



2019 Inventory of Air Emissions



THE PORT 
OF LOS ANGELES

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Environmental Management**

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Presentation Acronyms

- CAAP: Clean Air Action Plan
- CARB: California Air Resources Board
- CHE: Cargo Handling Equipment
- CH₄: methane
- CO: carbon monoxide
- CO₂: carbon dioxide
- CO₂e: carbon dioxide equivalent
- DPM: diesel particulate matter
- EI: emissions inventory
- EPA: U.S. Environmental Protection Agency
- ESI: Environmental Ship Index
- HC: hydrocarbons
- NO_x: oxides of nitrogen
- N₂O: nitrous oxide
- OGV: ocean-going vessel
- PM: particulate matter
- SCAQMD: South Coast Air Quality Management District
- SO_x: sulfur oxides
- TEU: twenty-foot equivalent unit
- tonnes or mtons: metric tons
- µg/m³: micrograms per cubic meter (concentration in air)

POLA Annual Emissions Inventories

- Annual activity-based
 - 2001, 2005 – 2019
- Source categories
 - Ships, harbor craft, cargo handling equipment, trucks, locomotives
- Pollutants
 - PM • PM₁₀ • PM_{2.5} • DPM • NO_x • SO_x • HC • CO
- Greenhouse gases
 - CO₂ • CH₄ • N₂O • CO₂e
- Annually coordinated with & reviewed by CARB, SCAQMD, & EPA





Emissions Reductions Since 2005

Diesel Particulate Matter:
DOWN

87%

2023 Goal
77%

Nitrogen Oxides:
DOWN

62%

2023 Goal
59%

Sulfur Oxides:
DOWN

98%

2023 Goal
93%

Greenhouse Gases
Equivalent:
DOWN

15%

25%

TEU
Increase



Comparisons to 2005 & 2018

EI Year	DPM	NO_x	SO_x	CO	HC	CO₂e
	tons	tons	tons	tons	tons	tonnes
2019	112	6,172	109	2,003	363	879,774
2018	118	6,554	118	2,132	380	933,572
2005	879	16,206	4,983	3,757	850	1,036,876
Previous Year (2018-2019)	-5%	-6%	-7%	-6%	-5%	-6%
CAAP Progress (2005-2019)	-87%	-62%	-98%	-47%	-57%	-15%



