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Submitted via email as directed at <https://www.nj.gov/dep/njpact>

Cc (email): Peg Hanna

**Subject: Maersk and APMT Comments on the NJ PACT Stakeholder Sessions for Port-related Mobile Sources Held September 2020**

Thank you for this opportunity to comment on the concept materials discussed at the NJ PACT Stakeholder sessions for ocean-going vessels (OGV), cargo handling equipment (CHE) and trucking and drayage. Our comments include the following:

1. Maersk businesses impacted by the NJ PACT concepts
2. Overarching considerations
3. Terminal and CHE comments and recommendations
4. Vessels - shore power, fuels - comments and recommendations
5. Other modes - trucking, warehouse CHE

### **1. Maersk Businesses impacted by the NJ PACT concepts**

Maersk is an integrated container logistics company working to connect and simplify our customers' supply chains. As the global leader in container shipping, the company operates in 130 countries and employs roughly 76,000 people. We operate about 750 container vessels globally. As of September 2020, 127 of our vessels had made almost 400 calls in 2020 at marine terminals in the Port Authority of New York and New Jersey (PANYNJ) complex, with many at our APM Terminals location in Elizabeth. Typically, each of these international vessels spends less than 5% of its operable lifetime in the waters of any one state or country.

Maersk is an environmental leader in shipping. Since 2008 we have reduced our fuel consumed and related emissions by 43% on a per container per kilometer basis. By 2030 we have



committed to a 60% reduction and to launch a first carbon-neutral vessel on our way to Net Zero Carbon Shipping by 2050. We now offer a first commercial net zero CO<sub>2</sub> service to our customers based on substituting biofuel for petroleum-based fuels. In the past Maersk voluntarily used cleaner fuels in California ports, and supported establishing both the California OGV Fuel Rule and the North American Emissions Control Area. We recently established the Maersk Mc-Kinney Moller Centre for Zero Carbon Shipping.

Maersk's APM Terminals (APMT) operates one of the world's most comprehensive port and integrated inland service networks, with over 70 facilities globally. We are uniquely positioned to help both shipping lines and landside customers grow their business and achieve better supply chain efficiency, flexibility and dependability. We are committed to full compliance and beyond with all national, state and local regulations in the Health, Safety, Sustainability and Environmental sectors. In selected global locations we have started the transition to new electrical-powered equipment to replace diesel-powered equipment, and we are moving forward with "green" electricity in a number of locations including New Jersey. APMT's Elizabeth NJ marine terminal has agreed to spend an additional \$40K per year to purchase green energy starting next year and for the subsequent 3 years.

Maersk companies have significant experience with California's sustainable freight and mobile source strategies.

- Maersk vessels have complied with the California At-Berth (shore power) Rule since 2010, using the Equivalent Emissions Reduction Option, and have complied with the OGV Fuel Rule for over a decade and incentives and voluntary actions prior to that. Brands include Maersk, SeaLand and Hamburg Süd.
- APMT's Pier 400 in the Port of Los Angeles completed installation of shore power infrastructure in 2013-2014, and over the last 15 years has aligned our cargo handling equipment (CHE) strategy and investments with state agency requirements and the San Pedro Bay Ports Clean Air Action Plan. APM Terminals is now installing hybrid cargo handling equipment in priority ports around the world, including Pier 400 in Los Angeles. This hybrid equipment reduces diesel emissions by well over half and can be converted to fully electric operations as equipment technology, supply of electricity and charging infrastructure become available.
- Our trucking and warehouse businesses have significant experience with California's extensive and evolving requirements for these sectors. Brands operating in CA and NJ include Performance Team, Hudd and Damco. One of our port drayage companies received and utilized incentive funding in 2009 for lease/purchase of 31 compliant port drayage trucks meeting then new 2009 CARB clean truck rules. They currently have a California Prop 1-B grant award of up to \$3.2M for 16 replacement zero emission electric or hydrogen fuel cell drayage trucks plus up to \$480,000 for facility infrastructure and are awaiting availability from vendors.

We would welcome the opportunity to share our experience with NJDEP in hopes of achieving joint environmental goals cost effectively while minimizing administrative burdens and enhancing operational flexibility.

