



Sustainable Supply Chain Advisory Committee

January Meeting Summary

Date: January 29th, 2020 | 11:00 am – 3:00 pm

Location: In-person at Port of Long Beach and via phone conference

Attendees: Attachment A

Meeting Agenda: Attachment B

Meeting Agenda

1. POLA/POLB Opening Remarks
 - a. Rick Cameron and Chris Cannon summarized key takeaways from the State of the Port events held in January 2020, and noted that collaborating on operational efficiencies while achieving a healthy business environment across the port complex is an important next step in each Port's work under the Clean Air Action Plan (CAAP).
2. Review & Finalize November Meeting Summary
 - a. The Committee advised that a key point from a fleet representative at the November Truck Stakeholder Roundtable was not included. The following statement has been added to the November meeting summary (Attachment C):
 - i. "It was suggested by the drayage fleet operators in attendance that the Ports should set a performance standard for industry to meet, and the drayage truck market will find a way to meet the standard. If the Ports set the standard at 0.02g/bhp-hr NOx, industry will make investment to deploy the trucks as the technology is commercially available and viable. It was also noted that removing the fee waiver for near-zero emission technology prematurely will have an impact on the ability of the market to invest in this technology, as well as truck resale values."
3. Updates on:
 - a. Approve 2020 Meeting Dates
 - i. 3/18 or 3/25 @ 11:30-3:30 (Los Angeles*)
 1. **The Committee agreed to meet on March 18th.**
 - ii. 5/20 (Los Angeles)
 - iii. 7/15 (Long Beach)
 - iv. 9/16 (Los Angeles)
 - v. 11/18 (Long Beach)
 - vi. **The Committee approved all proposed meeting dates from May through November 2020.**
 - b. Letter to Sacramento
 - i. In response to the Committee's prior request to send a letter advocating for dedicated funding for port equipment demonstrations and deployments to

legislators in Sacramento, GNA advised that this letter has been prepared and is in the final stages of review with a small sub-Committee.

- ii. The Committee noted that Governor Newsom's budget, released on January 10th, included a deep reduction in dedicated funding for heavy-duty technologies, and advised that it is important for the Committee's voice to be heard on this issue. Committee members acknowledged that the San Pedro Bay Ports are often overlooked for funding due to their relative success in terms of traffic volume. Rick Cameron (POLB) suggested that collaborating with the California Association of Port Authorities on current and future legislative efforts could enhance the Committee's reach and impact. Erick Martell noted that February 19th is Ports Day in Sacramento, providing a meaningful opportunity for the Committee's voice to be heard.
- iii. GNA will update the Committee when the letter was prepared to send to Sacramento, following guidance from Port government relations teams.

c. Committee Website

- i. GNA updated the Committee that is communicating with the Port of Long Beach's website team to assemble the materials and layout for the Committee's website. The updated website is expected to go live in the next couple of weeks.

d. Members

- i. GNA notified the Committee that CARB's recently-appointed Transportation and Toxics Division Chief, Heather Arias, would be officially joining as a Committee member. She is replacing Cynthia Marvin, who previously held this position on the Committee.
- ii. The Committee was also notified that Jerilyn Mendoza, who represented the Coalition for Clean Air (CCA) alongside Dr. Joe Lyou, has taken a position elsewhere and so will not continue to participate on the Committee.

4. Report on Progress against Committee Recommendations (POLA)

- a. Chris Cannon presented a summary of the Ports' work to date that directly responds to the 13 recommendations that the Committee has approved since its inception in 2016 (Attachment D). These recommendations have been developed to guide the Ports' efforts to achieve the goals of the CAAP. The Committee remarked on several points made over the course of the presentation.
 - i. Demonstration projects for cargo handling equipment and drayage trucks offer significant value to the Ports, terminal operators, manufacturers, and port workers by providing an opportunity to refine the technology to suit operational requirements as well as prepare sites for new equipment needs. However, the Committee noted that several recommendations identify a need for more demonstration funding to support large scale projects and stimulate infrastructure development. Funding and scoping these projects has been difficult due to a lack of volume availability from manufacturers, however the Committee and Ports agreed that this is shifting.
 - ii. The Committee advised that the Ports should position themselves to capture upcoming funding opportunities, and, to advocate for funding programs scoped to support 50-100 truck deployments with infrastructure. CARB and CEC are coordinating on a potential joint \$40M program (\$20M/agency) for two 50 ZE truck pilot projects; it was recommended that CEC Commissioner Patty Monahan be invited to the next Committee meeting to talk about this program.

- iii. Permitting delays for charging equipment has hindered the progress of several demonstration projects. While the Ports are working with their utilities and terminal operators to identify infrastructure needs today and in the future, the Committee observed that their experience could be leveraged to produce educational materials to smooth the path of project design and stakeholder engagement for future projects. The Committee also pointed to the value of local government's active support in addressing these hurdles and improving efficiencies.
- iv. **GNA will incorporate a recommendation that the POLA engineering staff and LADWP representatives join a future Committee meeting to provide an update on their joint EV infrastructure planning effort, into planning for a future committee meeting.**
- v. The Ports are engaged in ongoing dialogues with regional stakeholders including utilities, funding agencies, and other California Ports to define strategies for implementing cleaner technologies and infrastructure in a coordinated manner. The Committee emphasized that the gap of natural gas, battery electric and hydrogen fueling infrastructure is regional and cannot be addressed by and for the Port complex alone. The Committee affirmed that it has an opportunity to help convene stakeholders to form a regional response to this gap.
 - 1. **GNA will organize an infrastructure-focus roundtable discussion for a future Committee meeting.**
- b. The Ports suggested that they would present a status update twice a year (January and July). The Committee agreed, and emphasized that the Ports look to the specific targets outlined in recs in order to measure progress.

