WAREHOUSE ISR WORKING GROUP

10/30/2020

Version 10/27/20

WORKING GROUP MEETING AGENDA

- Background
  - 2nd draft rule language released 10/6/20
    - www.aqmd.gov/docs/default-source/planning/fbmsm-docs/draft-proposed-rule-2305.pdf
    - Additional rule materials available at: www.aqmd.gov/fbmsm
- Rule compliance examples for one hypothetical warehouse
- Bounding analysis for entire PR 2305 universe of facilities
- Socioeconomic analysis methodology
- Next steps

BACKGROUND ON RULE STRINGENCY

- PR 2305 will include two phase-in schedules
  - Size of warehouse determines when Points must first be earned
  - Stringency of rule will phase in through time
- Examples demonstrated on next slides use the same hypothetical stringency
- Example choices an individual warehouse operator might make for a 500,000 sf warehouse
  - Larger than 90% of warehouses in PR 2305 universe
- WAIRE Points Compliance Obligation (WPCO) determined using default Weighted Annual Truck Trip rates (WATTs = 175,000*)

	Year 1	Year 2	Year 3	Year 4	Year 5
Hypothetical Stringency	0.0002	0.0004	0.0006	0.0008	0.001
WPCO	35	70	105	140	175

** Rounded up from 173,375*

KEY ASSUMPTIONS FOR EXAMPLES

- 500,000 sf warehouse characteristics
  - Default truck visits*:
    Class 8 = 83/day, Class 2b-7 = 30/day

'Baseline' NOx Emissions (tons) by year using default trip rates and mileage and EMFAC 2017 emission rates

2022	2023	2024	2025	2026	Total
7.8	5.9	6.0	6.1	6.1	31.9

- Costs and emission reductions in following slides may overlap with incentive programs or CARB rules
  - Emission reductions shown do not account for additional reductions that will be facilitated by PR 2305
    - Example: emission reductions only shown related to truck VMT to/from a single warehouse, not total annual VMT from a truck
- Costs shown are default incremental costs from draft WAIRE Menu Technical Report
  www.aqmd.gov/docs/default-source/planning/fbmsm-docs/waire-menu-technical-report_draft_3-3-20.pdf
  - Actual costs experienced by warehouse operators may be different, but Point totals for actions would not change

* *Default trip rates from ITE Trip Generation Manual shown for illustration purposes. Actual truck trip data required for rule compliance.*

Draft WAIRE Menu *(version 10/9/2020)*

Action/Investment	Action/Investment Details	Reporting Metric	Annualized Metric	WAIRE Points per Annualized Metric	Discounted WAIRE Points Subparagraph (d)(6)(A)
Acquire ZE/NZE Trucks in Warehouse Operator Fleet	ZE Class 8	Number of trucks	One truck acquired	126	126
	ZE Class 4-7			68	68
	ZE Class 2b-3			14	14
	NZE Class 8			55	55
	NZE Class 4-7			26	26
ZE/NZE Truck Visits	ZE Class 8	Number of visits	365 truck visits	51	33
	ZE Class 4-7			12	9
	ZE Class 2b-3			9	6
	NZE Class 8			42	24
	NZE Class 4-7			12	9
Acquire ZE Yard Truck		Number of yard trucks	One yard truck acquired	177	177
Use ZE Yard Truck		Hours of use	1,000 hours	291	51
Install Onsite ZE Charging or Fueling Infrastructure	Level 5 EVSE Purchase	Number of EVSE purchased	One EVSE purchased	118	118
	Level 4 EVSE Purchase			51	51
	Level 3 EVSE Purchase			26	26
	Level 2 EVSE Purchase			5	5
	TRU Plug EVSE Purchase			3	3
	Begin construction on Level 3, 4, or 5 charger project	First day of construction	One construction project	9	9
	Begin construction on Level 2 charger project			9	9
	Begin construction on TRU Plug project			5	5
	Finalize Level 3, 4, or 5 charger project	The latter of final permit sign off or charger energization	One construction project	59	59
	Finalize Level 2 charger project			9	9
	Finalize TRU Plug project			7	7
	Hydrogen (H_2) Station	Daily capacity of station in kilograms (kg)	One 700 kg/day station construction project	1,680	1,680
Use Onsite ZE Charging or Fueling Infrastructure	Vehicle Charging	Kilowatt-hours (kWh) of dispensed electricity	165,000 kWh	42	24
	TRU Charging		10,658 kWh	10	3
	H_2 Station Usage	Kg of dispensed H_2	6,152 kg	43	25
Install Onsite Solar Panels	Rooftop	Size of system in kW	100 kW system	23	23
	Carport			27	27
Use Onsite Solar Panels		Energy production in kWh	165,000 kWh	2	2
Install High-Efficiency Filters or Filter Systems in Residences, Schools, Daycares, Hospitals, or Community Centers	Install Stand-Alone System	Number of systems installed	25 systems	55	55
	Install Filters	Number of filters installed	200 filters	51	51

