



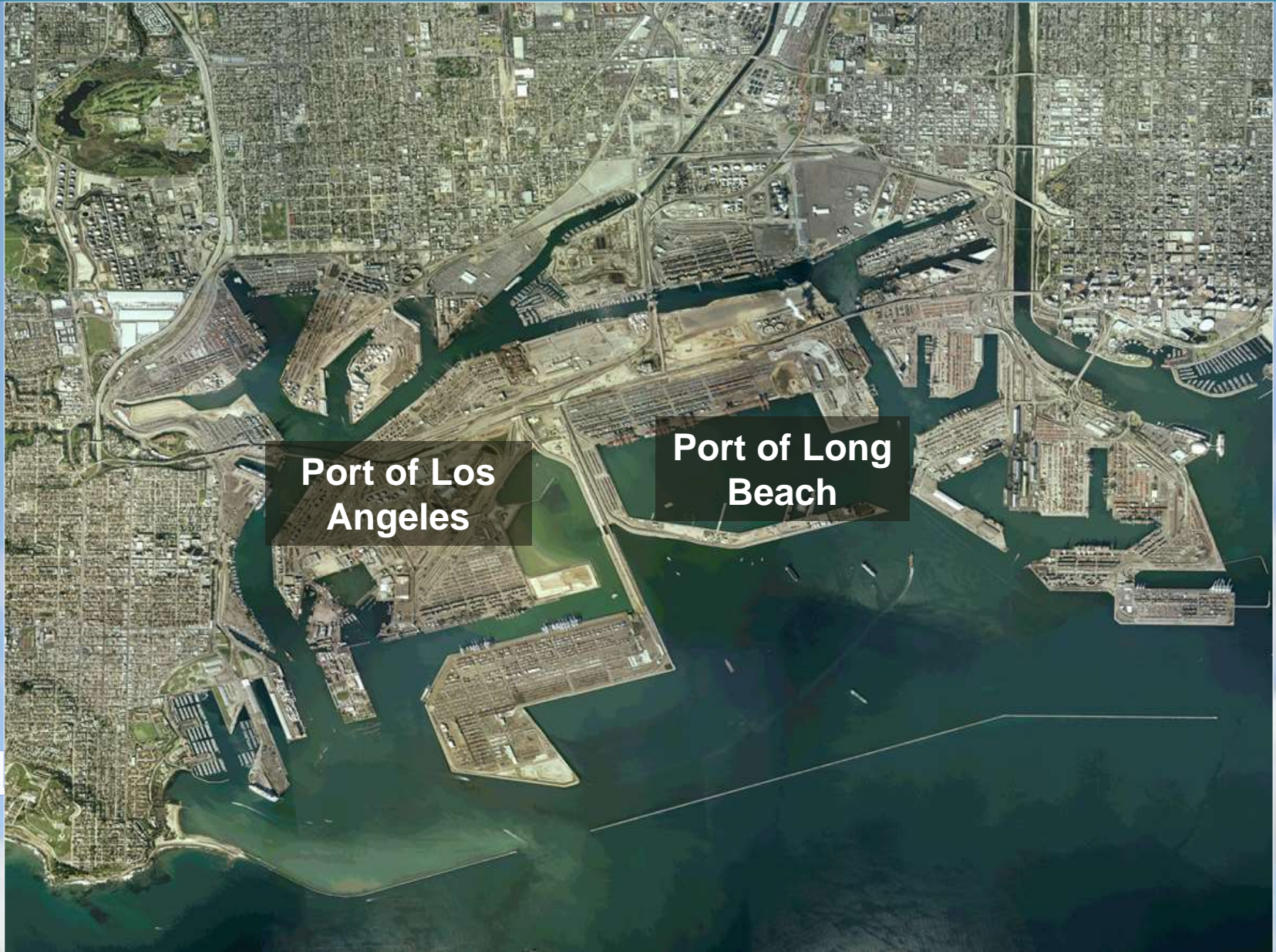
SAN PEDRO BAY PORTS CLEAN AIR ACTION PLAN

