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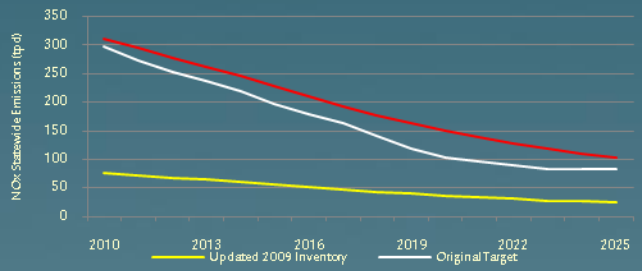
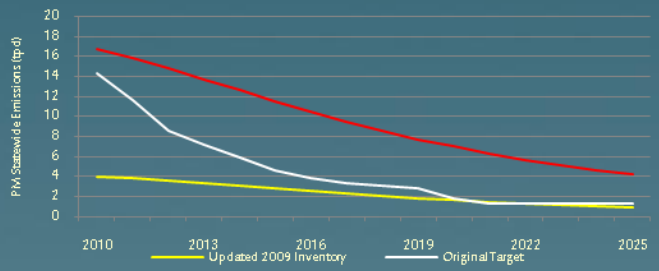
Quality People. Quality Projects.

Breathing Room

California Has Room
To Preserve and Protect Construction Jobs
And Still Exceed
Its Goals for Reducing Emissions from Off-Road Fleets

April 21, 2010





California's New In-Use Off-Road Diesel-Fueled Fleets Regulation

- Approved in July 2007
- Separately addresses emissions of nitrogen oxides (NOx) and particulate matter (PM)
- Applies to four industry categories – but just one of the four (Construction and Mining) accounts for at least 80% of the regulated equipment

California's New In-Use Off-Road Diesel-Fueled Fleets Regulation

- Established reporting requirements that took effect in April (large fleets), June (medium fleets) and August (small fleets) of 2009
- Established fleet average requirements that were originally scheduled to take effect in March of 2010 (large fleets), 2013 (medium fleets) and 2015 (small fleets)

California's New In-Use Off-Road Diesel-Fueled Fleets Regulation

- Based on 2000 emissions inventory
  - OFFROAD model
  - Best data then available to CARB
  - Baseline emissions for 2000
  - Forecast for future years
- Calibrated to drop NOx and PM emissions to specified levels
  - Compliance with State Implementation Plan
  - Environmental benefits versus economic burdens

Scope of Presentation

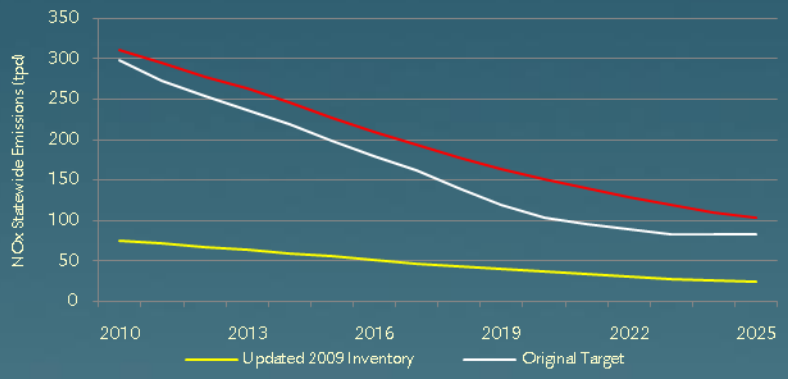
- A Quick Review
  - The Fundamentals of the OFFROAD Model
  - 2000 Emissions Inventory
  - 2009 Emissions Inventory
    - DOORS Data Provided on September 26, 2009

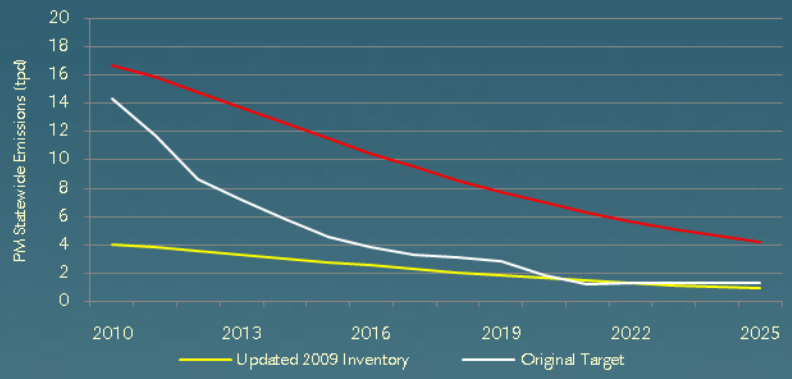
Scope of Presentation

- Updated 2009 Emissions Inventory
  - DOORS Data Provided on February 17, 2009
  - BOE and EIA Data on Diesel Fuel that Off-Road Equipment Consumed in 2009
  - Labor Union Data on the Hours that Operators Worked in 2009
- Conclusions

Bottom Line

CARB can do its part to preserve and protect
the remainder of the jobs in California's construction industry
and still **exceed** its targets for emissions from regulated fleets.





Fundamentals of the OFFROAD Model

- "Bottom Up" model designed to estimate current and project future emissions from off-road engines and vehicles
  - Agricultural, recreational, construction, mining, and other categories, but not rail or marine
  - Estimates and forecasts of emissions of hydrocarbons and carbon monoxide, as well as NOx and PM
    - Also diesel fuel diesel consumption

Fundamentals of the OFFROAD Model

- Originated in the mid-1990's
  - Many assumptions and methodologies dating back to that period
  - Not well documented
- Literally thousands of calculations
- But fundamental structure relatively straightforward

Fundamentals of the OFFROAD Model

For each model year, and each horsepower and equipment category, emissions and/or diesel fuel consumption are equal to the following:

Pieces of Equipment (Population)	X	Average Maximum Rated Horsepower	X	Average Hours of Operation (Activity)	X	Average Load During Operation	X	Emission/Fuel Factors

Fundamentals of the OFFROAD Model

- Different Emission Factors for each pollutant
  - Vary with age of engine
  - Also adjusted for unique fuel mixture that California requires
  - Measured in grams of pollutant per brake horsepower of engine work
- Also Diesel Fuel Consumption Factors
  - Measured in gallons of diesel fuel per brake horsepower of engine work
- Selected factor depends on purpose of estimate and/or forecast
  - Same inputs

Fundamentals of the OFFROAD Model

- Calculates and aggregates results for each model year of each horsepower and equipment category to produce baseline estimate for a particular year
- Applies growth factor to make forecasts for future years
  - Constant annual rate of growth for each population of equipment, equal to nearly 2% for Construction and Mining equipment
    - Apparently related to employment data but precise relationship uncertain

Fundamentals of the OFFROAD Model

- Not responsive to short-term swings in the economy
  - Activity assumed to be constant from year to year
- Baseline estimates likely to be wide of the mark for any one year
  - Low for years of unusually high activity
  - High for years of unusually low activity

2000 Emissions Inventory

- Starting point for new regulation
- Baseline estimate for year 2000
  - Earlier surveys and studies used to estimate inputs
    - Population
    - Average Maximum Rated Horsepower
    - Activity
    - Load Factors
    - Age Distribution