Draft Analysis

INDIVIDUAL WAREHOUSE SCENARIOS
1) PURCHASE/USE CLASS 8 NZE TRUCK (NO INCENTIVES)

Action	Year 1 (WPCO=35)			Year 2 (WPCO=70)			Year 3 (WPCO=105)			Year 4 (WPCO=140)			Year 5 (WPCO=175)		
	Buy 1 truck			*Use 1 truck, Use Bank*			*Buy 1 truck, Use 1 truck*			*Use 2 trucks, Use Bank*			*Buy 1 truck, Use 2 trucks*		
	Points Earned	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)
Truck Purchase	*55*	*-*	*$65*	*-*	*-*	*-*	*55*		*$65*	*-*	*-*	*-*	*55*	*0*	*$65*
*Truck Visits**	*-*	*-*	*-*	*60*	*0.07*	*$5*	*60*	*0.07*	*$5*	*120*	*0.14*	*$10*	*120*	*0.14*	*$10*
Banked Points Used	*-*	*-*	*-*	*10*	*-*	*-*	*-*	*-*	*-*	*20*	*-*	*-*	*-*	*-*	*-*
Total	**55**	**0**	**$65**	**70**	**0.07**	**$5**	**115**	**0.07**	**$70**	**140**	**0.14**	**$10**	**175**	**0.14**	**$75**
Points Banked	*20*			*0*			*10*			*0*			*0*		
Points in Bank at End of Year	*20*			*10*			*20*			*0*			*0*		

Notes:
* One truck assumed to make 10 visits/week, 52 weeks/yr = 520 visits/yr

NOx Reduced (tons) **0.42**

Total Cost **$225k**

Cost ($/sq. ft./yr) **$0.09**

Draft Analysis

INDIVIDUAL WAREHOUSE SCENARIOS

2) PURCHASE/USE CLASS 8 NZE TRUCK (NO INCENTIVES, EARLY PURCHASE)

Action	Year 1 (WPCO=35)			Year 2 (WPCO=70)			Year 3 (WPCO=105)			Year 4 (WPCO=140)			Year 5 (WPCO=175)		
	Buy 2 trucks			*Use 2 trucks*			*Use 2 trucks*			*Use 2 trucks, Use Bank*			*Use 2 trucks, Use Bank*		
	Points Earned	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)
Truck Purchase	*110*	-	*$130*	-	-	-	-	-	-	-	-	-	-	-	-
*Truck Visits**	-	-	-	*120*	*0.14*	*$10*	*120*	*0.14*	*$10*	*120*	*0.14*	*$10*	*120*	*0.14*	*$10*
Banked Points Used	-	-	-	-	-	-	-	-	-	*20*	-	-	*55*	-	-
Total	**110**	**0**	**$130**	**120**	**0.14**	**$10**	**120**	**0.14**	**$10**	**140**	**0.14**	**$10**	**175**	**0.14**	**$10**
Points Banked	*75*			*50*			*15*			*0*			*0*		
Points in Bank at End of Year	*75*			*125*			*140*			*65^*			*10*		

