



A Greener Port, Today and Tomorrow

Port of Long Beach Green Port Progress Report

JULY 2025

20
YEARS
LEADING GREEN



Port of
LONG BEACH
THE GREEN PORT



What is the Green Port Policy?

The Green Port Policy is the Port of Long Beach's commitment to always take into account the impact to the environment when making any decision – purchasing, planning, construction, community engagement and more.

We adopted the Policy in 2005 amid waves of growth and community concerns about the impact on the environment and public health.

During the early 2000s, the Port of Long Beach, one of 18 commercial strategic seaports in the United States, was growing. A new mega-terminal was opening at Pier T, the former site of the Long Beach Naval Station, while construction crews were completing the Alameda Corridor – a 20-mile rail link connecting the ports of Long Beach and Los Angeles to rail yards near downtown Los Angeles.

This rapid growth, however, came with consequences. With the increase in cargo operations came an increase in truck, vessel and train traffic, and the accompanying air pollution emissions from those diesel-powered sources. Residents, port workers and others raised issues about the air pollution resulting from the increase in cargo volume.

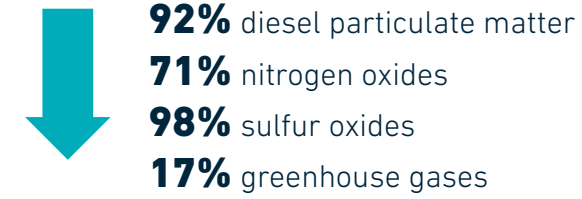
As the ports of Long Beach and Los Angeles looked to make further improvements to ensure they remained competitive regional economic engines in the new century, two marine terminal projects, one at the Port of Long Beach's Pier J and another in the Port of Los Angeles, were challenged over concerns of air quality impacts expected to be caused by the new developments.





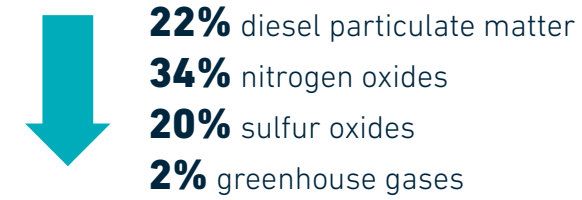
A Harbor Transformed

Reductions in emissions, 2005-2023



Cargo up 20% ↑

Reductions in emissions, 2017-2023



Cargo up 6% ↑

Reducing Emissions

Proactive and trailblazing adoption of cleaner technologies by the Port has outpaced the wider greening of U.S. society. Today, the Port's emission contributions to the South Coast Air Basin are a small part of the total.

The annual emissions inventory has found that since the Green Port Policy was adopted, emissions of diesel particulate matter, nitrogen oxides and sulfur oxides have seen dramatic reductions, all while cargo has increased. In particular, abating nitrogen oxides is a key focus of the South Coast Air Quality Management District, which regulates air pollution in Southern California. The Port exceeded its own 2023 goal of cutting nitrogen oxides by 59% several years ahead of schedule.

A new annual emissions report comes out each fall. Numbers change based on cargo volume and other factors.

The Green Port Policy is Born

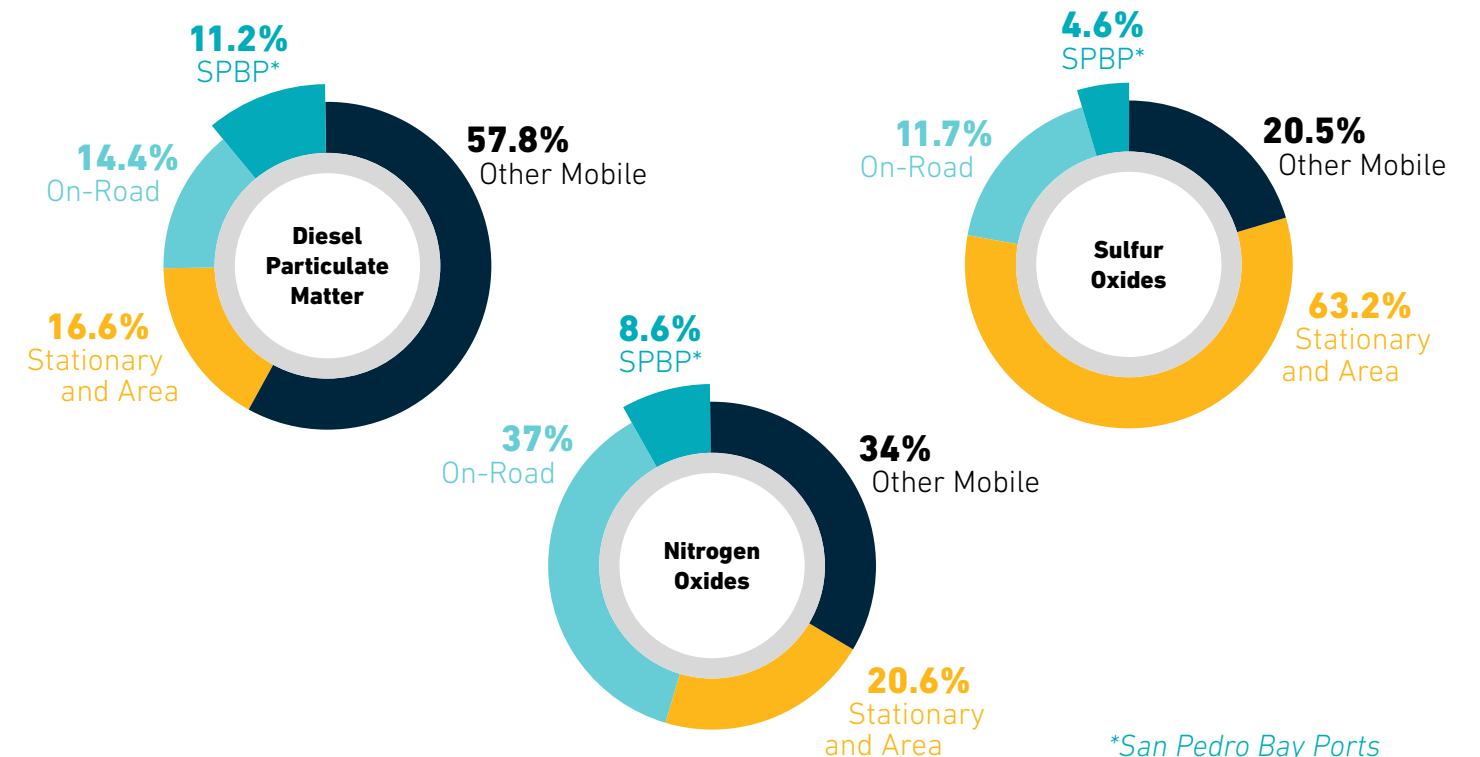
The Long Beach Board of Harbor Commissioners responded in 2005 to growing concerns over environmental impacts by adopting the **Green Port Policy**, a promise to Long Beach and beyond for a cleaner harbor, soil and skies with five guiding principles:

