


Transport Refrigeration Unit (TRU)
Airborne Toxic Control Measure (ATCM)
2011 Amendments - Workshop #2

May 10, 2011
Byron Sher Auditorium, Sacramento, CA



California Environmental Protection Agency
 Air Resources Board

Outline

TRU Regulation

- Background Information
- Update
- Emissions Inventory
- Overview of rulemaking & Next Steps
- Contact Information
- Discussion/Q&A



Questions and Comments

TRU Regulation

During workshop, after presentation:

- Email questions and comments during workshop (today only) to:

auditorium@calepa.ca.gov

- Conference call-in line
Toll-free in US and Canada: 800-779-1505
Toll Number: 212-2687-1669
Passcode: 55390

After workshop:

- Call Rich Boyd (916-322-8285) or Rod Hill (916-327-5636)

Background

- TRU ATCM adopted February 2004
- U.S. EPA approve waiver January 16, 2009
- 2010 Amendments adopted November 18, 2010
- 2010 Amendments:
 - Adopted November 18, 2010
 - Effective March 7, 2011
- 2011 Amendments – Workshop March 29, 2011



TRU Regulation

Basic Requirements

- Registration in ARBER
 - All TRUs based in California
 - Voluntary for TRUs based outside California
- Operator Reports
 - Affects all California terminals where TRUs are assigned
- Meet in-use performance standards
 - Affects all TRUs that operate in California – including those based outside of California if they operate in California
 - Phased compliance schedule – seven years after engine model year

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TRU Regulation

Background Why Control TRU Emissions?

- Diesel PM is a Toxic Air Contaminant
- Emissions per unit are high
- Large numbers congregate at distribution centers, cold storage warehouses, ports, and rail yards
- High near-source public health risk
- Often near residences, schools, hospitals
- Contribute to overall exposure to diesel PM

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Update

- Outreach to affected stakeholders
- Emissions Inventory Workgroup meeting
- Mobile catering service survey
- Activity and fuel use survey
- Meetings with TRU manufacturers
- Eliminating low-use exemption
- Evaluating addition of three-day pass

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TRU & TRU Gen Set Emissions Inventory

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Transport Refrigeration Unit Baseline Emissions Inventory (Revision)

California Air Resources Board
May 10, 2011

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TRU Inventory Calculation

Emissions =

Population * Activity Level *
Engine Horsepower * Load factor * Emission Factors *
(Correction Factors)

The emissions presented at this workshop do not account for the impact of the current ATCM or the amendments that may be proposed later.

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New Data Sources

- ARBER Registry
- Industry surveys
 - Manufacturers
 - Users
- ACT Nationwide Trailer Sales Data
- Ward's Auto Database
- Engine certification data

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Current Population: In-state

- In-state population for 2011 slightly lower than projected in previous inventory
 - Previously based on manufacturer survey
 - Currently based on combination of ARBER registration data and enforcement reports
 - 3% non-compliance rate for registering

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2011 Population Instate TRUs

	<15 hp	15-25 hp	>25 hp	Total
Previous estimate (2003)	6,344	2,259	32,644	41,248
Current estimate (2011)	5,270	2,715	29,416	37,401

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2011 Population Instate Gensets

	<15 hp	15-25 hp	>25 hp	Total
Previous estimate (2003)	0	0	5,367	5,367
Current estimate (2011)	0	0	6,647	6,647

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Population: Out of State

- Previous daily out-of-state TRU population based on estimate for instate population and a study by Pacific Environmental Services
- Daily population of TRUs visiting from out-of-state 10% lower than previously estimated for calendar year 2011
- Out-of-state genset population estimate added to inventory

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2011 Population: Out-of-state

	Daily Population
TRU Previous Estimate (2003)	10,881
TRU Current Estimate (2011)	9,805
Genset Current Estimate (2011)	1,342

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Age Distribution

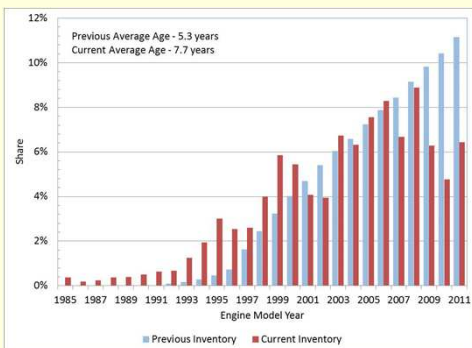
- For TRUs, current average age is higher than previously forecasted for calendar year 2011
 - Average age in previous inventory: 5.3 years
 - Average age in current inventory: 7.7 years
 - Due to the recession and the revised survival curve
- For gensets, average age is younger
 - Volatile distribution seen in reporting data
 - ARB conducting survey, discussing trends seen in genset model years with owner/operators and manufacturers

