BEFORE THE
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NJDEP)

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POST-STAKEHOLERS' MEETING
COMMENTS OF THE
PORT OF NY/NJ SUSTAINABLE SERVICES AGREEMENT

REDUCING CO2 EMISSIONS: CARGO HANDLING EQUIPMENT (CHE)

I. Who We Are

The Port of NY/NJ Sustainable Services Agreement (PONYNJSSA) is a marine terminal conference approved by the Federal Maritime Commission (F.M.C. Agreement No. 201175). Its members are marine terminal operators (MTOs) doing business in the Port of New York and New Jersey (hereinafter referred to as the "Port"). The PONYNJSSA became effective on December 6, 2007. The purpose of the PONYNJSSA is to permit its members to meet, discuss and agree on matters that relate to promoting environmentally sensitive, efficient, and secure marine terminal operations in the Port. The members of the PONYNJSSA are the six container terminal operators in the Port including APM Terminals Elizabeth, GCT Bayonne LP, GCT New York LP, Maher Terminals, Port Newark Container Terminal, and Red Hook Container Terminal.[1]

[1] Michael DiVirgilio, a consultant to the PONYNJSSA, made a statement on behalf of the PONYNJSSA during the stakeholders' meeting held by the NJDEP on September 16, 2020.

From its inception the PONYNJSSA has examined issues related to the air emissions emanating from terminal operations and have already instituted effective systems that have assisted the Port Authority of New York and New Jersey in furthering its Clean Air Strategies for the reduction of Nitrogen Oxides and fine particulates. The PONYNJSSA has been an active participant in the Clean Air Strategy Group facilitated by the Port Authority from its inception. Through Sustainable Terminals Services, Inc. (STS), a non-profit corporation created by the PONYNJSSA, member MTOs have developed a technology platform (PortTruckPass) that among its applications assists the Port Authority in enforcing its Clean Truck Program. The PortTruckPass platform including its Terminal Information Portal System (TIPS), has had a profound impact on reducing air emissions related to terminal operations.

TIPS, was established in September of 2015 and was the first-of-its-kind information system designed to enhance terminal efficiencies by reducing uncertainty regarding container availability and unnecessary terminal visits by truckers. Prior to the implementation of TIPS, drayage providers often dispatched truckers to marine terminals before containers were available for pick-up or without ensuring that outstanding charges have been paid and necessary releases issued. TIPS hastens terminal visits and transactions by providing advanced cargo availability information. Through TIPS, PONYNJSSA members provide a one-stop portal for general information regarding port wide matters as well as terminal-specific announcements regarding special conditions or changed operating hours. TIPS provides information about container availability and location, regulatory holds, any charges or demurrage as well as the status of free time, which dramatically reduces the amount of time a drayage trucker needs to spend at a terminal.

The United States Department of Commerce has singled out TIPS as one of its "Best Practices" for improving the Nation's competitiveness.[2]

TIPS is noteworthy because it was implemented by the MTOs not as the product of government regulation but as a commercial solution created with input from the Port Authority, cargo interests, and the port drayage community. In addition to TIPS, MTOs in the Port have also implemented or will be implementing truck reservations systems. Such systems, which are not necessarily an appropriate solution for all marine terminals, have enabled PONYNJSSA members to optimize terminal efficiencies and reduce truck turn times resulting in reduced air emissions.

II. Introduction

Members of the PONYNJSSA have been working individually and together as an industry as neighbors to improve the environment in and around their marine terminals in the Port. Over the last 10 years, working together between and among the many stakeholders that are part of the port community including, among others, the Port Authority, the borough of Staten Island, the cities of Bayonne, Elizabeth and Newark and the various regulatory agencies including NJDEP, the members of the PONYNJSSA have made tremendous strides in overall environmental improvements and specifically air quality. Even prior to the planning for the raising of the Bayonne Bridge, which was to usher in the era of the large containerships calling the Port, the members of the PONYNJSSA have worked diligently to improve their operations through major terminal infrastructure and equipment enhancements, including electrifying certain equipment, as well as using technology in ways that can move more cargo faster and more efficiently while also reducing

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[2] *Improving American Competitiveness: Best Practices by U.S. Port Communities*, 21st Century U.S. Port Competitiveness Initiative, U.S. Department of Commerce, December 2016 at 12, available at: http://trade.gov/td/services/oscpb/supplychain/acscc/resources/documents/USDOCBestPracticesByUSPortCommunitiesReportFINAL2017.pdf.

air emissions. The replacement of diesel cranes throughout the port with electric, the upgrades in facilities, the installation of on-site renewable power, the introduction of technology aimed at the reduction of terminal equipment and over-the-road truck idling, streamlining gate operations, and a host of other significant investments have taken place as part of a public-private partnership aimed at improving Port operations, improving air quality in the neighborhoods that we all live in, and strengthening the economic viability of both the Port and more broadly, the state and region.

