

The background of the slide is a wide-angle photograph of a busy port terminal. In the foreground and middle ground, there are numerous stacks of colorful shipping containers in shades of blue, red, yellow, and green. Several large blue gantry cranes are visible, used for loading and unloading containers from ships. In the background, a large bridge spans across the water, and the city skyline is visible under a clear sky.

SAN PEDRO BAY PORTS CLEAN AIR ACTION PLAN

NEXT STEPS ON
CLEAN TRUCKS PROGRAM
2018 2nd Quarterly Update

Teresa Pisano
Environmental Specialist
Port of Los Angeles



2017 CAAP CTP Milestones

- 2018 – Pre-2014 Trucks can no longer register in PDTR
- 2018-2019 – Clean Truck Rate Study completed
- 2018-2019 – Near Zero/Zero (NZE/ZE) emission equipment Feasibility Study completed
 - Study to be updated every 2 to 3 years
- 2019 – CARB promulgates NZE Manufacturing Standard
- 2019 – Annual Registration Fee Exemption for NZE/ZE Trucks
- 2020 – Clean Truck Rate goes into effect on non-NZE/ZE Trucks



CTP Milestones (Cont'd)

- 2023
 - Only NZE/ZE trucks can register in PDTR
 - Pre-2010 drayage trucks banned by State Truck and Bus Rule
- 2023-2035
 - Clean Truck Rate adjusts based on feasibility study and fleet composition to encourage transition to ZE by 2035
 - Informed by NZE/ZE equipment Feasibility Study updates
- 2035
 - Only ZE trucks can register in PDTR



CTP Implementation

- 2018 Tariff Modification Activities
 - Only allow 2014 or newer trucks to register in the PDTR
 - Existing pre-2014 trucks grandfathered
 - Tariff Change Board Approval Scheduled for June/July for both Ports
 - Scheduled to be effective on October 1, 2018
 - PDTR registration fee exemption for NZE/ZE trucks on hold, pending regulatory definition from the Air Resources Board



CTP Implementation

- Clean Truck Rate Study Goals
 - _ Assist transition to near zero and eventually zero emission equipment
 - _ Avoid cargo diversion
 - _ Maintain adequate supply of drayage trucks for Port service
- Status
 - _ Draft scope of work has been developed
 - _ Study expected to begin in late Summer 2018
 - _ Estimated completion 2nd Quarter 2019



CTP Implementation

- Near-Zero Emission (NZE) Truck Early Deployment Program
 - Joint incentive program with AQMD under development
 - Up to 140 NZE Trucks
 - Up to \$4M (\$2M each port) pending approval from Boards of Harbor Commissioners
 - AQMD has agreed to request \$2M from its Board
 - California Energy Commission has preliminarily agreed to provide \$8M
 - Goal to have NZE trucks on the road by the end of 2018



CTP Implementation

- Zero Emission (ZE) Truck early adopter activities
 - 50 to 100 ZE Truck Demonstration
 - Scope of Work under development
 - Trucking Fleet Survey
 - Informational Workshop to be scheduled Summer of 2018
 - RFI to Truck Manufacturers (OEMs)



SAN PEDRO BAY PORTS CLEAN AIR ACTION PLAN

UPDATE ON TECHNOLOGY
FEASIBILITY ASSESSMENTS
JUNE 26, 2018

Feasibility Assessments

- Cargo-Handling Equipment (CHE)
- Drayage Trucks



CHE Study



- OEM Survey
- Marine Terminal Operators (MTO) Survey

Truck Study



- Drayage Truck OEM Survey

Next steps



- Draft Feasibility Reports and public comment period expected in Q3.
- Final Feasibility Reports expected January 2019.

An aerial photograph of a coastal city, likely Seattle, showing a large harbor with a marina filled with boats, industrial areas, and residential neighborhoods. The city extends to the mountains in the background under a blue sky with light clouds.

Send comments to:

caap@cleanairactionplan.org



SAN PEDRO BAY PORTS CLEAN AIR ACTION PLAN

UPDATE ON TECHNOLOGY DEMONSTRATIONS IN THE PORTS

Heather Tomley
Director of Environmental Planning
Port of Long Beach

Jacob Goldberg
Environmental Specialist
Port of Los Angeles

Technology Development

An aerial night photograph of a port city, likely Los Angeles, showing illuminated buildings, streets, and a large harbor area with several ships docked at piers. The lights create a warm, golden glow against the dark night sky.