OVERVIEW, NEAR-TERM PRIORITIES & NEXT STEPS

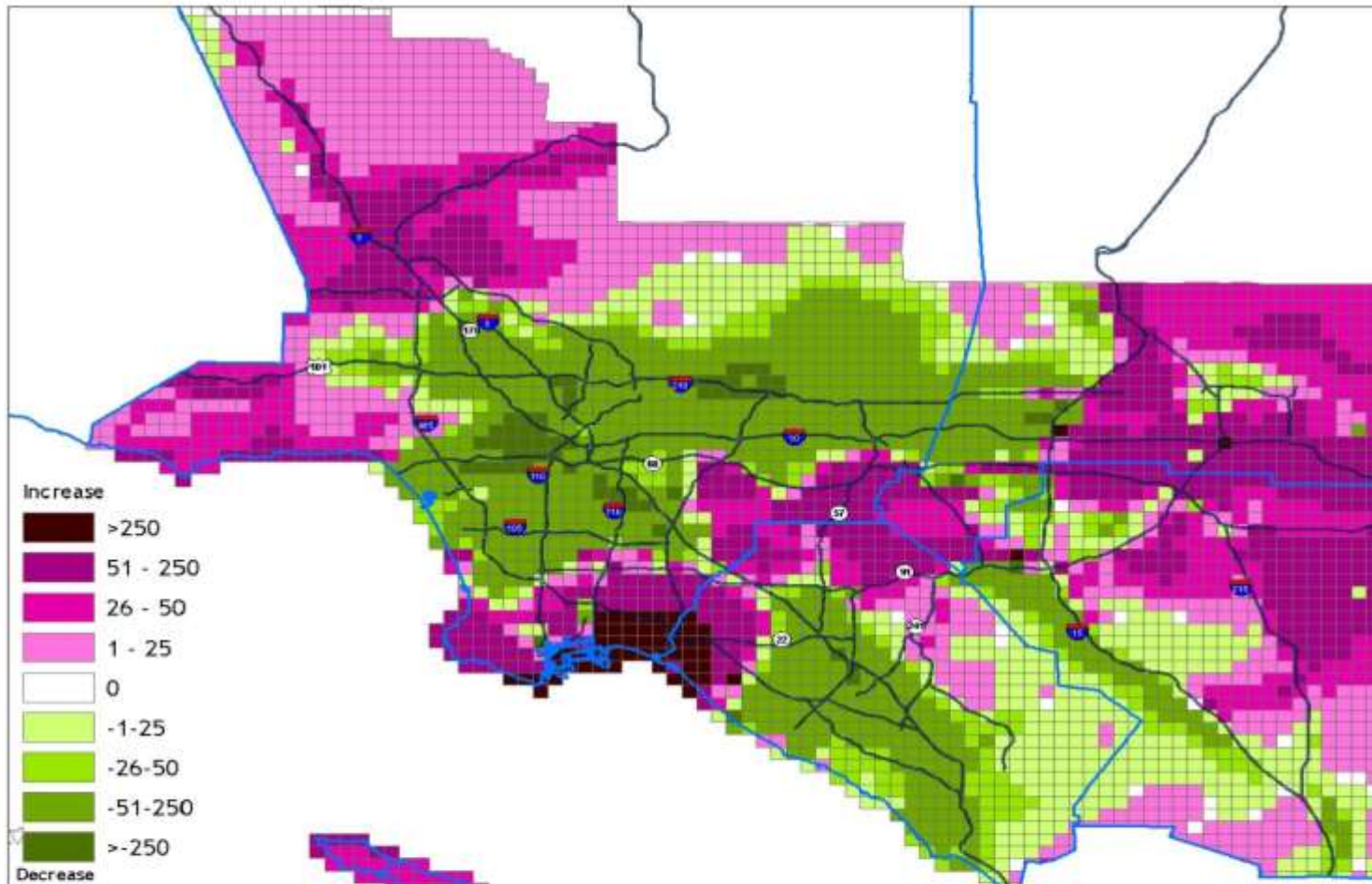
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San Pedro Bay Complex



Clean Air Action Plan Initial Development



**Pollution,
traffic are
linked
to illness**

ENVIRONMENT: German study finds heart attacks are three times more likely in congestion. Bad air is blamed.