- Protect the community from harmful environmental impacts of Port operations
- Distinguish the Port as a leader in environmental stewardship and compliance
- Promote sustainability
- Employ best available technology to avoid or reduce environmental impacts
- Engage and educate the community

The commitment led to a partnership with the neighboring Port of Los Angeles to create the joint **San Pedro Bay Ports Clean Air Action Plan (CAAP)** in 2006 and **Water Resources Action Plan (WRAP)** in 2009, which set the twin ports – the nation's busiest – on a path to transform the shipping industry in North America.

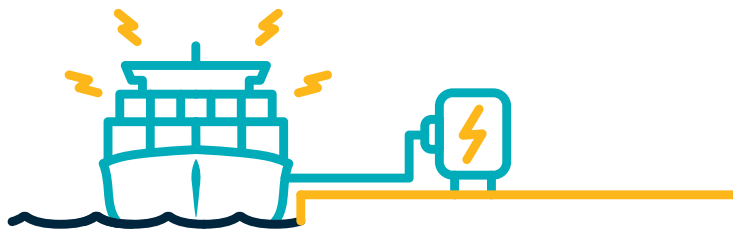
Myriad achievements in air quality, water and habitat restoration, green construction, clean energy and technology development have followed. Seaports all over the world have emulated the environmental programs that began in Long Beach.

2023 SOUTH COAST AIR BASIN EMISSIONS AND SOURCES



How did the Port improve air quality?

The Clean Air Action Plan adopted by the Long Beach and Los Angeles ports in 2006 created a strategy for reducing air pollution emissions from every port-related source – trucks, forklifts, trains, ships, tugboats and more. Programs spurred by the CAAP resulted in dramatic improvements.



Shore Power

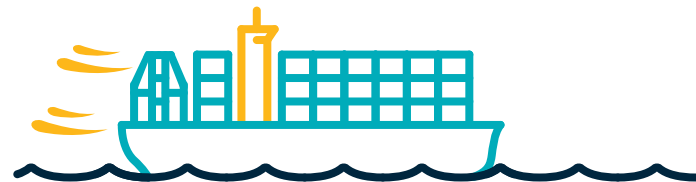
Vessels at berth plug into shore power to run vital systems instead of using diesel auxiliary engines.

- **\$180 million** invested by POLB to outfit all six container terminals
- **95% reduction** in emissions from ships at berth



Green Leases

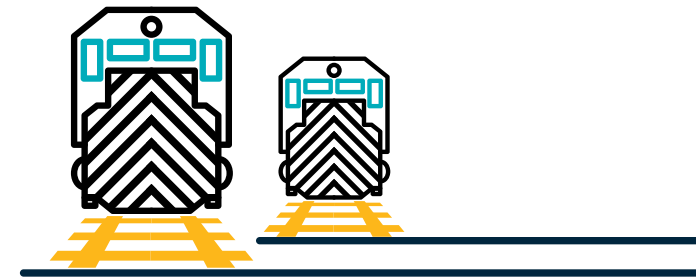
Since 2006, the Port has included environmental covenants in leases with tenants requiring the adoption of certain sustainable practices. Currently the Port has 24 active “green leases,” and another four such agreements are being considered by the Harbor Commission.



Vessel Speed Reduction Program

Cargo vessels slow down near the harbor, which burns less fuel and produces less air pollution. The Port provides financial incentives for carriers that voluntarily participate.

- **93% participation**



Cleaner Locomotives

The Port requires its shortline railroad operator to invest in new, lower-emitting locomotives, resulting in the nation’s cleanest railroad line.

Efficiency gained, emissions drop

Projects like the Supply Chain Information Highway provide data to plan work before containers arrive. The Pier B On-Dock Rail Support Facility pushes cargo to trains, taking trucks off the road. Making operations more efficient cuts pollution – since 2005, emissions per 10,000 containers handled have been reduced by as much as 98%.



Clean Trucks

The original **Clean Truck Program** was launched in 2008 and spurred replacement of about 15,000 trucks to the cleanest available diesel models, two years ahead of schedule.

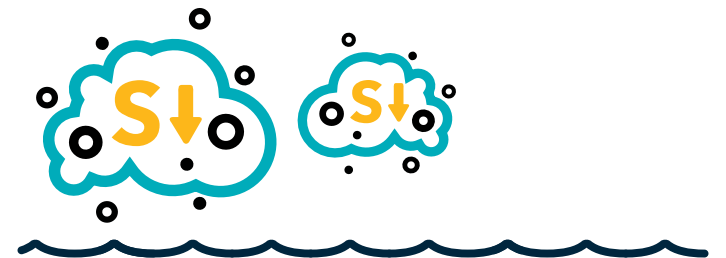
- Cost of changeover: **\$1.5 billion**, mostly by industry investment
- Reduced diesel pollution from harbor trucks by **90%**



Technology Advancement Program

The Technology Advancement Program (TAP) has a multimillion-dollar annual budget to nurture the development of clean air technology. TAP projects include zero-emissions trucks, harbor craft, locomotives and more.

