Sustainable Freight Advisory Committee

January Meeting Summary - DRAFT

Date: January 26th 2017 | 11 am – 3 pm

Location: In-person at the Port's Harbor Administrative Building and via phone conference

Attendees: Attachment A

Meeting Agenda: Attachment B

Overview:

The January 2017 Sustainable Freight Advisory Committee (i.e. the Committee, or SFAC) meeting focused on the Committee's ideas and draft recommendations for several elements of the Clean Air Action Plan (CAAP) Discussion Document. Suggested revisions to several of the draft recommendations were made and are expected to be finalized by and/or at the February SFAC meeting.

Key Discussion Items

(Action items in green)

1. **Review and approve December meeting summary**
    - The Committee agreed to approve the minutes as is
        - ACTION ITEM: GNA to send the approved meeting summary to Mayor Eric Garcetti, via Matt Petersen, and Gene Seroka.
        - ACTION ITEM: GNA to post meeting summary on website
            - GNA updated the Committee that the monthly meeting summaries and recommendations have been added to the Port's website, per the directives from the October meeting: https://www.portoflosangeles.org/environment/progress/advisors/

2. **Update from POLA**
    - Doane Liu informed the Committee that the Port just surpassed the western hemisphere cargo volume record.
    - Chris Cannon provided an update on the CAAP Discussion Document and the current public comment period.

3. **Update on previous recommendations**

- **ZE top handlers**
    - The Port of LA submitted an application to the CEC to fund the cost of two (2) electric top handlers.
    - The Committee discussed that there are other applications being submitted for similar projects in the Ports and that there is a need to have a central location where zero emission truck and CHE projects can be tracked, including existing and proposed.
        - ACTION ITEM: GNA to add page on Sustainable Progress site with tracker of proposals submitted to fund new, clean equipment with a tracker of applications that are proposed, awarded and under construction.

- **ZE trucks**
    - BYD remains interested in a 100 unit project deployment and will potentially be helping to pull together more specific project information to further develop the scope and anticipated costs.

- **Clean Trucks Program**
    - Letter from Mayor Garcetti to advocate for more funding has been drafted and is being reviewed and approved by the Mayor's office.

4. **POLA/LADWP committee recommendation**
    - It was suggested that the recommendation be expanded to include other City department, such as LAWA.
        - ACTION ITEM: Matt to reach out to LAWA to discuss this concept
        - ACTION ITEM: GNA to work with Committee to make suggested edits and circulate to the committee for approval before the February meeting.

5. **CAAP recommendations (prior to the comment period closing)**

- **System Efficiency / HPEC recommendation**
    - The Committee discussed strengthening the zero emission requirements and adding language on the project providing a net environmental health benefit
    - The Committee also discussed whether the facility will fall into the CAAP 2.0 policy. It was confirmed that it will because it is on port property.
    - Specific edits to the draft recommendation were discussed but an approval was not made.

- ACTION ITEM: GNA to work with Committee to make suggested edits and circulate to the committee for approval before the February meeting.
- Jonathan Rosenthal will recuse himself from the vote.

- **Clean Truck Program Acceleration Recommendation 2.0 (2023 near-zero requirement)**
  - The Committee discussed several elements of the draft recommendation, including the importance of phasing in a low emission truck requirement and not turning over the fleet in a single year. It was also discussed that it is important to have multiple products available from multiple manufacturers.
  - The above edits to the draft recommendation were discussed and will be included in the draft recommendation before it is recirculated for approval.
    - ACTION ITEM: GNA to work with Committee to include suggested edits in the draft and recirculate to the committee for approval before the February meeting.
  - An additional recommendation was discussed to encourage the collaboration of west coast ports coming together to show purchasing power to OEMs.
  - Michael S. informed the Committee about a recent request for information (RFI) that the Cities of Los Angeles, San Francisco, Portland and Seattle have developed to request feedback from qualified OEMs and upfitters that will assist in conducting a market survey regarding electrified transportation and port equipment.
    - ACTION ITEM: GNA to coordinate with the Mayor's office to model this recommendation off the City's recent EV RFI

- **Cargo handling equipment recommendation**
  - PMSA gave a presentation on costs of CHE. (See attachment C)
  - The Committee discussed the costs of full electrification and whether or not it is a feasible pathway. Alternative potential pathways were discussed by the group.
  - A recommendation was not reached. Discussion among the Committee will continue with an anticipated recommendation to come at the February meeting.

- ACTION ITEM: GNA to help facilitate a separate meeting to discuss this item in more detail with interested Committee members prior to the February meeting

- **Technology options and approaches for marine emission reductions**
  - Chris Cannon gave a presentation on currently available marine emission control technologies. (presentation included at Attachment D)
  - Presentation included a discussion on prioritizing efficiency projects for ships and terminals, land based capture systems, and after treatment scrubber technologies.
  - The Committee agreed to work towards a recommendation on marine at the February meeting.

- **Rail/locomotives**
  - Due to time constraints, this topic was not discussed and will be discussed at a future meeting.

6. **Agenda planning for February meeting**
   - The following topics are anticipated to be on the agenda for the Committee's February meeting:
     - CHE recommendation
     - Marine recommendation
     - Rail / locomotives recommendation
     - LADWP presentation on electrification infrastructure
     - Inland ports

Attachment A

Meeting Attendees

COMMITTEE MEMBERS

Michele Grubbs	Vice President, Pacific Merchant Shipping Association
Joe Lyou	President & CEO, Coalition for Clean Air & Governor's Appointee to the SCAQMD Governing Board
Adrian Martinez	Staff Attorney, Earthjustice
Cynthia Marvin (via phone conference)	Division Chief, California Air Resources Board
Matt Miyasato	Deputy Executive Officer, Science and Technology Advancement, SCAQMD
Peter Peyton	Former President, ILWU Marine Clerks Association of Los Angeles & Long Beach
Jonathan Rosenthal	Co-Portfolio Manager, Saybrook Capital
Elizabeth Warren	Executive Director, FuturePorts
Thomas Jelenic	Vice President, Pacific Merchant Shipping Association

CITY OF LOS ANGELES

Matt Petersen	Sustainability Officer, City of Los Angeles Mayor's Office
Michael Samulon	Policy Analyst, Sustainability Office, City of Los Angeles Mayor's Office

PORT OF LOS ANGELES & CONSULTANTS

Doane Liu	Port of Los Angeles
Chris Canon	Port of Los Angeles
Andrew Scott	Port of Los Angeles
Tim DeMoss	Port of Los Angeles
Erick Martell	Port of Los Angeles
Erik Neandross	GNA
Patrick Couch (via phone conference)	GNA
Alexis Wiley	GNA
Bruce Anderson	Starcrest Consulting (POLA contractor)

Attachment B

Sustainable Freight Advisory Committee
January 26th | 11 am – 3 pm
Meeting Agenda

