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# How a System-Wide Approach Can Accelerate Port Electrification in the U.S.

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**Executive Summary**

The U.S. is entering a new chapter in port electrification. Progress at pioneering sites like the Ports of Long Beach and Los Angeles is poised to expand significantly to include efforts in at least 26 other states and territories, assuming that funding disbursements continue under a new $3 billion federal investment in zero-emissions technology under the Clean Ports Program and other investment efforts. Under its Electric School Bus Initiative, the World Resources Institute has demonstrated the value of a system-wide approach to electrification that centers equity and recommends adopting this framework to ports seeking a similar transformation. Key elements include engagement across the port sector including: owners, terminal operators, manufacturers, utilities, policy makers and community-based organizations. By undertaking a coordinated, system-wide approach, U.S. ports can accelerate their efforts to achieve emissions benefits, cost savings and technology innovation. This paper primarily focuses on electrification of land-based equipment as a key mode for port decarbonization at seaports.

*Keywords: electric vehicles, heavy duty electric vehicles & buses, off-road & industrial electric vehicles*

## 1 Why Port Electrification is Important

Ports are important for people, nature and climate and serve as major hubs for global economic development and goods movement by connecting ocean vessels, ground equipment, rail and trucks [1], [2]. Beyond commerce, ports serve as critical infrastructure, supporting activities such as emergency relief operations and military staging [2]. In addition, ports provide access to cruise ships and ferries used to facilitate the transportation of people.

Alongside these benefits, there are concerning impacts to address. International shipping and ports contributed 2 to 3% of global CO2 emissions as nearly all port equipment, vehicles and vessels rely on fossil fuels [3], [4]. Cargo handling equipment and drayage trucks are powered by diesel or gasoline[5]. Ocean-going vessels generally use heavy fuel oils, also known as bunker oil and marine fuel, which are inexpensive but highly polluting crude oil leftovers [6], [7], [8]. Harbor crafts typically use diesel fuel and use engines within federal non-road emission tiers [9]. Backup generators and power supply typically rely on diesel. Ports have large energy consumption needs [10].

Port-based emissions affect air quality, waterways and other health and environmental concerns [11], [12]. Moreover, ports are often located in underserved communities most exposed to harmful emissions [13]. Reducing and eliminating emissions due to port operations would provide significant climate, health and environmental benefits.

The volume of goods coming through ports is anticipated to continue to rise over the next decade due to demand from e-commerce and global supply chains [14]. Increasing cargo throughput at ports would require continuous operations, the use of more powerful equipment, and a greater number of machines to handle the increased load. Without proper planning, this would lead to capacity constraints and increased pollution. There needs to be a balance in limiting harmful port emissions without sacrificing economic development.

World Resources Institute defines port electrification as the transition from fossil fuels to zero-emissions technology that include vehicles, equipment, and related infrastructure [5], [6], [7], [8], [9], [10]This paper focuses on electrification at seaports but recognizes the role of other fuels, including hydrogen, and alternative fuels in lowering emissions. As technologies mature, electric equipment will become cost competitive for drayage operations, cargo handling and other heavy duty cycles. Fuel choices in harder-to-abate sectors including oceangoing vessels, rail and long-haul trucking are still being tested and emerging.

# 2 Trends in US Port Electrification

There are more than 300 waterway or seaports across the United States and its territories [15], [16]. Of note there are also more than 100 inland or “dry” ports that serve as intermodal terminals connected by road or rail to a seaport [17]. While there are important electrification efforts underway and to be pursued at these inland ports, including with respect to drayage trucks that transport goods from ports to the rail system, this paper will focus largely on activities surrounding waterway ports. The paper does not cover additional important efforts associated with decarbonization of shipping vessels themselves, outside of shore power, as detailed by colleagues at WRI and others [18]. Such efforts are expected to gain momentum with the recent European Commission FuelEU Maritime Regulation and recent regulatory and economic agreements established under the International Maritime Organization [19], [20].

