

Public Hearing to Consider Proposed Amendments to Transport Refrigeration Unit (TRU) Airborne Toxic Control Measure (ATCM)



Sacramento, California

October 21, 2011

California Environmental Protection Agency



Air Resources Board

Overview

- **Background**
- **Emissions Inventory Update**
- **Proposed Amendments**
- **Economic Impacts**
- **Emissions Impacts**
- **Health Impacts**
- **Recommendation**



Background

- **Diesel PM identified as TAC in 1998**
- **TRU's congregate in large numbers at distribution centers**
 - **Very high near-source risk (> 100/million common)**
- **TRU ATCM adopted 2004**
- **U.S. EPA approved waiver January 16, 2009**
- **2010 Amendments**
 - **Board direction**



TRU Applications



- **What is a TRU?**
 - Refrigeration systems powered by integral diesel engines
 - Used to control the environment of temperature sensitive products that are transported in trucks, semi-trailers, railcars, and shipping containers



Primary Requirements of Current Regulation

- **Web-based registration**
 - Voluntary for TRUs based outside California
- **Submit Operator Reports**
 - California terminals where TRUs are assigned
- **Meet in-use performance standards**
 - Affects all TRUs that operate in California
 - Phased compliance schedule based on 7-year operational life

In-Use Performance Standards

- **Two levels of stringency**
 - **Low-Emission TRU (LETRU)**
 - >50 percent PM emission reduction
 - **Ultra-Low-Emission TRU (ULETRU)**
 - >85 percent PM emission reduction
- **Compliance options available now**
 - Repower - engine replacement
 - Retrofit with verified diesel particulate filter
 - Use alternative technology - hybrid electric
 - Available now for model year 2004

In-Use Performance Standard Compliance Schedule

- **Engine model year (MY) 2003 and older**
 - Step 1: Meet LETRU when 7 years old
 - Step 2: Meet ULETRU when 14 years old
- **Engine MY 2004 and newer**
 - Skip LETRU
 - Meet ULETRU when 7 years old

Implementation Status

- **Outreach training, compliance assistance**
- **Stakeholder issue meetings**
- **Regulatory advisories**
- **Compliance technology development and verification**
- **Technology forums**
- **Web-based TRU registration system**
- **Toll-free helpline**

Implementation Status

(Cont.)

- **Enforcement**
 - **Registration and in-use requirements**
 - **Inspections at:**
 - **Border crossings**
 - **Distribution centers**
 - **Scales**
 - **Ag inspection stations**
 - **Ports**
 - **Carrier terminals**
 - **Intermodal facilities**

Implementation Status

(Cont.)

- **Compliance Assistance**
 - Letters to owners registered in ARBER
 - Emails to TRU List Serve
 - Developing a List of “100% Compliant Fleets”

2010 Amendments

- **Board approved three amendments needed by the end of 2010**
 - Added compliance options for MY 2003 engines
 - Addressed flexibility engines
 - Enhanced OEM Reporting
- **Board directed staff to:**
 - Evaluate request for longer operational life
 - Emissions inventory update
 - Cost of compliance – economic impacts update
 - Health risk assessment update

Evaluate Longer Operational Life MY 2004 and Newer Engines

- **Impact of extending operational life to 8, 9, or 10 years**
 - **Public health risk at existing 7 years is too high**
 - **Potential public health impacts from delay**
 - **Increasing operational life to 8-10 years erodes cancer risk reductions by about 10-40 percent**
- **Staff recommends maintaining existing 7-year operational lifetime requirement**

Evaluate Longer Operational Life Health Risk at TRU Facilities

- **Estimated off-site potential cancer risk from a “typical” facility with current 7-year operational life:**

Activity (Engine Hours Per Week)	Loads Per Week	Near-Source Cancer Health Risks
100	40	>10 per million
1000	400	>100 per million

- **Activity at “large” distribution centers is higher**
 - **Average is about 2,000 hours per week**
 - **Highest reported: >8,000 hours per week**

Evaluate Longer Operational Life Health Risk at TRU Facilities (Cont.)