**Latino areas
are hit hard by
environmental
health threats**

REPORT: Group suffers more from pollution than the rest of the population, study finds.

Figure 4-8

**Change in CAMx RTRAC Simulated Air Toxics Risk (per million) from the 1998-99 to 2005
(using back-cast 1998 emissions and 1998-99 MM5 generated meteorological data fields)**

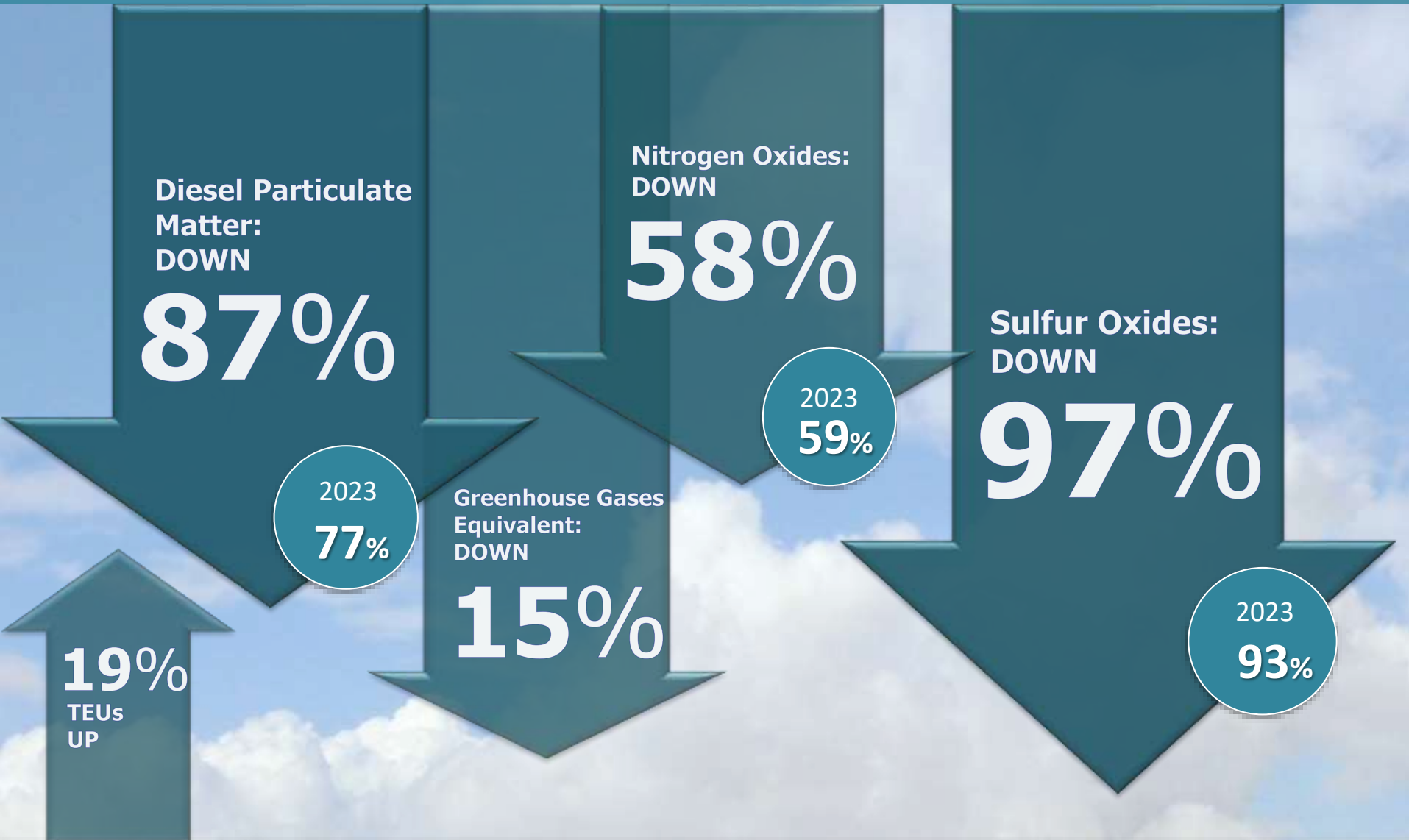
Clean Air Action Plan

Source Categories



1

San Pedro Bay Ports Air Quality Improvements (2005-2017)



Overview

An aerial photograph of a large harbor and city area. The harbor is filled with numerous ships and boats, and the city is densely packed with buildings. A semi-transparent teal box is overlaid on the center of the image, containing a list of strategies. The background image shows a wide expanse of water, a large city, and a harbor with many ships.

OCEAN-GOING VESSELS
HARBOR CRAFT
ON-ROAD TRUCKS
TERMINAL EQUIPMENT
EFFICIENCY IMPROVEMENTS

2017 CAAP Update Strategies

Ocean-Going Vessels



- Increase vessel speed reduction compliance within 40 nautical miles
- Use at-berth emission reduction technologies
- Incentivize energy efficiency upgrades and clean technologies
- Develop a Clean Ship Program to transition the oldest, most polluting ships out of the fleet

Heavy-Duty Trucks



- **Advance the Clean Trucks Program and transition to zero-emission trucks by 2035**
- **Adopt a reservation system at terminals to improve trucks turn times**