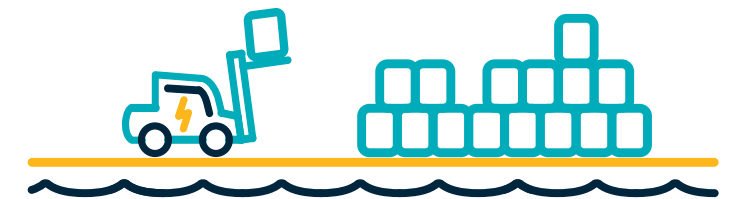
- **\$430 million** invested to date by San Pedro Bay ports and partners
- **40 projects** created to test or deploy new clean technology



Low-Sulfur Fuels Incentives

In advance of a state regulation requiring vessels to use low-sulfur fuels, the Port provided financial incentives to encourage early adoption. The program resulted in emissions reductions ahead of schedule.

- **\$9.9 million** in incentives offered to vessel operators by the Port of Long Beach, 2008-2009



Green Cargo-Handling Equipment

Over the last two decades the Port and its tenants have deployed the cleanest available cargo-handling equipment (CHE), demonstrating a variety of promising alternative fuel and zero-emissions equipment. Long Beach has 19% ZE CHE, the most for a major U.S. port.



Beneath the Surface

Before the Green Port Policy, pollutants from ship discharges, stormwater and industrial waste led to low dissolved oxygen content in the harbor, creating dead zones hostile to marine life.

Today, marine life is thriving at levels never seen in **multiple biological surveys over two decades**, with a 60% increase in biodiversity since 2000.

The latest survey – conducted in 2018 at a cost of \$1.5 million split by the two ports – identified the highest recorded biodiversity of the four previous complex-wide studies. In total, more than 1,000 species of plants or animals were observed, including 104 species of fish, 87 species of birds and five species of marine mammals. Kelp coverage was more than twice the amount observed in any previous study, with little decrease between spring and summer.

To accomplish this, the Port undertook a collaborative, scientific effort to address existing and potential sources and water and sediment pollution, establishing programs and guidance designed to reduce the introduction of new pollutants entering the harbor, and improve our management of the harbor waters and sediments.

The effort has led to partnerships between regulatory agencies and the Port, combining discharge regulations and Port inspection programs looking for illicit discharges and driving pollution reductions. Additionally, Port dredge and fill programs also support regional sediment disposal needs, including sequestering more than 1 million cubic yards of impacted sediment from third parties as part of the Middle Harbor terminal project, removing impacted material from Southern California.

To continue to drive down threats to the health of the marine environment, the Port is continuing to refine stormwater treatment best management practices and has developed a **Stormwater Design Guidance Manual** to inform future projects.

The Port has also enacted a **Climate Adaptation and Coastal Resiliency Plan (CRP)** to help manage the direct and indirect risks associated with climate change and coastal hazards. The CRP provides a framework for the Port to incorporate adaptive measures related to projected climate change into its policymaking and planning processes, construction practices, infrastructure design, and environmental documents. This first-of-its-kind plan also signifies the Port's compliance with California Assembly Bill 691 and has been approved by the State Lands Commission.

A new biological survey of the San Pedro Bay ports complex will be completed in 2025. The Port is also conducting a voluntary sediment remediation project in the Port's Channel 2 in 2025.

