltages less than 120VDC, significantly lower and safer than the 350VDC to 450VDC used by other vehicle manufacturers. “Some find it hard to believe that an electric truck can do everything their old diesel does while also being cooler, quieter, and lower cost to operate,” said Bohnstengel. “We invite fleets to drive the Orange EV truck and experience safer, emission-free yard management for themselves.”
About Firefly Transportation Services

Through state-of-the-art technology, Firefly Transportation Services is revolutionizing the spotting services industry. Firefly provides 100% electric trucks for yard management operations to create a safer and healthier work environment, support fleet sustainability goals, and reduce operating costs. For all spotting and shuttling services, Firefly delivers advanced analytics, KPI reporting, and in-depth business reviews. With nearly 75 years of combined experience in transportation, logistics, and supply chain management, the Firefly leadership team has deep industry expertise and is committed to improving clients’ bottom line productivity.

About Orange EV

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For Immediate Release

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Ability Tri-Modal Deploys Five Orange EV Electric Yard Trucks to Carson, California Distribution Operations

Delivering a return on investment while reducing carbon footprint
Ability Tri-Modal Deploys Five Orange EV Electric Yard Trucks to Carson, California Distribution Operations

Delivering a return on investment while reducing carbon footprint

KANSAS CITY, MO and CARSON, CA, June 20, 2018 - Orange EV and Ability Tri-Modal Transportation Services today announced the deployment of five (5) Orange EV T-Series pure-electric terminal trucks to three of Tri-Modal’s warehousing and distribution facilities, a combined 750,000 square feet of warehouse space close to the Ports of Los Angeles and Long Beach. Continuously seeking versatile solutions and operational excellence, Ability Tri-Modal has deployed the heavy-duty electric trucks to reduce carbon footprint while decreasing costs. “The Orange EV trucks are a solution-based purchase,” said Greg Owen, owner and Head Coach of Ability Tri-Modal. “They’re going to give us a return on investment.”

“Ability Tri-Modal is a clear leader and innovator in clean transportation” said Mike Saxton, Orange EV’s Chief Commercial Officer. “It’s been an honor to work with Greg Owen and his team to put in service the first commercially-deployed, 100% electric Class 8 trucks directly supporting the California ports of Los Angeles and Long Beach.”

Ability Tri-Modal uses ten terminal tractors for yard management, which operate up to 20 hours per day, five days a week. Said Owen, “The yard truck is the hardest-working piece of equipment in our fleet, and it’s also the most affected by increasingly strict environmental regulation.” Bob Krug, Maintenance Director for Ability Tri-Modal, added, “With older diesels, wear-and-tear and rough use were the main issues. With the newer ones, 90% of the problems are related to emissions control technology.”

“For the last 12 years or more, we’ve had two or three diesels down at any one time,” Owen stated. “We needed a solution, and until Orange EV, no one had answers.”

In their ongoing search for an economic, reliable alternative to diesel, Tri-Modal began tracking electric yard truck development. According to Owen, “Initial port demonstration projects were disappointing due to the early technologies. We then spoke with fleets that have been heavily operating Orange EV trucks for years, proving that Orange EV’s newer patent-pending technology does the job. These fleets indicate that downtime is minimal, maintenance and fuel costs are reduced, and Orange EV is committed to both their customers and ongoing product development. Orange EV provides a solution to the increased costs associated with diesel equipment.” Moderate-use sites report annual savings of $30,000 per Orange EV truck in fuel, maintenance, and emission control related costs; heavier-use sites can save much more.

With five electric yard trucks managing trailers at multiple Tri-Modal facilities, Krug concluded, “The Orange EV trucks have been perfect, going above and beyond expectations. We’ve had no issues and the drivers love them.”
The Orange EV deployment is just the latest initiative in Ability Tri-Modal's efforts to “think green” like the Port of Long Beach, operating as efficiently and sustainably as possible. The company has been honored on multiple occasions by the Ports of Los Angeles and Long Beach for early adaptation to the ports’ Clean Trucks Program, and operates a 100% clean truck fleet, in compliance with rigorous port and state requirements. Looking to the future, Tri-Modal plans to install solar panels to charge its growing fleet of electric equipment with electricity generated on-site.

Ability Tri-Modal utilized funding from the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) to purchase their Orange EV trucks. HVIP is currently open, offering incentive amounts of up to $175,000 per Orange EV terminal truck.

About Ability Tri-Modal Transportation Services

Ability Tri-Modal Transportation Services specializes in in trans-loading, consolidation and de-consolidation, warehousing, retail delivery, and a variety of value-added services. With operations in Carson, California and Ladson, South Carolina, Ability Tri-Modal is a proven, award-winning transportation company that is rooted in its devotion to superior customer service. The company continuously meets and exceeds expectations through highly versatile customer solutions, operational excellence, and results-driven attitude. Ability Tri-Modal’s motto, “Service Above Self” fuels the passion, innovation, and mission to execute measurable benefits to the customer.

About Orange EV

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For Immediate Release

Oakland Pallet Deploys Orange EV Electric Yard Truck for Product Staging and Local Delivery

charging with on-site solar power further reduces carbon footprint
Oakland Pallet Deploys Orange EV Electric Yard Truck for Product Staging and Local Delivery

Charging with on-site solar power further reduces carbon footprint

KANSAS CITY, MO and SAN LORENZO, CA, October 31, 2018 - Orange EV and Oakland Pallet Co., Inc. (OPC) today announced the deployment of an Orange EV T-Series pure electric terminal truck to the Oakland Pallet manufacturing and recycling facility in Modesto, CA. The 100% electric Class 8 truck, charged with on-site solar, moves product on-site and makes local deliveries.

"When purchasing a new truck, we chose electric over diesel for a few reasons, most importantly to reduce emissions in our Modesto community by utilizing our solar array for power instead of diesel combustion," said Carlos Padilla, Vice President and co-owner of Oakland Pallet. "But the beauty of the Orange EV terminal tractor is that it can be used to make local deliveries and pick-ups without tying up a long-distance tractor and driver." Terminal trucks (aka yard trucks, hostlers, spotters, goats) typically operate within the confines of container-handling facilities but can also be plated and registered for on-road use. Orange EV trucks are available in a range of configurations, designed to meet site-specific requirements.

For Oakland Pallet, the decision to deploy electric was both economic and environmental. Conscious of the source and lifecycle of their energy consumption, OPC installed a solar array at the Modesto operation. “Investing in the Orange EV truck was a win-win. It’s charged with on-site solar so doesn’t add to our energy costs, and it eliminates diesel costs and emissions,” commented Samuel Garza, Modesto Plant Manager. “The telematics also save money and time, sending automatic notifications so we can take care of small issues before they become big problems.” All Orange EV trucks are equipped with an onboard telematics system which provides real-time data for operations and reporting.

In addition to upcycling and recycling pallets, Oakland Pallet is committed to sustainability in all aspects of their operations, recovering and downcycling 600,000 cubic yards of cardboard, plastic, metal, and wood last year. “Our pallets are always on the move, used to transport products throughout the world. It’s our job to do what we can to minimize our environmental impact,” said Leticia Padilla, OPC’s Sustainability Program Manager. “The Orange EV truck has improved our community and work environment with reduced noise and emissions, and our driver loves that it’s so comfortable and easy to use. The charger was easy to install, and the battery has always had plenty of charge for our operations. Fleets don’t know what they’re missing – heavy duty electric is here, and it works.”