2000 Emissions Inventory

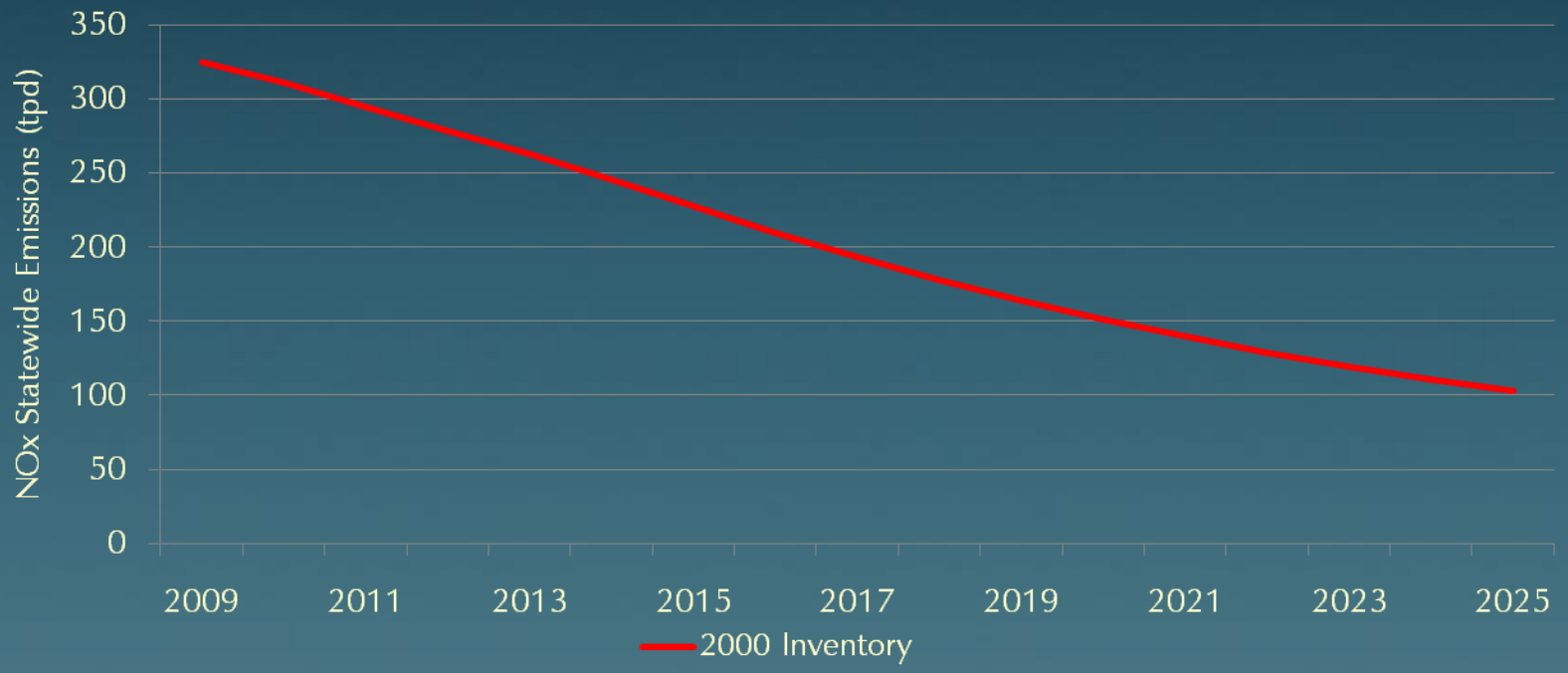
- Baseline estimate for year 2000
  - Emission Factors linked to regulatory standards through engine testing data
- Forecasts for future emissions
  - Based on Growth Factor

2000 Emissions Inventory for NOx

- OFFROAD model estimated 325 tons per day (tpd) in 2009
- OFFROAD model then projected steadily declining emissions through 2025
  - Down anywhere from 4.3% to 8% per year from 2010 to 2025
  - Down a cumulative total of 68.2% (to 103.2 tpd) between 2009 and 2025

NOx Emissions From Regulated Fleets (Tons Per Day)	
Year	2000 Inventory
2009	325.0
2010	311.0
2011	294.6
2012	278.6
2013	262.8
2014	246.0
2015	227.5
2016	209.9
2017	193.3
2018	177.8
2019	164.0
2020	150.8
2021	139.6
2022	128.8
2023	119.3
2024	110.7
2025	103.2

2000 Emissions Inventory for NOx

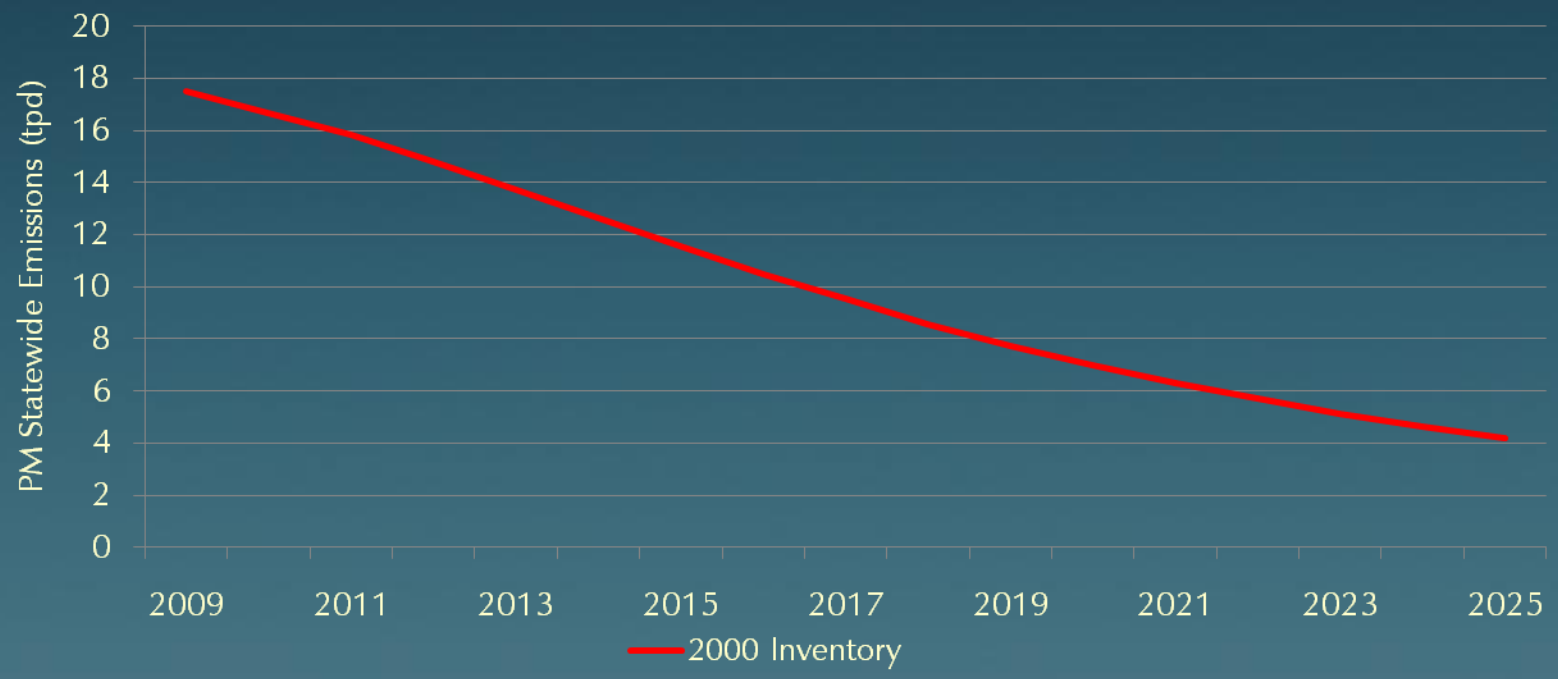


2000 Emissions Inventory for PM

- OFFROAD model estimated 17.49 tpd in 2009
- OFFROAD model then projected steadily declining emissions through 2025
  - Down anywhere from 4.6% to 10.2% per year though 2025
  - Down a cumulative total of 76.2% (to 4.2 tpd) between 2009 and 2025