1. Review and approve meeting summary from December meeting – 5 mins

2. Update from POLA – 5 mins

3. Update on previous recommendations – 20 mins
    a. ZE top handlers
    b. ZE trucks
    c. Clean Trucks Program

4. POLA/LADWP committee recommendation – 20 mins

5. CAAP recommendations (prior to the comment period closing) – 60 mins

    a. System Efficiency HPEC recommendation

    b. Clean Truck Program Acceleration Recommendation 2.0 (2023 near-zero requirement)

    c. Cargo handling equipment recommendation

    d. Technology options and approaches for marine emission reductions
        i. Presentation on marine emission control technologies (Chris Cannon)

    e. Rail/locomotives

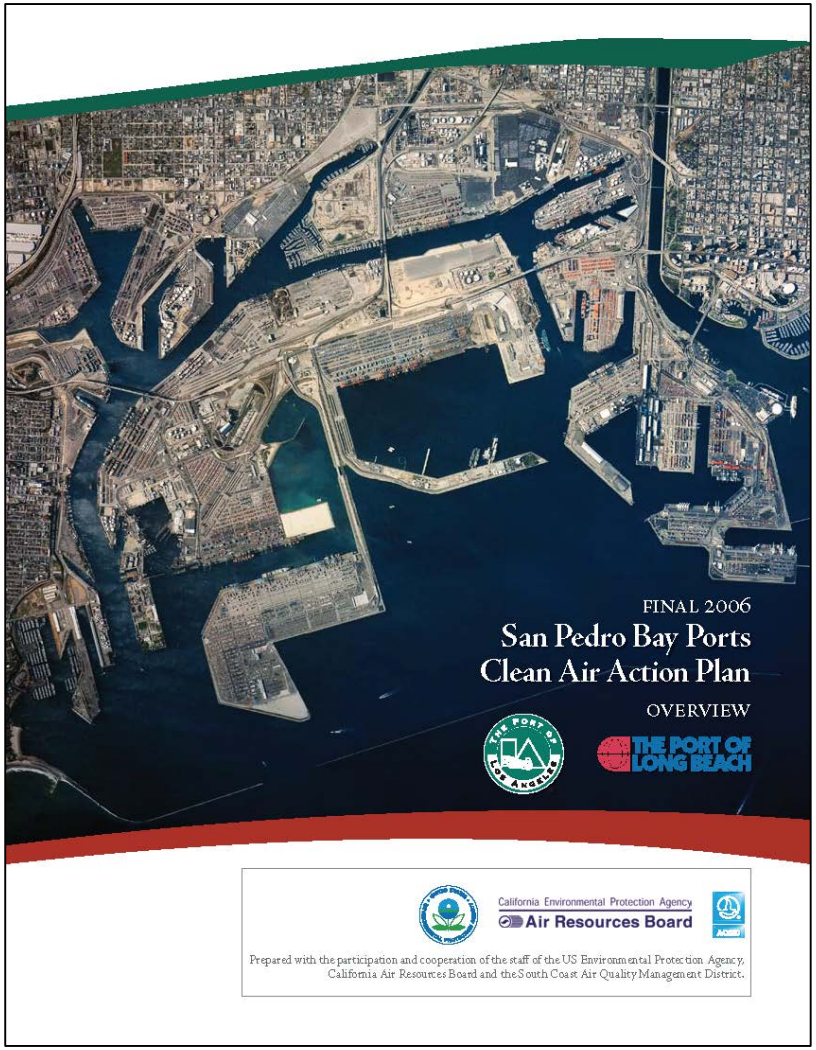
6. Agenda planning for February meeting – 10 mins

7. Next quarterly environmental open house – 5 mins
    January 9th at 6pm
    Bateman Hall (11331 Ernestine Ave., Lynwood, CA 90262)

Attachment C

PMSA

PACIFIC MERCHANT SHIPPING ASSOCIATION



"The Clean Air Action Plan is designed to develop mitigation measures and incentive programs necessary to reduce air emission and health risks while allowing port development to continue."

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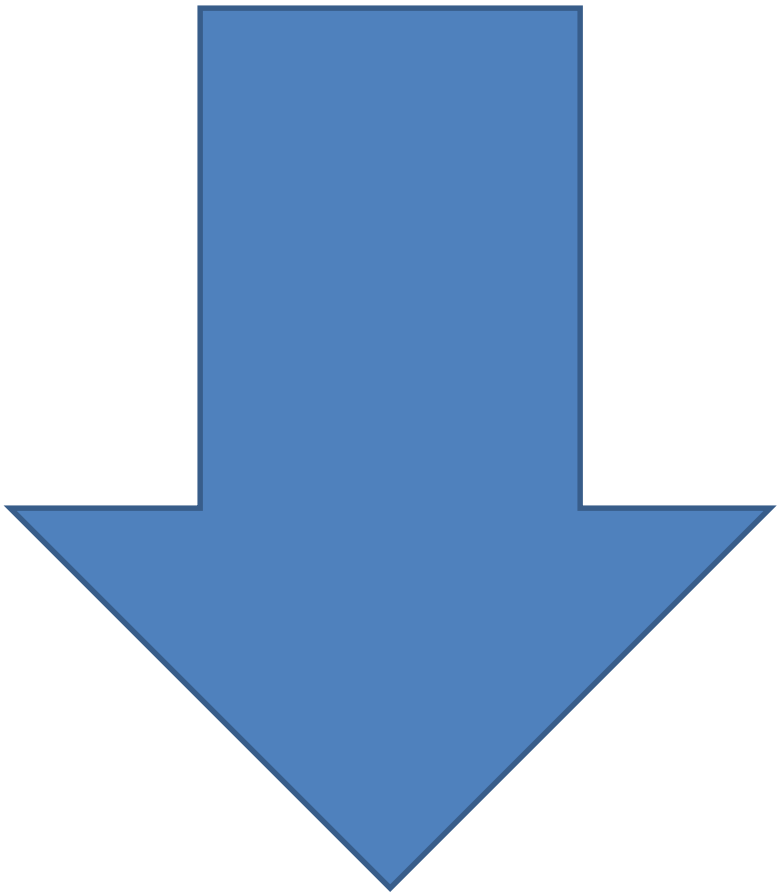
Great Progress on Improving Air Quality

DPM	85%
NO_x	51%
SO_x	97%



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But…

No Growth
&
Lost Market Share

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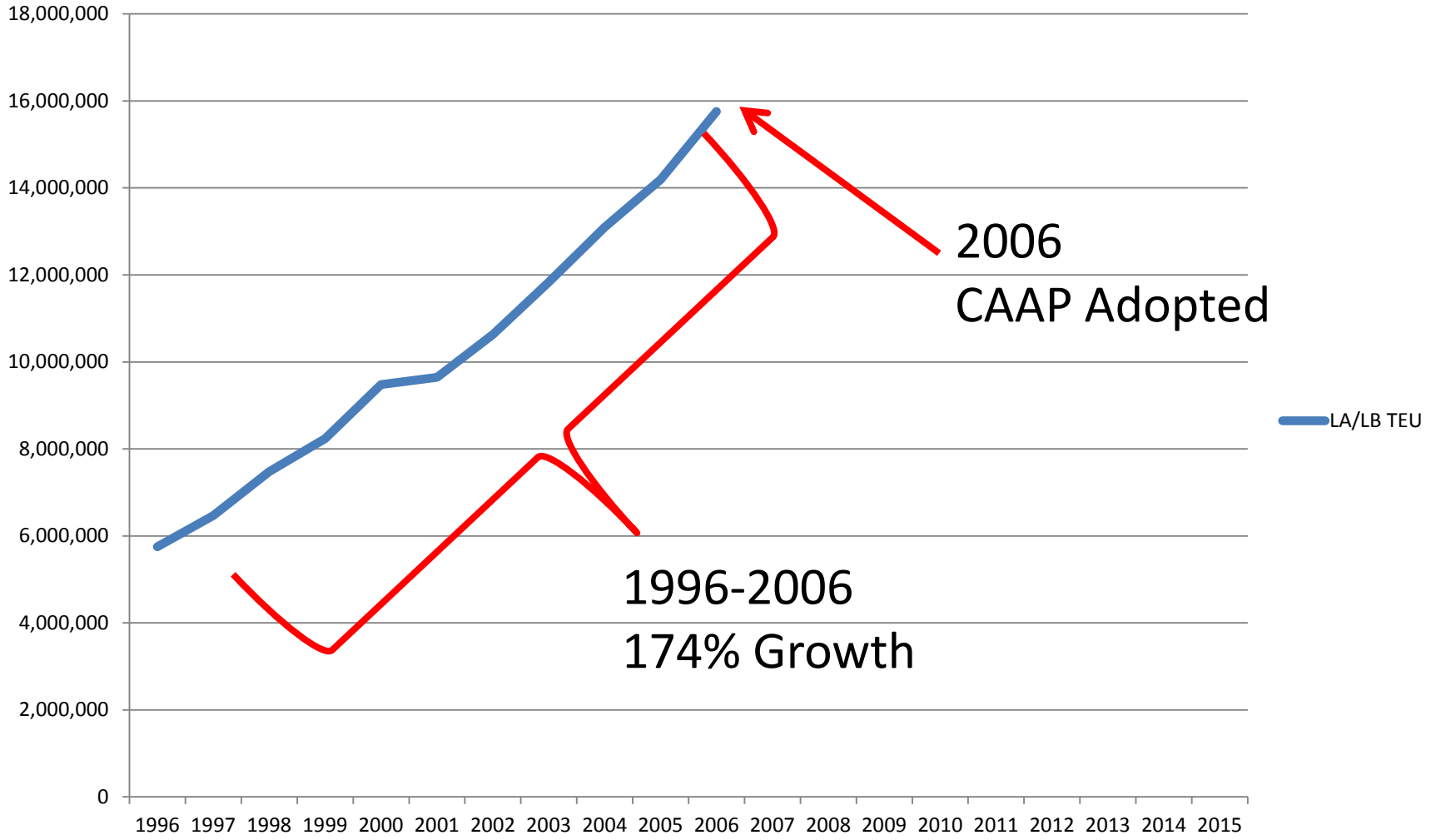
Growth Before the CAAP



