



Zero Emissions Technology Demonstrations



Port of
LONG BEACH
The Green Port

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Port of Long Beach

2017 CAAP Update

An aerial photograph of a coastal city and port. The city is densely packed with buildings and roads, extending to the waterfront. The port area is filled with shipping containers, cranes, and large cargo ships. The water is a deep blue, and the sky is clear.

Zero Emissions Goals

Terminal Equipment by 2030

On-Road Trucks by 2035



Real-World Demonstrations

Technology Advancement

Accelerate verification and commercial availability



World's Most Advanced Technologies

Middle Harbor

Electrified Terminal Operations



World's Most Advanced Technologies

Middle Harbor

Electrified Terminal Operations

Challenges

Emerging technologies under tough operating conditions with limited infrastructure and high cost



Strengths

Established goals, increasing incentive dollars and interest, plus strong partnerships




Feasibility Assessments

- Trucks
- Terminal Equipment



Purpose

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- A photograph of two semi-trucks driving on a multi-lane highway during the "blue hour" of twilight. On the left, a red semi-truck is driving towards the camera. On the right, a white semi-truck with a large tan trailer is driving away from the camera. The background shows a cityscape and hills under a deep blue sky. A semi-transparent teal box is overlaid on the bottom half of the image, containing a bulleted list.
- Assess feasibility of near-zero and zero-emissions
 - Evaluate progress toward CAAP goals
 - Identify actions to overcome challenges
 - Determine if timelines need to be adjusted

Scope


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- Technical Viability
- Commercial Availability
- Operational Feasibility
- Infrastructure Availability
- Key Economic Considerations

Technology Development

Zero Emission Technology Demonstrations

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- Demonstrations of Zero Emission On-Road Trucks and Development of 50-100 Truck Pilot Deployment
 - Switcher Locomotive Demonstration
 - Demonstrations of Zero Emission Terminal Equipment