## 2.1 Electrification Efforts at Top 10 U.S. Ports

The 10 largest U.S. container ports, by loaded twenty-foot equivalent unit (TEU) shipping containers, are shown in Table 1, alongside examples of electrification activity and community engagement efforts. This includes six indicators:(1) completion of an emissions inventory; (2) adoption of an emissions or electrification goal; (3) deployment of one or more electrification projects; (4) community engagement policy; (5) forum for public comments and (6) point of contact for community.

This overview provides an indication of the level of activity across 10 large ports in the U.S., based on container throughput. The authors wish to acknowledge limitations of this assessment: there are multiple ways to rank port activity levels, electrification efforts are not limited to large ports, incomplete statuses of electrification projects, and ports may have electrification ambitions limited by insufficient funding and constrained electricity infrastructure [21].

Limitations notwithstanding, substantial effort toward reducing emissions and environmental conditions has been made across U.S. ports. However, especially beyond these large ten, most U.S. ports are in the early stages of electrification and many are still at the exploration stage, and yet to take any specific actions. One promising indicator is the $8 billion in requested funds under the U.S. EPA Clean Ports Program to advance clean technologies exceeded by nearly three times the available $3 billion budget [22]. In short, port electrification efforts in the U.S. are mixed, with some strong early adopters, widespread interest and opportunities in electrification.

Globally, port electrification leadership has largely occurred in ports outside of the U.S. [23]. However, a recent assessment of the top 10 ports and terminals going electric globally (Table 2) include three major U.S ports: the Port of Los Angeles ($6^{th}$), Port of Long Beach ($7^{th}$), Port of New York/New Jersey ($8^{th}$), suggesting an opportunity to do more based on learnings both in the U.S. and globally.

Table 1: Electrification and engagement efforts for top 10 US ports by loaded TEUs in the US, 2022

| Rank of Port (000 TEUs) | | emissions inventory | emissions reduction target | example zero emissions activities | community engagement policy | forum for public comments | point of contact for community |
|---|---|---|---|---|---|---|---|
| 1 | Port of New York & New Jersey (6,660) | Scope 1,2,3 | Net Zero by 2050 | First all-electric straddle carrier in the US ; truck replacement and clean vessel incentive program | | | |
| 2 | Port of Los Angeles (6,424) | Scope 3 | Net Zero by 2030 | Offers vouchers worth $250,000 to incentivize procurement of ZE Heavy Duty Truck. | | | |
| 3 | Port of Long Beach (6,092) | Scope 3 | Net Zero by 2030 | Procuring 40 class 8 battery electric trucks; Replacing 60 diesel yard tractors with electric ones | | | |
| 4 | Port of Savannah (4,329) | Scope 1,2,3 | | Electrified 104 refrigerated container racks + building 15 electric refrigerated container racks | | | |
| 5 | Houston Port Authority (3,252) | Scope 3 | Carbon Neutral by 2050 | Received funding for 30 ZEV short haul, class 8 trucks + 15 portable EV truck chargers | | | |
| 6 | Port of Virgina (2,861) | Scope 1,2 | Carbon Neutral by 2040 | Procuring EV CHE, charging stations and BESS | | | |
| 7 | Port of Charleston (2,126) | Updating 2021 | | Constructing a facility to utilize 6 electric rail-mounted gantry cranes. | | | |
| 8 | Port of Oakland (1,791) | Scope 1,2,3 | 50% emissions reductions by 2030 | Existing/procuring 31 EV trucks + 18 charging stations | | | |
| 9 | Port of Tacoma (1,519) | Scope 1,2,3 | Net-zero by 2050 | Procuring 36-58 heavy duty ZEV trucks + 50 LDVs and CHEs within Northwest Seaport Alliance | | | |
| 10 | Port of Seattle (1,085) | Scope 1,2,3 | Net-zero by 2050 | | | | |

Sources: [24], [25], [26], [27], [28], [29], [30], [31], [32], [33], [34], [35], [36], [37]

