

# HARBOR CRAFT

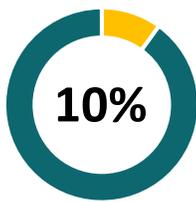
## Emissions Inventory & Strategic Outlook – January 2026

### EMISSIONS & TRENDS

**Current Share:** Harbor craft are the second largest source of port DPM and NOx relative to other sources.



Diesel Particulate Matter (DPM)



Nitrogen Oxides (NOx)



Greenhouse Gases (GHG)

#### Progress (2005-Present):



**72%** Reduction in DPM

**39%** Reduction in NOx

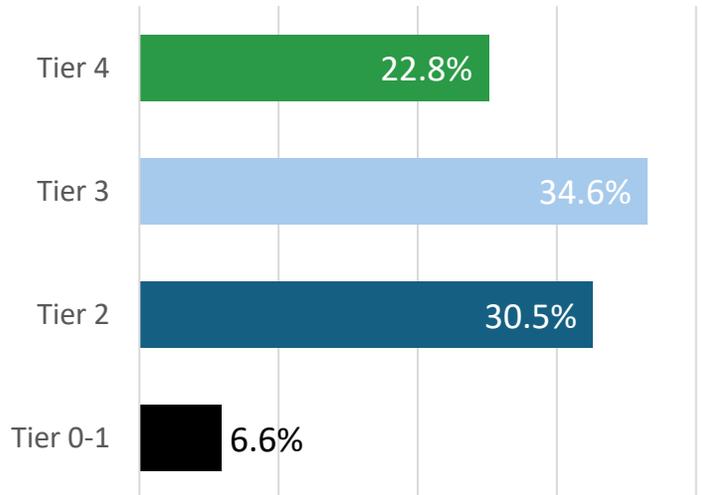
**Context:** Achieved while cargo volume grew 41%.

**2024 Inventory Note:** Long-term trends are down but when compared to 2023, emissions rose (DPM +18%, GHG +13%) largely due to surges in cargo volume.

### ENGINE TIER STATUS

**The Goal:** Transition to Tier 4 engines (cleanest) or Zero-Emissions as required by State Regulation.

**Current Reality:** The majority of the fleet still uses lower tier engines, but many are scheduled for upgrades over the next 2 years.



**Note:** 100% use renewable diesel which has lower emissions compared to conventional diesel.

### CURRENT STRATEGY HIGHLIGHTS



#### INNOVATION

\$33.7 Million in active technology demonstration projects.

**Focus:** Zero-emission capable tugs and excursion vessels.

**Partners:** Harbor Breeze, Bay Delta Maritime, Pacific Maritime Group, Arc Boats



#### INCENTIVES

\$28.7 Million awarded by Port of Long Beach in first funding round.

**Impact:** Upgrading 10 vessels to cleanest-diesel or zero-emission capability.

**Next Step:** Another funding round anticipated in 2026.



#### INFRASTRUCTURE

**Future Study:** Identifying charging and fueling locations for zero-emission craft.

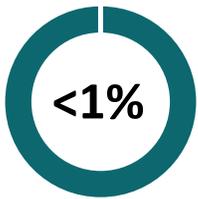
**Active Project:** Charging infrastructure is being installed in Los Angeles to support zero-emission excursion boats

# SWITCHER LOCOMOTIVES

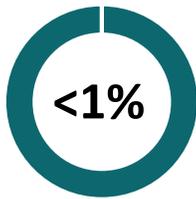
## Emissions Inventory & Strategic Outlook – January 2026

### EMISSIONS & TRENDS

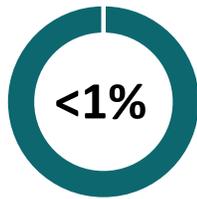
**Current Share:** Switcher locomotives account for a negligible share of total port-related emissions.