1,000 species of plants or animals

104
species of fish



87
species of birds

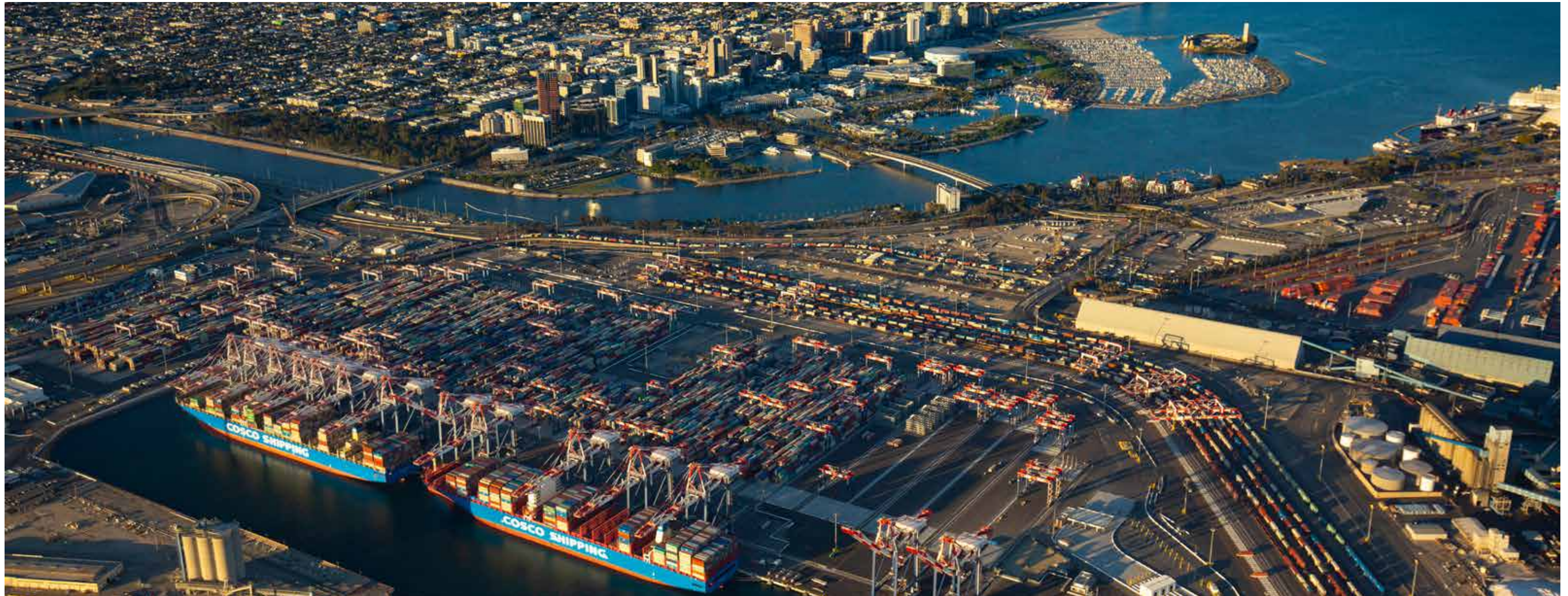


5
species of
marine mammals



118
acres of kelp beds





Operating Green

In addition to championing the transition of cargo operations to zero-emissions and other major sustainability initiatives at the harbor and throughout the region, the Port of Long Beach adheres to Green Port Policy values in its own operations and purchasing decisions.

Green Fleet Program: All vehicles purchased to be part of the Port's own fleet of utility and other vehicles must be the cleanest models available. The Port is creating its own green fleet, which even

includes an electric street sweeper to clean the Port's bike paths.

Green Construction: The Port facilitates the recycling and reuse of construction materials in its own construction and accepts the harbor dredge from other sites for landfill projects that can safely contain the sediments. Long Beach Container Terminal was created by reusing 1.5 million cubic yards of sediment from a West Basin deepening project as well as dredging at Marina del Rey and

Newport Harbor. A new project at a Port of Long Beach container terminal will use more than 1 million cubic yards of impacted sediment from a Newport Harbor dredging project, to help build 565 feet of new wharf.

Green Buildings: All major structures built in the Port must be **Leadership in Energy and Environmental Design (LEED) Gold level**, including the Port Administration Building at the Long Beach Civic Center.

Completed in 2019, the Port Administration Building includes photovoltaic panels that offset 25% of electricity consumption, an exterior that maximizes natural light exposure during the day, an underfloor air distribution system to reduce energy used for heating and cooling, and cisterns to manage stormwater runoff and irrigate the site.



A Collaborative Environmental Steward

In the decades since adopting the Green Port Policy, the Port of Long Beach is distinguished not only as a leader in environmental stewardship, but also as a socially responsible member of its community that considers the impacts of operations on its neighbors. The Port has numerous programs to give back to the communities it serves and engage residents.

Community Grants Program: A **\$65 million** program to enlist community members near the Port to seek funding for projects to improve the environment. To date, \$54.7 million has been committed. The program provides air filters for schools, bike lanes, park areas, stormwater control and more. The program has a **Community Grants Advisory Committee** made up of Long Beach residents who inform funding levels and direction of the program.

	Awarded 2009 to Date	FY 2025 Estimated Actuals	FY 2026 Budget
Community Health	\$16,509,096	\$54,100	\$1,300,000
Facilities Improvement	\$18,681,785	\$2,491,984	\$33,446
Community Infrastructure	\$19,525,717	\$2,785,000	\$1,865,123
TOTAL	\$54,716,598	\$5,331,084	\$3,198,569

The 2025 solicitation will be for Facility Improvements, with \$2.5 million available. Project types funded will include those that improve the spaces and resources of qualifying facilities serving vulnerable groups such as youth, older adults and individuals living with chronic illnesses.

Please **visit www.polb.com/grantopportunities** for updates on future grant opportunities.

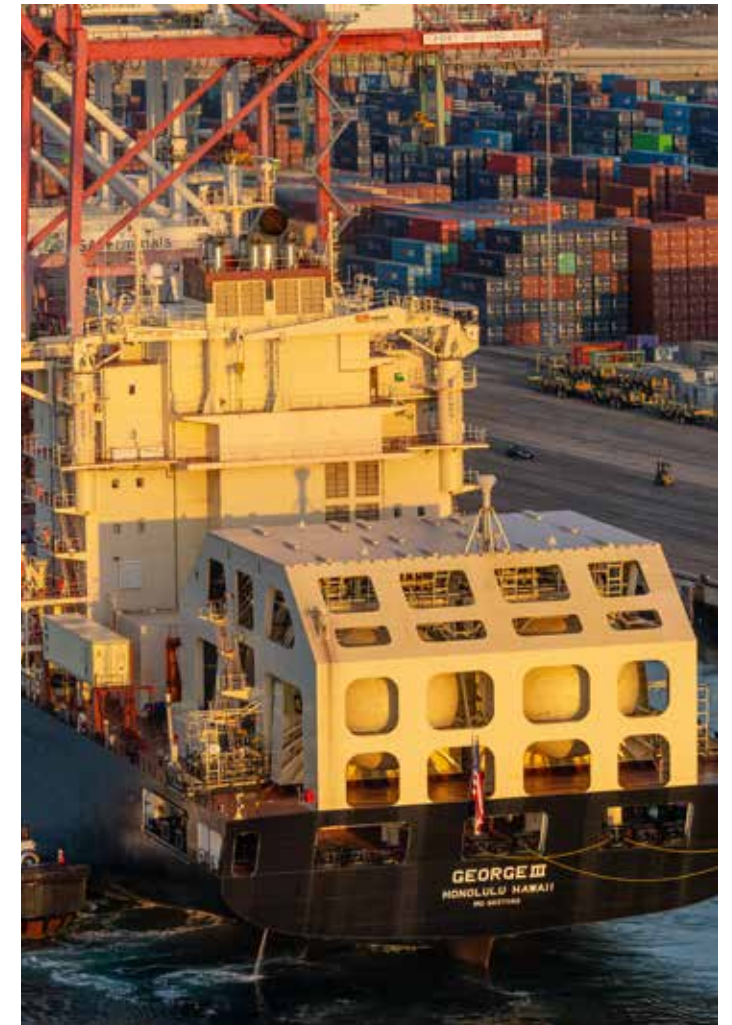
Engagement and Outreach: Comprehensive community and stakeholder engagement ongoing since adoption of the Green Port Policy has allowed the Port to connect with the public through participation in community events, **Clean Air**

Action Plan Stakeholder Meetings, the “Let’s Talk Port” events, Green Port Fests, Green Port Fairs, public harbor tours and more.