Notes:
* One truck assumed to make 10 visits/week, 52 weeks/yr = 520 visits/yr
^ Year 1 Banked Points expired

NOx Reduced (tons)	*Total Cost*	*Cost ($/sq. ft./yr)*
0.56	$170k	$0.07

Draft Analysis

INDIVIDUAL WAREHOUSE SCENARIOS
3) PURCHASE/USE MOYER-FUNDED CLASS 8 NZE TRUCK

Action	Year 1 (WPCO=35)			Year 2 (WPCO=70)			Year 3 (WPCO=105)			Year 4 (WPCO=140)			Year 5 (WPCO=175)		
	Buy 1 truck, Pay Mit. Fee			*Use 1 truck, Pay Mit. Fee*			*Buy 2 trucks, Use 1 truck, Pay Mit. Fee*			*Use 3 trucks*			*Use 3 trucks*		
	Points Earned	NOx (ton /year)	Cost ($1,000 /year)	Points Earned	NOx (ton /year)	Cost ($1,000 /year)	Points Earned	NOx (ton /year)	Cost ($1,000 /year)	Points Earned	NOx (ton /year)	Cost ($1,000 /year)	Points Earned	NOx (ton /year)	Cost ($1,000 /year)
*Truck Purchase**	*0*	*0*	*$0*	*-*	*-*	*-*	*0*	*0*	*$0*	*-*	*-*	*-*	*-*	*-*	*-*
*Truck Visits^*	*-*	*-*	*-*	*60*	*0.07*	*$5*	*60*	*0.07*	*$5*	*180*	*0.21*	*$15*	*180*	*0.21*	*$15*
Mitigation Fee	*35*	*0*	*$35*	*10*	*0*	*$10*	*45*	*0*	*$45*	*-*	*-*	*-*	*-*	*-*	*-*
Mitigation Fee Program#	*-*	*-*	*-*	*-*	*0.35*	*-*	*-*	*0.1*	*-*	*-*	*0.45*	*-*	*-*	*-*	*-*
Total	**35**	**0**	**$35**	**70**	**0.42**	**$15**	**105**	**0.17**	**$50**	**180**	**0.66**	**$15**	**180**	**0.21**	**$15**
Points Banked	*0*			*0*			*0*			*40*			*5*		
Points in Bank at End of Year	*0*			*0*			*0*			*40*			*45*		

Notes:
* Trucks bought using Moyer funds do not earn WAIRE Points for the truck purchase
^ One truck assumed to make ten visits/week, 52 weeks/yr
\# Mitigation program would prioritize funding projects near warehouses that paid the fee. Assumes $100k/ton. Funds collected in one year are spent in following year.

NOx Reduced (tons) **1.46** *Total Cost* **$130k** *Cost ($/sq. ft./yr)* **$0.05**

Draft Analysis

INDIVIDUAL WAREHOUSE SCENARIOS

4) USE CLASS 8 NZE TRUCKS FROM NON-OWNED FLEETS

Action	Year 1 (WPCO=35)			Year 2 (WPCO=70)			Year 3 (WPCO=105)			Year 4 (WPCO=140)			Year 5 (WPCO=175)		
	300 truck visits			*600 truck visits*			*900 truck visits*			*1,200 truck visits*			*1,500 truck visits*		
	Points Earned	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)
*Truck Visits**	*35*	*0.09*	*$3^*	*70*	*0.13*	*$6*	*105*	*0.2*	*$10*	*140*	*0.27*	*$13*	*175*	*0.34*	*$16*
Total	**35**	**0.09**	**$3**	**70**	**0.13**	**$6**	**105**	**0.2**	**$10**	**140**	**0.27**	**$13**	**175**	**0.34**	**$16**
Points Banked	*0*			*0*			*0*			*0*			*0*		
Points in Bank at End of Year	*0*			*0*			*0*			*0*			*0*		

Notes:

* Warehouse operator would ensure that NZE trucks from third parties are used at the facility at the level shown

^ Includes fuel costs and incremental capital cost of non-incentivized NZE truck (amortized over 3 years).