Regional Contributions

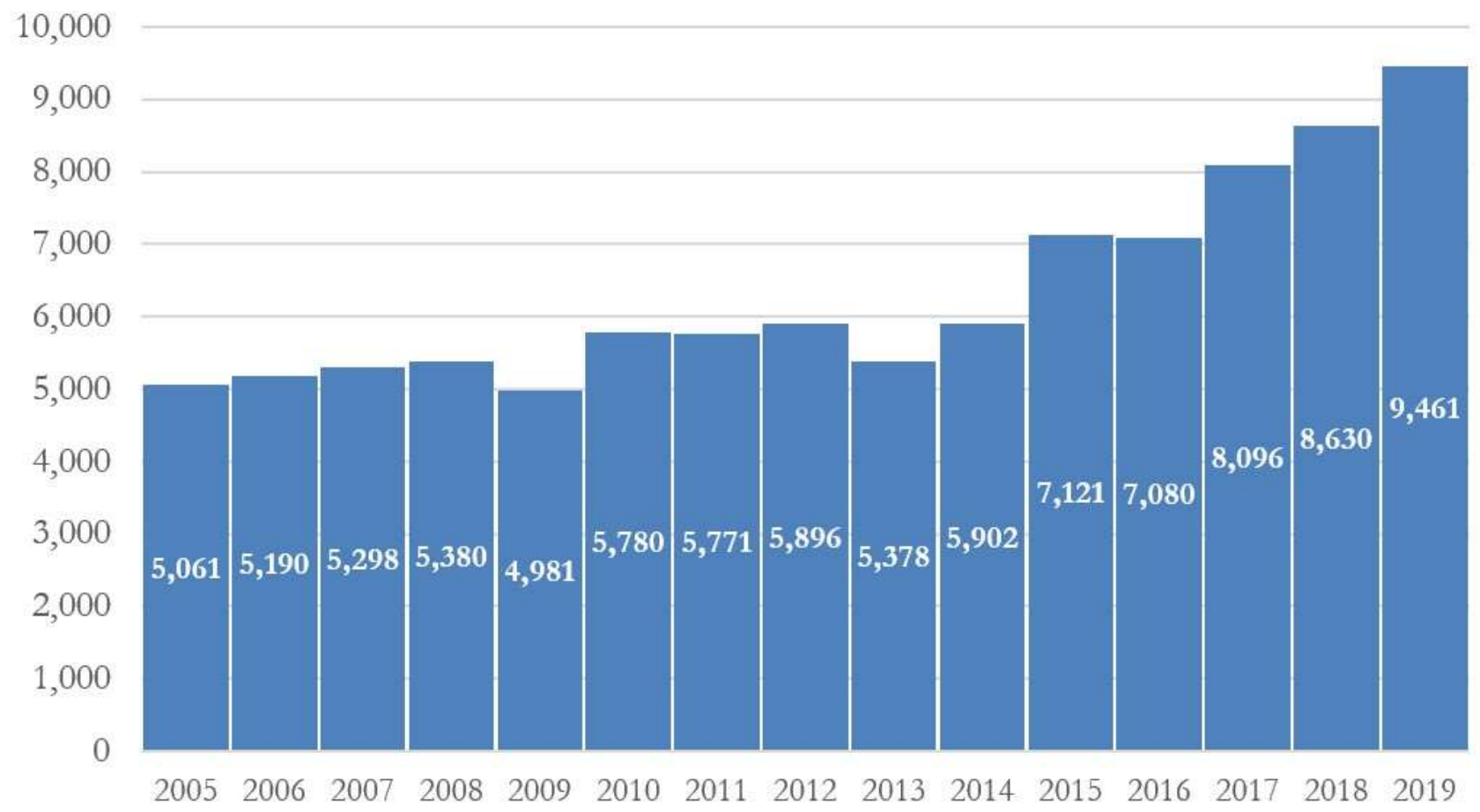
2005

2019



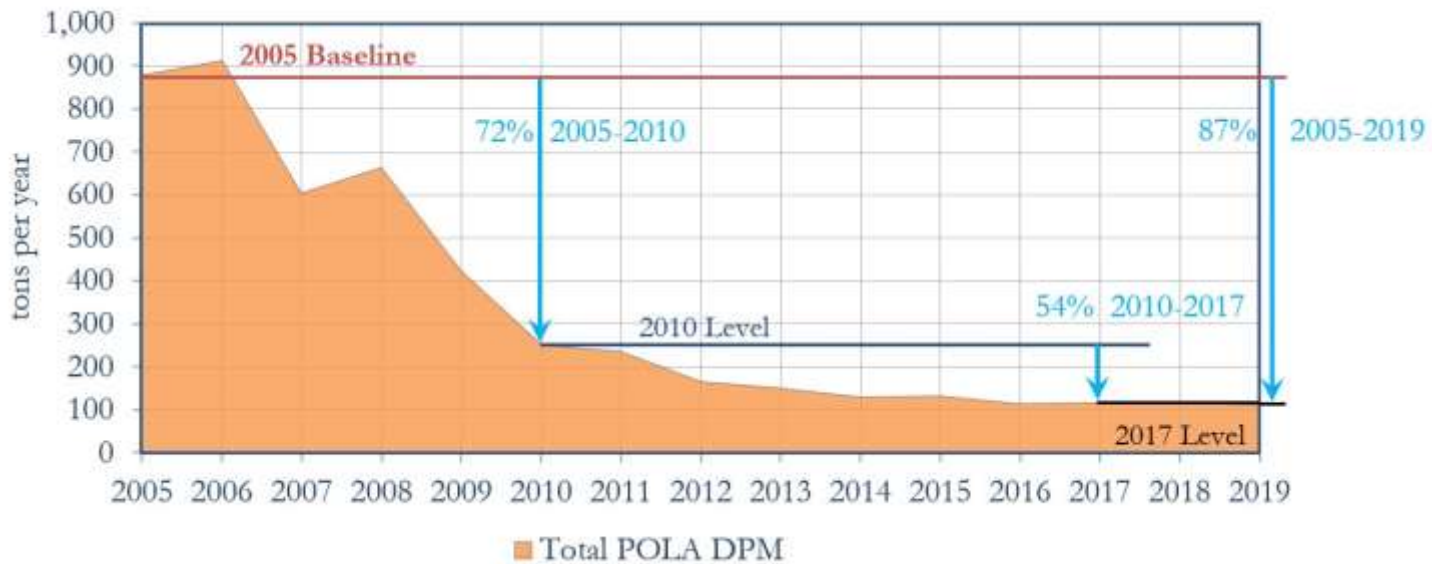
Vessel Efficiency Improvements

Average Container Ship Call Density, teus/call





CAAP DPM Progress





CAAP NO_x Progress



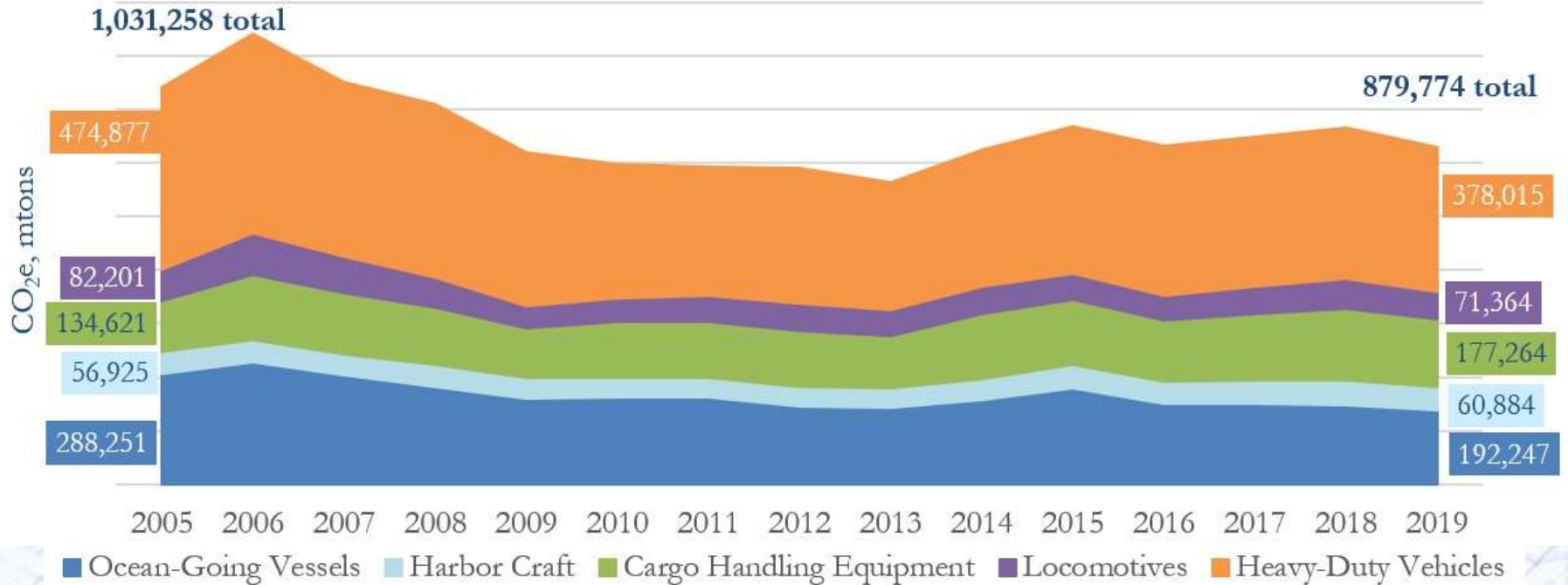


CAAP SO_x Progress



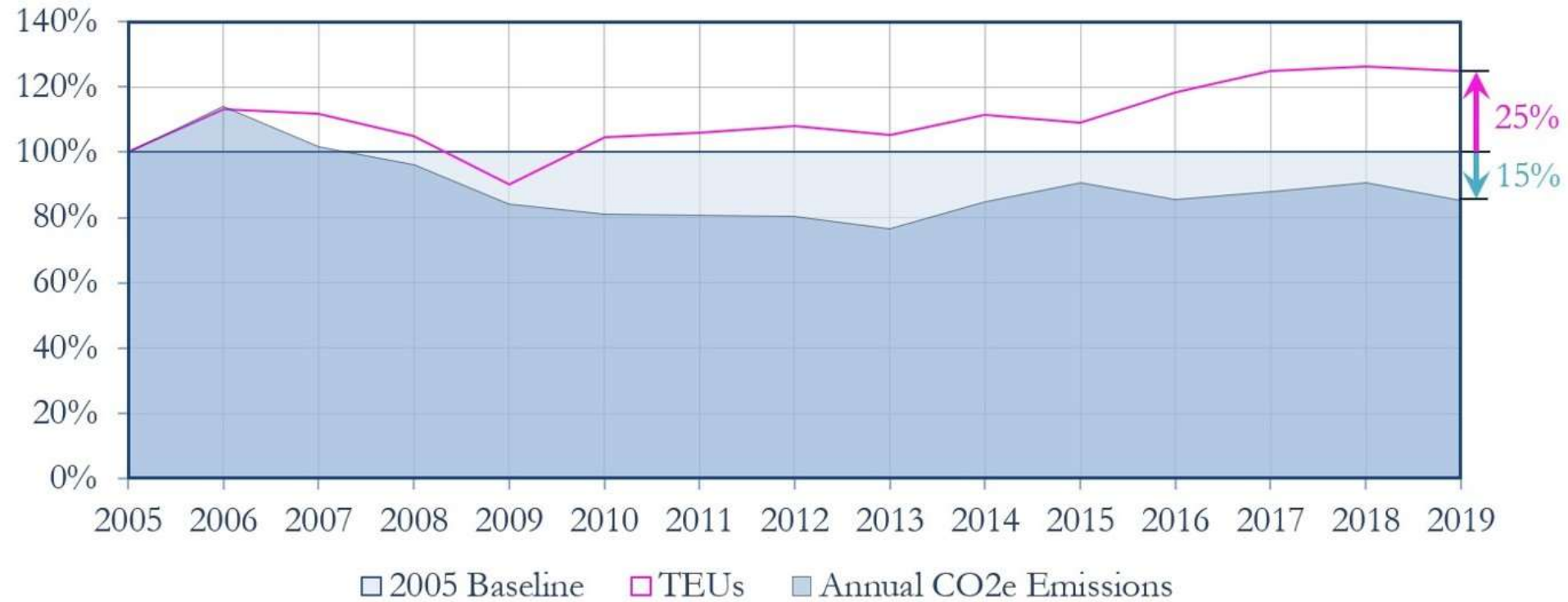