5. Lunch

6. Debrief – Clean Truck Rate Study & December Workshop (Ports)

- a. Chris Cannon summarized the key points of the clean truck rate study that was presented for a public workshop in December 2019, and the public comments received at that workshop. He noted that the majority response from the public workshop was that the rate is too low at \$10/TEU and would not achieve the program's goal of transitioning the port drayage fleet away from diesel fuel, while input from the cargo industry / business side suggests that the rate is too high. The Ports are currently accepting written comments and plan to propose a rate to their boards in the next two months, for implementation in the fall of 2020. Chris affirmed that their presentation will include a description of what they hope to accomplish with this rate program. Rick Cameron said that they are interested in putting the funds to use in the near term to support a clean truck transition, and are working with Port CFOs to develop a strategy to facilitate near-term action.
 - i. Several of the Committee members articulated a concern that the rate would not effectively drive a transition to cleaner zero and near-zero emission trucks.
 - ii. The Committee recommended that a full description of the expected results, and the desired outcomes of the proposed rate must be presented to the Ports' boards when the rate study and recommended rate is presented to each harbor commission. Mayor Garcetti's office advised that a proposed solution must be as nuanced as the problem, and take into consideration all possible outcomes.

- b. PMSA suggested that the study should look closely at the effect of the rate on truck driver job security as well as cargo diversion, and consider the SPBP's gateway costs relative to other ports in the U.S. PMSA presented a chart it had produced on cargo growth since 2006 and container forecasts since 2000 to illustrate the current diversion rates (Attachment E).
 - c. The Committee pointed out that the proposed rate will not generate sufficient funding to meet truck replacement needs, at the current Port Drayage Truck Registry population and replacement schedule. The Committee questioned the potential disconnect between the anticipated \$90 million per year in port funding and the total number of trucks that need to be replaced.
 - d. There was discussion about the risk of Federal sanctions on the region should the South Coast Air Basin fail to meet its various air quality compliance deadlines; it was also noted that the Federal government has not imposed sanctions for failing to meet air quality attainment deadlines (but it was further clarified, after the fact, that the Federal government does have the authority to impose sanctions for failing to adopt or implement appropriate clean air plans stemming from a failure to attain standards).
 - e. The Committee and Ports agreed that more information would be available in March regarding the rate and CARB's consideration of a Low NOx standard, and that this discussion would be resumed at that time.
 - f. Apart from on-road truck issues, there was discussion about an increased focus on cost-effectiveness as a way to prioritize emission reductions for the port and port region. A recent MTO-led study of cost-effectiveness for hybrid RTG cranes showed a potential for significant near-term emission reductions. However, given the CAAP's call for full ZE by 2030, the MTO is uncertain about making the investment in hybrid technology today given the long asset life of such equipment. **GNA will incorporate the Committee's request for a presentation on the MTO study and recommended further discussions on cost-effectiveness into planning for a future meeting.**
7. Debrief – Truck Stakeholder Roundtable (GNA)
- a. GNA presented the takeaways of the November Truck Stakeholder Roundtable and invited Committee member feedback on particular points (Attachment F). The Committee concurred on the points presented, and noted the following action items.
 - i. Technology Discussion
 - 1. The Committee agreed that the issue of sufficient ZE and NZE fueling infrastructure should be addressed in a future committee meeting. **GNA will therefore coordinate a roundtable discussion, with appropriate external stakeholders, on this topic for the Committee's May meeting.**
 - ii. Financing Discussion
 - 1. The Port of Long Beach shared with the Committee that a recent ground-truthing effort regarding the reported issues with near-zero emission natural gas trucks indicates that the actual issues are fewer than reported, and they are not related to the natural gas engine technology but to other factors related to truck OEM issues, including: starter/key issues; transmission software upgrades; and issues related to some of the trucks having been parked for nearly a year due to grant funding delays. It was confirmed that there are no technical issues related to the near-zero emission natural gas engines and trucks in the harbor, which is consistent with Cummins' input on the other

approximate 4,000 near-zero emission natural gas engines/trucks now running in the U.S.

2. The Committee recommended further discussion of financing strategies once the Ports have taken the proposed Clean Truck Rate to their respective harbor commissions in the coming months. The Ports requested additional discussion and feedback here to inform their development of a \$90 million incentive program, which will be developed and brought to the harbor commissions in the summer 2020. *GNA will coordinate an agenda item on these issues for the Committee's May meeting.*

iii. Define Committee action items, such as:

1. Infrastructure Stakeholder Roundtable
2. *The Committee agreed that it should host a roundtable focusing on Infrastructure in 2020, similar to prior roundtable meetings with truck OEMs and financing companies.*

8. Planning for Committee Activity in 2020

- a. The Committee referred to the recommendations that it has made for each equipment category, including the 2019 Funding Prioritization Recommendation, and identified areas where it could add value through its work in 2020.

i. Trucks

1. Clean Truck Program – Future Stakeholder Meeting 4.0
 - a. Continued discussion of financing challenges for clean trucks is needed once the truck rate is known and the details of the Ports' proposed \$90M funding program begin to be discussed.
2. EV Charging and Hydrogen Fueling Infrastructure – Future committee meeting
 - a. It was agreed that regional infrastructure development and coordination should be a focus of a future Committee meeting and other regional stakeholders should be considered for the roundtable discussion.
3. Zero Emission Truck Demonstrations
 - a. The Committee requested updates on the Toyota and Volvo truck demonstrations happening at the Port in 2020 and 2019.

ii. Marine Vessels

1. CARB At-berth Rule & AMP Alternatives (CARB)
2. Harbor Craft discussion (PMSA)
3. Members of the Committee expressed concern that CARB's proposed at-berth rule will require significant construction costs while removing funding from Harbor Craft technologies. Members of the Committee also commented that they have expressed concerns to CARB during the rule-making process, and will have a more thorough discussion on the opportunities in this equipment category after the CARB at-berth rule-making (expected in March).

iii. CHE

1. Pilot Program updates (Ports; GNA)
 - a. The Port of Long Beach proposed that the Ports discuss with PMSA approaches for improving system efficiencies to understand opportunities for progress in the CHE category.

2. MTO Site Visits or Roundtable

- a. The Committee agreed that a presentation from the MTOs on their equipment demonstrations would be beneficial for understanding new equipment performance from the operator's standpoint.
 - i. GNA will develop this request for a future Committee meeting.

iv. Locomotives

- 1. PHL upgrade
- 2. On-dock rail
 - a. This category would be better addressed later in the 2020 when further information from CARB regarding on-dock rail is expected to be shared.

v. Workforce Development

- 1. The Committee recognized the need for expanded workforce training to support the demonstrations and expected adoption of alternative fuel technologies. They noted that the CEC designates a portion of funding for this effort, and will explore this topic further in the second half of the year when the Committee has a greater understanding of the Clean Truck Program and CHE demonstration equipment performance.