Table 2: Top 10 Ports and Terminals Going Electric (Adapted from Chapman 2025) [23]

| Rank | Name (*Cargo Volume in TEUs)* | Highlights |
|---|---|---|
| 1 | Port of Yantai<br>*122 million* | World's first on-dock chassis battery swapping station<br>Net-zero infrastructure includes 100 electric trucks, 286 charging stations, and 1,206 charging piles |
| 2 | Port of Singapore<br>*37 million* | Net-zero emissions in domestic harbor craft sectors by 2050. All new harbor craft electric or net-zero fuel by 2030. Expecting nationwide deployment of charging stations for e-HC by 2025 |
| 3 | Port of Vancouver<br>*31 million* | Aims to achieve carbon neutrality by 2050. Adopting fast chargers, 26 new stations in 2024, with support of $22.5mn clean infrastructure grant |
| 4 | Port of Rotterdam<br>*15.3 million* | Expecting 2,000 electric trucks by 2030, 50 charging points. Opened first e-truck charging station in 2025 |
| 5 | Port of Antwerp-Bruges<br>*12 million* | Aims to achieve carbon neutrality by 2050. 6 new energy-efficient tugs which includes Europe's first fully electric RSD tugboat, Volta 1 |
| 6 | Port of Los Angeles<br>*9.3 million* | Zero emissions target by 2030. 425 battery-electric cargo handling units and 300 new charging stations planned |
| 7 | Port of Long Beach<br>*9 million* | All net-zero CHE by 2030, trucks by 2035. Installation of 60 hyper-fast charging stations, North America's largest heavy duty charging station opened in 2024 |
| 8 | Port of New York and New Jersey<br>*8 million* | Transitioning 2000+ vehicles to zero emission alternatives. Plans to cut 50% direct emissions by 2030 |
| 9 | Port of Hamburg<br>*5.8 million* | Targets for 2025 include fast-charging points and ~100 battery powered automated guided vehicles. Two electric workboats sent for inspection in 2024 |
| 10 | Port of Gothenburg<br>*1 million* | 4 terminals adopting electrification of their trucks. DFDS and Skaraslättens Transport have expanded electric fleets along with terminal upgrades by Wallenius Wilhelmsen |

## 2.2 Examples of Electrification Projects at U.S. Ports

Port electrification can be categorized as: (1) electrifying stationary cargo handling equipment (CHE); (2) electrifying vehicles including drayage trucks; (3) deploying shore power to support charging electric and hybrid-electric vessels; and, (4) establishing microgrids to provide power during grid outages. Battery-electric and hydrogen fuel cell technologies are in various stages of pilots and demonstrations for cargo handling equipment and vessels with the potential for scale [38], [39]. Battery-electric port vehicles and equipment have been deployed at several ports, especially drayage trucks, yard tractors, and forklifts. Several hydrogen fuel cell pilots are occurring in Californian ports but few have reached commercial maturity to-date [40], [41]. There are currently limited deployments of microgrids in port applications but an opportunity to apply learnings to other locations [42]. Examples of each of category can be found at one or more U.S. ports.

### 2.2.1 Electrifying Cargo Handling Equipment

CHE is essential to port operations and well-suited to electrification [5], [43], [44]. CHE that feature electric fuel types that can replace diesel, include: container cranes, forklifts, gantry cranes and terminal tractors, as seen in Table 3 [5]. CHE accounts for approximately 50-60% of scope 1 and scope 2 greenhouse gas emissions, which points to the importance of electrifying this segment for terminal operators to meet emissions reduction targets [44]. Electrifying CHE also helps reduce scope 3 emissions for shipping line operators and OEMs [44].

Table 3: Sample Cargo Handling Equipment and Fuel Types (adapted from Burnham 2022) [5]

| Equipment | Electric | Fuel Cell | Hybrid | Diesel | CNG | LPG | Gasoline |
|---|---|---|---|---|---|---|---|
| Automated Guided Vehicle | ● | | | | | | |
| Container Crane | ● | | | ● | | | |
| Forklift | ● | ● | | ● | ● | ● | ● |
| Rubber-Tired Gantry Crane | ● | | ● | ● | | | |
| Terminal Tractor | ● | | | ● | | | |

The Port of Virginia has electrified four of its 100 diesel yard tractors at the Norfolk International Terminals. This effort supports its goal of becoming carbon-neutral by 2040[45]. It has plans to continue this effort by replacing more than 150 pieces of equipment with $380 million in support that has been awarded under the U.S. EPA Clean Ports Program[46].