PM Emissions From Regulated Fleets (Tons Per Day)	
Year	2000 Inventory
2009	17.49
2010	16.69
2011	15.86
2012	14.82
2013	13.71
2014	12.65
2015	11.54
2016	10.48
2017	9.53
2018	8.56
2019	7.71
2020	6.98
2021	6.29
2022	5.69
2023	5.14
2024	4.64
2025	4.17

2000 Emissions Inventory for PM



2009 Emissions Inventory

- New regulation's reporting requirements took effect between April and August of 2009
- Opportunity to take fresh look at emissions inventory
- Embedded in DOORS data were new and better values for three inputs needed to estimate emissions in 2009
  - Population
  - Average Maximum Rated Horsepower
  - Age Distribution

2009 Emissions Inventory

- As did CARB, AGC relied on OFFROAD model
  - No modifications or adjustments to model itself
    - No changes to formula
    - Originally estimated and/or assumed values for Activity and Load
    - Same Emission Factors
    - Same Growth Factor

2009 Emissions Inventory

- AGC merely substituted DOORS data provided in September of 2009 for surveys and studies on which CARB had relied
- OFFROAD model estimates for 2009
- OFFROAD model forecasts for future years

2009 Emissions Inventory for NOx

- OFFROAD model estimated 239.1 tpd in 2009
- OFFROAD model then forecast steadily declining emissions through 2025
  - Down anywhere from 5.2% to 8.3% per year through 2025
  - Down a cumulative total of 70% (to 71.6 tpd) between 2009 and 2025

NOx Emissions From Regulated Fleets (Tons Per Day)	
Year	2009 Inventory
2009	239.1
2010	222.5
2011	210.9
2012	199.9
2013	189.3
2014	177.1
2015	163.9
2016	151.5
2017	139.5
2018	128.1
2019	117.6
2020	108.0
2021	99.3
2022	91.1
2023	83.5
2024	77.1
2025	71.6

2009 Emissions Inventory for NOx

- Close to originally forecast rate of decline in NOx emissions
  - 2000 Inventory: 4.3% to 8%
  - 2009 Inventory: 5.2% to 8.3%
- Also close to originally forecast decline in NOx emissions over entire period
  - 2000 Inventory: 68.2%
  - 2009 Inventory: 70%

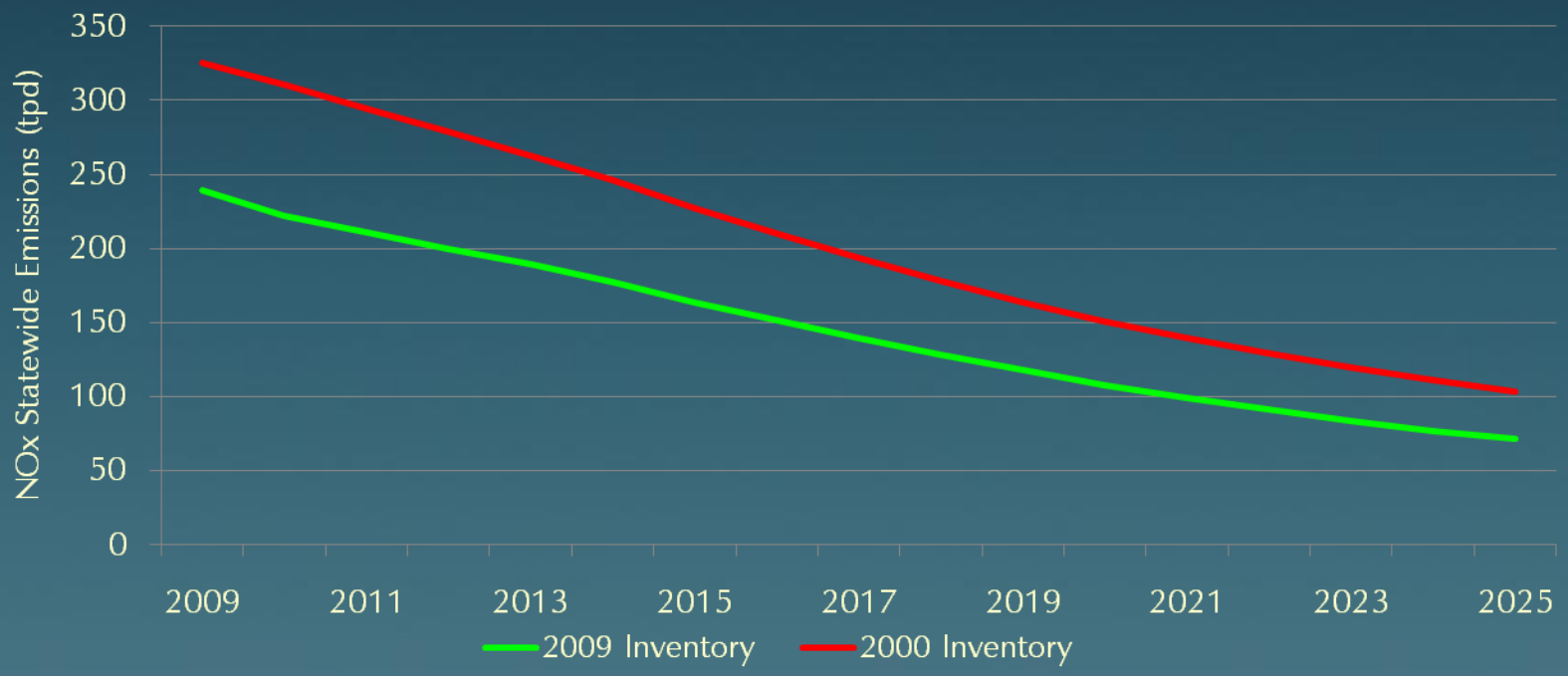
NOx Emissions From Regulated Fleets (Tons Per Day)		
Year	2000 Inventory	2009 Inventory
2009	325.0	239.1
2010	311.0	222.5
2011	294.6	210.9
2012	278.6	199.9
2013	262.8	189.3
2014	246.0	177.1
2015	227.5	163.9
2016	209.9	151.5
2017	193.3	139.5
2018	177.8	128.1
2019	164.0	117.6
2020	150.8	108.0
2021	139.6	99.3
2022	128.8	91.1
2023	119.3	83.5
2024	110.7	77.1
2025	103.2	71.6

2009 Emissions Inventory for NOx

- Very different picture of 2009
  - 2000 Inventory: 325 tpd in 2009
  - 2009 Inventory: 239.1 tpd in 2009