The **Zero Emissions, Energy Resilient Operations Policy (ZEERO)** created a roundtable and community collaborative group to provide feedback on Port air quality and energy programs.

Wetlands Restoration: Port-funded work at the Colorado Lagoon in Long Beach and the Bolsa Chica Wetlands in Huntington Beach brings new life to area wetlands that serve as critical marine habitat.

- Colorado Lagoon: **\$32 million**
- Bolsa Chica: **\$50 million**



Push to Zero

In 2017, the San Pedro Bay ports jointly updated the CAAP. The update contained ambitious goals of zero-emissions (ZE) cargo-handling equipment (CHE) by 2030 and zero-emissions drayage truck fleet by 2035.

The benefits to community health and the advancement of sustainable technologies created by the CAAP would be considerable. The cost of reaching zero emissions is estimated to be **\$12.6 billion to \$14 billion**.

Green Shipping Corridors

Green Shipping Corridors aim to support the transition to low- and zero-emissions vessel fuels to decarbonize the maritime supply chain and have enlisted international collaboration with the participation of port authorities, ocean carriers, governments, fuel suppliers and climate advocates. Agreements have been reached between the San Pedro Bay ports, and Shanghai and Singapore, bringing this exciting project to two of the most important routes in trans-Pacific trade. The ports will work to develop metrics for the corridors, based on existing International Maritime Organization (IMO) standards.

Shore Power for Non-Container Ships

In an expansion of the program for container and cruise ships, the state requires the control of emissions from docked vessels including tankers, auto carriers, and roll-on roll-off vessels, thus reducing additional emissions while at berth.

Green Ship Incentive Program

The Green Ship Incentive Program rewards vessel operators for deploying today's newest, greenest ships to the Port of Long Beach. It provides the greatest monetary incentive for Tier III ships of any seaport, potentially **up to \$9,000** per visit.

2024

Total vessel calls:

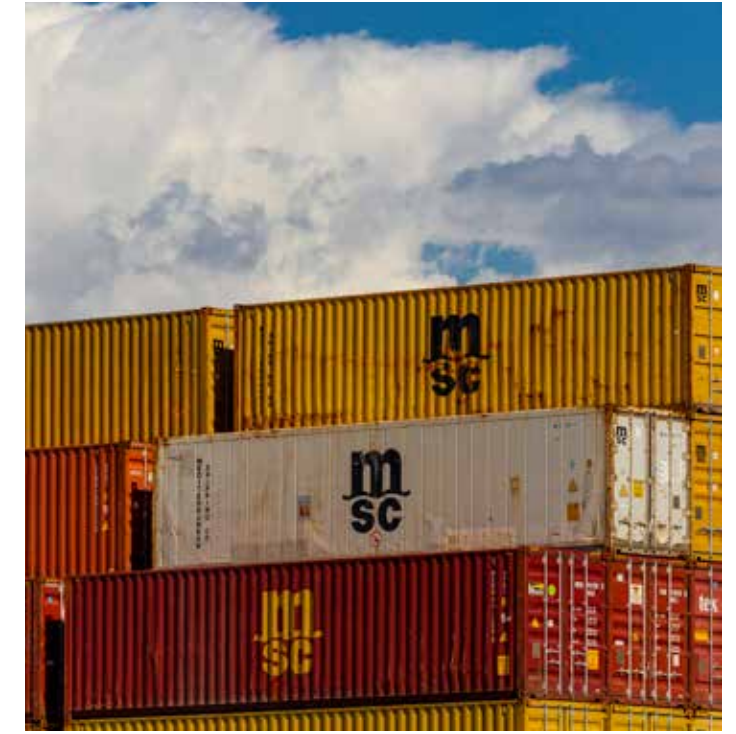
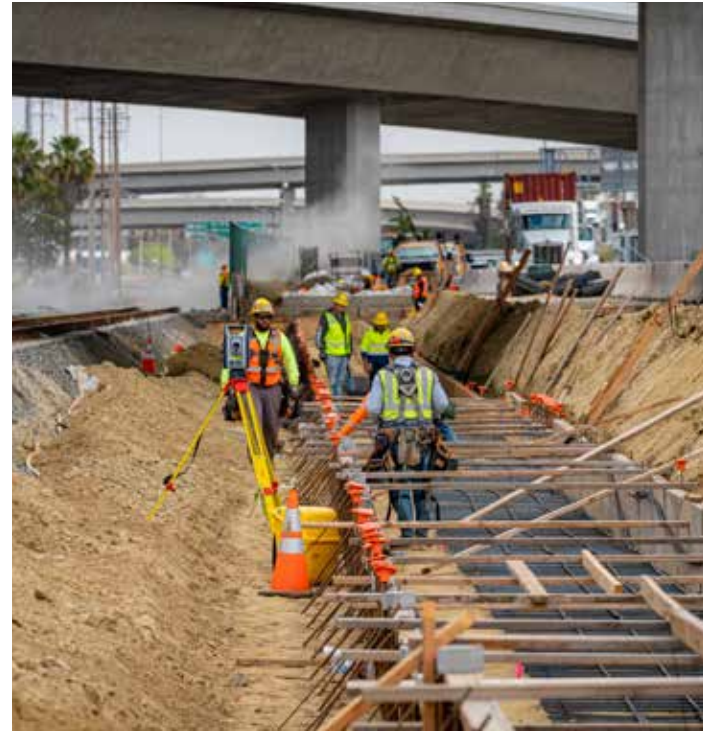
1,889

Vessel calls earning incentive:

662 (35%)

Total incentives paid:

\$2,060,400



Sustainable Terminals Accelerating Regional Transformation (START)

A plan to decarbonize the supply chain by addressing ships, tugs, cargo-handling equipment and trucks.