- **At least 500 facilities with a potential cancer risk above 10/million**

Data Source	Total Number of Facilities	Number of Facilities with Activity in Range	
		>100 hrs/week	>1,000 hrs/week
2006 Facility Survey	56	51	33
ARBER Operator Reports	500-650	400-500	Needs further study

- **At least 50% of these located near residences, off-site workplaces, and sensitive receptors**

TRU Emission Inventory Update

- **New input data collected since 2003 and applied to current inventory includes:**

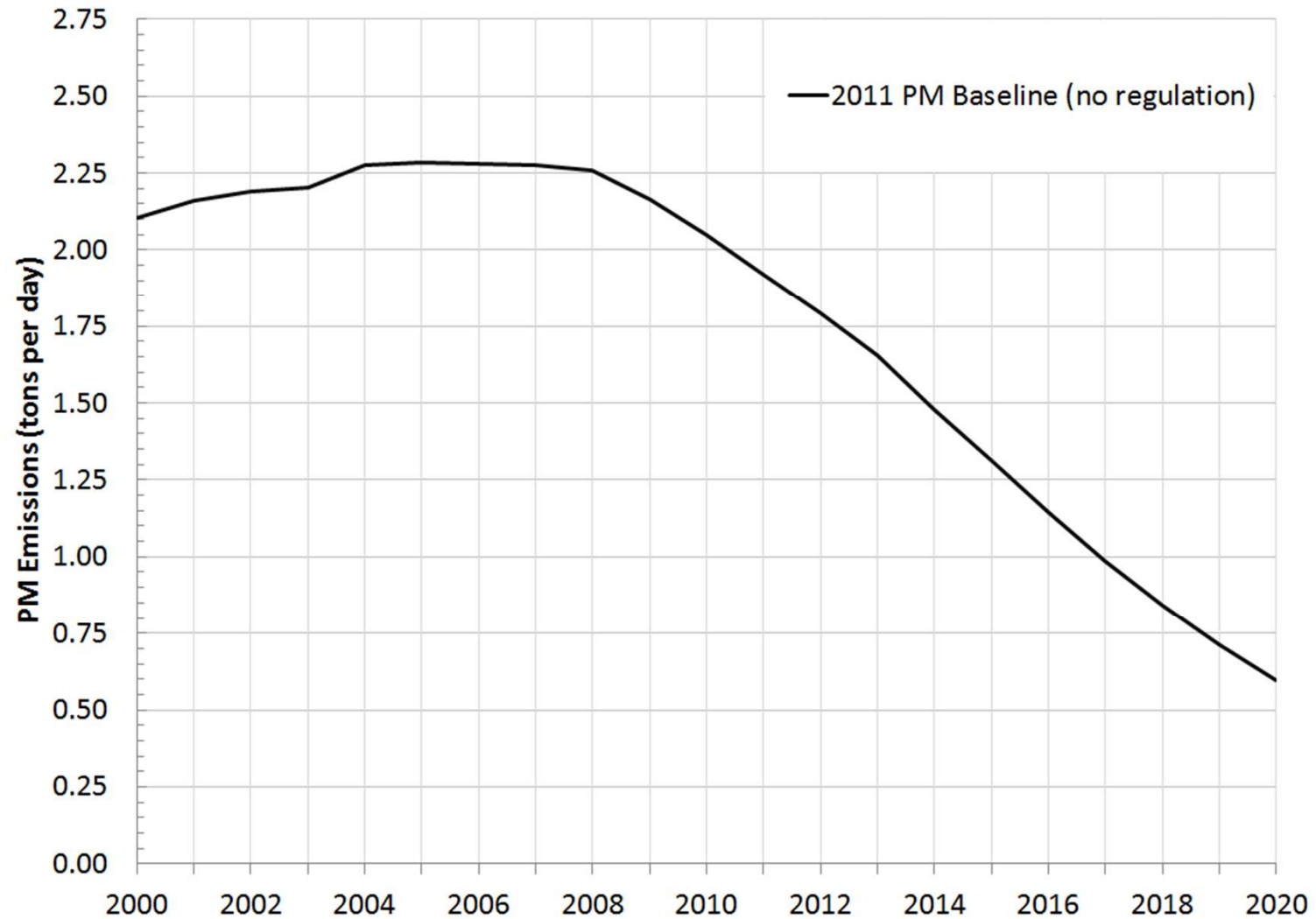
Input	Data Source
In-state population	2011 ARBER
Daily out-of-state population	2010 Truck and Bus Rule
Engine load factors	Manufacturer input, engine performance data
Annual engine activity, overall	2006 Facility Survey, 2010 Truck and Bus Rule
Annual engine activity, in-state	2006 Facility Survey
Emission Factors	Tier 4 final Standards
Growth Rate	1990-2010 national engine sales

TRU Emission Inventory Update (Cont.)