Source: Port of Los Angeles
Port of Long Beach

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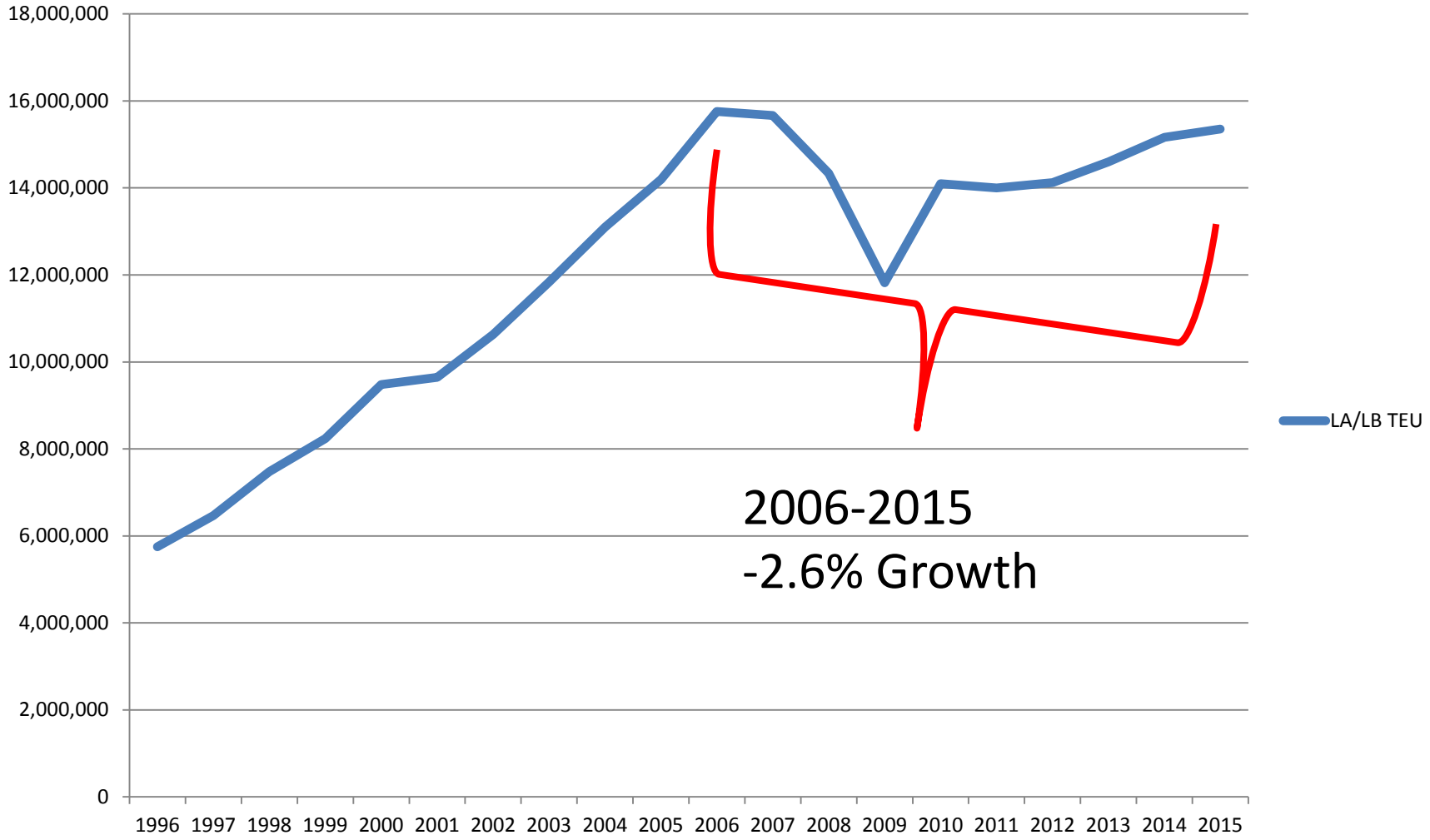
Growth Since the CAAP



Source: Port of Los Angeles
Port of Long Beach

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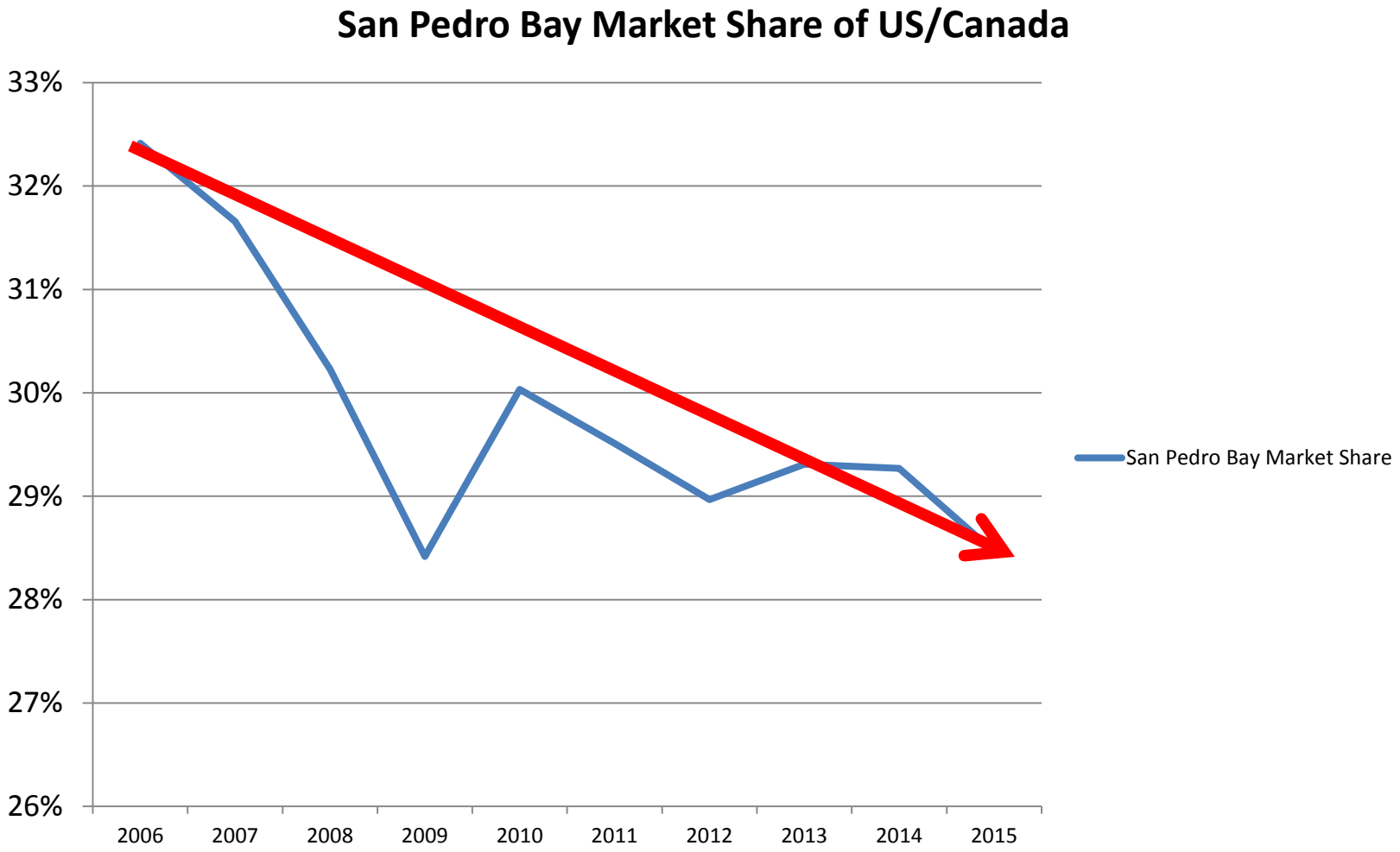
Lost Market Share