9. Future Agenda Items

- a. Next SSCAC Meeting: **TBD in meeting**
 - i. The Committee will next meet on March 18th, 2020.
- b. Agenda topics:
 - i. Clean Truck Program
 - ii. Truck Infrastructure Roundtable
 - iii. Pilot Projects
 - iv. Port Board Presentation
 - v. Mayoral Participation
 - vi. CARB At-berth Rule update

10. Conclusion & Next Steps

Attachment A

SSCAC Committee Members	
Michele Grubbs	PMSA
Thomas Jelenic	PMSA
Matt Miyasato	SCAQMD
Ray Familathe	ILWU Local 13
Andre Freeman	CARB (by phone)
Joe Lyo	CCA/CTC
Louis Dominguez	San Pedro Neighborhood Council
Adrian Martinez	EarthJustice
Stella Ursua	Grid Alternatives
Marnie Primmer	FuturePorts (by phone)
Los Angeles Port & City Staff	
Chris Cannon	Port of Los Angeles
Max Reyes	City of LA, Mayor's Office
Justin Halegren	City of LA (by phone)
David Reich	City of LA, Mayor's Office
Lauren Faber O'Connor	City of LA, Mayor's Office (by phone)
Michael Samulon	City of LA, Mayor's Office
Long Beach Port & City Staff	
Rick Cameron	Port of Long Beach
Heather Tomley	Port of Long Beach
Justin Ramirez	City of Long Beach, Mayor's Office
Bianca Roman Villanueva	Port of Long Beach
Sam Joumblat	Port of Long Beach
Wei Chi	Port of Long Beach
Meeting Facilitation Staff	
Erik Neandross	GNA
Eleanor Johnstone	GNA
Patrick Couch	GNA
Other Stakeholders	
Zorik Pirveysian	SCAQMD
Bryan Choe	SCAQMD
Jacob Haik	Councilman Joe Buscaino's Office

Attachment B

Meeting Agenda

11. POLA/POLB Opening Remarks
12. Review & Finalize November Meeting Summary
13. Updates on:
 - a. Approve 2020 Meeting Dates
 - i. 3/18 or 3/25 @ 11:30-3:30 (Los Angeles*)
 - ii. 5/20 (Los Angeles)
 - iii. 7/15 (Long Beach)
 - iv. 9/16 (Los Angeles)
 - v. 11/18 (Long Beach)
 - b. Letter to Sacramento
 - c. Committee Website
 - d. Members
14. Report on Progress against Committee Recommendations (POLA)
15. Lunch
16. Debrief – Clean Truck Rate Study & December Workshop (Ports)
17. Debrief – Truck Stakeholder Roundtable (GNA)
 - a. Technology Discussion
 - b. Financing Discussion
 - c. Define Committee action items, such as:
 - i. Infrastructure Stakeholder Roundtable
18. Planning for Committee Activity in 2020
 - a. Trucks
 - i. Clean Truck Program – Stakeholder Meeting 4.0
 - ii. EV Charging and Hydrogen Fueling Infrastructure – Future committee meeting
 - b. Marine Vessels
 - i. CARB At-berth Rule & AMP Alternatives (CARB)
 - ii. Harbor Craft discussion (PMSA)
 - c. CHE
 - i. Pilot Program updates (Ports; GNA)
 - ii. MTO Site Visits or Roundtable
 - d. Locomotives
 - i. PHL upgrade
 - ii. On-dock rail
 - e. Workforce Development
19. Future Agenda Items

- a. Next SSCAC Meeting: **TBD in meeting**
- b. Agenda topics:
 - i. Clean Truck Program
 - ii. Truck Infrastructure Roundtable
 - iii. Pilot Projects
 - iv. Port Board Presentation
 - v. Mayoral Participation
 - vi. CARB At-berth Rule update

20. Conclusion & Next Steps



Attachment C

Sustainable Supply Chain Advisory Committee *November Meeting Summary*

Date: November 20th, 2019 | 10:30 am – 4:30 pm

Location: In-person at Port of Long Beach and via phone conference

Attendees: Attachment A

Meeting Agenda: Attachment B

Overview:

The Ports' Sustainable Supply Chain Advisory Committee (SSCAC) invited heavy-duty truck manufacturers, dealerships, fleet managers, leasing companies, and harbor trucking stakeholders to have an interactive dialogue around the present and future market for zero- and near zero- emission technologies. As the Clean Air Action Plan (CAAP) calls for aggressive measures to drive investment and deployment of near-zero emission technology in the near term (by 2023) and zero emission technology in the longer term (by 2035), the Committee is seeking an understanding of the current and forward landscape for these technologies.

Summary of Discussion:

Following brief introductions from all meeting attendees, the meeting was kicked off by Chris Cannon and Heather Tomley giving a high-level overview of the CAAP and a status update on the ports' definition of a clean truck rate. Lauren Faber O'Connor subsequently gave an overview of key goals for the ports and their relationship to Mayor Eric Garcetti's sustainability plans for the City of Los Angeles, as well as the C40 Cities Climate Leadership Group. Committee members emphasized the importance of acting on this issue as a matter of public health concern, and the need for clearly defined funding sources as well as use of revenues collected through the clean truck rate.

The conversation for the first half of the meeting was organized around near-zero and zero emission technologies, with manufacturers addressing questions about the readiness of natural gas, battery electric and hydrogen fuel cell trucks to meet port drayage truck performance requirements. Production timelines were also discussed in relationship to the Clean Truck Program's series of deadlines for ramping up a clean truck rate. Questions were circulated to meeting participants in advance as thought prompts (see Attachment C). The key points of this discussion are summarized below.