Port of Long Beach:
\$3.5 million

California Air Resources Board:
\$50 million

Ports of Stockton and Oakland:
\$3.25 million

South Coast Air Quality Management District
\$500,000

OEMs and Demonstration Partners:
\$43.24 million

Project Partners: SSA Terminals, Shippers Transport Express, Matson Navigation Lines

System-Wide Investment in Freight Transport (SWIFT)

Comprising three major projects funded with Port and Freight Infrastructure Program (PFIP) grants from the California State Transportation Agency (CalSTA), the program addresses rail efficiency with new rail infrastructure, terminal efficiency with new cranes, top-handlers and other cargo-handling equipment, and vessel continuity with zero-emissions harbor craft.

CalSTA funds, Pier B On-Dock Rail Support Facility:
\$158.4 million

POLB matching funds for the Pier B On-Dock Rail Support Facility:
\$39 million

CalSTA funds for environmental projects
\$224.9 million

Operator matching funds:
\$100.3 million

Hydrogen Fuel Cell Equipment

The Port is at the forefront of **California's Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES)** and has received a grant to pursue the development of hydrogen fuel cell-powered cargo handling equipment, as a promising technology to help the Port meet its zero-emissions goals.

ARCHES:
\$50 million

Port of Long Beach (matching):
\$50 million

ZEERO

The **Zero Emissions, Energy Resilient Operations Policy (ZEERO)** is the Port of Long Beach's signature commitment to decarbonization. The Policy is based on the Port's long-standing focus on the environment, building upon the Green Port Policy to expand the the Port's reach and ambitions to address climate impacts throughout the supply chain.

The Elements of ZEERO:

- Zero-Emissions Infrastructure and Power Systems Capital Improvement Program
- Energy assets to ensure continuity and resiliency of critical port operations
- Accelerated deployment of lowest-carbon alternatives for oceangoing vessels
- Support for state and federal efforts to develop and supply renewable energy
- Carbon-neutral Harbor Department administrative operations by 2040
- Equitable economic opportunities and public health benefits

Building Zero-Emissions Infrastructure

The Port of Long Beach, known for its commitment to infrastructure modernization to improve operational efficiency, includes projects that support ZE cargo operations in its capital improvement plans. Zero-emissions infrastructure projects range from specific electrification plans for individual terminals to studying the potential for charging stations for zero-emissions locomotives that operate throughout the ports complex.

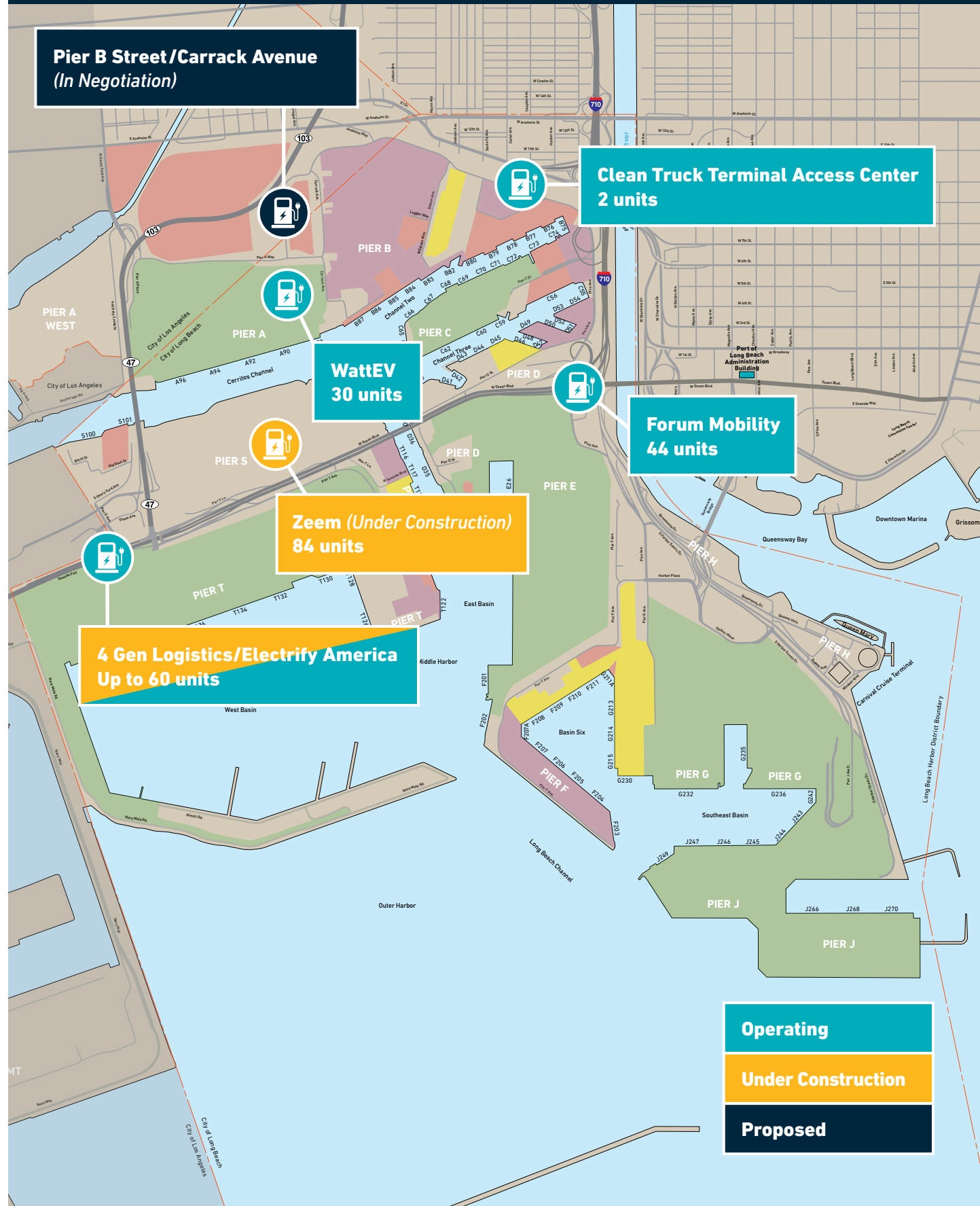
In Fiscal Year 2025, the Port of Long Beach has budgeted **\$43.6 million** – or nearly 12% of the capital improvement plan – for zero-emissions infrastructure. For the next 10 years, the Port