### 2.2.2 Electrifying Port Related Vehicles

Drayage trucks are often older and higher polluting than other vehicles and contribute disproportionately to emissions of greenhouse gases (GHGs), fine particulate matter (PM2.5), nitrogen oxides (NOx). Disadvantaged communities are disproportionately exposed to air pollution from heavy-duty trucks putting their health at greater risk[47]. Drayage trucks are viewed as an optimal use case for electrification due to their shorter routes matching well with available battery ranges [48]. A trucking company that supports operations at the ports of Los Angeles and Long Beach has added 15 electric drayage trucks to its fleet of 48 trucks. This effort supports the company's goal of going net-zero by 2030. The effort was supported by a variety of funding sources: California's Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project, Carl Moyer Program, the Southern California Edison Drayage Rebate and Charge Ready Transport Infrastructure Program and California Energy Commission's Clean Transportation Program[49].

### 2.2.3 Deploying Shore Power

Shore power is the process of providing land-based electrical power to ships while they are docked, allowing them to turn off their diesel engines and is becoming an increasingly popular way to reduce ship emissions. The Port of Seattle provides shore power to all three of its cruise ship berths, one of the first ports to offer simultaneous use of power at all berths as of October 2024 [50]. This effort started in 2011. Partners in the effort included the City of Seattle, Seattle City Light, the cruise ship industry and the local chapter of the International Longshore and Warehouse Union (ILWU). In June 2024, The Port of Seattle became the first port in the U.S. to independently require 100% of all cruise vessels homeported be shore power capable and utilize shore power [50]. PortMiami is the first major cruise port on the U.S. eastern seaboard to offer shore power capability at five cruise berths as of June 2024 [51]. Partners in the effort included Miami-Dade County, the cruise ship industry, and Florida Power & Light Company. Funding support included grants from the Florida Department of Transportation and the U.S. Environmental Protection Agency [51].

### 2.2.4 Establishing Microgrids at Ports

As electrification at ports increases demands on the electrical grid, alongside growth in other areas, microgrids can offer resiliency in the event of a grid outage by providing backup power and ensuring continuity of operations including for defense related missions. Microgrids typically combine a variety of clean energy resources, such as solar generation and stationary battery energy storage and often additional distributed back-up generation such as a biodiesel or renewable natural gas generator [42]. The Port of Long Beach has developed a microgrid that will provide zero-emissions electricity and resiliency for the Joint Command and Control Center located at the port. The microgrid combines solar panels and stationary battery energy storage. It reduces the reliance on diesel backup generators and lowers electricity costs. Long Beach City College completed a study which identified gaps in curriculum for training students to operate and maintain microgrids which will inform and support local workforce development [52], [53], [54]. Funding support included a grant from the California Energy Commission.

### 2.3 Influence of Terminal Operators, Shipping and Logistics Companies on Port Electrification

Companies across the port industry are helping shape the pace and direction of port electrification in the U.S. Large corporations with sustainability plans and carbon reduction targets are seeking to decarbonize their entire supply chain as required by Scope 3 greenhouse gas emissions accounting. Port tenants like shippers, cargo handlers, and freight forwarders are looking to meet demands made by their major customers like Amazon, Patagonia and IKEA to adopt zero-emissions equipment [55].

### 2.4 Challenges to Expanding Port Electrification in the U.S.

Challenges to expanding port electrification include cost, technology maturation, infrastructure and deployment obstacles that are similar to those experienced in other sectors. The upfront costs for electricity-based port technology are often significantly higher than for their diesel counterparts [56]. Special infrastructure like chargers and electrical capacity for charging battery-electric equipment and hydrogen fuel sources for fuel cell equipment are needed. Installing this infrastructure takes time and can be complex involving port landowners and tenants, utilities, permit approvers, community members, unions and more [42].