NOx Reduced (tons)	*Total Cost*	*Cost ($/sq. ft./yr)*
1.03	$48k	$0.02

Draft Analysis

INDIVIDUAL WAREHOUSE SCENARIOS
5) USE CLASS 8 ZE TRUCKS FROM NON-OWNED FLEETS

Action	Year 1 (WPCO=35)			Year 2 (WPCO=70)			Year 3 (WPCO=105)			Year 4 (WPCO=140)			Year 5 (WPCO=175)		
	Pay Mit. Fee			*500 truck visits*			*750 truck visits*			*1,000 truck visits*			*1,250 truck visits*		
	Points Earned	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)
*Truck Visits**	-	-	-	*70*	*0.12*	*$75*	*105*	*0.19*	*$112*	*140*	*0.25*	*$149*	*175*	*0.32*	*$187*
Mitigation Fee	*35^*	*0*	*$35*	-	-	-	-	-	-	-	-	-	-	-	-
Mitigation Fee Program#	-	-	-	-	*0.35*	-	-	-	-	-	-	-	-	-	-
Total	**35**	**0**	**$3**	**70**	**0.47**	**$75**	**105**	**0.19**	**$112**	**140**	**0.25**	**$149**	**175**	**0.32**	**$187**
Points Banked	*0*			*0*			*0*			*0*			*0*		
Points in Bank at End of Year	*0*			*0*			*0*			*0*			*0*		

Notes:
* Warehouse operator would ensure that NZE trucks from third parties are used at the facility at the level shown
^ Assumes Class 8 ZE trucks not commercially available until Year 2
# Mitigation program would prioritize funding projects near warehouses that paid the fee. Assumes $100k/ton. Funds collected in one year are spent in following year.

NOx Reduced (tons) **1.23**

Total Cost **$558k**

Cost ($/sq. ft./yr) **$0.22**

Draft Analysis

INDIVIDUAL WAREHOUSE SCENARIOS

6) INSTALL/USE ZE INFRASTRUCTURE & PURCHASE/USE ZE CLASS 6 & 8 TRUCKS

Action	Year 1 (WPCO=35)			Year 2 (WPCO=70)			Year 3 (WPCO=105)			Year 4 (WPCO=140)			Year 5 (WPCO=175)		
	Install 1 charger			*Buy 1 C6 truck, Use Bank*			*Buy 1 C6 truck, Use 1 C6 truck, Use charger, Use bank*			*Buy 1 C6 truck, Use 2 C6 trucks, Use charger*			*Buy 1 C8 truck, Use 3 C6 trucks, Use charger, Use bank*		
	Points Earned	**NOx (ton /year)**	**Cost ($1,000 /year)**	**Points Earned**	**NOx (ton /year)**	**Cost ($1,000 /year)**	**Points Earned**	**NOx (ton /year)**	**Cost ($1,000 /year)**	**Points Earned**	**NOx (ton /year)**	**Cost ($1,000 /year)**	**Points Earned**	**NOx (ton /year)**	**Cost ($1,000 /year)**
Install Lvl 3 Charger	*94*	*0*	*$110*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*
Purchase Truck	*-*	*-*	*-*	*68*	*0*	*$80*	*68*	*0*	*$80*	*68*	*0*	*$80*	*126*	*-*	*$150*
*Truck Visits**	*-*	*-*	*-*				*17*	*0.02*	*-$6*	*34*	*0.04*	*-$12*	*51*	*0.06*	*-$18*
*Charger Usage^*	*-*	*-*	*-*				*8*		*$0*	*16*		*$0*	*25*	*-*	*$0*
Use Banked Points	*-*	*-*	*-*	*2*	*-*	*-*	*12*	*-*	*-*	*22*	*-*	*-*	*-*	*-*	*-*
Total	**94**	**0**	**$110**	**70**	**0**	**$80**	**105**	**0.02**	**$74**	**167**	**0.04**	**$68**	**202**	**0.06**	**$132**
Points Banked	*59*			*0*			*0*			*0*			*27*		
Points in Bank at End of Year	*59*			*57*			*45*			*0#*			*27*		