Input	2011 Compared to 2003
In-state population	20 percent lower
Daily out-of-state population	10 percent lower
Engine load factors	13 percent lower
Annual engine activity, overall	15 percent higher, per unit
Annual engine activity, in-state	8 percent lower
Emission Factors	Future emission factors lower to reflect standard
Growth Rate	50 percent lower

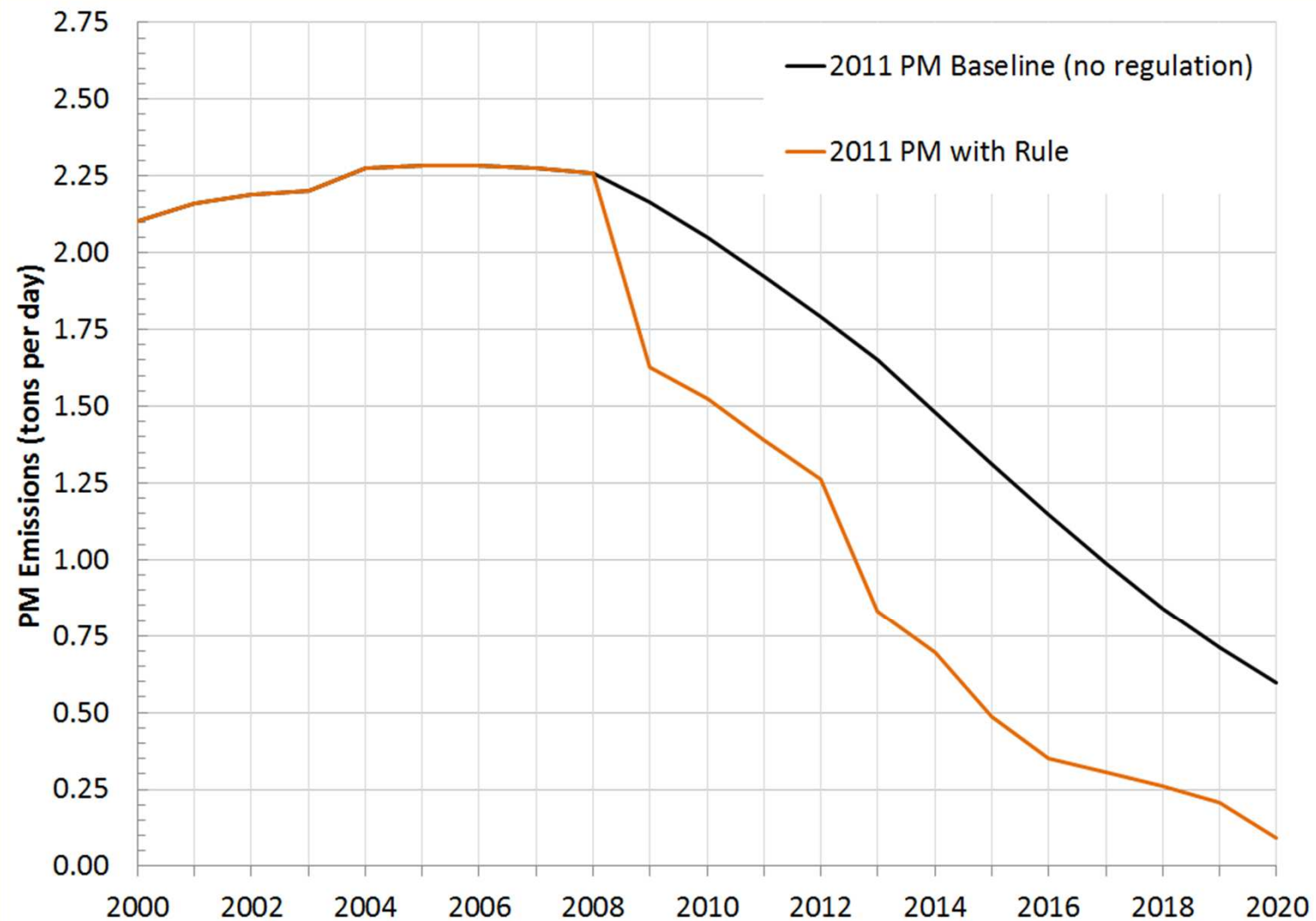
TRU Emission Inventory Update

Statewide PM Emissions



TRU Emission Inventory Update

Statewide PM Emissions



Economic Impacts Update

Actual Compared to 2003 Staff Report

- **Actual capital costs increased**
- **Operating and maintenance costs refined**
- **Compliance methods actually used**
 - **VDECS retrofits (20%)**
 - **Engine repowers (70%)**
 - **Unit replacements (10%)**
 - **Alternative Technologies (< 1%)**
- **Cost-Effectiveness changed**
 - **\$83 per pound PM (originally estimated \$10 to \$20 per pound)**