Near Zero-Emission (Natural Gas) Truck Technologies

- The group agreed that near-zero emission technologies are ready and available today, and that the use of renewable natural gas can further reduce GHG emissions. It was also discussed that the technology for diesel to achieve the ultra low NOx standard (generally agreed to be 0.02g/bhp-hr) does not exist today and does not have a clear timeline for achieving commercial and technical feasibility.
- Manufacturers Volvo and Daimler, and dealership representatives from Inland Kenworth and Rush Peterbilt, indicated that after a 4-6 month ramp-up period of their natural gas production process in 2020, they all could build and sell large volumes of natural gas trucks to meet market demand in 2020 and 2021. Even with a ramp-up period in order to scale production, it was noted that 6,000 to 8,000 natural gas trucks could be produced and delivered in 2020, if required. In 2021, there would be no limitation on natural gas production volumes, and additional fueling infrastructure would be built and scaled to meet growing demand.
- Dealerships and fleets observed that natural gas vehicles are not costly to maintain relative to diesel. While first generation natural gas truck / engine technology in 2006-2008 did experience higher levels of maintenance requirements and costs, it was noted that five generations of technology development has occurred over the last 10 plus years. In this process, the technology has continued to mature and today's natural gas engines are much more reliable and perform effectively.
- It was suggested by the drayage fleet operators in attendance that the Ports should set a performance standard for industry to meet, and the drayage truck market will find a way to meet the standard. If the Ports set the standard at 0.02g/bhp-hr NOx, industry will make investment to deploy the trucks as the technology is commercially available and viable. It was also noted that removing the fee waiver for near-zero emission technology prematurely will have an impact on the ability of the market to invest in this technology, as well as truck resale values.

Zero-Emission (Battery Electric & Hydrogen Fuel Cell) Truck Technologies

- The group observed that while several manufacturers have zero-emission vehicles on the road or in final development stages, the technology is not yet commercially ready and those vehicles that are in or near commercial production have not been proven in the port drayage duty cycle.
- Representatives from the port drayage fleets pointed out that just as natural gas truck technology took several generations to test and develop to the point of operational confidence, they anticipate that zero-emission technologies will require a similar maturation process and are thus still several years out from that same point of confidence.
- Demonstration projects were identified as incredibly important, and the group emphasized the need for more and long-term funding commitments to support further development and demonstration in real-world applications. It was noted that if the adoption of a technology is forced at a large scale before going through sufficient testing, demonstration and validation, and it does not perform as needed, major setbacks to the forward adoption of the technology can result. The experience with the 9-liter natural gas engine in port drayage applications was noted as a very applicable example of this point.

- TTSI pointed out that it has not yet seen a vehicle that can provide sufficient range and charging speeds to get the job done. Variations in loads, road grades, and drivers make it difficult to assess if the manufacturer's estimate of range is accurate and appropriate for each unique customer and job.
- Manufacturers Volvo and BYD (which has two class 8 tractors in commercial production today) said that they are preparing to scale up production in the next year or so. BYD indicated it aims to be ready to meet demand, while Volvo cautioned that its VNR truck is spec'd to each customers' needs and is not exclusively for the port drayage duty cycle. Volvo is committed to putting its trucks on the road by the end of 2020 for its Volvo LIGHTS project but observed that production volumes will remain limited until infrastructure solutions become more clearly defined for the customer.
- Nikola plans to have its production plant in Phoenix up and running in 2023 with an initial production volume of 5,000 units, ramping up to 35,000 by 2028; the company is seeking alternative production solutions to deliver units before 2023. Nikola indicated that its current sold-out status does not necessarily affect its ability to serve the LA and Long Beach drayage market.
- Zero emission fueling infrastructure was identified by all stakeholders as a critical issue around which clarity is lacking. The timeline to install a charging solution depends on the size of the power supply at that location, while charging solution selections depend on the relationship between funding, charging standards, and UL listing status. It was also noted that without there being clarity as to the long term forward growth of battery electric and hydrogen fuel cell electric trucks, it is extremely difficult to predict which kind of zero emission fueling infrastructure should be pursued and constructed to facilitate scaled truck deployments in the future.

The second part of the meeting was organized around financing concerns and solutions specific to the port drayage truck market, for both near-zero and zero emission technologies. Questions were circulated to the meeting participants in advance as thought prompts (see Appendix C). The key points of the conversation are described below.

Financing for Near Zero- and Zero- Emission Truck Technologies

- The price tag for new zero-emission trucks remains out of reach for most port truck drivers, particularly those who work as Independent Owner-Operators (IOOs). The group discussed issues around additional price factors such as:
 - High interest rates on leases and loans due to poor or non-existent credit by IOOs and the risk of new technologies;
 - High vehicle license fees due to the DMV's practice of assessing these on the new vehicle's manufacturer-estimated market price by the DMV; and
 - Potentially high costs to fuel if fueling infrastructure needs to be built at a facility, or if charging must occur during peak periods when the electricity price is high.

- Bonds were discussed as an option from the state's Green Bonds program, which offers more security for investors. Municipal, tax-exempt and green bonds were described as options with very little variation between them.
 - The ports' financial representatives described the use of a green bond on the 2007 Clean Truck Program, whereby their backstopping of the bonds eliminated the issue of a default rate. They also noted that only a small number of trucks exhibited issues that led to their defaulting, which was a small fraction of the total number of trucks supported by the program. However, the representatives indicated that they are not ready to conduct a similar program for the current Clean Truck Program because there are still many unknowns and a lack of confidence around the vehicle technology.
 - The group discussed the effect of a high versus low clean truck rate on the revenue that would be generated and available to support a bond program. This discussion considered the macro effect of a high truck rate diverting cargo from the SPBP complex, and a low rate serving as an "annoyance" that prolongs the use of diesel, as well.
- Dealers articulated their concern of being stuck with trucks that can't be sold. As the middleman, they are tasked with selling product but also taking back product that a customer doesn't want and decides to return. The financial risk to the dealership is significant, and it reduces their interest in selling new, unproven technologies with high price tags that require external funding.
- Customer challenges accessing funding were raised as a major concern. In addition to the group's concern that not enough funds are available for current and future deployments, Volvo noted that funds are "all over the place from the customer perspective" with different programs offering different amounts on vehicles and infrastructure. The current scenario of the customer being tasked with pulling enough funding from multiple sources to outfit their fleet for a specific technology prevents the customer from taking the steps for fleet conversion. The group agreed that HVIP is commonly referenced because it is easy to use.
- While some have expressed concerns about having to turn over the port drayage truck fleet two times – once for near-zero emission in the next several years and then again to get to zero emission by 2035 – it was agreed by the group that any truck replaced with a near zero emission natural gas truck in the near term (2020-2025) would be nearing the end of its useful life by approximately 2035, and thus consistent with a normal truck turnover cycle.
- Better understanding the drayage truck rate study that will soon be released by the ports will be critical for the group assembled to having more effective dialogue on the funding and financing of zero and near-zero emission trucks for the drayage truck market.