NOx Emissions From Regulated Fleets (Tons Per Day)		
Year	2000 Inventory	2009 Inventory
2009	325.0	239.1
2010	311.0	222.5
2011	294.6	210.9
2012	278.6	199.9
2013	262.8	189.3
2014	246.0	177.1
2015	227.5	163.9
2016	209.9	151.5
2017	193.3	139.5
2018	177.8	128.1
2019	164.0	117.6
2020	150.8	108.0
2021	139.6	99.3
2022	128.8	91.1
2023	119.3	83.5
2024	110.7	77.1
2025	103.2	71.6

2009 Emission Inventory for NOx



2009 Emissions Inventory for PM

- OFFROAD model estimated 12.9 tpd in 2009
- OFFROAD model then projected steadily declining emissions through 2025
  - Down anywhere from 5.3% to 12% through the year 2025
  - Down a cumulative total of 79% (to 2.7 tpd) between 2009 and 2025

PM Emissions From Regulated Fleets (Tons Per Day)	
Year	2009 Inventory
2009	12.91
2010	11.99
2011	11.35
2012	10.61
2013	9.85
2014	9.08
2015	8.32
2016	7.59
2017	6.87
2018	6.17
2019	5.53
2020	4.94
2021	4.41
2022	3.91
2023	3.44
2024	3.04
2025	2.71

2009 Emissions Inventory for PM

- Close to originally forecast rate of decline in PM emissions
  - 2000 Inventory: 4.6% to 10.2%
  - 2009 Inventory: 5.3% to 12%
- Also close to originally forecast decline in PM emissions over entire period
  - 2000 Inventory: 76%
  - 2009 Inventory: 79%

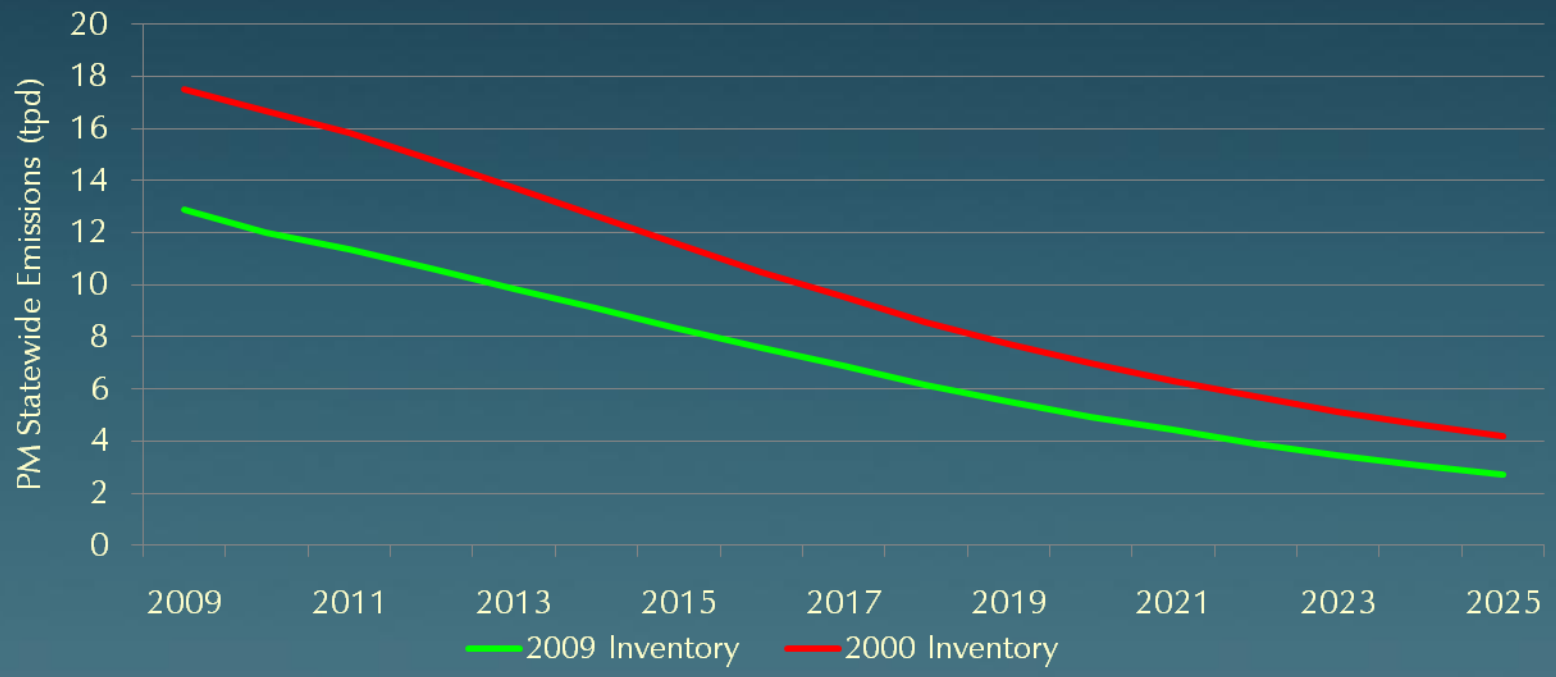
PM Emissions From Regulated Fleets (Tons Per Day)		
Year	2000 Inventory	2009 Inventory
2009	17.49	12.91
2010	16.69	11.99
2011	15.86	11.35
2012	14.82	10.61
2013	13.71	9.85
2014	12.65	9.08
2015	11.54	8.32
2016	10.48	7.59
2017	9.53	6.87
2018	8.56	6.17
2019	7.71	5.53
2020	6.98	4.94
2021	6.29	4.41
2022	5.69	3.91
2023	5.14	3.44
2024	4.64	3.04
2025	4.17	2.71

2009 Emissions Inventory for PM

- Very different picture of 2009
  - 2000 Inventory: 17.5 tpd
  - 2009 Inventory: 12.9 tpd

PM Emissions From Regulated Fleets (Tons Per Day)		
Year	2000 Inventory	2009 Inventory
2009	17.49	12.91
2010	16.69	11.99
2011	15.86	11.35
2012	14.82	10.61
2013	13.71	9.85
2014	12.65	9.08
2015	11.54	8.32
2016	10.48	7.59
2017	9.53	6.87
2018	8.56	6.17
2019	7.71	5.53
2020	6.98	4.94
2021	6.29	4.41
2022	5.69	3.91
2023	5.14	3.44
2024	4.64	3.04
2025	4.17	2.71

2009 Emissions Inventory for PM



Updated 2009 Emissions Inventory

- 2010 presented opportunity to further refine values needed to estimate emissions in 2009
  - Additional data had continued to trickle into CARB
    - Total population of reported equipment grew from 126,267 to 156,929 by February of 2010
  - Population, Average Maximum Horsepower and Age Distribution
  - Also “low use” equipment, which had grown in proportion to total

Updated 2009 Emissions Inventory

- 2010 also presented unique opportunity to investigate public reports that historical data on off-road fuel consumption had significant implications for OFFROAD model
  - Peer-reviewed research
    - Kean, A.J., Sawyer, R.F, and Harley, R.A., "A Fuel-Based Assessment of Off-Road Diesel Engine Emissions," *J. Air & Waste Manage. Assoc.* **50:**1929-2939, 2000.
    - Millstein, D.E., and Harley, R.A., "Revised estimates of construction activity and emissions: Effects on ozone and elemental carbon concentrations in southern California, *Atmospheric Environment* **43:**6328-6335, 2009.

