Green Port Building Blocks

• Environmental responsibility and economic growth are not always mutually exclusive

• Green growth has:
  – Enabled overall Port growth by allowing expansion projects to move forward as environmental impacts decline
  – Allowed cargo owners to market green logistics
  – Helped to push science of environmental source controls further along

• Community Investment important part of being environmentally responsible (indirect impacts hard to measure, but cannot be ignored)
Green Port Building Blocks

• For Air Quality, Green Port Policy has lead to:
  – Significant reduction of Criteria Pollutant Emissions (NOx, SOx, PM, CO, VOCs) and Health Risk
  – Fair share contribution to regional air quality attainment goals
  – Carbon footprint reduction co-benefits to meet Climate Change targets set by local, state and federal government

• Clean Air Action Plan (CAAP) is primary comprehensive air quality control program to accomplish these objectives
  – Emissions Inventory is a key CAAP planning tool
Clean Air Action Plan

• 2006 – First Comprehensive Port-Based Plan
  • Set consistent source-specific standards (Ships, Trucks, CHE, Trains, Harbor Craft)
  • Set reduction Health Risk targets from Port Operations
  • Set reduction targets “fair share” to reducing regional mass emissions
  • Enable Port development & optimization

• Updated - 2010
  • Health Risk Reduction Standard
    • 85% by 2020 (compared to 2005 baseline)
  • Emission Reductions Standard
    • NOx 22% by 2014 and 59% by 2023
    • SOx 93% by 2014 (and 2023)
    • DPM 72% by 2014 and 77% by 2023
2016 Air Emissions Results

Diesel Particulate Matter: DOWN
87%

Nitrogen Oxides: DOWN
57%

Greenhouse Gases: DOWN
15%

Sulfur Oxides: DOWN
98%

18% TEUs UP

2023
77%
59%
2023
93%
POLA Annual Emissions Inventories

- Annual Activity-based
- Source categories
  - Ships, harbor craft, cargo handling equipment, trucks, locomotives
- Pollutants
  - PM • PM$_{10}$ • PM$_{2.5}$ • DPM • NO$_x$ • SO$_x$ • HC • CO
- Greenhouse gases
  - CO$_2$ • CH$_4$ • N$_2$O • CO$_2$e
- Coordinated w/CARB, SCAQMD, & EPA
Role of Emission Inventories must Evolve

- Broader participation necessary
- New carbon footprint focus
- Energy consumption & supply
- Efficiency tracking
- Short lived climate pollutants
  - Tropospheric ozone
  - Black carbon
  - Methane
  - HFCs
2017 CAAP Update

- Build on Successes and plan for future
- Balance environmental stewardship with jobs and competitiveness
- Continue to reduce pollutants and health risk
- New danger from climate change
  - Zero emissions goal important for GHG
• Capture up to 100% of vessel at-berth emissions by 2030
• Modify Vessel Speed Reduction Program to maximize participation to 40 nm
• Incentivize energy-efficiency improvements and use of cleaner technologies
• Consider potential differential rate system to incentivize newer, cleaner vessels
• Transition trucks to near zero in short term and ultimately zero emissions by 2035
  • Feasibility assessments start in 2018
  • Truck rate starts in 2020
  • SMOG check pilot program
• Implement truck reservations system
CAAP: CARGO-HANDLING EQUIPMENT

Transition to zero emissions by 2030

- Also subject to feasibility assessments
- Near-zero may be a transition technology for certain source categories
Zero Emission Challenges

• Technology still in infancy stage for heavy duty equipment
  • Range limitations
  • High Cost

• Infrastructure is costly and will require long range planning

• Near zero emissions reasonable alternative?
  • Hybrid engines have very low emissions
  • Cheaper
  • Alternative fuel can be zero emissions equivalent

• Air agencies need near-term progress

• Zero emissions NEEDED to solve GHG crisis
Zero Emissions Program
Drayage Trucks – Cargo Handling Equipment

“Harbor Department staff believes that short-haul drayage and on-terminal container handling equipment are the two areas of maritime goods movement operations where zero and near-zero emission solutions are most likely to develop in the near-term.”

- **Harbor Department Role:**
  - Facilitate expanded testing and deployment
  - Establish clear test guidelines and procedures
  - Plan and Develop Port Infrastructure (battery charging standardization)
  - Work with regional stakeholders on testing and development
- **Demonstrate broad commercial availability and cost**
  - OEMs must see opportunity and develop commercially available ZE units, servicing
  - Increased production volume will reduce cost
- **Demonstrate operational reliability**
  - Show that they work full marine duty cycles and have long-term dependability
  - Port of Los Angeles has committed to test as many zero emissions vehicles as possible
Green Ports Initiative
Drayage Trucks – Cargo Handling Equipment

- **Market maker strategy to increase volume of equipment that can be purchased/tested**
  - CAAP commits to 100 on-road truck demonstration (each port already has other ZE projects)
  - Green Ports initiative idea goes beyond the Ports of Los Angeles and Long Beach
- **Green Ports Initiative will focus on equipment in areas where zero emissions will emerge**
  - More than just ports
  - Local/neighborhood delivery vehicles
  - Waste haulers
  - Port terminal equipment
  - Short haul on-road drayage
- **Climate Mayors will help establish a coalition of Cities and Ports**
  - Not limited to US partners
- **Request for Information (RFI) from OEMs will be released in Spring 2018**
San Pedro Bay’s Changing Role

- Transitioning from “Landlord Port” to “Partnering Port” model
- Deeper Collaboration is Necessary
- Broader Dialogue with Supply Chain Stakeholders
- Balancing critical environmental needs with economic imperatives
Data Solutions Portal Concept
Spring Pilot Project

➢ Partnership with GE Transportation
➢ One terminal, two steamship lines, and one string of ships
➢ Channeled, secure access to data that supply chain stakeholders need
➢ Benefits supply chain efficiency, predictability, and reliability
➢ Keeps the supply chain flowing

To conquer the complexity, the Port of Los Angeles and GE Transportation are partnering to launch a
VISIONARY DIGITAL SOLUTION
VeRail Near-Zero Emissions Locomotive Demonstration

• Development and Demonstration of a Near-Zero emissions, 2,100Hp Switcher Locomotive, powered by Compressed Natural Gas

• Much cleaner than the current highest EPA Locomotive Standard (Tier 4):
  – 90% reduction in PM
  – 90% reduction of NOx
  – 20% reduction in GHG

• Project Partners/Cost:
  VeRail - $3+ Million
  Combined Ports - $600,000
  SCAQMD - $1,000,000
  Southern California Gas Company – $500,000
  Pacific Harbor Lines - In-Kind Services
Thank you