Terminal Equipment

ZPMC



- **Transition to zero emissions terminal equipment by 2030**
- **Limit idling**



Additional 2017 CAAP Update Highlights

- **Expand use of on-dock rail**
- **Accelerate deployment of cleaner harbor craft engines**
- **Encourage improvements in freight efficiencies**
- **Develop Green Terminal Recognition Program**
- **Ensure energy infrastructure is available to support use of cleaner technologies**



Incremental Cost Estimates

	Low End	High End
Trucks		
Near-Zero Emissions	\$1,002,000,000	\$1,026,000,000
Zero-Emissions	\$2,927,000,000	\$8,289,000,000
Cargo-Handling Equipment		
Equipment	\$914,000,000	\$2,105,000,000
Infrastructure		\$2,166,000,000
At-Berth Emission Reduction Technologies		\$138,000,000
Incentive Programs for Ships		\$137,000,000
Technology Demonstration & Development		\$22,000,000
TOTAL	\$7,306,000,000	\$13,888,000,000

Technology Development

An aerial night photograph of a port city, likely Los Angeles, showing the harbor, city lights, and industrial areas. The image is used as a background for the slide.

- Demonstrations of Zero Emission On-Road Trucks and Development of 50-100 Truck Pilot Deployment
- Demonstration of Harbor Craft Technologies
- Near-Zero Switcher Locomotive Demonstration
- Vessel Energy Efficiency Improvements Evaluation and Demonstration of At-Berth Emission Reduction Technologies
- Demonstrations of Zero Emission Terminal Equipment

