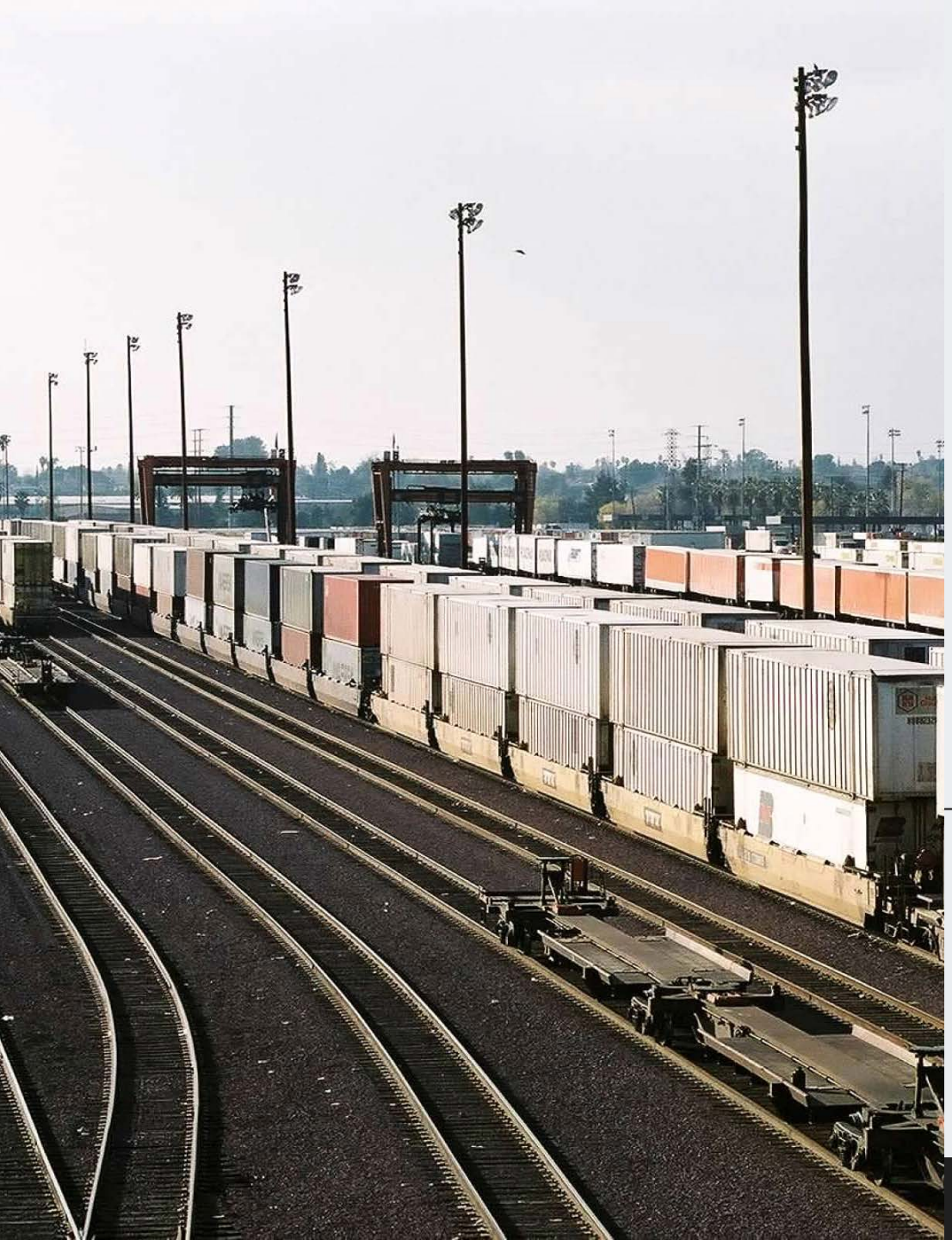


Proposed Rule 2306 - Indirect Source Rule for New Intermodal Facilities

Working Group Meeting #5

06/07/2022
10:00AM (PST)
SOUTH COAST AQMD

Join Zoom Webinar Meeting - from PC or Laptop
https://scaqmd.zoom.us/j/98170661356
Zoom Webinar ID: 981 7066 1356
Teleconference Dial In (669) 900-6833

Agenda

- Recent Activities
- Technology & Infrastructure Considerations
- Intermodal Facility Operations
- Opportunities for Emission Reductions
- Next Steps
- Discussion