Source Category CO₂e Trends



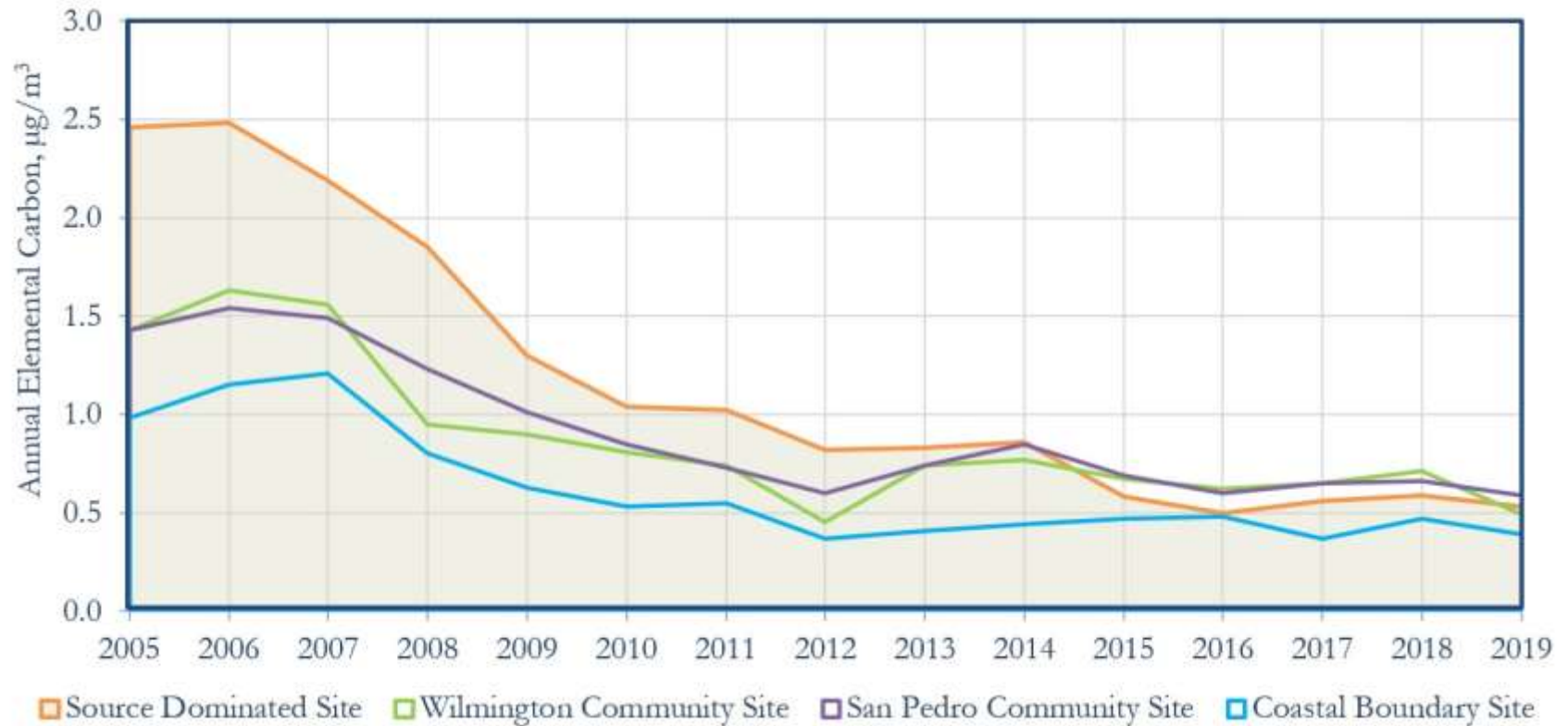


CAAP CO₂e Progress





POLA Air Monitoring Network





Looking Ahead

- Covid-19 Impacts
 - Ships appear to be the most affected emission source category
 - Types of ship activity: Calls to POLA, Calls to POLB, Calls to POLA+POLB, & ***Transient calls***
 - Container ships – cargo volumes down, blank sailings due to economic impact of pandemic
 - Cruise ships – high POLA and transient activity in April and then nearly no activity since
 - Bulk liquid ships – unprecedented low activity for POLA & unprecedented high activity for transient ships



Looking Ahead

- Governor's Executive Orders (EO) related to suspension of shore power
 - Due to extreme heat event, State of Emergencies were proclaimed
 - First EO: 'Ships berthed between 17-20 August at California ports shall not be required to use shore power until 24 August.'

Data for POLA

- Total AMP calls cancelled 4
- Calls that remained AMP'd 3

- Second EO: 'Ships berthed between 4-8 September at California ports shall not be required to use shore power until 11 September.'