Our members, together with the Port Authority and other stakeholders have taken the lead in voluntarily transitioning to cleaner vehicles and equipment as well as implementation of other environmental sustainability projects that benefit our community. Overall, as reported by the Port Authority, criteria air pollutant emissions from port related activity have been reduced dramatically through voluntary programs over the past decade; Nitrogen Oxide emissions are down by 38%, Particulate Matter emissions are down 74%, and Sulfur Dioxide emissions have been reduced by 98% from 2006 levels while cargo volume has increased by 41%. This is significant, even though the total emissions generated by port related commercial activity represents a small piece of the overall emissions generated in the three surrounding counties of Essex, Hudson and Union. In fact, GHG emissions from port related activity represent less than 4% of all GHG emissions in the respective counties. As examples of the efforts undertaken by the MTOs, one reports that it has reduced its diesel consumption per container by 43% between 2006 and 2019 and reduced its gas consumption per container by 22% for the same period. Another reports that 100% of its container handling equipment is currently Tier 3 or Tier 4/Tier 4F compliant, far exceeding EPA requirements.

III. The Port is Unique

It has been said, "that if you have seen one port, you have seen one port." The Port is substantially different than many other ports, including those in California, due to many factors including the ownership model. The Port is referred to as a "Landlord Port," meaning that the Port Authority of New York and New Jersey owns the land that the MTOs lease for their respective marine terminal operations. Most significantly, the Port is distinguished by its unique environmental factors, including among others, those involving weather conditions and prevailing wind patterns affecting air flow. Thus, solutions that work in California may not be appropriate, necessary, or even effective, in this Port. This means at least three things:

- If the MTOs are to continue their efforts in electrifying Cargo Handling Equipment (CHE), all of the relevant stakeholders must work together to develop comprehensive, achievable, and coherent plans to further develop the electrical and other infrastructure that will be necessary to accommodate our mutual goals and objectives.

- New equipment introduction rules being developed by the Port Authority and these will obviate the need for new regulation by the NJDEP.

- California's ports are unique in that there are few competitors in close geographic proximity. In comparison, the Port of New York and New Jersey has competing ports all along the East Coast. Unnecessarily burdensome regulation on New Jersey's ports without a coordinated effort with neighboring states could result in a loss of business and increase in truck emissions as the cargo destined for the State is driven in from neighboring states.

The members of the PONYNJSSA are open to demonstrating emerging and evolving zero emission technologies for their extensive array of CHE to assess the suitability of these machines and vehicles for widespread deployment at their terminals. However, they need financial assistance and other support from the State to do so. One of our members, for example, was recently awarded substantial funding under the Volkswagen settlement for deployment of ten electric yard tractors. While significant, it must be emphasized that the terminal operation at which these are being deployed is significantly smaller than others and is not typical of the operations or equipment duty

cycle of other terminal operations in the Port. That said, other members also have applications pending under that program for other types of electrified CHE. The level of interest of our members in demonstrating these new technologies is significant, however, at the same time, the inadequacy of this unique one-time program as a long-term source of funding to encourage those demonstrations is striking. It is therefore our strong belief that, prior to introduction of any regulatory requirements, further development of both technologies and the implementation strategies are needed to enable and encourage large-scale deployment of Zero Emission (ZE) CHE. Implementation strategies could include, for example, expansion of technology demonstrations and development of new and dedicated funding programs, as well as development of plans to assure that necessary infrastructure upgrades are in place. At this stage in the development and commercialization of the technology there are simply too many unknowns. PONYNJSSA members cannot allow these unknowns to jeopardize the economic productivity of, and the many jobs dependent upon their operations in this Port.[3]

Further, the feasibility of any potential ZE regulations will depend heavily on how the rules are structured and how stranded assets would be treated. A rule that requires all equipment in operation to be fully ZE by 2030, for example, is unlikely to be feasible, as this will require terminal operators to get rid of substantial quantities of equipment with useful life remaining. However, if the rule is structured such that all new purchases from 2030 onward are required to be ZE, the feasibility of meeting this schedule will improve, although the schedule will still present substantial technical and infrastructure-related challenges.

[3] We refer the Department to the comments submitted by the New York Shipping Association, Inc. regarding the economic impact of the operations and investments of the marine terminal operators in the Port on the economy of the State of New Jersey and the region.

IV. Comments—Marine Terminal CHE Presents Challenges to ZE Plans

These comments focus on battery-electric CHE as the most likely zero-emissions CHE at marine terminals because the state of development is advanced enough to allow a preliminary analysis at this time. Other potentially cost-effective options exist (or will exist), including those powered by hydrogen fuel cell or internal combustion engines using alternative and renewable fuels, but these technologies are thought to have significant downsides in terms of current development status, cost, fuel availability, local and/or upstream emissions compared to battery-electric vehicles.