Source: AAPA
Port of Los Angeles
Port of Long Beach

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2.1 Million TEU lost
How many lost jobs?
How much lost economic impact?

Photo courtesy of the Port of Los Angeles

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Our members support the transition to zero and near-zero technologies

Photo courtesy of the Port of Long Beach

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Transition to ZE/NZE will cost terminals $19 Billion to $29 Billion

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The ports must increase competitiveness

Photo courtesy of the Port of Long Beach

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CALIFORNIA SUSTAINABLE FREIGHT ACTION PLAN

"to improve freight efficiency, transition to zero-emission technologies, and *increase competitiveness* of California's freight system"

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CAAP must be linked to growth & competitiveness

- Analyze the CAAP for its impact on competitiveness
- Develop a Competitiveness Action Plan

Photo courtesy of the Port of Long Beach

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Attachment D

Ship Emissions Reduction Strategies

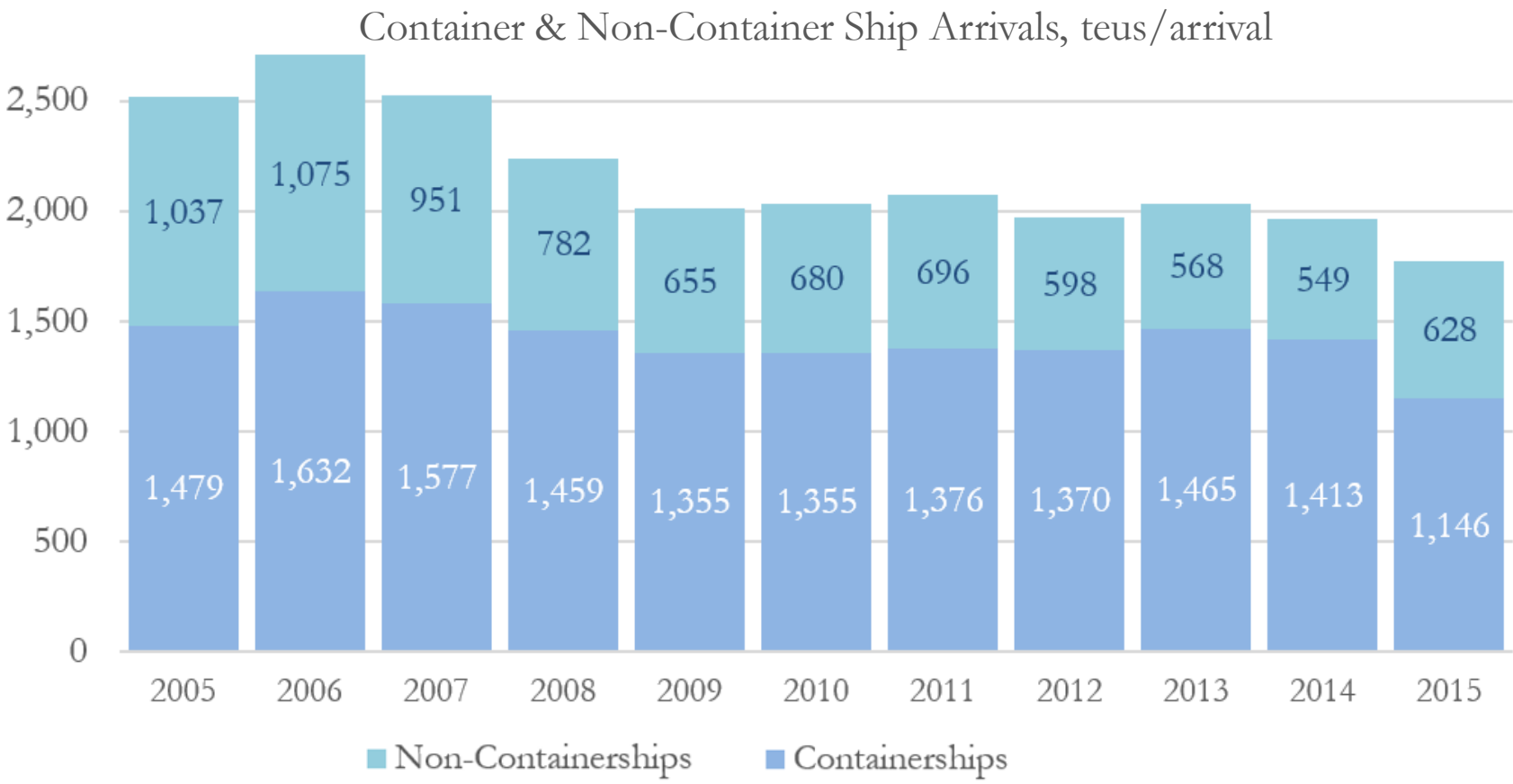
Ship Emissions 101

- Ship Groups
  - ✓ Container
  - ✓ Non-Container
- Emissions Sources
  - ✓ Propulsion engines
  - ✓ Auxiliary engines
  - ✓ Auxiliary boilers
- Operational Modes
  - ✓ Transit
  - ✓ Maneuvering
  - ✓ At-Berth
  - ✓ At-Anchorage

