

June 5, 2023

The Honorable Michael Regan
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Docket ID No. EPA-HQ-OAR-2023-0216-0001

Dear Administrator Regan,

America's seaports, represented by the American Association of Port Authorities (AAPA), are the center of our nation's trade and transportation systems. International trade through seaports accounts for over a quarter of the U.S. gross domestic product (GDP). Seaports handle approximately \$6 billion worth of import and export goods daily, generate nearly 31 million jobs, and provide more than \$378 billion annually in federal, state, and local tax revenues. The \$3 billion Clean Ports Program has the potential to provide transformational investment in cutting-edge technologies across the country. As these comments make clear, port electrification is still a nascent industry, with supply chains still lacking broad commercialization and reliability. There is a saying in the port industry: "If you've seen one port, you've seen one port." Indeed, an electrification project that makes sense for a large container port may not make sense for a mid-sized bulk cargo port. It is critical that the Environmental Protection Agency (EPA) allow broad flexibility to applicants to procure the equipment that makes sense for their situations. AAPA's comments are delineated into the five areas of interest outlined in the Request for Information (RFI).

A. Technology Availability and Market-Readiness:

There are a few categories of zero-emission equipment produced in the United States in limited quantities, but the vast majority of equipment types have zero American manufacturers. Lead times on delivery vary by equipment type but are typically in the 12-18 month range. Since most of AAPA's members (and most American port authorities) are landlord ports, there is incomplete knowledge of the exact origin and availability of equipment. Private marine terminal operators have a large role in the procurement and evaluation of equipment. However, based on the feedback of our members, AAPA can summarize equipment availability as follows, which includes both domestic and foreign manufacturers:

- Several available brands of electric drayage trucks
- Two known brands of hydrogen drayage trucks
- Electric rail-mounted gantry cranes are available
- Electric rubber-tired gantry cranes are available only in beta models



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- One known company is testing hydrogen rubber-tired gantry cranes
- Many companies produce electric yard tractors
- One known company produces hydrogen yard tractors
- Shore power systems are available in electric models
- There are companies that can produce hydrogen fuel cell systems for shore power, but to AAPA's knowledge, it is not currently used at any port authorities.

Lead times:

- 12-18 months for shore power systems
- One port remarked that a small number of electric yard tractors were available immediately, but that a larger quantity would take 18 months. Another remarked that electric yard tractors were not available for 36 months.
- One American manufacturer of electric yard tractors remarked that they hold no inventory of manufactured equipment. All equipment is immediately delivered to a customer upon completion. Lead times are therefore quite lengthy.

With these long lead times, it is critical that EPA conduct its grant administration and permitting in such a way that grants can be obligated prior to the delivery of equipment. With less than five years remaining until the \$3 billion from the Inflation Reduction Act expires, it is likely that some or much of the equipment purchased with these grants is delivered after September 2027.

B. Performance:

Data on equipment performance is limited because landlord ports do not generally collect detailed data. Also, ports that have procured this equipment have often not yet had the time to use it through the end of its lifecycle, so knowledge about the long-term reliability and maintenance costs of equipment is not yet known. However, one operating port notes that electric yard tractors can do 9-10 hours of "light work," and while they have not tested it yet, they expect 7-8 hours of "heavy work" before batteries are depleted. Ideally, electric yard tractors could operate for 20 hours with 4 hours of charging, but a model that can achieve this is not yet available. Some ports are looking at increasing the number of tractors they employ to allow one unit to charge while another works. This arrangement would obviously be far from ideal and would cost significantly more than employing a single diesel-powered tractor. Hydrogen-powered yard tractors could conceivably refuel in the same time it takes a diesel tractor to refuel (ten minutes or less), but the aforementioned operating port has not yet found the necessary equipment available. Other ports that are using electric-powered equipment note that shifts need to be carefully planned so that batteries are not depleted.

Ports have either observed or expect maintenance needs of electric equipment to be less than diesel-powered models, but more data based on working experience is needed.



In general, charging times are a major roadblock to shifting large quantities of equipment over from diesel to electric. Hybrid equipment allows for much greater reliability while drastically reducing emissions.

C. Pricing:

In general, all electric and hydrogen-powered models of equipment are much more expensive than diesel-powered equipment. Electric yard tractors can cost as much as 3.5 times a diesel machine, and hydrogen yard tractors 4.5 times the cost. After accounting for charging infrastructure, an electric yard tractor can cost 5.5 times a diesel machine. Hydrogen models of reach stackers, empty container handlers, and top picks cost 2.5 times diesel machines, and hydrogen-powered shuttle trucks or straddle carriers cost 1.5 times diesel machines. One port remarked that, in general, electric models cost twice and hydrogen three times as much as diesel machines.

Shore power systems cost about \$20 million per berth. This price was consistent for multiple ports building shore power systems for cruise or cargo berths. This price includes a new substation, duct bank work, switch gear, and cable-handling equipment. It is worth noting that shore power systems mitigate emissions at cruise and cargo ports alike. It is important that EPA make grants to both types of ports to meet diverse emission mitigation goals.

As far as payback periods, measurement is difficult due to the limited data obtained by landlord ports and because much of this equipment is still far from the end of its useful life. However, one port remarked that the payback period on an electric yard tractor is nine years, assuming maintenance costs are 40% of diesel equipment. In this equipment, the battery must be replaced after six years, and the equipment is expected to be retired after twelve years. This is compared to an eight-year useful life of diesel equipment.