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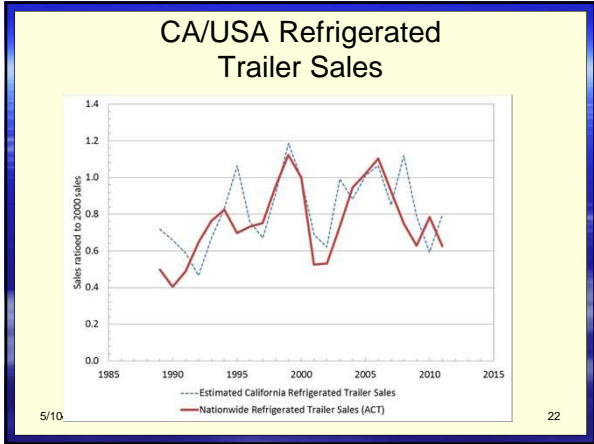
MY Distribution - TRUs

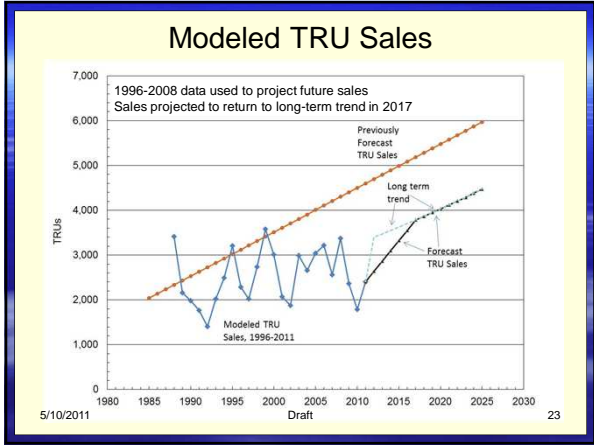


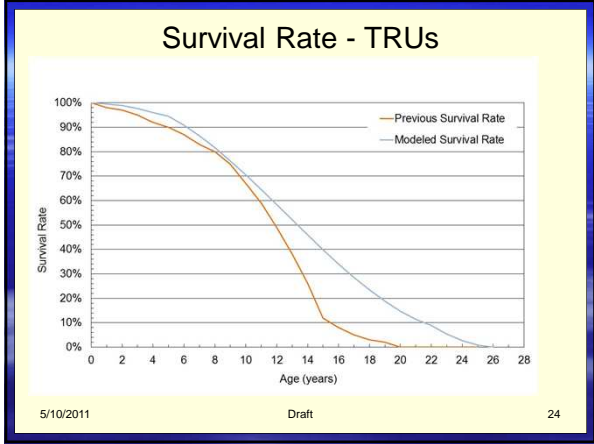
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Future Population - Gensets

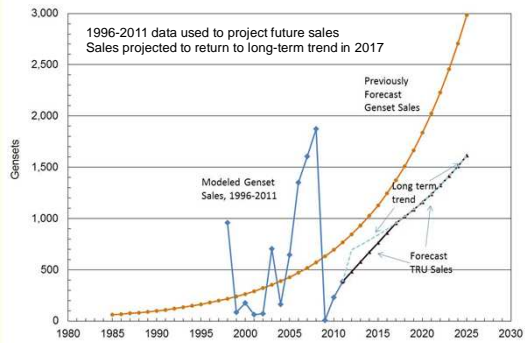
- Stakeholder feedback indicates gensets used differently from TRUs
 - Utilized shorter survival rate for gensets
 - Previous sales estimated from current MY distribution and survival curve
- Future sales projected from trend of previous sales

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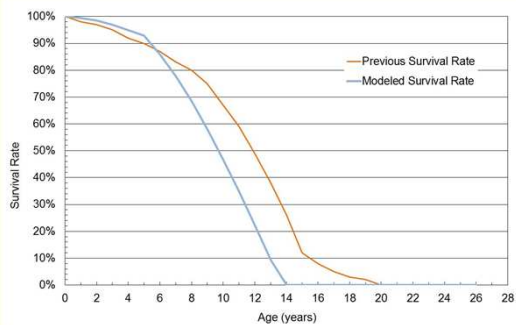
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Genset Sales



Survival Rate - Gensets



Activity

- Activity data estimated for trailers from survey conducted by CARB of larger fleets in 2006
 - Industry workgroup indicated that activity not likely to differ with fleet size or unit age
 - Industry workgroup indicated that activity per unit likely did not decrease with recession
- Activity for gensets assumed identical to that of trailers of similar size

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Total Activity* (hours per year)

	TRUs, <25 hp	TRUs, >25 hp	Gensets
Previous estimate (2003)	1,038	1,465	1,100
Current estimate (2011)	1,465	1,753	1,753