plans **\$222 million** in ZE infrastructure projects. These figures do not include the contributions that individual terminal operators and other stakeholders are also making to support the Port's zero-emissions transformation. All six container terminals have projects to support ZE cargo-handling equipment. The Port's zero-emissions infrastructure plan also includes but is not limited to hydrogen fueling facilities for fuel cell-powered cargo-handling equipment; shore power for non-container terminals; and the transition of the Port's harbor craft fleet to zero emissions.



PROJECT	DESCRIPTION	STATUS
CONTAINER TERMINALS		
Electrification	Terminal operators planning and building infrastructure to support ZE CHE.	Container terminals are moving their projects through planning and CEQA into the design and construction stages.
SHORE POWER		
Adding to bulk terminals	Adding outlets for liquid bulk and auto carrier vessels to plug into clean electricity at berth.	Terminal operators building new equipment to allow noncontainer ships to switch off engines and control their at-berth emissions.
HYDROGEN		
Fueling infrastructure for hydrogen fuel cell CHE	Port has released a call for projects for hydrogen-fueled for cargo handling equipment	Port's environmental planners now reviewing proposals.
DRAYAGE TRUCKS		
Charging, Refueling for ZE trucks	POLB and charging companies adding public charging stations for battery-electric trucks; eyeing future hydrogen fuel cell refueling.	POLB reached 2028 goal of 100 public chargers in Harbor District three years early and more are on the way. Hydrogen refueling being studied.
POLB FLEET		
POLB building charging network for its own fleet of EVs	Installing at Maintenance Facility, Field Offices and Joint Command and Control (Security) Center.	Several in operation and more on the way.
HARBOR CRAFT		
Harbor Craft Next Generation Technologies Study (SPB)	Joint study between POLA and POLB will be undertaken to evaluate emerging tugboat technologies and infrastructure needs.	Planning stages.
ZE Infrastructure and Vessel Feasibility Study (POLB)	Comprehensive feasibility study and vessel analysis that includes a detailed assessment of the current and projected Port-owned harbor craft fleet (dive boats, surveys).	Consultant selection.
LOCOMOTIVES		
ZE Locomotive Assessment	Study performed every 5 years to evaluate opportunities for ZE charging/ fueling infrastructure at Pier B rail yard.	First study completed and posted on website at www.polb.com/zeroemissions .
GENERAL PORT INFRASTRUCTURE		
Electric Dredge Connection	Enhance capacity for electric-powered dredging in POLB.	Performing survey and geotechnical investigations to support the civil design.
Microgrid at JCCC	Advanced solar array, storage and controls in place to provide emergency power to Joint Command and Control (Security) Center, without gas or diesel generators.	Completed and operational.

CHARGING DEPOTS FOR ZE ELECTRIC DRAYAGE TRUCKS AT POLB



A Commitment to Clean Trucks

The Clean Truck Program launched in 2008 has led to dramatic reductions of emissions from the tens of thousands of trucks in the San Pedro Bay ports complex drayage fleet. Rather than rest on those accomplishments, the ports of Long Beach and Los Angeles have launched an ambitious effort to transition the fleet to zero-emissions. The zero-emissions contingent of trucks working San Pedro Bay is growing; from just 28 in December 2021 to more than 500 today. They are mostly battery-electric and include a growing number of hydrogen fuel cell-powered trucks.

In April 2022, the San Pedro Bay ports started the **Clean Truck Fund Rate (CTFR)**, a \$10 per loaded TEU charge to the cargo owner for every loaded container entering or leaving a San Pedro Bay terminal by truck. The first two years of the program within the Port of Long Beach generated **\$116 million** to help fund the transition to a ZE fleet.

Revenue collected by the CTFR helps support the purchase of ZE trucks by trucking companies and drivers. In collaboration with California's Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP), purchasers of ZE trucks can get significant assistance. For example, small trucking fleets (20 trucks or fewer) can receive up to \$436,000 for a battery-electric truck, and up to \$676,000 for a hydrogen fuel cell truck in incentives.

The Port's CTFR also supports development of charging stations for heavy-duty battery-electric trucks. By January 2025, the Port of Long Beach had surpassed a goal originally set for 2028 of opening more than 100 chargers within the Harbor District, and more are on the way.



The Challenges

Technology Readiness

Shifting cargo operations to zero emissions is an enormous technological and operational challenge. It cannot be overstated. This is probably the biggest technological shift this industry has faced since the invention of the combustion engine.

While we are working to advance the technology, we do not have control of how fast the advancements in zero emissions are made. In addition, much of the existing technology is currently being manufactured in foreign countries or cannot meet the demands of the Port's cargo volumes or duty cycles.

Regulatory Pressures

Sometimes regulations that aim to reduce environmental impacts revolve around yet-to-be-developed technologies and/or lack a balanced approach that should take cost, competitiveness, and workforce into consideration.

Need for Funding

Billions of dollars will be needed to completely transition Port operations to zero emissions. The Port will need to access support from other financial sources to achieve this goal.