A. Market Factors Impacting the Deployment of ZE CHE

MTOs, regulators, and other stakeholders need to fully understand the various emerging and rapidly evolving products before making major investments in new equipment and fueling infrastructure, and regulators need to understand the market, the relative environmental impact, and the technical challenges prior to implementing new regulations. One of the especially important issues for battery electric yard tractors and other CHE in port operations is whether they can achieve diesel-equivalent shift operating time between battery charging events. Over the next few years, demonstrations must play an essential role in assessing the possibilities of wide deployment of ZE CHE. Demonstrations are the key to gain revenue-service operational experience in the rigorous duty cycles that typify Port CHE operations. For example, before a battery-electric product can be mass deployed, the MTOs need to gain detailed understanding about such factors as operating time between charging events, battery life, vehicle or equipment residual value, infrastructure requirements, and total cost of ownership. Gathering this information requires sufficient demonstration and testing time with multiple pre-production units in operation. To address the current lack of revenue service operational data on ZE CHE, the Port (and

government agencies like NJDEP, NJBPU, NJEDA) need to join with MTOs to initiate and fund essential demonstration programs. It is difficult to overstate the importance to the MTOs of gaining real-world experience with – and confidence in – the operational feasibility of any emerging CHE platform before widely deploying it in regular operations.

Most (if not all) CHE original equipment manufacturers (OEMs) are now developing ZE fuel and technology platforms for their products. ZE models include those fueled by electricity generated by batteries, grid electricity, or hydrogen fuel cells. While early production prototypes and demonstration models exist, and individual units are available for use by interested parties (including some recently deployed at this Port), large-scale production and purchases are currently not available. In general, these early units will effectively be custom-made as ordered and will have much higher purchase costs and deployment lead times in contrast with fully commercially available vehicles, as full commercial production of this new breed of equipment requires a much more robust manufacturing infrastructure and speed of delivery. That said, transitioning existing CHE to ZE entails new opportunities as well as significant challenges (and risks) for MTOs. While the cost effectiveness of reducing key emissions ($ per unit of reduction) by deploying currently available ZE CHE is currently extremely low, that can be improved over time for yard tractors and other CHE. For that cost-effectiveness to improve, OEMs will need to achieve significant cost reductions with the onboard energy storage systems they utilize and achieve greater economies of scale through higher-volume manufacturing. Furthermore, the infrastructure necessary to fuel these machines must be fully conceptualized and developed. Even after commercially viable ZE platforms become available in given CHE applications, it will be an iterative, gradual process to widely transition the current fleet to ZE. This must be done in close coordination with designing, funding, and building suitable charging infrastructures.

In a rapidly evolving field, various CHE types are currently in different stages of commercialization and market availability for ZE fuel technology platforms, at a high level for example:

- ZE grid-electric Rubber Tire Gantry (RTG) cranes are technically feasible and fully commercialized. However, this busbar solution reduces operation flexibility and will require a full redesign of the container yard making the change to ZE RTG very costly.

- ZE battery-electric yard tractors are in "early commercialization" stages (just beginning demonstrations, with very little or no experience in revenue service, to date).

- ZE CHE (battery-electric and fuel cell) are primarily in technology development stages for most other heavy-duty CHE.

Over the next several years, it will be very important for OEMs and MTOs, through public/private demonstration projects, to attempt to validate marketing claims, high expectations, and hype to fully assess which, if any, ZE CHE platforms can meet MTO needs for performance, safety, and cost metrics. At the same time, critical infrastructure build-out requirements will need to be identified and developed. If these things come to fruition, the commercial availability and technical feasibility of ZE platforms for CHE applications may fundamentally improve and the MTOs could feel comfortable with these technologies without risking the significant economic impacts of Port commerce.

B. Technical Issues Involved With the Deployment of ZE CHE

For purposes of these comments, technical feasibility refers to the ability of advanced CHE to provide similar or better performance and achievement across five key parameters, when compared to the baseline CHE powered by diesel-fueled internal combustion engines. Specifically, the following five parameters must be considered prior to development of any regulatory program to assess and evaluate overall feasibility:

1) commercial availability;
2) technical viability;

3) operational feasibility;
4) infrastructure availability, and
5) economic workability.

These five parameters must interact to collectively define feasibility. Failure to meet any one parameter could present a significant barrier to wide-scale deployment at the Port. However, until a technology has made substantial progress in achieving the first two parameters – commercial availability and technical viability – it is not possible to conduct a detailed and accurate assessment of the three remaining parameters. This is due to the lack of basic, verifiable cost information and equipment design data that have been corroborated on products in real-world revenue service.