Oakland Pallet utilized funding from the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) to purchase their Orange EV truck. HVIP is currently open, enabling discounts of up to $165,000 per Orange EV terminal truck.
About Oakland Pallet Company

Oakland Pallet Co., Inc. (OPC), established in 1987, is a privately owned and operated business headquartered in San Lorenzo, California, in the heart of the Greater San Francisco Bay Area. With more than 200 employees and multiple facilities throughout California, Oakland Pallet is positioned to efficiently meet customer needs offering new pallets and services ranging from pallet recycling and custom pallet design to on-site inventory control, trailer staging, and just-in-time delivery. A certified Bay Area Green Business, OPC is committed to reducing its environmental footprint, offering best quality, sustainable pallet solutions. Oakland Pallet’s customer-base spans a wide range of industries including wineries, tech, food & beverage, major DC’s, and a variety of manufacturing companies throughout California.

About Orange EV

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For Immediate Release

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Chautauqua County Deploys Orange EV Electric Terminal Truck

County Eliminates Truck Emissions While Lowering Operating Costs
Chautauqua County Deploys Orange EV Electric Terminal Truck

County Eliminates Truck Emissions While Lowering Operating Costs

KANSAS CITY, MO and MAYVILLE, NY, December 6, 2017 - Orange EV and Chautauqua County today announced the deployment of an Orange EV T-Series pure-electric terminal truck at the North County Transfer Station in Fredonia, NY. Replacing a 15+ year old diesel truck with 100% electric completely eliminates yard truck emissions and diesel fuel consumption while advancing efforts to meet the energy, environmental, and economic goals established in the Chautauqua County 20/20 Comprehensive Plan. With this deployment, Chautauqua County became the nation’s first county government to introduce 100% electric, Class 8 trucks into commercial fleet operations.

The Orange EV electric terminal truck, also known as a yard jockey, spotter, or yard truck, was purchased at a discount enabled by New York State’s voucher incentive program.

“We were looking to implement a cost-effective Clean Fleets project as part of the Clean Energy Communities Program, and the Orange EV truck made sense both financially and operationally,” said Mark Odell, Chautauqua County Legislator. “We not only saved on the purchase price, but also expect to see reduced lifetime operating costs.”

Mike Saxton, Orange EV’s Chief Commercial Officer, said, “Single-shift waste transfer operations are best supported by Orange EV’s Standard Duty T-Series with standard onboard charging, powered by a single 240-volt circuit readily available at most industrial sites.”

In New York State, fleets have been purchasing Orange EV’s pure-electric terminal trucks for about the cost of a new diesel. From the first day of operation these fleets have been saving up to 90% on fuel and reducing maintenance and repair costs, while realizing a range of health and safety benefits.

“It’s been exciting and rewarding to work with Chautauqua on this project,” said Saxton. “It’s taken only a few months from concept though evaluation, decision, and deployment and they’ve become the nation’s first county government to deploy 100% electric, Class 8 trucks.”

Chautauqua’s new electric yard truck, which is shuttling trailers at the North County Transfer Station, is expected to work through a full shift on a single charge.

“The Orange EV truck is much smoother, quieter and cleaner than the old diesel truck and will create a better, healthier environment for employees and the surrounding community,” said George Spanos, Chautauqua County Public Facilities Director. “We are already planning to order a second Orange EV yard truck in January 2018 to be deployed at the South County Transfer Station.”
About Chautauqua County

Covering 1,065 square miles, Chautauqua County is the westernmost county in the state of New York. County operations serve 2 cities, 27 towns, and 15 villages, and in November 2017, Chautauqua County received a New York State Regional Impact Award for implementing local projects with significant regional impact. Vince Horrigan is the Chautauqua County Executive.

About Orange EV

Kansas City based Orange EV is the leading OEM providing industrial fleets with heavy duty electric solutions that do the same work while eliminating diesel fuel and emissions. Building both new and re-powered vehicles, Orange EV was the first and is still the only manufacturer building 100% electric Class 8 vehicles that have been commercially deployed into container handling operations. Contact Orange EV at 866-688-5223, Sales@OrangeEV.com, or by visiting the company’s website at OrangeEV.com. Media: Contact Mike Saxton at 866-688-5223 ext. 702 or MikeS@OrangeEV.com.
For Immediate Release

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With Orange EV, OMSS becomes first to commercially deploy 100% electric Class 8 truck to Port of Oakland

Meeting the needs of truckers while reducing impacts on local community
With Orange EV, OMSS becomes first to commercially deploy 100% electric Class 8 truck to Port of Oakland

Meeting the needs of truckers while reducing impacts on local community

KANSAS CITY, MO and OAKLAND, CA, June 26, 2018 - Orange EV and Oakland Maritime Support Services (OMSS) today announced the deployment of an Orange EV T-Series pure-electric terminal truck to its operations serving the Port of Oakland, the San Francisco Bay Area's largest seaport and 5th busiest in the U.S. Through this deployment, OMSS will eliminate yard truck emissions, better serve the port drayage trucking fleet, and reduce the impacts of trucking within West Oakland.

“OMSS is now operating the first commercially-deployed, 100% electric Class 8 truck in the Port of Oakland,” said Mike Saxton, Chief Commercial Officer for Orange EV. “Bill Aboudi is a community leader and staunch advocate for alternative fuel technologies. Many fleets continue to purchase diesel, but OMSS chose Orange EV’s pure electric.”

Aboudi is inviting interested fleets to visit OMSS, see the Orange EV truck, and understand its capabilities. “The technology is here, it does the job, and is ready for prime time right now. We understand that people need to see it to believe it, so we’d welcome those interested to call and come visit. We love showing off the truck.”

OMSS provides parking and services for truckers who move containers to and from the Port of Oakland, thereby alleviating street congestion in West Oakland. To further reduce the impacts of truck activity within the community, OMSS has continued to add services. The new OMSS Center, expected to be complete within two years, will expand current offerings while adding office space, food services, truck scales, a trans-load facility, and more.

"The OMSS mission is a community mission,” said Bill Aboudi, President of OMSS. “We strive to serve the trucking community while also significantly reducing emissions, noise, and truck activity in West Oakland. We’re proud to work with the City of Oakland on this valuable project, and grateful for the ongoing support from Council members Lynette Gibson McElhaney and Rebecca Kaplan."

Brian Beveridge, Co-Director of the West Oakland Environmental Indicators Project, commented, "It's exciting to see the zero emissions revolution finally getting a foothold at the Port of Oakland, and we are proud that a good friend of the community like Bill is taking the lead with Orange EV’s technology. Every diesel engine that is replaced with electric is a step toward a cleaner and healthier community in West Oakland."

OMSS uses terminal trucks to move and pre-stage containers for truckers utilizing OMSS facilities. Before purchasing the Orange EV truck, OMSS researched alternatives. “We looked around, but other electric trucks were too heavy, couldn’t meet our operating requirements, or weren’t ready for market,” stated Aboudi. “The yard hostler is critical to our operations, so we naturally wanted to go with the industry leader. That’s Orange EV. They specialize in electric hostlers and it shows. The
Orange EV truck looks the same, acts the same, and does the same job as our current hostler, but is much easier to operate and maintain, and has zero emissions."

Orange EV’s battery-electric terminal trucks have torque on demand, smooth acceleration and deceleration, low noise and vibration, and can be built in multiple configurations to meet site-specific needs and duty cycles. Fleets report significant savings from reduced maintenance, repair, and downtime. Orange EV’s powertrain has far fewer parts than diesels and is largely maintenance-free. Depending upon operation, Orange EV trucks can run more than 24 hours on a single charge.

“In early use, the battery never dropped below 85%,” said Aboudi. “The Orange EV truck is very easy to charge, and drivers plug in whenever the truck isn’t in use. With our operations, we can use it 24/7 with no problems whatsoever.” Aboudi continued, “The support we’ve received from Orange EV is unparalleled. The sales team was thorough and responsive, explaining the technology, working to understand our operations, and ensuring the truck was spec’d properly. And since we don’t have personnel to service our hostler, we need and appreciate our local Orange EV service technician.”