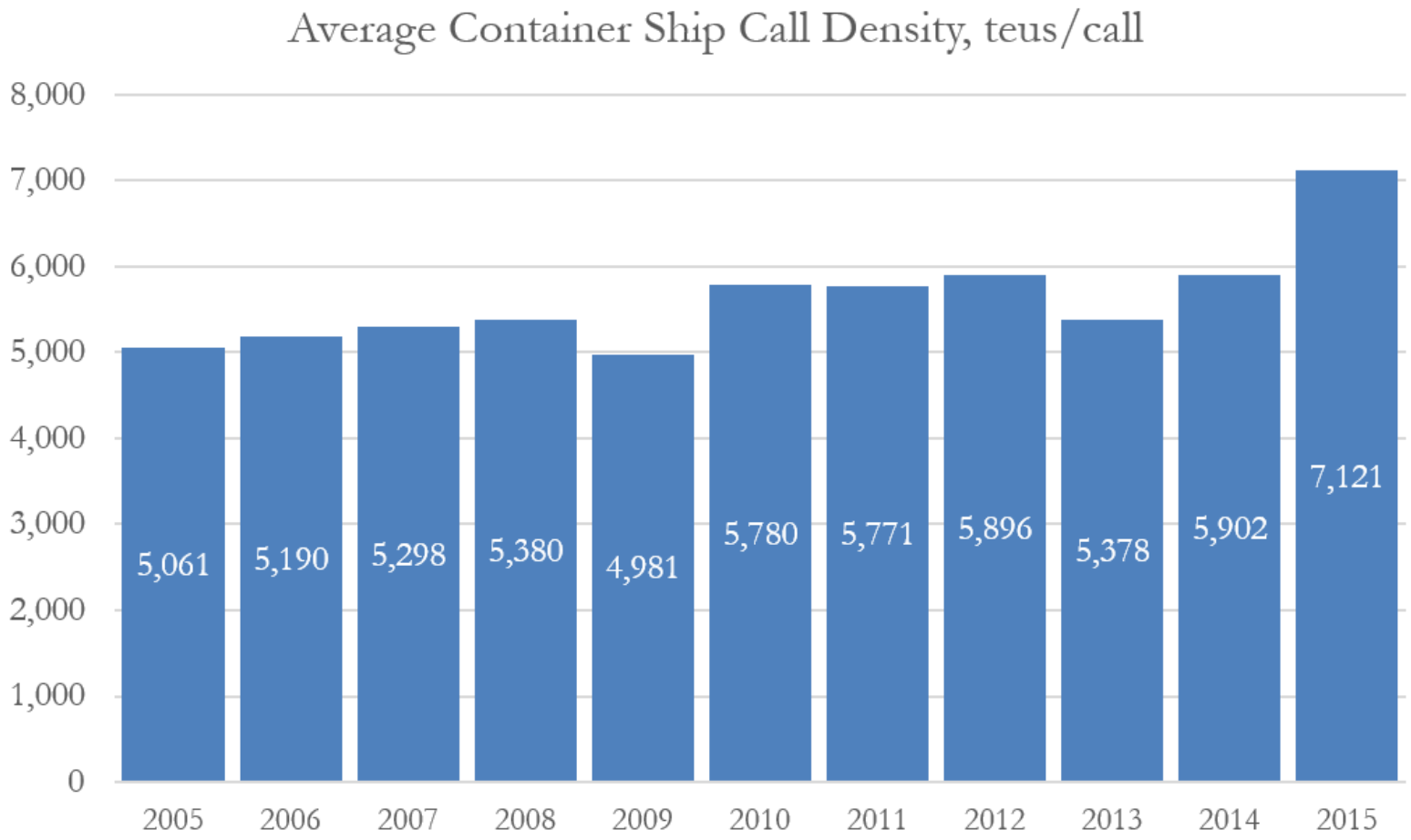
What are the Reduction Strategies?

- Ship-Based Technologies
  - ✓ Engine & boiler technologies – exhaust gas recirculation, de-rating, IMO Tier 3, etc.
  - ✓ After-treatment – scrubbers, SCRs, etc.
  - ✓ Energy – alternative fuels, shore power, etc.
- NonShip-Based Technologies
  - ✓ Barge-based after-treatment technologies
  - ✓ Land-based after-treatment technologies
- Efficiency-Based
  - ✓ Operational efficiencies – VSR, reduced time at-berth or anchorage, larger cleaner ships, etc.

Efficiency Improvements



Efficiency Improvements



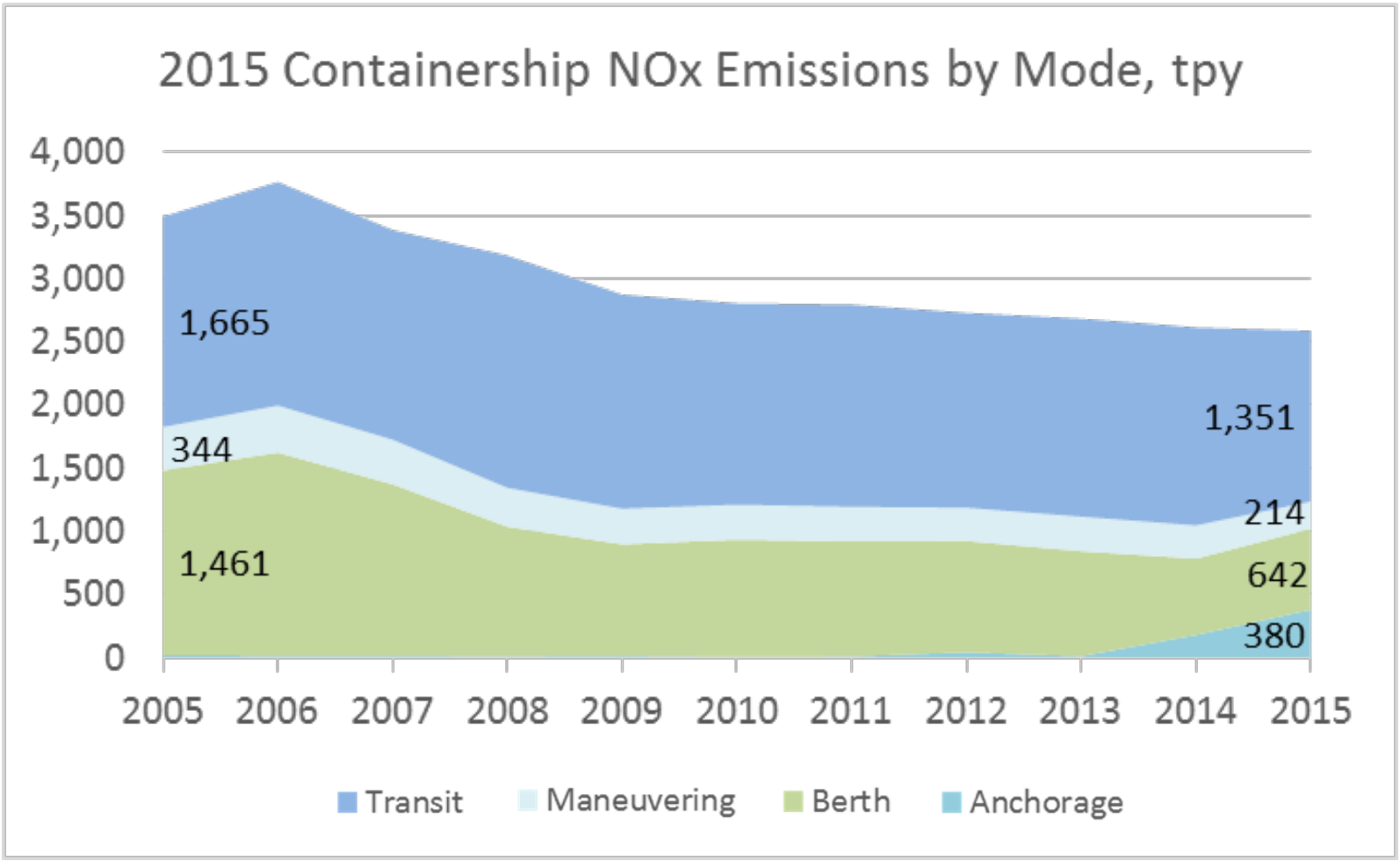
What are we Currently Doing?

- Transit Emissions Reduction Strategies
  - ✓ CARB/ECA - 0.1% S fuels & IMO Tier 3
  - ✓ Vessel Speed Reduction (VSR)
  - ✓ Environmental Ship Index (ESI)