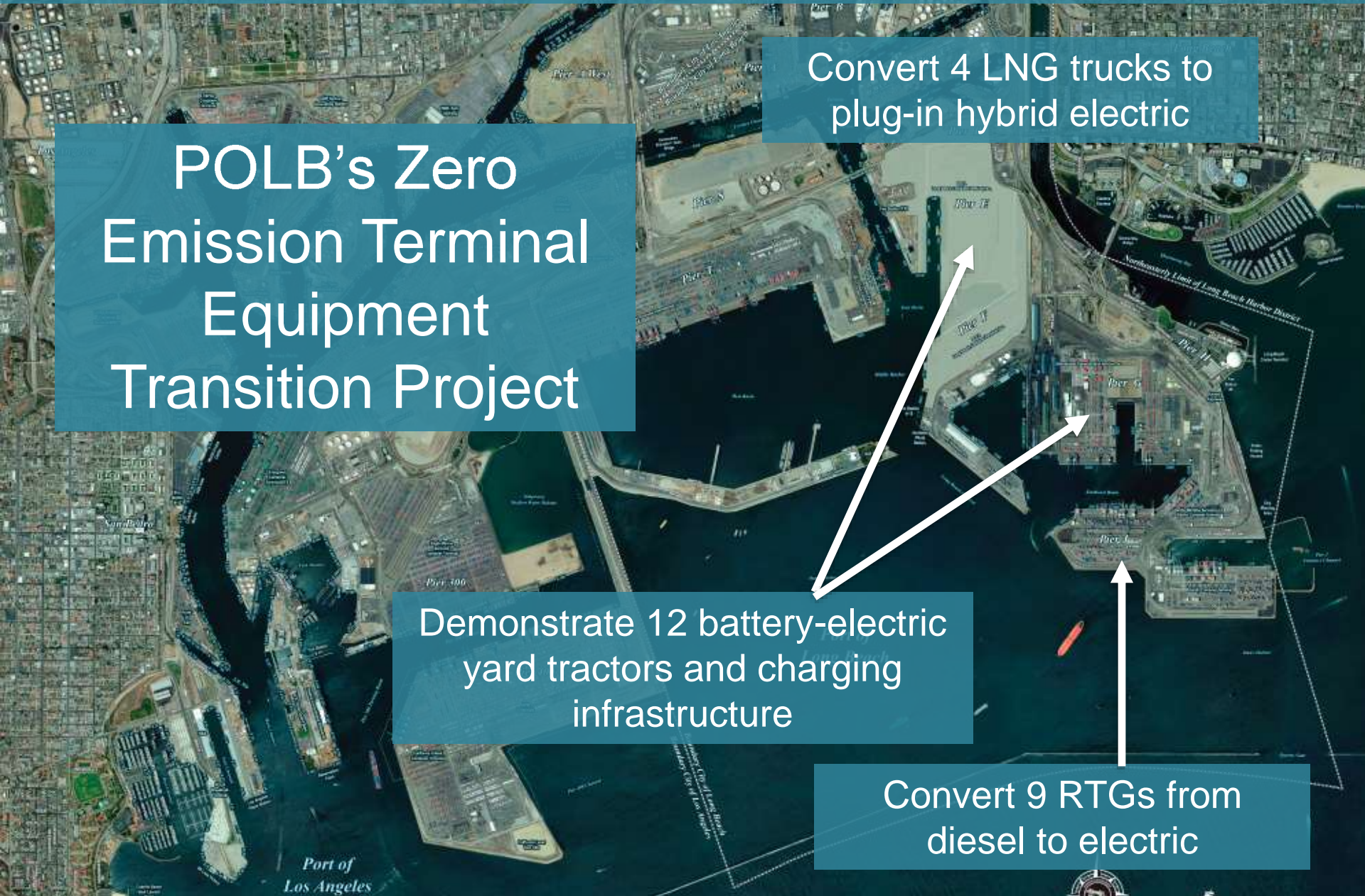
Technology Development

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

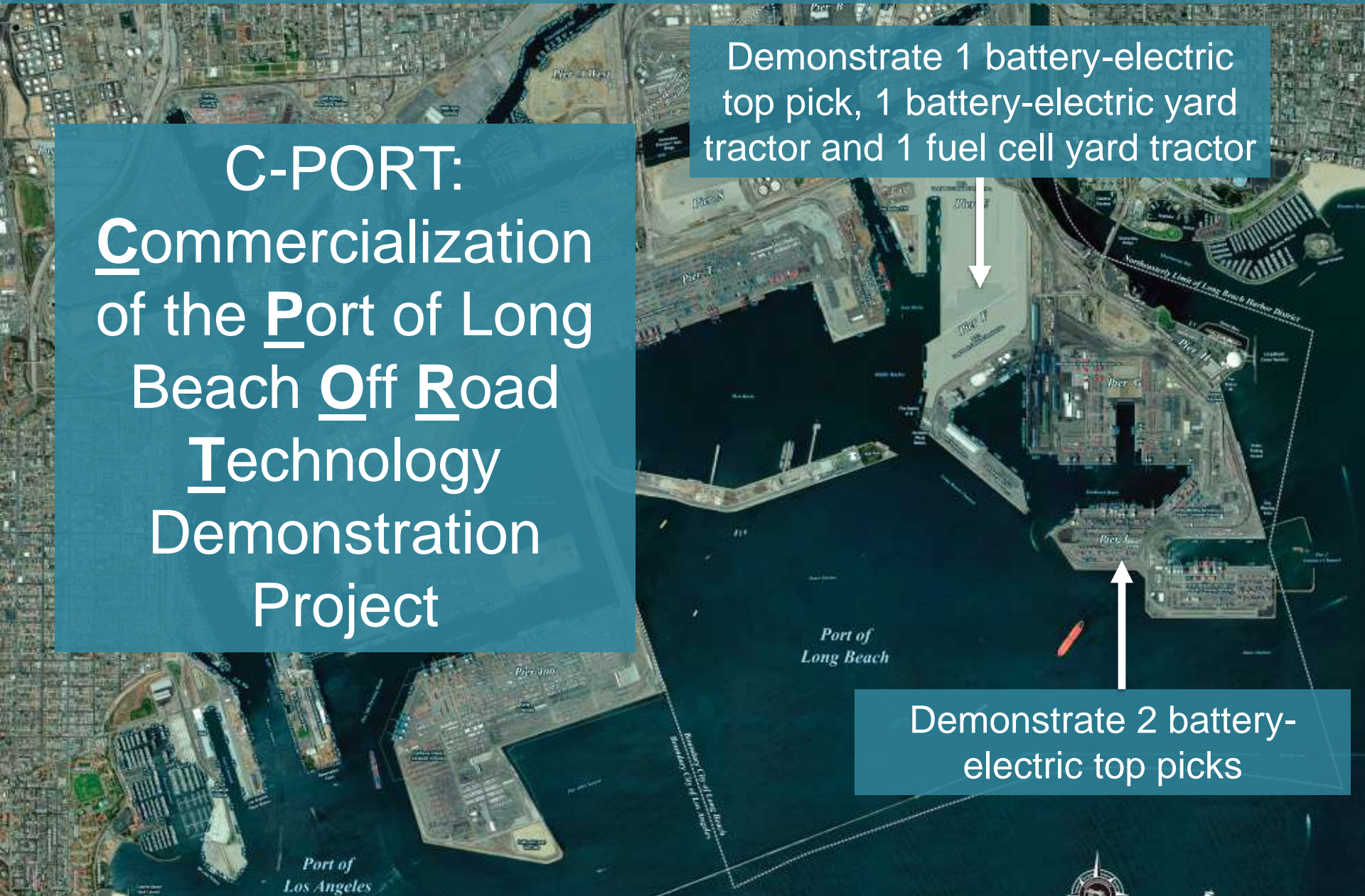


Technology Development

C-PORT:
Commercialization
of the **P**ort of Long
Beach **O**ff **R**oad
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

An aerial photograph of the Port of Los Angeles and Long Beach. The image shows a complex network of piers, roads, and waterways. A white arrow points from a text box on the right towards Pier 7 in the center of the image. Labels for 'Port of Los Angeles', 'Terminal Island', 'Port of Long Beach', and 'Northwestern Limit of Long Beach Harbor Project' are visible on the map.