Updated 2009 Emissions Inventory

- Not only DOORS data but also other data for all of 2009 became available in 2010
  - Red dye diesel fuel that all off-road equipment burned in 2009
  - Hours that equipment operators worked in 2009
  - Sources of additional data included Locals 3 and 12 of International Union of Operating Engineers, California Board of Equalization, and Energy Information Administration of U.S. Department of Energy

Updated 2009 Emissions Inventory

- Again, AGC began with OFFROAD model
  - No modifications or adjustments to model itself
    - No changes to formula
    - Originally estimated and/or assumed values for Activity and Load
    - Same Emission and Fuel Factors
    - Same Growth Factor

Updated 2009 Emissions Inventory

- First, AGC substituted DOORS data provided in February of 2010 for DOORS data provided in September of 2009
- Second, AGC accounted for equipment reported to be low use
  - 7.5% of total population of equipment
  - Assumed to operate no more than 100 hours per year, as required by regulation
  - Scaling factor equal to 0.16
    - Ratio of regulatory limit (100 hours per year) to otherwise estimated and/or assumed hours of operation

Updated 2009 Emissions Inventory

- Third, AGC confirmed and quantified disparity between actual data and model's estimates of off-road diesel fuel consumption for 2009
- Finally, AGC aligned model with actual data on off-road diesel fuel consumption
  - Actual Fuel Consumption Factor equal to 0.282
    - Ratio of off-road fuel consumption in 2009 to OFFROAD model's estimate of same
    - External to model itself

Updated 2009 Emissions Inventory

- Third step in process the most challenging
  - Simple and straightforward question: how did actual data compare with model's estimates for 2009
    - Actual data divided by model's estimate should equal one
  - Challenges were two
    - Ensuring apples-to-apples comparison
    - Adjusting for short-term fluctuations in Activity

Updated 2009 Emissions Inventory

- Total gallons of red-dye fuel that Board of Equalization (BOE) reported to be sold for off-road use in 2009 provided starting point
  - 14.59% of that total allocated to construction
    - Equal to allocation that Energy Information Agency made in 2008
      - Most recent year
    - Conservative allocation, as construction industry more depressed than other sectors in 2009

Updated 2009 Emissions Inventory

- 25% of construction equipment's share of red-dye fuel then added to that figure – to account for clear fuel that off-road construction equipment also consumed in 2009
  - Most recent year for which BOE has complete data on such fuel is 2006
  - In 2004, 2005 and 2006, ratio of clear to red-dye fuel that off-road equipment consumed ranged from 21.1% to 25.1%
  - Selected ratio equal to actual ratio for 2005

Updated 2009 Emissions Inventory

- 10% of all fuel that off-road construction equipment consumed in 2009 then added to that figure – to account for mining portion of combined Construction and Mining category that OFFROAD model addresses
  - Necessary for apples-to-apples comparison
  - Mining equipment equal to 1% of all equipment in construction and mining category
    - Baker, R., "Characterization of the Off-Road Equipment Population," Eastern Research Group, Final Report to the California Air Resources Board, December 2008.
  - Conservative assumption that mining equipment has significantly higher Activity and/or Load Factors – together, ten times construction

Updated 2009 Emissions Inventory

- 12.4% of all fuel that construction and mining equipment consumed in 2009 then added to that figure – to account for Airport Ground Support, Industrial, and Oil Drilling categories of off-road equipment
  - Model also addresses, and regulation also covers, those three categories of off-road diesel equipment
  - Model itself yields ratio
    - Combined estimate for other three categories relative to estimate for Construction and Mining
    - Also necessary for apples-to-apples comparison

Updated 2009 Emissions Inventory

- Hours that operating engineers reported in 2005 and 2009 formed starting for downward adjustment of Activity
  - Activity factor built into model assumed to equal 2005
    - Another conservative assumption, as 2005 was peak year for GDP originating in California construction industry
  - Hours that operating engineers reported working fell 39.5% between that year and 2009
  - After accounting for changes in population and mix of equipment over same period, downward adjustment for drop in Activity came to 32%

Updated 2009 Emissions Inventory

Diesel Fuel Actually Consumed by Regulated Fleets in 2009

red dye diesel fuel consumed by off-road construction equipment	106,054,957
clear diesel fuel consumed by off-road construction equipment	+ 26,513,740
total diesel fuel consumed by off-road construction equipment	132,568,697
diesel fuel consumed by off-road mining equipment	+13,256,870
diesel fuel consumed by off-road construction and mining equipment	145,825,567
diesel fuel consumed by off-road equipment in other regulated fleets	+18,082,370
diesel fuel consumed by all regulated fleets	163,907,937

Updated 2009 Emissions Inventory

Model's Estimate of Diesel Fuel Consumed by Regulated Fleets in 2009

model's estimate of total diesel fuel consumed by all regulated fleets*	853,852,530
downward adjustment for drop in Activity between 2005 and 2009	- 273,232,795
adjusted estimate of diesel fuel consumed by all regulated fleets	580,619,735

*Based on DOORS data, including low use vehicles

Updated 2009 Emissions Inventory

Actual Fuel Consumption Factor

total diesel fuel actually consumed by all regulated fleets	163,907,937
Activity adjusted estimate of diesel fuel consumed by all regulated fleets*	÷ 580,619,735
adjustment factor	0.282

*Based on DOORS data, including low use vehicles

Updated 2009 Emissions Inventory

- Started with original OFFROAD model
- Based on DOORS data, updated inputs for Population, Average Maximum Horsepower and Age Distribution
  - Also applied scaling factor to “low use” equipment
- Applied Actual Fuel Consumption factor

Updated 2009 Emissions Inventory

- No adjustment for Activity
  - Only used to calculate Actual Fuel Consumption factor
  - Same Activity that CARB assumed when it developed its 2000 emissions inventory
  - Same Activity that model would assume in absence of any recession
- No change in Growth Factor
  - Same Growth Factor that CARB assumed when it developed its 2000 emissions inventory
  - Same growth that model would assume in absence of any recession

Updated 2009 Emissions Inventory for NOx

- OFFROAD model estimated 81.3 tpd in 2009
- OFFROAD model then forecast steadily declining emissions through 2025
  - Down anywhere from 5.3% to 8.3% per year through 2025
  - Down a cumulative total of 70.2% (to 24.2 tpd) between 2009 and 2025

NOx Emissions From Regulated Fleets (Tons Per Day)	
Year	Updated 2009 Inventory
2009	81.3
2010	75.7
2011	71.7
2012	67.9
2013	64.3
2014	60.1
2015	55.5
2016	51.3
2017	47.2
2018	43.3
2019	39.8
2020	36.5
2021	33.6
2022	30.8
2023	28.2
2024	26.1
2025	24.2

Updated 2009 Emissions Inventory for NOx

- Still close to originally forecast rate of decline in NOx emissions
  - 2000 Inventory: 4.3% to 8%
  - Updated 2009 Inventory: 5.3% to 8.3%
- Still close to originally forecast decline of NOx emissions over entire period
  - 2000 Inventory: 68.2%
  - Updated 2009 Inventory: 70.2%