OMSS utilized funding from the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) to purchase their Orange EV truck. “Every incentive program should be like HVIP,” commented Aboudi. “It’s a simple process that gets new technology deployed quickly without burdening fleets with a lot of paperwork.” HVIP is currently open, offering incentive amounts of up to $175,000 per Orange EV terminal truck.

About Oakland Maritime Support Services

Oakland Maritime Support Services (OMSS) is a truck parking and services facility for the 8,000+ trucks moving to and from the Port of Oakland on a daily basis. OMSS is currently modernizing, expanding, and relocating their existing facility to a 15-acre parcel at the former Oakland Army Base, further reducing the impact of truck activity in the West Oakland community. The new OMSS Center will be a one-stop service destination for trucks at the Port of Oakland, providing auto and truck fueling stations, parking, container storage, truck scales, trans-load facility, a convenience market, restaurant food court, office space, and other services. The OMSS Center will be a “green” state-of-the-art trucking services facility showcasing clean energy alternatives including a biodiesel fueling station.

About Orange EV

Kansas City based Orange EV is the leading OEM providing industrial fleets with heavy duty electric vehicle solutions that are proven to save money while being safer, more reliable, and preferred by drivers and management alike. Orange EV trucks meet the most rigorous duty cycles and 24x7 shift schedules while eliminating diesel fuel and emissions. Building both new and re-powered terminal trucks with patent-pending technology, Orange EV was the first and is still the only manufacturer offering 100% electric Class 8 vehicles that have been commercially deployed and re-ordered into container handling operations. For information contact: Mike Saxton at 866-688-5223 x702, MikeS@OrangeEV.com or via OrangeEV.com.
For Immediate Release

Dimension Fabricators Deploys Orange EV Electric Yard Truck Powered by Onsite Solar Array

Schenectady, NY area manufacturer advances customer sustainability goals while improving employee health and safety
Dimension Fabricators Deploys Orange EV Electric Yard Truck Powered by Onsite Solar Array

Schenectady, NY area manufacturer advances customer sustainability goals while improving employee health and safety

KANSAS CITY, MO and SCHENECTADY, NY, March 21, 2018 - Orange EV and Dimension Fabricators, Inc. today announced the deployment of a custom Orange EV T-Series pure-electric terminal truck to Dimension’s manufacturing facility in the Schenectady, NY area. The Orange EV electric yard truck joins Dimension’s fleet of specialty tractors and trailers, all designed for 100-foot loads of concrete-reinforcing steel products.

Powered by solar energy generated onsite, the new 100% electric truck further reduces Dimension’s carbon footprint, increases energy efficiency, decreases operational costs, and helps customers achieve supply-chain sustainability goals. The emission-free Orange EV truck can be used indoors, and the clean, quiet, vibration-free operation improves employee health and safety.

Scott Stevens, Dimension’s President, commented, “In order to deliver the highest quality product, we continually adopt new technologies and develop innovative processes to meet customer needs in the most efficient and sustainable ways.” Dimension unveiled its 942-kW solar array in August 2017 and five months later deployed its first pure-electric terminal truck, now effectively free to fuel with energy generated by Dimension’s rooftop solar panels. Scott continued, “We believe investments in clean technology are not only the right thing to do for the environment, but also give us, and by extension our customers, a competitive advantage.”

The electric truck was purchased using funds through the New York Truck Voucher Incentive Program which supports Governor Andrew M. Cuomo’s aggressive clean energy goals to reduce greenhouse gas emissions 40 percent by 2030. The New York State Energy Research and Development Authority (NYSERDA) administers the program.

Alicia Barton, President and CEO, NYSERDA said, “Dimension Fabricators continues to show leadership by demonstrating how manufacturing companies can incorporate clean energy technologies into their businesses to reduce operating costs and create a healthier environment for employees. Its sustainability goals are a prime example of how local businesses are supporting Governor Cuomo’s nation-leading clean energy goals and our fight against climate change.”

As a result of the Truck Voucher Incentive Program, Dimension deployed the Orange EV truck for about the price of a diesel. By eliminating diesel fuel, exhaust fluid, and other diesel-related expenses, they expect significantly reduced lifetime operating costs. Dimension anticipates fuel and preventative maintenance savings of at least $10,000-$15,000 annually on 2,000-2,500 hours of truck operation.

“Going electric means we’re also free from headaches that come with diesel emission control technology,” shared Scott. “For emissions control systems to work, diesel exhaust has to get and stay hot, which doesn’t happen with low-speed, start-stop usage like ours. As a result, systems clog up and trucks don’t work properly.”
In contrast, Orange EV electric trucks don’t need emission controls and are simpler and more energy efficient than diesels. “To meet emissions standards, diesels have become increasingly complex, problematic, and costly,” said Mike Saxton, Orange EV’s Chief Commercial Officer. “Orange EV’s powertrain has far fewer parts and is largely maintenance-free. This means less wear and tear, reducing maintenance, repair, and downtime. And the powertrain is just one of many improvements fleets prefer over diesel.”

Since Dimension’s trucks must operate inside the plant alongside active manufacturing processes, vibration, noise, and exhaust from diesels are a nuisance and potential safety hazard. “Our drivers routinely back 60-foot trailers into the plant, and the diesel trucks vibrate and rattle, shaking mirrors wildly and moving them out of alignment. It’s aggravating and unsafe,” shared Greg Stevens, Dimension’s Operations Manager. “The Orange EV truck is a drastic improvement – it’s smooth and quiet, we no longer have to shout to communicate, and no fumes exhaust into the building.”

Driver satisfaction is increasingly important in an industry facing driver shortages. Dimension has very low turnover and strives to further increase retention, in part by enhancing driver comfort. “Happy and safe operators stick with you for the long term, and the guys just love the new Orange EV truck,” said Greg. “They can’t stop raving about it, especially the interior creature comforts given recent weather. It’s been extremely cold with highs in the single digits. The way the operators are in and out of the truck making short moves, they really appreciate heat that actually works.”

Orange EV directly discounted the price of Dimension’s truck using the New York Truck Voucher Incentive Program. Funds are still available but fleets are encouraged to act by end of March; under the current program, trucks must be delivered and funds redeemed by June 30, 2018.

About Dimension Fabricators
Serving the construction industry since 1984, Dimension Fabricators, Inc., produces concrete-reinforcing steel products including rebar, assembled cages, epoxy coated steel, wire mesh, welded steel fabrications, threaded anchors, and more. Dimension provides quality, customized service supplying assembly drawings prepared in-house, pre-assembled materials, and product delivered via its fleet of specialty tractors and trailers. Continuously developing & adopting new technologies, Dimension has earned a reputation as the fabricator for difficult and challenging civil and structural reinforcing work, supporting some of the most complex engineering projects on the eastern seaboard. With a 942-kW rooftop solar array, Dimension’s manufacturing process is now powered by renewable energy. Learn more at DimensionFab.com.

About Orange EV
Kansas City based Orange EV is the leading OEM providing industrial fleets with heavy duty electric vehicle solutions that do the same work while eliminating diesel fuel and emissions. Building both new and re-powered terminal trucks (aka yard trucks, hostlers, spotters), Orange EV was the first and is still the only manufacturer offering 100% electric Class 8 vehicles that have been commercially deployed and re-ordered into container handling operations. For information contact: Mike Saxton at 866-688-5223 x702, MikeS@OrangeEV.com or via OrangeEV.com.
Orange EV builds pure electric, industrial strength vehicles that are proven and preferred by drivers and management alike. Commercially deployed since 2015 with paying customers, Orange EV electric terminal trucks are working coast to coast in mission-critical container handling roles, meeting the most rigorous duty cycles and 24x7 shift schedules in all seasons and temperature ranges.

