



Emerging Technologies and Strategies for Emission Reductions

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Emerging Technologies: Challenges and Opportunities



Port of
LONG BEACH
The Green Port

Heather Tomley

Director of Environmental Planning
Port of Long Beach



Technology Advancement Program

Real-World Demonstrations

Accelerate verification and commercial availability



Transpower Zero Emission Class 8 Truck

Battery electric; Zero tailpipe emissions



Advanced Maritime Emissions Control System

No vessel retrofits; >95% emission reductions



Foss Hybrid Tugboat

Battery power during low loads; 73% PM reductions



Rypos

Diesel Particulate Filter

Verified as Level III Device
for Rubber Tired Gantry
Cranes in 2013

>85% reduction in PM



Vycon

Flywheel energy storage

Verified as Level I device

Energy efficiency

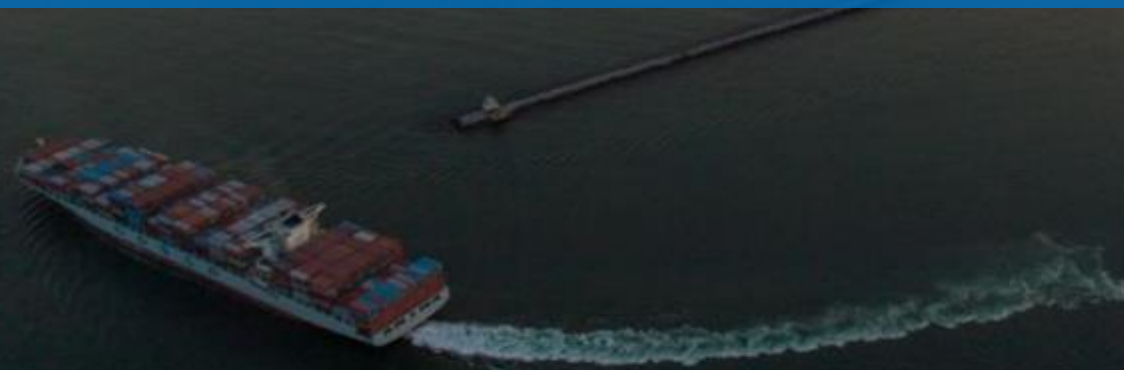
Technology Advancement Program

Progress to Date

Formal review process

> \$8 Million toward 25+ projects

Zero emission, hybrid, scrubbers, filters, clean fuels, etc.



Technology Advancement Program

Next Steps

Seek zero emission and vessel technologies

Partner with air agencies and port operators

Monitor grant opportunities