Attachment D

Port report on Progress against Committee Recommendations



SPBP Sustainable Supply Chain Advisory Committee Recommendations Update



THE PORT
OF LOS ANGELES 

January 27, 2020



SFAC Recommendation List

1. Zero Emission Top Handlers
2. Zero Emission Drayage Trucks
3. Clean Trucks Program Acceleration
4. POLA-LADWP Committee
5. System Efficiency – HPEC
6. Multi-Port Clean Tech Requests for Information (RFI)
7. POLA LED Light Conversion
8. Cargo Handling Equipment
9. Clean Truck Program Acceleration 2.0
10. Prioritize Funding for Clean Technology Deployment at the San Pedro Bay Port Complex
11. Increase Use of On-Dock and Low Emissions Locomotives
12. SPBP – System of Systems
13. SPBP – Funding and Resource Prioritization



1. Zero Emission Top Handlers

“By Dec 31 2016...issue an RFP for the demonstration of zero emission (ZE) top handlers at one or more Port terminals”

- POLA is currently managing a demonstration of 2 ZE top handlers at Everport Marine Terminal
 - Two other projects under development (managed by SCAQMD and the Center for Transportation and the Environment)
- POLB is currently managing a demonstration of 3 ZE Top handler
- These handlers have all been delivered, and are pending final approval of charging infrastructure to begin full demonstrations
- Initial feedback has been very positive



2. Zero-Emission Drayage Trucks

“...[P]ursue the evaluation and demonstration of zero-emission drayage trucks in preparation for a feasibility report in 2020 or sooner.”

- Ports currently directly or indirectly supporting 78 ZE drayage trucks in various demonstrations across Southern California (POLA, POLB, SCAQMD)
- Ports released first Truck Feasibility Study in April 2019.



3. Clean Trucks Program Acceleration

“Take advantage of the diverse stakeholder group represented within the SFAC...work with federal, state and local agencies, elected officials, and other to advocate for this shared vision to the greatest extent possible...work with Long Beach Mayor and the Port of Long Beach...Ensure that the San Pedro Bay Ports’ competitiveness in increased...lower the cost to the truck owner of the transition to zero and near-zero emission trucks...”

- Clean Truck Program (CTP) implementation ongoing:
 - Early Adopter Program funded: \$14 Million
 - SCAQMD, POLA, POLB, California Energy Commission
 - New CTP Requirement: all new registered trucks must be 2014 model year or newer
 - Implemented October 1, 2018



3. CTP Acceleration (Cont.)

- Clean Truck Rate will raise a fund which will be used to help purchase clean trucks for drayage operators.
- Rate anticipated to commence collection before the end of 2020
 - Currently in contract negotiations with Rate Collection Vendor
 - CTP Fund will be used to assist truck owners in the transition to zero and near-zero emission trucks



4. POLA-LADWP Committee

“...convene a task force consisting of the Executive Director of the Port of Los Angeles, the General Manager of LADWP, and other appropriate staff... To identify the infrastructure necessary to support the widespread electrification of the goods movement activities in and around the Port of Los Angeles...”

- Still under development:
 - POLA has completed an initial Zero Emission Infrastructure Needs study
 - POLA-DWP MOU for clean technology infrastructure projects signed. Total of \$15 Million to Port projects.



5. System Efficiency – HPEC

“...work with officials at the local, state and federal levels to advance the development and implementation of the HPEC Project. Additionally...explore and facilitate as appropriate, the use of a public-private-partnership (PPP) model in order to maximize both private and public sector cooperation, support and investment in the project.

- Project Discontinued.



6. Multi-Port Clean Tech RFI

“...lead the development of multiple Multi-Port Requests for Information (RFI) from manufacturers of zero and near-zero emission drayage trucks, container handling equipment, marine engines / Fuel technologies, LED lighting, and other potential equipment...”

- The Ports issued a Technology Advancement Program Call for Projects in 2018, resulting in 4 demonstration projects currently underway
- The Los Angeles Cleantech Incubator, with support from the Ports, issued a RFI to zero emission drayage truck manufacturers in 2018.
- In January 2020, the Technology Advancement Program released an Open RFI for concept papers related to clean technology projects interested in support or funding from the Ports



7. POLA LED Light Conversion

“...work to aggressively retrofit the lighting in the Port to high efficiency LED technology as soon as possible.”

- POLA has begun a program to replace all High Mast lighting at terminals with LED
- High Mast LED replacement costs estimated at \$6.5 Million
 - Anticipated to save approximately 3MW of power, with and average of 10,950 MWhr per year.
- Project began in 2019, and is anticipated to be completed by 2022.



8. Cargo Handling Equipment

“...proposing the following process for identifying opportunities for air pollution and greenhouse gas emission reductions from cargo handling equipment.”

- Ports conducted and published a Feasibility Assessment on the current state of clean cargo handling equipment in September 2020.
- Currently managing or supporting 16 demonstration projects (POLA, POLB, SCAQMD):
 - 74 ZE Battery Electric Yard Tractors (2 Hydrogen)
 - 8 ZE Battery Electric Top Handlers (1 Hydrogen)
 - 9 Grid Electric RTGs
 - 3 ZE Battery Electric Large-Capacity Forklifts



9. Clean Truck Program Acceleration 2.0

“...that the San Pedro Bay Ports are exclusively served by trucks operating with zero tailpipe emissions or meeting the anticipated CARB Ultra-Low NO_x emission standard...by July 1 2023.”