⇒ Same load, doing the same job
⇒ More reliable, less downtime
⇒ Saving up to 90% on fuel, maintenance, emission control and much more
⇒ Significantly lower cost of ownership
⇒ No diesel, no emissions
⇒ Cooler, smoother, quieter, cleaner

Working up to 24+ hours on a single charge and supporting 24x7 operations, all Orange EV trucks are built to site-specific needs with customer-driven configurations on battery, charging, and other standard options.

Just plug it in and go.

To learn more or request a quote, contact Orange EV at 866-688-5223 x702 or Sales@OrangeEV.com

Orange, the new Green: Visit Orange EV.com to see the T-Series in action

“New trucks you already know” Orange EV T-Series Pure Electric Terminal Trucks are proudly made in Kansas City, MO
June 7, 2019

Chris Cannon, Director of Environmental Management
Port of Los Angeles
425 S Palos Verdes St
San Pedro, California 90732

Heather Tomley, Acting Managing Director of Planning and Environmental Affairs
Port of Long Beach
4801 Airport Plaza Drive
Long Beach, California 90815

Submitted via email to caap@cleanairactionplan.org

Re: Comments on Draft 2018 Feasibility Assessment of Cargo Handling Equipment (CHE) by the Ports of Los Angeles and Long Beach

Dear Ms. Tomley and Mr. Cannon,

Thank you for the opportunity to comment on the 2018 Draft Cargo Handling Equipment Feasibility Assessment (Draft Assessment) and for extending the deadline for our comments to June 7. We submit the following comments on behalf of the undersigned members of the Impact Project, a coalition of environmental justice community groups, environmental NGOs, and academics, many of whom have advocated to advance clean technology at the Ports for decades. We are deeply invested in ensuring that the Ports remain on track to achieve their zero-emission targets, as they are critical to improving the quality of life and public health in our communities.
In 2017, Mayor Garcia and Mayor Garcetti issued a joint Executive Directive establishing the goal of transitioning to 100% zero-emission cargo handling equipment (CHE) at the Ports by 2030. This goal was reaffirmed by the Ports through the 2017 Clean Air Action Plan Update (CAAP). The Feasibility Assessment for Cargo Handling Equipment is a critical step toward achieving the 2030 goal. Indeed, as stated in the CAAP Framework for Feasibility Assessments, a major purpose of the CAAP Feasibility Assessments is to evaluate the status of zero-emission technology and infrastructure in relationship to the CAAP’s deadlines. According to the Framework:

Feasibility assessments are intended to consider whether the Ports are on track to meet CAAP goals. These assessments will provide critical information on where challenges remain and where focused attention and support is needed. In addition, this information will also inform whether these timelines may need to be adjusted. As a result of these assessments, the Ports could:

- Determine what actions need to be taken to reach the deadlines specified for each strategy, for example, additional technology demonstrations, new funding programs, additional infrastructure installments
- Issue advisories or further guidance to the industry in order to provide additional flexibility as necessary to meet the CAAP deadlines.

As written, the Draft Assessment does not evaluate progress or strategies needed to achieve the 2030 zero-emission goal for cargo handling equipment. Accordingly, the Draft Assessment does not fulfill its purpose under the CAAP, and will not position the Ports to achieve the 2030 goal.

Thus, we request that the Ports re-do the Draft Assessment to address omissions, and circulate a new draft for public review and comment. In addition, we request that the Ports establish an advisory committee that includes community representatives and technical experts to oversee this effort and any subsequent assessments. The advisory committee will help ensure that subsequent reports serve the public interest and CAAP goals.

1. The Assessment should evaluate whether the Ports are on track to achieve 100% zero-emission CHE by 2030.

The CAAP Framework for Developing Feasibility Assessments specifically states that Feasibility Assessments developed under the CAAP will include within their scope a “characterization of the likelihood of meeting the CAAP strategy deadlines.” The Framework also provides that Feasibility Assessments will provide a terminal-by-terminal evaluation of the status of available infrastructure “and projections of infrastructure needs to meet the CAAP deadlines.” Indeed, Feasibility Assessments “are intended to consider whether the Ports are on track to meet CAAP goals” in order to drive development of policies and strategies to achieve

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2 Id. at 7.
3 Id. at 2.
4 Id. at 6.
electrification.\textsuperscript{5} However, the current Draft Assessment contains no evaluation of whether the Ports are on track to meet their goal.

a. **Broaden the evaluation to an 11-year timeline.**

To evaluate whether CAAP deadlines will be met, it is inappropriate for the Draft Assessment to only consider zero-emission technologies in 2018-2021 and not consider a longer term perspective for meeting the Mayors’ Executive Directive and CAAP goal in 2030.\textsuperscript{6} Both assessing whether the Ports are on track to meet CAAP goals\textsuperscript{7} and whether the technology has the potential to be a cost-competitive purchase option that will lead to commercial adoption\textsuperscript{8} require the Ports to adopt a longer-term perspective in their Assessment.

b. **Evaluate progress toward meeting 2030 goals.**

As the Ports previously committed, the Assessment should evaluate how close (or far) they are to meeting the 2030 zero emissions goal based on the types of CHE currently used by the Ports and the electrical infrastructure already in place. Such an evaluation would signal where additional policies, infrastructure investments, incentive funding, demonstration projects, or other strategies are necessary to implement the CAAP goals.

The Assessment could also consider how upcoming regulatory actions, fleet turnover, and technological advances might help close the gap between status quo and achieving the 2030 goal.

2. **The Assessment should include strategies to meet the Ports’ 2030 zero-emission goal.**

The underlying question that the Ports should address through the feasibility assessments is: How will the Ports meet their goal of 100% zero-emission CHE by 2030? Creating a roadmap of recommended strategies and policies will prepare terminal operators and send necessary signals to manufactures about the demand for zero emissions technologies over the next decade. In this section, we outline strategies critical to achieving the 2030 goal.

a. **Establish interim milestones to reach 100% zero-emission CHE by 2030.**

The Ports should set interim milestones to ensure that zero-emission cargo handling equipment is phased-in by 2030. The Assessment should be used to inform whether the Ports are on track to meet those milestones, and to provide additional incentives to achieve those milestones where necessary.

In addition to the CAAP goals, the Ports should also factor in the upcoming California Air Resources Board (CARB) mandate to require zero emission technologies for port equipment at terminals in setting milestones. CARB staff are proposing to phase in this regulation beginning in 2026.\textsuperscript{9} Given the Mayors’ directive, we expect the ports to not only be supporters of the

\textsuperscript{5} Id. at 7.
\textsuperscript{6} Draft Assessment at iii.
\textsuperscript{7} CAAP Framework for Developing Feasibility Assessments at 7.
\textsuperscript{8} Id.
\textsuperscript{9} See CARB staff presentation, May 2019 Regulatory Drivers for Transportation Electrification of Freight and Off-Road Equipment at 20.
upcoming CARB regulation, but for the port terminals to be in overcompliance with this upcomin regulation.

b. Work with operators on the next wave of zero-emission CHE in the near-term.