Staff Activities Since February Working Group Meeting

- Updates to South Coast AQMD Governing Board Mobile Source Committee *(April meeting)*
- Ongoing health effects discussions with Dr. Nichole Quick
- Continuation of rule concept development
- Stakeholder meetings with environmental & community groups
- Visits to communities adjacent to proposed facility sites for information gathering
- Participation in U.S.DOE-Argonne National Lab Rail Decarboni-zation workshop

Technology & Infrastructure Considerations

Rapid But Uneven Technological Advancement Towards Zero Emission Intermodal Railyard Operations

ZE Charging/Fueling Infrastructure Development

Locomotives [1]

Varying by operation

TRUs [2]

Varying by TRU types

Drayage Trucks [3]

Varying by duty cycle

Cargo Handling Equipment [4]

1 https://ww2.arb.ca.gov/sites/default/files/2020-06/final_rail_tech_assessment_11282016%20-%20ADA%2020200117.pdf
2 https://ww2.arb.ca.gov/our-work/programs/transport-refrigeration-unit
3 https://ww2.arb.ca.gov/sites/default/files/2021-08/210909acfdraftdrayage.pdf
4 https://cleanairactionplan.org/download/239/cargo-handling-equipment/5151/2021-che-report-v21-final-master-draft_3-01-22.pdf
5 https://www.aqmd.gov/docs/default-source/technology-research/annual-reports-and-plan-updates/2020-annual-report-2021-plan-update.pdf?sfvrsn=8

Potential Pathways for Reducing Emissions from Locomotives

Near Term

Tier 4 locomotives offers quickest implementation approach for emission reductions

- Renewable diesel can provide additional criteria pollutant emission reductions as a drop in fuel
- Some certified Tier 4 locos may achieve Tier 4+ NOx reductions

~75-85% lower NOx than Tier 2

~5% lower NOx anticipated for pre-Tier 4 engines*

Medium and Long Term

Key examples of recent/upcoming projects for zero emissions freight locos

- ZE railcar movers commercially available for certain yard switching applications, with additional projects being demonstrated
  - One battery switcher [Pacific Harbor Line/Progress Rail]
  - One hydrogen fuel cell switcher [CA Energy Commission/GTI/Sierra Northern]
  - 20 electric switchers [UP/Wabtec/Progress Rail]

100% reduction

- One line haul battery-electric loco operating as a hybrid together with diesel locos *(Barstow ↔ Stockton)* [CARB/SJVAPCD/Wabtec/BNSF ZANZEFF]

~10% reduction in fuel use & Tier 4+

- One short distance haul with a single battery-electric loco *(LA ↔ Barstow)* [EPA/SCAQMD/Progress Rail/BNSF TAG]

100% reduction

Low and Zero Carbon Fuel Sources

Renewable Diesel

Hydrogen Fuel Cell

Battery-Electric

*Inferred from: https://ww2.arb.ca.gov/sites/default/files/2021-11/Low_Emission_Diesel_Study_Final_Report.pdf

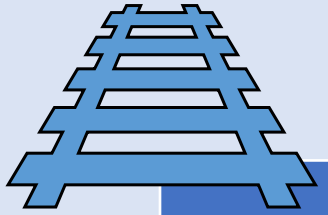
Availability of ZE Technology for Other Rail Yard Emission Sources

Pathway to Zero Emission Technology

Cargo-Handling Equipment	Drayage Trucks	Transportation Refrigeration Units
Tier 4 and hybrid available	Low NOx NG commercially available	Plug-in hybrids are commercially available
Some battery-electric options commercially available	Battery-electric options emerging commercially	Zero Emissions TRUs in development for trailers and railcars

CARB Low NOx Omnibus and ACT regulations and tech assessments: https://ww2.arb.ca.gov/rulemaking/2020/hdomnibuslownox, https://ww2.arb.ca.gov/rulemaking/2019/advancedcleantrucks
CARB Draft TRU Tech Assessment: https://ww2.arb.ca.gov/sites/default/files/2022-05/DRAFT%202022%20TRU%20Tech%20Assessment.pdf
San Pedro Bay Ports Draft CHE Tech Assessment: https://cleanairactionplan.org/download/239/cargo-handling-equipment/5151/2021-che-report-v21-final-master-draft_3-01-22.pdf