Proposed Amendments

- **Extension of ULETRU compliance date for some MY 2003 and older engines**
- **Provide flexibility**
- **Improve enforceability**
- **Improve compliance rates**
- **Clarify existing requirements**

Proposed Amendments

Extension for MY 2003 and Older Engines

- **Model year 2003 and older, if met LETRU**
 - **Extend ULETRU compliance date 1 year**
 - **MY 2001 and older, if met LETRU by 12-31-08, results in 2 year ULETRU extension**
- **Extends operational life**
- **Restores competitive fairness for emission reduction actions taken**
- **Negligible emissions and risk impacts**

Proposed Amendments

Administrative Extensions

- **Up to one-year extension if complying technology is not available**
 - Application required before deadline
 - Demonstrates no suitable filter or engine available
- **Up to four-month extension if delivery or installation are delayed**
- **Case-by-case consideration**

Proposed Amendments

Provide Flexibility

- **Use of unit manufacture year instead of engine model year - extends operational life**
- **Use of unique equipment identification numbers instead of ARB's**
- **Exemptions**
 - **Obviously nonoperational equipment**
 - **Non-diesel-powered refrigeration systems**
 - **TRUs used during certain emergencies**

Proposed Amendments

Improve Enforceability

- **Clarify recordkeeping requirements for hybrid electric TRUs**
 - TRU engine operation eliminated at nonretail facilities (distribution centers)
 - Electric power plugs must be available
 - TRU engine operation limited to less than 30 minutes at retail delivery points
- **Automated electronic tracking and reporting phased in, starting 2013**
 - Small initial capital cost
 - Significant labor savings – expected payback less than 1 year

Proposed Amendments

Improve Compliance Rates

- **Hired or contracted carriers must dispatch compliant TRUs**
 - **Brokers, shippers, and receivers must demonstrate due diligence**
 - **Contract with carrier must specify use of ARB-compliant equipment**
- **Minimizes unfair competition created by noncompliant equipment**

Proposed Amendments

Improve Compliance Rates (Cont.)

- **TRU manufacturers and engine rebuilders**
 - Provide registration information documents and supplemental engine labels
- **Dealers and repair shops**
 - Pass registration information documents to next party in chain (ultimately to the end-user)
- **TRU manufacturers that use flexibility engines**
 - Notify ARB
 - Provide supplemental labels and written disclosure