There are types of zero-emission cargo handling equipment that are ready to deploy today. In fact, in the next two to three years, more than 125 pieces of zero-emission CHE will be deployed at ports throughout California, including many at the San Pedro Bay Ports.\(^{10}\) The Draft Assessment finds that zero-emission yard tractors, rubber tire gantry (RTG) cranes, and small capacity forklifts are currently technically viable and commercially available. Even though there is some uncertainty on how the new units that are soon to be deployed will perform, the Ports should anticipate the need to accelerate deployment of these technologies by installing needed infrastructure, providing incentives to make them economically equivalent to non-zero technologies and helping terminal operators take full advantage of grants and other incentives. This is especially true given that the Draft Assessment finds that ZE yard tractors and RTG cranes after incentives cost less than their diesel counterparts.\(^{11}\) This is likely true for small forklifts and several other types of CHE. Thus, it is imperative that the Ports take advantage of this opportunity.

In order to meet the 2030 goals, it will be critical to phase-in technology prior to lease renewals. The Ports should work with terminals to implement zero-emission technologies prior to lease renewals and ensure that terminals are on track to meet the 2030 goals. For instance, the Ports could work with terminals to develop zero-emission targets prior to lease renewals and back up those targets with a robust program of incentives from the Ports, government agencies and the utilities. The Ports should help terminals apply for competitive grants and navigate the complex world of “stacking” the many incentives and competitive grants, and provide assistance on determining the best charging and rate options. Waiting to transition to zero-emission CHE until terminal lease agreements are up for renewal may not achieve the 2030 deadlines. For many terminal operators it will delay too long the turnover of diesel cargo handling equipment to cleaner technologies. The Ports must find a way to do early implementation of ZE cargo handling equipment in the best-fit, least-cost way and learn lessons prior to their leases expiring.

When leases are renewed the Ports should include lease conditions that are aligned with achieving 100% zero-emission cargo handling equipment by 2030. The milestones for zero-emission CHE in the new leases should be stringent and enforceable. The Ports’ vision for lease conditions regarding ZE CHE should be announced far in advance in order to give a clear signal to terminal operators.

c. Install infrastructure to support zero-emission CHE.

Development of electrification infrastructure is a prerequisite to achieving zero-emission terminals. In the Draft Assessment, infrastructure availability was specifically identified as an area where the Ports have not achieved full feasibility for zero-emission yard tractors and zero-emission rubber tired gantry cranes. Planning for and installing electrification infrastructure is a

\(^{10}\) Draft Assessment at 24.
\(^{11}\) Draft Assessment at 74-75.
role that the Ports must proactively take on, as the CAAP recognizes that it is the Ports and utilities’ responsibilities to provide for electrification infrastructure.\textsuperscript{12}

Both Ports should take on an effort to find the best locations for siting electric infrastructure, and addressing barriers to charging infrastructure (e.g., improved codes and standards). The Port of Long Beach is to be commended for developing the first-ever Port Community Electric Vehicle Blueprint, which includes project elements to identify optimal procedures and locations for charging heavy-duty battery-electric vehicles and equipment.

The Ports should prioritize installing infrastructure to support zero-emission technology by taking accelerated advantage of SCE rates and new five-year, $356M charging infrastructure incentive program,\textsuperscript{13} and seeking LADWP funds for commercialization of electric CHEs. Because the SCE incentive program is first-come, first-served and available to all of SCE’s region, the Port of Long Beach and the terminals should act fast to secure as much as possible for EVs with charging stations and electric RTG cranes.\textsuperscript{14} The Ports should maximize their effort to help terminal operators understand rate options, charging options and their distribution system impact for their specific use cases. The Feasibility Assessment should detail how to take full advantage of utility rates and funding by developing in-depth infrastructure plans for the Ports.

Finally, the Ports should work with SCE and LADWP to investigate distribution system and substation capacity today, and to develop plans to upgrade capacity in order to accommodate zero-emission CHE coming online to meet upcoming CARB regulations and the 2030 goals.

d. Work with utilities and tenants on capturing Low Carbon Fuel Standard credits.

Low Carbon Fuel Standard (LCFS) credits can be a potent incentive for zero-emission CHE equipment. However, the shipping industry does not appear poised to take advantage of this incentive. The Ports should work to make sure LCFS credits actually benefit terminal operators and others operating zero-emission CHE at the Ports.

3. The Draft Assessment does not give zero-emission technologies a fair shot.

The Draft Assessment fails to take into account all available information, leading to inaccurate conclusions about the true costs and benefits of zero-emission versus near-zero technologies. We provide the following suggestions for a new Draft Assessment.

a. Consider stranded assets costs in analyzing near-zero technologies.

The Draft Assessment’s focus on technologies that can be deployed in the next three years inappropriately favors near-term deployment of natural gas technologies that are purportedly more feasible than zero-emissions today, without accounting for long-term costs of transitioning to natural gas.\textsuperscript{15} We are concerned that by failing to take a long-term view that two

\textsuperscript{12} CAAP at 54-55 (“No part of this strategy would require terminal operators to purchase zero- or near-zero emissions equipment if there are any delays by Ports or utilities in installing the needed infrastructure to support such equipment, either inside or outside the marine terminal.”).

\textsuperscript{13} SCE’s program pays for much of the charging infrastructure costs not only on the utility side of the meter, but on the customer’s side of the meter also.

\textsuperscript{14} According to SCE, transportation electrification with charging stations for vehicle batteries and electric RTG cranes are eligible, but ship-to-shore cranes are not.

\textsuperscript{15} While there are caveats in the report, these are easily missed.
transitions will be taken at the Ports: first a transition from diesel to natural gas, and then from natural gas to electric.

This approach not only delays the transition to electrification but results in stranded assets for natural gas refueling infrastructure. Encouraging operators to install near-zero CHE in the short-term could require significant natural gas infrastructure investments that will need to be abandoned and replaced with ZE-supporting infrastructure a few years later. In addition, the useful life of cargo handling equipment in some cases is up to 15 years—yard hostlers have a typical life span of 7-10 years, and RTG cranes and top handlers have a typical life span of 15-25 years. If terminal operators purchase near-zero emission equipment after year 2020, the equipment may need to be replaced before the end of its useful life to meet the 2030 zero-emission deadline. The added costs of stranded assets for near-zero pieces of equipment and infrastructure should be calculated as part of the economic workability analysis for near-zero technologies to increase transparency about the true costs of a near term shift to near-zero.

b. Include emission reductions as a primary screening parameter.

The Draft Assessment states that its ultimate objective is to ascertain which zero-emission and/or near-zero goods movement platforms are feasible “to fully perform goods movement at the Ports, while also systematically and sufficiently reducing harmful emissions in line with aggressive CAAP goals.” Thus, emissions reductions should be a screening factor to determine which technologies are feasible to achieve the dual goals.

The 2020 and 2030 emissions benefit of the different technology options for nitrogen oxides (NOx), particulate matter (PM), air toxics and greenhouse gases (GHG) on both a well-to-wheels and local basis should be added as a third primary screening parameter along with commercial availability and technical viability. The Ports should assess whether technologies will be sufficient to achieve emission reductions outlined in the CAAP and by state and local policies. The GHG emissions (well-to-wheel) should be calculated based on the SCE and LADWP averages for today and for 2030 rather than the statewide grid averages. SCE’s today is about 66.65 grams per megajoule and the number for both utilities will decrease dramatically with a 60 percent renewables requirement in 2030.18

c. Consider broader data sources.

A new Draft Assessment should factor in the broader, global macro-trends: battery prices are falling dramatically for all sizes and types of electric vehicles, electric CHEs will benefit from the very rapid trend to electrification by major, well capitalized truck manufacturers, and

16 Draft Assessment at 43.
17 Draft Assessment at 9.
20 See, e.g., Katie Fehrenbacher, The big truck makers are starting to take electric trucks seriously, GreenBiz (Apr. 25, 2019), available at https://www.greenbiz.com/article/big-truck-makers-are-starting-take-electric-trucks-.
manufacturers of trucks and goods movement equipment are primarily being pushed by electrification in China and European cities and ports. These are drivers we have not seen before with other fuels.

