



# REDUCTION OF AIR EMISSIONS

## THROUGH PUBLIC-PRIVATE PARTNERSHIPS

Lisa Wunder, Marine Environmental Manager,  
Port of Los Angeles, USA



At the Port of Los Angeles (POLA), air pollution from port-related operations is at its lowest in more than 12 years, while container volumes are at an all-time high. Much of this progress is the direct result of public agencies and private industry working together to develop and deploy clean technology and practices for moving cargo more efficiently.

POLA strengthened these partnerships under the Clean Air Action Plan (CAAP), which was developed with the Port of Long Beach, as well as other programmes for reducing air pollutants from mobile sources. POLA's emissions inventories validate the dramatic results of all these efforts: a 57% reduction in oxides of nitrogen (NOx), an 87% reduction in diesel particulate matter (DPM), and a 98% reduction in oxides of sulfur (SOx) from ships, trucks, trains, harbour craft, and cargo handling equipment since the baseline year of 2005.

In November, the two ports finalized the 2017 CAAP Update, which incorporates new goals and strategies to reduce and, where possible, eliminate harmful air emissions from port-related sources. The programmes below are among the innovative ways POLA and its public and private partners are collaborating to build on clean air progress. While serving as models for the maritime industry and goods movement around the globe, these partnerships also are paving the way for next-generation business and environmental solutions.

### KEY PROGRAMMES

#### PASHA GREEN OMNI TERMINAL

Based on their shared desire to advance port terminal equipment technology in order to reduce air emissions, POLA and multiple private industry partners secured funding to launch the Green

Omni Terminal project at POLA's breakbulk terminal operated by Pasha Stevedoring and Terminals L.P. With a grant of more than US\$14 million from the California Air Resources Board (CARB), this project will test pre-commercial zero and near-zero emission technologies and serve as a template for the sustainable movement of goods throughout Southern California. The project will demonstrate a variety of green technologies and efficiency procedures, including zero emission heavy-duty vehicles, a solar-powered microgrid, and an at-berth vessel emission control system. The upgrades are expected to be completed by 2019.

#### EVERPORT ADVANCED YARD TRACTOR DEPLOYMENT PROJECT

Ensuring a safe, resilient, and reliable supply of energy while reducing energy costs and environmental impacts is another shared goal of POLA and its