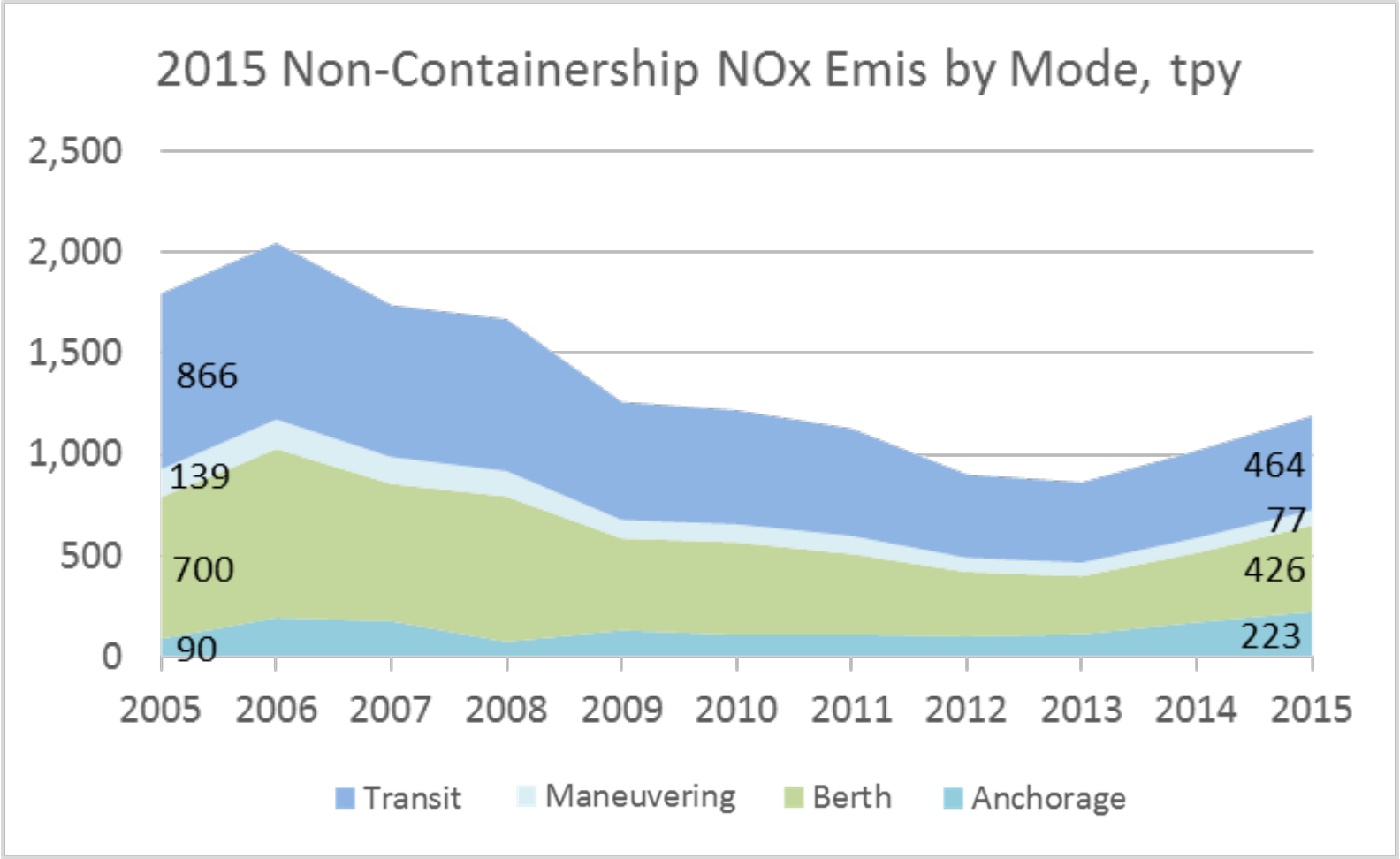
- At-Berth Emissions Reduction Strategies
  - ✓ CARB/ECA - 0.1% S fuels & IMO Tier 3
  - ✓ CARB shore power regulation
  - ✓ ESI