The Ports should collect data and trends globally from both CHEs and trucks, determine lessons learned, and assume an even more visionary approach to planning. The Ports should take advantage of existing studies on electrification of zero-emission drayage and freight trucks and investigate where this information on trends, costs, emissions and barriers can be applied to ZE cargo handling equipment. In addition, the new draft assessment should also survey more manufacturers than the eleven in the Draft Assessment and seek a long term vision from the manufacturers.

With new demonstration projects coming online, additional data will be available in a few months. The Ports should account for the most updated data in a new draft assessment.

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21 Id.
22 The Draft Assessment has done some of this. For example, see section on electric RTG cranes at 20-22.
24 For example, perhaps Daimler, Volkswagen, Volvo or Chinese manufacturers would be willing to expand their electrification efforts to some types of CHE and respond to the survey. Perhaps start-ups such as Tesla, Terberg, DJ electric and Ballard would respond to the survey.
d. Provide a more accurate analysis of costs and incentives for technologies.

A new draft assessment should consider the following when calculating costs of various technologies:

- A cost assessment and economic workability rating should be based on costs with incentives rather than the conservative approach taken in the Draft Assessments (e.g., the costs without incentives).\textsuperscript{25} Not including incentives when determining economic workability is inconsistent with the direction provided by the CAAP’s framework for developing feasibility assessment which calls for including “incentive funding provided to date and in the future.”\textsuperscript{26}
- Future stranded assets for the near-zero-emission (NZE) infrastructure should be added to the cost analysis.
- Summarize costs in dollars per hour or dollars per mile for the various fuels before and after incentives. Because zero-emission technologies are much more efficient in using fuel and have less maintenance compared to other technologies, showing total costs in this way is much better than how costs are shown in the Draft Assessment. For example, in the Draft Assessment it’s not clear if the favorable fuel use efficiencies for operating electrification technologies\textsuperscript{27} were included in the cost assessment.
- The Draft Assessment should consider penalties in their cost analysis. Gasoline and diesel fuels have additional costs assessed to them under CARB’s LCFS regulation and in a few years propane and fossil natural gas fuels will too. In addition, there are added costs that should show up in future years in the purchase price of CHEs with engines due to the cost of additional emission control equipment.

e. Increase transparency of supporting data and conclusions.

The Draft Assessment’s “roll-up” assessment for the ZE and NZE technologies that are furthest along is misleading to the reader, and appears to disadvantage zero-emission technologies. A comprehensive chart that shows all of the “bubbles” for all of the factors should be shown as this will show a more accurate comparison of the battery electric, grid-electric and natural gas fueled CHEs. In addition, the Ports should provide increased transparency about data sources for its conclusions, including discussions with stakeholders.

\textsuperscript{25} An assessment of costs with incentives should include Clean Off-Road Equipment Voucher Incentive Program (CORE), Hybrid Truck and Bus Voucher Incentive Program (HVIP) Low Carbon Fuel Standard (LCFS) incentives, Southern California Edison’s (SCE’s) Charge Ready, and possibly other grant funds. At minimum, a new assessment should describe the long list of stackable incentives and competitive grants that can be used to reduce the cost of the different types of CHEs including the California Air Resources Board’s (CARB’s) Low Carbon Transportation grants and Volkswagen settlement mitigation trust grants; South Coast Air Quality Management District’s (SCAQMD’s) grants including the Carl Moyer Program, the Technology Advancement Office grants, Prop 1B and MSRC grants; California Energy Commission (CEC) grants including the Alternative and Renewable Fuel Vehicle Technology (ARFVT) and Electric Program Investment Charge (EPIC) programs, funds from the utilities, funds from the Ports and AB 617 funds. These programs should be explained in detail and included in the cost assessments where applicable.

\textsuperscript{26} CAAP framework for developing feasibility assessments at 7.

\textsuperscript{27} Draft Assessment at 48. Typically, emission comparisons take into account the fuel use efficiency of electric and fuel cell technologies by dividing the grams per megajoule by an energy economy ratio (EER) which is a dimensionless number used to compare alternative fuels to a gasoline or diesel fuel in a fair manner. Similarly, for cost comparisons the reduced use of electric fuel compared to gasoline or diesel should be more clearly stated in the assessment with supporting footnotes on how the calculation was made.
4. **Additional Comments**

   a. **Zero-emission CHE should provide good jobs for workers.**

      We appreciate that the Ports’ assessment has not fallen into the trap of equating automation with zero-emissions. Because automation is being pursued in combustion applications and zero-emission applications, this effort by industry to disparage zero-emissions should be rejected. We suggest that the Draft Assessment should explain that zero-emission cargo handling equipment does not require automation, and should provide strategies to couple transitioning to ZE technology with workforce development to train workers on new zero-emission technologies.

   b. **Additional technology categories should be assessed.**

      A new draft assessment should include a plan for electrification in areas outside the four CHEs examined in the Draft Assessment. For example, electric forklifts compete with propane forklifts today in similar operations and lift-capacities as shown in Appendix C of the Draft Assessment. Also, the “other” category of CHEs at the Ports contains many electrics and these applications\(^{28}\) should be encouraged to be fully electric as soon as possible.

5. **Closing**

   In summary, we request that the Ports prepare a new draft assessment in the near-term in order to take advantage of new information that will be released soon, and to fix the fundamental focus and scope to align with CAAP goals by adding in an 11-year roadmap that includes our policy recommendations. Redoing the assessment next fall could allow for additional information regarding the large amount of zero-emission CHE being deployed to be incorporated. We also request that the Ports commission an advisory group made up of public members and technical experts to oversee the preparation of a new report to ensure that it serves the public interest and CAAP goals.

   We appreciate your consideration of these comments. Please do not hesitate to contact us if you have questions about these comments.

Sincerely,

Heather Kryczka
Natural Resources Defense Council

Taylor Thomas
East Yard Communities for Environmental Justice

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\(^{28}\) Pallet jacks, man lifts, ship-to-shore cranes, rail-mounted gantry cranes, sweepers and other types. *See* Draft Assessment at 12, Figure 1.
Andrea Vidaurre  
Center for Community Action & Environmental Justice

Adrian Martinez  
Earthjustice

Peter Warren  
San Pedro Peninsula Homeowners Coalition

Carlo De La Cruz  
Sierra Club

Jessica Tovar  
Urban & Environmental Policy Institute, Occidental College

Theral Golden  
West Long Beach Neighborhood Association
June 07, 2019

Chris Cannon
Port of Los Angeles
425 South Palos Verdes St.
San Pedro, CA 90731

Heather Tomley
Port of Long Beach
4801 Airport Plaza Dr.
Long Beach, CA 90815

Submitted online to caap@cleanairactionplan.org

Re: Comments on the San Pedro Bay Ports Draft 2018 Feasibility Assessment for Cargo-Handling Equipment

Dear Ms. Tomley & Mr. Cannon:

Southern California Edison (SCE) appreciates the opportunity to comment on the San Pedro Bay Ports (Ports) Draft 2018 Feasibility Assessment for Cargo-Handling Equipment (Feasibility Assessment). SCE is proud to be a partner with the customers and communities in our service territory to facilitate the adoption of zero-emission (ZE) technologies, improve air quality in our region, and make meaningful progress towards reaching our climate targets. As an infrastructure provider and facilitator of ZE technologies, SCE looks forward to working with the Ports by continuing to provide input on the transition to a ZE future in support of the Clean Air Action Plan (CAAP) greenhouse gas (GHG) targets and transition to all ZE port equipment by 2030 and all ZE drayage trucks by 2035.