- Demonstrations of Zero Emission On-Road Trucks and Development of 50 to 100 Truck Pilot Deployment
- Evaluation of Vessel Energy Efficiency Technologies and Demonstration of Vessel At-Berth Technologies
- Demonstration of Harbor Craft Technology
- Near-Zero Switcher Locomotive Demonstration
- Demonstrations of Zero Emission Terminal Equipment
- 2018 TAP Call for Projects

Technology Development



POLA's Green Omni Terminal Demonstration Project

Demonstrate 4 battery-electric yard tractors, 2 battery-electric on-road trucks, 2 electric forklifts, 1 electric top handler, solar rooftop array with battery storage and microgrid controls, and land-based vessel emission capture system



Port of
Long Beach

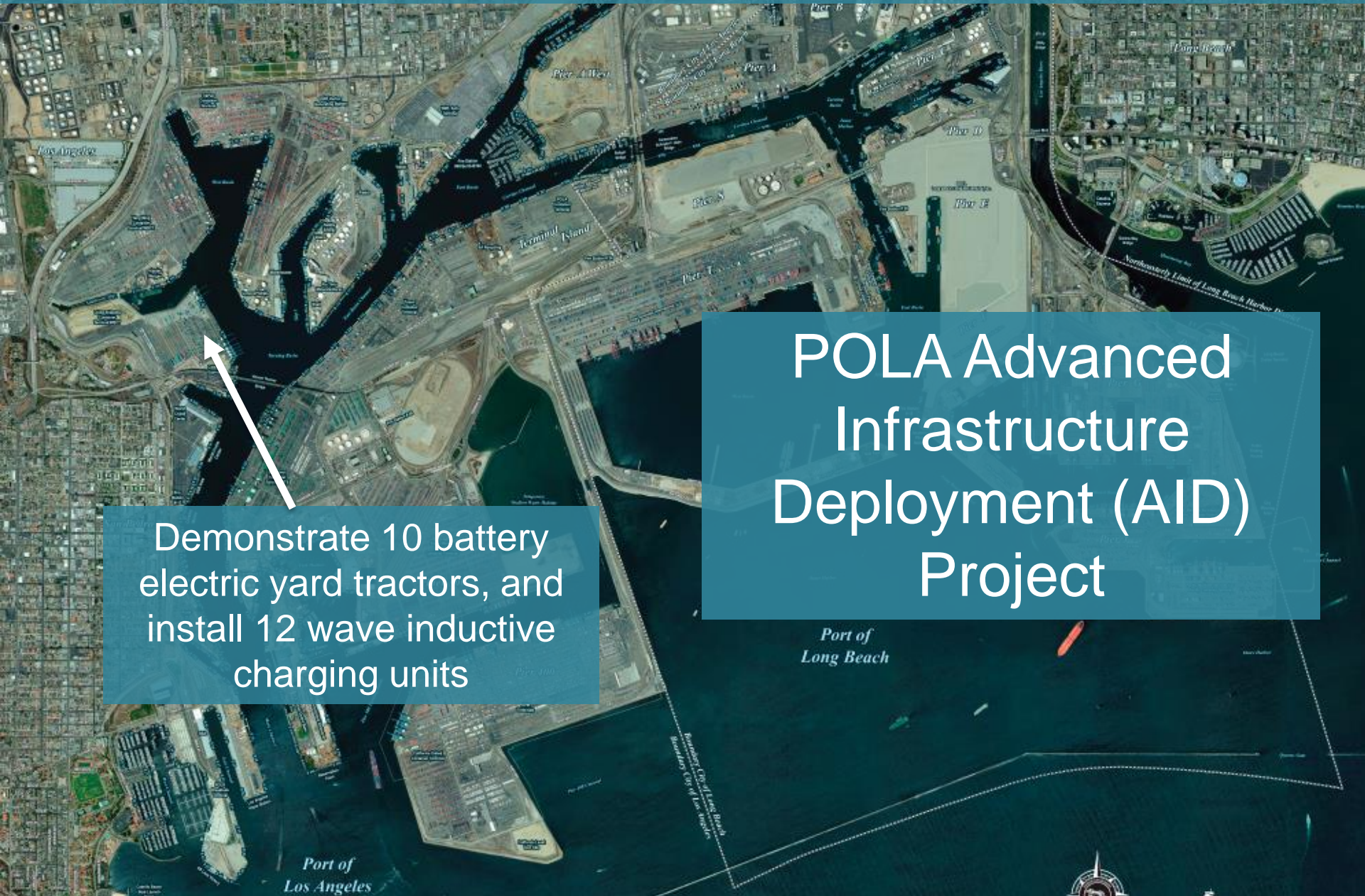
Technology Development



POLA's Everport
Advanced Cargo
Handling Equipment
Demonstration
Projects

Demonstrate 20 low-NO_x RNG
yard tractors, 8 battery-electric
yard tractors, 2 battery-electric top
picks, and charging infrastructure