Proposed Amendments

Clarifications

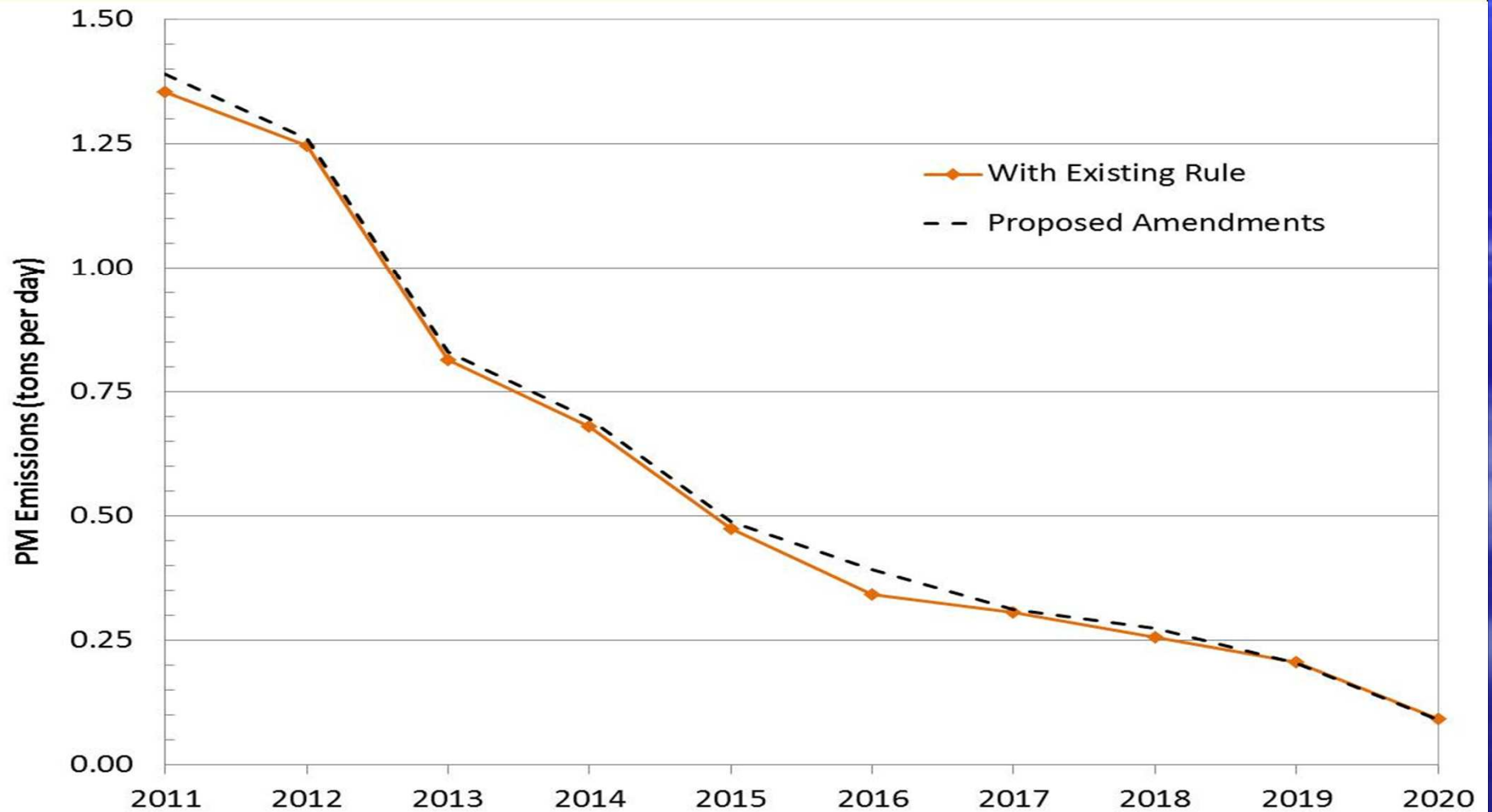
- **Repowering with a new replacement or a rebuilt engine**
 - **Effective model year determines when it must meet the in-use standards**
- **Noncompliant equipment**
 - **Flexibility for dealers to possess, sell, and move noncompliant units**
 - **Seller must disclose noncompliant status to buyer**
- **Requirements for lessors and lessees**
- **Engine rebuilders**
 - **Rebuild to a cleaner configuration**

Economic Impacts

2011 Amendments

Proposed Amendment	Statewide Regulatory Cost or (Savings)
ULETRU Extension for \leq MY 2003 Timely LETRU Compliance	(\$350,000)
Electronic Recordkeeping for Hybrid Electric/Electric Standby	(\$3.9 million)
Compliance Verification for Responsible Parties	\$11 million
Exemption of TRUs Used During Emergencies	(\$340,000)
Use of TRU Manufacture Year	(\$21 million)
Supplemental Labels and Registration Information	\$1.6 million
Net Total Cost or (Savings)	(\$13 million)

Emissions Impacts Proposed Amendments



Health Impacts Proposed Amendments

- **Small annual reductions deferred several years**
 - **Combined emissions impacts for all proposed amendments totals 0.21 tpd (2009 to 2018)**
- **Emission reductions continue**
- **Public health risk reductions at distribution centers continues**

Compliance Options

- **Several options for complying with standards**
- **Engine or unit replacement**
 - Chosen for 80% of units, readily available
- **Retrofits**
 - Chosen for 20% of units
 - **Availability of Level 3 retrofit (>25 hp MY 2004)**
 - One fully verified Level 3 retrofit available now
 - 2nd expected to be verified and available fall 2011
 - **Amendments allow Executive Officer to extend compliance deadline for availability, delivery, and installation delays**

Staff's Suggested Modifications to Proposed Amendments

- **OEMs provide disclosure document with units that are equipped with a flexibility engine**
- **Dealers notify the end-user that unit is equipped with a flexibility engine and provide the OEM's written disclosure**
- **Provide OEM the flexibility to develop alternatives to providing registration information documents with each unit**

Recommendation

- **Adopt the proposed amendments**
- **Direct staff to:**
 - Continue outreach efforts
 - Continue working with brokers, shippers, and receivers on compliance assistance tools
 - Administratively implement the Executive Officer extension authority for MY 2004, if necessary
 - Continue to work with electronic tracking system suppliers
 - Evaluate alternatives to enable TRUs rated at less than 25 hp to comply with ULETRU