## 3 Role of federal, state and utility funding on U.S. port electrification

Federal, state and utility funding play an important part in supporting U.S. port electrification and includes a variety of programs. This includes supporting purchases and installation for equipment, vehicles, vessels and infrastructure, as well as assistance in planning, workforce training and community engagement [57][58][2][59]

### 3.1 Federal Funding Support

Over the span of the last five years (2019 to 2024), at least $3.9 billion in federal support has been awarded for port electrification efforts through the following programs: U.S. Environmental Protection Agency, Clean Ports Program and Diesel Emissions Reduction Program and U.S. Department of Transportation, Maritime Administration Port Infrastructure Development Program, Federal Highway Administration Reduction of Truck Emissions at Port Facilities Grant Program and Federal Transit Administration Ferry Grant Program [36], [60], [61], [62], [63]

The most notable single public investment to date in the U.S. is the federal Clean Ports Program that was created by Congress in 2022 and is currently under review by the new Administration [58]. In October, 2024, the U.S. Environmental Protection Agency (EPA) announced $3 billion in awards in support of zero emissions technology deployment and air quality planning. The awards were made to applicants from 27 states and territories, which span different types of ports, port equipment and geographic regions [2]. Notably, there was strong demand for this funding with over $8 billion in applications, close to three times the available amount [59]. Ports received planning funding to create emissions inventories and develop roadmaps towards emissions reductions and clean technology adoption. Ports also received substantial funding to implement electric and hydrogen trucks, vessels, rail, offroad equipment, shore power and solar generation [18]. The status of funding awards is currently under review while some awardees are moving forward with their plans.

### 3.2 State Funding Support

For many years, California offered substantial zero-emissions funding for port equipment like drayage trucks, terminal tractors, off-road equipment and vessels. This statewide investment helped transform the Ports of Long Beach, Los Angeles, Oakland, San Diego and Hueneme. For example, the Ports of Long Beach and Los Angeles, reduced their diesel emissions by 91% from 2005 to 2023 from implementing clean technology [64]. Additional states have since created funding programs, including Maryland, New Jersey, New York, Texas and Washington [21]. Support from specific programs from just two states, California and Washington, totals close to $1 billion [65], [66], [67].

### 3.3 Utility Funding Support

Electric utilities are also a source of support, including through make ready infrastructure programs and grant funding, in addition to in-kind support and supportive rates and tariffs. Examples are provided in Table 4.

Table 4: Examples of Utility Program Support for Port Electrification

| Utility - Program Name | Description of Support |
|---|---|
| Southern California Edison - Charge Ready Transport / Port Electrification | Infrastructure for electric trucks, port equipment, shore power Works with Port of Long Beach and Port of Los Angeles; funds make-ready infrastructure. |
| San Diego Gas & Electric - Power Your Drive for Fleets | Port vehicle and equipment electrification; focus on reducing GHG emissions at ports and logistics centers. |
| Pacific Gas & Electric - EV Fleet Program | Port vehicle and equipment electrification; focus on reducing GHG emissions at ports and logistics centers. |
| Los Angeles Department of Water and Power - Port Electrification | Custom incentives for port and shipping terminal electrification; supports shore power and other terminal electrification. |
| New York Power Authority - EVolve NY & Port Electrification Projects | Electrification planning and funding for ports like Port of Albany; focus on clean transportation and heavy-duty electrification. |
| Seattle City Light - Port of Seattle Shore Power Expansion | Funding and support for shore power at cruise terminals; partnerships with Port of Seattle and Northwest Seaport Alliance. |

Sources: [68], [69], [70], [71], [72], [73]

# 4 Advancing a System-Wide Approach with an Equity Focus

Electrifying ports and eliminating harmful emissions requires a systems-wide approach that embeds equity. Near-port communities and populations have been historically underinvested and are disproportionately exposed to harmful emissions surrounding ports areas [13], [74]. Particularly vulnerable populations include children, older adults and pregnant women with emissions exposures having lifelong impacts [75], [76]. Equity considerations include public health impacts and opportunities for education and employment.