Diesel Particulate Matter (DPM)



Nitrogen Oxides (NOx)



Greenhouse Gases (GHG)

### Progress (2005-Present):



**92%** Reduction in DPM

**85%** Reduction in NOx

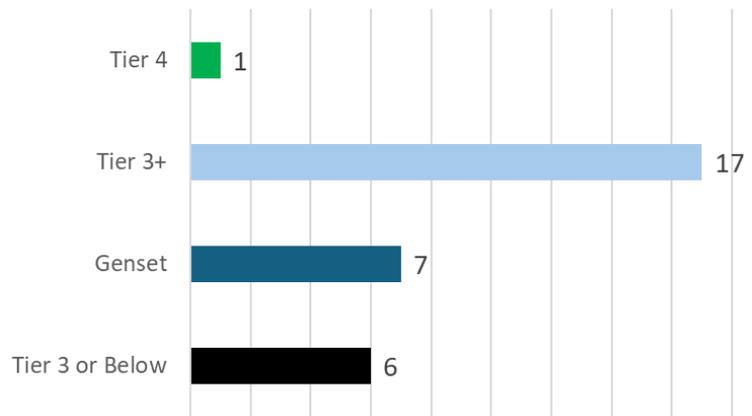
**Context:** Achieved while cargo volume grew 41%.

**2024 Inventory Note:** Long-term trends are down but compared to 2023 emissions rose (DPM +9%, GHG +3%) largely due to recent surges in cargo volume.

### FLEET STATUS

**The Goal:** Transition the switcher fleet to Zero-Emission (ZE) via new technology and operator contracts.

**Current Reality:** The current fleet is modernizing but relies on diesel technology and older engines.



**Fuel Note:** 100% of the switcher locomotive fleet uses renewable diesel which has lower emissions compared to conventional diesel.

### CURRENT STRATEGY HIGHLIGHTS



#### INNOVATION

**Active Demonstrations:** The Ports have invested in demos including a recent test of a battery-electric locomotive.

**POLA Project:** Using a Federal grant to develop an electric switcher locomotive with expected deployment in 2026.



#### INCENTIVES

**POLB Program:** Launching a new incentive program in early 2026 to provide funds for zero-emission switchers.

**Assessment:** POLB conducts a tech assessment every five years to support the Pier B On-Dock Rail Support Facility Project.



#### PROCUREMENT & CHARGING

**Rail Operator:** Procurement for new on-port rail operator prioritizes applicants with defined ZE switcher implementation plan.

**Charging:** POLA developing charging components alongside locomotive grant project.

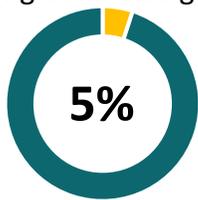
# San Pedro Bay Ports Background

# DRAYAGE TRUCKS

## Emissions Inventory & Strategic Outlook – January 2026

### EMISSIONS & TRENDS

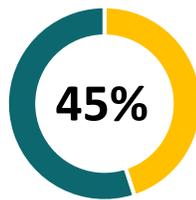
**Current Share:** Drayage trucks account for a small share of total port-related air emissions but the largest share of greenhouse gas emissions.



Diesel Particulate Matter (DPM)



Nitrogen Oxides (NOx)



Greenhouse Gases (GHG)

### Progress (2005-Present):



**98%** Reduction in DPM

**94%** Reduction in NOx

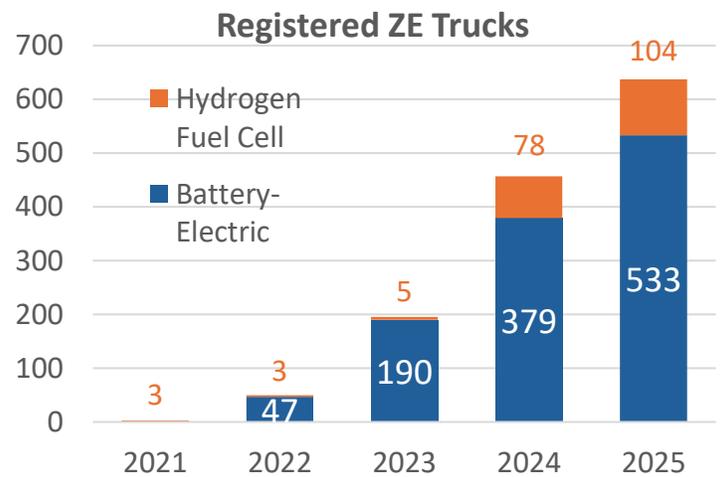
**Context:** Achieved while cargo volume grew 41%.