Notes:
* Each truck assumed to make ten visits/week, 52 weeks/yr
^ Assumes 33,000 kWh/yr for each C6 truck
# Year 1 Banked Points expired

NOx Reduced (tons) **0.12**

Total Cost **$464k**

Cost ($/sq. ft./yr) **$0.19**

INDIVIDUAL WAREHOUSE SCENARIOS

Draft Analysis

7) PAY MITIGATION FEE

Action	Year 1 (WPCO=35)			Year 2 (WPCO=70)			Year 3 (WPCO=105)			Year 4 (WPCO=140)			Year 5 (WPCO=175)		
	300 truck visits			*600 truck visits*			*900 truck visits*			*1,200 truck visits*			*1,500 truck visits*		
	Points Earned	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)	**Points Earned**	**NOx** (ton /year)	**Cost** ($1,000 /year)
Mitigation Fee	*35*	*0*	*$35*	*70*	*0*	*$70*	*105*	*0*	*$105*	*140*	*0*	*$140*	*175*	*0*	*$175*
*Mitigation Fee Program**	*-*	*-*	*-*	*-*	*0.35*	*-*	*-*	*0.70*	*-*	*-*	*1.05*	*-*	*-*	*1.40*	*-*
Total	**35**	**0**	**$35**	**70**	**0.35**	**$70**	**105**	**0.70**	**$105**	**140**	**1.05**	**$140**	**175**	**1.40**	**$175**
Points Banked	*0*			*0*			*0*			*0*			*0*		
Points in Bank at End of Year	*0*			*0*			*0*			*0*			*0*		

Notes:

* Mitigation program would prioritize funding projects near warehouses that paid the fee. Assumes $100k/ton. Funds collected in one year are spent in following year.

SUMMARY OF EXAMPLES FOR A 500,000 SF WAREHOUSE WITH A STRINGENCY = 0.001

Example #	Example	5-year NOx (tons)	5-year Cost ($1,000)	Cost per sq. ft./yr.
1	Purchase/Use Class 8 NZE Truck (No Incentives)	0.42	$225	$0.09
2	Purchase/Use Class 8 NZE Truck (No Incentives, Early Purchase)	0.56	$170	$0.07
3	Purchase/Use Moyer-Funded Class 8 NZE Truck	1.46	$130	$0.05
4	Use Class 8 NZE Trucks from 3rd party fleets	1.03	$48	$0.02
5	Use Class 8 ZE Trucks from 3rd party fleets	1.23	$558	$0.22
6	Install/Use ZE infrastructure & purchase/use ZE Class 6 & 8 Trucks	0.12	$464	$0.19
7	Pay Mitigation Fee	3.50	$525	$0.21

- Incremental costs and emission reductions may partially overlap with incentive programs or CARB rules
  - PR 2305 would ensure that emission reductions occur in South Coast AQMD

PR 2305 UNIVERSE 'ONE-OPTION' BOUNDING ANALYSIS EXAMPLE

- Table on next slide shows entire PR 2305 universe using same final hypothetical stringency as previous 500k sf warehouse examples
  - Only showing 'Year 5' snapshot (i.e. 2026), which requires ~0.22 million total WAIRE Points from entire warehouse universe
- Table shows potential outcome if all warehouse operators only choose one option to comply with the rule
  - Each row yields ~0.22 million WAIRE Points
  - Rows should not be added together
- Table does not account for earlier investments being used to reduce costs in modeled year