Key Infrastructure Considerations



On-site

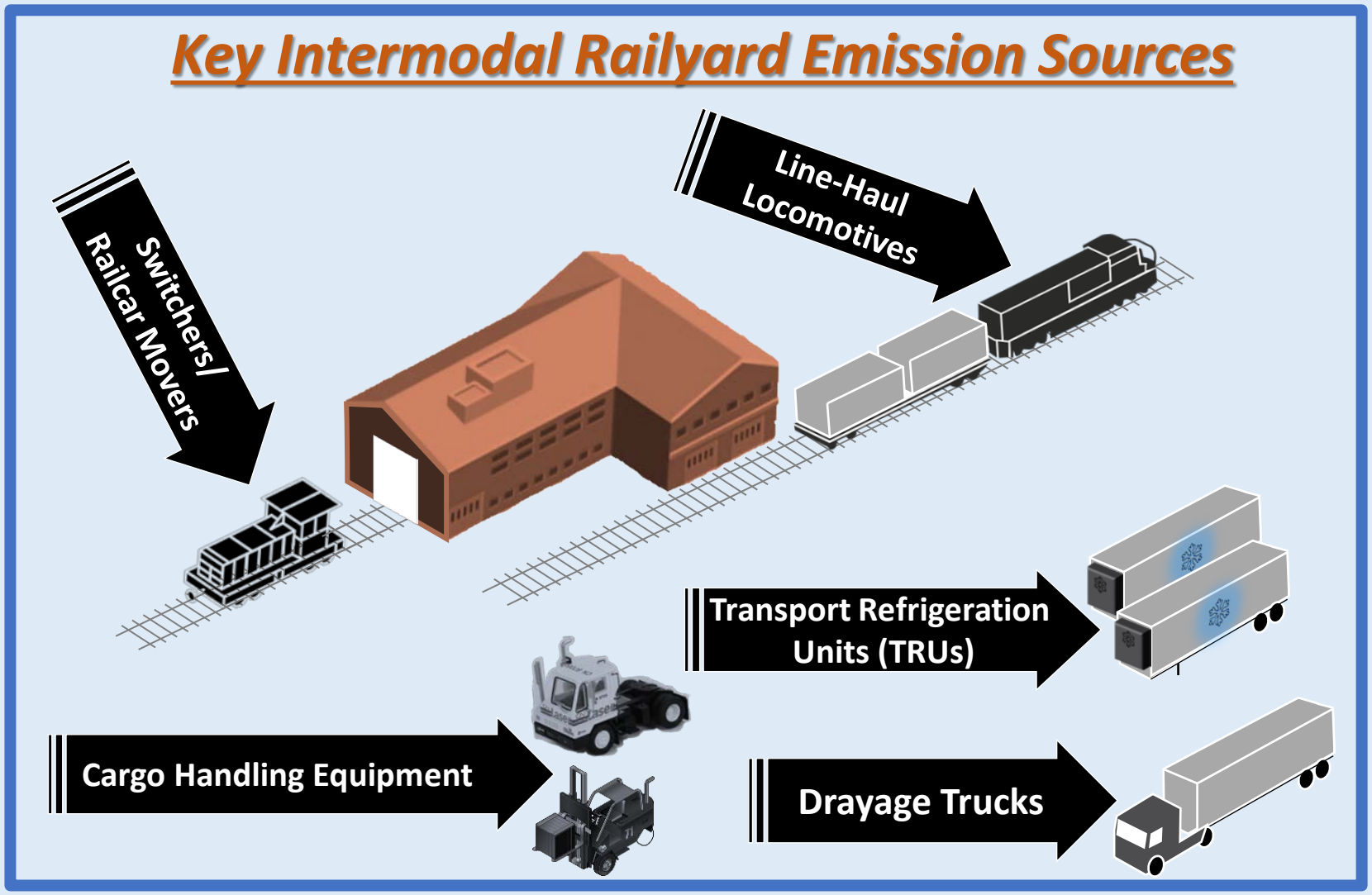
- Designated space for ZE charging of CHE and yard hostlers
- Safety of ZE technology
- Costs associated with implementation
- How ZE locomotive fueling points will be integrated with the rest of the network
- Appropriateness of site for ZE fueling of different vehicle types (e.g., drayage trucks)
- Lead time to construct