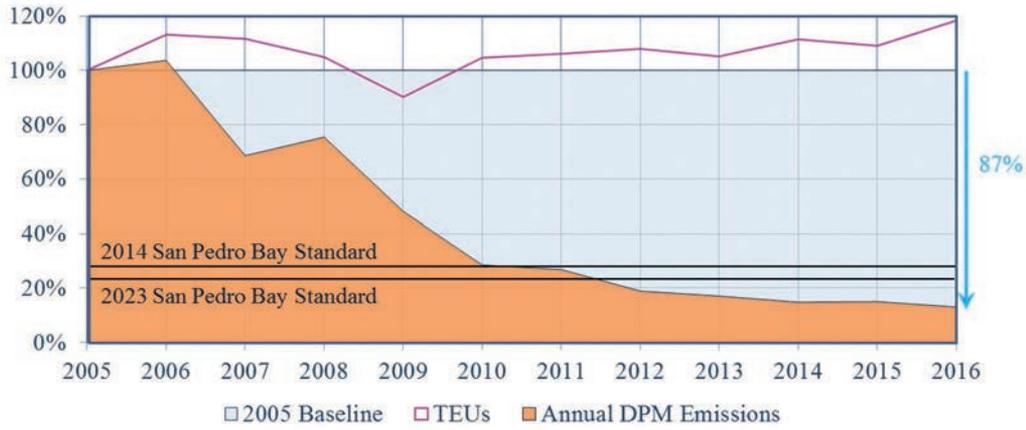


Figure: 2005 – 2016 DPM reductions



Figure: 2005 – 2016 NOx reductions

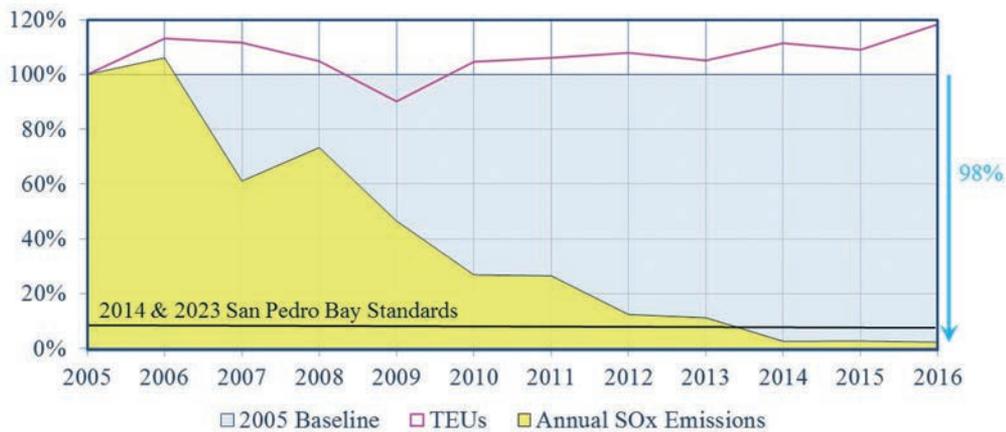


Figure: 2005 – 2016 SOx reductions

partners. With a \$5.8 million grant from the California Energy Commission (CEC), POLA will demonstrate five pre-commercial BYD battery-electric zero emission yard tractors and 20 pre-commercial capacity near-zero emission yard tractors equipped with the CARB-certified Cummins Westport low NOx engines (0.02 grams of NOx/brake horsepower-hour) at its Everport Container Terminal. To further reduce greenhouse gases (GHGs), the near-zero emission yard tractors will run

on renewable liquefied natural gas (RNG). Additionally, the CEC awarded POLA a \$4.5 million grant to demonstrate two battery-electric top handlers, three additional electric yard tractors, and charging infrastructure. The vehicles will be tested for a year with a final report due in 2020.

**POLA/GE INFORMATION PORTAL**

POLA and GE Transportation are partnering to pilot a first-of-its-kind port information portal to demonstrate the benefits of

digitizing maritime shipping data and making it available in real time to cargo owners, shipping lines and supply chain operators through secure, channeled access. The digital platform will provide stakeholders with greater line-of-sight and planning capabilities to more effectively service ultra-large container vessels. Cargo data used in the two-month pilot project will include filtered information from the US Customs and Border Protection’s Automated Commercial Environment

(ACE) system. The project is a critical first step toward next-level coordination within the industry. With an extended window of time for tracking inbound cargo, ports and terminal operators will be able to more effectively service vessels, optimize cargo movement, and improve the predictability and reliability of the supply chain.

**CLEAN TRUCK PROGRAM**

The Clean Truck Program (CTP) established a progressive ban on high polluting trucks, created a Concession Program for truck operators, and facilitated the replacement of old trucks with low-emission vehicles. This bold initiative – which banned all drayage trucks whose engines did not meet US Environmental Protection Agency 2007 on-road truck emissions standards – accelerated the replacement of high-polluting trucks at the port complex and advanced clean air progress faster than expected. Today, approximately 53 per cent of the trucks serving POLA have engines that meet the 2007 standard and 47 per cent meet the newest and cleanest 2010 standard. As a result, DPM emissions from trucks plummeted 97 per cent between 2005 and 2016. With the 2017 CAAP Update, trucks now entering service to the port complex must be model year 2014 or newer. In 2023, trucks entering port service must meet near-zero emission requirements. A differentiated rate structure to encourage the purchase of cleaner trucks is expected to begin in 2020. These strategies require close coordination between trucking companies, truck drivers, technology developers, and other stakeholders.

**TECHNOLOGY ADVANCEMENT PROGRAM**

Encouraging the development of cutting-edge technologies has been crucial to achieving POLA’s aggressive clean air goals, as well as those set by other government agencies. To expedite progress, some standards were intentionally set beyond what was feasibly achievable with the technology available at the time. POLA allocates up to \$1.5 million annually for the Technology Advancement Program (TAP), which provides funding, guidance, and staff support to test promising air technologies in a real-world port environment. Projects focus on all five major mobile sources of port-related air pollution, with the goal of getting successful technologies to market as quickly as possible. POLA works closely with technology developers, regulatory agencies, the Port of Long Beach, and our industry partners to take these technologies from testing to commercialization and – ultimately – widespread adoption.