Technology Development



POLB's Electric Vehicle Blueprint

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

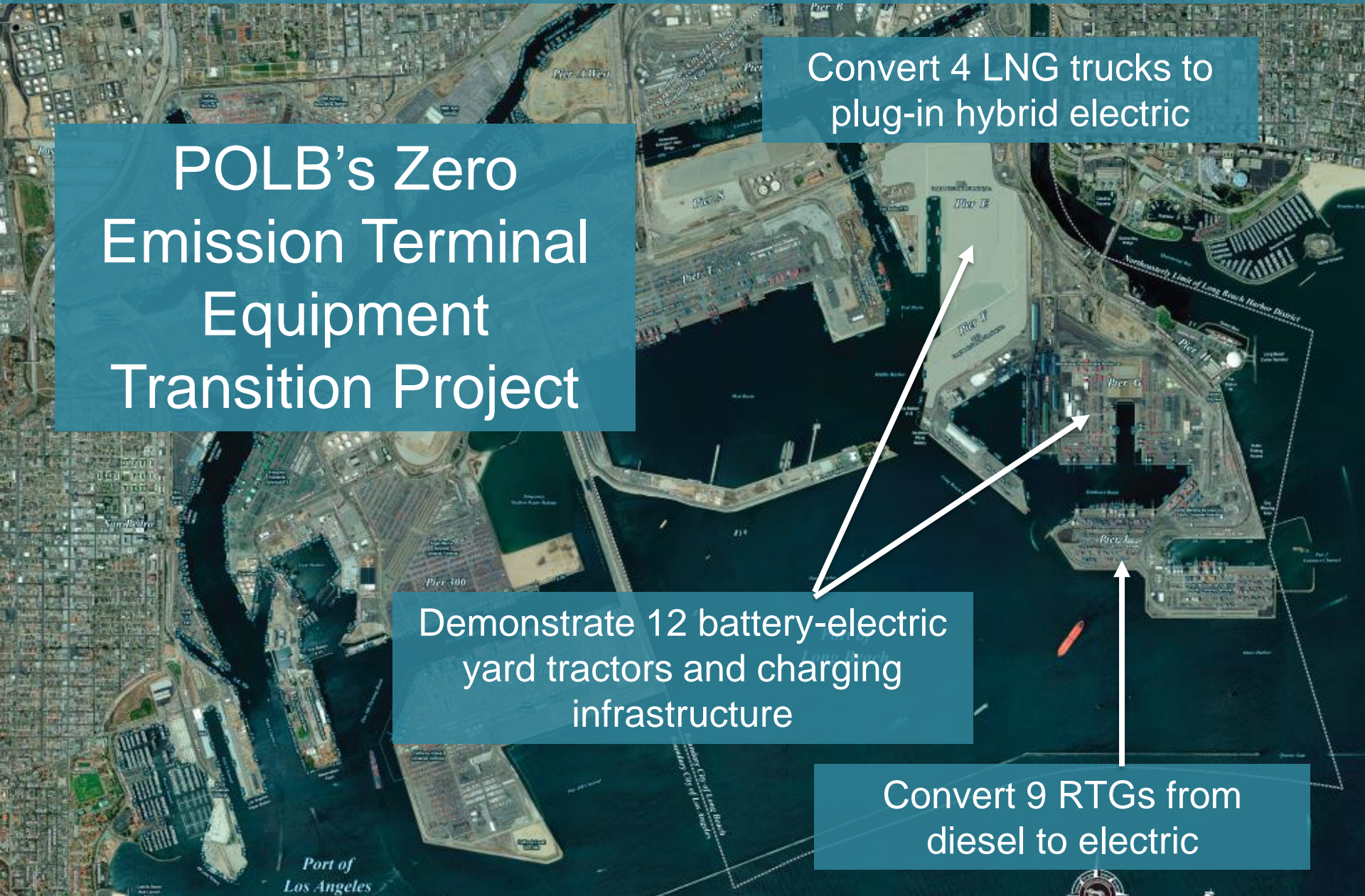
Technology Development

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

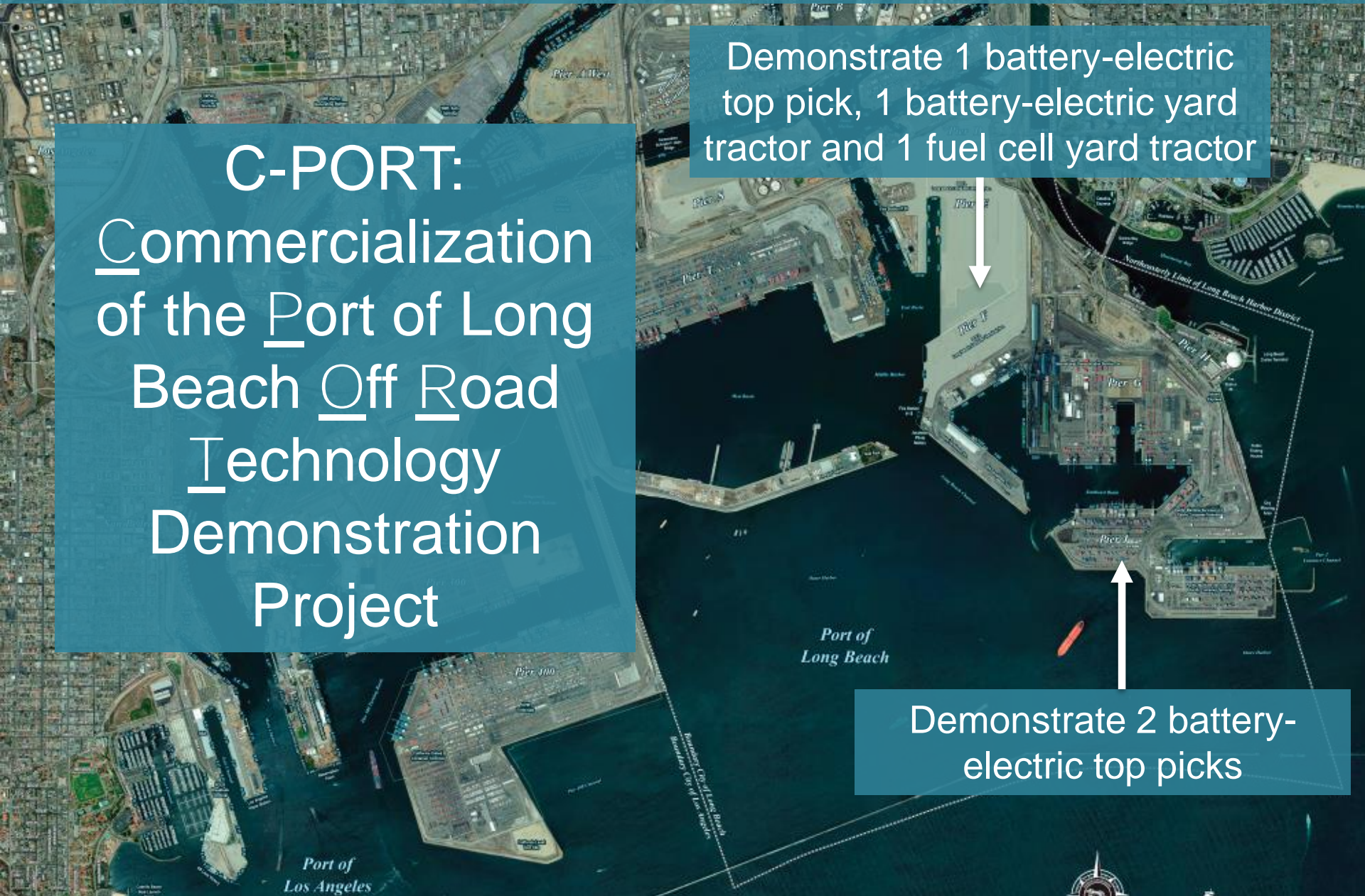


Technology Development

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

Port Advanced Vehicle Electrification (PAVE) Project



Install electrical charging infrastructure for nearly 40 piece of terminal equipment, demonstrate DC fast charging and battery storage

Technology Development

A satellite map of the Port of Long Beach, showing various piers (Pier A, Pier B, Pier C, Pier D, Pier E, Pier F, Pier G, Pier H, Pier I, Pier J, Pier K, Pier L, Pier M, Pier N, Pier O, Pier P, Pier Q, Pier R, Pier S, Pier T, Pier U, Pier V, Pier W, Pier X, Pier Y, Pier Z) and surrounding areas. A blue text box is overlaid on the map, containing the text: "Install solar panels, battery storage, and microgrid controls to allow JCCC to continue operations during an outage".

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

A satellite map of the Port of Los Angeles, showing various piers (Pier 100, Pier 101, Pier 102, Pier 103, Pier 104, Pier 105, Pier 106, Pier 107, Pier 108, Pier 109, Pier 110, Pier 111, Pier 112, Pier 113, Pier 114, Pier 115, Pier 116, Pier 117, Pier 118, Pier 119, Pier 120) and surrounding areas. A blue text box is overlaid on the map, containing the text: "POLB Microgrid – Resilience for Critical Facilities".

POLB Microgrid –
Resilience for
Critical Facilities