- Clean Truck Program (CTP) implementation ongoing:
 - Early Adopter Program funded: \$14 Million
 - SCAQMD, POLA, POLB, California Energy Commission
- Clean Truck Rate will raise a fund which will be used to help purchase clean trucks for drayage operators.
 - Rate anticipated to commence collection before the end of 2020



10. Prioritize Funding for Clean Technology Development at the SPBP Complex

“...Mayor Garcetti aggressively communicate with relevant federal, state, and local agencies and elected officials to call for prioritization of available funding for zero and near zero emission goods movement technologies in California.”

- The Ports have received \$157 Million over the last few years (Total project cost: \$285 Million)
- Sample Projects:
 - POLA:
 - “Shore to Store” project
 - Wireless Charging Demonstration
 - Advanced Cargo Handling Equipment Deployments
 - Green Omni-Terminal
 - POLB:
 - Sustainable Terminals Accelerating Regional Transformation project
 - ZE Equipment Transition Project
 - Commercialization of POLB Off-Road Technology Demonstration Project
 - Port Advanced Vehicle Electrification



11. Increase Use of On-Dock & Low Emissions Locomotives

- “Coordinate with GE on Port Optimzer Project”

Project ongoing

- “Work with the Port’s Engineering Team to identify...the range of on and off-Port infrastructure...needed to increase on-dock rail capacity”

Several Engineering projects focused on expansion of rail capacity underway

- “Work with UP, BNSF, and PHL to identify strategies and opportunities to bring their Tier 4 or better locomotives into Port related activities...”

Coordination meetings ongoing. BNSF working on Zero Emission Line-haul locomotive, PHL working to plan next phase of Tier 4 upgrades.

- “Use the SPBP’s Technology Advancement Program to support development...of locomotives capable of zero emission operation.”

Port-sponsored ZE loco project discontinued. Exploring future options.



12. SPBP – System of Systems

“...As new fuels, technologies and/or system improvements are considered and proposed, analysis should be completed...to identify potential areas of benefit and risk to system efficiency from the proposed action, and identify measures to address the risks, and evaluate how the proposed action will help contribute to the states goal of improving freight system efficiency by 25% by 2030.”



13. SPBP – Funding & Resource Prioritization

“...Focus on the largest sources of emissions with near-term and currently available technologies...Near term pilots that are scalable...Cost-effective investments with environmental, economic, and technological sustainability...Protecting human health...by accelerating the deployment of zero and near-zero emission technologies...”

- Port staff is working on a detailed cost-effectiveness assessment, analyzing the potential emissions reductions of various potential strategies versus their total cost
- Initial results place a high priority on upgrading:
 - Harbor Craft
 - Trucks
 - Cargo Handling Equipment

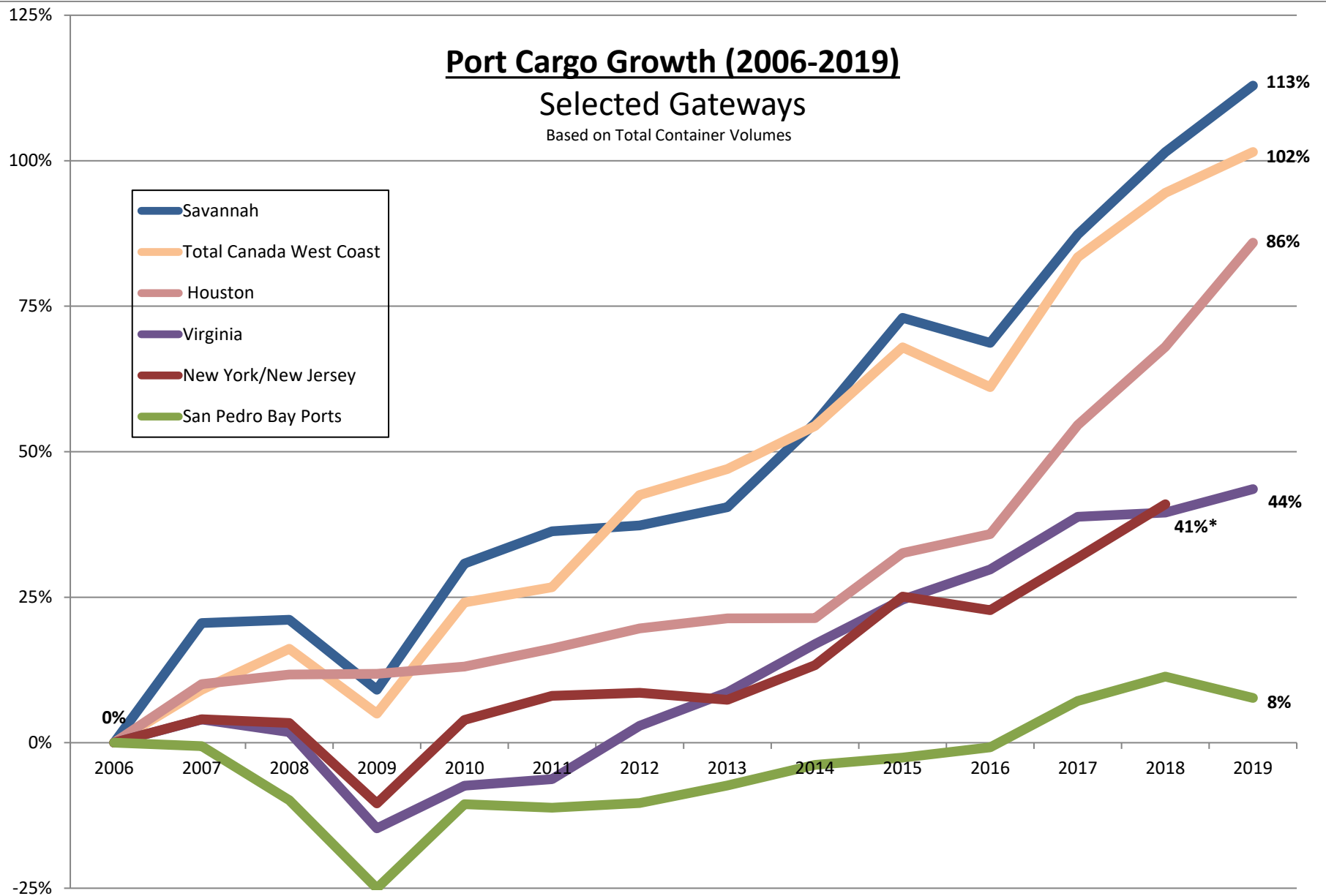
Attachment E

San Pedro Bay Port Cargo Growth and Forecasts (PMSA)