- Fleet Efficiency Improvements

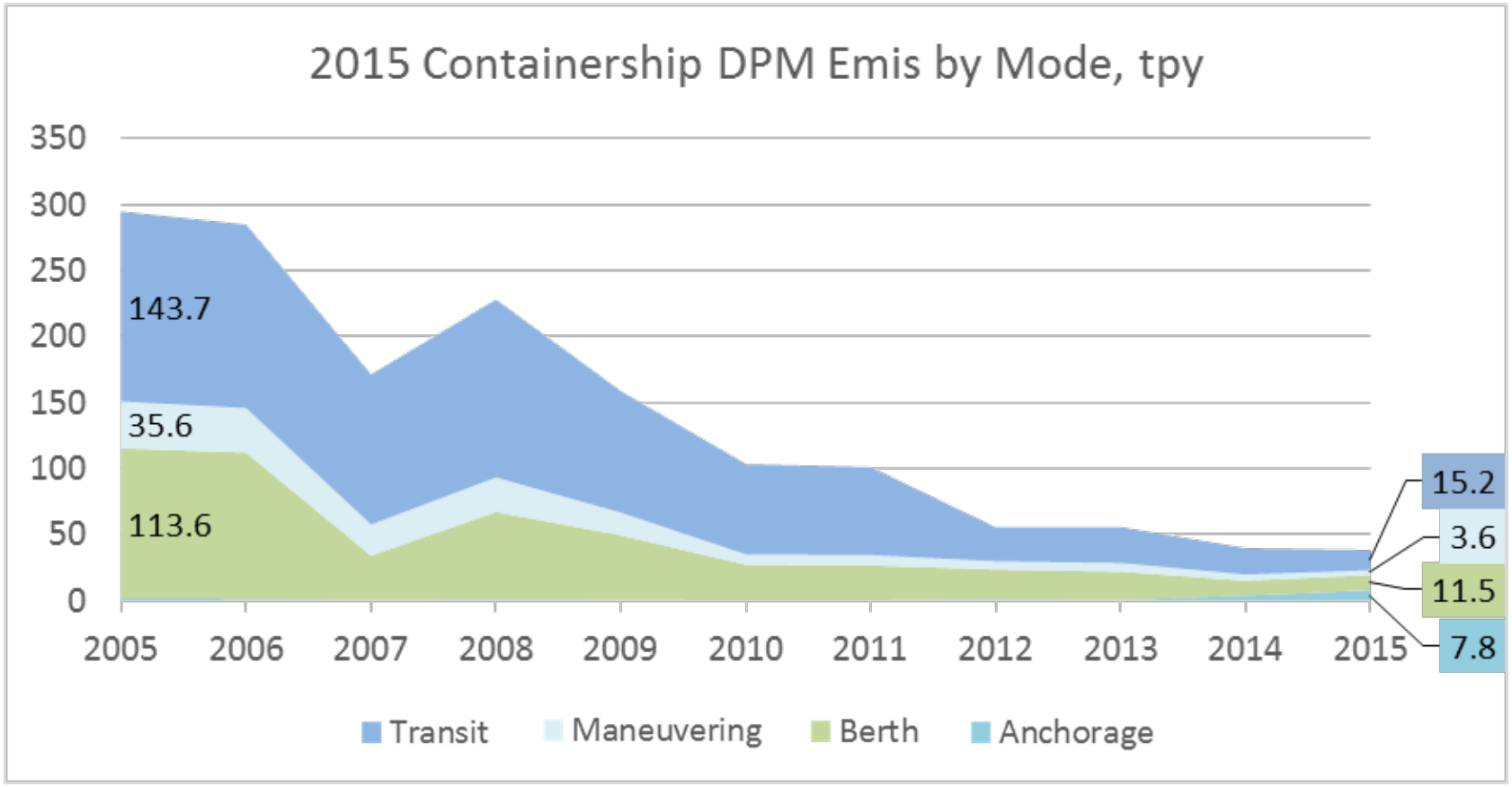
Containership NOx Trends



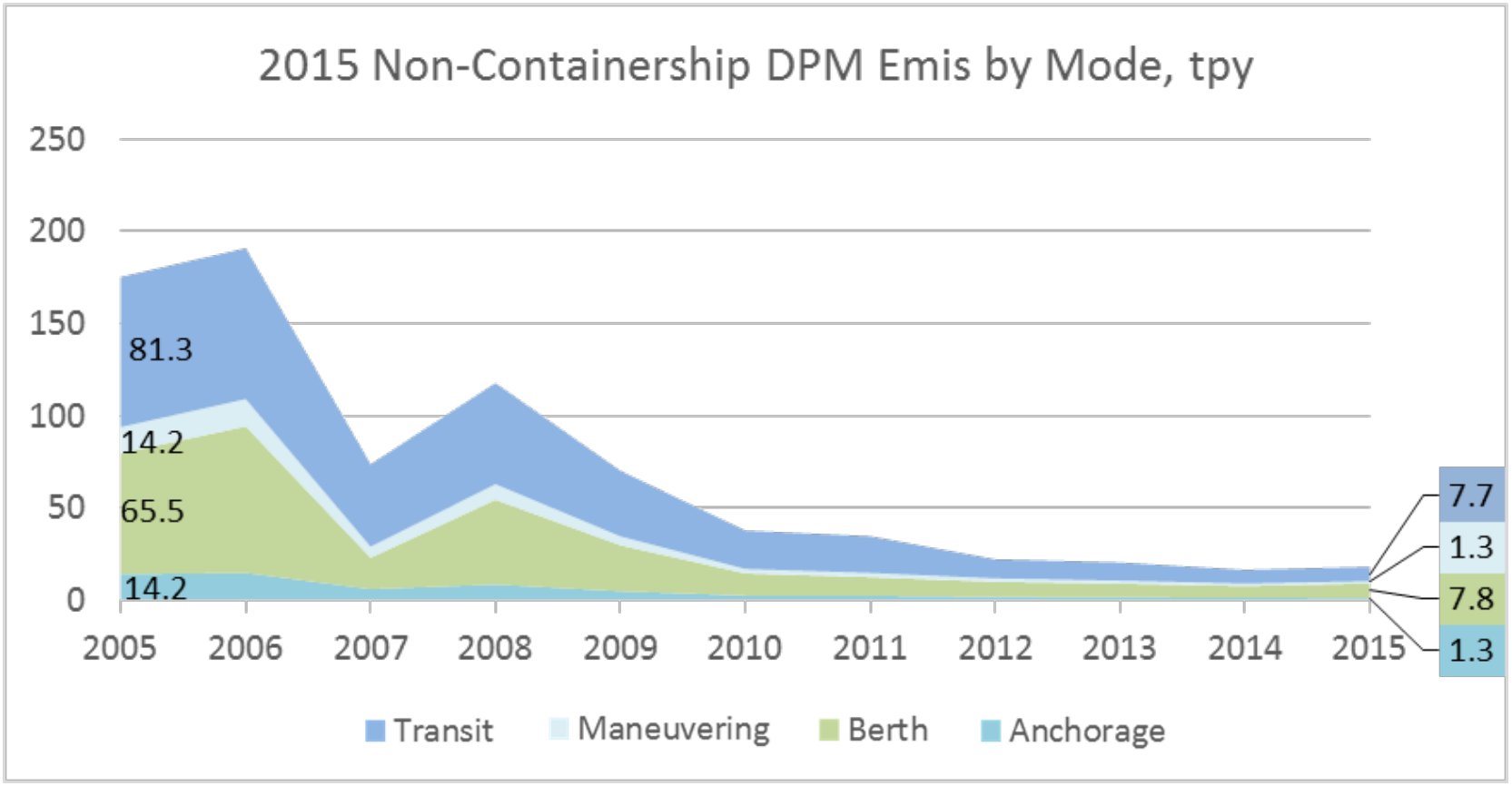
Non-Containership NOx Trends



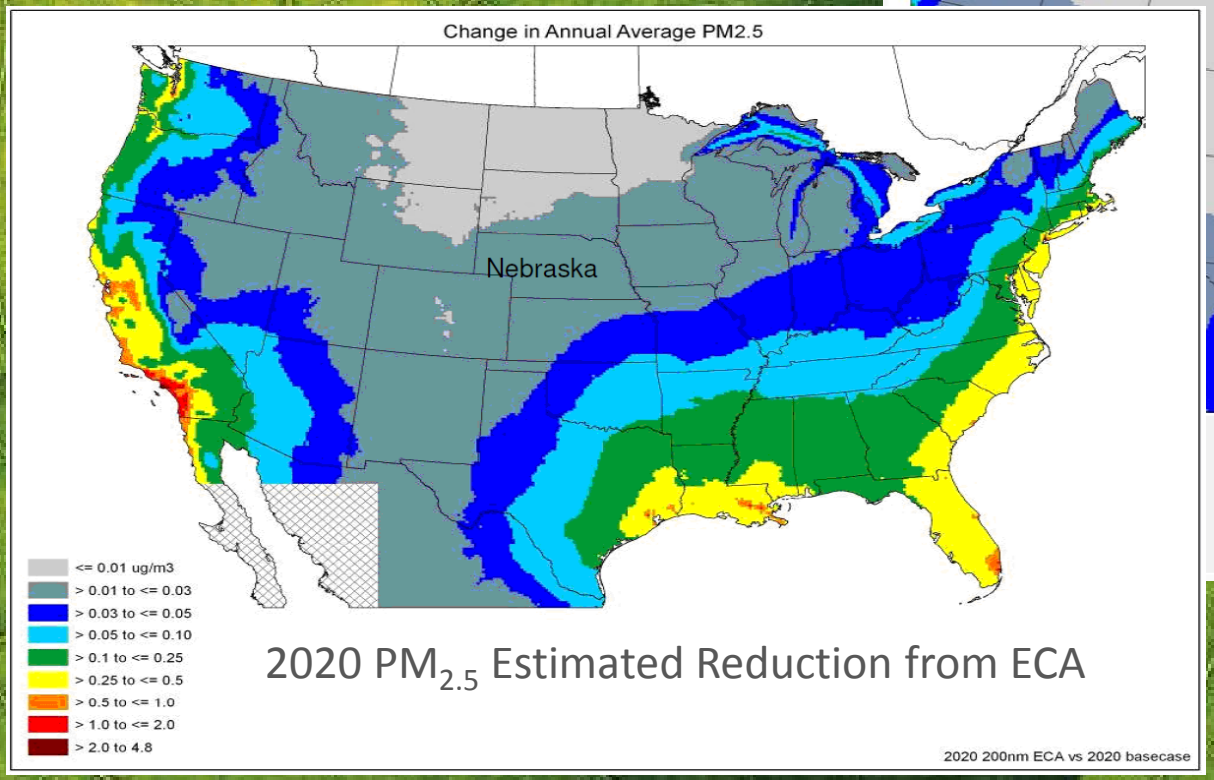
Containership DPM Trends



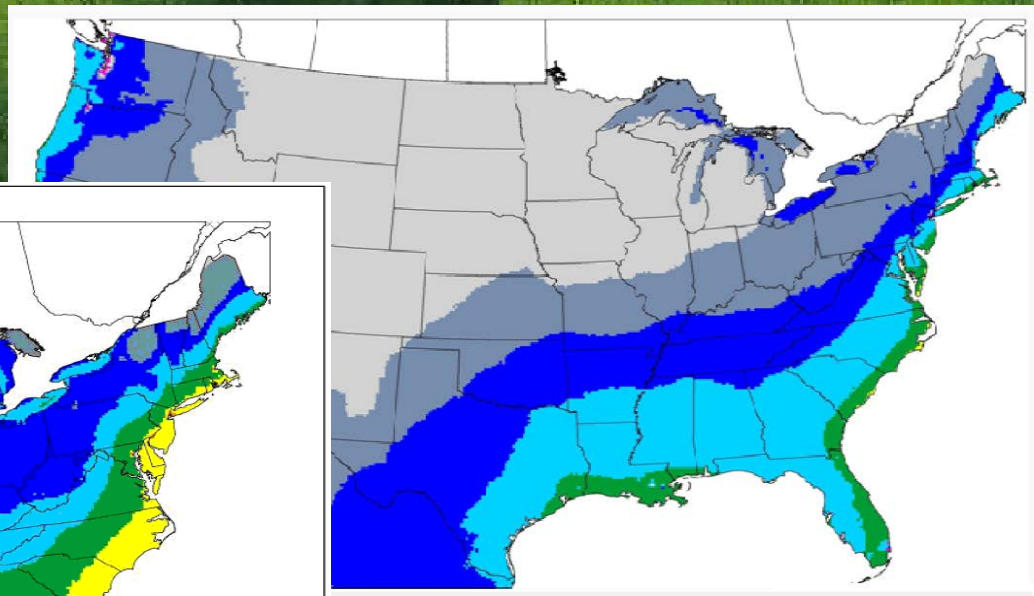
Non-Containership DPM Trends



Still Need to do More?



