Increasing Energy Demands

- Reductions in air emissions drive energy trends
  - Alternative Maritime Power
    - AMP: 50% by 2014, 70% by 2017, & 80% by 2020
    - Accommodation of 10,000+ TEU Ships + Cruise Ships
  - Port electrification
  - Renewables

- Operational growth
- Terminal automation
Increasing Energy Demands

![Chart showing increasing energy demands over years, with categories for 6 Automated Terminals, 4 Automated Terminals, 1 Automated Terminal, AMP Load, and Existing Load.]
EMAP Energy Pillars

- Resiliency
- Availability
- Reliability
- Efficiency
- Sustainability
Resiliency: Existing Electrical Infrastructure

• Port is a National Asset
  – Physical & Cyber Threats to the Electrical Grid
  – Aging Infrastructure
  – Overgeneration of Renewables
  – Lack of Sufficient Electricity Redundancies

• Resiliency Assessment
Resiliency: Port Complex Microgrid

• Partnership with LADWP
• Incorporation of Harbor Generating Station
• Star vs. Ring Infrastructure
Resiliency: Pasha Solar Microgrid Demonstration
Resiliency: Pasha Solar Microgrid Demonstration

Solar Array Provides Power Every Day

Generator Also Allows Solar to Operate

Port Substation

Grid Power

Terminal Operates Only if Utility Provides Power
Resiliency: Pasha Solar Microgrid Demonstration

Biofuel/NG Generator Runs During Grid Failure

Solar Array Provides Power Every Day

Generator Also Allows Solar to Operate

Generator Runs w/o Grid

Port Substation

Terminal Operates When Needed

Grid Power
Availability: Meet Energy Demands of Today & Tomorrow

- Port Energy Demand
- Existing Infrastructure
- LADWP
  - Integrated Resource Plan
Availability: Port Fuel Cell Project

- Port Administration Building Fuel Cell
  - 300-kW system
  - Powers day-to-day operations
Reliability: System Enhancements

• Load Projection Analysis
• Improve Transmission & Distribution System
• Reduce Outages
Efficiency

• LED Lighting Conversion
• Terminal Assessment & Efficiency Program
• Peak Shaving & Load Shifting
Efficiency/ Cost

High Scenario (6 ACTs)  Mid Scenario (4 ACTs)  Low Scenario (1 ACT)
Sustainability: Renewables

• Solar PV Systems
  – 5.7 MW (LADWP FiT)
  – 1 MW (Pasha - LADWP SIP)
  – Solar RFP

• Wind Generation

• Offshore Energy Feasibility
Energy Management Action Plan

Roadmap to improve the energy profile at the Port while keeping up with the accelerating electrification and energy demand

- Strategic Leadership
- Partnerships
- Projects
- Funding

Sustainable Port Operations

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