* Not all of this activity occurs in California

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Activity (share allotted to California)

	TRUs, neighboring states	TRUs, Nonneighboring states	TRUs, California
Previous estimate (2003)	100% of Daily	100% of Daily	100% of Annual
Current estimate (2011)	39.3% of Annual	9.9% of Annual	78% of Annual

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Engine Horsepower Load Factor

- Average engine size estimated from ARBER registry and industry information
- Average load factor estimated from industry data on engine performance curves
 - Certification data supports current load factors
 - More information always helpful

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Average Engine Horsepower (Previous Inventory Categories)

	TRUs, <15 hp	TRUs, >15 hp, <25 hp	TRUs, >25 hp	Gensets, >25hp
Previous estimate (2003)	10 hp (15%)	17 hp (5%)	34 hp (80%)	34 hp (100%)
Current estimate (2011)	13 hp (14%)	17 hp (7%)	34 hp (79%)	31 hp (100%)

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Average Engine Horsepower (Current Inventory Categories)

	TRUs, <11 hp	TRUs, >11 hp, <25 hp	TRUs, >25 hp	Gensets, >25hp
Current estimate (2011)	9 hp (0.7%)	14 hp (20.6%)	34 hp (78.7%)	31 hp (100%)

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Load Factor

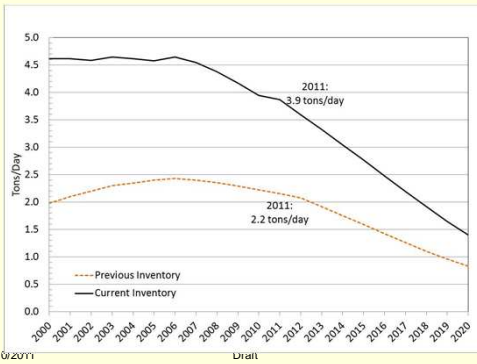
	TRUs, <11 hp	TRUs, >11 hp, <25 hp	TRUs, >25 hp	Gensets, >25hp
Previous estimate (2003)	0.64	0.64	0.53	0.45
Current estimate (2011)	0.64	0.64	0.53	0.53

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Draft Baseline PM Emissions

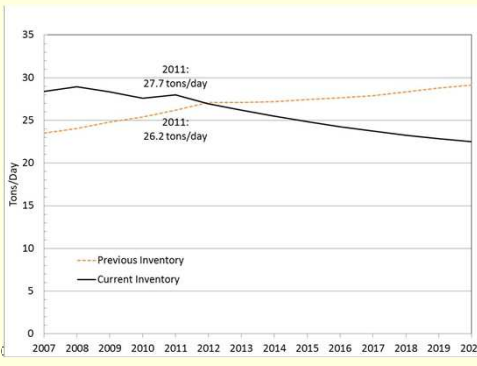


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Draft Baseline NOx Emissions



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Summary of Changes

- Calendar Year 2011 Population Estimates
 - Truck/Trailer 9% lower, Gensets 14% lower
 - Average age of population 2.4 years older
- Activity Estimates
 - Truck/Trailer activity 20% higher, Gensets 80% higher
 - Portion of population activity allocated outside CA (22%)
 - Overall CA activity per unit similar to previous inventory
- Emission Factors
 - Average emission factors increased due to fleet age
 - Emission factors adjusted to reflect OFFROAD2007
 - Tier 4 emission factors directly accounted for

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Summary

- Emissions for PM currently estimated 77% higher for 2011 than previously estimated
- Emissions for PM currently estimated 68% higher for 2020 than previously estimated
- Emissions for NOx similar to what was estimated previously for 2011
 - Emission standards more consistent

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Economic Analysis

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Economic Analysis

- Inputs and assumptions
 - TRU populations from emissions inventory
 - Updated cost of compliance options
 - Weighted average for compliance methods across populations from ARBER
- Evaluate costs for potential amendments and alternatives
- Expressed in 2011 dollars

Overview of Rulemaking Process

- Workshops - informal comments
 - March 29, 2011 - Draft concepts
 - May 10, 2011 – Emissions Inventory
 - June 16, 2011 – Draft language, emissions & public health risk
- 45-Day Public Notice of Rulemaking
 - Formal comment period begins
Fall 2011
- Board Public Hearing – Fall 2011

TRU Regulation Contact Information

- TRU website: <http://www.arb.ca.gov/diesel/tru/tru.htm>
- TRU List Serve: <http://www.arb.ca.gov/listserv/tru.htm>
- TRU Help Line: 1-888-878-2826 (1-888-TRU-ATCM)
- Comments after workshop:
Rich Boyd (rboyd@arb.ca.gov, 916-322-8285) or
Rod Hill (rhill@arb.ca.gov, 916-327-5636)



Proposed Revision Concepts

Questions and Comments

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