Draft Analysis

PR 2305 UNIVERSE 'ONE-OPTION' BOUNDING ANALYSIS EXAMPLE

(~0.22 MILLION POINTS, SEE PREVIOUS SLIDE)

WAIRE Menu Action	Annual Actions	Notes	NOx Reductions (tpd)	Diesel PM Reductions (tpd)	Cost per sq. ft./yr.
ZE Class 8 Truck Visits	~1.6 million visits	*~3% of all HHD VMT in SCAB*	1.2	0.01	$0.31
NZE Class 8 Truck Visits	~1.9 million visits	*~3% of all HHD VMT in SCAB*	1.1	0.01	$0.03
ZE Class 8 Truck Purchases	~1,753 trucks	*~2% of all HHD vehicles in SCAB*	N/A	N/A	$0.35
NZE Class 8 Truck Purchases	~4,016 trucks	*~4% of all HHD vehicles in SCAB*	N/A	N/A	$0.34
Level 3 Charger Installations	~2,350 chargers		N/A	N/A	$0.34
Level 5 Charger Installations	~1,187 chargers		N/A	N/A	$0.34
Charger Usage	~868 GWh	*~0.3% of state electrical demand*	3.9	0.03	$0.21
H2 Station Installations	~131 stations		N/A	N/A	$0.35
H2 Station Usage	~32 million kg		3.8	0.03	$0.42
ZE Hostler Usage	~0.8 million hrs of use	*~0.8 hrs/day per warehouse*	0.41	0.02	$0.01
Solar Panel Installations	~1.0 GW	*~9% of all warehouse roof space*	N/A	N/A	$3.29
Solar Panel Generation	~9,300 GWh	*Only enough roof space available to earn about 50% of Points needed*	<1.8*	N/A	$0
Mitigation Fee	~$220 million	*Assumes Mitigation Program achieves $100k/ton NOx*	6.0	Not Calculated	$0.29

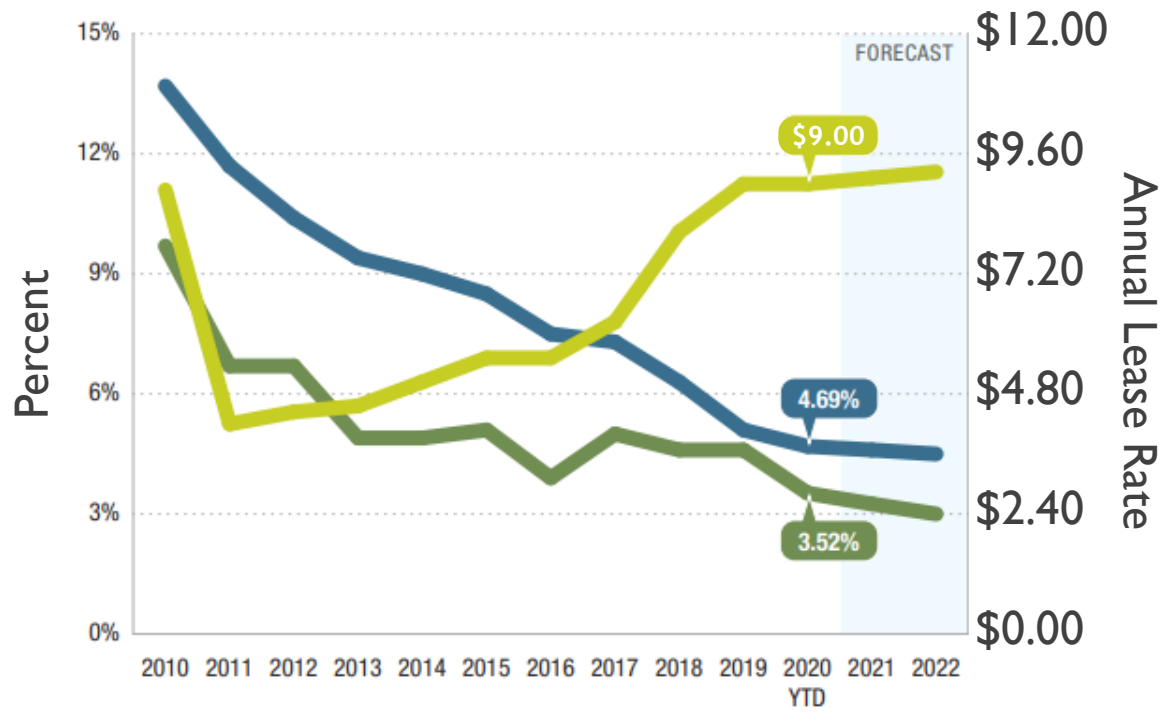
**Total power plant NOx in SCAB in 2026 = ~1.8 tpd*