Data for POLA

- Total AMP calls cancelled 7
- Calls that remained AMP'd 6

Available Online

<http://portofla.org/emissions-inventory>

PORT OF LOS ANGELES INVENTORY OF AIR EMISSIONS - 2019



Technical Report
APP# 191122-551 A
September 2020

Prepared by:
STARCREST CONSULTING GROUP, LLC

2019 AIR QUALITY REPORT CARD

SAN PEDRO BAY STANDARDS

As identified in the San Pedro Bay Ports Clean Air Action Plan (CAAP), San Pedro Bay Standards establish the long-term emissions-reduction and health risk-reduction goals for the ports of Los Angeles and Long Beach.

- Emission Reduction Standards for DPM, NO_x and SO_x have target years of 2014 and 2023 to support state ambient air quality goals.
- The Health Risk Reduction Standard has a target year of 2020 to align with California Air Resources Board's Goods Movement Emission Reduction Plan.

All reductions shown are compared to 2003 baseline levels.

CLEAN AIR ACTION PLAN GOALS

	2014	2023
DPM	72%	77%
PM ₁₀	32%	68%
SO _x	82%	88%
Health Risk		95%

OVERALL REDUCTIONS

Pollutant	%	tons
DPM	87%	767
PM ₁₀	86%	702
PM _{2.5}	87%	821
NO _x	82%	10,034
SO _x	88%	4,674

Health Risk
EPM used as a sample for health risk: 87%

EMISSIONS PER 18,000 TEU HANDLED REDUCTIONS

Pollutant	%	tons
DPM	89%	1.08
PM ₁₀	88%	0.97
PM _{2.5}	89%	1.13
NO _x	88%	15.04
SO _x	88%	6.54

OCEAN-GOING VESSEL EMISSIONS REDUCTIONS

Pollutant	%	tons
DPM	91%	425
PM ₁₀	88%	379
PM _{2.5}	89%	480
NO _x	48%	2,552
SO _x	88%	4,725

HEAVY-DUTY VEHICLE/CLEAN TRUCK EMISSIONS REDUCTIONS

Pollutant	%	tons
DPM	87%	239
PM ₁₀	86%	229
PM _{2.5}	86%	239
NO _x	78%	4,525
SO _x	82%	41

HARBOR CRAFT EMISSIONS REDUCTIONS

Pollutant	%	tons
DPM	54%	29
PM ₁₀	54%	27
PM _{2.5}	54%	29
NO _x	43%	963
SO _x	89%	0

RAIL EMISSIONS REDUCTIONS

Pollutant	%	tons
DPM	44%	25
PM ₁₀	45%	24
PM _{2.5}	44%	25
NO _x	48%	830
SO _x	89%	97

CARGO-HANDLING EQUIPMENT EMISSIONS REDUCTIONS

Pollutant	%	tons
DPM	91%	48
PM ₁₀	87%	44
PM _{2.5}	88%	47
NO _x	74%	1,183
SO _x	80%	7

CO₂ EQUIVALENT CHANGES BY SOURCE TYPE

Source Type	%	Changes
Ocean-Going Vessels	+33%	+96,004
Harbor Craft	+7%	+3,959
Cargo-Handling Equipment	+32%	+42,643
Rail	+15%	+10,837
Heavy-Duty Vehicles	+20%	+96,862
TOTAL	+15%	+157,102

PRIMARY POLLUTANTS DEFINED:
 DPM = Diesel Particulate Matter
 PM₁₀ = Diesel Particulate Matter
 PM_{2.5} = Diesel Particulate Matter
 NO_x = Nitrogen Oxides
 SO_x = Sulfur Oxides
 EPM = Emissions Per 18,000 TEU Handled
 EPM₁₀ = Emissions Per 18,000 TEU Handled
 EPM_{2.5} = Emissions Per 18,000 TEU Handled
 EPM_{CO2} = Emissions Per 18,000 TEU Handled

portofla.org/emissions-inventory