Off-site

- Availability and feedstocks of hydrogen fuel
- Availability of adequate electrical power and upstream grid hardware
- Availability of zero emission fuels during a power outage
- Availability of charging/fueling stations for drayage trucks

Intermodal Facility Operations

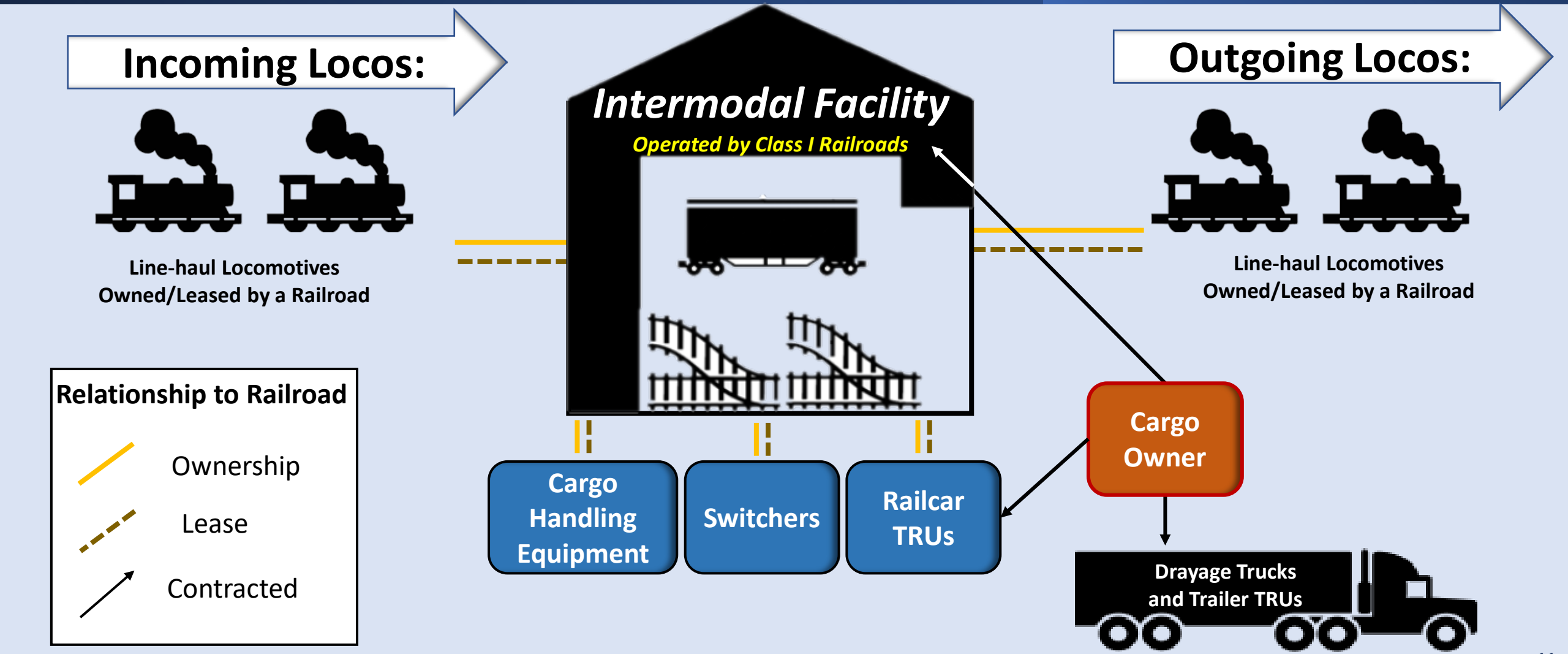
Understanding of Facility Operations is Key to PR 2306 Rule Design



Who can decide or influence:

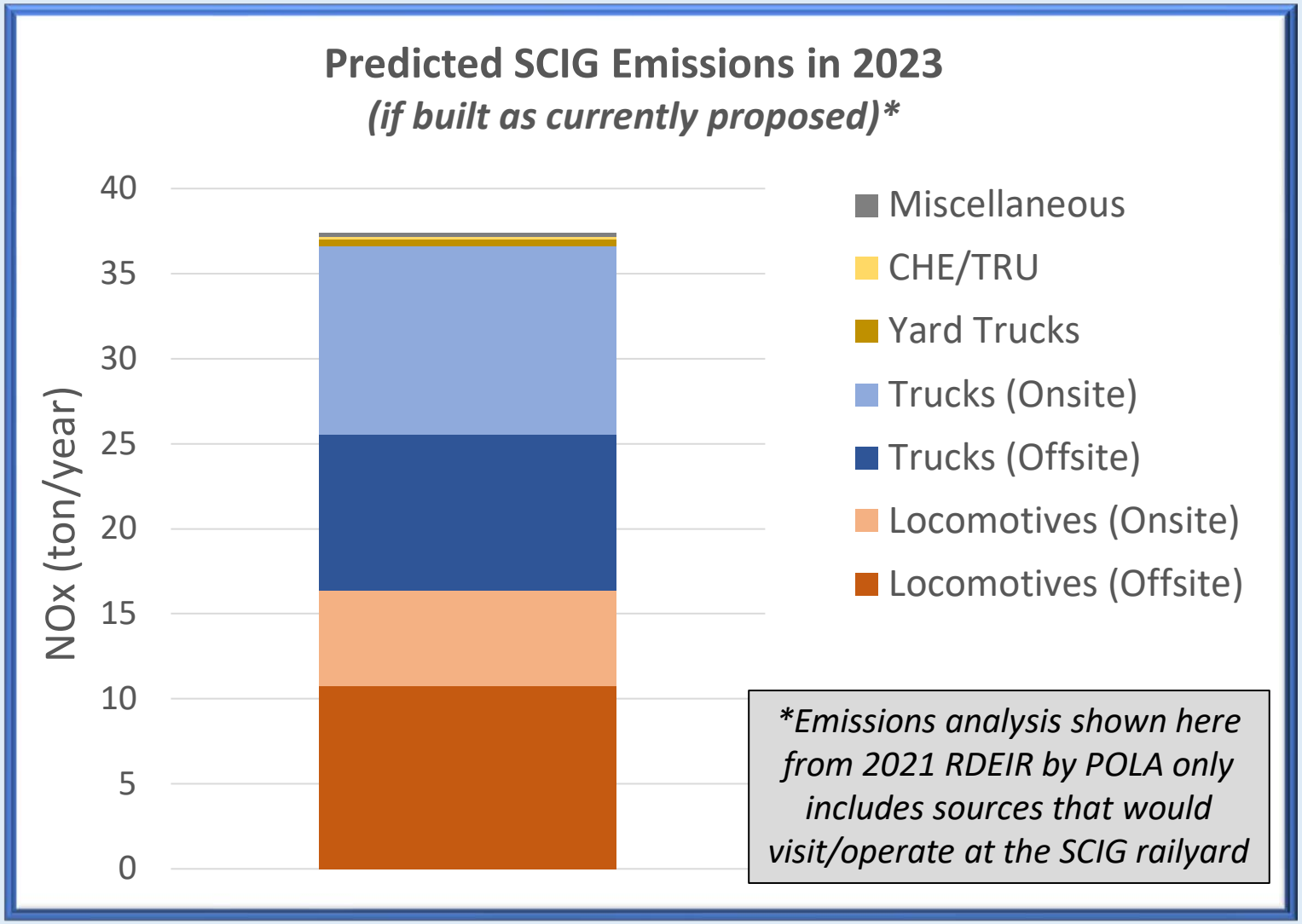
- Facility siting and design?
- Fleet turnover for each emission source?
- Carriers' dispatching decisions?
- On- and off-site infrastructure development?

Intermodal Facility Operator Relationships



*Operator relationships illustrated here are based on staff's current understanding