POTENTIAL COSTS OF HYPOTHETICAL SCENARIOS RELATIVE TO CURRENT LEASE RATES

Costs from hypothetical scenarios on previous slides typically range from ~$0.02/sf – $0.35/sf

- **≤4% of current lease rates**
- **Industry has experienced higher average annual increases in lease rates since 2011**
  - **With decreasing vacancy**

Inland Empire Industrial Lease Rates (3rd Qtr 2020)



Adapted from www.voitco.com

SOUTH COAST AQMD SOCIOECONOMIC ASSESSMENTS (SIAs)

- South Coast AQMD staff prepares a SIA for most South Coast AQMD rules
- Under Health and Safety Code 40440.8, 'typical' SIAs consider:
  - Types of businesses affected
  - One-time compliance costs (capital costs):
    - Cost of purchasing NZE/ZE trucks; charging stations; hydrogen fueling stations; etc.
  - Recurring costs (annual costs):
    - Additional fuel cost for NZE trucks; fuel cost savings for ZE trucks; electric charger usage; hydrogen station usage; and mitigation fee.
  - Job and economic impacts associated with implementation of PR 2305
  - Emission reduction potential
  - Necessity of rule in order to attain state and federal air quality standards

SCOPE OF SOCIOECONOMIC ANALYSIS FOR PR 2305

- Five components
  - 'Typical' socioeconomic analysis for rule *(previous slide)*
  - Demographic analysis of communities near warehouses and warehouse employees
  - Use results from Port Clean Truck Fund Rate economic study
  - Additional study of likelihood of warehouse relocations by Industrial Economics, Inc. (IEc). and Calstart
  - 3rd party peer review

IEc STUDY CONTRACT TASKS

1. Assessment of warehousing in South Coast AQMD region
2. Assessment of real estate markets in adjacent areas
3. Assessment of truck fleets serving warehouses in South Coast AQMD region and neighboring areas
4. Estimating changes in warehouse costs if relocated
5. Relocation scenario analyses of ISR rule

Assessment of local warehousing industry, local fleets, and space to relocate warehousing outside of South Coast AQMD region.

Modeling and estimating likelihood of warehouses moving due to warehouse ISR.