A hydrogen fuel cell manufacturing company in AAPA's Industry Solution Provider membership noted that the payback period is entirely dependent on the cost of fuel, as the cost of hydrogen makes up about 70% of the total cost of ownership of a hydrogen fuel cell vehicle. With only a nascent hydrogen supply chain and federal production incentives that have not had sufficient time to impact the national market, it is difficult to estimate the payback period of hydrogen equipment.

D. Domestic Materials Sourcing and Manufacturing:

Equipment that ports report being able to source from Build America, Buy America (BABA)-compliant manufacturers include electric yard tractors, vehicle charging systems, hydrogen fuel, and one manufacturer of a shore power cable-handling system. All other port equipment types described above are not available from any American manufacturers.



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The results from AAPA’s outreach to members confirm what we have heard in conversations with our memberships for months and years: there is an insufficient supply chain of American manufacturers of zero-emission port equipment. For the Clean Ports Program to be successful, applicants must be allowed to purchase equipment from abroad. This is consistent with EPA’s existing policies. Guidance for the Clean School Bus Program noted that EPA does not consider vehicles and engines to be “infrastructure,” and it therefore does not fall under BABA requirements.¹ However, while one port noted that vehicle charging systems are available from American manufacturers, another noted that transformers were only available with 18 months’ lead time, and we have heard of even longer lead times for other electric grid components. Requiring all electric grid and charging infrastructure to come from American manufacturers will significantly delay implementation of zero-emission equipment. It would be in the public interest that EPA grant a waiver to BABA requirements for charging infrastructure to allow port authorities to purchase certain electric grid infrastructure components from abroad.

E. Other Practical Considerations:

Safety Concerns: For electric batteries, ports must consider how to safely dispose of batteries at the end of their useful life and how to prepare for the possibility of a battery fire, especially in an area nearby combustible fuel and materials. Safety concerns are paramount for hydrogen, which is explosive. The Clean Ports Program has allowances for grants to be spent on planning activities. This should include grants for ports to develop safety protocols and training exercises to prepare for these risks.

Electric Grid Infrastructure: Every new unit of electric equipment acquired will come with significant charging needs. It is of paramount importance that the Clean Ports Program include funding for charging and electric grid infrastructure. The Clean School Bus Program included allowances for charging infrastructure, and the electricity demand from a fleet of cargo-handling equipment or a shore power system is sure to be much higher than a fleet of school buses. Without requisite funding for electric grid infrastructure, electric equipment acquired with Clean Ports Program grants will become a liability, as ports will have to find other sources of funding for infrastructure or risk having the electric equipment as a stranded asset. In many ports, utilities do not provide sufficient supplies of electricity, and new transmission lines will be necessary to charge any new equipment.

Do Not Fund Non-Maritime Private Freight Infrastructure: AAPA and the maritime industry were concerned to hear EPA give consideration to commenters in recent listening sessions who advocated that Clean Ports Program funding be spent on equipment and infrastructure at inland freight depots run by private cargo owners. While emissions associated with truck and rail shipping at inland locations are certainly a worthy concern, such locations are not what

¹ [Public interest adjustment period waiver of the Build America, Buy America Act, for 2022 Clean School Bus Rebate Program; 2022 DERA State Grants; and 2022 DERA Tribal and Insular Area Request for Applications](#)



Congress intended for this program. The Inflation Reduction Act required that the applicant to the Clean Ports Program be a public entity, including a port authority, or a private company applying in conjunction with a public applicant. Port authorities are unique public entities established chiefly on waterways. Public-private partnerships are critical to the freight and maritime industries, but taxpayers should not be subsidizing the operations of private shippers if a public entity is not involved. If the Clean Ports Program funds infrastructure not associated with maritime port authorities, the \$3 billion will be spread too thin to have any meaningful effect.

Pilot and Demonstration Projects: As was outlined above, there are only a few categories of equipment that are readily available from many manufacturers in electric models, namely yard tractors and drayage trucks. For other types of equipment, there are either only a handful of manufacturers or new equipment models are in development. It is crucial that EPA not draw an arbitrary line between what equipment counts as “commercially available” and what is still in a “pilot” phase. As is evident from ports with fleets of electric yard tractors that don’t yet understand what the long-term payback or maintenance costs will be, all this equipment is still being tested and evaluated by its users. Zero-emission port equipment is much more expensive than traditionally fueled models. Federal grants are prime opportunities for our members to finance projects and purchase equipment that their tenants might not be able to afford without assistance. It is critical that grant funds be used to advance the development of cutting-edge technologies in need of incentives. A port authority and its tenants will not know whether or what type of nascent equipment to purchase until it has been manufactured, put in the field, and evaluated. We are not advocating that the entire \$3 billion in funding be spent on duplicative pilot projects, but AAPA cautions EPA from making premature decisions about what types of equipment can and cannot be purchased with grants based on incomplete market information. Let the users of equipment decide what makes the most sense for their operations and long-term emission mitigation goals, and grants can still be awarded to ensure that emissions are meaningfully mitigated. **After all, the Inflation Reduction Act specified that the Clean Ports program was available for “zero-emission port equipment.” There was no “commercially available” qualifier in the legislative text.**

Thank you very much for the opportunity to provide comments on the establishment of this grant program, and please do not hesitate to reach out for more information.

Very Respectfully,



Christopher J. Connor



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President and CEO
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