2020 $PM_{2.5}$ Estimated Reduction from ECA



2020 Ozone Estimated Reduction from ECA

How do we get to the Next Level?

- Transit Emissions Reduction Strategies
  - ✓ Ship-based strategies - scrubbers
- At-Berth Emissions Reduction Strategies
  - ✓ Shore & barge-based systems
- Fleet Efficiency Improvements
  - ✓ Optimization of operations

Scrubber 101

- Dry Scrubbers
- Wet Scrubber Types
  - ✓ Open Loop
  - ✓ Closed Loop
  - ✓ Hybrid
- Emissions Reduced
  - ✓ SOx 98% PM 80% NOx 5%
- Emissions Controlled
  - ✓ Transit (all)
  - ✓ At-Berth & At-Anchorage
- Projected Scrubber Penetration
  - ✓ IMO 2020 Global Fuel Cap
  - ✓ IMO MEPC 70/INF.6
    - 3.8k by 2020
    - Max 3k ships could be retrofitted annually

AEC MARITIME

ALFA LAVAL

DUPONT BELCO®

CLEAN MARINE

CR Ocean Engineering

GREEN TECH MARINE

MAN

MES

SAACKE

WÄRTSILÄ

Scrubber 101

Strengths

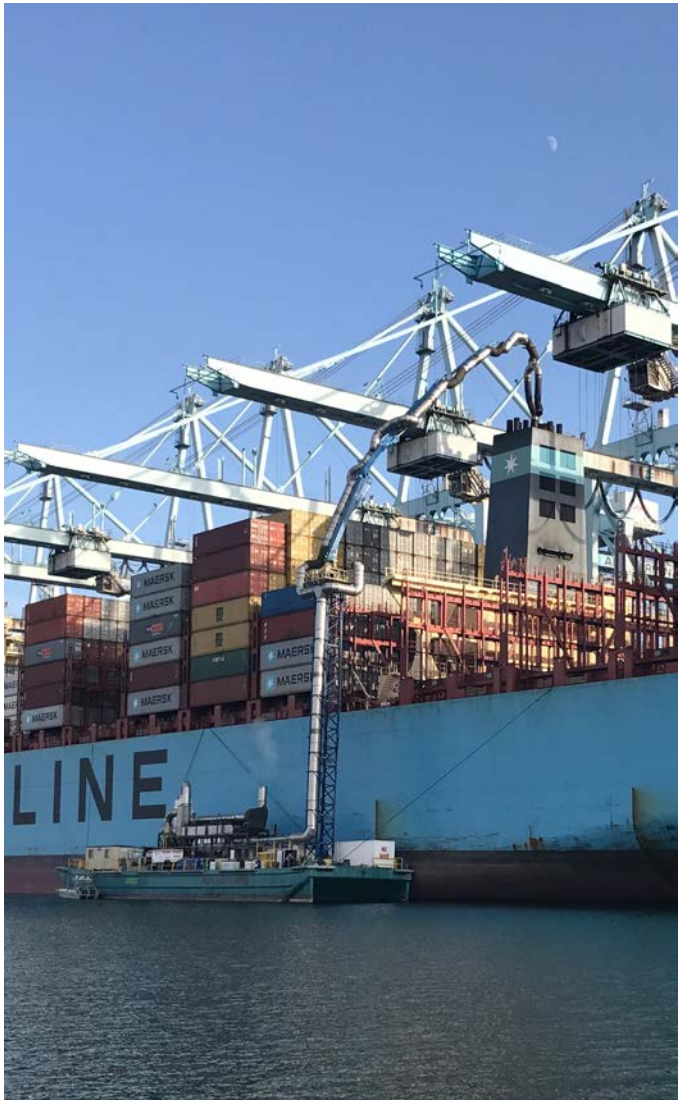
- ✓ IMO 2020 Global Fuel Cap will increase installations
- ✓ Significant PM & SOx reductions
- ✓ Reduces transit, at-berth, & at-anchorage emissions
- ✓ No extra at-berth infrastructure needs
- ✓ Operationally unobtrusive once installed

Limitations

- ✓ No significant NOx reductions
- ✓ Waste stream disposal
- ✓ High retrofit costs per ship
- ✓ Not cost effective for smaller ships
- ✓ High uncertainty on number of ships calling each year equipped with scrubbers
- ✓ Might need CARB verification of emissions reduction levels

Barge-Based Capture Systems 101

- Barge-Based Systems
  - ✓ AMECS - ACTI
  - ✓ METS-1 - CAEM
- Emissions Reduced
  - ✓ NOx 72-80%
  - ✓ PM 76-86%
- Emissions Controlled
  - ✓ At-Berth (one to two engines)
- Projected Penetration
  - ✓ Currently two systems
  - ✓ Third company coming



Barge-Based Capture Systems 101

Strengths

- ✓ Certified alternative to CARB shorepower regulation
- ✓ 72-86% reductions for NOx & PM
- ✓ Does not require ship-board infrastructure
- ✓ Could apply to most vessel types
- ✓ No extra at-berth infrastructure needs
- ✓ Potentially able to reduce anchorage emissions

Limitations

- ✓ Only reduces at-berth auxiliary engine emissions
- ✓ Barge systems very expensive
- ✓ Potential operational & navigation limitations
- ✓ Safety issues with some vessel types
- ✓ Only CARB verified for specific range of containerships
- ✓ Will need CARB verification for each vessel class
- ✓ Limited industry acceptance
- ✓ Labor intensive
- ✓ Vessels cannot bunker
- ✓ Waste stream disposal

Shorepower 101

- Emissions Reduced
  - ✓ All pollutants reduced to zero at ship while plugged in
  - ✓ Total GHG reduction depends on grid makeup
- Emissions Controlled
  - ✓ At-Berth (all engines)
  - ✓ Does not control auxiliary boiler emissions
- Projected Penetration
  - ✓ CARB shorepower rule
  - ✓ 2018 – 80% of regulated fleets (container, reefer, & cruise)

Shorepower 101

Strengths

- ✓ CARB shorepower regulation
- ✓ Zero emissions at ship when plugged in
- ✓ International standards
- ✓ Once infrastructure is in place, generally easy to operate
- ✓ Shore-side infrastructure has long life
- ✓ Ships can bunker while connected

Limitations

- ✓ Only reduces at-berth auxiliary engine emissions
- ✓ Most expensive reduction strategy ranging: $0.75-$2M/ship & $7-$29M/berth
- ✓ Requires a high number of ships to be retrofitted
- ✓ Only mandated in CA
- ✓ Vault locations limits where ships can berth
- ✓ Not cost effective for non-liner services (tramp/spot)
- ✓ Stranded assets syndrome
- ✓ Does reduce emissions during connect/disconnect
- ✓ Moderate labor required
- ✓ Expensive onboard maintenance

Summary & Conclusions

- No 'Silver Bullet'
  - ✓ Solution based on numerous variables – Which emissions? Which mode(s)? Which emission sources? Ship-based or non-ship-based?
- Currently implementing the most rigorous ship measures at any port
- Ultimately best solution is for new clean IMO Tier 3 fleet
  - ✓ We don't think this will happen until the late 2030s to mid 2040s
- Looking forward – What can we do until the fleet is turned over?
  - ✓ Continue current measures including VSR, shorepower, fuel switching, ESI, etc.
  - ✓ Optimize operational efficiencies both ship and terminal side
  - ✓ From a port perspective, land-based capture systems where applicable would be better solution than barge-based
  - ✓ Barge-based systems good for plugging holes when shorepower or land-based systems are not available
  - ✓ Track scrubber & other (SCR, engine and scrubber mods) after treatment technology uptake