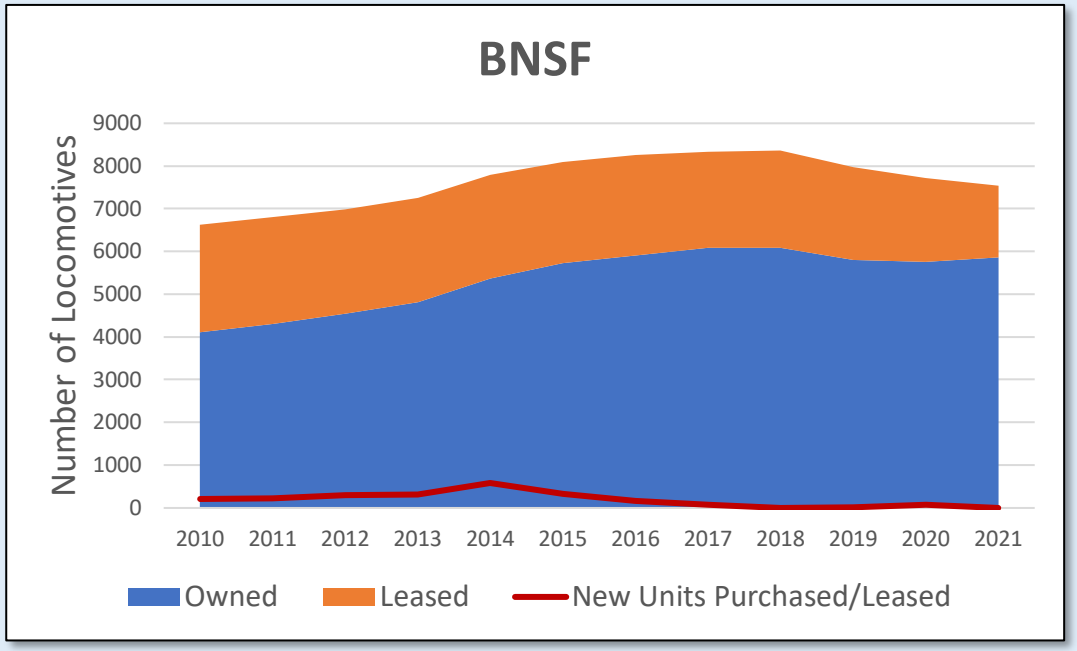
Locomotives and Drayage Trucks Account for Majority of NOx Emissions

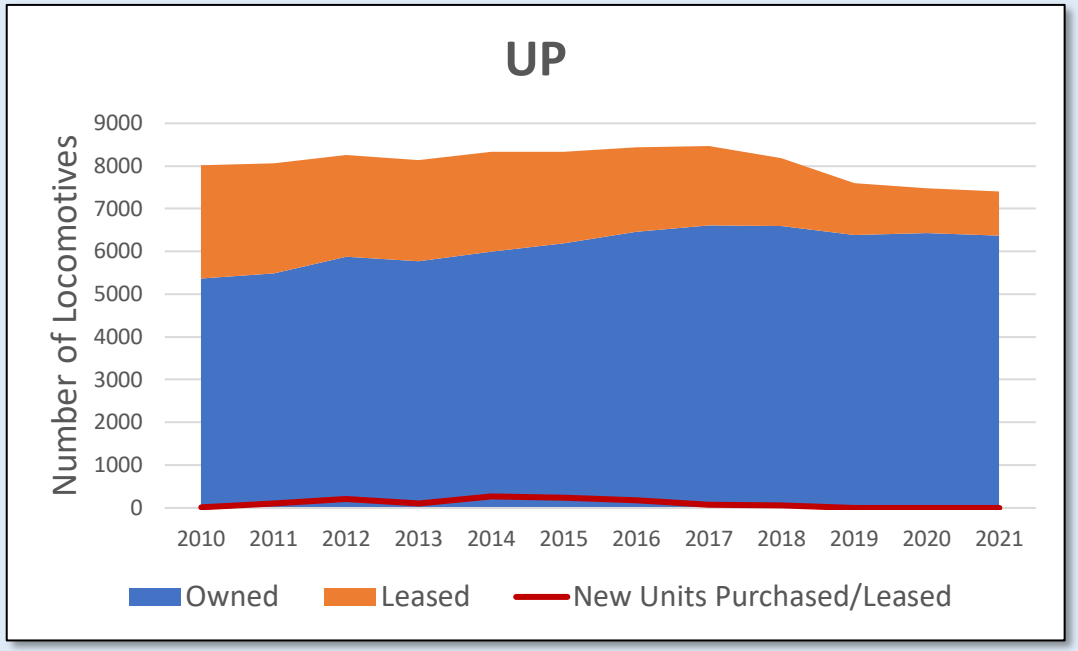


- Emission reductions needed from all emission sources at new intermodal facilities
- Emission profile at new intermodal railyards expected to be dominated by on-road trucks and locomotives

Locomotive Profile

BNSF Locomotive Fleet – 7,718 total; 4,927 operating within the District *(64% of total)*
UP Locomotive Fleet – 7,484 total; 4,602 operating within the District *(61% of total)*





* Fleet totals from nationwide units in service at the beginning of 2021 as reported in Form R-1 to the Surface Transportation Board (STB), excluding passenger units, and from CARB's 2020 South Coast Fleet Average Form F-A-1 Summary; charts data from STB Form R-1 annual reports at close of year. Both railroads reported fewer locomotives in service at close of 2021, with BNSF reporting 7,533 units (185 fewer than a year ago) and UP reporting 7,400 units (84 fewer than a year ago).