Energy Supply

We know that from 2019 to 2030, the Port's energy demand is forecast to increase six-fold due to the electrification of the terminals. Demand is also going up in other sectors, so the availability of energy is a challenge. The Port is working on a variety of energy initiatives.

Clean Maritime Fuels: Clean maritime fuels are not readily available, a Port whitepaper has found. The Port is developing a feasibility assessment to plan for future fuels such as green hydrogen, green methanol, green ammonia, renewable natural gas and biofuels.

Microgrid: The Port's microgrid system includes a solar panel array and mobile energy storage and control technology. It can provide emergency backup power for the Port's Security Center and port pilots station.

\$25 million budget

Shared by:
\$5 million California Energy Commission
\$20 million Port of Long Beach

Pier Wind: Currently under design, it would be the nation's largest facility specifically designed to assemble offshore wind turbines, in support of renewable energy growth. Fully assembled floating wind turbines each capable of generating 20 megawatts of energy would be towed by sea from the Port to offshore wind farms in Central and Northern California. The cost is \$4.6 billion.

Availability of Hydrogen Fuel

Through ARCHES, California has just begun to plan a system to produce, store and distribute renewable hydrogen, on a scale to make it cost effective.

Upgrading Port Equipment

13,531 active trucks in SPB

Cost



548 low NOx





479 battery electric





82 hydrogen fuel cell

1,551 pieces of CHE at POLB

19% powered by electricity 

6% powered by propane 

11% powered by gasoline 

64% powered by diesel 



Used Diesel Drayage Truck:
\$55,000

New Diesel Drayage Truck:
\$125,000

Zero-Emissions Truck:
\$500,000 to \$700,000

Zero-Emissions Cargo-Handling Equipment

Top handler:
\$2 million to \$3 million



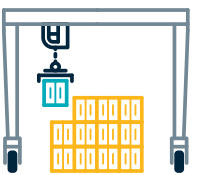
Yard tractor:
\$500,000 to \$600,000

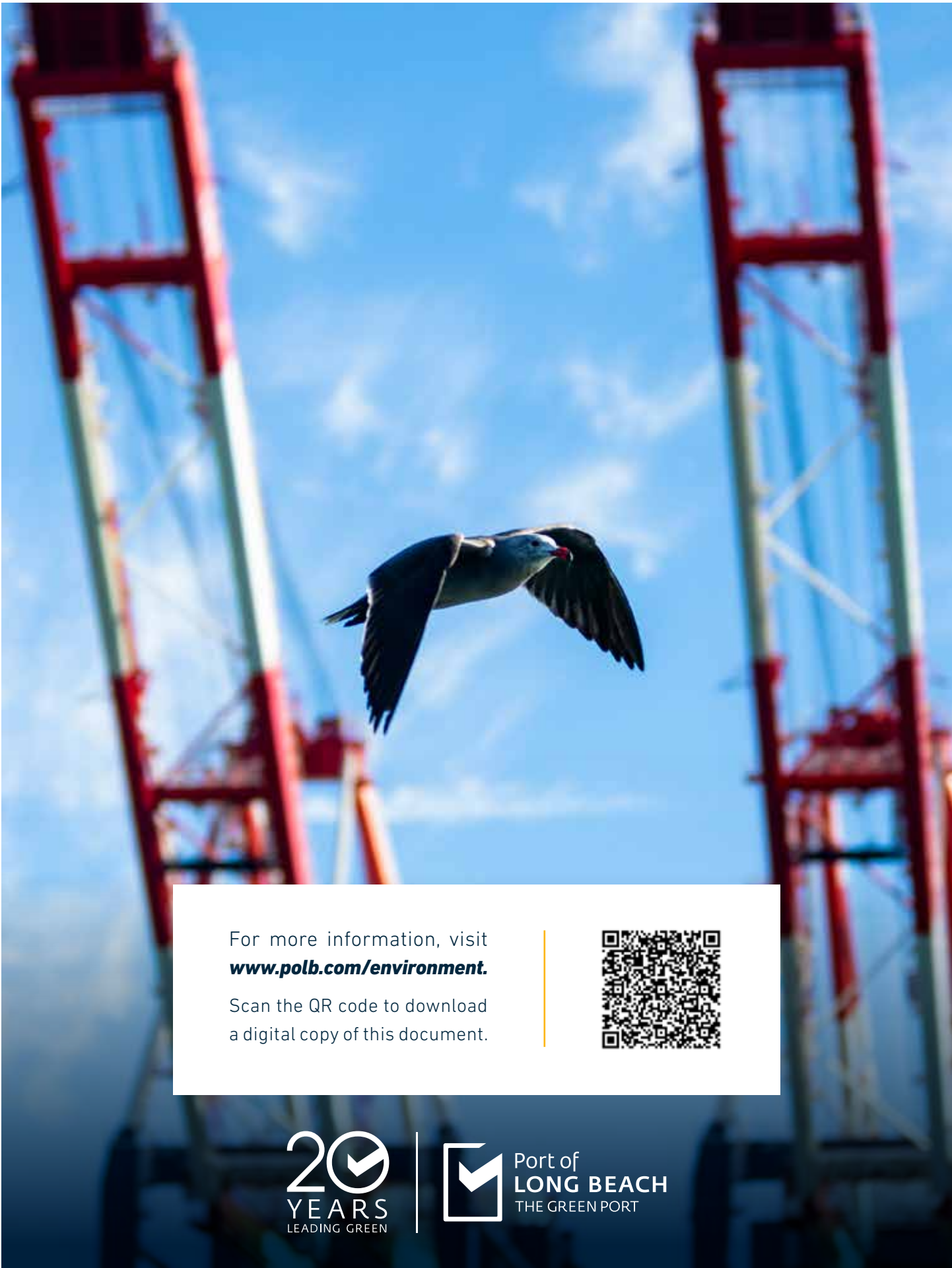


Forklift:
\$700,000 to \$1 million



Rubber-tired gantry crane:
\$2 million





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