Technology Development



Demonstrate 10 battery electric yard tractors, and install 12 wave inductive charging units

POLA Advanced Infrastructure Deployment (AID) Project

Technology Development

GE Information Portal

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



Technology Development

An aerial photograph of the Port of Los Angeles, showing a complex network of piers (Pier A through Pier G) and surrounding urban areas. The map is overlaid with a semi-transparent blue box containing text. The text is white and reads: 'POLB's Electric Vehicle Blueprint' and 'Map the path to zero emissions evaluating electric infrastructure needs, financing, workforce components and community impacts'. The map shows various buildings, roads, and waterways, with labels for 'Los Angeles', 'San Pedro', and 'Port of Los Angeles'. A compass rose is visible in the bottom right corner.

POLB's Electric Vehicle Blueprint

Map the path to zero emissions evaluating electric infrastructure needs, financing, workforce components and community impacts

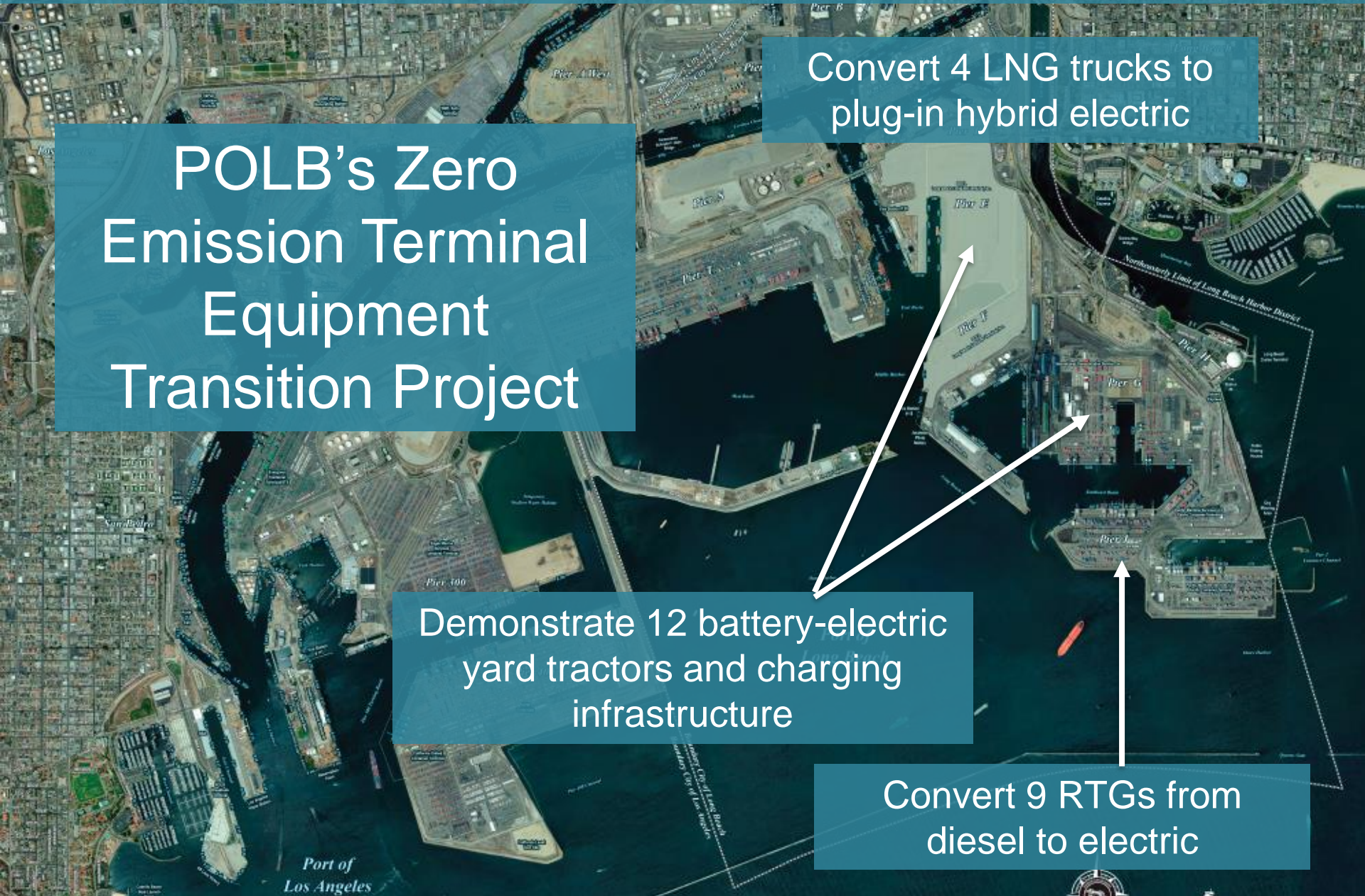
Technology Development

POLB's Zero Emission Terminal Equipment Transition Project

Convert 4 LNG trucks to plug-in hybrid electric

Demonstrate 12 battery-electric yard tractors and charging infrastructure

Convert 9 RTGs from diesel to electric

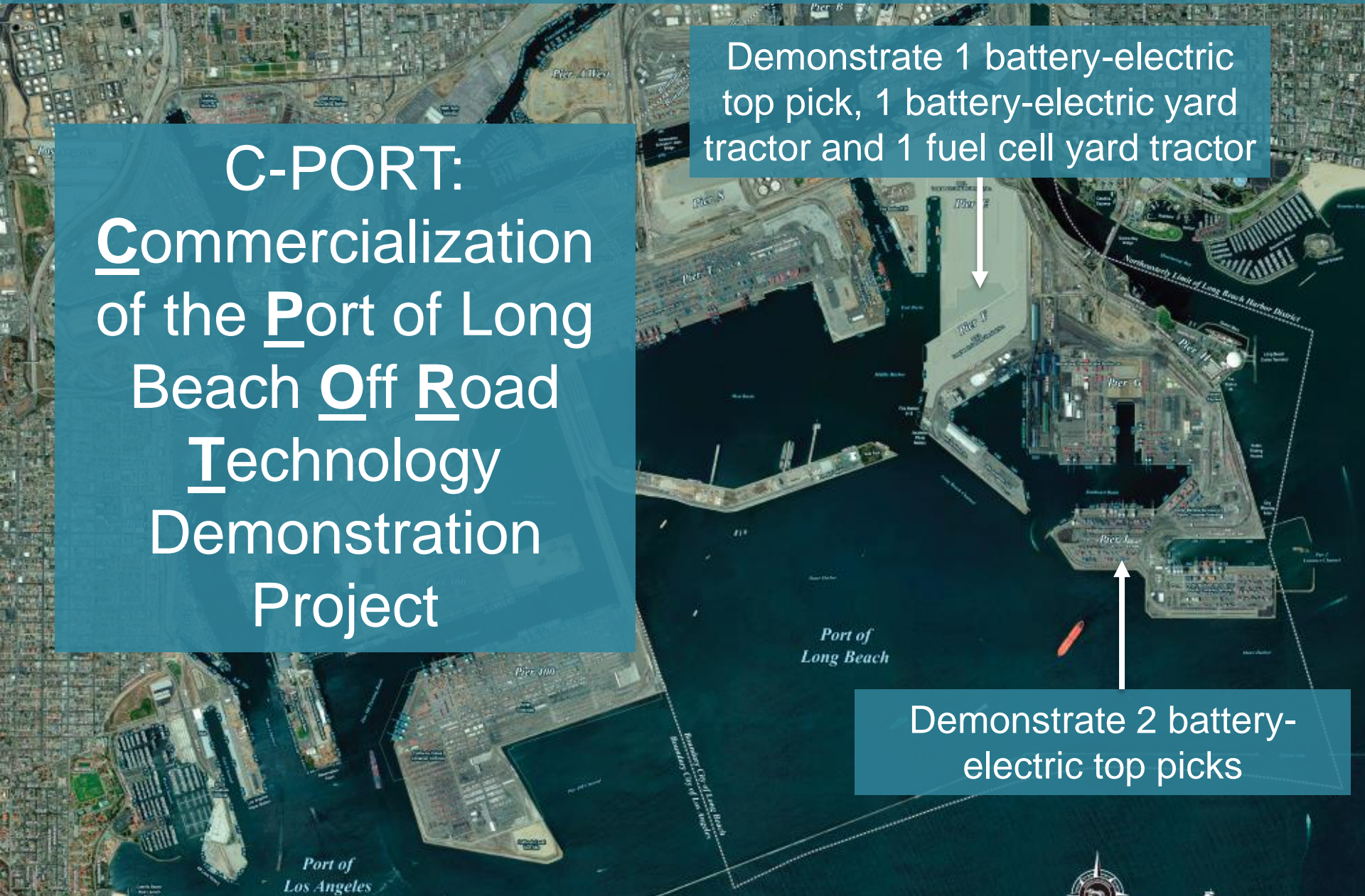


Technology Development

C-PORT: Commercialization of the Port of Long Beach Off Road Technology Demonstration Project