Opportunities for Emission Reductions at New Intermodal Facilities

Opportunities to Reduce Emissions from Locomotives

Emission Source	Key Milestones from Upcoming CARB Regulation	Industry Commitments for Deployment	Potential Opportunities for Additional Emission Reductions
 Line-haul Locomotives	• Begin depositing to Spending Account in mid-2023 • Locomotive Useful Life Limit Starting in 2030	▪ Technology demonstrations and pilot testing for battery-electric, hydrogen fuel cell, and hybrid locomotives	Installing ZE charging/fueling infrastructure for line-haul *(at new facility or other loco service facilities)* Additional Tier 4 deployment
 Switcher Locomotives	• ZE Switcher turnover starting in 2025	▪ Purchasing a limited number of 100% ZE battery-electric switchers	Installing ZE charging/fueling infrastructure for switchers Faster replacement of pre-Tier 4 switchers (preference for ZE)

Opportunities to Reduce Emissions from Other Intermodal Facility Sources

Emission Source	Key Milestones from Upcoming CARB Regulations	Industry Commitments for Deployment	Potential Opportunity for Additional Emission Reductions
 Cargo Handling Equipment (CHE)	• Phase in of ZE CHE starting in 2026 • Over 90% ZE deployment by 2036	▪ ZE CHE at Colton ▪ LNG yard trucks and electric wide-span gantries at SCIG	Implementation of 100% ZE CHE and supporting infrastructure at SCIG facility
 Drayage Trucks	• Newly registered trucks must be ZE starting January 2024 • All drayage trucks ZE by 2035	▪ BNSF claims a reduction in daily truck VMT regionwide from proposed facilities	Earlier adoption of ZE drayage trucks and supporting infrastructure Especially for near-dock facility Site truck routes/entrances away from sensitive receptors *(exposure reduction)*
 Transport Refrigeration Units (TRUs)	• Assessing ZE technologies for railcar and trailer TRUs • Tentative CARB Board consideration 2025	▪ None	Railroad participation in ZE TRU demonstrations Establishing locations for ZE TRU infrastructure

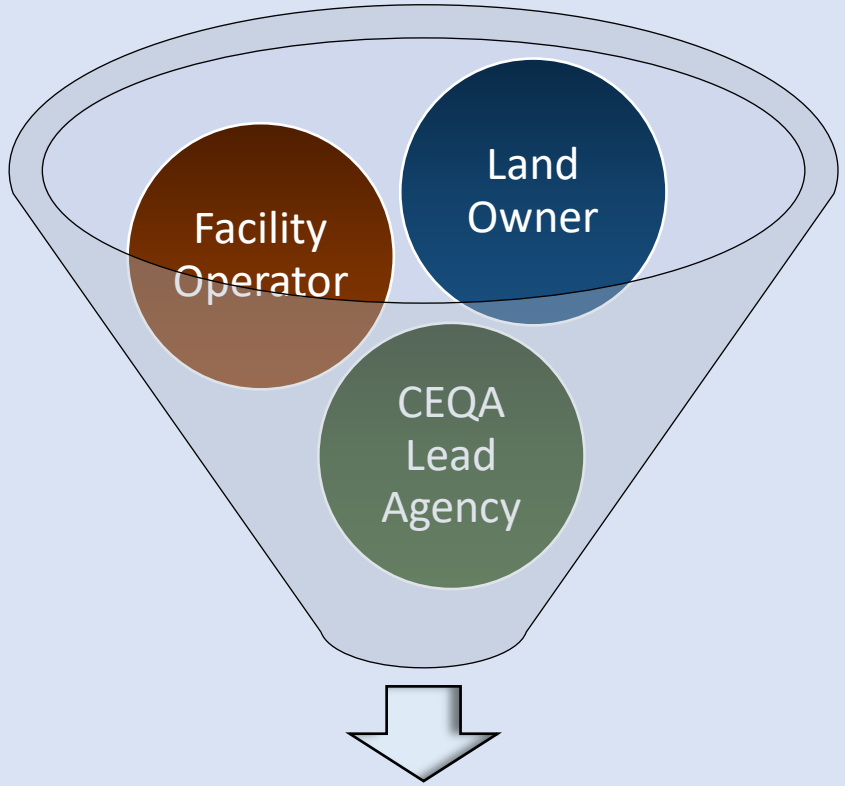
Entities Involved in New Intermodal Facility Development