Multi-sector partnerships are essential, which calls for engagement with port governing bodies, companies, equity and community organizations, labor, energy providers, manufacturers, and policymakers. Most U.S. ports are publicly owned, run by a port authority or a state or municipal government, using one of three operational structures: landlord ports, port-controlled or fully private terminals. Landlord ports are most common whereby the port owns the land and basic infrastructure, and private companies lease terminals and invest in supporting structures. In a port-controlled model, the port owns and operates the terminals. Fully private terminals are owned and operated by private companies, often using long-term leases.

Taking a systems change approach to port electrification to address needs of underserved communities can ensure that electrification does not happen without community input and buy-in . We replicate the framework used in WRI's Electric School Bus Initiative, which includes working collaboratively with: school districts seeking to deploy electric vehicles, partners and community organizations, particularly those in low-income areas, communities of color and those disproportionately impacted by diesel exhaust pollution; manufacturers to identify bottlenecks, increase capacity, and prepare the workforce; electric utilities, policymakers, operators and to identify and advance equity-oriented electric system solutions, including innovations in vehicle-to-anything (V2X) technologies and infrastructure deployment; supporting community voices and engaging policymakers in federal, state and municipal governments to usher in the policy solutions and funding and financing to reduce barriers [77].

This approach can be taken with members of the port electrification system, many of which are similar. Critical players are shown in Figure 1. Port owners and tenant companies have influence and can introduce clean technologies in their terminals and ports. Communities play an important role motivating nearby ports to clean up and by shaping adoption and implementation of port growth. Other key stakeholders like technology providers -- manufacturers, dealers, utilities and contractors -- facilitate timely implementation of plans. Policymakers and labor organizations further accelerate the clean technology transition through supportive policies and trained workers, respectively.

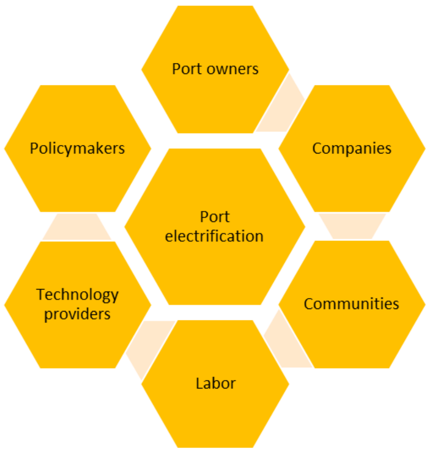


Figure 1: Members of the port electrification system

WRI has developed an equity framework (Figure 2) to guide its work in the school bus sector and ensure its activities and possible outcomes consider equity; this framework can be adapted to equitable port electrification [78]. To develop guiding principles and a shared equity vision in the port sector, key stakeholders would include leaders and partners like port trade associations, near-port communities and non-profit organizations. A landscape research analysis of existing literature, data, needs assessments and stakeholder mapping would compile the existing equity conditions and work on port-related equity. These inputs would similarly form the basis for equitable actions in port electrification like a website, goals and strategies, monitoring, evaluation & learning (MEL), equity learning and equity dialogue spaces.