It should also be noted that heavy duty battery-electric charging methods and standards are rapidly evolving, and the industry remains in a state of flux with no single standard having emerged as the clear winner. Charging times, required systems, and power availability also remain significant issues for MTOs. The scope and parameters of the infrastructure build-out for a fully electrified yard tractor fleet are not yet known but are believed to be substantial. Before infrastructure can be designed and installed at a marine terminal facility, a clear understanding of the performance and charging requirements of battery-electric CHE must be developed. Although the overall amount of electric power needed for CHE charging is thought to be low in the near term compared to the current power used at the Port due to the relatively small number of units that will be deployed, the peak power delivery capacity required for charging on busy days may become substantial. There is also the likelihood that new business models will develop in which third-parties may become interested in developing innovative financial structures including "Energy As A Service" and/or "Charging As A Service". Such innovation should be encouraged,

but again, demonstration programs are necessary to provide significantly more technical, financial, and other critical information in this regard.

C. Operational Concerns

One critical point to keep in mind is that there is a full alignment of interests among the MTOs, ocean carriers, cargo interests, regulators, and other stakeholders – that is, the faster a container is off-loaded from a ship and taken off the terminal, the better for all involved. Efficiency is the key to successful port operations. The MTOs and the regional economy cannot allow that hard-won efficiency to be jeopardized.

Marine terminal operations are complex, interactive systems. All CHE must be operated in careful coordination with a wide variety of terminal operations to move cargo optimally, economically, and safely from ship to terminal, from terminal to truck or rail and vice versa. Each piece of equipment is responsible for executing one or more specific portions of a cargo move. If there are any hiccups or delays caused by any single piece of equipment, this has the potential to create bottlenecks and reduce efficiencies of other CHE in the chain. There are many variations on the basic theme of container pick-up or delivery. In general, a standard container import process begins with ship-to-shore cranes discharging containers from ships to the terminal stringpiece where they are retrieved by CHE depending on the terminal equipment deployment. Some terminals utilize yard tractors for this purpose, while others utilize straddle or shuttle carrier or other CHE. CHE will bring the containers into the yard where the containers are stacked. The import container will later be transferred from the stack to an over-the-road drayage truck by an RTG crane, RMG crane, a straddle carrier, top loader or moved by a yard tractor and delivered to a rail yard. Delays caused by any single piece of equipment are likely to affect the utilization and performance of many other pieces of equipment in the chain. It is also important to note that the energy and power needs for a given CHE type depends on its specific application and duty cycle.

MTOs generally do not have dedicated CHE fleets to focus on a specific type of operation - the same CHE may be used in a variety of applications that have varying duty cycles. Integrating any new piece of technology, certainly without fully understanding its capabilities and limitations, is a complex balancing act. To avoid operational impacts of any new technology, any operationally feasible technology must be proven to offer a one-to-one replacement for existing diesel equipment.

V. Port Authority Regulations

The members of the PONYNJSSA are aware that the Port Authority has also considered the type, quantity and age of CHE operated in the Port as well as the market availability of Near Zero Emission (NZE) or ZE options. As such, they have recently announced an intention to incorporate certain requirements into the Rules and Regulations for Port Authority Marine Terminals (Federal Maritime Commission Tariff No. 10) in January 2021. While the members of the PONYNJSSA are in the process of considering these new requirements and have yet to take a position on them, we do agree that the State should take an iterative and achievable approach in coordination and consistent with the Port Authority when considering the establishment of new Statewide policies for off road vehicles and CHE. As previously stated, to aid the acceleration and comprehensiveness of a transition to zero or near-zero emission CHE, significant funding is needed for pilot demonstrations of equipment, electrical infrastructure assessments and upgrades, and installation of charging stations.

VI. Conclusion

In closing we believe that the significant amount of work and investment that has already been accomplished as well as the goals and objectives already laid out by the MTOs , meet or exceed any of the goals and objectives being discussed by the NJDEP related to air quality

standards. Additionally, the Port Authority's recent proposal on cargo handling equipment and air quality requirements obviates the need for any new rule proposals.

The combination of terminal operator investments, greenhouse gas and air quality objectives set by the terminal operators or their parent companies, air quality objectives required by the various industries that surround the terminal operators and the recent requirements by the Port Authority all lead to a continued path towards air quality improvements. By working together with all stakeholders NJDEP resources could be better spent by helping to overcome infrastructure and technology challenges that exist for the Port to fulfill its mission and obligations to the region.

We look forward to future detailed discussions where resources, technology, and infrastructure capabilities, and as well as limitations, can be reviewed in detail. Thank you for permitting the PONYNJSSA to submit this information.

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Respectfully submitted,

PORT OF NY/NY SUSTAINABLE SERVICES AGREEMENT

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