Currently Planned New Intermodal Facilities*	**Land Owner**	**CEQA Lead Agency**	**Facility Operator**
SCIG	City of LA**	City of LA	BNSF
Colton	BNSF	CA High Speed Rail	BNSF

*Other new railyards could have different relationships

** Mostly owned by City of LA, with some land to be acquired by BNSF

Each entity can have a role in planning and implementing ZE technologies

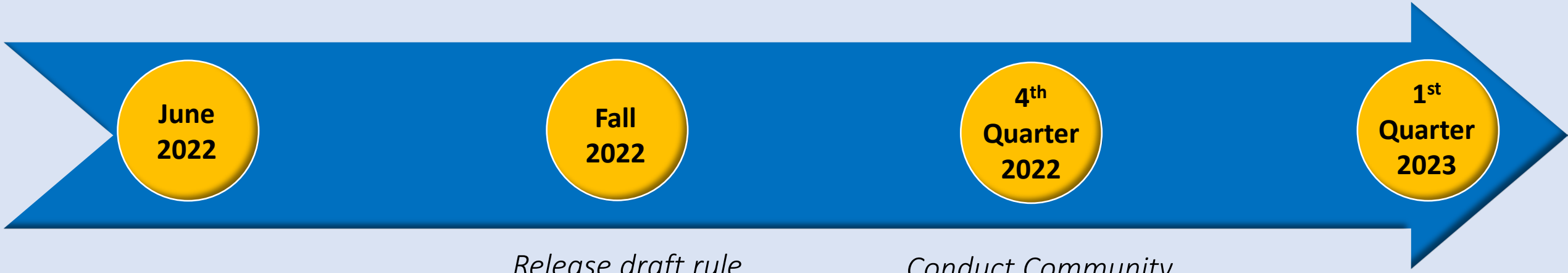


ISR Applicability TBD

Next Steps

Looking Ahead at Development of PR 2306

- ❑ Continue Mobile Source Committee updates and Working Group Meetings
- ❑ Complete rule development before new railyards are built



Next Steps

- Continued Rule Concept Development to Be Discussed Next Meeting
- Visits to New Rail Yard Sites and Local Communities
- Stakeholder Group Meetings and Other Public Engagement Activities
- Update South Coast AQMD Mobile Source Committee

Staff Contacts

Proposed Rule 2306		
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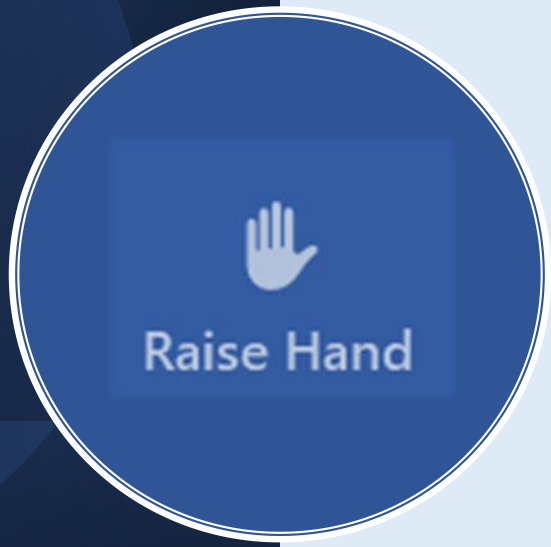
Sign up for the mailing list at: https://www.aqmd.gov/sign-up (select “Proposed Rule 2306”) Email us at: RailyardISR@aqmd.gov. For more information, visit: www.aqmd.gov/fbmsm (click into “Railyard and Intermodal Facilities”)		

Open Discussion



ZOOM:

- Click on the “Raise Hand” button at the bottom of your screen.

TELECONFERENCE:

- Dial *9 to “raise your hand”

Your name will be called when it is your turn to speak and the meeting host will unmute your line.