NOx Emissions From Regulated Fleets (Tons Per Day)

Year	2000 Inventory	Updated 2009 Inventory
2009	325.0	81.3
2010	311.0	75.7
2011	294.6	71.7
2012	278.6	67.9
2013	262.8	64.3
2014	246.0	60.1
2015	227.5	55.5
2016	209.9	51.3
2017	193.3	47.2
2018	177.8	43.3
2019	164.0	39.8
2020	150.8	36.5
2021	139.6	33.6
2022	128.8	30.8
2023	119.3	28.2
2024	110.7	26.1
2025	103.2	24.2

Updated 2009 Emissions Inventory for NOx

- But even bigger difference between originally forecast and newly estimated emissions in 2009
  - 2000 Inventory: 325 tpd in 2009
  - Updated 2009 Inventory: 81.3 tpd in 2009

NOx Emissions From Regulated Fleets (Tons Per Day)		
Year	2000 Inventory	Updated 2009 Inventory
2009	325.0	81.3
2010	311.0	75.7
2011	294.6	71.7
2012	278.6	67.9
2013	262.8	64.3
2014	246.0	60.1
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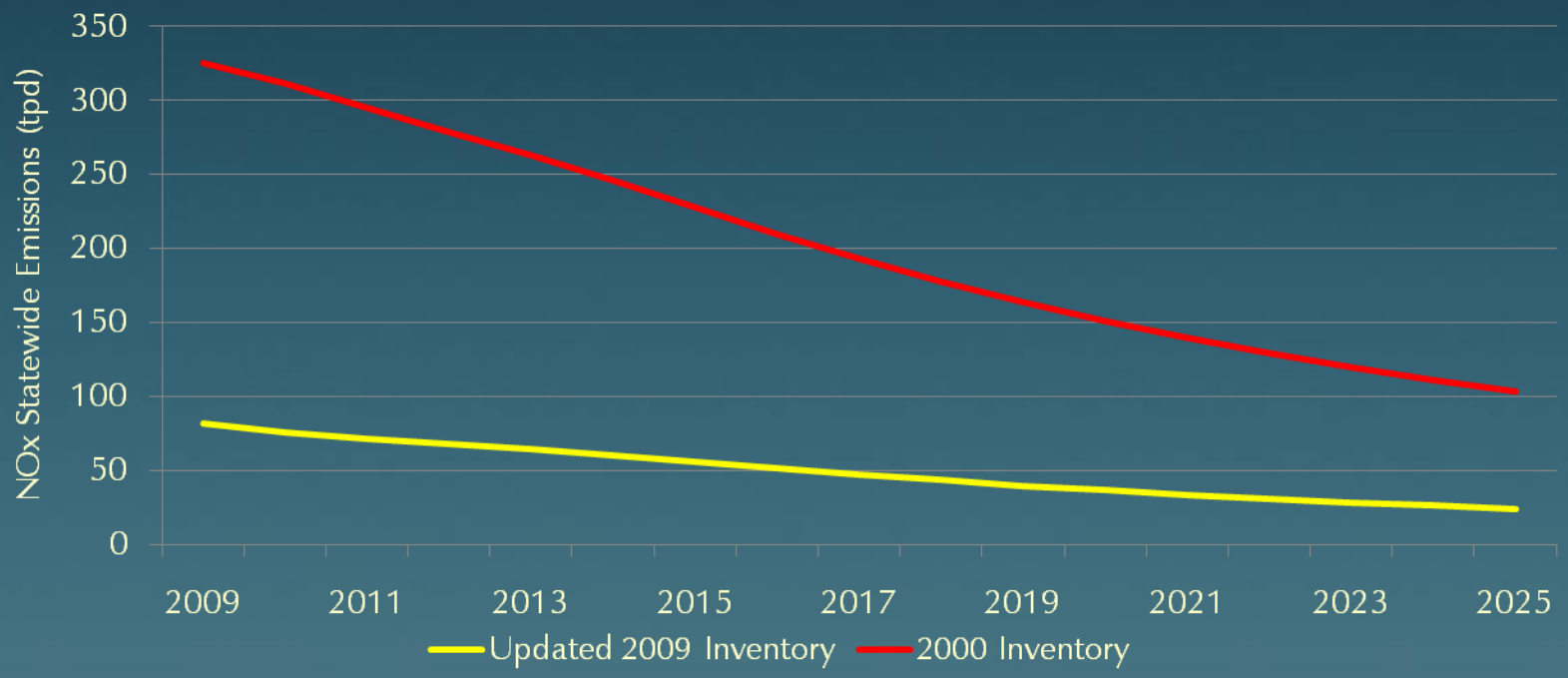
2017	193.3	47.2
2018	177.8	43.3
2019	164.0	39.8
2020	150.8	36.5
2021	139.6	33.6
2022	128.8	30.8
2023	119.3	28.2
2024	110.7	26.1
2025	103.2	24.2

Updated 2009 Emissions Inventory for NOx



Updated 2009 Emissions Inventory for PM

- OFFROAD model estimated 4.34 tpd in 2009
- OFFROAD model then projected steadily declining emissions through 2025
  - Down anywhere from 5.4% to 11.9% through the year 2025
  - Down a cumulative total of 79% (to 0.91 tpd) between 2009 and 2025

PM Emissions From Regulated Fleets (Tons Per Day)	
Year	Updated 2009 Inventory
2009	4.34
2010	4.03
2011	3.81
2012	3.56
2013	3.31
2014	3.05
2015	2.79
2016	2.54
2017	2.30
2018	2.07
2019	1.85
2020	1.65
2021	1.48
2022	1.31
2023	1.15
2024	1.02
2025	0.91

Updated 2009 Emissions Inventory for PM

- Still close to originally forecast rate of decline in PM emissions
  - 2000 Inventory: 4.6% to 10.2%
  - Updated 2009 Inventory: 5.4% to 11.9%
- Also close to originally forecast decline in PM emissions over entire period
  - 2000 Inventory: 76%
  - Updated 2009 Inventory: 79%