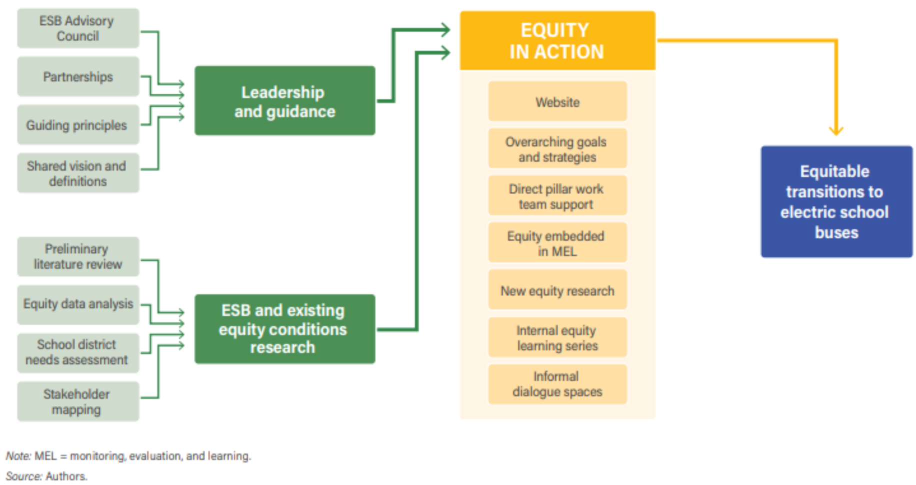


Figure 2: Process for leading with equity in the Electric School Bus Initiative

## 5 Key Recommendations

A multi-sector approach that centers equity ensures that key stakeholders are part of the decision-making process and that ambitious project goals are achievable. In Table 5, we recommend how the main ecosystem stakeholders could engage and how to include equity considerations, alongside examples of action from key player within the U.S. sector. Overall, an effective system-wide approach is one that considers and engages across the many parts of the sector from the earliest stages of port electrification.

Table 5: Role of key stakeholders and equity considerations in port electrification

| **Key Sector** Stakeholder *Role* | Equity Considerations | Examples of Action |
|---|---|---|
| **Port owners** Port authorities, governing bodies, state or local agencies *Oversee plans, coordinate* | How are owners seeking to engage the community in electrification | *Setting net zero/carbon neutrality goal* |

| | | |
|---|---|---|
| *with tenants, stakeholders, infrastructure owner* | efforts? How are they approaching setting equity incentives? | Cleveland Ports<br>Port Houston |
| **Companies** Port tenants, shipping and logistics companies *Acquire zero-emissions equipment, fleet transition planning, workforce training* | How are companies seeking to engage the community in electrification efforts? What are labor conditions and training opportunities? | *Acquiring zero-emissions equipment*<br><br>SSA Marine |
| **Communities** Port communities, environmental justice groups, research entities, universities *Advocate, prioritize public health, planning* | Are there opportunities to provide input and feedback easily and from an early stage? | *Educate and engage*<br><br>Coalition for Healthy Ports New Jersey |
| **Labor** Unions representing port workers, truck contractors, longshoremen, family owned businesses *Discuss and plan workforce needs in the zero emissions transition* | Does labor have a seat at the table as efforts are being developed and deployed? Are workers provided career advancement and training opportunities? | *Worker inclusion*<br><br>International Brotherhood of Electrical Workers |
| **Manufacturers** Marine vessels, cargo handling equipment, drayage trucks, dealerships, microgrids *Provide reliable, affordable, and interoperable zero-emissions equipment and infrastructure* | How are manufacturers supporting electrification policies? What role are they playing in workforce development? | *Demonstrate electric vessels in U.S.*<br><br>Crowley<br>Candela |
| **Energy providers** Utilities, charging/energy-as-a-service provider, resiliency planning *Provide electrification services to increase uptime and lower costs* | How are energy providers supporting electrification efforts, especially in underserved communities? | *Installing infrastructure and rates*<br><br>Port of Long Beach |
| **Policymakers** Federal, state, and local government including public utility commissions *Develop strategies, advance regulations, catalyze further funding and investments, support stakeholder consultations* | How are policy makers including underserved communities in program and incentive designs? Is funding prioritized for communities most burdened by pollution? | *Mandate clean energy & short power*<br><br>California Air Resources Board |
| **Civil Society** Non-profit organizations, research institutions *Input into electrification, document on the ground conditions and potential benefits* | How is civil society included in the design, development and deployment of efforts? Are researchers provided access to data and information? | *Policy development and advocacy*<br><br>Ports for People |

Sources: [79], [80], [81], [82], [83], [84], [85], [86]

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