**2024 Inventory Note:** Long-term trends are down but compared to 2023 emissions rose (DPM +42%, GHG +18%) largely due to recent surges in cargo volume.

### FLEET STATUS

**The Goal:** Transition the entire drayage fleet to Zero-Emissions (ZE) technology.

**Current Reality:** In December 2025, there were 17,762 registered trucks and 14,345 were active. ZE trucks account for 3% of all truck moves.



**Note:** Market fragmented among fleets of varying size: 1-10 trucks (17%), 11-20 trucks (16%), 21-50 trucks (26%), 51 and above (41%).

### CURRENT STRATEGY HIGHLIGHTS



#### INNOVATION

**Demonstrations:** Actively fund projects to advance ZE truck technologies to validate performance.

**Active Projects:** Pilots monitor range capability, noting a typical shift requires 117-300 miles with needed range of up to 550 miles.



#### INCENTIVES

**Clean Truck Fund Rate (CTFR):** Cargo owners pay \$10 for 20-ft or \$20 for 40-ft container per truck move; ZE trucks exempt.

**Reinvestment:** Collected CTFR funds are used for ZE purchase incentives and to offset high-cost of hydrogen fuel.



#### INFRASTRUCTURE

**Funding Support:** CTFR revenue is also directed toward building ZE truck charging infrastructure.

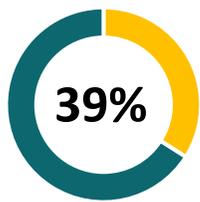
**Active Projects:** The ports are investing in charging depots and hydrogen fuel near the port complex and regionally.

# OCEAN-GOING VESSELS

## Emissions Inventory & Strategic Outlook – January 2026

### EMISSIONS & TRENDS

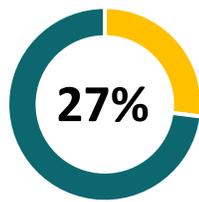
**Current Share:** Ocean Going Vessels (OGVs) remain a dominant source of port-related emissions.



Diesel Particulate Matter (DPM)



Nitrogen Oxides (NOx)



Greenhouse Gases (GHG)



Sulfur Oxides (SOx)

**Progress (2005-Present):**



98% in SOx

93% in DPM

54% in NOx

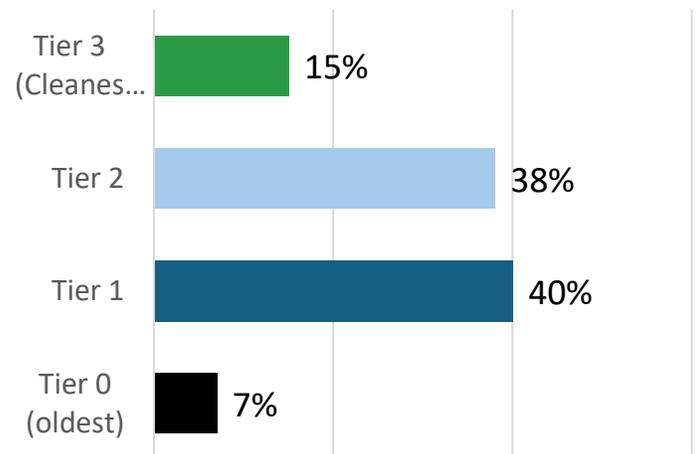
**Context:** Achieved while cargo volume (TEUs) grew 41%.

**2024 Inventory Note:** While long-term trends are down, GHGs increased 18% and NOx rose 1% since 2023, reflecting increased vessel activity.

### ENGINE TIER STATUS

**The Goal:** Transition to net-zero lifecycle carbon emissions through use of cleaner technology and fuel.

**Current Reality:** Tier 1 and Tier 2 engines still dominate the fleet calling San Pedro Bay.



**Note:** The primary fuel is marine gas oil (MGO), but vessels using LNG and methanol have started to make calls.

### CURRENT STRATEGY HIGHLIGHTS



#### INNOVATION

**Global Partnership:** Working with Shanghai and Singapore to accelerate use of clean marine fuels and technologies.

**Demos:** Financial support for technology projects, including water-in-fuel emulsions, slide valves, and scrubbers.



#### INCENTIVES

**Speed Reduction:** Voluntary program with 95% participation, offers incentives to slow down reducing engine load.

**Clean Ship Incentives:** Rewards ships using cleaner tech via Environmental Ship Index (ESI) and Green Ship Incentives.