Demonstrate 1 battery-electric
top pick, 1 battery-electric yard
tractor and 1 fuel cell yard tractor

Demonstrate 2 battery-
electric top picks



Technology Development

Install solar panels, battery storage, and microgrid controls to allow JCCC to continue operations during an outage

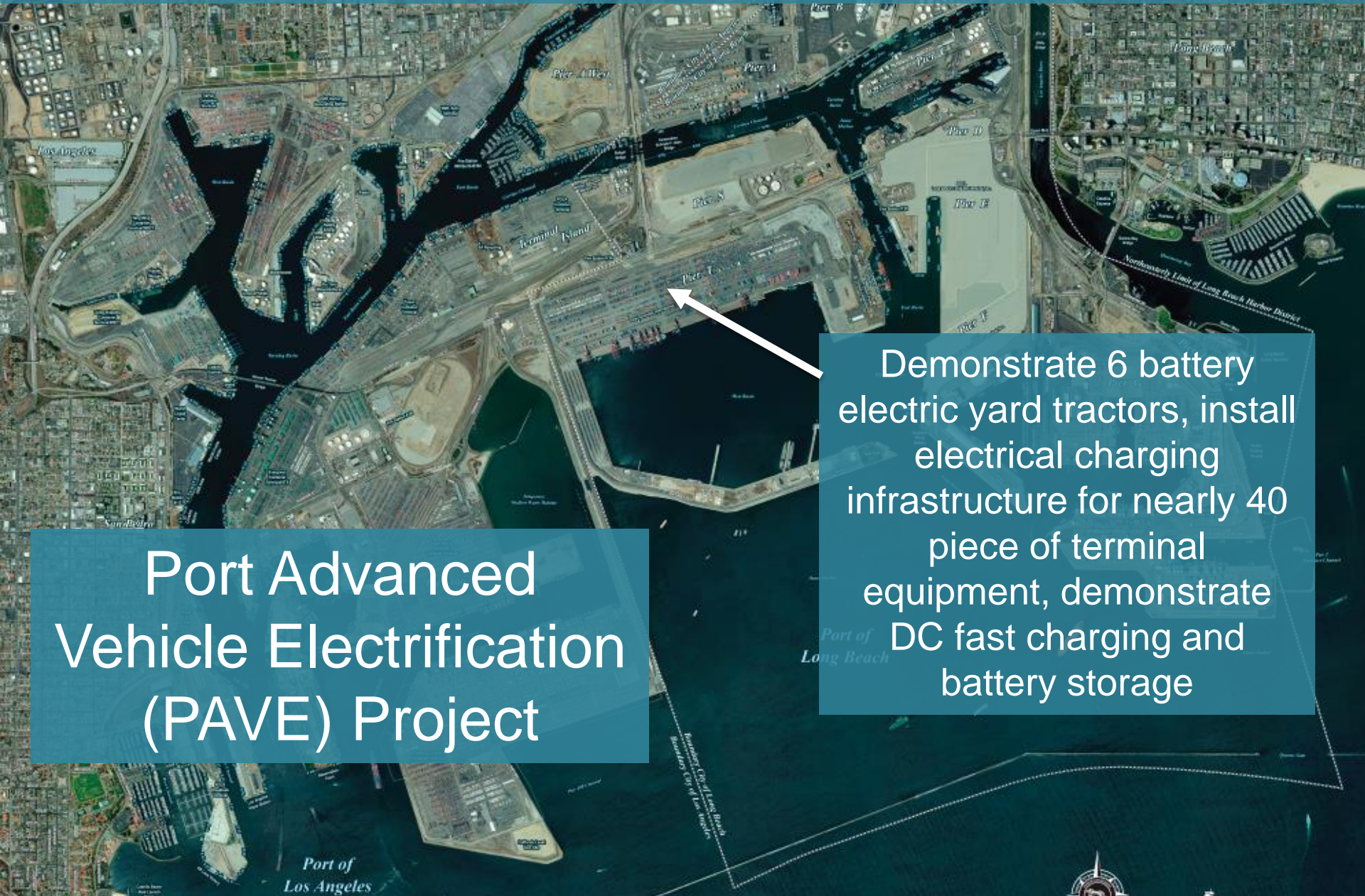
POLB Microgrid –
Resilience for
Critical Facilities