## **2. Overarching Themes**

1. California has spent many years and very significant funding developing and implementing their ports-related air quality strategies and infrastructure. The time, cost and operational disruptions during infrastructure modifications must be managed carefully and have all been necessary to achieve the needed reductions. Almost all rules include an extended phase-in period to provide permitting and retrofitting or replacement of equipment. Ideally the remaining useful lifetimes of equipment will be considered in developing these strategies.
2. While it may seem tempting to adopt the California model and regulations by reference, significant differences and barriers exist.
  - a. Geography and competition: California has an extensive coastline and no nearby competing ports. This is dramatically different for the US East coast and especially for PANYNJ, where vessels have the choice of calling marine terminals in New York or New Jersey, and other major ports that are nearby. Alignment of requirements across the region is important to avoid unintended consequences.
  - b. Competitiveness of New York and other Ports vs New Jersey Ports (cost advantage for those other ports after implementation): A portion (up to 20%) of the business coming to the port is intermodal (destined inland) and discretionary. It does not involve truck power and only briefly passes through the port. It is very price elastic and can move via other states (NY, PA, VA, etc). We urge the NJDEP to consider this factor in establishing a long-term strategy for zero and near-zero emissions equipment.
  - c. Business models and operational considerations differ between east and west coasts. In the PANYNJ area vessel calls are shorter and vessels are often smaller.
3. Emissions reduction proposals for California POLA/POLB and other California ports have included projected estimates of expected dollars and cargo volume (TEU) due to expected cargo diversion from those ports to other US and Canadian ports. Any emissions reductions proposals resulting in increased new technology operating costs should be evaluated on a regional / multi-state / multi-port basis and should include these factors.
4. New fuels or power sources and electrification can compete for scarce resources for vessels, CHE and trucking/drayage. It's important to take a long-term view, provide

flexibility and stay the course to prevent “stranded assets.” An example is the recent controversy in California about how natural gas-powered vehicles should be treated -- as Zero Emissions Vehicles (ZEV) or Near-Zero Emissions (NZEV). Equipment availability and implementation speed should be considered in strategy development. For vessels, the high activity level on reducing CO2 and other emissions and IMO’s regulatory work on Greenhouse Gas reductions points to non-carbon fuels, potentially changing the long-term usefulness of certain investments such as shore power.

5. California’s rules are complex, often confusing, and carry significant administrative burdens for both the agency and the regulated community. Changes to new approaches often entail equally complex but different compliance requirements. A stakeholder process with industry could lead to alternative compliance approaches and metrics.
6. Electrification depends on grid reliability, capacity and generation portfolio. Availability and reliability of these new vehicles and their connections or charging infrastructure is an unknown and major changes are costly and slow to implement.
7. Considering duty cycles, weather constraints, operational requirements and resulting technology maturity is critical to successful evaluation of new approaches in all these sectors.

### **3. Cargo Handling Equipment**

A few additional comments specific to CHE:

- APM Terminals provided input to the more detailed CHE comments by the Port of New York and New Jersey Sustainable Services Agreement (Marine Terminal Operators (MTO) group) and endorses those comments. Therefore, we will not reiterate those comments in detail here.
- The emissions stemming from the Port Area are only a small part of the NJ total, and CHE is a relatively small part of that PANYNJ contribution. Thus, while we understand the focus, we trust the solutions are not confined to the Goods Movement and Marine industry.
- Timelines: Legislation/Implementation/Execution timeline is important. This equipment represents very significant investments, is critical to efficient operations, and marine terminal CHE has known and limited lifetimes ranging between 10-30 years, so long-term investment strategies and funding sources are essential. We note that California provided significant time (10-15 years and some ongoing) for businesses and suppliers to adapt and still encountered challenges.