#### INFRASTRUCTURE

**Shore Power:** The ports pioneered shoreside power, also known as Alternative Maritime Power (AMP).

**Current Status:** Berths are equipped for container and tanker vessels to plug into electrical grid while at berth.

# CARGO HANDLING EQUIPMENT

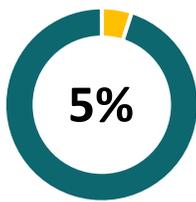
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### EMISSIONS & TRENDS

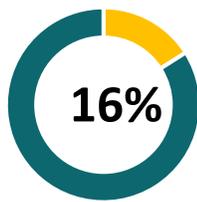
**Current Share:** Cargo handling equipment (CHE) is the 3<sup>rd</sup> largest contributor to port-related emissions.



Diesel Particulate Matter (DPM)

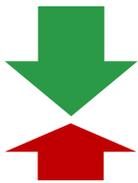


Nitrogen Oxides (NOx)



Greenhouse Gases (GHG)

### Progress (2005-Present):



**78%** Reduction in DPM

**82%** Reduction in NOx

**16%** Increase in GHGs

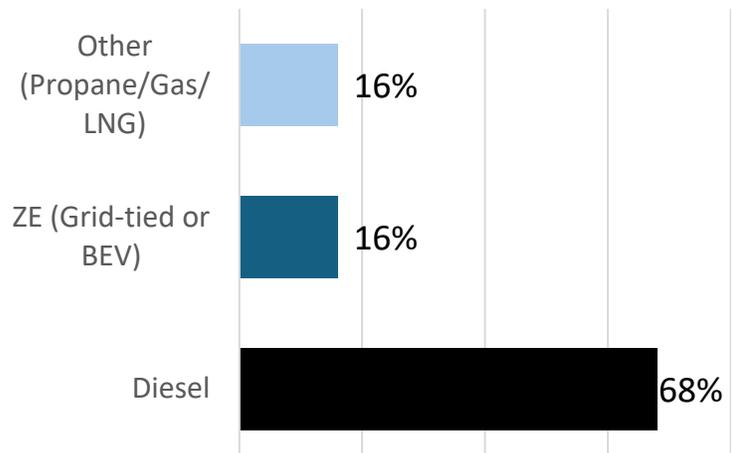
**Context:** Achieved while cargo volume grew 41%.

**High Emitters:** Three equipment types – yard tractors, top handlers, and RTGs – comprise 85% of the Complex's CHE NOx emissions and 89% of CHE GHG emissions.

### FLEET FUEL STATUS

**The Goal:** Transition to Zero-Emissions (ZE) technology.

**Current Reality:** Understanding technological and infrastructure readiness is critical. The majority of the fleet still uses diesel.



**Total Inventory:** 3,632 pieces of equipment serving the Ports in 2024.

**Fuel Trend:** The diesel share has held steady at 68% since 2017. 47% of the fleet uses renewable diesel.

### CURRENT STRATEGY HIGHLIGHTS



#### INNOVATION

**Feasibility:** ZE CHE feasibility assessment every three years; the next release is expected Q1 2026.

**Demos:** Nearly \$200M in CHE technology demos through the Technology Advancement Program and grants.



#### INCENTIVES

**Active Funding:** State and Federal funding secured to deploy nearly 600 pieces of new ZE CHE over next three years.

**New Program:** POLB launching new incentive program in 2026 providing \$58M for ZE CHE and hard-to-decarbonize sources.



#### INFRASTRUCTURE

**ZE Infrastructure Plans:** Ports working with terminals to develop infrastructure plans under the Cooperative Agreement with SCAQMD.

**Utilities:** Both ports are working with their utilities on service upgrades to support ZE.