**SCE is a proud partner in helping realize the benefits of ZE technologies at the Port of Long Beach.**

SCE is extremely proud to be a partner in helping to fulfill the promise of the CAAP by facilitating increasing numbers of ZE cargo-handling equipment. SCE is providing significant resources for the Port of Long Beach Zero-Emissions Terminal Equipment Transition Project. SCE’s construction efforts to support the electrification of 9 rubber tired gantry cranes at SSA Marine Terminal Pier J is nearly complete. In addition, we are well underway with construction to support charging infrastructure for the battery electric yard tractors at ITS Terminal at Pier G.

On May 20, 2019 SCE launched the Charge Ready Transport program, focused on providing the necessary infrastructure to electrify 8,490 medium- and heavy-duty on- and off-road vehicles for our customers in SCE service territory. This 5-year $356 million program will allow further adoption of ZE technologies, some examples of which are already being demonstrated through the efforts
mentioned above at the SSA and ITS Terminals. The Port’s Sustainable Terminals Accelerating Regional Transportation, or START, project at Matson Terminal Pier C is eligible to participate in SCE’s Charge Ready Transport Program. We are in discussions with the Port of Long Beach and Matson staff on the process to participate in the program.

In addition to providing important emission reductions and public health benefits – especially for employees on site, electrifying vehicles at the Ports can provide important fuel savings and reduced operating and maintenance (O&M) costs.

**Battery electric vehicles provide the largest opportunity to reduce greenhouse gases and criteria air pollutants simultaneously, drawing a feasible path to achieve state climate goals.**

California’s greenhouse gas (GHG) goals call for a 40 percent reduction in GHG emissions from 1990 levels by 2030 and carbon neutrality no later than 2045, in addition to the previously established 80 percent reduction goal by 2050. To support the ambitious 2030 and 2050 GHG reduction goals, SCE developed The Clean Power and Electrification Pathway. Without significant decarbonization in the transportation sector, achieving California’s GHG-reduction goals becomes impossible. In fact, we may need to further reduce GHG emissions by 2030 to put us on a feasible path to meet the 2045 carbon neutrality goal.

Tables 35 and 36 in the Feasibility Assessment show 81.49 gCO2e/MJ as the carbon intensity (CI) for powering cargo-handling equipment from the grid.\(^1\) The CI assumption for powering ZE battery electric vehicles is based on California’s average state-wide grid electricity supplied to electric vehicles. SCE’s grid is comparably cleaner than the state-wide grid, having a CI of 66.65 gCO2e/MJ compared with the cited state-wide average.\(^2\) Also, in comparing relative emissions profiles of alternative fuels as they displace conventional fossil fuels, it is important to adjust CI values by the Energy Economy Ratio (EER) to account for the efficiency of the alternative fuel as compared to a reference fuel used in the same powertrain. These values have a significant impact in evaluating the relative CI of alternative fuel options.\(^3\) When these two corrections are made, medium-and-heavy-duty electric vehicles such as yard tractors fueled by SCE’s grid are 77% less GHG-intensive than RNG-fueled vehicles and 86% less GHG-intensive than conventional LNG-fueled vehicles.\(^4\) It should

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\(^1\)DRAFT 2018 Feasibility Assessment for Cargo-Handling Equipment, see pgs. 76 and 77

\(^2\)Based on SCE’s CO2e emissions from delivered electricity in 2016, 66.65 gCO2e/MJ, pg. A-31, [http://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A1806015/1620/219474631.pdf](http://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A1806015/1620/219474631.pdf).

\(^3\)CARB describes this methodology in the Low Carbon Fuel Standard regulation: "For comparison on an equivalent basis (gCO2e per MJ of conventional fuel displaced), the CIs listed in Tables 7-1 and 7-2 must be divided by the EER in Table 5 for the appropriate fuel-vehicle combination." [https://www.arb.ca.gov/regact/2018/lcfs18/lcfs18.pdf?_ga=2.48961634.591313094.1548526138-1823936443.1523905092](https://www.arb.ca.gov/regact/2018/lcfs18/lcfs18.pdf?_ga=2.48961634.591313094.1548526138-1823936443.1523905092), see pgs. 8 and 160

\(^4\)Carbon Intensity cited in Table 35 (pg. 76) of the Feasibility Assessment for conventional LNG is 86.44 gCO2e/MJ and 51.51 gCO2e/MJ for RNG LNG. Values cited for charging BEVs in Table 35 are 81.49 and 81.94 gCO2e/MJ. These values claim up to a 59% carbon intensity improvement of using natural gas fuels over electricity from the grid. When SCE’s grid-specific CI is accounted for and necessary EER adjustments are taken into account per the methodology described by CARB in the footnote above, the resulting CI for traditional LNG is 86.44/0.9 = 96.04
be noted that the low range of the EER is assumed while many manufacturers in the Feasibility Assessment cited higher values, so this should be taken as a conservative estimate of the disparity in relative GHG reduction potential.⁵

As SCE’s grid continues to get cleaner with even more renewable energy, the GHG benefits of electric vehicles over conventional LNG and RNG LNG-fueled vehicles grows even wider with every year.

**Cost-effectiveness should holistically account for both improving air quality and deeper GHG reductions at the same time, not analyzed separately.**

In order to ensure alignment in near-term decision-making with long-term achievement of goals, it is important that the assessment of alternative vehicle and fuel options adopt a long-term approach regarding the path to the CAAP’s 2030 & 2050 GHG targets and 2030 ZE cargo-handling equipment goals. The cost-effectiveness of reaching CAAP goals and targets must be assessed in the broader context of improving air quality and cutting greenhouse gases simultaneously in alignment with the air quality needs of the region and California’s climate targets. The report examines the cost-effectiveness of relative technologies in achieving criteria pollutant reductions and GHG reductions as separate goals.

In SCE’s Clean Power and Electrification Pathway analysis, SCE examined various technology pathways, including RNG, hydrogen, and electrification, for achievement of these goals, using relative abatement potential and costs, feasibility (availability of technology, infrastructure requirements, economies of scale, consumer preference, timing of deployment), and an assessment of stranded asset risk. In this analysis, electrification was the most cost-effective path.⁶

The Feasibility Assessment’s treatment of cost-effectiveness in achieving emissions reductions presents a limited, short-term snapshot assessment and does not offer an adequate analytical foundation upon which to base further strategy on achieving the goals and targets in the CAAP. The report does not adequately advise on the most cost-effective option to simultaneously improve air quality, reduce greenhouse gases, and achieve the Ports 2030 and 2050 GHG targets and 2030 ZE cargo-handling equipment goals in alignment with air quality and climate needs in the region and the State.

gCO₂e/MJ and the CI for RNG LNG is 51.51/0.9 = 57.23 gCO₂e/MJ. Charging with electricity from SCE’s grid and accounting for the EER adjustment of 5.0 for BEV Trucks (found in Table 5 of the LCFS Final Regulation Order) yields a CI for BEVs of 13.33 gCO₂e/MJ (66.65/5 = 13.33), an 86% improvement over conventional LNG when compared to the EER-adjusted value of 96.04 gCO₂e/MJ and a 77% improvement when compared to RNG LNG at 57.23 gCO₂e/MJ.⁵

⁵Draft Cargo-Handling Equipment Feasibility Assessment, see Table 22 on pg. 48 with EER values from manufacturers ranging from 5.3 to 7.0
Interim near-term goals for ZE cargo-handling equipment are required to draw a more certain path to achieving CAAP 2030 ZE cargo-handling equipment goals and 2030 and 2050 GHG targets.