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

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

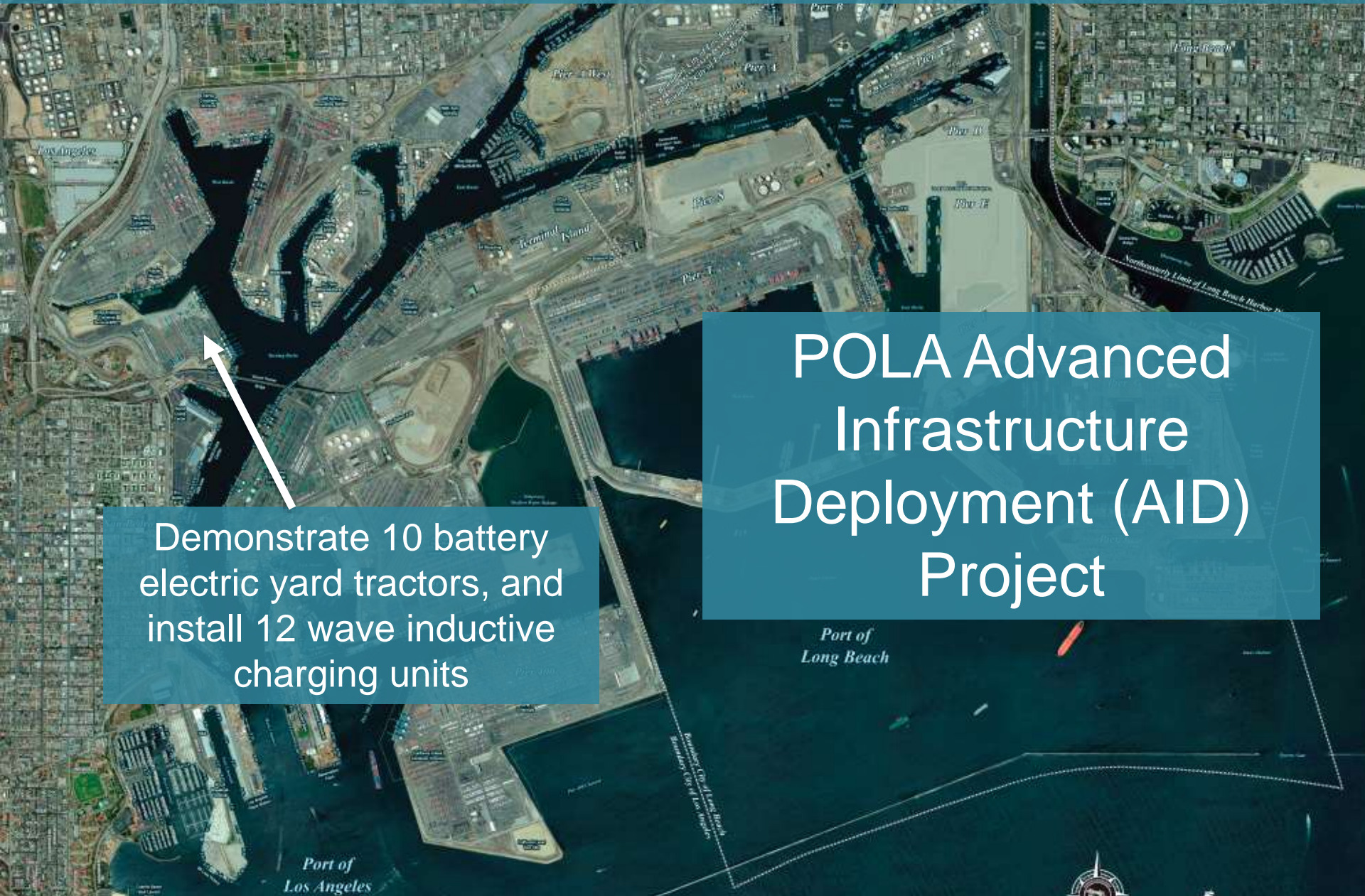
Technology Development



POLA's Everport
Advanced Cargo
Handling Equipment
Demonstration
Projects

Demonstrate 20 low-NOx 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