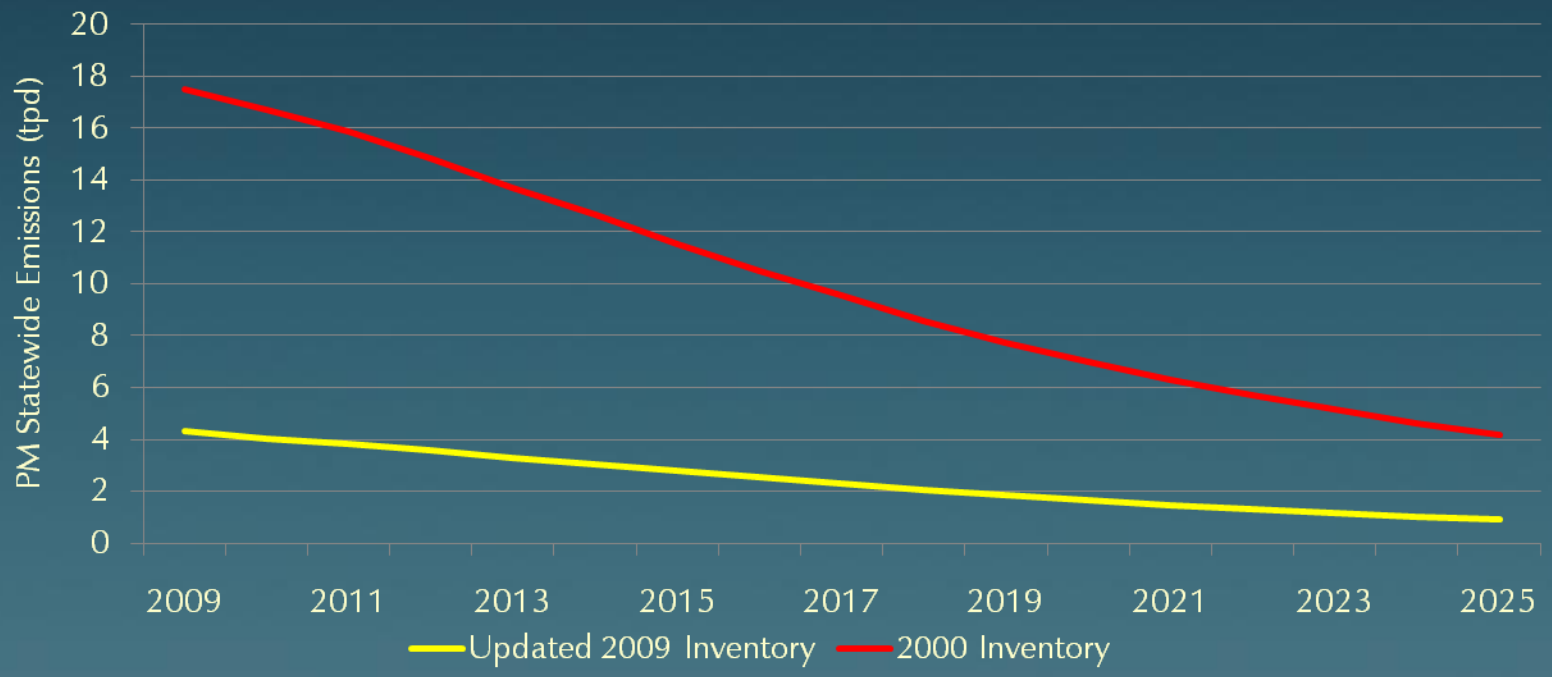
PM Emissions From Regulated Fleets (Tons Per Day)		
Year	2000 Inventory	Updated 2009 Inventory
2009	17.49	4.34
2010	16.69	4.03
2011	15.86	3.81
2012	14.82	3.56
2013	13.71	3.31
2014	12.65	3.05
2015	11.54	2.79
2016	10.48	2.54
2017	9.53	2.30
2018	8.56	2.07
2019	7.71	1.85
2020	6.98	1.65
2021	6.29	1.48
2022	5.69	1.31
2023	5.14	1.15
2024	4.64	1.02
2025	4.17	0.91

Updated 2009 Emissions Inventory for PM

- But even bigger difference between originally forecast and newly estimated emissions in 2009
  - 2000 Inventory: 17.5 tpd
  - Updated 2009 Inventory: 4.3 tpd

PM Emissions From Regulated Fleets (Tons Per Day)		
Year	2000 Inventory	Updated 2009 Inventory
2009	17.49	4.34
2010	16.69	4.03
2011	15.86	3.81
2012	14.82	3.56
2013	13.71	3.31
2014	12.65	3.05
2015	11.54	2.79
2016	10.48	2.54
2017	9.53	2.30
2018	8.56	2.07
2019	7.71	1.85
2020	6.98	1.65
2021	6.29	1.48
2022	5.69	1.31
2023	5.14	1.15
2024	4.64	1.02
2025	4.17	0.91

Updated 2009 Emissions Inventory for PM



Why the Differences

- Updated 2009 emission inventory dramatically differs from 2000 emissions inventory for several reasons
  - Population of Equipment: 156,929 versus 191,678
  - Low use category of equipment: 100 hours versus 625 hours
  - Diesel fuel that regulated fleets actually consume: 163,907,937 versus 580,619,735 in 2009
    - After controlling for Population, Average Maximum Horsepower and Age Distribution, <u>and adjusting for drop in Activity</u>

Why the Differences

- **NOT** recession
  - Inventory based on same level of Activity that CARB assumed prior to recession
  - Except to extent that downturn restrained growth in population of off-road equipment between 2000 and 2009
- **NOT** forecast of slow economic recovery
  - Inventory based on same Growth Factor that CARB applied prior to recession

Conclusions

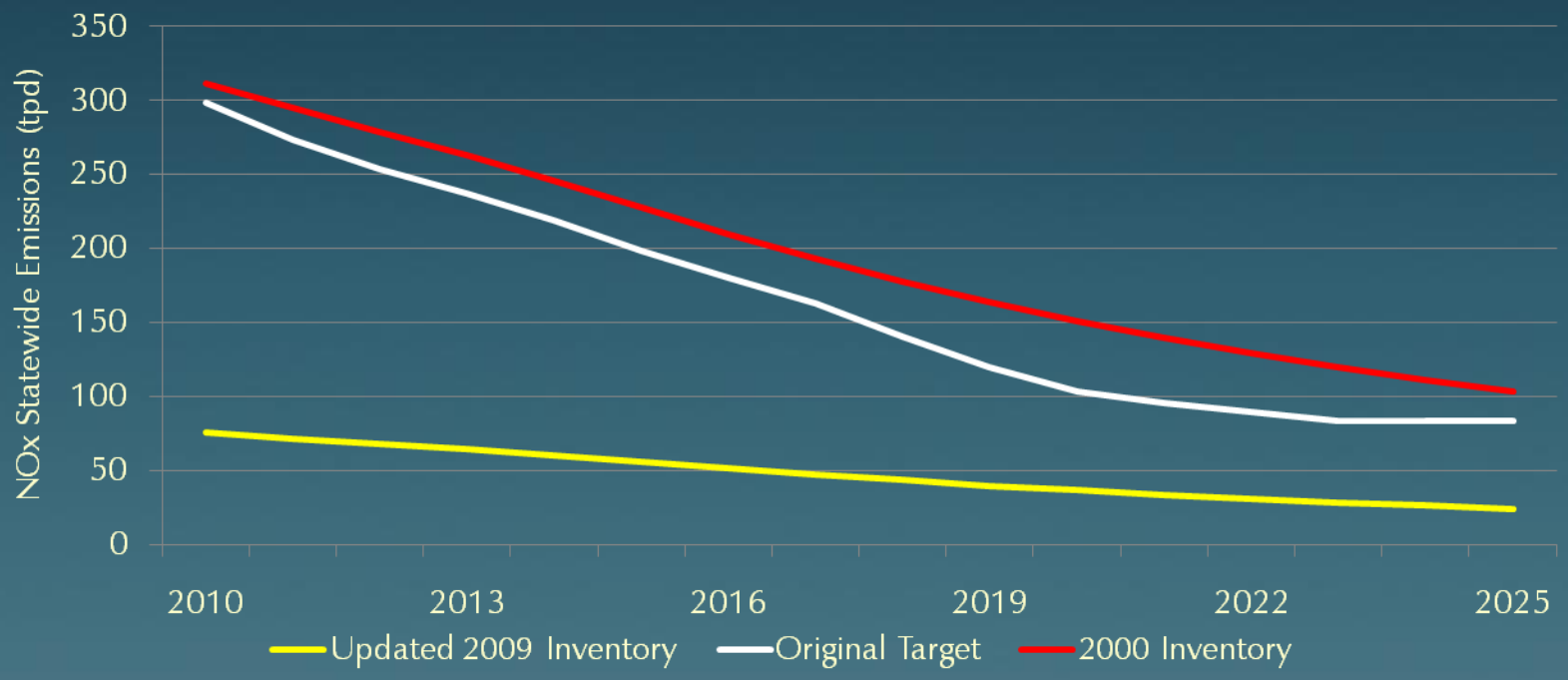
- CARB has more than enough room to grant AGC's request for further relief from the new regulation and still hit, indeed **exceed,** the Board's original targets for emissions from the regulated fleets.
  - True for NOx
  - Also true for PM