Port Cargo Growth (2006-2019)

Selected Gateways

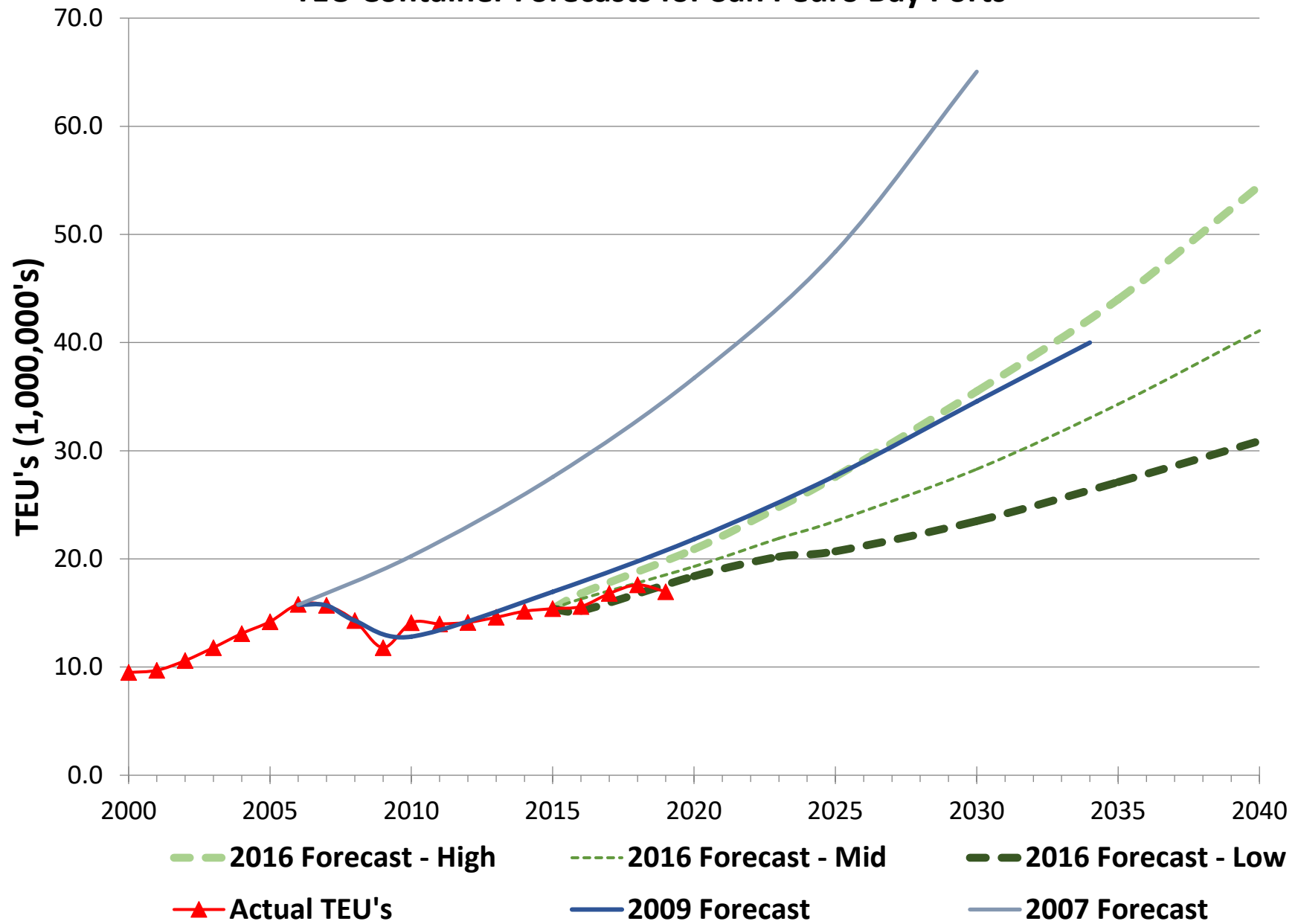
Based on Total Container Volumes



Source: American Association of Port Authorities (AAPA), NAFTA Port Container Traffic Data
Official Port Websites

* -2019 Data Unavailable

TEU Container Forecasts for San Pedro Bay Ports



Attachment F

November 2019 Truck Stakeholder Roundtable Key Takeaways (GNA)

2019 Truck Stakeholder Roundtable

Key Takeaways



2019 Truck Stakeholder Roundtable – NZE Tech.

Near-Zero Technology is Ready to Go: Can Achieve Immediate NOx and GHG Benefits

- The group agreed that near-zero emission technologies are ready and available today, and that the use of renewable natural gas can further reduce GHG emissions. It was also discussed that the technology for diesel to achieve the ultra low NOx standard (generally agreed to be 0.02g/bhp-hr) does not exist today and does not have a clear timeline for achieving commercial and technical feasibility.

No Production or Fuel Infrastructure Limitations: Can Replace 100% SPBP Drayage Fleet with NZE Technology by End of 2021

- Manufacturers Volvo and Daimler, and dealership representatives from Inland Kenworth and Rush Peterbilt, indicated that after a 4-6 month ramp-up period of their natural gas production process in 2020, they all could build and sell large volumes of natural gas trucks to meet market demand in 2020 and 2021. Even with a ramp-up period in order to scale production, it was noted that 6,000 to 8,000 natural gas trucks could be produced and delivered in 2020, if required. In 2021, there would be no limitation on natural gas production volumes, and additional fueling infrastructure would be built and scaled to meet growing demand.