Technology Development

Port Advanced Vehicle Electrification (PAVE) Project

Demonstrate 6 battery electric yard tractors, install electrical charging infrastructure for nearly 40 piece of terminal equipment, demonstrate DC fast charging and battery storage



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SAN PEDRO BAY PORTS
CLEAN AIR ACTION PLAN

THANK YOU FOR PARTICIPATING

The background of the slide is a wide-angle photograph of a busy port. In the foreground, there are numerous stacks of colorful shipping containers (red, blue, yellow, green) and several large blue gantry cranes. In the middle ground, there are more stacks of containers and some industrial buildings. In the background, a large bridge spans across the water, and the city skyline is visible under a clear sky.

SAN PEDRO BAY PORTS **CLEAN AIR ACTION PLAN**

OVERVIEW OF OCEAN GOING VESSEL STRATEGIES

June 26, 2018

2005 vs. 2016

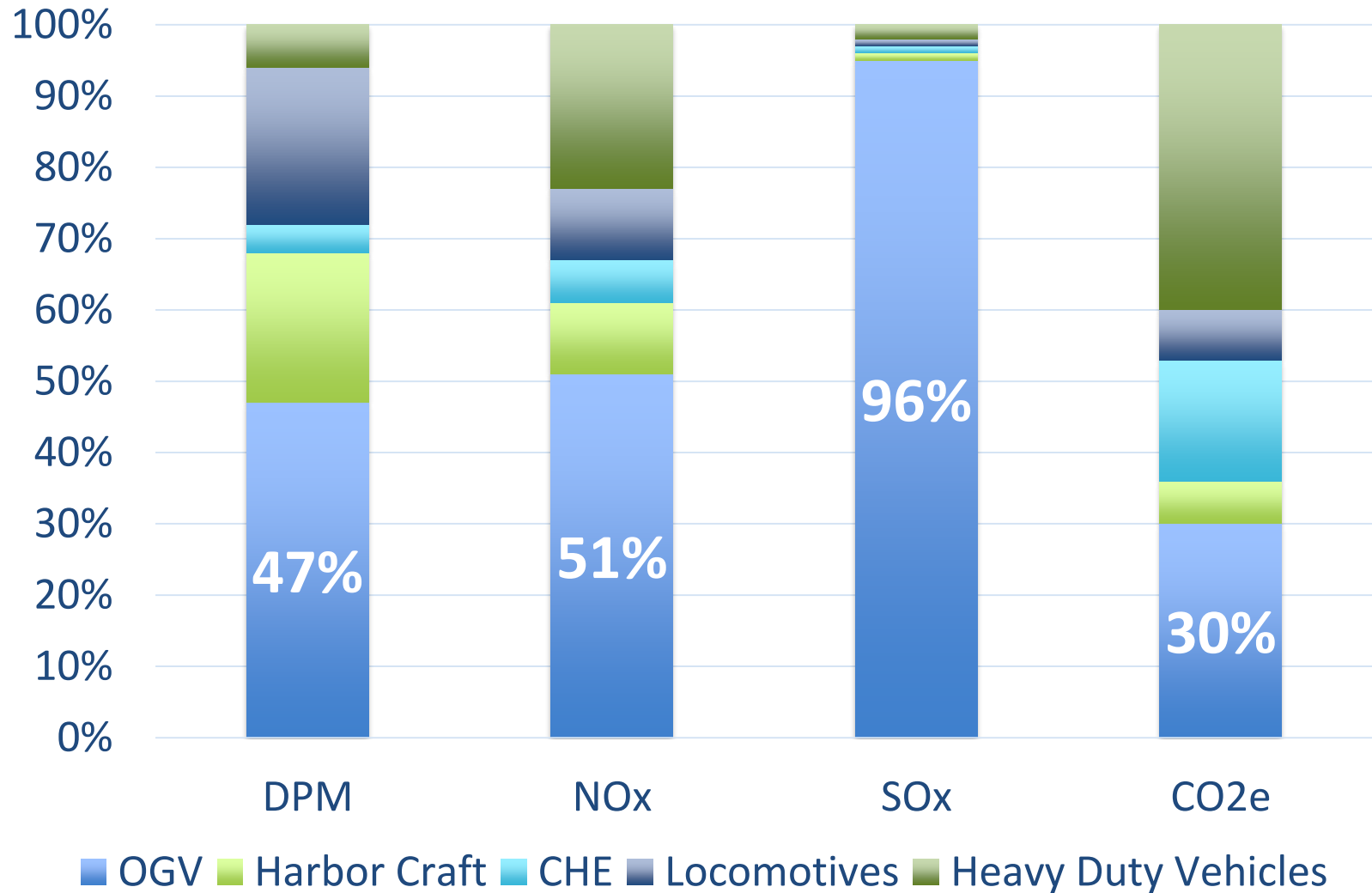
Overall Container Volumes up 10%

Containers (TEUs) per container ship calls
up 40%

Container ship calls down 21%

All ship arrivals down 23%

Emissions Today



Strategies for Ships

- Incentive Programs
- Technology Solutions
- Regulatory & Funding Advocacy



Vessel Speed Reduction





Green Ships/Environmental Ship Index
The Ports give financial incentives for ships with the cleanest engines



Shore Power

**Ships have been plugging in since 2008
Equivalent of taking 42,000 cars off the road each day**

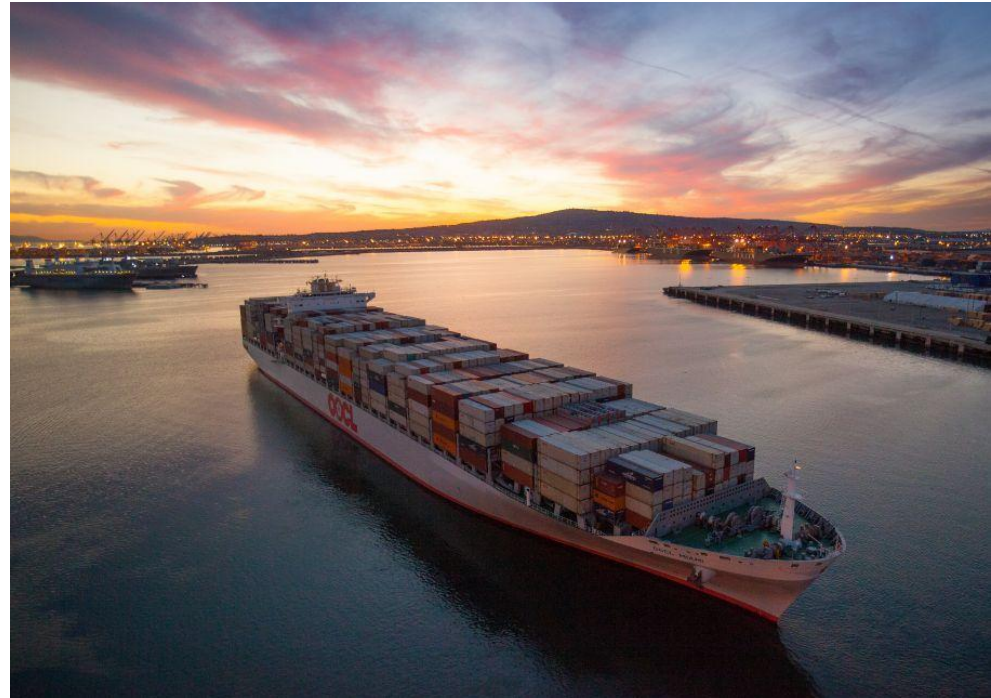
Shore Power Alternatives



Technology Advancement

Current Projects

- Land or Barge-Based OGV At-Berth Exhaust Emissions Capture & Treatment Systems RFP
- Maersk OGV Energy Efficiency Measurement Demonstration