**SHORE POWER**

In 2004, POLA was the world’s first port to install shore power at a container terminal. POLA now offers shore power at 25 berths, more than any other port in the world. Each ship call that connects to shore power reduces fuel consumption by about 6.5 metric tons, including electricity generation offset. Developing and operating a shore power system requires significant collaboration between shipping lines, terminal operators and ports. POLA also collaborated with ports around the world to develop the international standard for high-voltage shore power connection systems.

**VESSEL SPEED REDUCTION PROGRAM**

The Vessel Speed Reduction Program (VSRP) reduces NOx emissions from ships by slowing their speeds to 12 knots or less within 20 nautical miles (nm) of the port. The programme offers an added incentive for maintaining this speed within 40nm. VSRP was established as a voluntary program in 2001, and POLA began offering ship operators financial incentives in 2008. Since 2001, the voluntary compliance rate has steadily increased each year. In November 2017, compliance rates were 90% for ships within 20nm and 82% for ships within 40nm. In 2016, the programme resulted in a reduction of GHG emissions in the San Pedro Bay of more than 93,000 tons. Under the 2017 CAAP Update, VSRP continues with modifications to optimize incentives for emission reductions.

**INTERNATIONAL COLLABORATION**

POLA has been a leader in several international partnerships, including as a founding member of the International Association of Ports and Harbors’ (IAPH) World Port Climate Initiative (WPCI). As the central hubs for transportation and economics in the global supply chain, approximately 60 of the world’s major ports came together to reduce port-related emissions. POLA hosted the formation of the WPCI in 2008 and is the lead port for the IAPH Tool Box and Carbon Footprinting working groups. In March 2018, WPCI will become the World Ports Sustainability Program (WPSP).

In 2006, POLA co-founded the Pacific Ports Clean Air Collaborative (PPCAC), a group of ports, regulatory agencies, shipping lines, and other stakeholders along the Pacific Rim, which share information and collaborate on air quality initiatives. POLA co-hosted the most recent PPCAC conference in Shanghai in November 2015, and will host the next conference in Los Angeles in March 2018.

In 2013, POLA became the first port in North America to join the WPCI’s

Environmental Ship Index (ESI) programme. This programme rewards vessel operators for going beyond compliance to reduce DPM, NOx, and GHG emissions and encourages the use of cleaner technology and practices ahead of regulations. POLA’s programme offers financial incentives to operators who voluntarily bring their newest and cleanest vessels to Los Angeles and demonstrate new onboard vessel technologies. Of all ship calls to POLA in 2017, 56% were ESI participants and 42% earned incentives. Today, 54 ports and other incentive providers and 6,157 ships participate in this global programme.

**CONCLUSION**

Under the 2017 CAAP Update, POLA set new goals to advance clean air progress: up to 100% zero-emission cargo-handling equipment on terminals by 2030, up to 100% zero-emission drayage trucks entering the Port by 2035, and GHG reduction goals for 2030 and 2050. To meet these goals, public entities, regulatory agencies, and businesses must continue and intensify their collaboration.

**ABOUT THE AUTHOR**

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 Lisa Wunder is a Marine Environmental Manager in the Port of Los Angeles’ Environmental Management Division. Ms. Wunder oversees activities dealing with air quality and site remediation. Additionally, Ms. Wunder is the liaison for several international cooperative efforts including the Pacific Ports Clean Air Collaborative.

**ABOUT THE ORGANIZATION**

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 The Port of Los Angeles is America’s premier port and has a strong commitment to developing innovative strategic and sustainable operations that benefit Southern California’s economy and quality of life. As North America’s leading seaport in terms by container volume and cargo value, the Port of Los Angeles facilitated \$272 billion in trade during 2016.

**ENQUIRIES**

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 425 S. Palos Verdes Street  
 P.O. Box 151  
 San Pedro,  
 CA 90733-0151  
 Tel/TDD: (310) SEA-PORT  
 (310) 732-7678  
 Web: www.portoflosangeles.org