Today's Natural Gas Engine/Truck Technology is Robust and Reliable: Challenges from 1st Generation Tech in '06-'08 No Longer Exist

- Dealerships and fleets observed that natural gas vehicles are not costly to maintain relative to diesel. While first generation natural gas truck / engine technology in 2006-2008 did experience higher levels of maintenance requirements and costs, it was noted that five generations of technology development has occurred over the last 10 plus years. In this process, the technology has continued to mature and today's natural gas engines are much more reliable and perform effectively.

2019 Truck Stakeholder Roundtable – ZE Tech.

Zero Emission Technology is Not Yet Ready

- The group observed that while several manufacturers have zero-emission vehicles on the road or in final development stages, the technology is not yet commercially ready and those vehicles that are in or near commercial production have not been proven in the port drayage duty cycle.
- TTSI pointed out that it has not yet seen a vehicle that can provide sufficient range and charging speeds to get the job done. Variations in loads, road grades, and drivers make it difficult to assess if the manufacturer's estimate of range is accurate and appropriate for each unique customer and job.
- Manufacturers Volvo and BYD (which has two class 8 tractors in commercial production today) said that they are preparing to scale up production in the next year or so. BYD indicated it aims to be ready to meet demand, while Volvo cautioned that its VNR truck is spec'd to each customers' needs and is not exclusively for the port drayage duty cycle. Volvo is committed to putting its trucks on the road by the end of 2020 for its Volvo LIGHTS project but observed that production volumes will remain limited until infrastructure solutions become more clearly defined for the customer.
- Nikola plans to have its production plant in Phoenix up and running in 2023 with an initial production volume of 5,000 units, ramping up to 35,000 by 2028; the company is seeking alternative production solutions to deliver units before 2023. Nikola indicated that its current sold-out status does not necessarily affect its ability to serve the LA and Long Beach drayage market.



2019 Truck Stakeholder Roundtable – ZE Tech.

Caution Suggested in Forcing First Generation Technology Which is Subject to Reliability and Performance Concerns

- Representatives from the port drayage fleets pointed out that just as natural gas truck technology took several generations to test and develop to the point of operational confidence, they anticipate that zero-emission technologies will require a similar maturation process and are thus still several years out from that same point of confidence.
- Demonstration projects were identified as incredibly important, and the group emphasized the need for more and long-term funding commitments to support further development and demonstration in real-world applications. It was noted that if the adoption of a technology is forced at a large scale before going thorough sufficient testing, demonstration and validation, and it does not perform as needed, major setbacks to the forward adoption of the technology can result. The experience with the 9-liter natural gas engine in port drayage applications was noted as a very applicable example of this point.

Infrastructure is a Significant Barrier

- Zero emission fueling infrastructure was identified by all stakeholders as a critical issue around which clarity is lacking. The timeline to install a charging solution depends on the size of the power supply at that location, while charging solution selections depend on the relationship between funding, charging standards, and UL listing status. It was also noted that without there being clarity as to the long term forward growth of battery electric and hydrogen fuel cell electric trucks, it is extremely difficult to predict which kind of zero emission fueling infrastructure should be pursued and constructed to facilitate scaled truck deployments in the future.



2019 Truck Stakeholder Roundtable - Financing

Capital costs for ZE and NZE remain out of reach for IOOs.

- The price tag for new zero-emission trucks remains out of reach for most port truck drivers, particularly those who work as Independent Owner-Operators (IOOs). The group discussed issues around additional price factors such as:
 - High interest rates on leases and loans due to poor or non-existent credit by IOOs and the risk of new technologies;
 - High vehicle license fees due to the DMV's practice of assessing these on the new vehicle's manufacturer-estimated market price by the DMV; and
 - Potentially high costs to fuel if fueling infrastructure needs to be built at a facility, or if charging must occur during peak periods when the electricity price is high.
- Customer challenges accessing funding were raised as a major concern. In addition to the group's concern that not enough funds are available for current and future deployments, Volvo noted that funds are "all over the place from the customer perspective" with different programs offering different amounts on vehicles and infrastructure. The current scenario of the customer being tasked with pulling enough funding from multiple sources to outfit their fleet for a specific technology prevents the customer from taking the steps for fleet conversion. The group agreed that HVIP is commonly referenced because it is easy to use.

2019 Truck Stakeholder Roundtable - Financing

Port Green Bonds in 2007 was Successful, but Significant Hesitation for New Green Bond Program Because of Technology Unknowns in 2020

- Bonds were discussed as an option from the State's Green Bonds program, which offers more security for investors. Municipal, tax-exempt and green bonds were described as options with very little variation between them.
 - The ports' financial representatives described the use of a green bond on the 2007 Clean Truck Program, whereby their backstopping of the bonds eliminated the issue of a default rate. They also noted that only a small number of trucks exhibited issues that led to their defaulting, which was a small fraction of the total number of trucks supported by the program. However, the representatives indicated that they are not ready to conduct a similar program for the current Clean Truck Program because there are still many unknowns and a lack of confidence around the vehicle technology.
 - The group discussed the effect of a high versus low clean truck rate on the revenue that would be generated and available to support a bond program. This discussion considered the macro effect of a high truck rate diverting cargo from the SPBP complex, and a low rate serving as an "annoyance" that prolongs the use of diesel, as well.

Dealer Transaction Challenges Creates Significant Added Risk

- Dealers articulated their concern of being stuck with trucks that can't be sold. As the middleman, they are tasked with selling product but also taking back product that a customer doesn't want and decides to return. The financial risk to the dealership is significant, and it reduces their interest in selling new, unproven technologies with high price tags that require external funding.

2019 Truck Stakeholder Roundtable - Financing

Turnover to NZE and then ZE is Consistent with Normal Trade Cycles

- While some have expressed concerns about having to turn over the port drayage truck fleet two times – once for near-zero emission in the next several years and then again to get to zero emission by 2035 – it was agreed by the group that any truck replaced with a near zero emission natural gas truck in the near term (2020-2025) would be nearing the end of its useful life by approximately 2035, and thus consistent with a normal truck turnover cycle.

The Final Truck Rate Will Have a Material Impact on the Forward NZE and ZE Drayage Truck Market

- Better understanding of the drayage truck rate study that will soon be released by the ports will be critical for the group assembled to having more effective dialogue on the funding and financing of zero and near-zero emission trucks for the drayage truck market.