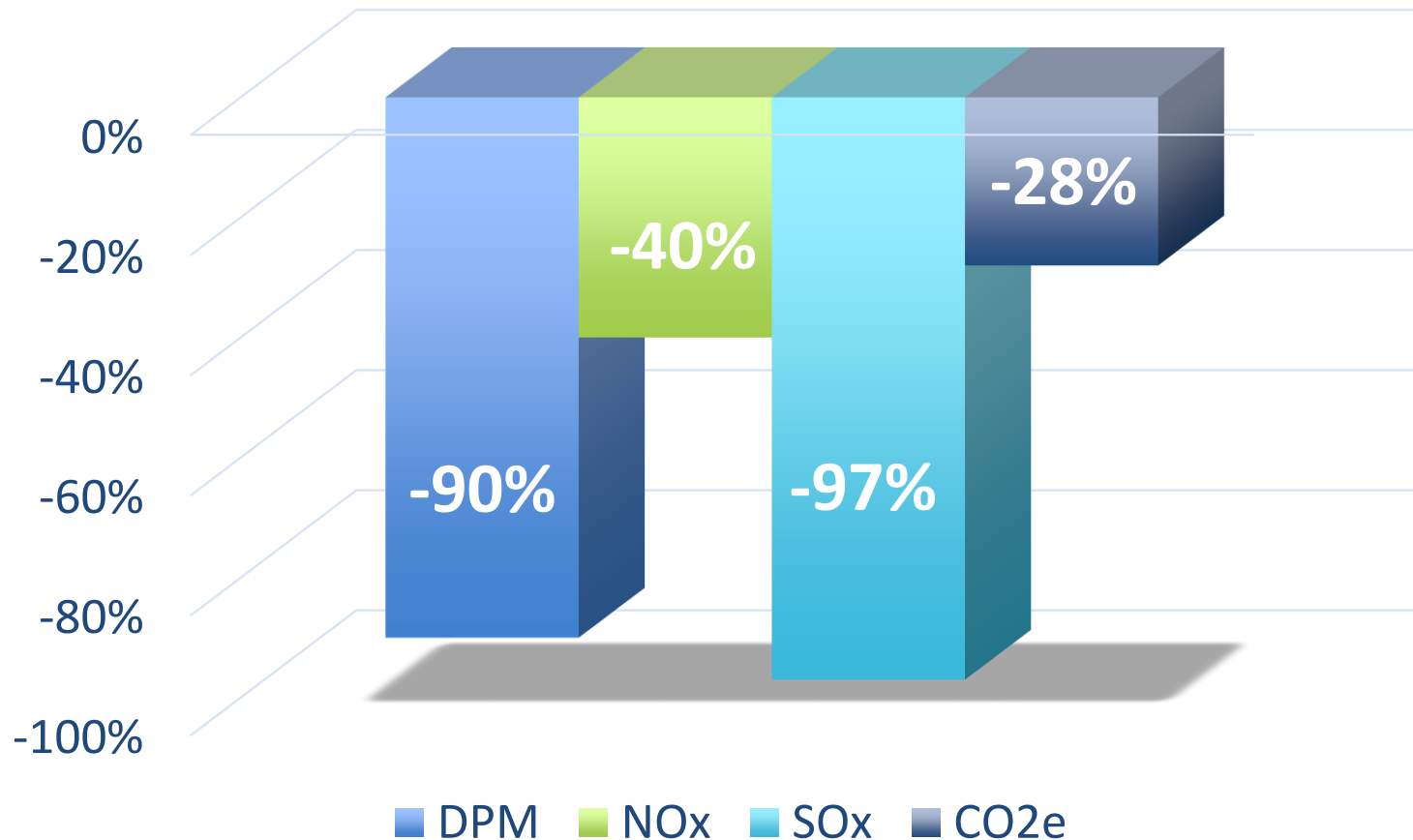
Technology Advancement

Previous Projects

- Tri-Mer Mobile Emissions Treatment System (METS-1)
- ACTI Advanced Maritime Emission Control System
- APL Singapore Slide Valve & Water-In-Fuel Emulsion
- Alternative Petroleum Technologies
- Bluefield Holdings/Krystallon Ocean Going Vessel Scrubber
- OGV Slide Valve Low-Load Emissions Evaluation

EMISSION REDUCTIONS

OGV Emission Reductions Since 2005



Strategies in the CAAP

- September 2018 - Participation in the State Amendment of Vessel At-Berth Regulation
- January 1, 2019 – RFP for Emissions Capture & Treatment Systems
- 2019 - Ship Incentive Program Modification
- 2023 - Economic Assessment for Clean Ship Rate
- 2025 - Clean Ship Differential Rate Program
- Ongoing - West Coast Ship Incentive Collaboration
- At-Berth Infrastructure Assessments
- VSR Program Modification

Progress to Date

- Participating in CARB Ports Working Group to amend at-berth regulation
- At-berth emission reduction RFP: 4 responses received; under evaluation
- Applied for grant funds to expand ship incentive programs
- Conducting outreach on VSR modifications
- Collaborating with West Coast ports on ship incentive portal and route planner – in partnership with Port of Vancouver, identifying a consultant to assist with ports facilitation and building the framework

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