The Feasibility Assessment states that the document is not meant to inventory emission reductions and the associated health benefits realized through ZE and NZE cargo-handling equipment, or to establish timelines of various CAAP goals, or forecast commercialization. It is important that these limitations of the Feasibility Assessment as a guiding document for the CAAP be carefully considered as the Ports guide planning and implementation of the CAAP and assess how to achieve the ultimate CAAP goals and targets.

Significant action on electrifying cargo-handling equipment is necessary now in order to lay the important groundwork and set the Ports on a path to ultimately reaching CAAP goals and targets, contributing to the region’s air quality needs and California’s climate change targets. Overinvestment in natural gas-fueled NZE cargo-handling equipment, and associated required infrastructure buildout, risks a more costly, fuel supply-constrained option, with less environmental benefit and significant stranded asset risk.

A more appropriate alternative is a staged, phased-in approach that commits to meaningful and significant near-term action and investment in ZE to achieve a more orderly, less economically disruptive transition. The greater macroeconomic and risk-mitigating benefits in meaningful, ambitious early incremental actions in a “softer landing” approach compared to delayed, sweeping action in “hard landing” approaches have been discussed in the literature of technology turnover in decarbonizing economies.7

Approaches that accelerate the transition to NZE cargo-handling equipment in the short-term and delay ZE cargo-handling equipment deployment to outer years present significant risk in reaching the Ports ZE cargo-handling equipment goals and GHG targets. Near-term underinvestment in the pilot programs, demonstrations, and early action in ZE vehicle and infrastructure deployment could inhibit the ability of the Ports to reach its ultimate goals. While “Infrastructure Availability” is discussed in the Feasibility Assessment, the risk of underinvestment in ZE technology in the near-term undermining the achievement of long-term goals is not discussed, but poses significant risk in attaining goals.

Not every piece of cargo-handling equipment might be ready to electrify in the near-term, but cases where particular duty cycles or use cases present near-term appropriate opportunities to electrify should be sought and taken in early years. Early action now can take advantage of available incentives and infrastructure programs such as SCE’s Charge Ready Transport program. Increasing electrification in cargo-handling equipment where feasible in the near-term reduces the overall cost of the pathway and softens the landing in reaching CAAP targets. The Ports should examine and set interim targets for cargo-handling equipment that chart a course to reaching 2030 targets. It is

7European Systemic Risk Board, European System of Financial Supervision, "Too late, too sudden: Transition to a low-carbon economy and systemic risk"
important to set interim targets and goals to benchmark progress and encourage early action that takes advantage of existing incentives, utility infrastructure programs, and favorable commercial EV rates that are available now and over the next five years. Waiting until later years bears significant risk.

**The scaling of ZE electric infrastructure has been approved with significant funding, concrete near-term timelines (2019-2024), and number of vehicles supported.**

The Feasibility Assessment gives a lower rating to “Infrastructure Availability” for ZE cargo-handling equipment compared with NZE cargo-handling equipment. It is important to take stock of the significant investment currently at work state-wide to provide infrastructure to electrify the transportation sector in the near-term. Last year, California invested over $700 million for supporting charging networks for electric vehicles.\(^8\) SCE was approved for $356 million over five years (2019-2024) to support infrastructure investments at 870 sites to support the electrification of 8,490 medium- and heavy-duty vehicles. Also, SCE has a robust system in the Port of Long Beach complex to enable the adoption of electrification of terminal equipment.

Expanding medium- and heavy-duty vehicle charging networks supported by an increasingly cleaner electrical grid supports technologies that will continue to improve air quality, and helps California achieve both 2030 and 2050 GHG targets, with low risk of stranded investment on the path to decarbonizing California’s economy.

**Accounting for incentives and SCE’s favorable commercial EV rates shows increasingly favorable economics for ZE cargo-handling equipment powered by SCE’s grid.**

The aim of incentives is to spur technological change in the large-scale transformation of the transportation sector. In the Feasibility Assessment, the economics of ZE cargo-handling equipment grew more favorable when incentives were incorporated.

However, the Feasibility Assessment recommends that economic workability be based on non-incentivized cost of ownership. It is important to acknowledge that these incentives do not exist in a vacuum, but rather in a greater policy context. Annual funding allocations ultimately serve codified State and regional policies within an overall policy strategy to guide funding to incentives and programs that drive technological change in the service of ambitious long-term, multi-year air quality and climate goals. SCE’s own strategy around transportation electrification programs is guided by a corporate vision in line with achieving those same air quality and climate goals.

The State’s cap and trade program extension and Low Carbon Fuel Standard in place until at least 2030 are unambiguous market signals of sources of revenues to be directed to support transition to cleaner transportation over the next decade. There are significant resources, commitment, and

\(^8\)California, New York, New Jersey see nearly $1.38 in new EV funding, *Utility Dive*
dedication being marshaled from a host of sources to ensuring the continued sustained growth of transportation electrification as they serve a critical role in achieving air quality and climate targets.

**The report should be updated annually to take stock of rapidly advancing ZE technology market developments.**

The ZE medium- and heavy-duty vehicle market is evolving faster than expected. New equipment models may challenge prior technology and performance assumptions, with unexpected progressions, presenting compelling technological and economic cases for accelerating adoption in the marketplace. It is important to take stock of these developments to adequately inform policy decision-making in reaching 2030 ZE cargo-handling goals and 2030 and 2050 GHG targets.

We thank the Ports staff and preparers of the Feasibility Assessment for the opportunity to review and provide our comments. SCE supports the Ports transition to a zero-emissions future and looks forward to supporting customers through the transition to modes of transporting goods that improve air quality in the region while cutting greenhouses gases helping to meet California's goals, and continuing to contribute to the economic growth of our region.

Thank you for considering our comments and we look forward to finding solutions together to achieve a zero-emissions future for the benefit of our communitites and customers, the region, and the State.

Sincerely,

Michael A. Backstrom
Managing Director, Energy & Environmental Policy
Southern California Edison Company
RE: CHBC COMMENTS ON 2018 FEASIBILITY ASSESSMENT FOR CARGO-HANDLING EQUIPMENT (CHE)

Dear CAAP Team,

The California Hydrogen Business Council (CHBC) appreciates the opportunity to comment on the 2018 Feasibility Assessment For Cargo-Handling Equipment.

The CHBC would like to provide overall support of the CAAP and its goal of transitioning all equipment to zero emission. We support the feasibility document and desire further consideration of fuel cells as the technology develops.

We would like to specifically comment on page 33, this section is about TECHNICAL READINESS, however it includes COMMERCIAL comments in the last column of Table 11. Those commercial comments should be moved to the commercial section of the document. As written, the comments confuse the issue of technical readiness.

Furthermore, on pages 33, 34, and 36 the document comments that “… but significant challenges remain.” Again, this section 6 is about TECHNICAL READINESS, so it is unclear which challenges are meant that are of technical nature.

We suggest the statement should be removed, or elaborated on.

While commercial challenges certainly remain, they rest mostly on OEM equipment providers to integrate fuel cell technologies into vehicles and equipment. Fuel cells, as a product, are a technology that is ready and is being implemented in a myriad of vehicles today.

We would be happy to answer any questions you may have about our comments. Please feel free to contact us.
Best regards,

Emanuel Wagner
Deputy Director
California Hydrogen Business Council

The CHBC is comprised of over 100 companies and agencies involved in the business of hydrogen. Our mission is to advance the commercialization of hydrogen in the energy sector, including transportation, goods movement, and stationary power systems to reduce emissions and dependence on oil. The views expressed in these comments are those of the CHBC, and do not necessarily reflect the views of all of the individual CHBC member companies. CHBC members are listed here:
https://www.californiahydrogen.org/aboutus/chbc-members/