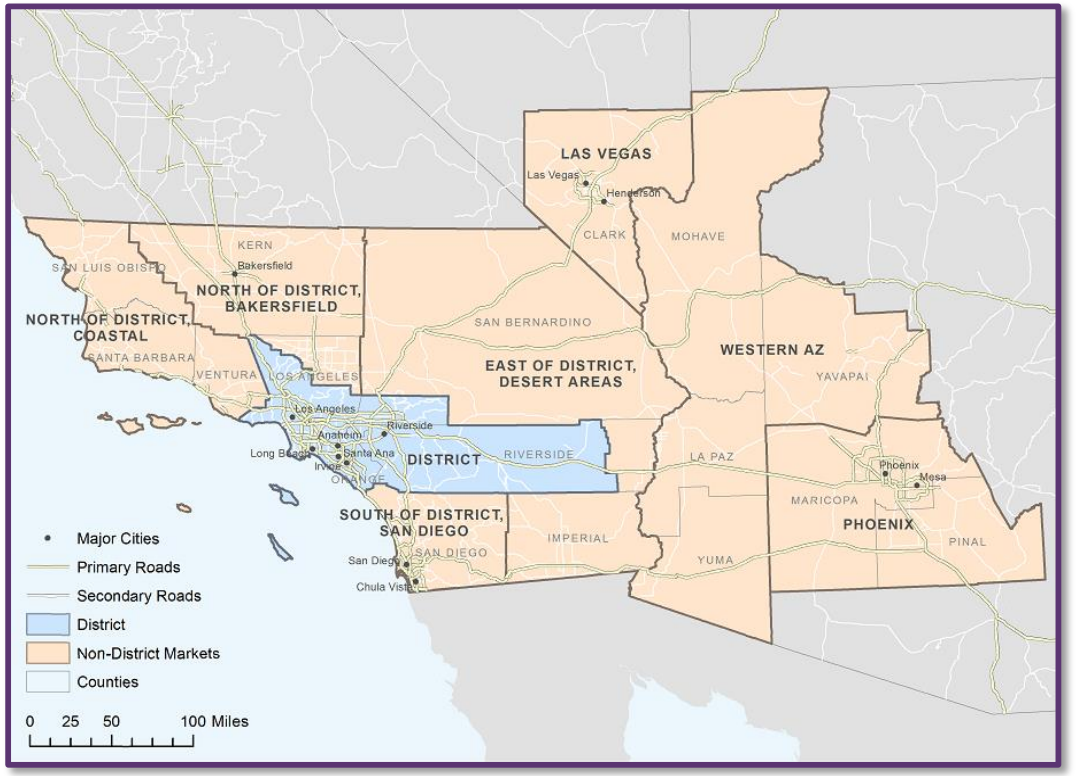
IEc STUDY METHODOLOGY – TASKS 1-3

1. Assessment of warehousing in South Coast AQMD region
   - Defined nine warehouse categories by expanding upon SCAG 2018 report
   - Interviewed industry stakeholders about factors affecting location decisions
     - Multiple stakeholders pointed to transportation network
2. Assessment of real-estate markets in adjacent areas
   - Identified available warehouse space in nearby regions outside the South Coast AQMD region using CoStar
   - Produced medium- and long-term trends of warehouse capacity using CoStar
3. Assessment of regional and nearby truck fleets serving warehouses
   - Involves surveying warehouses with fleets. Surveying efforts difficult in wake of COVID-19

IEc STUDY METHODOLOGY – TASK 4

4. Estimating changes in warehouse operation costs if relocated

- Considers relocation of each warehouse to seven different nearby regions
  - Uses 'pathway' results from Leachman (2017) study
- Includes cost differences due to the following:
  - Transportation costs (changes in trucking/rail distance)
  - Relocation costs (moving operations to warehouse in nearby region)
  - Labor costs (accounts for differences in industry-specific wage rates)
  - Power costs (accounts for differences in electric power costs outside CA)



IEc STUDY METHODOLOGY – TASK 5

5. Relocation scenario analyses of ISR rule
   - Each scenario analysis does the following:
     - Compares average expected PR 2305 compliance cost to cost of relocating to any nearby region (20-year timeframe)
     - If compliance cost > relocation cost, warehouse may choose to relocate due to PR 2305
   - Many PR 2305 compliance scenario analyses possible
     - Examples include different compliance costs per square foot of warehouse, and/or different phase-in schedules

NEXT STEPS AND CONTACTS

- Future opportunities for ‘formal’ public comment
  - CEQA
  - Preliminary draft staff report
  - Draft staff report
  - Governing Board
    - Mobile Source Committee and Public Hearing for rule adoption
- ‘Informal’ comments/discussions also encouraged
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