NOx Cushion

- Latest forecasts for NOx are dramatically lower than targeted rates in each and every year between 2010 and 2025
  - Anywhere from 64.5% to 74.6% below targeted rates

NOx Emissions From Regulated Fleets (Tons Per Day)			
Year	CARB Targets	Updated 2009 Inventory	Delta
2010	298.4	75.7	-222.7
2011	273.3	71.7	-201.6
2012	253.6	67.9	-185.7
2013	236.9	64.3	-172.6
2014	218.8	60.1	-158.7
2015	198.0	55.5	-142.5
2016	179.8	51.3	-128.5
2017	162.5	47.2	-115.3
2018	140.7	43.3	-97.4
2019	119.7	39.8	-79.9
2020	102.9	36.5	-66.4
2021	95.5	33.6	-61.9
2022	89.7	30.8	-58.9
2023	83.6	28.2	-55.4
2024	83.6	26.1	-57.5
2025	83.6	24.2	-59.4

NOx Cushion

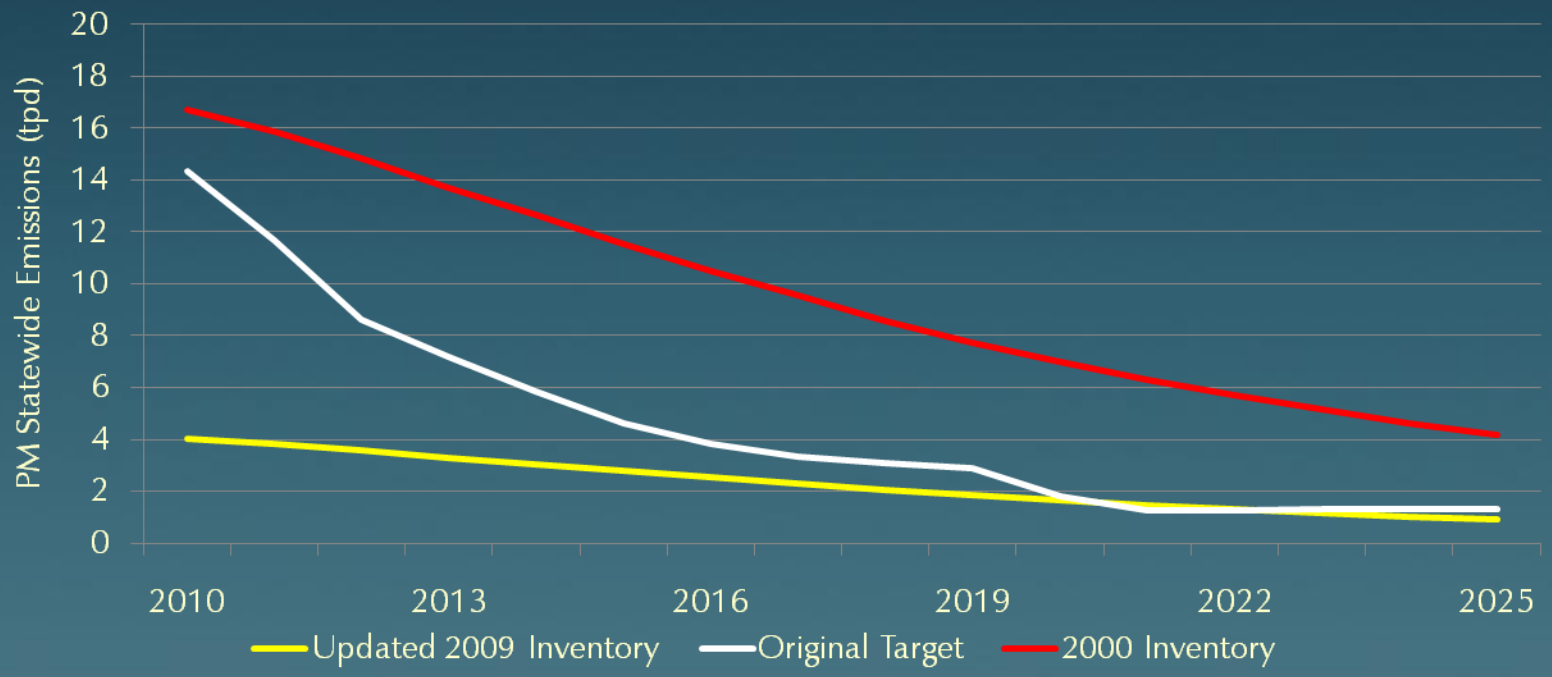

NOx Statewide Emissions (tpd)
350
300
250
200
150
100
50
0
2010
2013
2016
2019
2022
2025
Updated 2009 Inventory
Original Target
2000 Inventory

PM Cushion

- Latest forecasts for PM are below targeted rates in 14 of 16 years between 2010 and 2025, including first 11
  - As much as 71.9% below targeted rates
  - More than 30% below targeted rates through 2019

PM Emissions From Regulated Fleets (Tons Per Day)			
Year	CARB Targets	Updated 2009 Inventory	Delta
2010	14.35	4.03	-10.32
2011	11.69	3.81	-7.87
2012	8.62	3.56	-5.05
2013	7.21	3.31	-3.90
2014	5.84	3.05	-2.80
2015	4.60	2.79	-1.81
2016	3.83	2.54	-1.29
2017	3.34	2.30	-1.03
2018	3.09	2.07	-1.02
2019	2.89	1.85	-1.03
2020	1.81	1.65	-0.15
2021	1.26	1.48	0.22
2022	1.28	1.31	0.03
2023	1.29	1.15	-0.14
2024	1.30	1.02	-0.28
2025	1.31	0.91	-0.40

PM Cushion


PM Statewide Emissions (tpd)
20
18
16
14
12
10
8
6
4
2
0
2010
2013
2016
2019
2022
2025
Updated 2009 Inventory
Original Target
2000 Inventory

Conclusions

- AGC has asked CARB for the following:
  - Apply the small fleet requirements to all fleets
  - Clarify that exempt vehicles are excluded from all calculations of horsepower, average fleet emissions and the like
  - Create a "safe harbor" for fleet owners at risk of suffering serious financial harm, capping the expenditure that any one owner would have to make in any one year
- CARB has emissions cushion to make these changes and still meet, indeed **exceed,** its targets for emissions from regulated fleets

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Thank you.

Michael E. Kennedy, Esq.
General Counsel
Associated General Contractors of America
2300 Wilson Boulevard, Suite 400
Arlington, VA 22201
Direct: 703-837-5335 Email: kennedym@agc.org