- To the NJDEP we stress that the Port/MTO Capacity and efficiency is expected to decrease during implementation of charging infrastructure due to civil works disrupting operations.
- The best implementation scenario for Port/MTO efficiency is that regulations are phased in when new CHE equipment is to be purchased, and existing and similar equipment is required only to make cost-efficient modifications during its normal lifetime. This recommendation is based on experience in other ports globally. When terminals have been forced to sell equipment prior to the normal end of life they have had to do it at fire sale prices. The result is that the receiving ports become more competitive while the regulated terminal takes on higher costs of new equipment.
- We recommend that any new regulations be applicable to all new equipment purchased vs. all equipment currently on terminal. If this guideline is not followed, it comes with
  - Asset Lifecycle Cost (~\$55 million estimated lost value)
  - Cost of Replacement (starting at ~\$120 million depending on equipment specifications)
  - Bridging regulations – It is essential for supply chain flow that provisions are in place to ensure that operators can continue to operate until the new equipment is received and fully operational, as lead-times for equipment can vary between 2-3 years.
- We also note that CHE at some NJ facilities (e.g., warehouse or distribution centers) may be very low utilization but essential to operational resilience. Specific provisions should be made for this situation and extended lifetime of CHE due to minimal usage.
- Electrification of CHE
  - Only full electrification is proven for Rubber Tired Gantry (RTG) and all other advanced technologies are unproven at this time (batteries, hydrogen, etc.) However, this solution limits the operator in flexibility and infrastructure costs.
  - Equipment R&D is currently stuck at battery lifetime in combination with hoisting requirements, which are critical as Marine operations run 24/7.
  - Current technology is advancing quickly, and according to sources in the industry mobile electrification appears possible within 2 to 4 year for most CHE.
  - Battery technology on an industrial scale is unproven in the temperature ranges found in NJ.
- Electrification of Equipment requires yard and infrastructure redesign. (this also applies to shore power installation)
  - Electrical network of Port Complex to be readdressed due to new demand peaks (PSE&G)
  - Charging Stations and battery storage are not considered in any of the current buildings and infrastructure.



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- Complete Yard overhaul, as the original port was designed in the 1950's with smaller modifications over the years. A preliminary rough estimate is \$140 million for the APMT facility.
- Is the energy sourced to the Port "green," and is there enough green energy available for creating a zero-emission terminal? Rates of this green electricity must be comparable to current fuel costs and need to be negotiated well in advance or incentivized.
- APMT has agreed to spend an additional \$40K per year to purchase green energy starting next year and for the subsequent 3 years as part of the Maersk global CO<sub>2</sub> and Sustainability Goals. These costs are expected to increase significantly with electrification unless the State establishes programs to incentivize the move to green power in parallel with the move to electrification.
- A side note on Tier 4 Final: Equipment reliability for Tier 4 Final equipment at our CA facilities has been significantly lower than previous equipment. Part of this is related to the dramatically different duty cycle for marine terminal equipment, where SCR equipment is temperamental and tends to plug (believed to be due to lower engine heat vs. on-road use of similar engines). This impact should be understood before new state standards are adopted. An accelerated push to Tier 4 Final CHE could also delay the move to new technologies/fuels and electrification.

An October 14, 2020 stakeholder report on the San Pedro Bay Ports Clean Air Action Plan included experience on a number of demonstration projects on CHE and trucks. The Port of Los Angeles and Port of Long Beach teams doing the report provided significant technical details and stated that slides will be available on the SPBP CAAP website. Battery capacity for the duty cycle was reported. Funding for these projects was provided by CARB and the California Energy Commission, and projects reportedly had at least 50% matching by the Ports, MTOs, vendors and others. Unforeseen costs have also arisen for electrical infrastructure and other upgrades.

#### **4. Shore Power and vessel fuels:**

The existing California At-berth regulation has been an important and successful contributor in the dramatic reduction of shipping-related emissions. It is administratively very complex, and California Air Resources Board staff (CARB) found it necessary to issue three Regulatory Advisories (2013, 2015 and 2017) to enable implementation and improve clarity. The CARB Board recently approved a replacement approach for this regulation. The new rule becomes effective January 2023, and so is untested and is believed to present significant compliance challenges for the currently regulated fleets and new challenges for MTOs.

My comments in the stakeholder session included these:



- Costs:
  - The costs for shore and vessel retrofits shown in the presentation are in line with California experience, assuming that vessels have shore power connections installed on only one side (second side adds additional cost).
  - The stated Port/terminal costs do not include utility, community, DOT or Port Authority costs for required electric grid upgrades needed off-port, which are expected to be significant.
  - Shore power equipment maintenance costs reported to CARB in their earlier studies now seem to be significantly understated based on more recent data as vessel shore power equipment ages in the harsh marine environment.
  - As of September 2020, 127 Maersk-operated vessels had made almost 400 unique calls in 2020 at marine terminals in the Port Authority of New York and New Jersey (PANYNJ) complex, with many at our APM Terminals location in Elizabeth. Based on the NJDEP estimate of \$1M per vessel to install shore power equipment on one side, the cost of equipping just these vessels would be on the order of \$127M.
  - Based on California experience and NJDEP estimates, refurbishing 5 berths with shore power will cost \$35 million (\$7 million each), which does not include the change in terminal and port complex electrical infrastructure mentioned above.
- Redeployment of vessels is an essential part of the global operating model. At this time only 8 to 10% of the industry's global fleet has shore power capability installed, and port shore power infrastructure is limited to California, some ports in China, and a few berths in other countries. This picture may change as Europe and possibly additional North American ports commit to shore power. For New Jersey, alignment with EU plans for shore power is highly recommended. New Jersey also has the potential for a quick start to shore power by incentivizing shore power connections where berth and vessel have the capability.
- Rates for electricity must be relevant to vessel fuel costs and need to be negotiated well in advance. A savings potential with "green" power will accelerate adoption.
- Cost-effectiveness of each measure should be considered in light of New Jersey emissions inventories, with care in projections to the future considering vessel age and size changes as well as cargo growth (Based on experience reported by the Port of Long Beach). Larger vessels also have extended impacts beyond the vessels themselves, including fewer transits, fewer tugs and pilot boats required, and reduced lost terminal productivity during vessel docking/undocking.
- Alternatives to shore power have been problematic, with difficult business models, and exist only in LA and Long Beach (one company in each port). No other ports have any commercial alternatives, making implementation of the new CARB regulation uncertain. The cost stated for land-based capture and control is based on a limited prototype, and all of these systems also increase GHG emissions or use of electricity and operating costs.



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- The California OGV Fuel rule predated the North American Emissions Control Area by several years. Today the added benefit for requiring distillate fuel and not allowing scrubbers is believed to be marginal and may be detrimental. This rule now forces some vessels to make two significant fuel system changes inbound and two outbound, raising questions of the total net benefit.
- Well-designed incentive programs can be very effective in changing behaviors, enabling technology demonstrations and can encourage bringing new technology to market. Maersk has participated actively in a range of incentive programs in both New Jersey and in California sponsored by the Port Authorities, including Technology Advancement, shore power, clean fuels and speed reductions (e.g., PANYNJ CVI).

We have also reviewed and support the comments on Shore power submitted by the World Shipping Council.

## **5. Trucking/drayage and other facilities**

As mentioned above, our trucking and warehouse businesses have significant experience with California's extensive and evolving requirements for these sectors. Brands operating in both CA and NJ include Performance Team, Hudd and Damco.

- Incentive programs can be very effective in changing behaviors, enabling technology demonstrations and can encourage bringing new technology to market. One of our port drayage companies received and utilized incentive funding in 2009 for lease/purchase of 31 compliant port drayage trucks meeting then new 2009 CARB clean truck rules, and currently has a California Prop 1-B grant award of up to \$3.2M for 16 replacement zero emission electric or hydrogen fuel cell drayage trucks plus up to \$480,000 for facility infrastructure if required, and is awaiting availability of these technologies from vendors.
- As shown in the NJDEP PACT slides, duty cycles, feasible recharging/refuelling location availability and range are very important in selecting technologies appropriate for this sector.
- The line between drayage and conventional trucking is blurred, with trucks potentially operating in both markets.
- Technology availability, cost risk and operational reliability risk are significant barriers in this market, especially for small fleets/companies and owner-operators.
- No experience exists at this time on reliability and maintenance requirements on electrified equipment or availability of equipment based on duty cycles.
- Large Entity reporting – Does NJ propose to adopt the CARB approach? The CARB Advanced Clean Truck Rule Large Entity Reporting process is administratively challenging for both industry and agency but became less onerous when the proposal changed to a one-time requirement.





- We also suggest that NJDEP encourage EPA to align their SmartWay initiatives to enable reporting and encourage use of all possible new fuel/energy systems. Our trucking divisions are SmartWay partners.

The October 14, 2020 stakeholder report on the San Pedro Bay Ports Clean Air Action Plan mentioned above also included comments by Chris Canon of POLA on the experience with 20 ZE HD trucks in operations, and their developing strategy for Zero Emissions technologies and financing. A point of note was the heavy weight of the battery-electric trucks. An OEM Summit is being developed, with plans expected in the next few weeks.

Again, thank you for this opportunity to comment on the stakeholder materials. We are happy to meet with NJDEP to share our experience with the corresponding California programs, and seek approaches that meet the environmental goals while minimizing administrative burdens and costs and providing the essential operational flexibility.

Sincerely,

A handwritten signature in blue ink that reads "Lee Kindberg".

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